



**SEW**  
**EURODRIVE**

# Operating Instructions



**MOVIDRIVE® MDX60B/61B**





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# 1 General information

## 1.1 About this documentation

**The current version of the documentation is the original.**

This documentation is an integral part of the product. The documentation is written for all employees who assemble, install, start up, and service this product.

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

## 1.2 Structure of the safety notes

### 1.2.1 Meaning of signal words

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

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

### 1.2.2 Structure of section-related safety notes

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

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



#### SIGNAL WORD

Type and source of hazard.






Possible consequence(s) if disregarded.

- Measure(s) to prevent the hazard.

### Meaning of the hazard symbols

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

| Hazard symbol | Meaning        |
|---------------|----------------|
|               | General hazard |

| Hazard symbol   | Meaning                                 |
|---|---|
|  | Warning of dangerous electrical voltage |
|  | Warning of hot surfaces                 |
|  | Warning of risk of crushing             |
|  | Warning of suspended load               |
|  | Warning of automatic restart            |

### 1.2.3 Structure of embedded safety notes

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

This is the formal structure of an embedded safety note:

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

## 1.3 Rights to claim under limited warranty

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

## 1.4 Exclusion of liability

Read the information in this documentation, otherwise safe operation is impossible. You must comply with the information contained in this documentation to achieve the specified product characteristics and performance features. SEW-EURODRIVE assumes no liability for injury to persons or damage to equipment or property resulting from non-observance of these operating instructions. In such cases, SEW-EURODRIVE assumes no liability for defects.

## 1.5 Other applicable documentation

Observe the corresponding documentation for all further components.



## **1.6 Product names and trademarks**

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

## **1.7 Copyright notice**

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## 2 Safety notes

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

### 2.1 General

Never install damaged products or take them into operation. Submit a complaint to the shipping company immediately in the event of damage.

During operation, inverters can have live, bare and movable or rotating parts as well as hot surfaces, depending on their degree of protection.

Removing covers without authorization, improper use, or incorrect installation and operation may result in severe injuries to persons or damage to machinery.

Refer to the documentation for additional information.

### 2.2 Target group

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

Skilled persons (electrically) in the context of these basic safety notes are all persons familiar with the installation, assembly, startup and operation of the product who possess the necessary qualifications.

All persons involved in any other work, such as transportation, storage, operation and waste disposal, must be trained appropriately.

## 2.3 Designated use

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

In case of installation in machines, startup of the inverters (meaning the start of designated use) is prohibited until it is determined that the machine meets the requirements stipulated in the Machinery Directive 2006/42/EC; EN 60204 must be observed.

Startup (i.e. the start of designated use) is only permitted under observance of the EMC Directive (2014/30/EU).

The drive inverters meet the requirements stipulated in low voltage guideline 2014/35/EU. The harmonized standards of the EN 61800-5-1/DIN VDE T105 series in connection with EN 60439-1/VDE 0660 part 500 and EN 60146/VDE 0558 are applied to these inverters.

Adhere to the technical data and information on the connection requirements as provided on the nameplate and in the documentation.

### 2.3.1 Safety Functions

MOVIDRIVE® MDX60/61B drive inverters may not perform safety functions without higher-level safety systems. Use higher-level safety systems to ensure protection of equipment and personnel.

For safety applications, observe the specifications in the "MOVIDRIVE® MDX60B/61B Functional Safety" manual.

## 2.4 Transportation and storage

Observe the notes on transportation, storage and proper handling. Observe the climatic conditions as stated in the section "General technical data".

## 2.5 Setup

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

Protect the drive inverters from excessive strain. Ensure that elements are not deformed and/or insulation spaces are maintained, particularly during transportation. Avoid contact with electronic elements and contacts.

Drive inverters contain components that can be damaged by electrostatic energy and improper handling. Prevent mechanical damage or destruction of electric components (may pose health risk).

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

- Use in potentially explosive atmospheres.
- Use in areas exposed to harmful oils, acids, gases, vapors, dust, radiation, etc.
- Use in non-stationary applications which are subject to mechanical vibration and impact loads in excess of the requirements in EN 61800-5-1.



## 2.6 Electrical connection

Observe the applicable national accident prevention guidelines when working on live inverters (e.g. BGV A3).

Electrical installation must be carried out in compliance with pertinent regulations (e.g. cable cross sections, fusing, protective conductor connection). For any additional information, refer to the applicable documentation.



### ▲ WARNING

Electric shock due to charged capacitors. Dangerous voltage levels may still be present inside the device and at the terminals up to 10 minutes after disconnection from the power supply.

Severe or fatal injuries.

- Wait for 10 minutes after the frequency inverter has been separated from the voltage supply. Make sure that the device is de-energized. Only then must you commence any work on the device.
- Observe the corresponding information signs on the frequency inverter.

You will find notes on EMC compliant installation, such as shielding, grounding, arrangement of filters and routing of lines, in the documentation of the drive inverters. Always observe these notes even with inverters bearing the CE marking. The manufacturer of the system or machine is responsible for maintaining the limits established by EMC legislation.

Preventive measures and protection devices must correspond to the regulations in force (e.g. EN 60204 or EN 61800-5-1).

Required preventive measure: Grounding the device.

MOVIDRIVE® B in size 7 is equipped with an additional indicator LED under the lower front cover. If the indicator LED is lit up, DC link voltage is present. Do not touch power connections. Check that there is no voltage present before touching power connections even if the LED display indicates that there is no voltage.

## 2.7 Protective separation

The device meets all requirements for reliable isolation of power and electronics connections in accordance with EN 61800-5-1. All connected circuits must also satisfy the requirements for safe disconnection to ensure reliable isolation.

## 2.8 Operation

Systems into which the drive inverters are installed must be equipped with additional monitoring and protection devices, if necessary, according to applicable safety regulations; e.g. the German law governing technical equipment (Gesetz über technische Arbeitsmittel), accident prevention regulations, etc. The operating software may be used to make changes to the drive inverter.

**▲ WARNING**

Electric shock due to charged capacitors. Dangerous voltage levels may still be present inside the device and at the terminals up to 10 minutes after disconnection from the power supply.

Severe or fatal injuries.

- Wait for 10 minutes after the frequency inverter has been separated from the voltage supply. Make sure that the device is de-energized. Only then must you commence any work on the device.
- Observe the corresponding information signs on the frequency inverter.

Keep all covers and doors closed during operation.

The fact that the status LED and other display elements (such as the display LED on size 7 units) are no longer illuminated does not indicate that the device has been disconnected from the power supply and no longer carries any voltage.

Check that there is no voltage present before touching power connections even if the LED display indicates that there is no voltage.

Mechanical blocking or internal safety functions of the device can cause a motor standstill. Eliminating the cause of the problem or performing a reset may result in the drive re-starting automatically. If, for safety reasons, this is not permitted for the drive-controlled machine, disconnect the device from the supply system before you start troubleshooting.

# 3

## Device structure

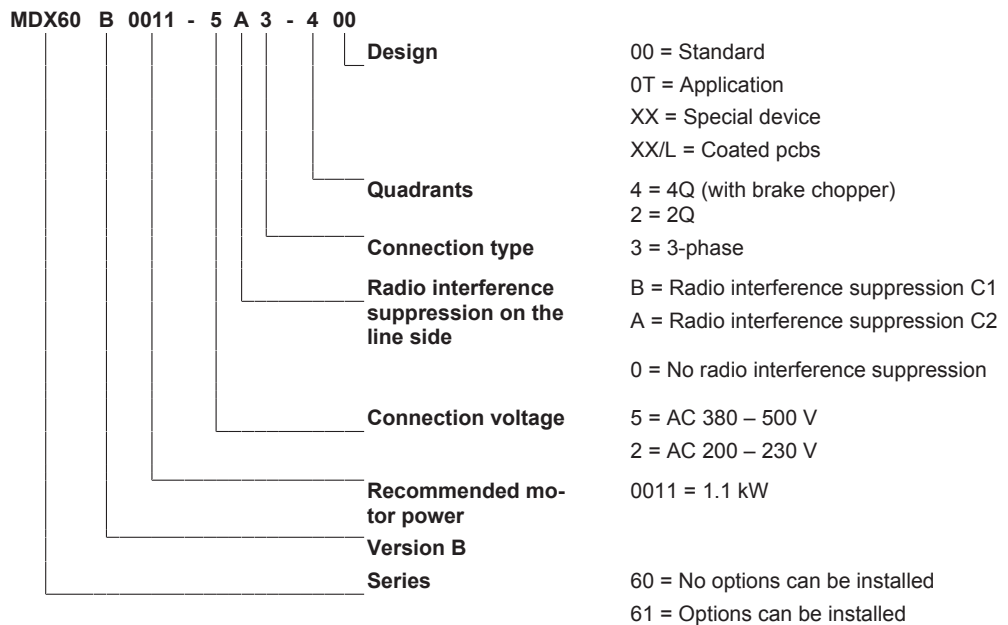
Type designation, nameplates and scope of delivery

### 3 Device structure

#### 3.1 Type designation, nameplates and scope of delivery

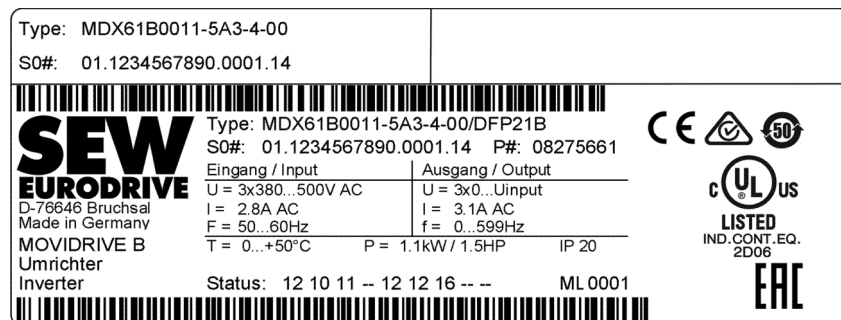
##### 3.1.1 Type designation

The following diagram shows the type designation of the MOVIDRIVE® MDX60/61B inverter:



##### 3.1.2 System nameplate size 0

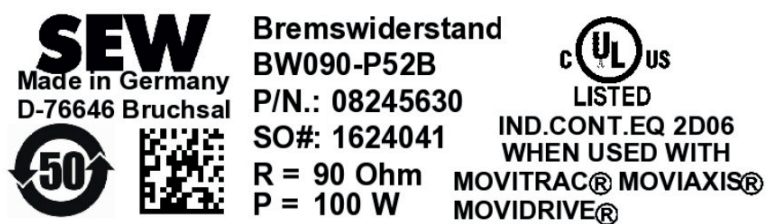
The **system nameplate** for MDX60B/61B size 0 is attached to the side of the device.



27021599563947147

##### 3.1.3 Nameplate for BW090-P52B braking resistor

The BW090-P52B braking resistor is only available for MDX60B/61B size 0.



9007201054468235

23534850/EN – 11/2017



3.1.4 System nameplate for sizes 1 – 7

The system nameplate is attached to MDX61B.. as follows:

- On the side of the device in size 1 – 6
- On the upper front cover of size 7

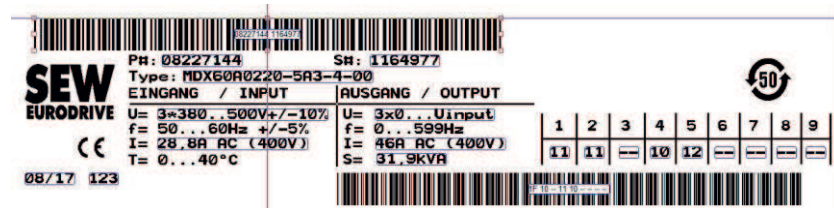


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3.1.5 Power section nameplate for sizes 1 – 7

The power section nameplate is attached to MDX61B.. as follows:

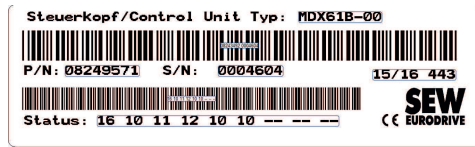
- On the side of the device in size 1 – 2
- On the front of the device in size 3 – 6
- Top left inside the size 7 device



9007201054499979

### 3.1.6 Control unit nameplate for sizes 1 – 7

The control unit nameplate is attached to the front of MDX61B.. size 1 – 7.



9007201054503051

### 3.1.7 Option card nameplate



9007201054506123

## 3.2 Scope of Delivery


### 3.2.1 Sizes 0 – 7

- Connector housing for signal terminals (X10 – X17), connected.
- Plug housing for the power terminals (X1 – X4), connected.
- Pluggable memory card, connected

### 3.2.2 Size 0

- 1 set of shield clamps for power cable and signal cable, not installed. The set of shield clamps comprises:
  - 2 shield clamps for power cable (2 contact clips each)
  - 1 shield clamp for signal cable (1 contact clip) for MDX60B
  - 1 shield clamp for signal cable (2 contact clips) for MDX61B
  - 6 contact clips
  - 6 screws for attaching the contact clips
  - 3 screws for attaching the contact clips to the device

### 3.2.3 Sizes 1 – 7

- 1 set of shield clamps for signal cable, not installed. The set of shield clamps comprises:
  - 1 shield clamp for signal cable (1 contact clip)
  - 2 contact clips
  - 2 screws for attaching the contact clips
  - 1 screw for attaching the shield clamp to the device
- Only for size 6: Carrying bar and 2 split pins
- For size 7, you can order the connection set DLA11B (part no. 18223125) with connection screws and 3 PE terminals.
- Sizes 2S and 2:
  - Shield terminal of the power connection ("Shield clamp for power section, sizes 2S and 2" (→  85))

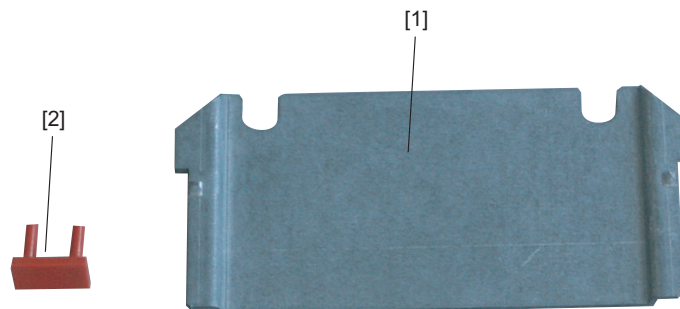
### 3.2.4 Size 2S

- Accessories set, not installed. The accessories set (→ Following illustration) comprises:
  - 2 mounting feet [1] to be plugged into the heat sink
  - 2 touch guards [2] to be fastened to terminals X4: -U<sub>z</sub>/+U<sub>z</sub> and -X3:-R(8)/+R(9).

Degree of protection IP20 is achieved as soon as one of the following conditions is fulfilled:

- Touch guard [2] mounted to X3/X4 (→ section "Touch guard")
- An adequately prefabricated cable is connected to X3/X4

If neither of the two conditions is fulfilled, the degree of protection is IP10.



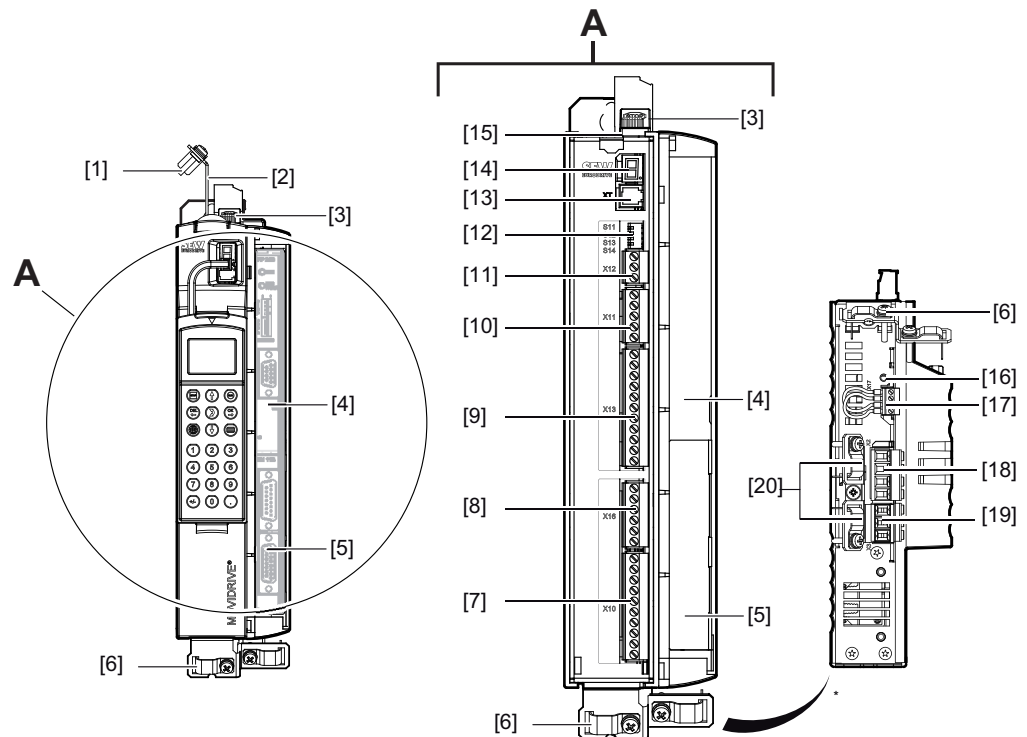
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# 3 Device structure

Size 0

## 3.3 Size 0

MDX60/61B-5A3 (AC 400/500 V devices): 0005/0008/0011/0014



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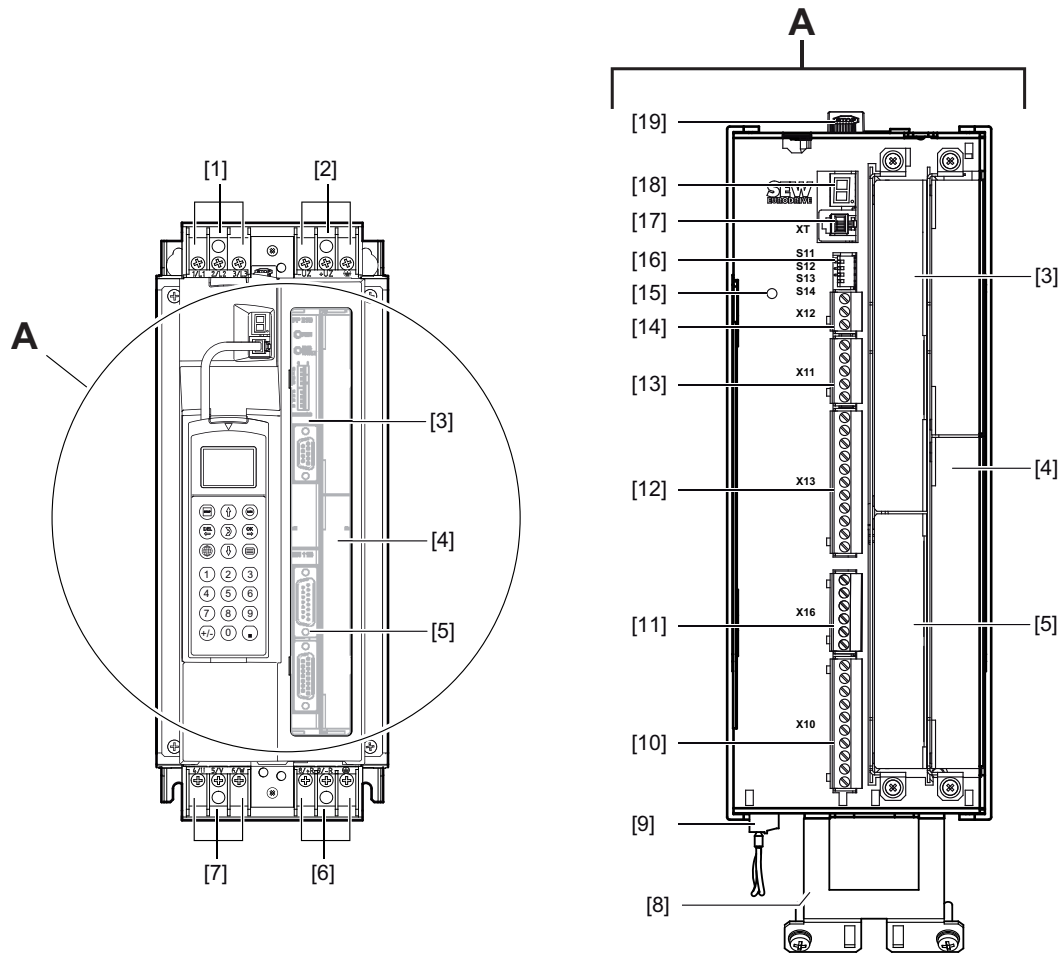
\*View of the bottom of the device

- [1] Power shield clamp for supply system connection and DC link connection
- [2] X4: Connection for DC link coupling  $-U_z + U_z$  and PE connection, separable
- [3] X1: Power supply connection L1, L2, L3 and PE connection, separable
- [4] Only with MDX61B: Fieldbus slot
- [5] Only with MDX61B: Encoder slot
- [6] Shield clamp for signal cables MDX61B size 0
- [7] X10: Signal terminal strip for digital outputs and TF/TH input
- [8] X16: Signal terminal strip digital inputs and outputs
- [9] X13: Signal terminal strip terminal strip for digital inputs and RS485 interface
- [10] X11: Signal terminal strip for setpoint input AI1 and 10 V reference voltage
- [11] X12: Signal terminal strip system bus (SBus)
- [12] DIP switches S11 – S14
- [13] XT: Slot for DBG60B keypad or USB11A/UWS21B serial interface
- [14] 7-segment display
- [15] Memory card
- [16] Grounding screw M4 × 14
- [17] X17: Signal terminal block for safety contacts of drive safety function STO
- [18] X2: Motor connection U, V, W and PE connection, separable
- [19] X3: Braking resistor connection +R / -R and PE connection, separable
- [20] Power shield clamp for motor connection and braking resistor connection

## 3.4 Size 1

MDX61B-5A3 (AC 400/500 V devices): 0015/0022/0030/0040

MDX61B-2A3 (AC 230 V devices): 0015/0022/0037



2205808267

- [1] X1: Power supply connection 1/L1, 2/L2, 3/L3, separable
- [2] X4: Connection for DC link coupling  $-U_z +U_z$ , separable
- [3] Fieldbus slot
- [4] Expansion slot
- [5] Encoder slot
- [6] X3: Braking resistor connection 8/+R, 9/-R and PE connection, separable
- [7] X2: Motor connection 4/U, 5/V, 6/W and PE connection, separable
- [8] Shield clamp for signal cables and PE connection
- [9] X17: Signal terminal block for safety contacts of drive safety function STO
- [10] X10: Signal terminal strip for digital outputs and TF/TH input
- [11] X16: Signal terminal strip digital inputs and outputs
- [12] X13: Signal terminal strip terminal strip for digital inputs and RS485 interface
- [13] X11: Signal terminal strip for setpoint input AI1 and 10 V reference voltage
- [14] X12: Signal terminal strip system bus (SBus)

[15] Grounding screw M4 × 14

[16] DIP switches S11 – S14

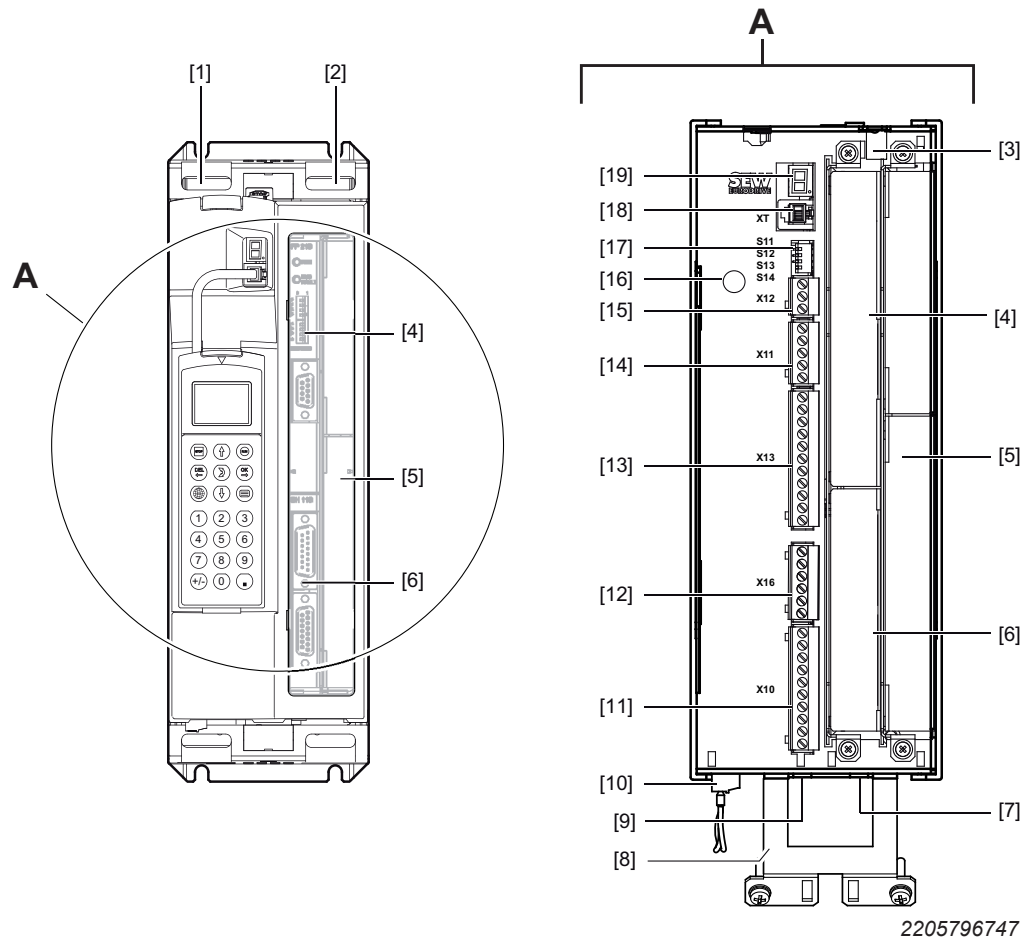
[17] XT: Slot for DBG60B keypad or USB11A/UWS21B serial interface

[18] 7-segment display

[19] Memory card

## 3.5 Size 2S

MDX61B-5A3 (AC 400/500 V devices): 0055/0075



2205796747

- [1] X1: Line connection 1/L1, 2/L2, 3/L3
- [2] X4: Connection for DC link coupling  $-U_z$   $+U_z$  and PE connection
- [3] Memory card
- [4] Fieldbus slot
- [5] Expansion slot
- [6] Encoder slot
- [7] X3: Braking resistor connection 8/+R, 9/-R and PE connection
- [8] Shield clamp for signal cables and PE connection
- [9] X2: Motor connection 4/U, 5/V, 6/W
- [10] X17: Signal terminal block for safety contacts of drive safety function STO
- [11] X10: Signal terminal strip for digital outputs and TF/TH input
- [12] X16: Signal terminal strip digital inputs and outputs
- [13] X13: Signal terminal strip terminal strip for digital inputs and RS485 interface
- [14] X11: Signal terminal strip for setpoint input AI1 and 10 V reference voltage
- [15] X12: Signal terminal strip system bus (SBus)

[16] Grounding screw M4 × 14

[17] DIP switches S11 – S14

[18] XT: Slot for DBG60B keypad or USB11A/UWS21B serial interface

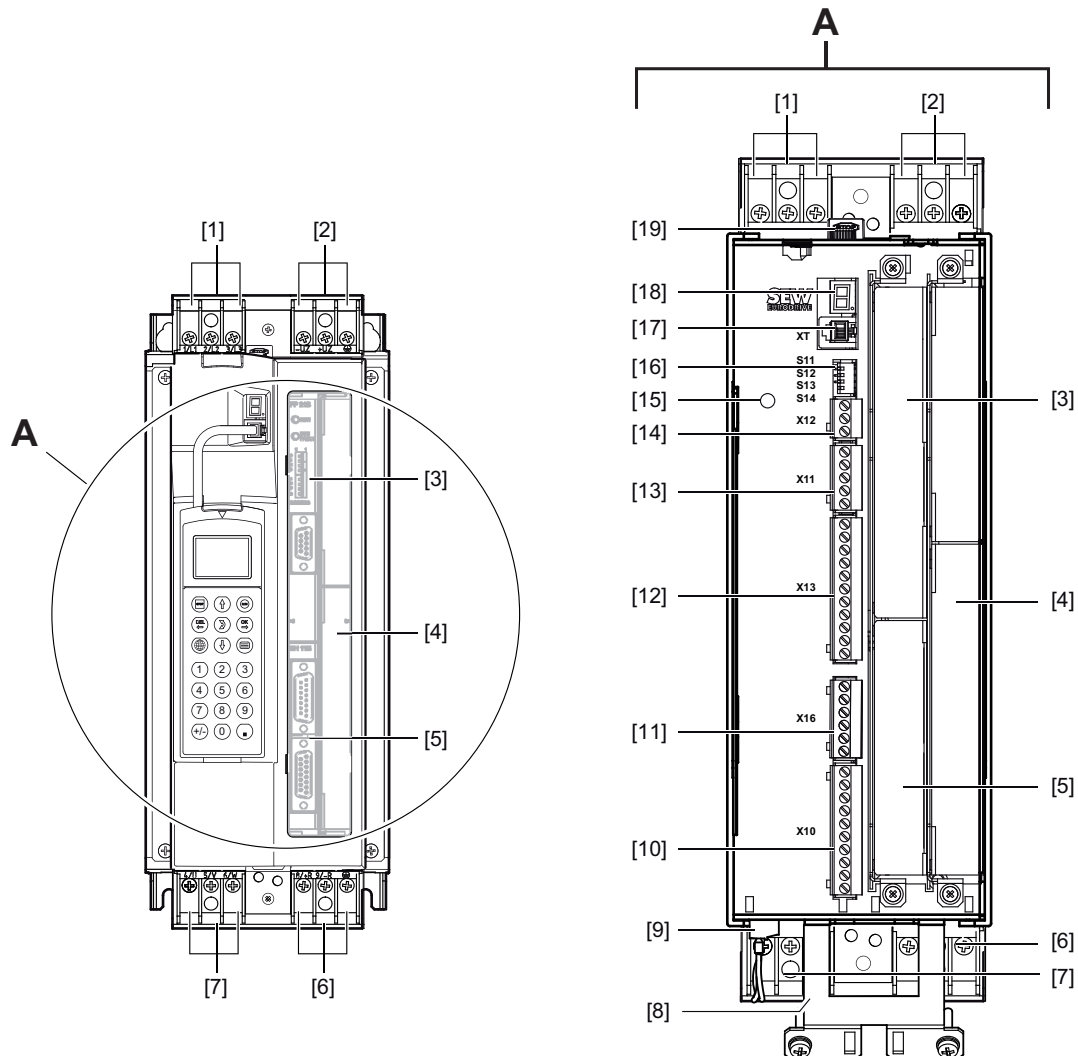
[19] 7-segment display



## 3.6 Size 2

MDX61B-5A3 (AC 400/500 V devices): 0110

MDX61B-2A3 (AC 230 V devices): 0055/0075



2205794827

[1] X1: Line connection 1/L1, 2/L2, 3/L3

[2] X4: Connection for DC link coupling  $-U_z$   $+U_z$  and PE connection

[3] Fieldbus slot

[4] Expansion slot

[5] Encoder slot

[6] X3: Braking resistor connection 8/+R, 9/-R and PE connection

[7] X2: Motor connection 4/U, 5/V, 6/W

[8] Shield clamp for signal cables and PE connection

[9] X17: Signal terminal block for safety contacts of drive safety function STO

[10] X10: Signal terminal strip for digital outputs and TF/TH input

[11] X16: Signal terminal strip digital inputs and outputs

[12] X13: Signal terminal strip terminal strip for digital inputs and RS485 interface

[13] X11: Signal terminal strip for setpoint input AI1 and 10 V reference voltage

[14] X12: Signal terminal strip system bus (SBus)

[15] Grounding screw M4 × 14

[16] DIP switches S11 – S14

[17] XT: Slot for DBG60B keypad or USB/11AUWS21B serial interface

[18] 7-segment display

[19] Memory card

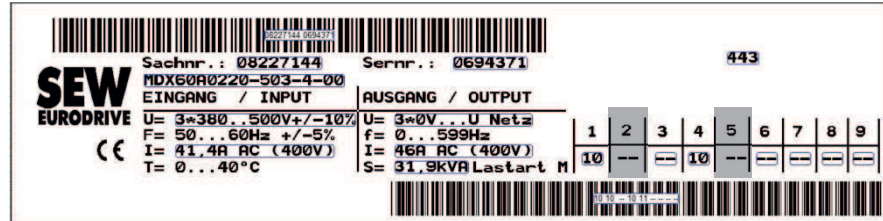
3.7 Size 3

Size 3 is available in 2 hardware designs that can be distinguished using the nameplate.

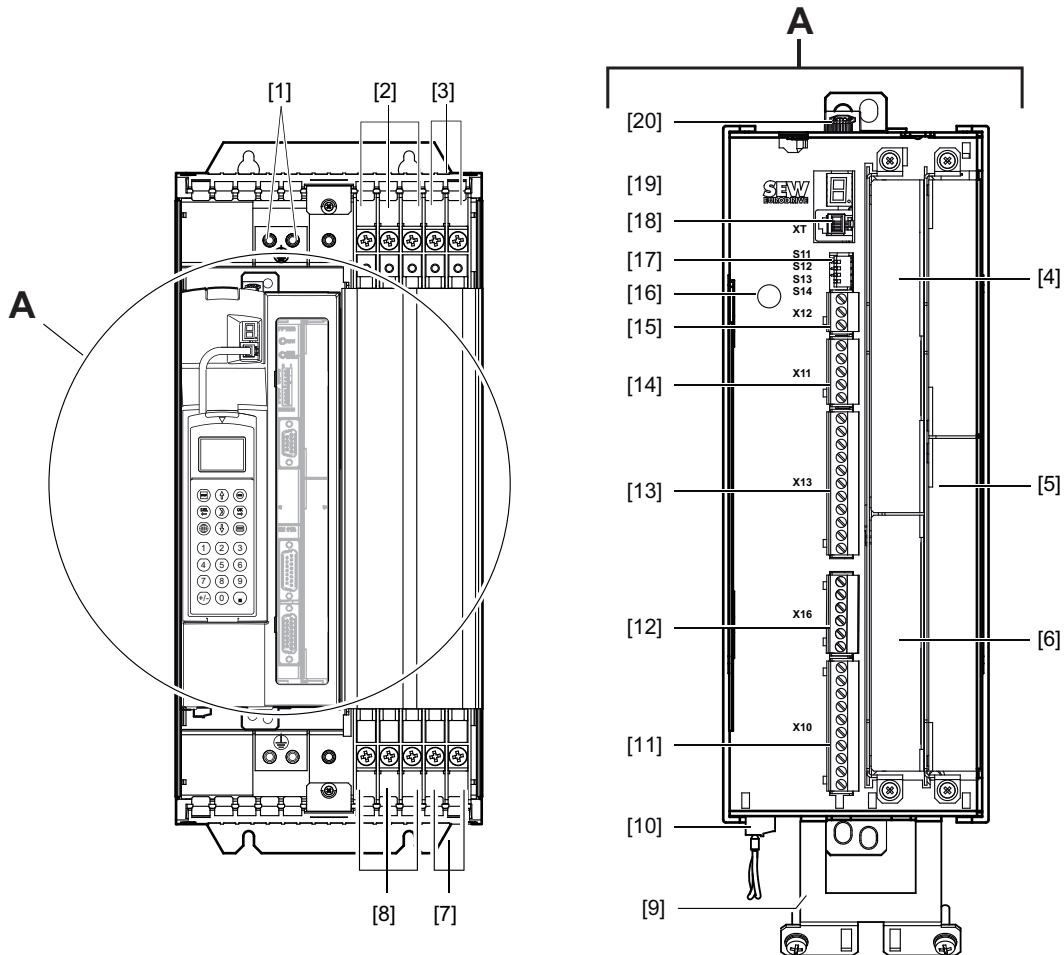
MDX61B-503 (AC 400/500 V devices): 0150/0220/0300

MDX61B-203 (AC 230 V devices): 0110/0150

The version before the redesign does not have entries in the status fields 2 and 5 of the nameplate.



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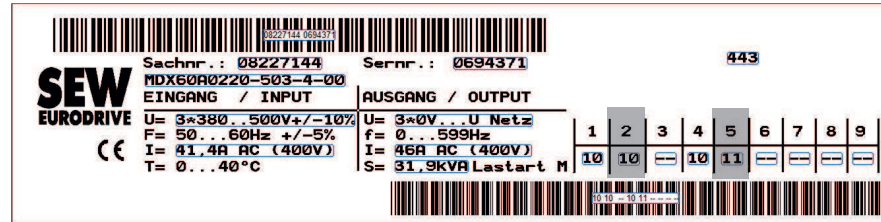
- [1] PE connection
- [2] X1: Line connection 1/L1, 2/L2, 3/L3
- [3] X4: Connection for DC link coupling -U<sub>z</sub> +U<sub>z</sub>
- [4] Fieldbus slot

- [5] Expansion slot
- [6] Encoder slot
- [7] X3: Braking resistor connection 8/+R, 9/-R
- [8] X2: Motor connection 4/U, 5/V, 6/W
- [9] Shield clamp for signal cables and PE connection
- [10] X17: Signal terminal block for safety contacts of drive safety function STO
- [11] X10: Signal terminal strip for digital outputs and TF/TH input
- [12] X16: Signal terminal strip digital inputs and outputs
- [13] X13: Signal terminal strip terminal strip for digital inputs and RS485 interface
- [14] X11: Signal terminal strip for setpoint input AI1 and 10 V reference voltage
- [15] X12: Signal terminal strip system bus (SBus)
- [16] Grounding screw M4 × 14
- [17] DIP switches S11 – S14
- [18] XT: Slot for DBG60B keypad or USB11A/UWS21B serial interface
- [19] 7-segment display
- [20] Memory card

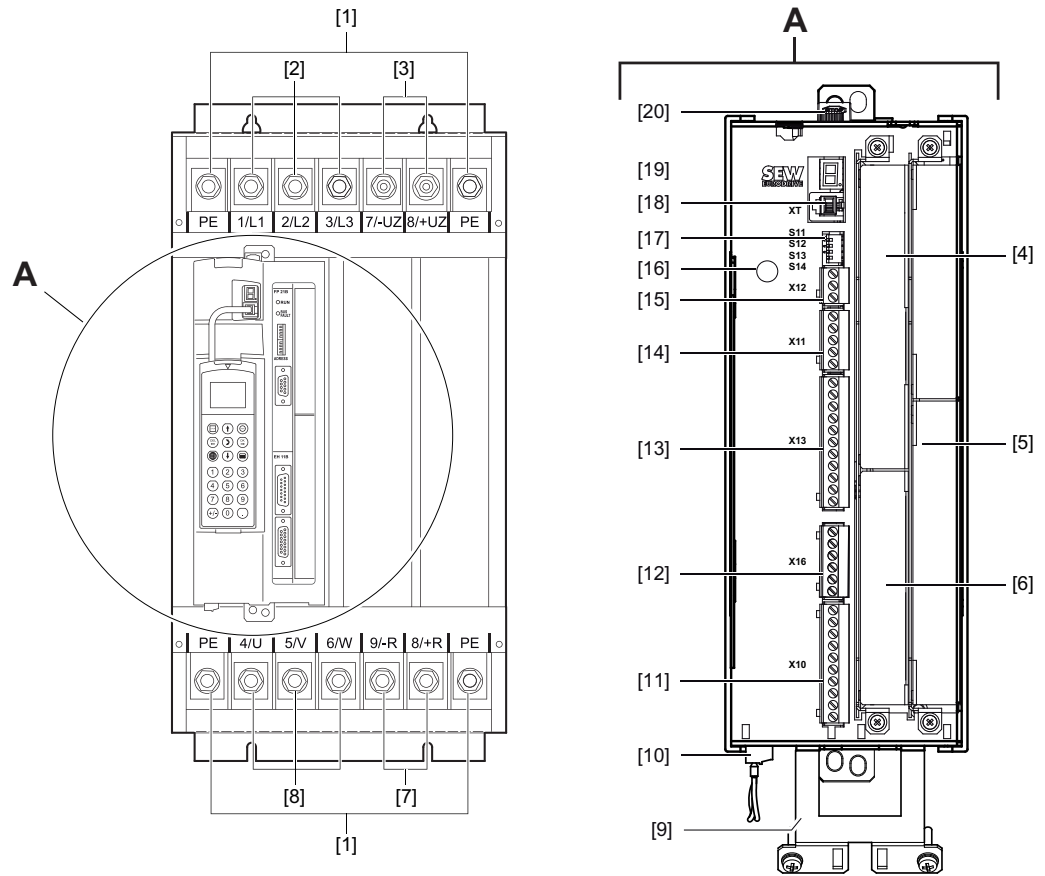
MDX61B-503 (AC 400/500 V units): 0150/0220/0300

MDX61B-203 (AC 230 V units): 0110/0150

The redesigned version has entries in the status fields **2** and **5** of the nameplate



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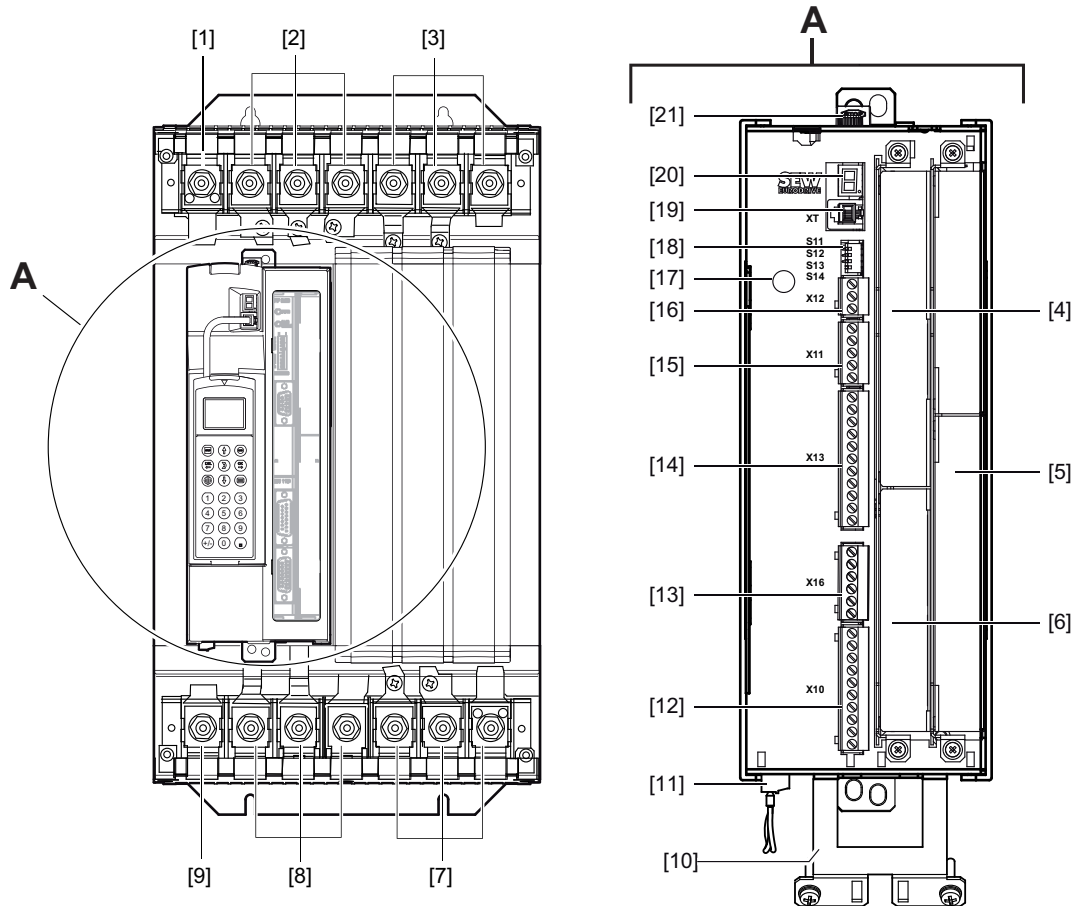
- [1] PE connection
- [2] X1: Line connection 1/L1, 2/L2, 3/L3
- [3] X4: Connection for DC link coupling  $-U_z +U_z$
- [4] Fieldbus slot
- [5] Expansion slot
- [6] Encoder slot
- [7] X3: Braking resistor connection 8/+R, 9/-R
- [8] X2: Motor connection 4/U, 5/V, 6/W
- [9] Shield clamp for signal cables and PE connection
- [10] X17: Signal terminal block for safety contacts of drive safety function STO
- [11] X10: Signal terminal strip for digital outputs and TF/TH input
- [12] X16: Signal terminal strip digital inputs and outputs
- [13] X13: Signal terminal strip terminal strip for digital inputs and RS485 interface
- [14] X11: Signal terminal strip for setpoint input AI1 and 10 V reference voltage
- [15] X12: Signal terminal strip system bus (SBus)
- [16] Grounding screw M4 × 14
- [17] DIP switches S11 – S14
- [18] XT: Slot for DBG60B keypad or USB11A/UWS21B serial interface
- [19] 7-segment display

[20] Memory card

## 3.8 Size 4

MDX61B-503 (AC 400/500 V devices): 0370/0450

MDX61B-203 (AC 230 V devices): 0220/0300



2205800587

- [1] PE connection
- [2] X1: Line connection 1/L1, 2/L2, 3/L3
- [3] X4: Connection for DC link coupling  $-U_z$   $+U_z$  and PE connection
- [4] Fieldbus slot
- [5] Expansion slot
- [6] Encoder slot
- [7] X3: Braking resistor connection 8/+R, 9/-R and PE connection
- [8] X2: Motor connection 4/U, 5/V, 6/W
- [9] PE connection
- [10] Shield clamp for signal cables
- [11] X17: Signal terminal block for safety contacts of drive safety function STO
- [12] X10: Signal terminal strip for digital outputs and TF/TH input
- [13] X16: Signal terminal strip digital inputs and outputs
- [14] X13: Signal terminal strip terminal strip for digital inputs and RS485 interface
- [15] X11: Signal terminal strip for setpoint input AI1 and 10 V reference voltage

[16] X12: Signal terminal strip system bus (SBus)

[17] Grounding screw M4 × 14

[18] DIP switches S11 – S14

[19] XT: Slot for DBG60B keypad or USB11A/UWS21B serial interface

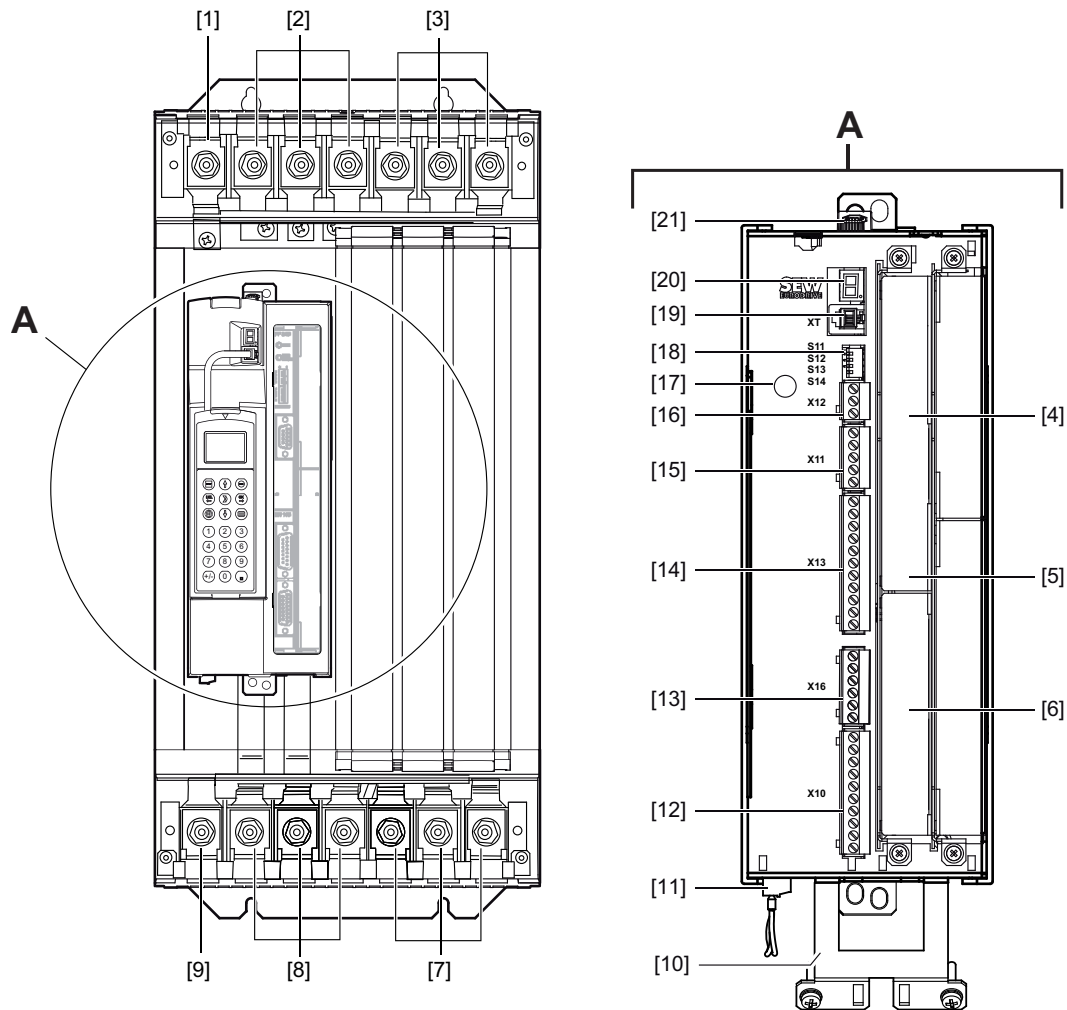
[20] 7-segment display

[21] Memory card



## 3.9 Size 5

MDX61B-503 (AC 400/500 V devices): 0550/0750



2205802507

- [1] PE connection
- [2] X1: Line connection 1/L1, 2/L2, 3/L3
- [3] X4: Connection for DC link coupling  $-U_z +U_z$  and PE connection
- [4] Fieldbus slot
- [5] Expansion slot
- [6] Encoder slot
- [7] X3: Braking resistor connection 8/+R, 9/-R and PE connection
- [8] X2: Motor connection 4/U, 5/V, 6/W
- [9] PE connection
- [10] Shield clamp for signal cables
- [11] X17: Signal terminal block for safety contacts of drive safety function STO
- [12] X10: Signal terminal strip for digital outputs and TF/TH input
- [13] X16: Signal terminal strip digital inputs and outputs

[14] X13: Signal terminal strip terminal strip for digital inputs and RS485 interface

[15] X11: Signal terminal strip for setpoint input AI1 and 10 V reference voltage

[16] X12: Signal terminal strip system bus (SBus)

[17] Grounding screw M4 × 14

[18] DIP switches S11 – S14

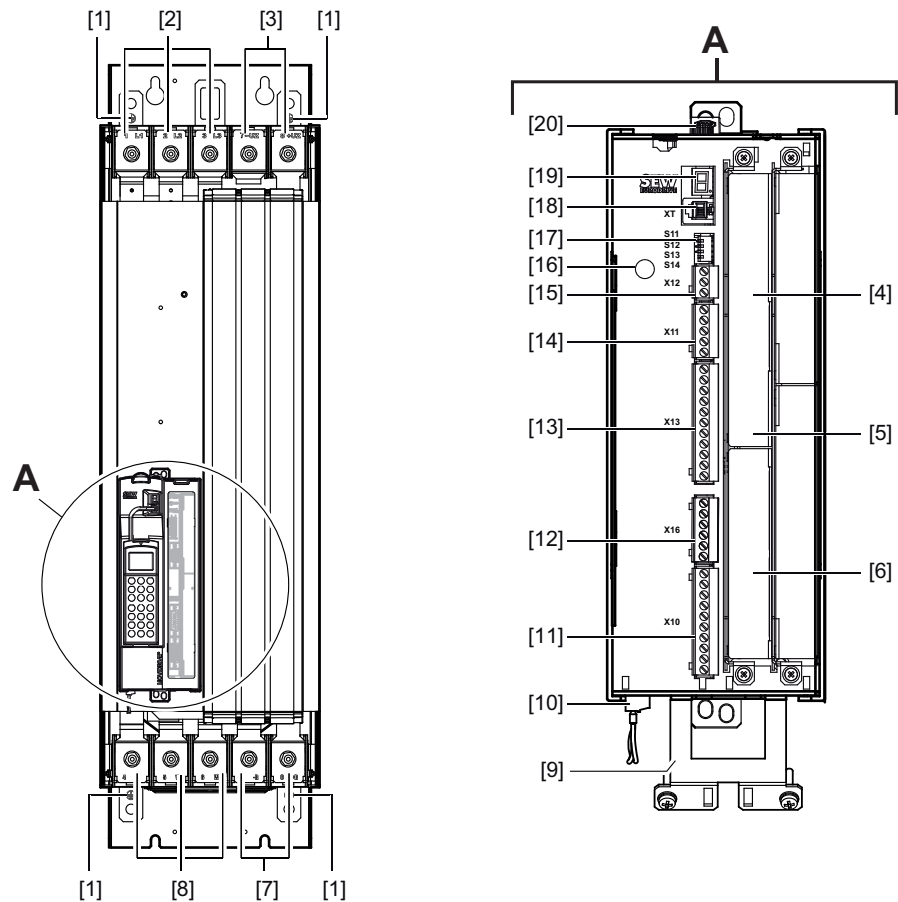
[19] XT: Slot for DBG60B keypad or USB11A/UWS21B serial interface

[20] 7-segment display

[21] Memory card

## 3.10 Size 6

MDX61B-503 (AC 400/500 V devices): 0900/1100/1320



2205804427

- [1] PE connection
- [2] X1: Line connection 1/L1, 2/L2, 3/L3
- [3] X4: Connection for DC link coupling  $-U_z +U_z$
- [4] Fieldbus slot
- [5] Expansion slot
- [6] Encoder slot
- [7] X3: Braking resistor connection 8/+R, 9/-R
- [8] X2: Motor connection 4/U, 5/V, 6/W and PE connection
- [9] Shield clamp for signal cables
- [10] X17: Signal terminal block for safety contacts of drive safety function STO
- [11] X10: Signal terminal strip for digital outputs and TF/TH input
- [12] X16: Signal terminal strip digital inputs and outputs
- [13] X13: Signal terminal strip terminal strip for digital inputs and RS485 interface
- [14] X11: Signal terminal strip for setpoint input AI1 and 10 V reference voltage
- [15] X12: Signal terminal strip system bus (SBus)
- [16] Threaded hole for grounding screw M4 × 8 or M4 × 10

[17] DIP switches S11 – S14

[18] XT: Slot for DBG60B keypad or USB11A/UWS21B serial interface

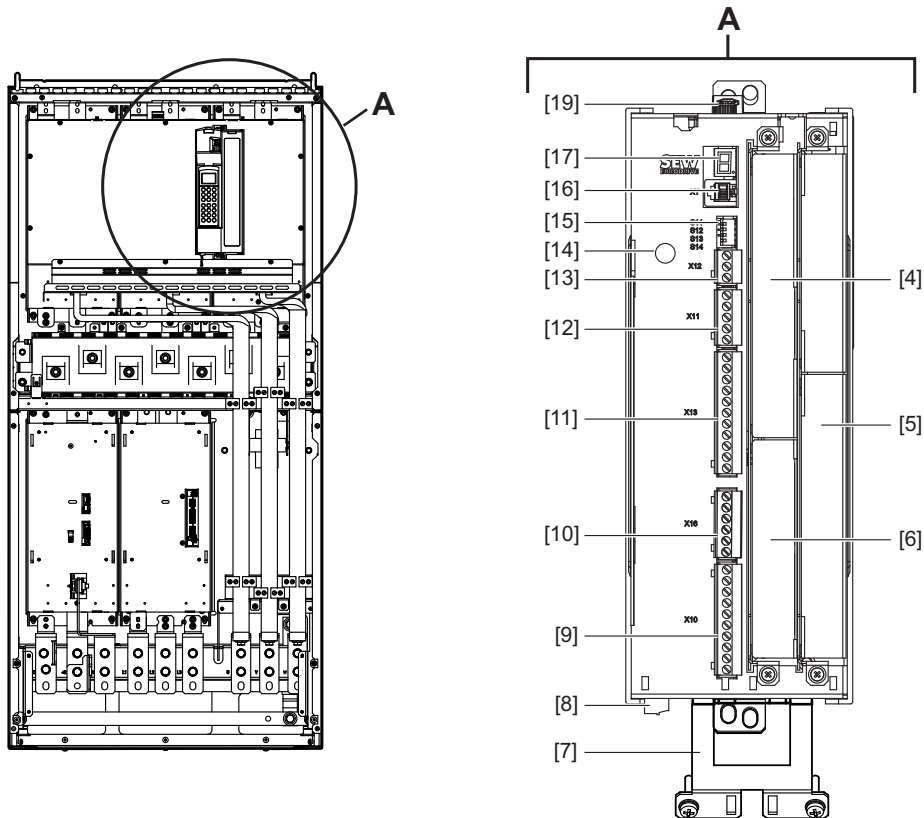
[19] 7-segment display

[20] Memory card

### 3.11 Size 7

#### 3.11.1 Control unit

MDX61B-503 (AC 400/500 V devices): 1600/2000/2500



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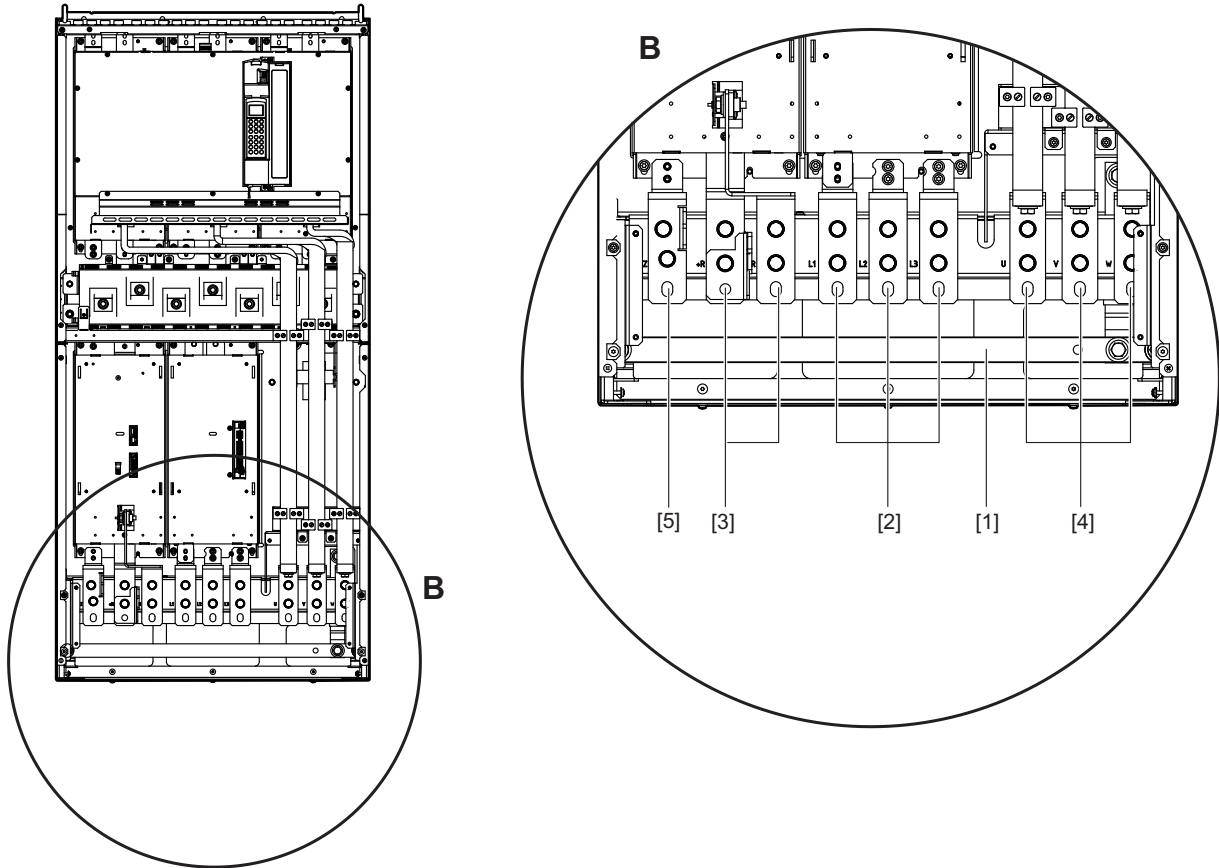
- [4] Fieldbus slot
- [5] Expansion slot
- [6] Encoder slot
- [7] Shield clamp for signal cables
- [8] X17: Signal terminal block for safety contacts of drive safety function STO
- [9] X10: Signal terminal strip for digital outputs and TF/TH input
- [10] X16: Signal terminal strip digital inputs and outputs
- [11] X13: Signal terminal strip terminal strip for digital inputs and RS485 interface
- [12] X11: Signal terminal strip for setpoint input AI1 and 10 V reference voltage
- [13] X12: Signal terminal strip system bus (SBus)
- [14] Grounding screw M4 × 14
- [15] DIP switches S11 – S14
- [16] XT: Slot for DBG60B keypad or USB11A/UWS21B serial interface
- [17] 7-segment display
- [19] Memory card

# 3 Device structure

Size 7

## 3.11.2 Power section

MDX61B-503 (AC 400/500 V devices): 1600/2000/2500

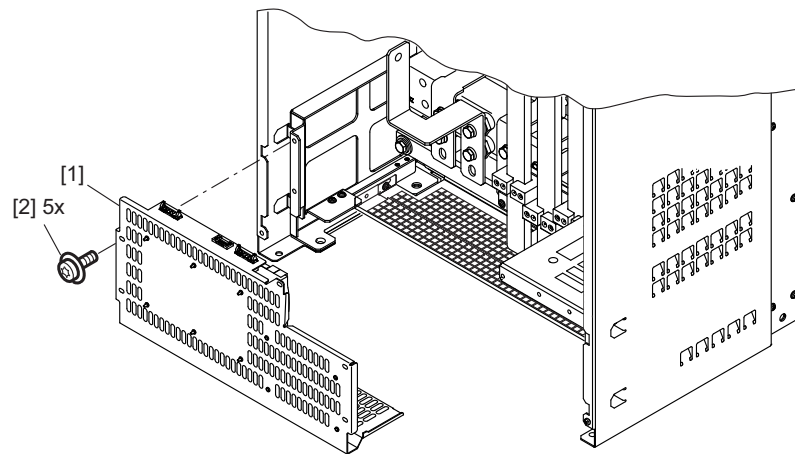


2077053963

- [1] PE connection rail (thickness = 10 mm)
- [2] X1: Line connection 1/L1, 2/L2, 3/L3
- [3] X3: Braking resistor connection 8/+R, 9/-R
- [4] X2: Motor connection 4/U, 5/V, 6/W
- [5] -U<sub>2</sub>: Only with DC link adapter accessory

### 3.11.3 DC power supply unit

MDX61B-503 (AC 400/500 V devices): 1600/2000/2500



20089692683

[1] DC power supply unit

[2] Screw

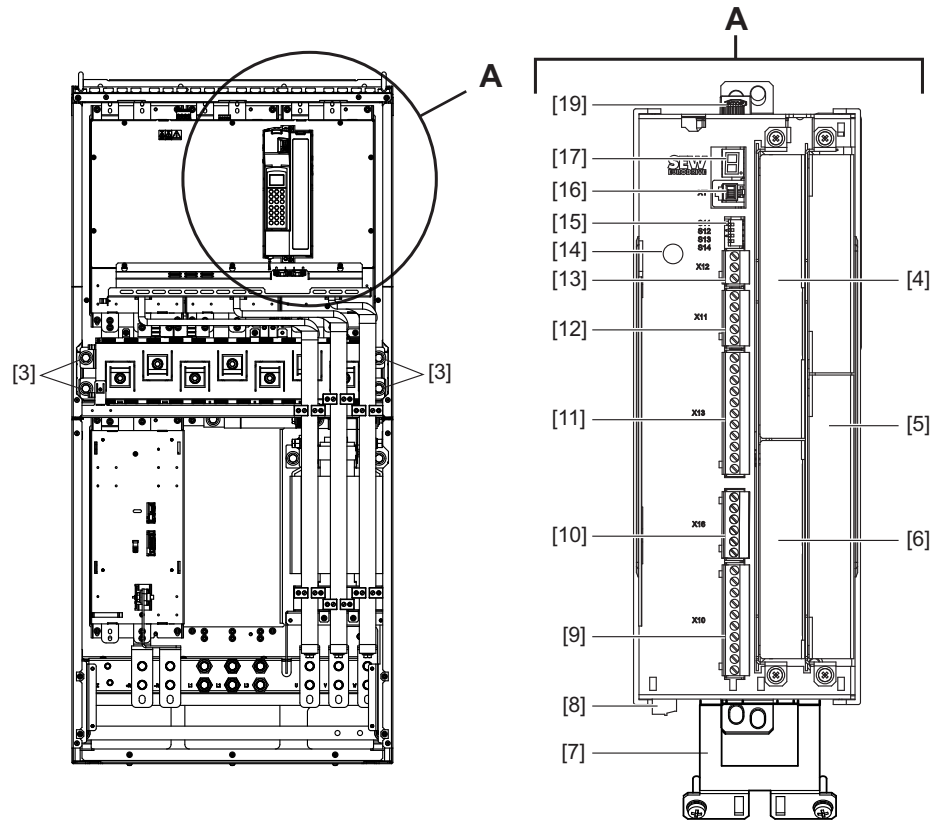
#### Connections for power supply unit (PE L1 L2 L3)

- Cross section: 6 mm<sup>2</sup>
- Tightening torque  $\leq 4 \text{ mm}^2 = 0.5 \text{ Nm}$
- Tightening torque  $> 4 \text{ mm}^2 = 0.7 \text{ Nm} - 0.8 \text{ Nm}$

### 3.12 MOVIDRIVE® MDX62B motor inverter size 7

#### 3.12.1 Control unit

MDX62B-503 (AC 400/500 V devices): 1600 / 2000 / 2500



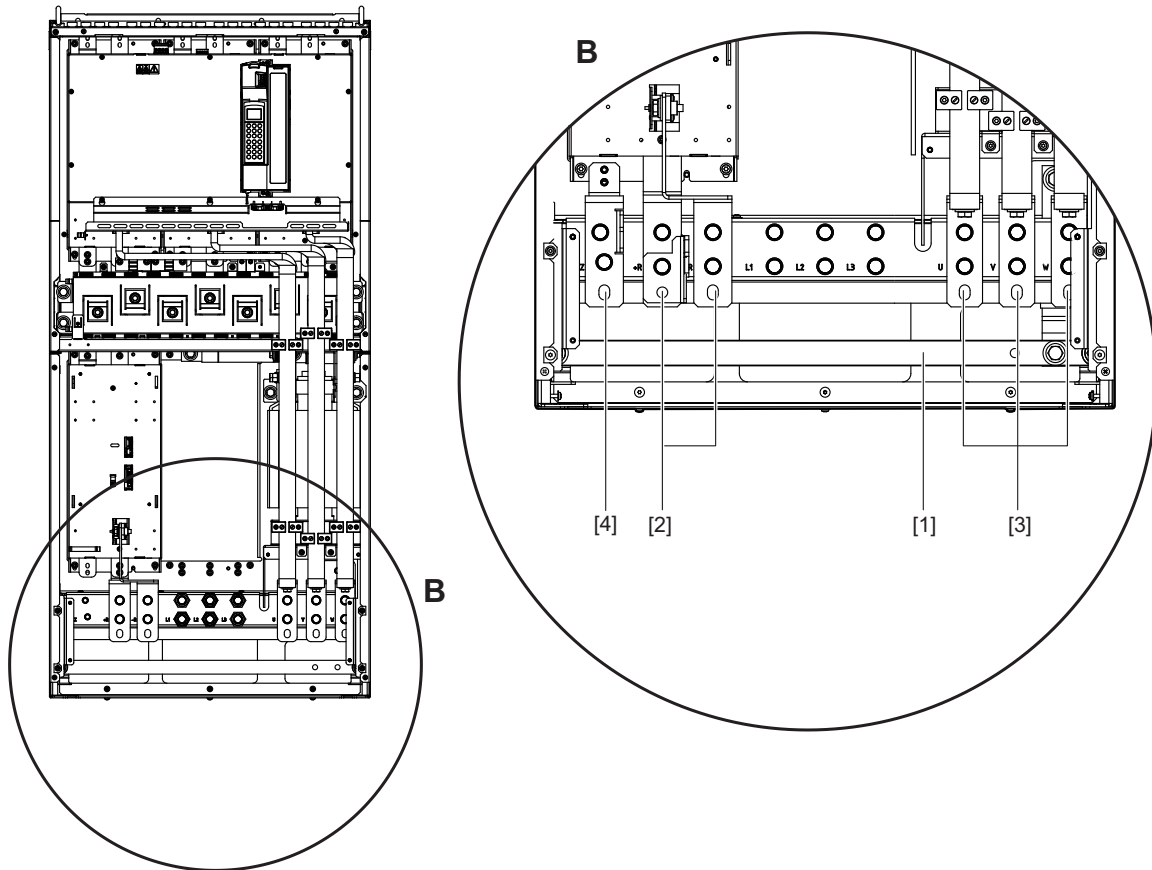
- [3] Connection for DC link coupling  $-U_z +U_z$
- [4] Fieldbus slot
- [5] Expansion slot
- [6] Encoder slot
- [7] Shield clamp for signal cables
- [8] X17: Signal terminal block for safety contacts of drive safety function STO
- [9] X10: Signal terminal strip for digital outputs and TF/TH input
- [10] X16: Signal terminal strip digital inputs and outputs
- [11] X13: Signal terminal strip terminal strip for digital inputs and RS485 interface
- [12] X11: Signal terminal strip for setpoint input AI1 and 10 V reference voltage
- [13] X12: Signal terminal strip system bus (SBus)
- [14] Grounding screw M4 × 14
- [15] DIP switches S11 – S14
- [16] XT: Slot for DBG60B keypad or UWS21B serial interface
- [17] 7-segment display
- [19] Memory card

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## 3.12.2 Power section

MDX62B-503 (AC 400/500 V devices): 1600 / 2000 / 2500

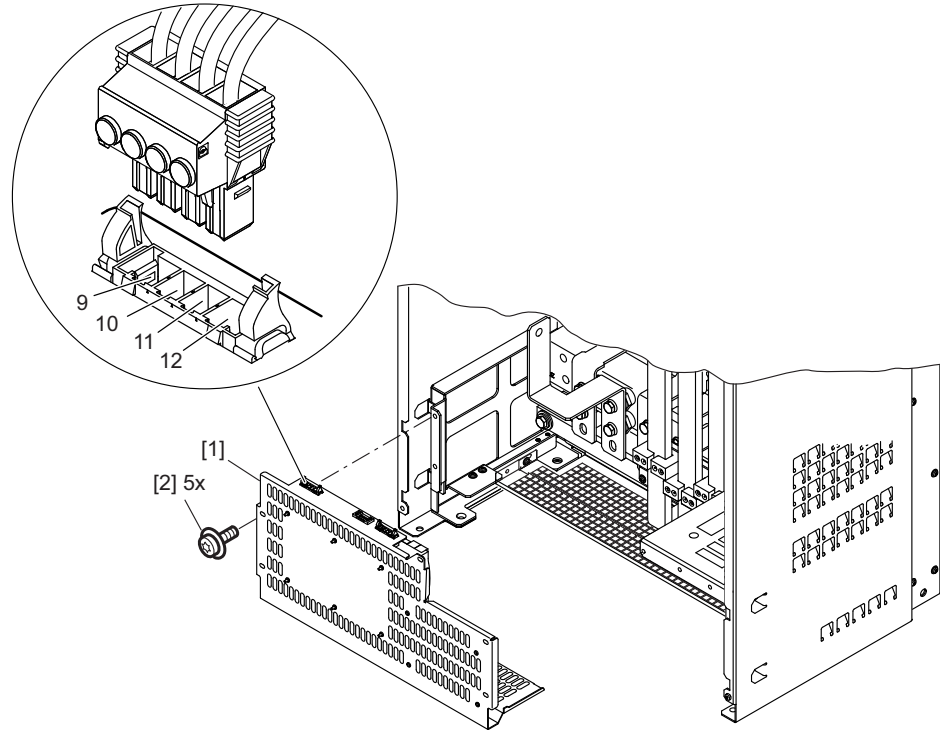


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- [1] PE connection rail (thickness = 10 mm)
- [2] X3: Braking resistor connection 8/+R, 9/-R
- [3] X2: Motor connection 4/U, 5/V, 6/W
- [4] -U<sub>2</sub>: Only with DC link adapter accessory

### 3.12.3 DC power supply unit

MDX62B-503 (AC 400/500 V devices): 1600 / 2000 / 2500



9007201561717259

[1] DC power supply unit

[2] Screw

## 4 Installation

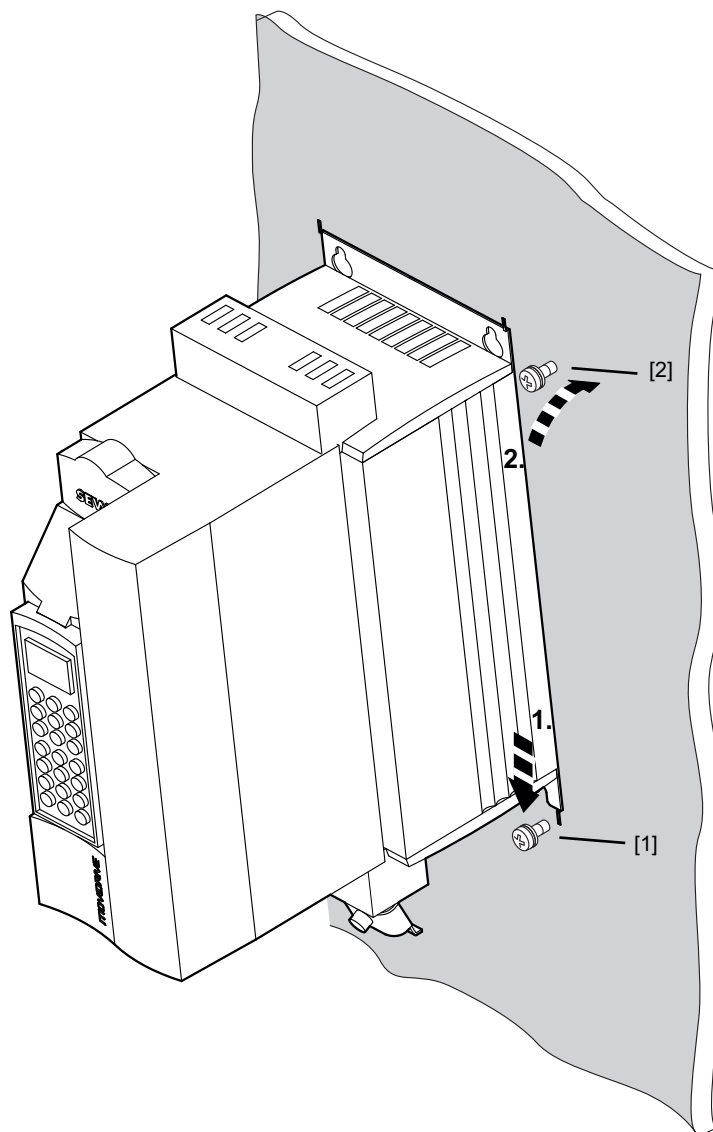
MOVIDRIVE® B application inverters are exclusively suitable for control cabinet installation according to the degree of protection.

### 4.1 Installation instructions for the basic unit

#### 4.1.1 General installation notes for size 0 – 6

The retaining screws [1] and [2] are screwed into the prepared mounting grid in the control cabinet but not tightened.

1. Place the module with the slotted holes on the device base plate onto the retaining screws [1] from the top.



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2. Push the module backwards to insert the retaining screws [2] into the upper holes in the device base plate.
3. Lower the module.

# 4 Installation

Installation instructions for the basic unit

4. Tighten the retaining screws [1] and [2].

## Installation notes for size 7

SEW-EURODRIVE recommends the following SEW accessories for control cabinet installation of MOVIDRIVE® size 7:

- **Mounting base** to be installed under the basic device
  - Fastening the device
  - Integrated grounded cable clamping rail
  - Extended connection space facilitates installation
- **Air duct** for dissipating heat from the control cabinet
  - No increased heating of the control cabinet
  - Reduction of air conditioner power

| MOVIDRIVE®           | Mounting base                   | Air duct                        |
|----------------------|---------------------------------|---------------------------------|
| MDX61B1600/2000/2500 | DLS11B<br>Part number: 18226027 | DLK11B<br>Part number: 18226035 |

### 4.1.2 Tightening torques

#### Power terminal tightening torques

**Only use original connection elements.** Note the **permitted tightening torques** for MOVIDRIVE® power terminals.

| Size        | Tightening torque |
|-------------|-------------------|
|             | Nm                |
| 0, 1 and 2S | 0.6               |
| 2           | 1.5               |
| 3           | 3.5               |
| 4 and 5     | 14.0              |
| 6           | 20.0              |
| 7           | 70.0              |

- The permitted tightening torque of the **signal terminals** is 0.6 Nm.

#### General tightening torques

Note the permitted tightening torques:

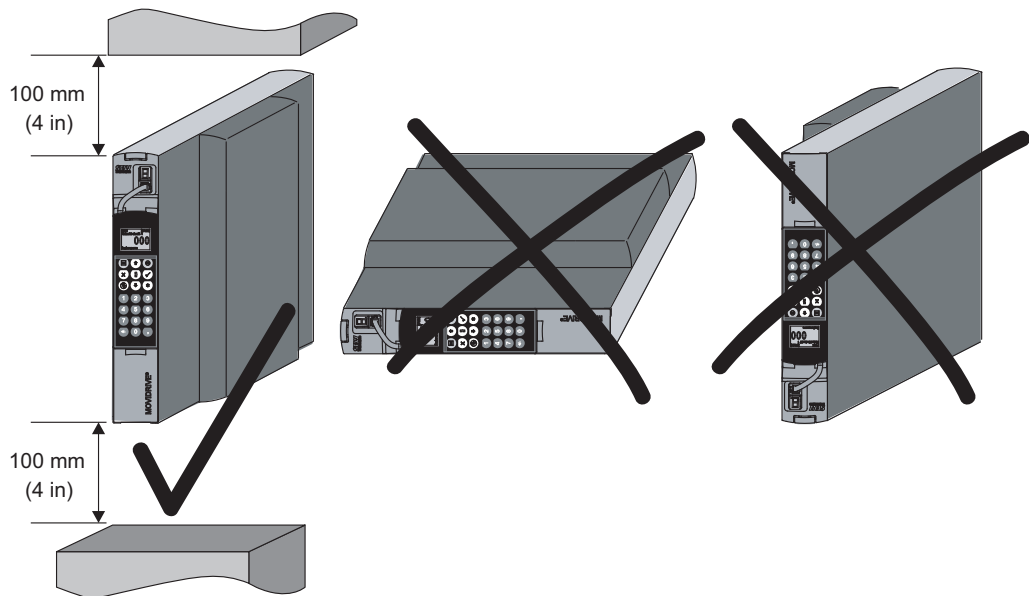
| Component                 | Screws  | Tightening torque |
|---------------------------|---------|-------------------|
|                           |         | Nm                |
| Cover screws              | M5 x 25 | 1.4 – 1.7         |
| Screws with integral disk | M4      | 1.7               |
|                           | M5      | 3.4               |
|                           | M6      | 5.7               |
| Conductor rail screws     | M10     | 20                |

# 4 Installation

Installation instructions for the basic unit

## 4.1.3 Minimum clearance and mounting position

- Leave at least 100 mm clearance **above and below** the device for optimum cooling. Make sure air circulation in the clearance is not impaired by cables or other installation equipment. With sizes 4, 5 and 6, do not install any components that are sensitive to high temperatures within 300 mm of the top of the device.
- Ensure unobstructed cooling air supply and make sure that air heated by other units cannot be drawn in or reused.
- There is no need for clearance at the sides of the device. You may line up the units directly next to each other.
- Only install the devices **vertically**. Do not install them horizontally, tilted or upside down (→ following figure, applies to all sizes).



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## 4.1.4 Separate cable ducts

- Route power cables and signal cables in **separate** cable ducts.

### NOTICE

Hot surfaces

The heat sink temperature may rise above 70 °C.



### ⚠ WARNING

Electric shock due to charged capacitors. Dangerous voltage levels may still be present inside the device and at the terminals up to 10 minutes after disconnection from the power supply.

Severe or fatal injuries.

- Wait for 10 minutes after the frequency inverter has been separated from the voltage supply. Make sure that the device is de-energized. Only then must you commence any work on the device.
- Observe the corresponding information signs on the frequency inverter.



23534850/EN – 11/2017

#### 4.1.5 Fuses and residual current devices

- Install the fuses at the **beginning** of the supply system lead after the supply bus junction (observe the wiring diagram for basic device, power section and brake).
- SEW-EURODRIVE recommends not to use earth-leakage circuit breakers in plants with frequency inverters as an earth-leakage circuit breaker reduces the plant availability.



#### ⚠ WARNING

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

Severe or fatal injuries.

- The product can cause direct current in the PE conductor. If a residual current device (RCD) or a residual current monitoring device (RCM) is used for protection in the event of a direct or indirect contact, only a type B RCD or RCM is permitted on the supply end of the product.

#### 4.1.6 Supply system and brake contactors

- Only use contactors in utilization category **AC-3** (EN 60947-4-1) as mains and brake contactors.

#### INFORMATION



- Only use the input contactor **K11** (→ chapter "Wiring diagram for basic device") **to switch the inverter on and off**. Do **not** use it for jog mode. For jog mode, use the commands "Enable/stop", "CW/stop" or "CCW/stop".
- Observe a minimum switch-off time of 10 s for the line contactor K11.

#### 4.1.7 PE connection (EN 61800-5-1)

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

- **Supply system lead  $< 10$  mm<sup>2</sup>:**  
Route a **second PE conductor with the cross section of the supply system lead** in parallel to the protective earth via separate terminals or use a **copper protective earth conductor with a cross section of 10 mm<sup>2</sup>**.
- **Supply system cable 10 mm<sup>2</sup> – 16 mm<sup>2</sup>:**  
Route a copper PE conductor with the same cable cross section as the supply system cable.
- **Supply system cable 16 mm<sup>2</sup> – 35 mm<sup>2</sup>:**  
Route a copper PE conductor with a cable cross section of 16 mm<sup>2</sup>.
- **Supply system cable  $> 35$  mm<sup>2</sup>:**  
Route a copper PE conductor with half the cross section of the supply system cable.

#### 4.1.8 IT systems

- MOVIDRIVE® B is designed for operation on TN and TT systems with a directly grounded star point. Operation on voltage supply systems with a non-grounded star point is permitted. In this case, SEW-EURODRIVE recommends using **earth-leakage monitors with pulse-code measurement** for voltage supply systems with a non-grounded star point (**IT systems**). Using such devices prevents the earth-leakage monitor mis-tripping due to the ground capacitance of the inverter. **No EMC limits are specified for interference emission in voltage supply systems without a grounded star point (IT systems).**
- In size 7, you can deactivate the interference suppression capacitors. Note the information in the "MOVIDRIVE® MDX60B / 61B – Inspection and Maintenance of Size 7" manual.

#### 4.1.9 Cable cross sections

- Line cable: **Core cross section according to nominal input current  $I_{line}$**  at nominal load.
- Motor cable: **Cable cross section according to rated output current  $I_N$ .**
- Signal cables of basic device (terminals X10, X11, X12, X13, X16):
  - 1 core per terminal 0.20 – 2.5 mm<sup>2</sup> (AWG 24 – 13)
  - 2 cores per terminal 0.25 – 1 mm<sup>2</sup> (AWG 23 – 17)
- Signal cables of terminal X17 and DIO11B terminal expansion board (terminals X20, X21, X22):
  - 1 core per terminal 0.08 – 1.5 mm<sup>2</sup> (AWG 28 – 16)
  - 2 cores per terminal 0.25 – 1 mm<sup>2</sup> (AWG 23 – 17)



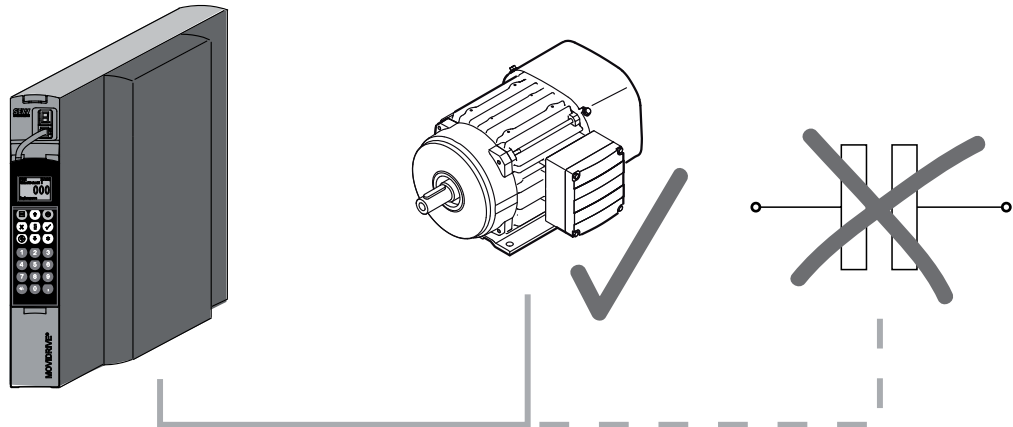
#### 4.1.10 Unit output

### NOTICE



MOVIDRIVE® B can suffer irreparable damage if you connect capacitive loads.

- Only connect ohmic/inductive loads (motors).
- Never connect capacitive loads.



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#### 4.1.11 Permitted mounting the braking resistors

### WARNING



Non-permissible installation might lead to an accumulation of heat in the braking resistor due to reduced convection. A tripping temperature contact or an overheated braking resistor can lead to a system standstill.

Adhere to the following minimum clearances:

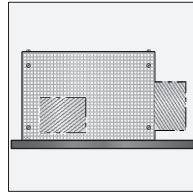
- About 200 mm to adjacent components and walls
- About 300 mm to above components/ceilings

# 4 Installation

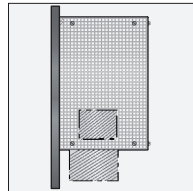
Installation instructions for the basic unit

## Grid resistors

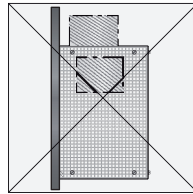
You must fulfill the following requirements for mounting the grid resistors:



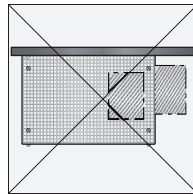
- **Permitted:** Mounting on horizontal surfaces.



- **Permitted:** Mounting on vertical surfaces with terminals pointing downwards when there is a perforated sheet at the top.



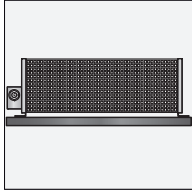
- **Not permitted:** Mounting on vertical surfaces with terminals pointing upwards, to the right or left. (The connection terminals can be placed within the steel grid, where appropriate. Ensure the proper position of connection terminals also in this case).

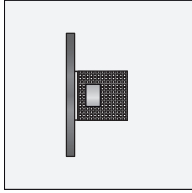


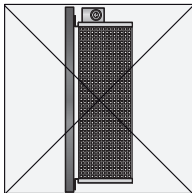
- **Not permitted:** Mounting on vertical surfaces with the terminals facing downwards. (The connection terminals can be placed within the steel grid, where appropriate. Ensure the proper position of connection terminals also in this case).

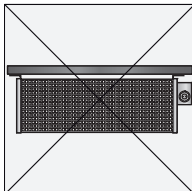
## Wire resistors

You must fulfill the following requirements for mounting the wire resistors:

- 

• **Permitted:** Mounting on horizontal surfaces.
- 

• **Permitted:** Mounting on vertical surfaces when there is a perforated sheet at the top or connection terminals at the bottom
- 

• **Not permitted:** Mounting on vertical surfaces when the connection terminals are at the top.
- 

• **Not permitted:** Mounting on horizontal surfaces when the connection terminals are at the bottom.

### 4.1.12 Connecting braking resistors

- **Use two tightly twisted leads or a 2-core shielded power cable.** Cable cross section according to tripping current  $I_F$  of F16. The nominal voltage of the cable must amount to at least  $V_0/V = 300\text{ V}/500\text{ V}$  (according to DIN VDE 0298).
- Protect the braking resistor (except for BW90-P52B) using a **bimetallic relay** (→ wiring diagram for basic device, power section and brake). Set the **trip current** according to the technical data of the braking resistor. SEW-EURODRIVE recommends using an overcurrent relay from trip class 10 or 10A in accordance with EN 60947-4-1.
- For braking resistors of the **BW...-T / BW...-P** series, the integrated temperature switch/overcurrent relay can be connected using a 2-core shielded cable as an alternative to a bimetallic relay.
- In the documented assignments of drive inverters and **flat-type resistors**, flat-design resistors have an internal thermal protection (non-replaceable fuse) that interrupts the current circuit in the event of overload. Install the flat-type braking resistors together with the appropriate **touch guard**.

### 4.1.13 Braking resistor operation

- The supply cables to the braking resistors carry a **high pulsed DC voltage** during rated operation.



### ▲ WARNING

The surfaces of the braking resistors get very hot when the braking resistors are loaded with  $P_N$ .

Risk of burns and fire.

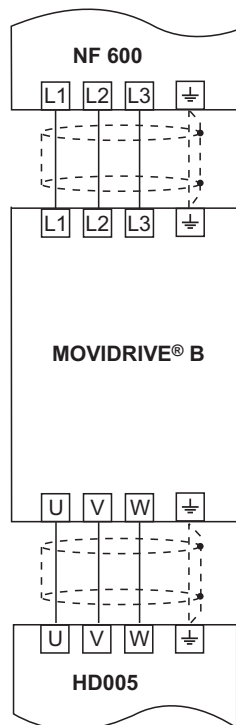
- Choose a suitable installation location. Braking resistors are usually mounted on top of the control cabinet.
- Do not touch the braking resistors.

#### 4.1.14 Binary inputs / binary outputs

- The **digital inputs** are electrically isolated by **optocouplers**.
- The digital outputs are **short-circuit proof** and **external-voltage proof up to DC 30 V**. External voltages > DC 30 V can destroy the digital outputs.

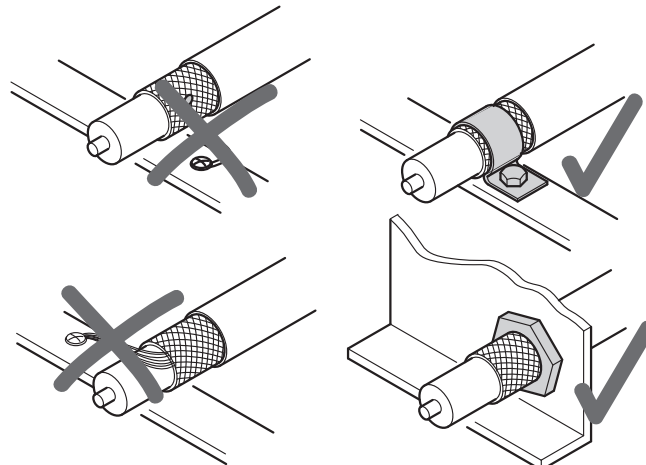
#### 4.1.15 EMC-compliant installation

- All cables except for the power supply line **must be shielded**. As an alternative to the shielding, the option HD.. (output choke) or HF (output filter) can be used for the motor cable to achieve the emitted interference limit values.



#### Shielded cables

- When using shielded motor cables, e.g. prefabricated motor cables from SEW-EURODRIVE, you must keep the **unshielded conductors** between the shield and connection terminal of the inverter **as short as possible**.
- **Connect the shield by the shortest possible route and make sure it is earthed over a wide area at both ends.** Ground one end of the shield using an interference suppression capacitor (220 nF/50 V) to avoid ground loops. If using double-shielded cables, ground the outer shield on the inverter end and the inner shield on the other end.



1804841739

*Correct shield connection using metal clamp (shield clamp) or cable gland*

- You can also use earthed sheet-metal ducts or metal pipes to shield the cables. Route the power and signal cables separately.
- Ground the **inverter** and **all additional devices** to ensure **high-frequency compatibility** (wide area, metal-on-metal contact between the device housing and ground, e.g. unpainted control cabinet mounting panel).

## INFORMATION



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

**NF.. line filter**

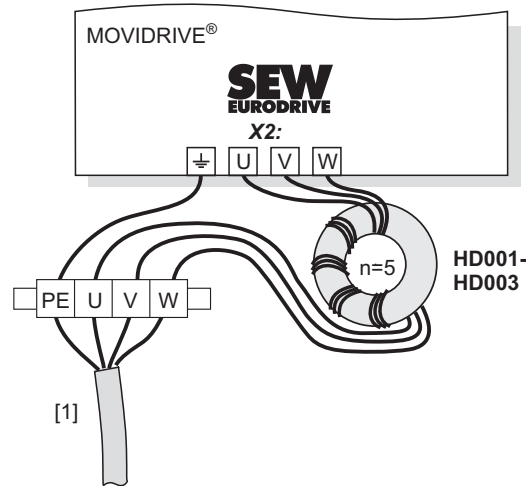
- The NF.. line filter option can be used to maintain the class C1 limit for MOVIDRIVE® MDX60B/61B in size 0 – 5.
- Do not switch between the line filter and MOVIDRIVE® MDX60B/61B.
- Install the line filter **close to the inverter** but outside the minimum clearance for cooling.
- **Keep the length of the cable between the line filter and the application inverter to an absolute minimum, and never more than 400 mm.** Unshielded, twisted cables are sufficient. Use also unshielded lines for the supply system lead.
- SEW-EURODRIVE recommends taking one of the following **EMC measures on the motor side to maintain class C1 and C2 limits:**
  - Shielded motor cable
  - HD... output choke option
  - HF.. output filter option (in operating modes VFC and V/f)

**Interference emission category**

Compliance with category C2 according to EN 61800-3 has been tested in a CE typical drive system. SEW-EURODRIVE can provide detailed information on request.

### HD... output choke

- Install the **output choke close to the inverter** but outside the minimum clearance for cooling.
- For HD001 – HD003: Route **all three phases** (U, V, W) of the motor cable [1] **through the output choke**. To achieve a higher filter effect, do **not** route the **PE conductor** through the output choke.



1804844811

Connection of output choke HD001 – HD003

[1] Motor cable

# 4 Installation

Installation instructions for the basic unit

## 4.1.16 Installation notes for size 6

MOVIDRIVE® devices in size 6 (0900 – 1320) have one fixed lifting eye [1]. Use a crane and the lifting eye [1] to install the device.



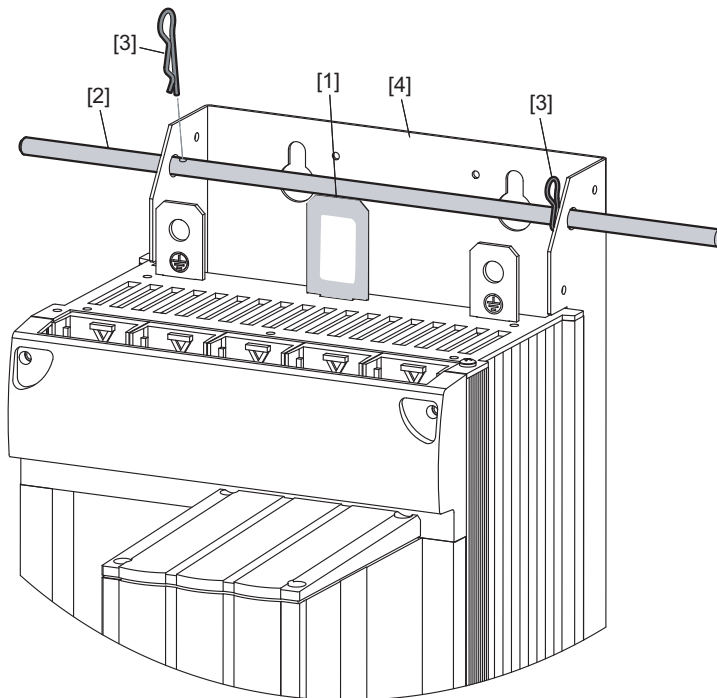
### ⚠ WARNING

Suspended load.

Danger of fatal injury if the load falls.

- Do not stand under the suspended load.
- Secure the danger zone.

If a crane is not available, you can push a carrying bar [2] through the rear panel [4] to facilitate installation (included in the delivery scope of size 6). Secure the carrying bar [2] against axial displacement using the split pins [3] (see figure below).



1802249355

- [1] Fixed lifting eye
- [2] Carrying bar (included in the delivery of size 6)
- [3] 2 Split pins (included in the delivery of size 6)
- [4] Rear panel

## 4.1.17 Installation notes for size 7

MOVIDRIVE® devices in size 7 (1600 – 2500) have 4 fixed lifting eyes [2] for transport. You may only use these four lifting eyes [2] for installation.



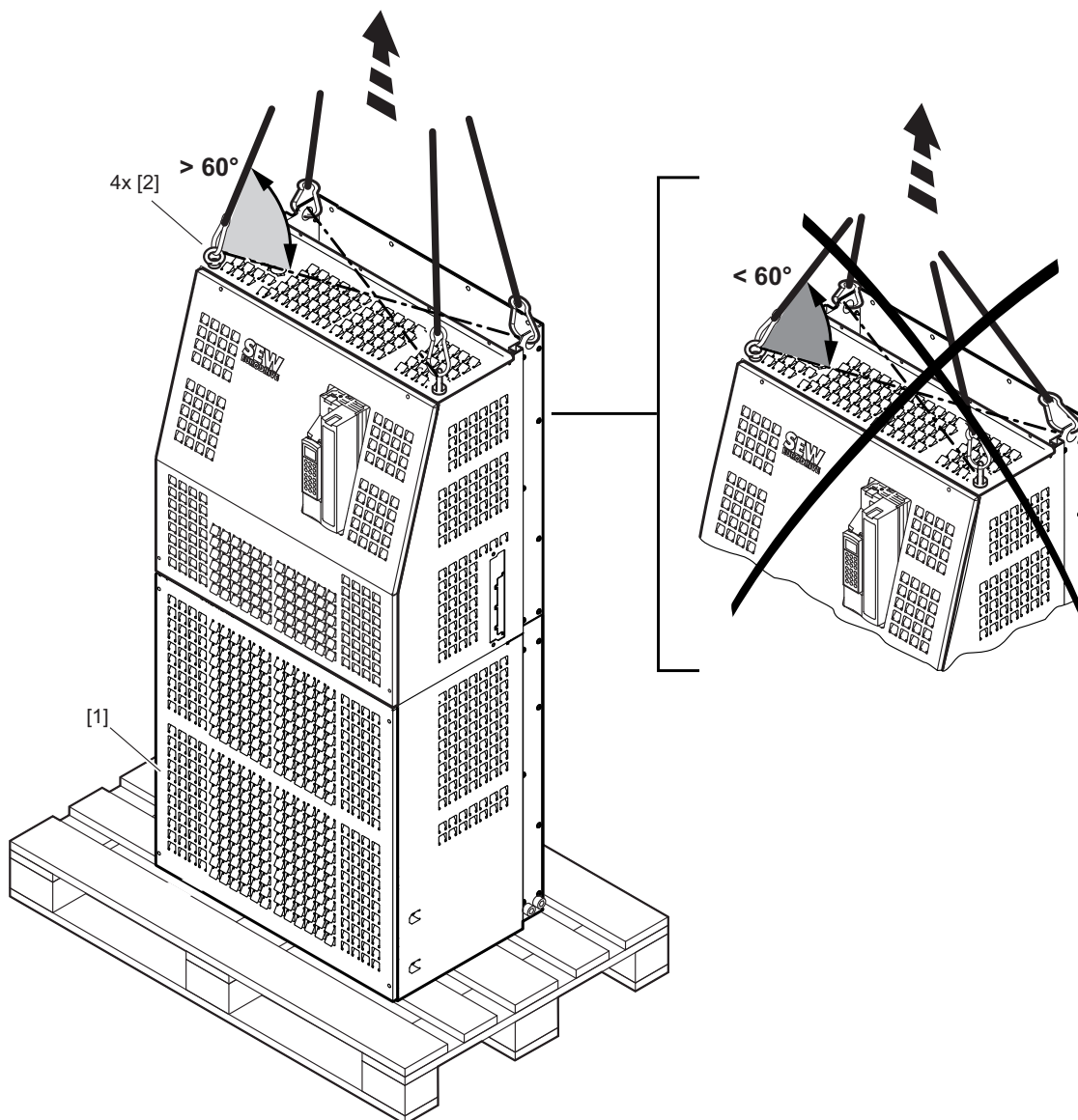
**▲ WARNING**



Suspended load.

Danger of fatal injury if the load falls.

- Do not stand under the suspended load.
- Secure the danger zone.
- Always use all 4 lifting eyes.
- Align the lifting eyes with the direction of tension



[1] Installed front cover

[2] 4 lifting eyes

18014400586880139

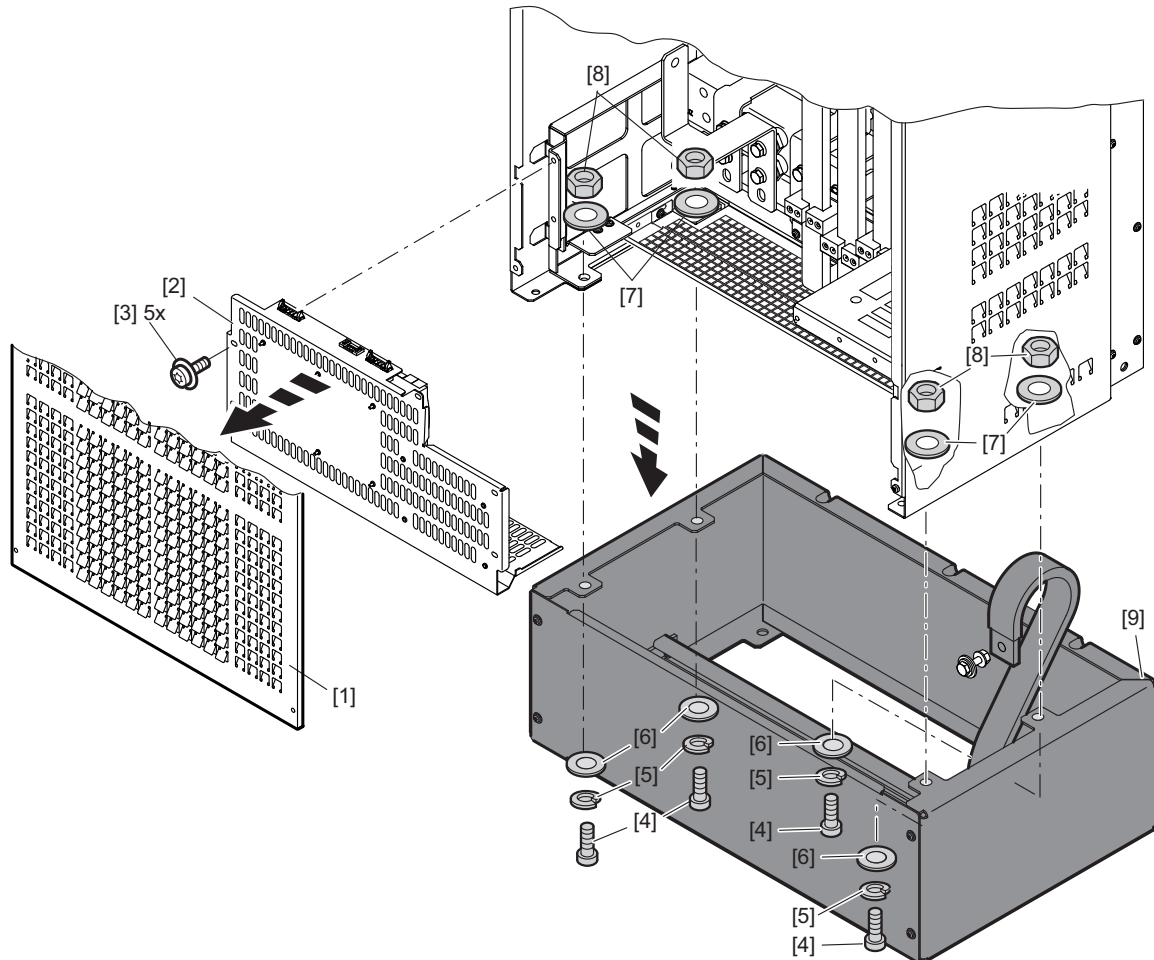
# 4 Installation

Installation instructions for the basic unit

## 4.1.18 Optional scope of delivery for size 7

### DLS11B mounting base

The **mounting base DLS11B** with mounting material [9] (part no.: 18226027) is used to install MOVIDRIVE® B, size 7 **on the floor of the control cabinet**. MOVIDRIVE® B size 7 must be screwed onto the mounting base immediately after installation (see following figure). Do not take MOVIDRIVE® B size 7 into operation until the mounting base has been completely mounted.



2076968843

The mounting material (pos. 3 - 8) is enclosed in a plastic bag.

- |  |                 |
|--|-----------------|
| [1] Front cover                          | [5] Lock washer |
| [2] Insert (for external power supply)   | [6] Washer      |
| [3] Insert for retaining screws          | [7] Washer      |
| [4] Machine screw M8 × 30 hexagon socket | [8] M8 nut      |

Proceed as follows to install the mounting base [9] to MOVIDRIVE® B, size 7:

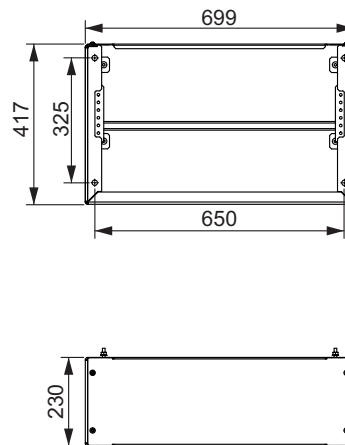
1. Loosen (not unscrew!) the 4 retaining screws of the front cover [1] until you can lift it off. Remove the front cover [1].
2. Remove the insert [2]. Loosen the 5 retaining screws [5] to do so.
3. The following steps apply to each of the 4 mounting holes.
  - Position the washer [7] centrally between inverter and mounting base [9].

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- Place the lock washer [5] and the washer [6] onto the socket head screw [4] M8×30.
  - Insert the preassembled socket head screw through the mounting hole.
  - Screw the M8 nut [8] onto the socket head screw. Tightening torque 20 Nm. Apply thread locking compound.
4. Replace the insert [2] into the device and fasten it using the 5 retaining screws.
  5. Place the front cover [1] onto the device and fasten it using the 4 retaining screws.

#### *DLS11B mounting base wiring diagram*

The following figure shows the dimensions of the DLS11B mounting base.



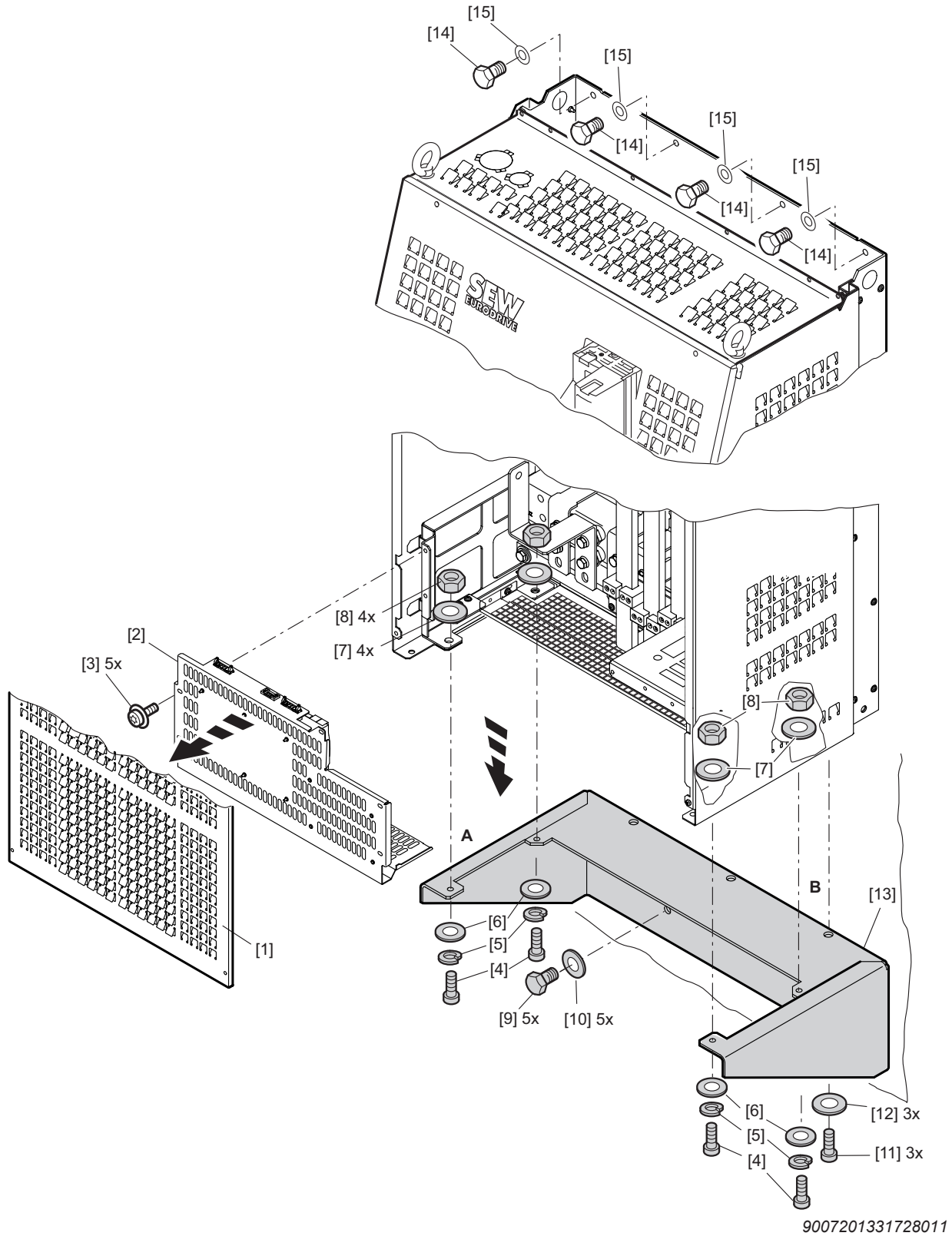
2076984331

# 4 Installation

Installation instructions for the basic unit

## DLH11B wall bracket

The **wall bracket DLH11B** [13] (part no: 18226108) is used to attach MOVIDRIVE® B size 7 to the wall (see following figure). Do not take MOVIDRIVE® B size 7 into operation until the installation of the device is complete.



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**The installation material for wall mounting is not included in the delivery of SEW-EURODRIVE.**

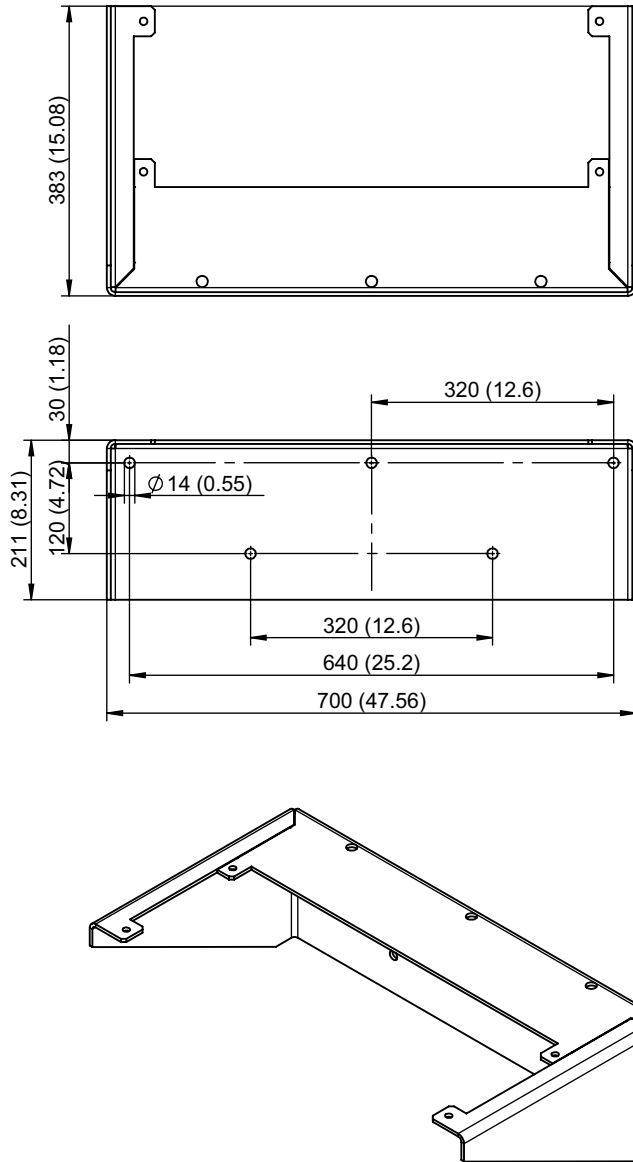
Proceed as follows to fasten the wall bracket [13] to MOVIDRIVE® B size 7:

1. Loosen (not unscrew!) the 4 retaining screws of the front cover [1] until you can lift it off. Remove the front cover [1].
2. Remove the insert [2]. Loosen the 5 retaining screws [5] to do so.
3. The wall bracket [13] is screwed onto MOVIDRIVE® B at 5 points [A, B] (see figure above).
  - Place a washer [7] at each point centrally between inverter and wall bracket [13].
  - Place the lock washer [5] and the washer [6] onto the hexagon socket head screw [4] M8 × 30.
  - Insert the preassembled socket head screw through the two mounting holes [A].
  - Screw the M8 nut [8] onto the socket head screw. Tightening torque 20 Nm. Apply thread locking compound.
  - Screw the wall bracket to MOVIDRIVE® B at the 3 mounting bores [B] using the retaining screws [11] and washers [12].
4. Replace the insert [2] into the device and fasten it using the 5 retaining screws.
5. Place the front cover [1] onto the device and fasten it using the 4 retaining screws.
6. To mount MOVIDRIVE® B size 7 to a wall (material not included in the delivery), use
  - 4 retaining screws [14] and washers [15] for the 4 mounting holes at the top of the device and
  - 5 retaining screws [9] and washers [10] for the 5 mounting holes on the wall bracket [13].

# 4 Installation

Installation instructions for the basic unit

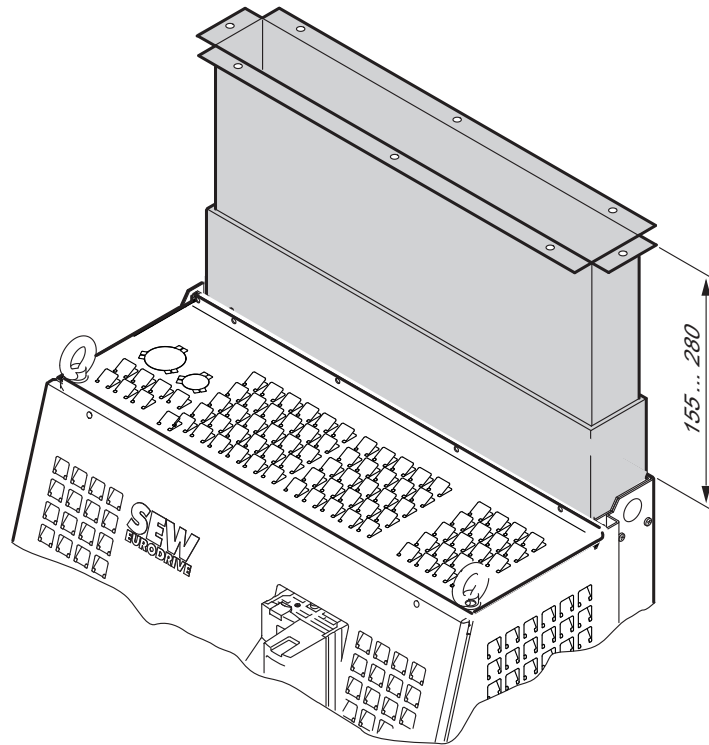
Dimension drawing for DLH11B wall bracket



9007201676959499

**DLK11B air duct**

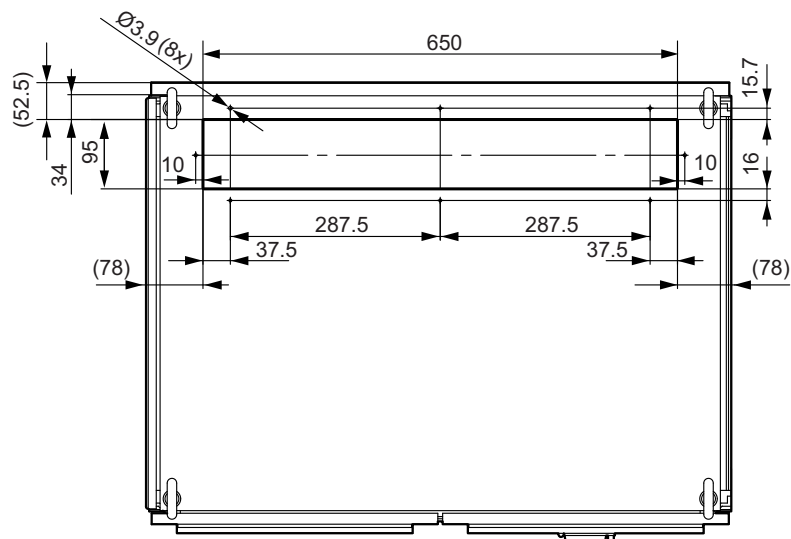
An optional **DLK11B air duct** (part no.: 18226035) is available to dissipate heat of MOVIDRIVE® B size 7. Install the air duct in such a way that it points vertically upwards (see figure below).



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*Roof cut-out for DLK11B air duct*

The following figure shows the cut-out of the control cabinet roof for the DLK11B air duct.



18014400586475403

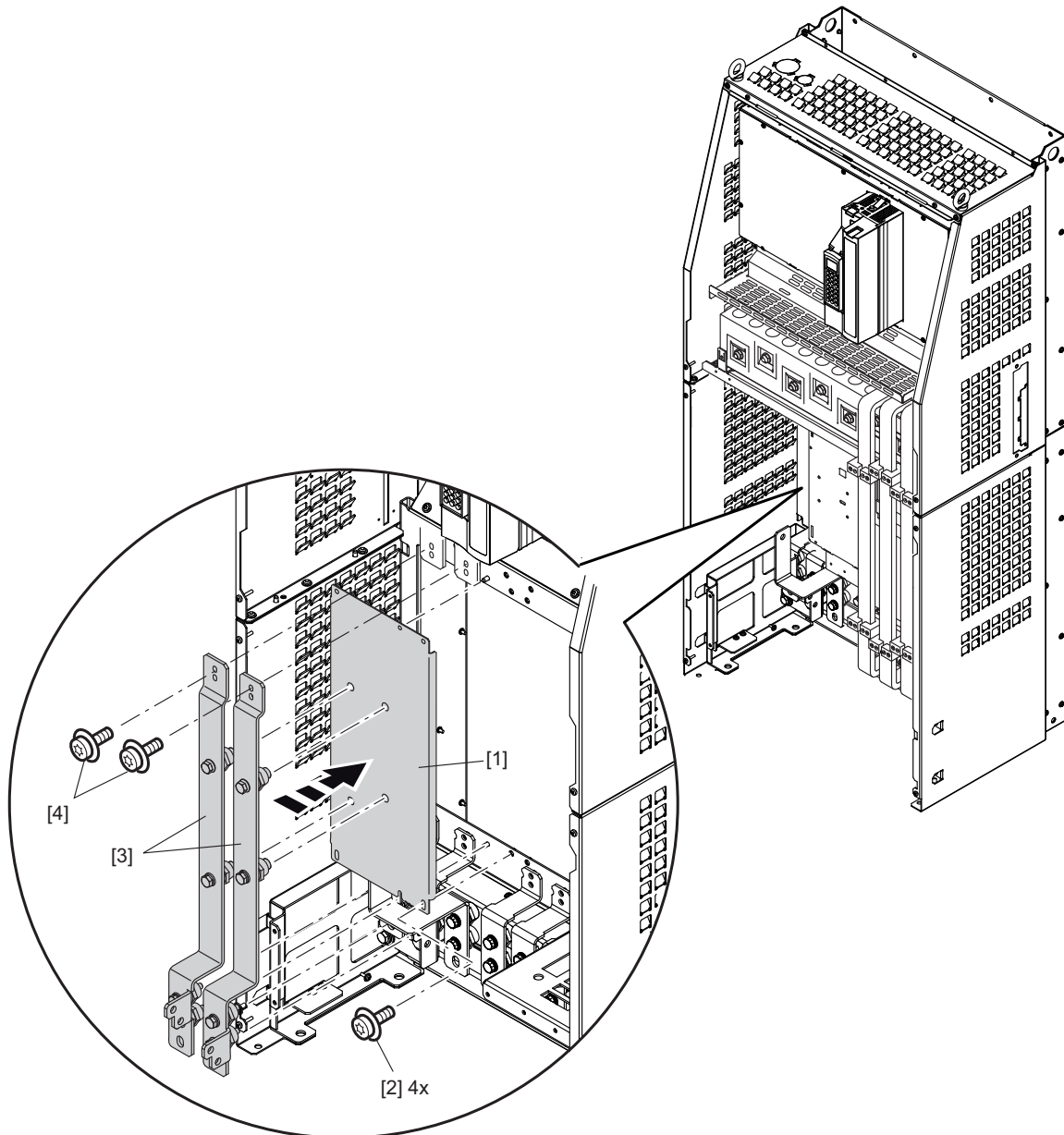
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# 4 Installation

Installation instructions for the basic unit

## 2Q DLZ12B DC link adapter

The DC link adapter **2Q DLZ12B** (part no.: 18227295) can be used to provide a DC link connection at the bottom of the device:



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1. Loosen the 4 screws of both the upper and lower cover and remove them.
2. Loosen the 5 screws of the insert and remove it.
3. Place the cover panel on the fastening pin of the slot for the brake chopper module.
4. Position the 2 upper retaining screws [2] of the cover panel [1] in the frame. Position the 2 lower retaining screws of the cover panel in the frame.
5. Screw the insulating spacers tightly to the cover panel [1].
6. Screw the insulating spacers tightly to the frame (bottom).
7. Position the 2 screws of the mounting lug  $-U_z$  at the DC link (top left).
8. Position the 2 screws of the mounting lug  $+U_z$  at the DC link (top right).



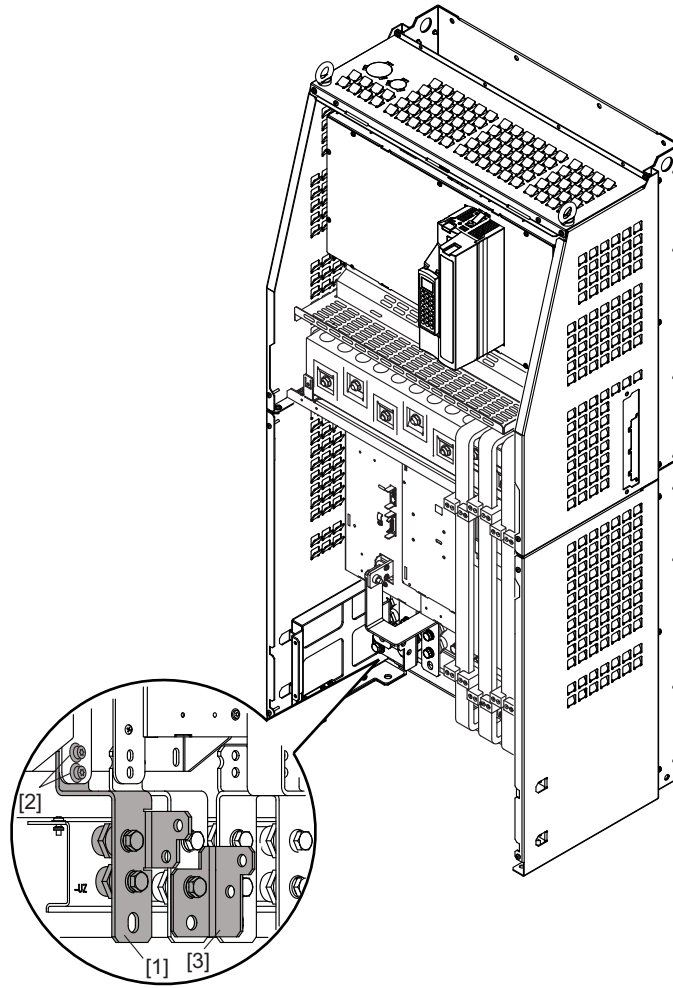
9. Position the 4 screws of the mounting lug  $-U_z$  and  $+U_z$  on the insulating spacer.
10. Tighten all screws of the mounting lug  $-U_z$  and  $+U_z$ .
11. Replace the covers.

# 4 Installation

Installation instructions for the basic unit

## 4Q DLZ14B DC link adapter

The DC link adapter **4Q DLZ14B** (part no.: 18227287) can be used to provide a DC link connection at the bottom of the device:



9007201531075595

1. Loosen the 4 screws of the upper cover and remove it.
2. Loosen the 4 screws of the lower cover and remove it.
3. Position the 2 screws of the conductor rail [1] -U<sub>z</sub> on the brake chopper module (bottom left) on the insulating spacer.
4. Position the 2 screws of the conductor rail [1] -U<sub>z</sub> on the insulating spacer.
5. Tighten all screws of the mounting lug -U<sub>z</sub>.
6. Screw on the angle bracket [3].
7. Replace the covers.

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### Side panel for DC link coupling

To connect 2 devices via the DLZ11B or DLZ31B DC link coupling side by side, the side panel of MOVIDRIVE® must be opened.

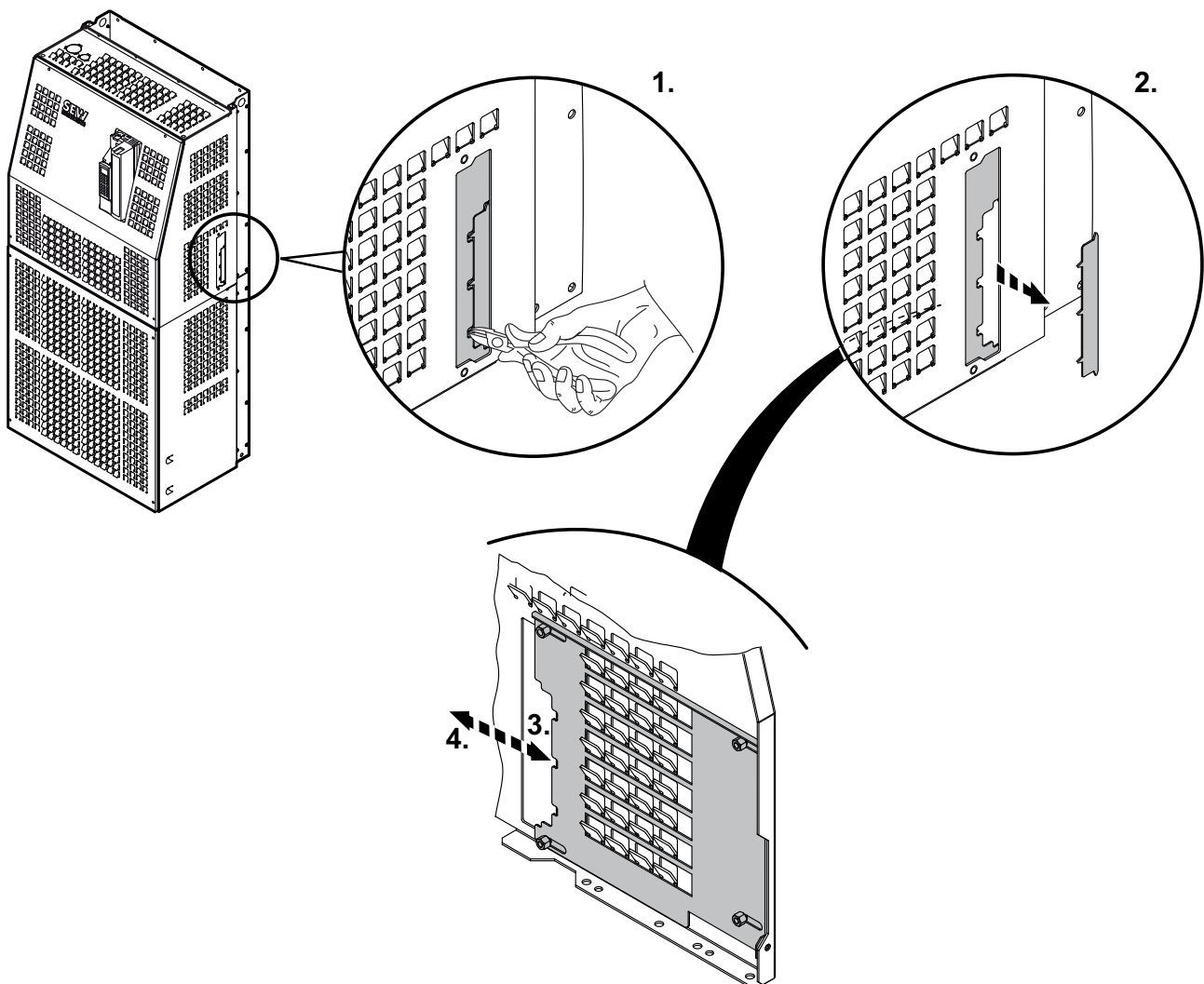
Proceed as follows to prepare MOVIDRIVE® for the side-by-side connection:

#### ⚠ CAUTION

Sharp edges

Minor injuries.

- Wear suitable protective gloves when cutting.



3919054475


1. Use cutting pliers to cut an opening according to the figure.
2. Remove the metal you have cut out.
3. When the front cover is open, the sliding door to the DC link connection can be moved.
4. When you screw on the front cover, the sliding door to the DC link connection is closed and fixed.

**DLZ11B DC link coupling**

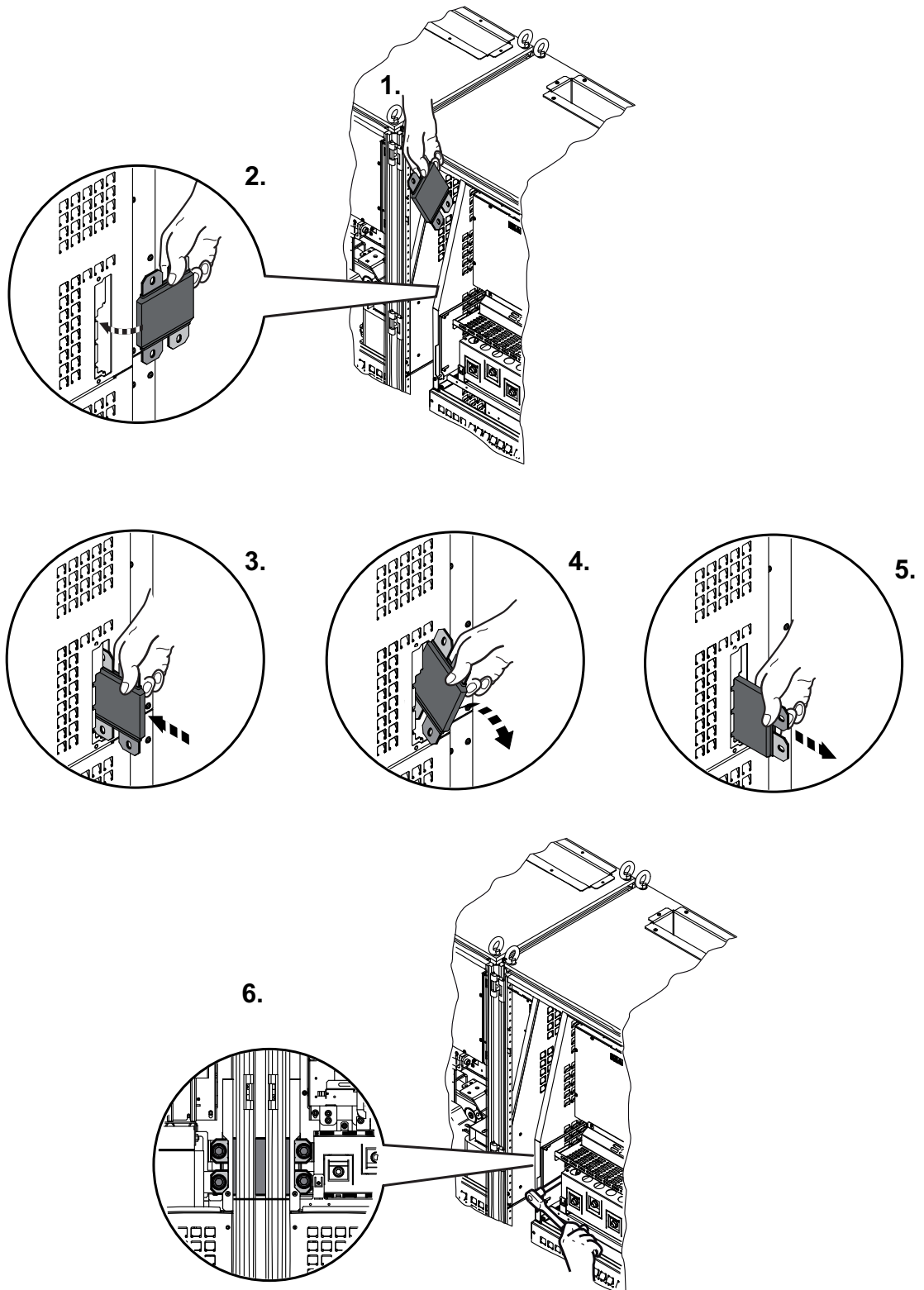
You can use the **DLZ11B DC link coupling** to connect 2 size 7 devices side by side. The DLZ11B DC link coupling is available in three different lengths:

- 100 mm (part number: 18231934)
- 200 mm (part number: 18235662)
- 300 mm (part number: 18235670)

Proceed as follows to connect 2 devices:

1. Depending on the DC link coupling, the units that you want to connect must be installed at ground level and 100 mm, 200 mm or 300 mm apart from each other.
2. Loosen the 4 screws of the upper cover and remove it.
3. Loosen the 4 screws of the lower cover and remove it.
4. Cut the opening in the side panel according to chapter "Side panel for DC link coupling" (→  65).
5. Insert the DC link connections into the devices.
  - Insert the **100 mm DC link connection** vertically into the device.
  - Turn the 100 mm DC link connection in the device by 90°.
  - Insert the **200 mm and 300 mm DC link connection** into the one device skewed up to the stop.

- Tip the DC link connection into the second device from above



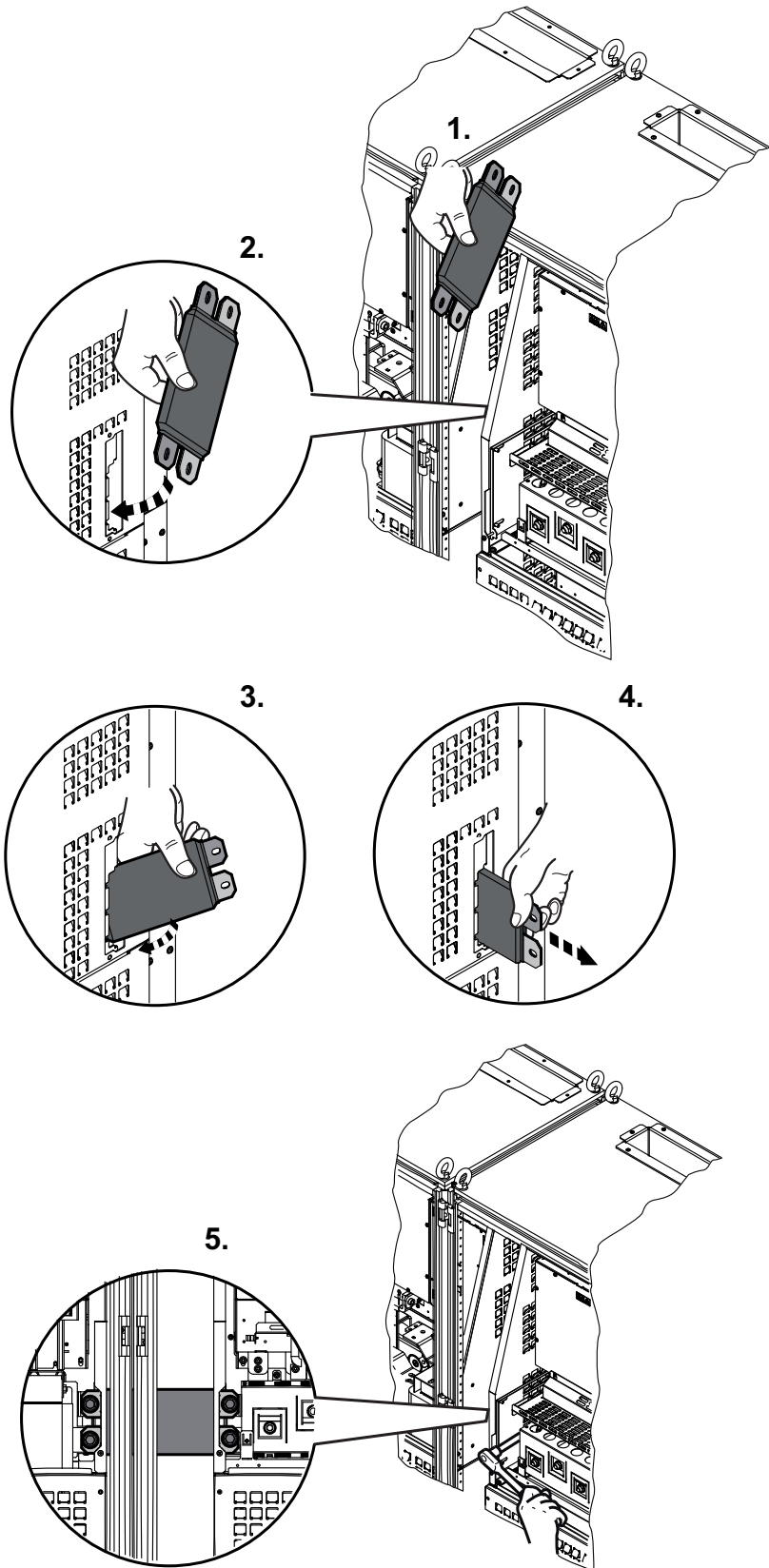
9007201531079435

- Insert the **200 mm and 300 mm DC link connection** into the one device skewed up to the stop.

# 4 Installation

Installation instructions for the basic unit

- Tip the DC link connection into the second device from above



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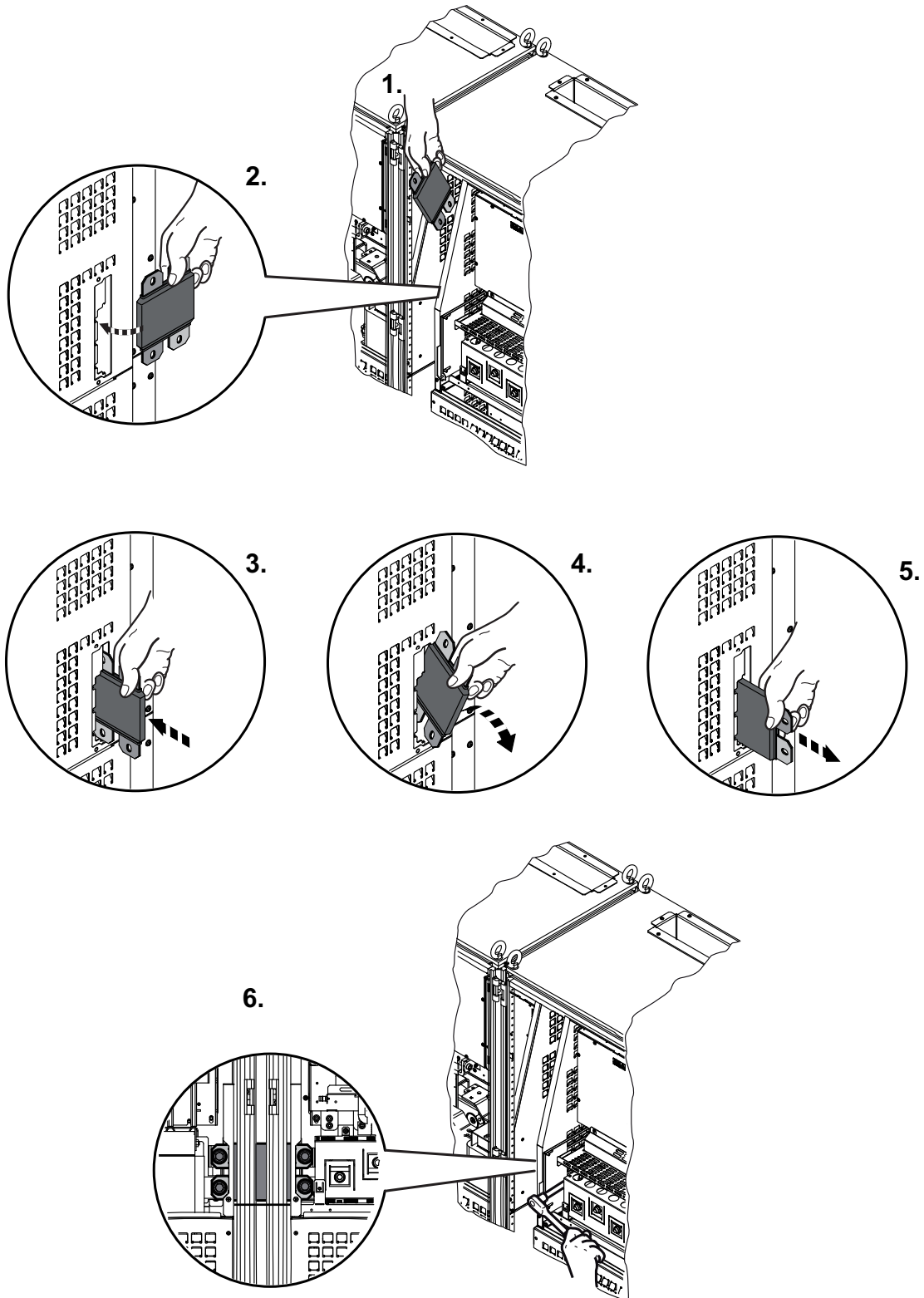
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- Screw the DC link coupling to one device first. Then attach it to the other devices.
  - Tighten the screws.
  - Replace the covers.
6. Screw the DC link coupling to one device first. Then attach it to the other devices.
  7. Tighten the screws.

# 4 Installation

Installation instructions for the basic unit

8. Replace the covers.



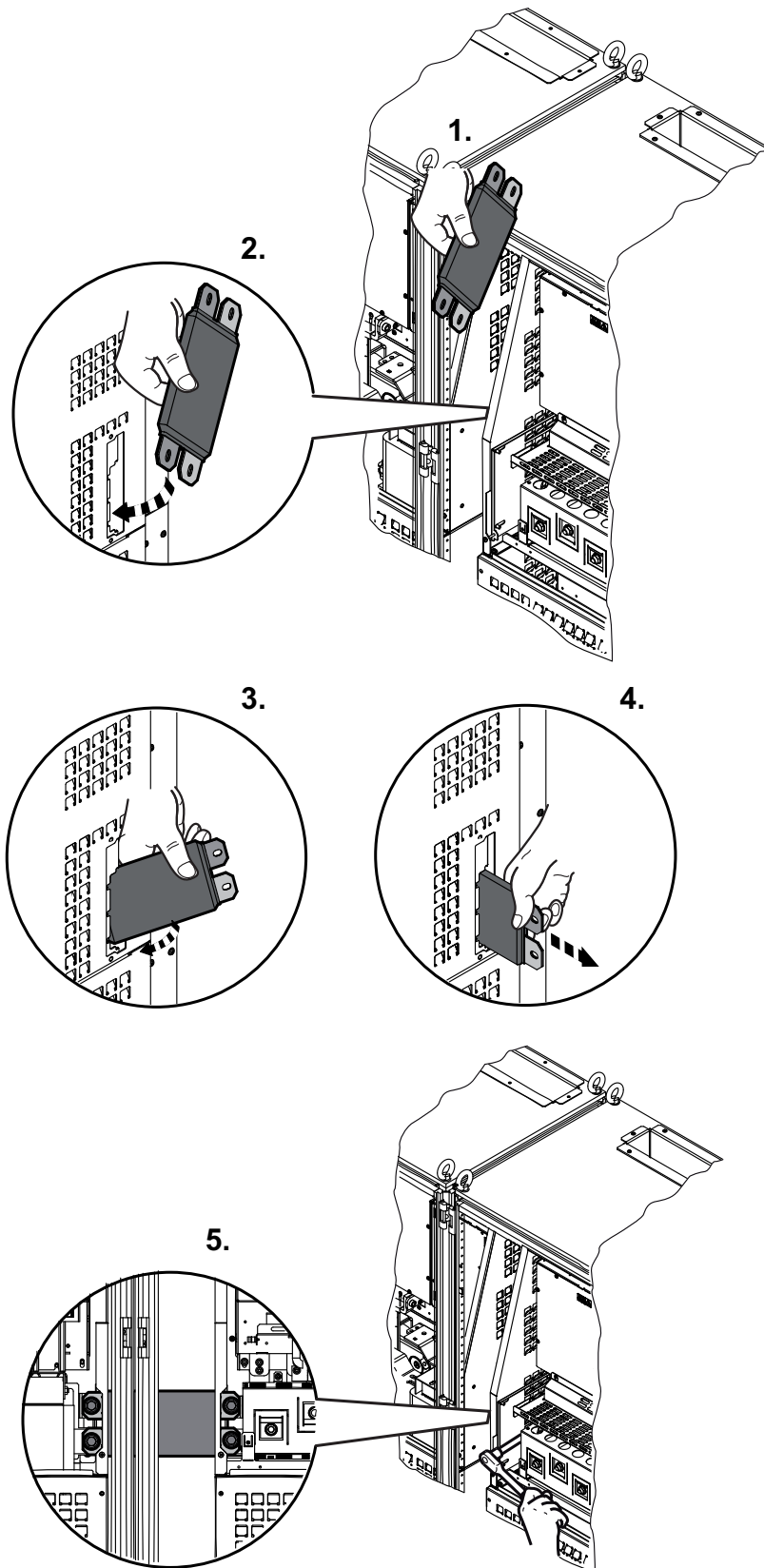
9. Insert the **200 mm and 300 mm DC link connection** into the one device skewed up to the stop.

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10. Tip the DC link connection into the second device from above



3919719051

11. Screw the DC link coupling to one device first. Then attach it to the other devices.

12. Tighten the screws.

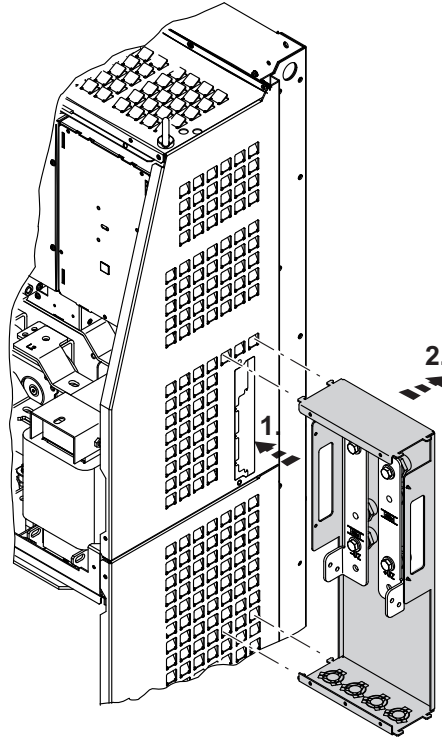
# 4 Installation

Installation instructions for the basic unit

13. Replace the covers.

## DLZ31B DC link coupling

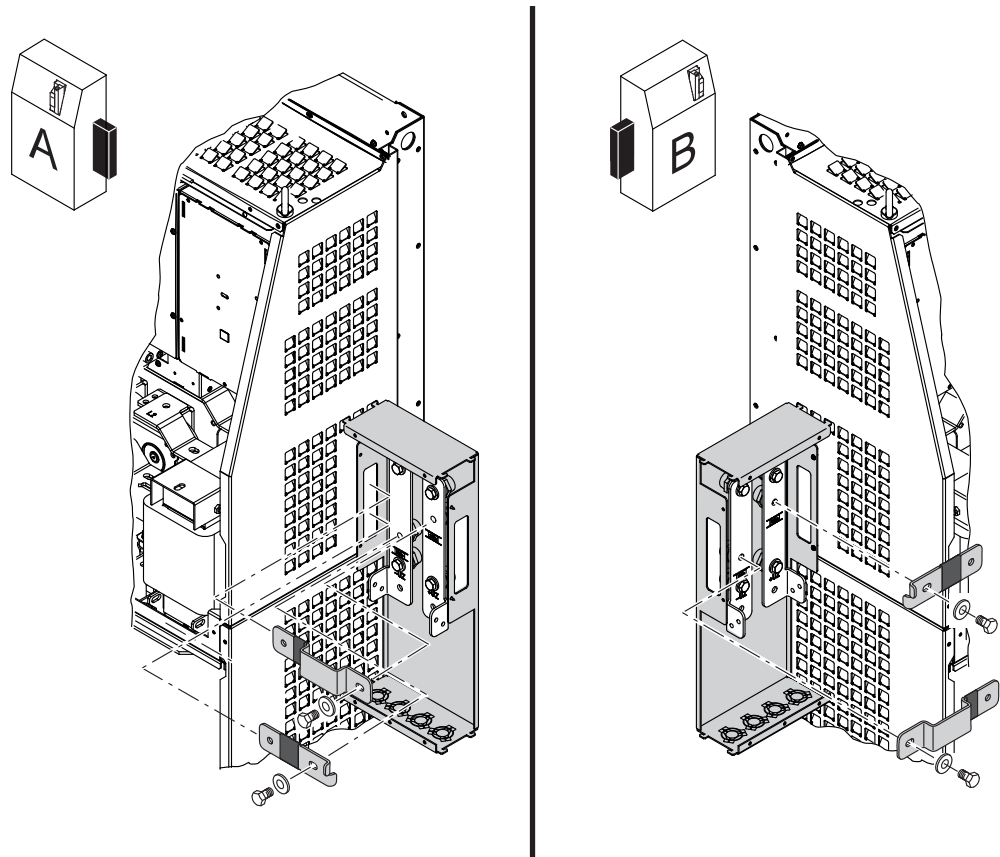
To connect a device in size 7 and a smaller size side by side, you can use the **DLZ31B DC link coupling** (part number: 18236286):



3435514891

1. Loosen the 4 screws of the upper cover and remove it.
2. Loosen the 5 screws of the cover of the DC link coupling and remove the cover.
3. Cut the opening in the side panel according to chapter "Side panel for DC link coupling" (→ 65).
4. Mount the DC link coupling to the side panel of the size 7 device.

5. Mount the DC link coupling to the side panel of the size 7 device with 2 tapping screws.



3435511051

Insert the DC link connections into the devices. Observe the arrangement of the conductor rails depending on the mounting position.

- Mounting position A: Long conductor rail with bracket at the top, short conductor rail at the bottom
- Mounting position B: Short conductor rail at the top, long conductor rail with bracket at the bottom
- Fasten the DC link connections with screws in the size 7 device first, then in the DC link coupling.
- Tighten the screws.
- Replace the covers.
- Insert the DC link connections into the devices. Observe the arrangement of the conductor rails depending on the mounting position.
  - Mounting position A: Long conductor rail with bracket at the top, short conductor rail at the bottom
  - Mounting position B: Short conductor rail at the top, long conductor rail with bracket at the bottom
- Fasten the DC link connections with screws in the size 7 device first, then in the DC link coupling.
- Tighten the screws.
- Replace the covers.

# 4 Installation

Installation instructions for the basic unit

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## *Connection options per conductor rail*

You have the following options to connect the conductor rail:

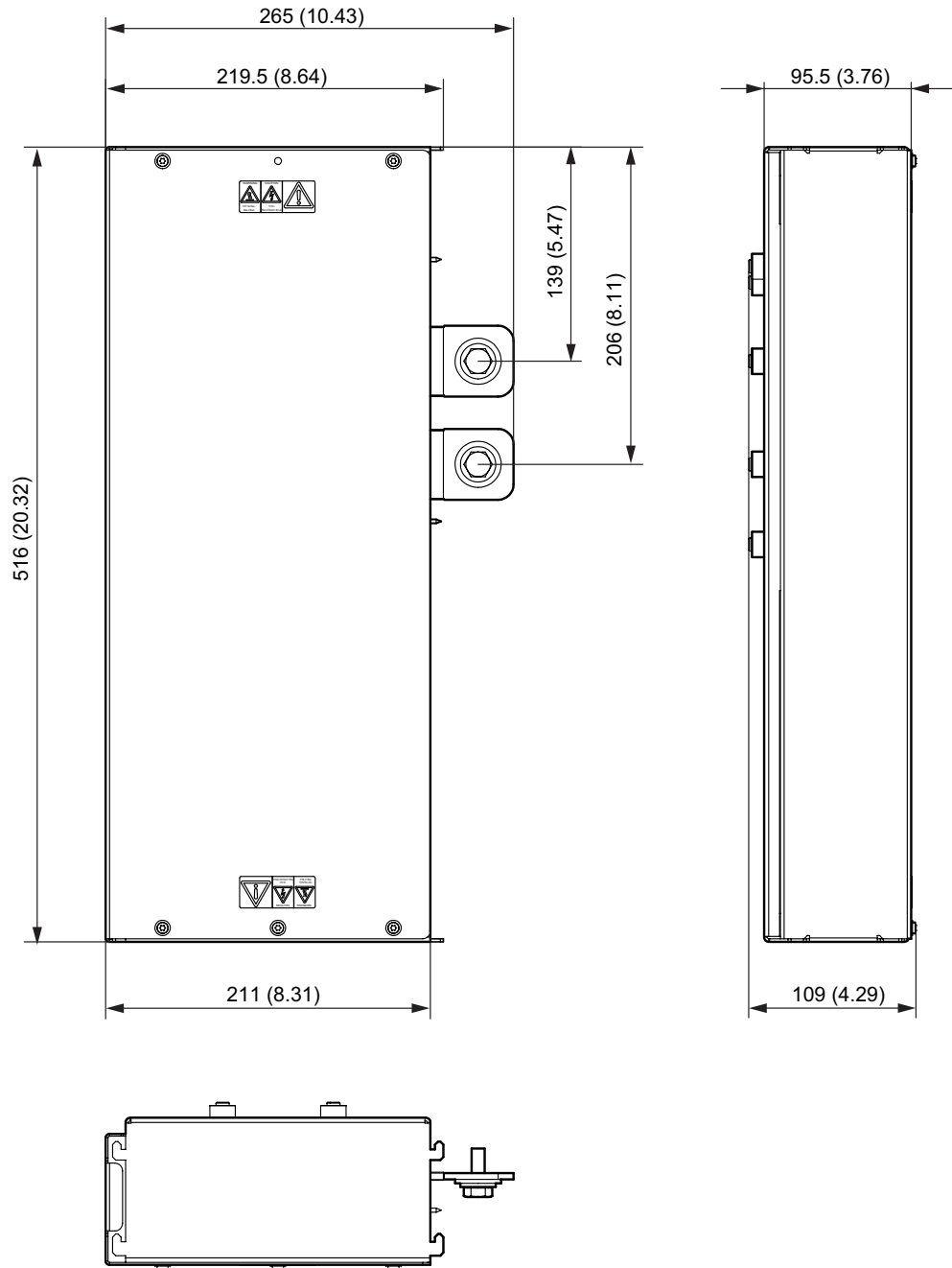
- 2 bores with a 7 mm diameter
- 1 bore with an 11 mm diameter

Observe the following installation notes in addition:

- Connection of max  $2 \times 150 \text{ mm}^2$  per conductor rail
- Provide the cable lugs with heat shrink tubing
- Provide for sufficient voltage distance between the screw ends and the metal parts
- There are 4 optional positions for M20 or M32 cable openings
- Use the provided edge protection for cables  $\geq 150 \text{ mm}^2$ .

DLZ31B DC link coupling dimension drawing

The following figure shows the dimensions of the DLZ31B DC link coupling.



4099258123

# 4 Installation

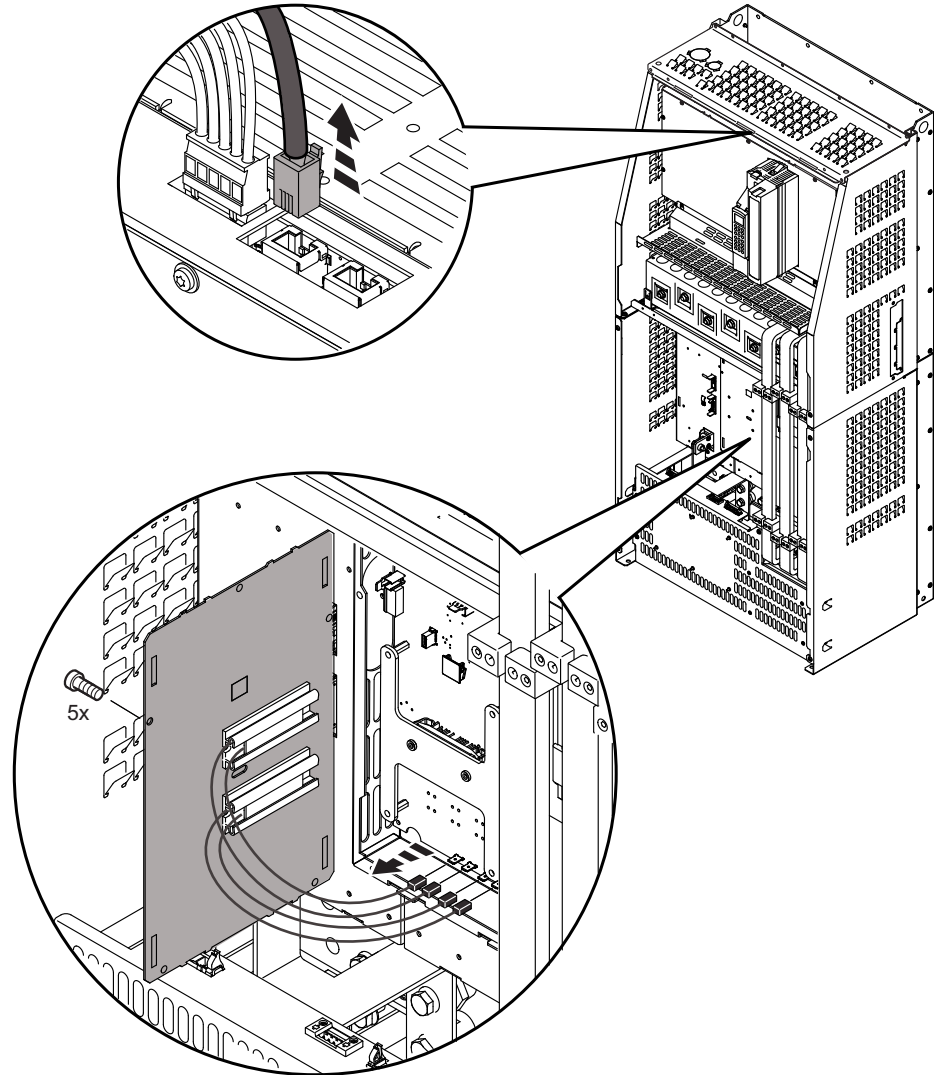
Installation instructions for the basic unit

## Conversion to motor inverter

A MOVIDRIVE® MDX61B inverter can be used as MDR62B motor inverter. The following applications can be considered:

- Supply via MDR61B regenerative power supply
- Supply via MOVIDRIVE® MDX61B connection type B

Proceed as follow to operate an inverter as MDX62B motor inverter:



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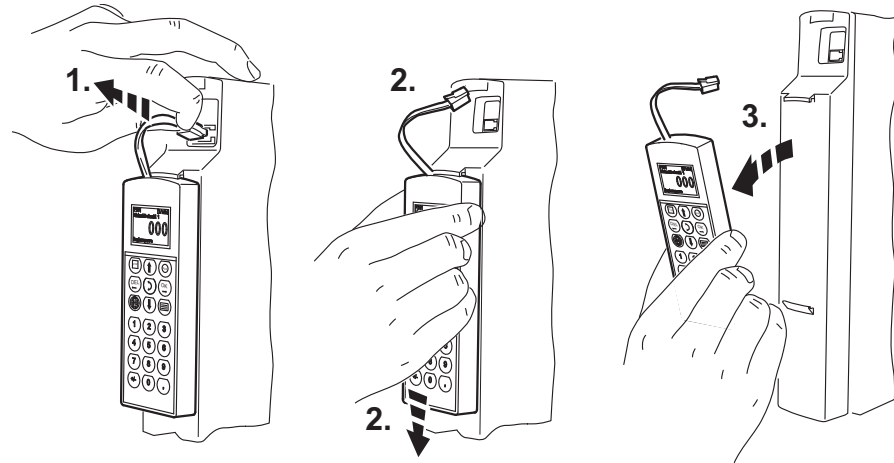
- Loosen the 4 screws of the upper cover and remove it.
- Loosen the 4 screws of the lower cover and remove it.
- Pull the CAN bus plug (RJ45) at the top of the inverter.
- Loosen the 5 screws of the cover of the precharge and discharge control and remove the cover.
- Pull the 4 flat plugs of the discharge resistors from the board.
- Fasten the loose cables.
- Replace the covers.

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## 4.2 Removing/installing the keypad

### 4.2.1 Removing the keypad

Proceed as follows:

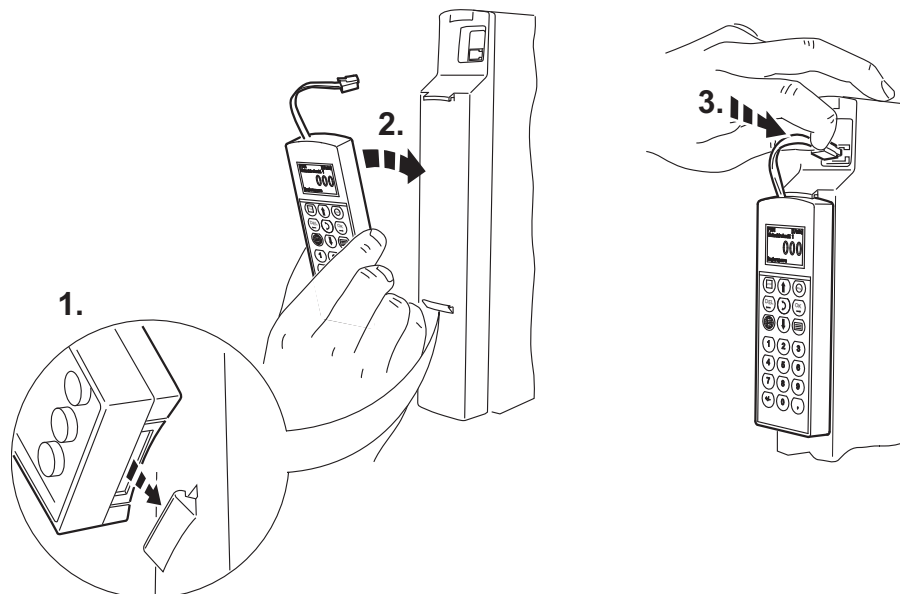


1804920715

1. Unplug the connection cable from the XT slot.
2. Carefully push the keypad downwards until it comes off the upper fixture on the front cover.
3. Remove the keypad **forward** (not to the side!).

### 4.2.2 Installing the keypad

Proceed as follows:



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1. Place the underside of the keypad onto the lower fixture of the front cover.
2. Push the keypad into the upper fixture of the front cover.
3. Plug the connecting cable into the XT slot.

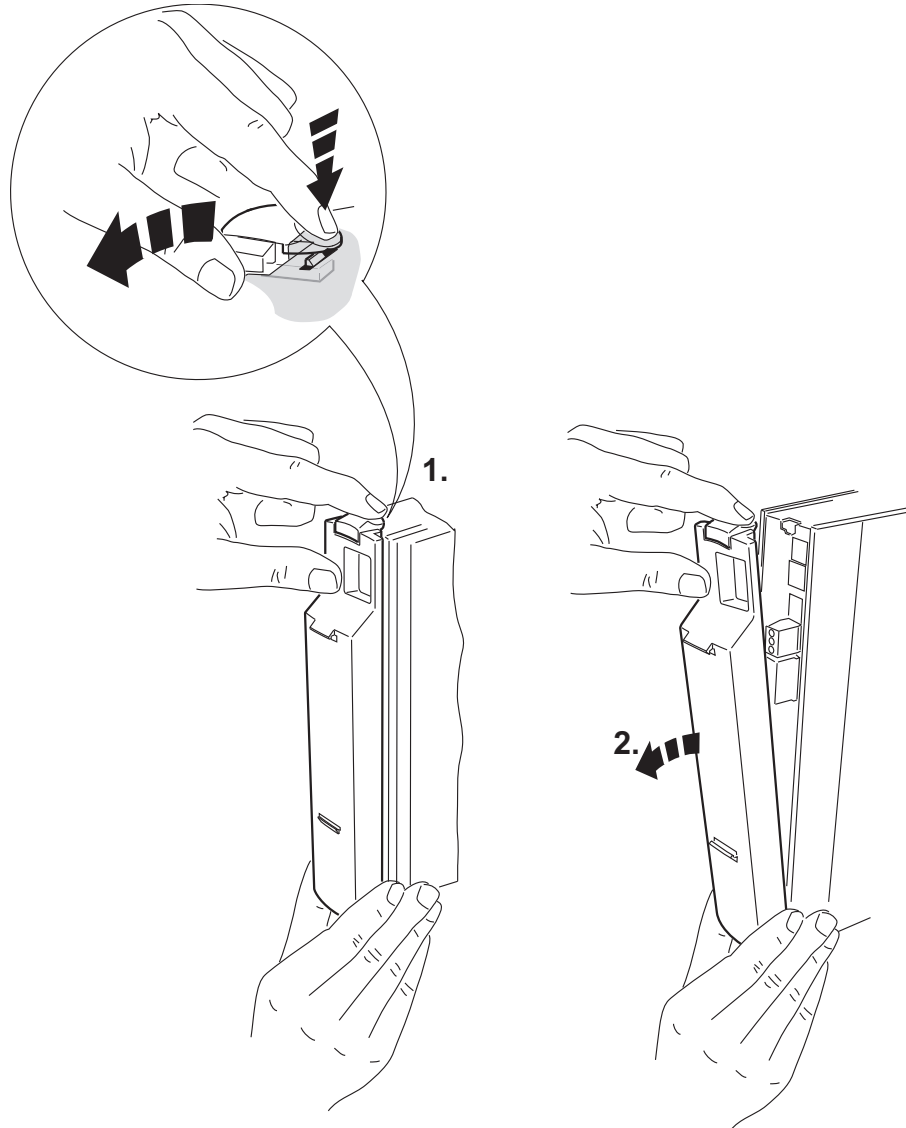
# 4 Installation

## Removing/installing the front cover

### 4.3 Removing/installing the front cover

#### 4.3.1 Removing the front cover

Proceed as follows to remove the front cover:



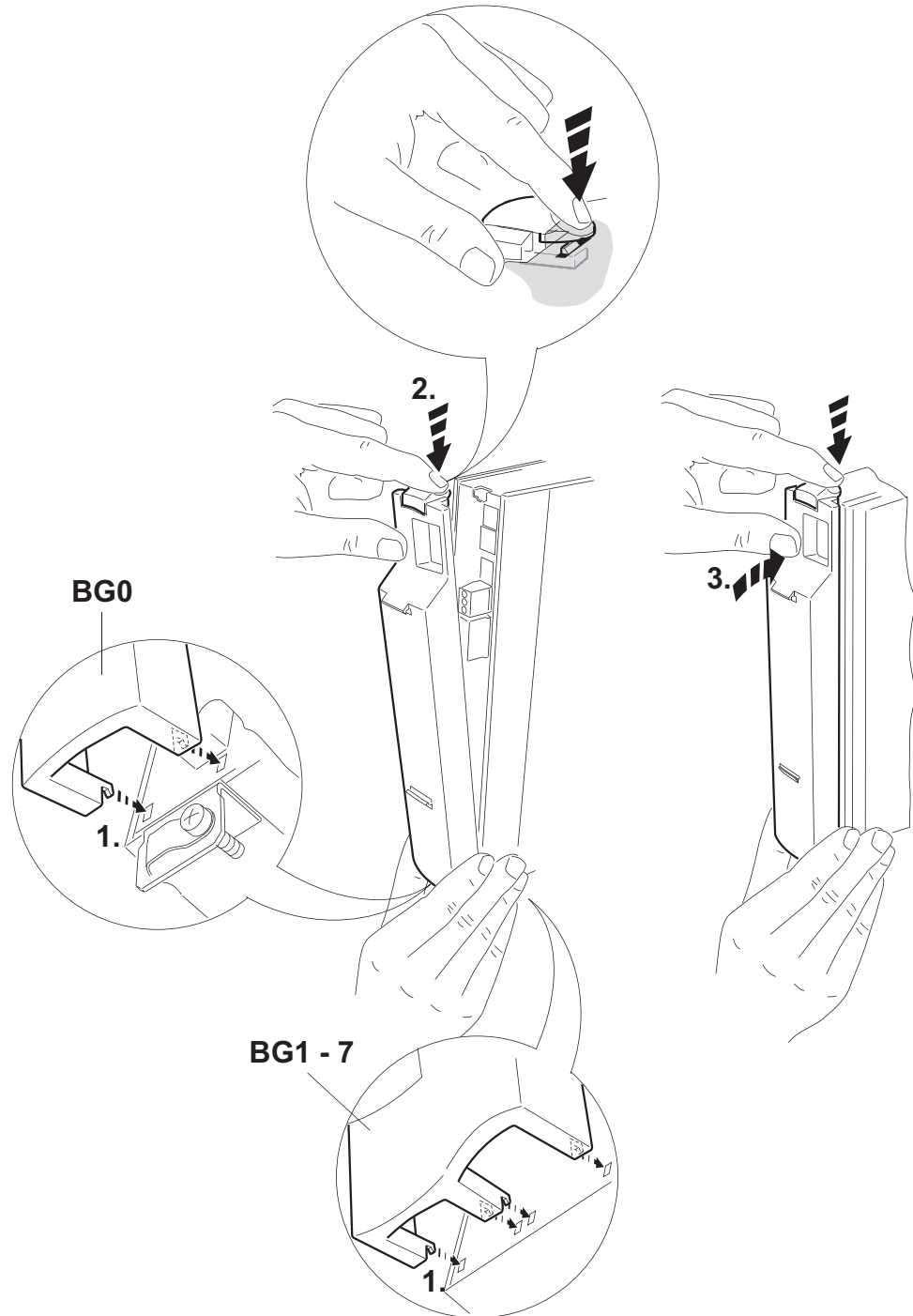
1804955147

1. If a keypad is installed, remove it first.
2. Press the grooved clip on top of the front cover.
3. Keep the clip pressed down to remove the front cover.



### 4.3.2 Installing the front cover

Proceed as follows to install the front cover:



1804958219

1. Insert the underside of the front cover into the support.
2. Keep the grooved clip on top of the front cover pressed down.
3. Push the front cover onto the device.

## 4.4 Information regarding UL

### INFORMATION



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

#### 4.4.1 Field wiring power terminals

- Use 75 °C copper wire only - models with suffix 0075, 0110, 0370, 0450, 0550, 0750, 0900, 1100, 1320, 1600, 2000, 2500.

Use 60/75 °C copper wire only - models with suffix 0005, 0008, 0011, 0014, 0015, 0022, 0030, 0037, 0040, 0055, 0150, 0220, 0300.

- Tighten terminals to in-lbs (Nm) as follows:

| Series                    | Size        | in-lbs | Nm  |
|---------------------------|-------------|--------|-----|
| MOVIDRIVE®<br>MDX 60B/61B | 0XS, 0S, 0L | 5      | 0.6 |
|                           | 1, 2S       | 5      | 0.6 |
|                           | 2           | 13     | 1.5 |
|                           | 3           | 31     | 3.5 |
|                           | 4, 5        | 120    | 14  |
|                           | 6           | 180    | 20  |
|                           | 7           | 620    | 70  |

Field wiring is to be made using listed ZMVV Lugs - models size 2, 3, 5.

#### 4.4.2 Short circuit current rating

Suitable for use on a circuit capable of delivering not more than

- 200,000 rms symmetrical amperes when protected by fuses and circuit breakers as described in the tables below.
- 65,000 rms symmetrical amperes when protected by ABB and Rockwell Type E Combination Motor controllers as described in the tables below.
- MOVIDRIVE® MDX60B/61B 0005 - 2500 (400 V units only).  
Max. voltage is limited to 500 V.
- MOVIDRIVE® MDX60B/61B 0015 - 0300 (230 V units only).  
Max. voltage is limited to 240 V.

#### 4.4.3 Branch circuit protection

Integral solid state short circuit protection does not provide branch circuit protection. Branch circuit protection must be provided in accordance with the National Electrical Code and any additional local codes.

#### AC 400/500 V devices

| Three Phase 380 V – 500 V Voltage Range |   |  |  |   |
|---|---|--|--|---|
|   | SCCR: 200 kA/ 500 V<br>when protected by:                     | SCCR: 200 kA/ 500 V<br>when protected by                         | SCCR: 65 kA/ 480 V:<br>when protected by <sup>1)</sup> : | SCCR: 65 kA/ 460 V<br>when protected by:                          |
| Model                                   | Non Semiconductor<br>Fuses (currents are ma-<br>ximum values) | Inverse-Time Circuit<br>Breaker (currents are<br>maximum values) | Type E Combination Motor Controller                      |   |
| MOVIDRIVE® MODEL,<br>0005 (Size 0S)     | 15 A / 600 V  | 25 A / 500 V   | ABB, Model MS132-2.5<br>Rated 480 V, 1 HP                | Rockwell Automation<br>Model 140M-C2E-B25,<br>Rated 460 V, 1.5 HP |
| MOVIDRIVE® MODEL,<br>0008 (Size 0S)     | 15 A / 600 V  | 25 A / 500 V   | ABB, Model MS132-4.0<br>Rated 480 V, 2 HP                | Rockwell Automation<br>Model 140M-C2E-B40,<br>Rated 460 V, 3 HP   |
| MOVIDRIVE® MODEL,<br>0011 (Size 0M)     | 15 A / 600 V  | 25 A / 500 V   | ABB, Model MS132-4.0<br>Rated 480 V, 2 HP                | Rockwell Automation<br>Model 140M-C2E-B40,<br>Rated 460 V, 3 HP   |
| MOVIDRIVE® MODEL,<br>0014 (Size 0M)     | 15 A / 600 V  | 25 A / 500 V   | ABB, Model MS132-6.3<br>Rated 480 V, 3 HP                | Rockwell Automation<br>Model 140M-C2E-B63,<br>Rated 460 V, 5 HP   |
| MOVIDRIVE® MODEL,<br>0015 (Size 1)      | 35 A / 600 V  | 25 A / 500 V   | ABB, Model MS132-6.3<br>Rated 480 V, 3 HP                | Rockwell Automation<br>Model 140M-C2E-B63,<br>Rated 460 V, 5 HP   |
| MOVIDRIVE® MODEL,<br>0022 (Size 1)      | 35 A / 600 V  | 25 A / 500 V   | ABB, Model MS132-6.3<br>Rated 480 V, 3 HP                | Rockwell Automation<br>Model 140M-C2E-B63,<br>Rated 460 V, 5 HP   |
| MOVIDRIVE® MODEL,<br>0030 (Size 1)      | 35 A / 600 V  | 25 A / 500 V   | ABB, Model MS132-10<br>Rated 480 V, 5 HP                 | Rockwell Automation<br>Model 140M-C2E-C10,<br>Rated 460 V, 7.5 HP |
| MOVIDRIVE® MODEL,<br>0040 (Size 1)      | 35 A / 600 V  | 25 A / 500 V   | ABB, Model MS132-12<br>Rated 480 V, 7.5 HP               | Rockwell Automation<br>Model 140M-D8E-C16,<br>Rated 460 V, 10 HP  |
| MOVIDRIVE® MODEL,<br>0055 (Size 2S)     | 60 A / 600 V  | 25 A / 500 V   | ABB, Model MS132-16<br>Rated 480 V, 10 HP                | Rockwell Automation<br>Model 140M-D8E-C16,<br>Rated 460 V, 10 HP  |
| MOVIDRIVE® MODEL,<br>0075 (Size 2S)     | 60 A / 600 V  | 25 A / 500 V   | ABB, Model MS132-20<br>Rated 480 V, 10 HP                | Rockwell Automation<br>Model 140M-D8E-C20,<br>Rated 460 V, 15 HP  |
| MOVIDRIVE® MODEL,<br>0110 (Size 2)      | 60 A / 600 V  | -  | ABB, Model MS132-32<br>Rated 480 V, 20 HP                | Rockwell Automation<br>Model 140M-F8E-C32,<br>Rated 460 V, 25 HP  |
| MOVIDRIVE® MODEL,<br>0150 (Size 3)      | 175 A / 600 V   | 90 A / 500 V   | ABB, Model MS450-40E<br>Rated 480 V, 30 HP               | Rockwell Automation<br>Model 140M-F8E-C45,<br>Rated 460 V, 30 HP  |
| MOVIDRIVE® MODEL,<br>0220 (Size 3)      | 175 A / 600 V   | 90 A / 500 V   | ABB, Model MS495-63E<br>Rated 480 V, 50 HP               | -   |
| MOVIDRIVE® MODEL,<br>0300 (Size 3)      | 175 A / 600 V   | 90 A / 500 V   | ABB, Model MS495-75E<br>Rated 480 V, 60 HP               | -   |
| MOVIDRIVE® MODEL,<br>0370 (Size 4)      | 350 A / 600 V   | 175 A / 500 V  | ABB, Model MS495-90E<br>Rated 480 V, 75 HP               | -   |
| MOVIDRIVE® MODEL,<br>0450 (Size 4)      | 350 A / 600 V   | 175 A / 500 V  | -  | -   |
| MOVIDRIVE® MODEL,<br>0550 (Size 5)      | 225 A / 600 V   | 175 A / 500 V  | -  | -   |
| MOVIDRIVE® MODEL,<br>0750 (Size 5)      | 225 A / 600 V   | 175 A / 500 V  | -  | -   |
| MOVIDRIVE® MODEL,<br>0900 (Size 6)      | 250 A / 600 V   | 300 A / 500 V  | -  | -   |

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# 4

## Installation

Information regarding UL

| Three Phase 380 V – 500 V Voltage Range |   |  |   |                                       |
|---|---|--|---|---------------------------------------|
|   | SCCR: 200 kA/ 500 V when protected by:                | SCCR: 200 kA/ 500 V when protected by:                     | SCCR: 65 kA/ 480 V: when protected by <sup>1)</sup> : | SCCR: 65 kA/ 460 V when protected by: |
| Model                                   | Non Semiconductor Fuses (currents are maximum values) | Inverse-Time Circuit Breaker (currents are maximum values) | Type E Combination Motor Controller                   |                                       |
| MOVIDRIVE® MODEL, 1100 (Size 6)         | 300 A / 600 V   | 300 A / 500 V  | -   | -                                     |
| MOVIDRIVE® MODEL, 1320 (Size 6)         | 400 A / 600 V   | 300 A / 500 V  | -   | -                                     |
| MOVIDRIVE® MODEL, 1600 (Size 7)         | 400 A / 600 V   | 600 A / 500 V  | -   | -                                     |
| MOVIDRIVE® MODEL, 2000 (Size 7)         | 500 A / 600 V   | 600 A / 500 V  | -   | -                                     |
| MOVIDRIVE® MODEL, 2500 (Size 7)         | 600 A / 600 V   | 600 A / 500 V  | -   | -                                     |

1) Drives employing Type E Combination Motor Controller model MS132-12, -16, -20, -25, -32 must be installed with Current Limiter Series S803W-SCLxxx-SR manufactured by ABB, otherwise SCCR rated 30kA/ 480 Vrms.

### AC 230 V devices

| Three Phase 200 V – 240 V Voltage Range |   |  |  |   |
|---|---|--|--|---|
|   | SCCR: 200 kA/ 240 V when protected by:                | SCCR: 200 kA/ 240 V when protected by:                     | SCCR: 65 kA/ 240 V when protected by <sup>1)</sup> : | SCCR: 65 kA/ 240 V when protected by:                       |
| Model                                   | Non Semiconductor Fuses (currents are maximum values) | Inverse-Time Circuit Breaker (currents are maximum values) | Type E Combination Motor Controller                  |   |
| MOVIDRIVE® MODEL, 0015 (Size 1)         | 30 A / 250 V  | 25 A / 240 V   | ABB, Model MS132-10 Rated 480 V, 5 HP                | Rockwell Automation Model 140M-C2E-C10, Rated 460 V, 7.5 HP |
| MOVIDRIVE® MODEL, 0022 (Size 1)         | 30 A / 250 V  | 25 A / 240 V   | ABB, Model MS132-10 Rated 480 V, 5 HP                | Rockwell Automation Model 140M-C2E-C10, Rated 460 V, 7.5 HP |
| MOVIDRIVE® MODEL, 0037 (Size 1)         | 30 A / 250 V  | 25 A / 240 V   | ABB, Model MS132-20 Rated 480 V, 10 HP               | Rockwell Automation Model 140M-D8E-C20, Rated 460 V, 15 HP  |
| MOVIDRIVE® MODEL, 0055 (Size 2)         | 60 A / 250 V  | 40 A / 240 V   | ABB, Model MS132-25 Rated 480 V, 15 HP               | Rockwell Automation Model 140M-F8E-C25, Rated 460 V, 20 HP  |
| MOVIDRIVE® MODEL, 0075 (Size 2)         | 60 A / 250 V  | 40 A / 240 V   | ABB, Model MS450-40E Rated 480 V, 30 HP              | Rockwell Automation Model 140M-F8E-C45, Rated 460 V, 30 HP  |
| MOVIDRIVE® MODEL, 0110 (Size 3)         | 175 A / 250 V   | 90 A / 240 V   | ABB, Model MS450-50E Rated 480 V, 40 HP              | -   |
| MOVIDRIVE® MODEL, 0150 (Size 3)         | 175 A / 250 V   | 90 A / 240 V   | ABB, Model MS495-63E Rated 480 V, 50 HP              | -   |
| MOVIDRIVE® MODEL, 0220 (Size 4)         | 350 A / 250 V   | 175 A / 240 V  | ABB, Model MS495-90E Rated 480 V, 75 HP              | -   |
| MOVIDRIVE® MODEL, 0300 (Size 4)         | 350 A / 250 V   | 175 A / 240 V  | -  | -   |

1) Drives employing Type E Combination Motor Controller model MS132-12, -16, -20, -25, -32 must be installed with Current Limiter Series S803W-SCLxxx-SR manufactured by ABB, otherwise SCCR rated 30kA/ 480 Vrms.

#### 4.4.4 Motor overload protection

The units are provided with load and speed-sensitive overload protection and thermal memory retention upon shutdown or power loss.

The trip current is adjusted to 150 % of the rated motor current.

#### 4.4.5 Ambient temperature

The units are suitable for an ambient temperature of 40 °C, max. 60 °C with derated output current.

To determine output current rating at higher than 40 °C, the output current should be derated 2.5 % per °C between 40 °C and 50 °C, and 3 % per °C between 50 °C and 60 °C.

#### INFORMATION



- Use only tested units with a **limited output voltage** ( $V_{\max} = \text{DC } 30 \text{ V}$ ) and **limited output current** ( $I_{\max} = 8 \text{ A}$ ) as an **external DC 24 V voltage source**.

- UL certification does not apply to operation in voltage supply systems with a non-grounded star point (IT systems).

#### 4.4.6 Environmental Conditions

The units are for use in pollution degree 2 environments.

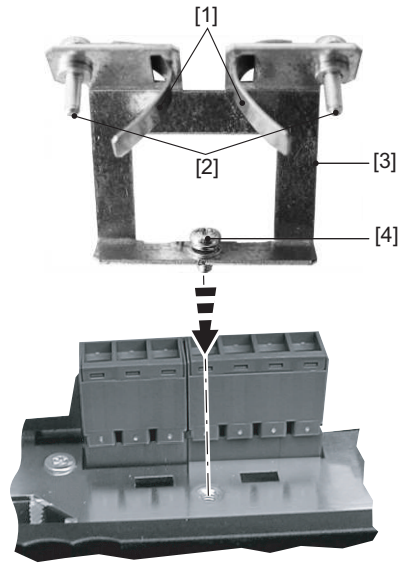
### 4.5 Shield clamps

#### 4.5.1 Shield clamp for power section, size 0

A set of shield clamps is supplied as standard for the power section of MOVIDRIVE® MDX60B/61B size 0. The shield clamps are not yet installed.

Install the shield clamps for the power section as follows:

- Secure the contact clips to the shield plates.
- Secure the shield clamps to the top and the bottom of the device.

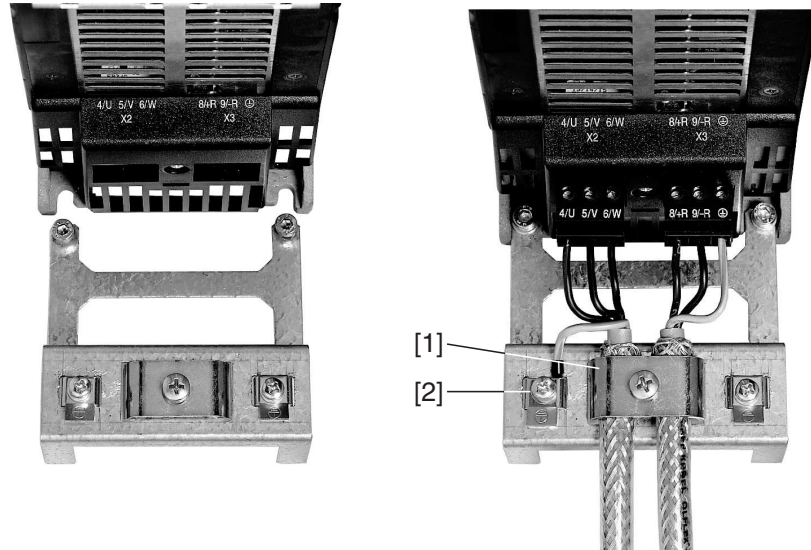


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- [1] Contact clips
- [2] Retaining screws for contact clip
- [3] Shield plate
- [4] Retaining screw for shield clamp

#### 4.5.2 Shield clamp for power section, size 1

A shield clamp is supplied as standard for the power section with MOVIDRIVE® MDX61B size 1. Install this shield clamp on the power section together with the retaining screws of the device.



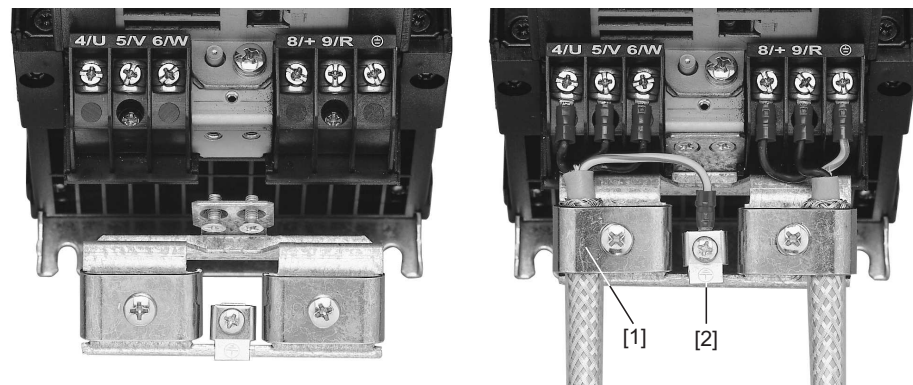
1805289867

[1] Power section shield clamp

[2] PE connection

#### 4.5.3 Shield clamp for power section, sizes 2S and 2

A shield clamp for the power section is supplied as standard with two retaining screws with MOVIDRIVE® MDX61B sizes 2S and 2. Install these shield clamp using the two retaining screws.



1805291787

[1] Power section shield clamp

[2] PE connection

The shield clamps for the power section provide you with a very convenient way of installing the shield for the motor cable and braking resistor cable. Apply the shield and PE conductor as shown in the figures below.

# 4 Installation

## Shield clamps

### 4.5.4 Shield clamp for power section, sizes 3 to 7

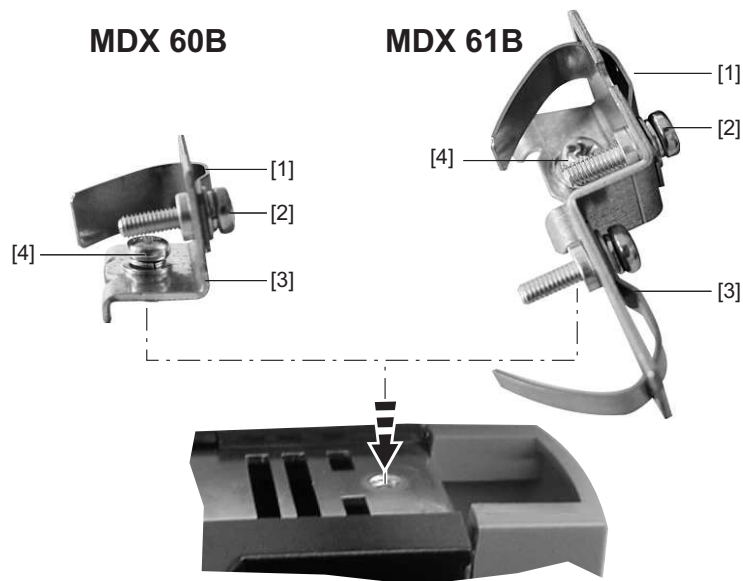
No shield clamps for the power section are supplied with MOVIDRIVE® MDX61B sizes 3 – 7. Use commercially available shield clamps for installing the shielding of motor and brake cables. Apply the shield as closely as possible to the inverter.

### 4.5.5 Shield clamp for signal cables

Install the shield clamp for the signal cable as follows:

- If installed, remove the keypad and the front cover.
- Size 0: Attach the shield clamp on the bottom of the device.
- Sizes 1 to 7: Attach the shield clamp on the bottom of the control device.

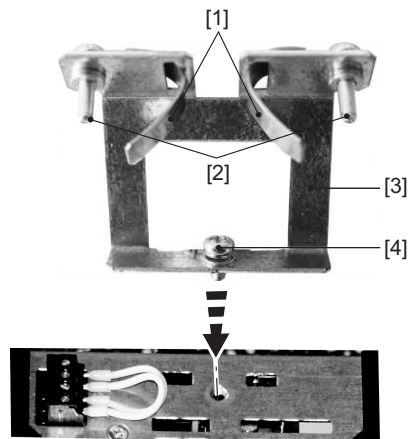
#### Size 0



1805296011



Size 1 to 7



1805401483

- [1] Contact clip(s)
- [2] Retaining screw(s) for contact clips
- [3] Shield plate
- [4] Retaining screw for shield terminal

# 4 Installation

Touch guard for power terminals

## 4.6 Touch guard for power terminals



### ⚠ WARNING

Uncovered power connections.

Severe or fatal injuries from electric shock.

- Install the touch guard according to the regulations.
- Never start the device if the touch guard is not installed.

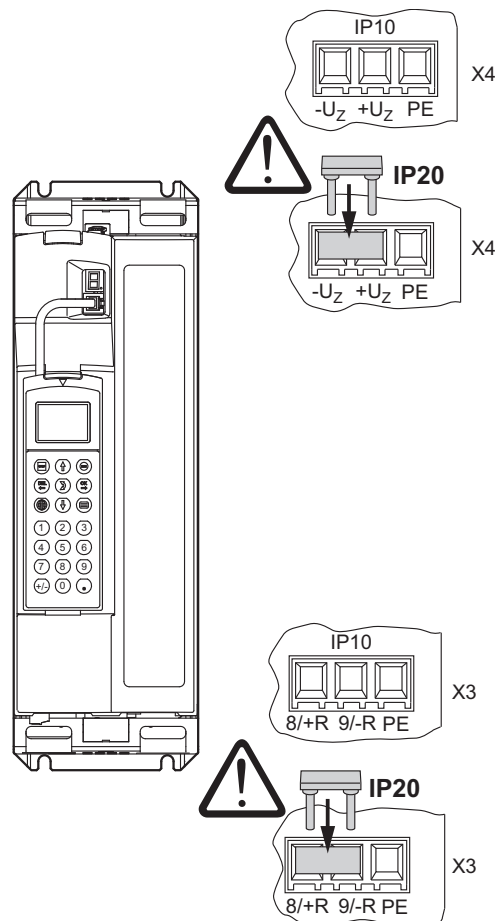
### 4.6.1 Size 2S

IP20 is achieved for MOVIDRIVE® MDX61B size 2S if one of the following conditions is fulfilled:

- Touch guard is installed on X3 / X4
- An adequate cable is connected to X3 / X4

If neither of the two conditions is fulfilled, the degree of protection is IP10.

The following figure shows the touch guard for MOVIDRIVE® MDX61B size 2S.



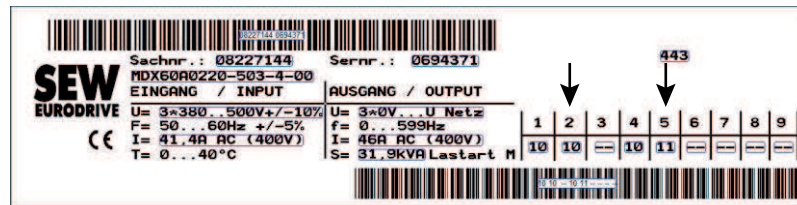
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4.6.2 Size 3

The new hardware versions of size 3 can be recognized by the entries in the status fields 2 and 5 on the nameplate of the power section. Older hardware versions do not have entries in the status fields 2 and 5.

As an example for the current hardware version, the entry in status field 2 is "10" and the entry in status field 5 is "11" in the nameplate shown below.



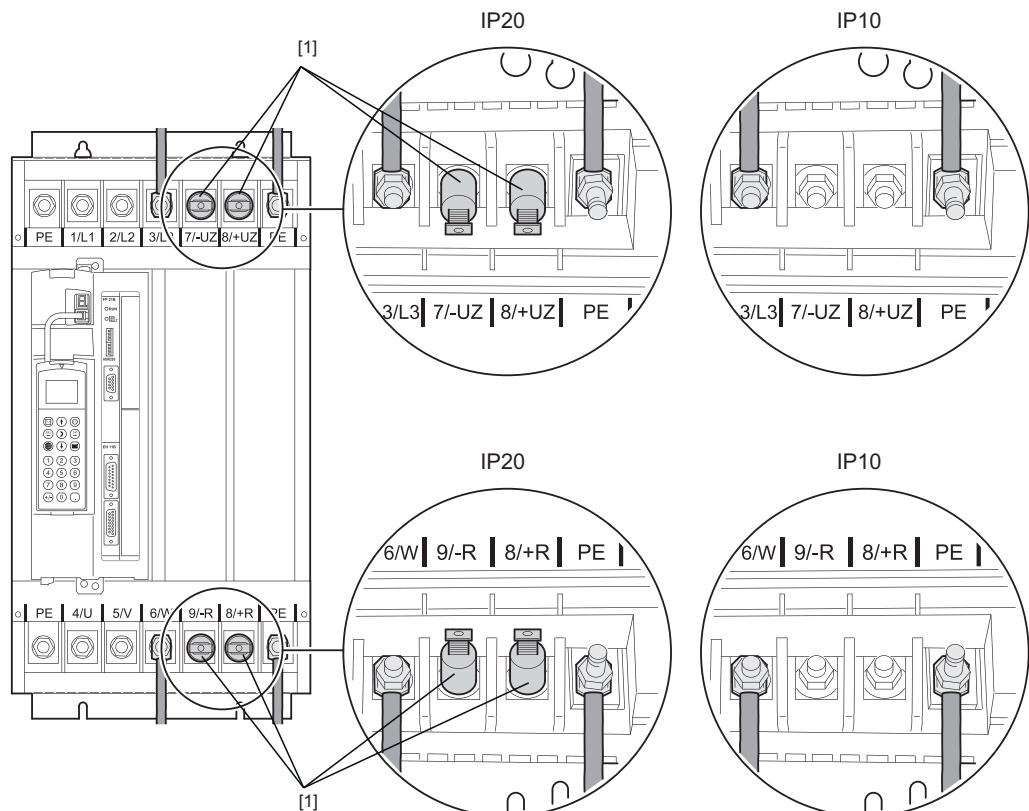
At the factory, the power connections 7/-UZ, 8/+UZ, 9/-R and 8/+R of inverters of size 3 are equipped with insulation caps for protection against contact, see figure. If the insulation caps are removed without connecting cables with insulating tubing, the inverters only have degree of protection IP10.

INFORMATION



- Unused clamping points/connection points (except PE) must be equipped with the depicted insulation caps in order to achieve the degree of protection IP20.

The following figure shows the touch guard for MOVIDRIVE® MDX61B size 3.



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[1] Insulation caps

# 4 Installation

Touch guard for power terminals

## Heat shrink tubing

The size 3 inverters have degree of protection IP20 if all power cables (connections X1, X2, X3, X4) are covered with a heat shrink tubing as shown in the following illustration.



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### 4.6.3 Sizes 4 and 5

IP20 is achieved for MOVIDRIVE® MDX61B sizes 4 and 5 (AC 500 V devices: MDX61B0370/0450/0550/0750; AC 230 V devices: MDX61B0220/0300), as soon as one of the following conditions is fulfilled:

- Power cables with heat shrink tubing and a cable cross section of  $\geq 35 \text{ mm}^2$  (AWG2) are connected to X1, X2, X3, X4. The additional DLB11B touch guard does not have to be installed.
- Power cables with heat shrink tubing and a cable cross section of  $< 35 \text{ mm}^2$  (AWG2) are connected to X1, X2, X3, X4. The DLB11B touch guard must be installed properly (see section "Installing the DLB11B touch guard").
- The DLB11B touch guard must be connected to power terminals that are not connected. The DLB11B touch guard does not have to be connected to the PE terminals.

If neither of the conditions is fulfilled, the degree of protection is IP10. The **DLB11B touch guard (12 pieces included in the delivery)** is available via the **part number 0823 111 7**.

#### Installing the DLB11B touch guard

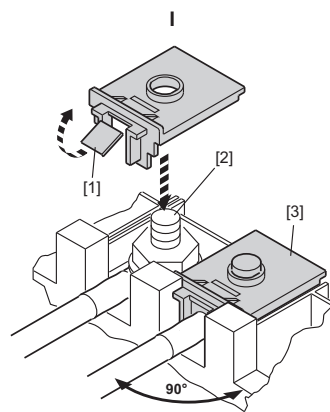
Proceed as follows when installing the **DLB11B touch guard**:

- Figure I: Power terminal with connected power cable with a cable cross section of  $< 35 \text{ mm}^2$  (AWG2):

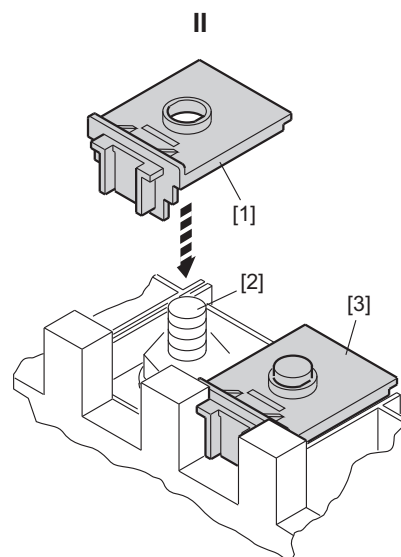
Remove the plastic lug [1] and push the DLB11B touch guard [3] on the respective terminal stud [2] of the power terminal. Make sure that the cable output is straight. Install the safety cover for the power terminals.

- Figure II: Power terminal without connected power cable:

Push the DLB11B touch guard [1] on the respective terminal stud [2]. Install the safety cover for the power terminals.



1805413643



1805519115

- [1] Plastic lug
- [2] Terminal stud
- [3] Correctly mounted touch guard

- [1] Touch guard
- [2] Terminal stud
- [3] Correctly mounted touch guard

# 4

## Installation

Touch guard for power terminals

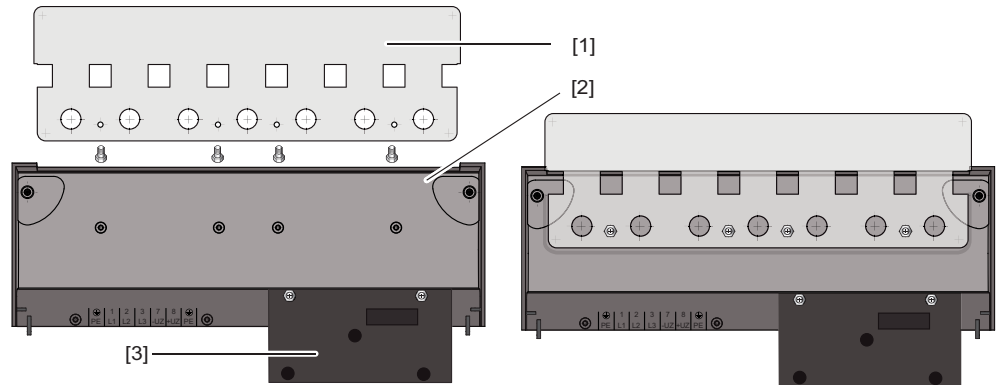
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For additional information on the X1, X2, X3 and X4 power terminals, refer to chapter "Technical data".

## 4.6.4 Sizes 4 – 6

MOVIDRIVE® size 4 (AC 500 V devices: MDX61B0370/0450; AC 230 V devices: MDX61B0220/0300), size 5 (MDX61B0550/0750) and size 6 (MDX61B0900/1100/1320), two touch guards with eight retaining screws are supplied as standard. Install the touch guard on both safety covers of the power terminals.

The following figure shows the touch guard for MOVIDRIVE® MDX61B sizes 4, 5, and 6.



2288546699

The touch guard comprises the following parts:

- [1] Cover plate
- [2] Connection plate
- [3] Screen (only for size 5)

IP10 degree of protection is only achieved for the MOVIDRIVE® MDX61B devices sizes 4, 5 and 6 when the following conditions are fulfilled:

- Touch guard is fully installed
- Heat shrink tubing is installed on the power cables of all power terminals (X1, X2, X3, X4) (see following picture)



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## INFORMATION



If the above conditions are not met, MOVIDRIVE® device sizes 4, 5 and 6 have degree of protection IP00.

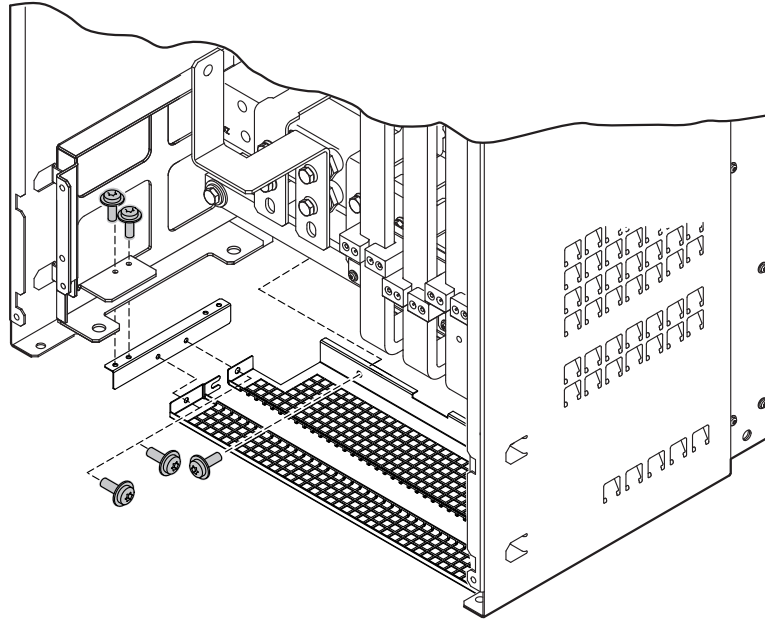
# 4 Installation

Touch guard for power terminals

## 4.6.5 Size 7

### Installing the touch guard DLB21B

Degree of protection IP20 is achieved for MOVIDRIVE® MDX61B size 7 when the touch guard DLB21B (part no 18226086) is trimmed to size by the customer and mounted in front and behind the power connections.



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### INFORMATION

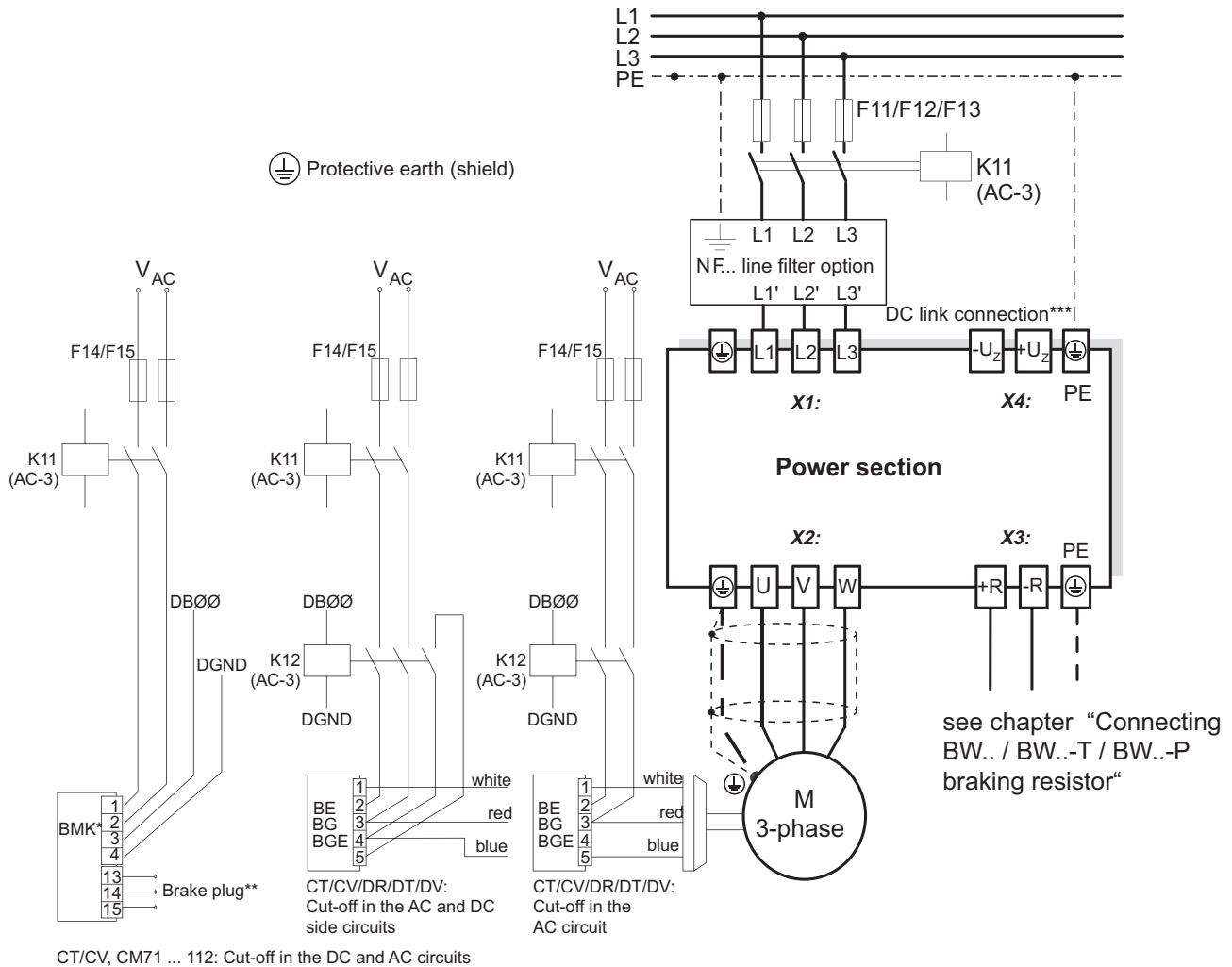


If the above conditions are not met, MOVIDRIVE® device size 7 has degree of protection IP00.



## 4.7 Wiring diagrams for basic device

### 4.7.1 Power section (sizes 0 – 6) and brake



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\*\* **Strictly adhere to the connection sequence of the brake connector.** Incorrect connection will cause irreparable damage to the brake. **Observe the operating instructions of the used motors** when connecting the brake using the terminal box.

\*\*\* With sizes 1, 2 and 2S, there is no PE connection next to the supply system connection terminals and motor connection terminals (X1, X2). In this case, use the PE terminal next to the DC link connection (X4).

## INFORMATION



Folgen

- Connect the brake rectifier using a separate supply system lead.
- **Supply via the motor voltage is not permitted.**

Always switch off the brake on the DC and AC sides with:

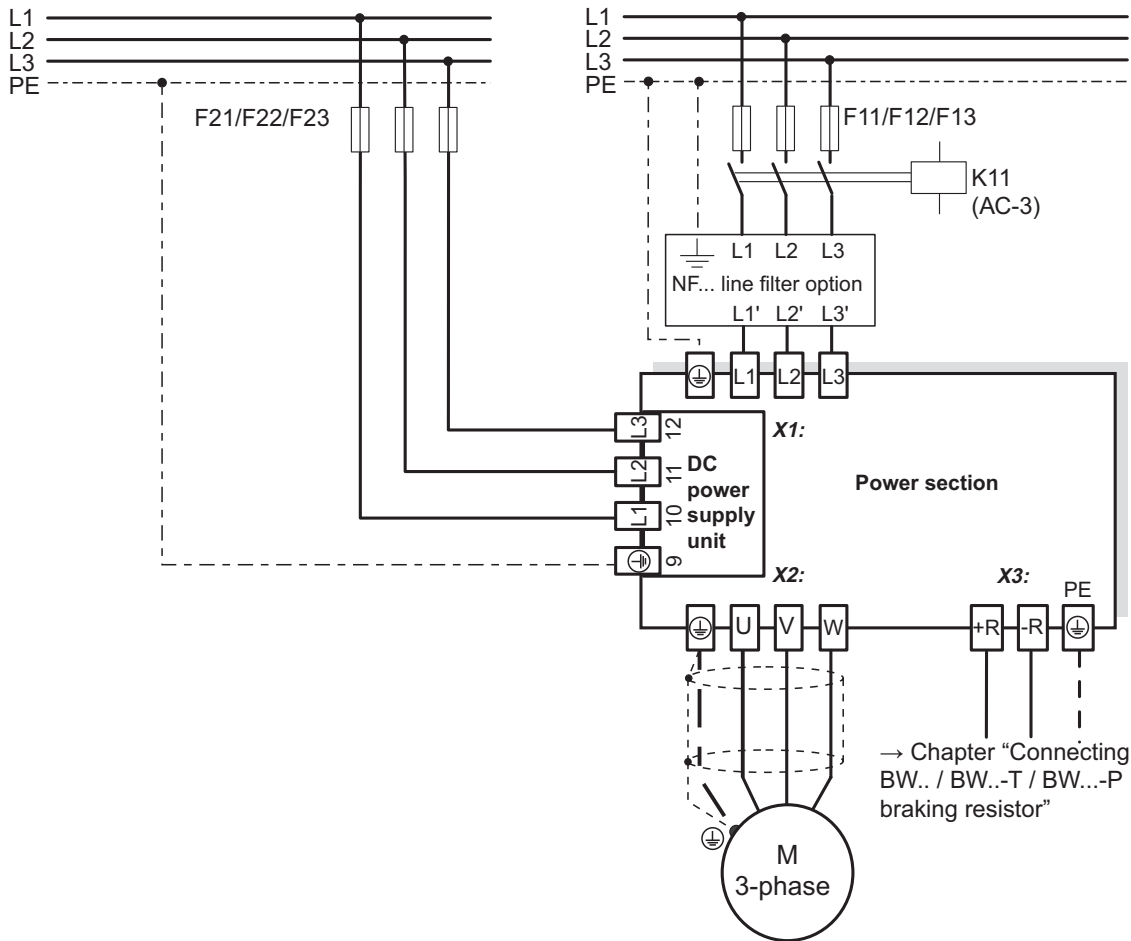
- All lifting applications,
- Drives that require a rapid brake response time
- CFC and SERVO operating modes.

# 4 Installation

Wiring diagrams for basic device

## 4.7.2 Power section and DC power supply unit (size 7)

For connecting the brake, refer to the wiring diagram of size 1 – 6.



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### Technical data of DC power supply unit:

- Nominal line current: AC 2.4 A
- Inrush current AC 30 A / AC 380 - 500 V

### INFORMATION



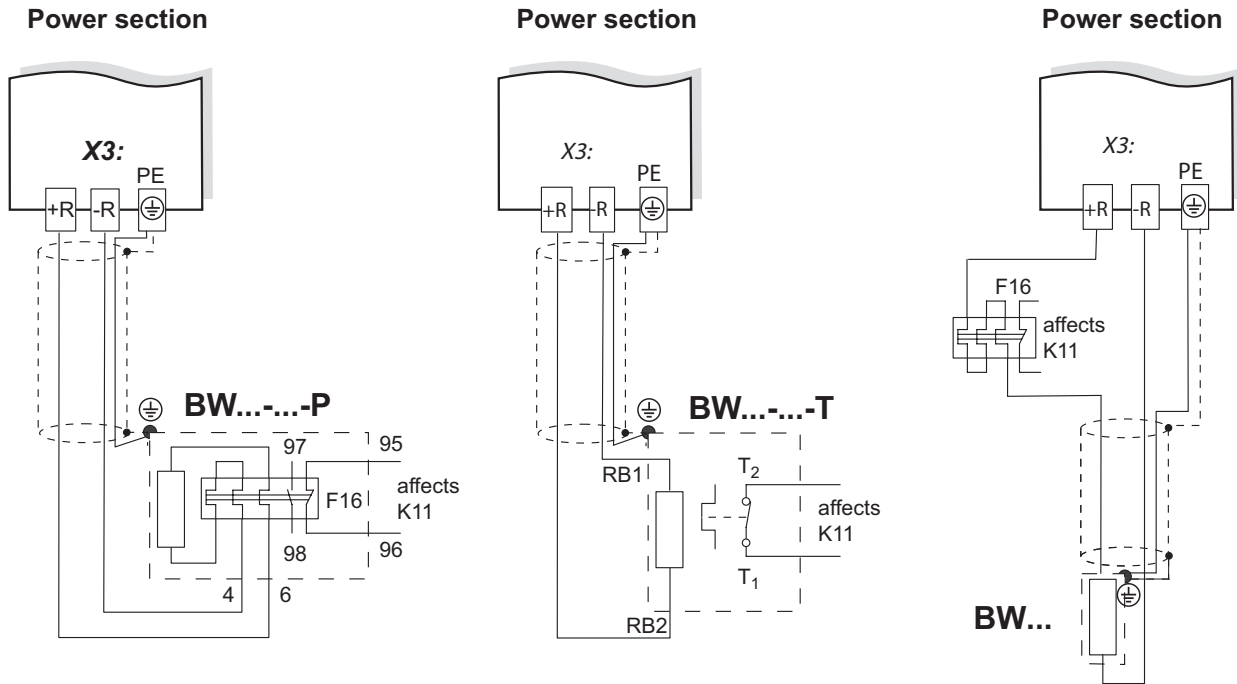
**Note** that the connection of external +24 V power supply units to the X10:9 control terminal is not permitted in backup mode via power supply unit. Incorrect connection prompts an error message.

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4.7.3 Brake rectifier in control cabinet

Install the connection cables between the brake rectifier and the brake separately from other power cables when installing the brake rectifier in the control cabinet. Joint installation is only permitted with shielded power cables.

4.7.4 Braking resistor BW... / BW...-T / BW...-P



9007201060304139

When the signal contact F16 trips, K11 must be opened and DIØØ/"controller inhibit" must receive a "0" signal. The resistor circuit must not be interrupted.

When the internal temperature switch trips, K11 must be opened and DIØØ/"controller inhibit" must receive a "0" signal. The resistor circuit must not be interrupted.

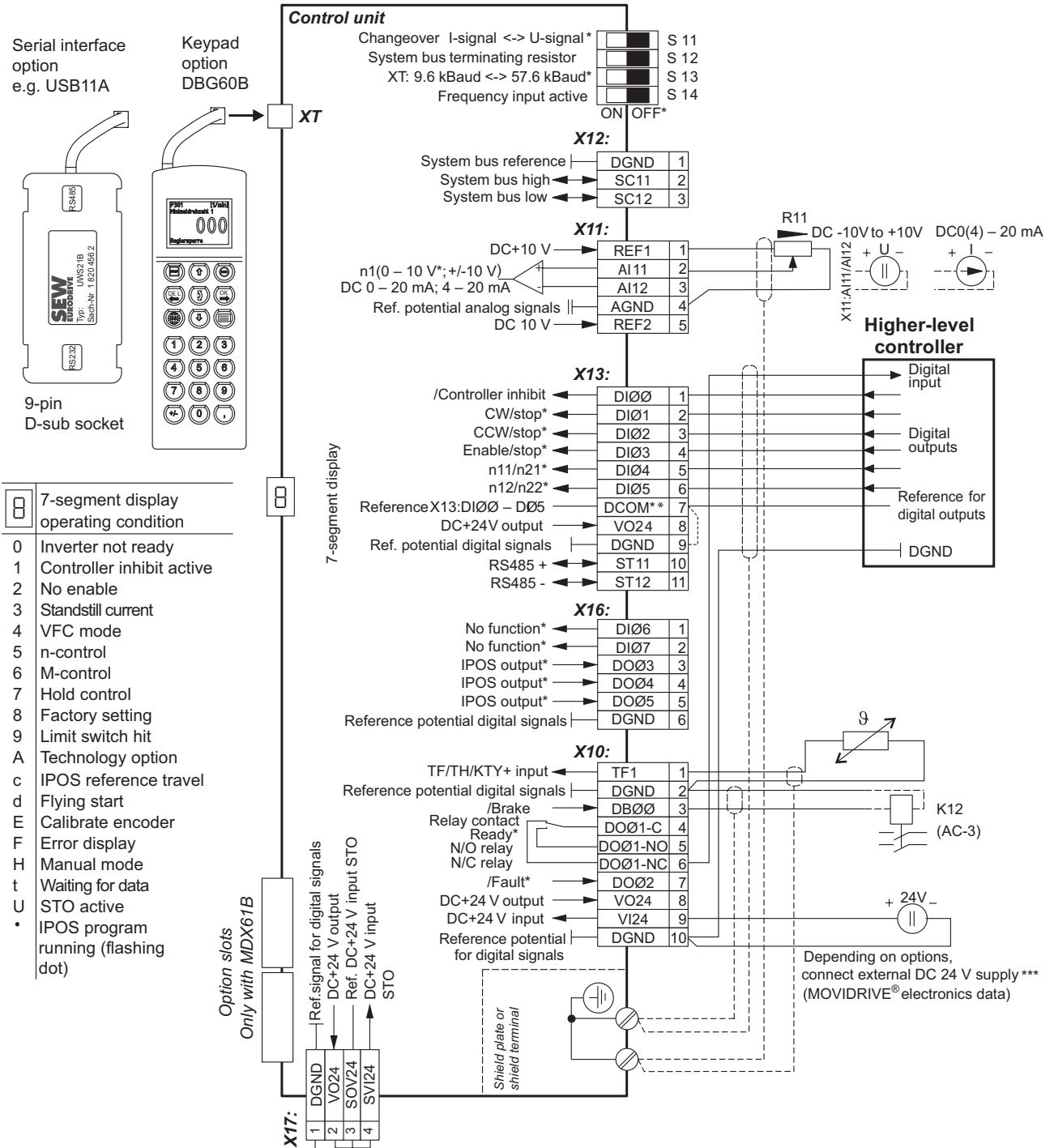
When the external bimetallic relay (F16) trips, K11 must be opened and DIØØ/"controller inhibit" must receive a "0" signal. The resistor circuit must not be interrupted.

| Braking resistor type | Overload protection |  |                                 |
|-----------------------|---------------------|--|---------------------------------|
|                       | Design specified    | Internal temperature switch (.T), (.P)   | External bimetallic relay (F16) |
| BW...                 | -                   | -  | Required                        |
| BW...-T / P           | -                   | One of the 2 options must be selected (internal temperature switch / external bimetallic relay). |                                 |
| BW...-003 / BW...-005 | Adequate            | -  | Permitted                       |
| BW090-P52B            | Adequate            | -  | -                               |

# 4 Installation

## Wiring diagrams for basic device

### 4.7.5 MDX60B/61B signal terminals



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\* Factory setting

\*\* If the digital inputs are connected to the DC 24 V voltage supply X13:8 "VO24", install a jumper between X13:7 (DCOM) and X13:9 (DGND) on MOVIDRIVE®.

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DGND (X10, X12, X13, X16, X17) is connected with PE as standard (tapped hole, see chapter "Device structure"). You can establish electrical isolation by removing the M4 × 14 grounding screw. When using a DCS21B/22B/S31B/32B and DEU21B option card, electrical isolation is not possible.

\*\*\* External voltage supply via X:10 only for sizes 0 – 6. For size 7, the 24 V backup voltage is realized via the DC power supply.

#### 4.7.6 Description of terminal functions on the basic device (power section and control unit)

| Terminal      |                                       | Function  |  |
|---------------|---------------------------------------|---|--|
| X1:1/2/3      | L1/L2/L3 (PE)                         | Line connection   |  |
| X2:4/5/6      | U/V/W (PE)                            | Motor connection  |  |
| X3:8/9        | +R/-R (PE)                            | Braking resistor connection   |  |
| X4:           | +U <sub>z</sub> /-U <sub>z</sub> (PE) | DC link connection  |  |
| 9, 10, 11, 12 | <b>L1/L2/L3/PE</b>                    | Connection of switched-mode power supply (only for size 7)  |  |
| S11:          |                                       | Changeover I signal DC(0(4) – 20 mA) ↔ U signal DC(-10 V – 0 – 10 V, 0 – 10 V), factory set to U signal.  |  |
| S12:          |                                       | Switching system bus terminating resistor on/off; factory setting: OFF.   |  |
| S13:          |                                       | Set baud rate for the RS485 interface XT.<br>Either 9.6 or 57.6 baud, factory set to 57.6 baud.   |  |
| S14:          |                                       | Switch frequency input on or off, factory setting: switched off.  |  |
| X12:1         | DGND                                  | Reference potential system bus  |  |
| X12:2         | SC11                                  | System bus high   |  |
| X12:3         | SC12                                  | System bus low  |  |
| X11:1         | REF1                                  | DC+10 V (max. DC 3 mA) for setpoint potentiometer   |  |
| X11:2/3       | AI11/12                               | Setpoint input n1 (differential input or input with AGND reference potential), signal form → P11_ / S11   |  |
| X11:4         | AGND                                  | Reference potential for analog signals (REF1, REF2, AI..., AO...)   |  |
| X11:5         | REF2                                  | DC–10 V (max. DC 3 mA) for setpoint potentiometer   |  |
| X13:1         | DIØØ                                  | Digital , with fixed assignment "/Controller inhibit"   | <ul style="list-style-type: none"> <li>The digital inputs are electrically isolated by opto-couplers.</li> <li>Selection options for digital inputs 2 – 6 (DIØ1 – DIØ5) → Parameter menu P60_</li> </ul>   |
| X13:2         | DIØ1                                  | Digital input 2, factory set to "CW/stop"   |  |
| X13:3         | DIØ2                                  | Digital input 3, factory set to "CCW/stop"  |  |
| X13:4         | DIØ3                                  | Digital input 4, factory set to "Enable/stop"   |  |
| X13:5         | DIØ4                                  | Digital input 5, factory set to "n11/n21"   |  |
| X13:6         | DIØ5                                  | Digital input 6, factory set to "n12/n22"   |  |
| X13:7         | DCOM                                  | Reference for digital inputs X13:1 – X13:6 (DIØØ – DIØ5) and X16:1/X16:2 (DIØ6 – DIØ7) <ul style="list-style-type: none"> <li>Switching digital inputs with DC+24 V external voltage: Connection X13:7 (DCOM) must be connected to the reference potential of the external voltage. <ul style="list-style-type: none"> <li>Without jumper X13:7-X13:9 (DCOM-DGND) → Isolated digital inputs</li> <li>With jumper X13:7-X13:9 (DCOM-DGND) → Non-isolated digital inputs</li> </ul> </li> <li>The digital inputs must be switched with DC+24 V from X13:8 or X10:8 (VO24) → Jumper required X13:7-X13:9 (DCOM-DGND).</li> </ul> |  |
| X13:8         | VO24                                  | Auxiliary voltage output DC+24 V (max. load X13:8 <b>and</b> X10:8 = 400 mA) for external command switches  |  |
| X13:9         | DGND                                  | Reference potential for binary signals  |  |
| X13:10        | ST11                                  | RS485+ (baud rate has a fixed setting of 9.6 kBaud)   |  |
| X13:11        | ST12                                  | RS485-  |  |
| X16:1         | DIØ6                                  | Digital input 7, factory set to "No function"   | <ul style="list-style-type: none"> <li>The digital inputs are electrically isolated by opto-couplers.</li> <li>Selection options for digital inputs 7 to 8 (DIØ6/ DIØ7) → Parameter menu P60_</li> <li>Selection options for digital outputs 3 to 5 (DOØ3 – DOØ5) → Parameter menu P62_</li> </ul> |
| X16:2         | DIØ7                                  | Digital input 8, factory set to "No function"   |  |
| X16:3         | DOØ3                                  | Digital output 3, factory set to "IPOS output"  |  |
| X16:4         | DOØ4                                  | Digital output 4, factory set to "IPOS output"  |  |
| X16:5         | DOØ5                                  | Digital output 5, factory set to "IPOS output"<br><b>Do not connect external voltage to digital outputs X16:3 (DOØ3) and X16:5 (DOØ5)!</b>  |  |
| X16:6         | DGND                                  | Reference potential for binary signals  |  |
| X10:1         | TF1                                   | KTY+/TF-/TH connection (connect to X10:2 via TF/TH), factory set to "No response" (→ P835)  |  |
| X10:2         | DGND                                  | Reference potential for binary signals / KTY–   |  |
| X10:3         | DBØØ                                  | Digital output DBØØ with fixed assignment "/Brake", load capacity max DC 150 mA (short-circuit proof, protected against external voltage to DC 30 V)  |  |
| X10:4         | DOØ1-C                                | Shared contact digital output 1, factory set to "Ready"   |  |
| X10:5         | DOØ1-NO                               | Normally open contact digital output 1, max. load capacity of relay contacts DC 30 V and DC 0.8 A   |  |
| X10:6         | DOØ1-NC                               | NC contact digital output 1   |  |
| X10:7         | DOØ2                                  | Digital output DBØ2, factory set to "/Fault", max. load capacity DC 50 mA (short-circuit proof, protected against external voltage to DC 30 V). Selection options for digital outputs 1 and 2 (DOØ1 and DOØ2) → Parameter menu P62_ . Do not apply external voltage to digital outputs X10:3 (DBØØ) and X10:7 (DOØ2).   |  |
| X10:8         | VO24                                  | Auxiliary voltage output DC+24 V (max. additional load X13:8 <b>and</b> X10:8 = 400 mA) for external command switches   |  |

| Terminal |       | Function   |
|----------|-------|--|
| X10:9    | VI24  | Input DC+24 V voltage supply (backup voltage depending on options, unit diagnosis when supply system off)  |
| X10:10   | DGND  | Reference potential for binary signals<br><b>Information on X:10.9: Only connect external backup voltage DC +24 V to sizes 0 – 6. With size 7, the DC power supply unit must be connected to the supply system. Refer to chapter "Power section and DC power supply unit (size 7)" (→ 96).</b> |
| X17:1    | DGND  | Reference potential for X17:2  |
| X17:2    | VO24  | Auxiliary voltage output DC+24 V, <b>only to supply X17:4 on the same device. Maximally 1 additional BST may be connected</b>  |
| X17:3    | SOV24 | Reference potential for DC +24 V "STO" input (safety contact)  |
| X17:4    | SVI24 | DC+24 V "STO" input (safety contact)   |
| XT       |       | Only service interface. Option slot: DBG60B / UWS21B / USB11A  |

# 4 Installation

Assignment of braking resistors, chokes and filters

## 4.8 Assignment of braking resistors, chokes and filters

### 4.8.1 AC 400/500 V devices, size 0

| MOVIDRIVE® MDX60/61B...-5A3                        |                            |                      |                        | 0005   | 0008     | 0011 | 0014     |
|--|----------------------------|----------------------|------------------------|--|----------|------|----------|
| Size   |                            |                      |                        | 0  |          |      |          |
| Braking resistors<br>BW... /<br>BW...-T            | Tripping current           | Part number<br>BW... | Part number<br>BW...-T |  |          |      |          |
| BW090-P52B <sup>1)</sup>                           | -                          | 08245630             |                        |  |          |      |          |
| BW072-003  | I <sub>F</sub> = 0.8 A     | 08260583             |                        |  |          |      |          |
| BW072-005  | I <sub>F</sub> = 1.2 A     | 08260605             |                        |  |          |      |          |
| BW168/BW168-T                                      | I <sub>F</sub> = 3.6 A     | 0820604X             | 18201334               |  |          |      |          |
| BW100-006<br>BW100-006-T                           | I <sub>F</sub> = 2.4 A     | 08217017             | 18204198               |  |          |      |          |
| Line chokes  |                            | Part number          |                        |  |          |      |          |
| ND020-013  | Total current = AC<br>20 A | 08260125             |                        |  |          |      |          |
| Line filter  |                            | Part number          |                        |  |          |      |          |
| NF009-503  |                            | 08274126             |                        |  |          |      |          |
| Output chokes                                      | Inner diameter             | Part number          |                        |  |          |      |          |
| HD001  | d = 50 mm                  | 08133255             |                        | For cable cross sections 1.5 – 16 mm <sup>2</sup> (AWG 16 – 6) |          |      |          |
| HD002  | d = 23 mm                  | 08135576             |                        | For cable cross sections ≤ 1.5 mm <sup>2</sup> (AWG 16)        |          |      |          |
| Output filter (only in operating modes VFC or V/f) |                            | Part number          |                        |  |          |      |          |
| HF008-503  |                            | 0826029X             |                        |  | <b>A</b> |      |          |
| HF015-503  |                            | 08260303             |                        |  | <b>B</b> |      | <b>A</b> |
| HF022-503  |                            | 08260311             |                        |  |          |      | <b>B</b> |

1) Internal thermal overload protection, no bimetallic relay required.

- A** In nominal operation (100%)  
**B** With variable torque load (125%)



## 4.8.2 AC 400/500 V devices, sizes 1, 2S, and 2

| MOVIDRIVE® MDX61B...-5A3                           |                            |                      |                        | 0015  | 0022 | 0030 | 0040 | 0055 | 0075 | 0110 |
|--|----------------------------|----------------------|------------------------|---|------|------|------|------|------|------|
| Size   |                            |                      |                        | 1   |      |      | 2S   |      | 2    |      |
| Braking resistors<br>BW... / BW...-T               | Tripping current           | Part number<br>BW... | Part number<br>BW...-T |   |      |      |      |      |      |      |
| BW100-005  | $I_F = 1.0 \text{ A}$      | 08262691             |                        |   |      |      |      |      |      |      |
| BW100-006/<br><b>BW100-006-T</b>                   | $I_F = 2.4 \text{ A}$      | 08217017             | 18204198               |   |      |      |      |      |      |      |
| BW168/BW168-T                                      | $I_F = 3.6 \text{ A}$      | 0820604X             | 18201334               |   |      |      |      |      |      |      |
| BW268/BW268-T                                      | $I_F = 4.2 \text{ A}$      | 08207151             | 18204171               |   |      |      |      |      |      |      |
| BW147/BW147-T                                      | $I_F = 5.1 \text{ A}$      | 08207135             | 18201342               |   |      |      |      |      |      |      |
| BW247/BW247-T                                      | $I_F = 6.5 \text{ A}$      | 08207143             | 18200842               |   |      |      |      |      |      |      |
| BW347/BW347-T                                      | $I_F = 9.2 \text{ A}$      | 08207984             | 18201350               |   |      |      |      |      |      |      |
| BW039-012/<br><b>BW039-012-T</b>                   | $I_F = 5.5 \text{ A}$      | 08216894             | 18201369               |   |      |      |      |      |      |      |
| <b>BW039-026-T</b>                                 | $I_F = 8.2 \text{ A}$      |                      | 18204155               |   |      |      |      |      |      |      |
| <b>BW039-050-T</b>                                 | $I_F = 11.3 \text{ A}$     |                      | 18201377               |   |      |      |      |      |      |      |
| Line chokes  |                            | Part number          |                        |   |      |      |      |      |      |      |
| ND020-013  | Total current = AC<br>20 A | 08260125             |                        |   |      |      |      |      |      |      |
| ND045-013  | Total current = AC 45<br>A | 08260133             |                        |   |      |      |      |      |      |      |
| Line filter  |                            | Part number          |                        |   |      |      |      |      |      |      |
| NF009-503  |                            | 08274126             |                        |   |      |      | A    |      |      |      |
| NF014-503  |                            | 0827116X             |                        |   |      |      | B    |      | A    |      |
| NF018-503  |                            | 08274134             |                        |   |      |      |      |      | B    |      |
| NF035-503  |                            | 08271283             |                        |   |      |      |      |      |      |      |
| Output chokes                                      |                            | Inner diameter       | Part number            |   |      |      |      |      |      |      |
| HD001  | d = 50 mm                  | 08133255             |                        | For cable cross sections 1.5 – 16 mm <sup>2</sup> (AWG 16 – 26) |      |      |      |      |      |      |
| HD002  | d = 23 mm                  | 08135576             |                        | For cable cross sections ≤ 1.5 mm <sup>2</sup> (AWG 16)         |      |      |      |      |      |      |
| HD003  | d = 88 mm                  | 08135584             |                        | For cable cross sections > 16 mm <sup>2</sup> (AWG 6)           |      |      |      |      |      |      |
| Output filter (only in operating modes VFC or V/f) |                            | Part number          |                        |   |      |      |      |      |      |      |
| HF015-503  |                            | 08260303             |                        | A   |      |      |      |      |      |      |
| HF022-503  |                            | 08260311             |                        | B   | A    |      |      |      |      |      |
| HF030-503  |                            | 0826032X             |                        |   | B    | A    |      |      |      |      |
| HF040-503  |                            | 08263116             |                        |   |      | B    | A    |      |      |      |
| HF055-503  |                            | 08263124             |                        |   |      |      | B    | A    |      |      |
| HF075-503  |                            | 08263132             |                        |   |      |      |      | B    | A    |      |
| HF023-403  |                            | 08257841             |                        |   |      |      |      |      | B    | A    |
| HF033-403  |                            | 0825785X             |                        |   |      |      |      |      |      | B    |

A In nominal operation (100%)

B With variable torque load (125%)

# 4

## Installation

### Assignment of braking resistors, chokes and filters

#### 4.8.3 AC 400/500 V devices, sizes 3 and 4

| MOVIDRIVE® MDX61B...-503                              |                             |                      |  |                        | 0150 | 0220 | 0300  | 0370  | 0450 |
|---|-----------------------------|----------------------|--|------------------------|------|------|-------|-------|------|
| Size  |                             |                      |  |                        | 3    |      |       | 4     |      |
| Braking resistors<br>BW... /<br>BW...-T<br>BW...-P    | Tripping current            | Part number<br>BW... | Part number<br>BW...-T   | Part number<br>BW...-P |      |      |       |       |      |
| BW018-015/<br>BW018-015-P                             | $I_F = 9.1 \text{ A}$       | 08216843             |  | 18204163               |      |      |       | C     | C    |
| BW018-035-T   | $I_F = 13.9 \text{ A}$      |                      | 18201385   |                        |      |      |       | C     | C    |
| BW018-075-T   | $I_F = 20.4 \text{ A}$      |                      | 18201393   |                        |      |      |       | C     | C    |
| BW915-T   | $I_F = 32.7 \text{ A}$      |                      | 18204139   |                        |      |      |       |       |      |
| BW012-025/<br>BW012-025-P                             | $I_F = 14.4 \text{ A}$      | 08216800             |  | 18204147               |      |      |       |       |      |
| BW012-050-T   | $I_F = 20.4 \text{ A}$      |                      | 18201407   |                        |      |      |       |       |      |
| BW012-100-T   | $I_F = 28.9 \text{ A}$      |                      | 18201415   |                        |      |      |       |       |      |
| BW106-T   | $I_F = 47.4 \text{ A}$      |                      | 18200834   |                        |      |      |       |       |      |
| BW206-T   | $I_F = 54.8 \text{ A}$      |                      | 18204120   |                        |      |      |       |       |      |
| Line chokes   |                             | Part number          |  |                        |      |      |       |       |      |
| ND045-013   | Total current = AC<br>45 A  | 08260133             |  |                        |      | A    |       |       |      |
| ND085-013   | Total current = AC<br>85 A  | 08260141             |  |                        |      | B    |       |       | A    |
| ND150-013   | Total current = AC<br>150 A | 08255482             |  |                        |      |      |       |       | B    |
| ND300-0053  | Total current = AC<br>300 A | 08277214             |  |                        |      |      |       |       |      |
| Line filter   |                             | Part number          |  |                        |      |      |       |       |      |
| NF035-503   |                             | 08271283             |  |                        |      | A    |       |       |      |
| NF048-503   |                             | 08271178             |  |                        |      | B    | A     |       |      |
| NF063-503   |                             | 08274142             |  |                        |      |      | B     | A     |      |
| NF085-503   |                             | 08274150             |  |                        |      |      |       | B     | A    |
| NF115-503   |                             | 08274169             |  |                        |      |      |       |       | B    |
| Output chokes   | Inner diameter              | Part number          |  |                        |      |      |       |       |      |
| HD001   | d = 50 mm                   | 08133255             | For cable cross sections 1.5 – 16 mm <sup>2</sup> (AWG 16 – 6) |                        |      |      |       |       |      |
| HD003   | d = 88 mm                   | 08135584             | For cable cross sections > 16 mm <sup>2</sup> (AWG 6)          |                        |      |      |       |       |      |
| Output filter (only in operating modes VFC<br>or V/f) |                             | Part number          |  |                        |      |      |       |       |      |
| HF033-403   |                             | 0825785X             |  |                        |      | A    | B / H | A / H |      |
| HF047-403   |                             | 08257868             |  |                        |      | B    | A     |       |      |
| HF450-503   |                             | 08269483             |  |                        |      |      |       | B     | A/H  |

- A** In nominal operation (100%)
- B** With variable torque load (125%)
- C** Connect two braking resistors in parallel and set twice the tripping current on F16 ( $2 \times I_F$ )
- D** Connect three braking resistors in parallel and set three times the tripping current on F16 ( $3 \times I_F$ )
- E** Connect four braking resistors in parallel and set four times the tripping current on F16 ( $4 \times I_F$ )
- H** Two filter in parallel

## 4.8.4 AC 400/500 V devices, sizes 5 – 7

| MOVIDRIVE® MDX61B...-503                           |  |                          | 0550   | 0750 | 0900 | 1100 | 1320 | 1600 | 2000 | 2500 |
|--|--|--------------------------|--|------|------|------|------|------|------|------|
| Size   |  |                          | 5  |      | 6    |      |      | 7    |      |      |
| Braking resistors<br>BW.....-T                     | Tripping current                                       | Part number<br>BW.....-T |  |      |      |      |      |      |      |      |
| BW106-T  | $I_F = 47.4 \text{ A}$                                 | 18200834                 |  |      | C    | C    | C    | D    | E    | F    |
| BW206-T  | $I_F = 54.8 \text{ A}$                                 | 18204120                 |  |      | C    | C    | C    | D    | E    | F    |
| BW1.4-170  | $I_F = 110 \text{ A}$                                  | 13301527                 |  |      |      |      |      |      |      |      |
| BW003-420-T  | $I_F = 129 \text{ A}$                                  | 13302345                 |  |      |      |      |      | C    | C    | C    |
| Line filter  |  | Part number              |  |      |      |      |      |      |      |      |
| NF115-503  |  | 08274169                 | A  |      |      |      |      |      |      |      |
| NF150-503  |  | 08274177                 | B  | A    |      |      |      |      |      |      |
| NF210-503  |  | 08274185                 |  | B    |      | A    |      |      |      |      |
| NF300-503  |  | 08274193                 |  |      |      | B    |      |      |      |      |
| NF600-503  |  | 17963389                 |  |      |      |      |      | B    | B    | B    |
| Output chokes                                      | Inner diameter   | Part number              |  |      |      |      |      |      |      |      |
| HD001  | d = 50 mm  | 08133255                 | For cable cross sections 1.5 – 16 mm <sup>2</sup> (AWG 16 – 6) |      |      |      |      |      |      |      |
| HD003  | d = 88 mm  | 08135584                 | For cable cross sections > 16 mm <sup>2</sup> (AWG 6)          |      |      |      |      |      |      |      |
| HD004  | Connection<br>with M12 bolt                            | 08168857                 |  |      |      |      |      |      |      |      |
| HD005  | Connection<br>With M12 cable lug, M10<br>PE connection | 17963362                 |  |      |      |      |      | B    | B    | B    |
| Output filter (only in V/f and VFC operating mode) |  | Part number              |  |      |      |      |      |      |      |      |
| HF450-503  |  | 08269483                 | H  | H    |      |      |      |      |      |      |
| HF180-403  |  | 08299099                 |  |      |      |      |      |      |      |      |
| HF325-403  |  | 08299483                 |  |      |      |      |      |      |      |      |

- A** In nominal operation (100%)  
**B** With variable torque load (125%)  
**C** Connect two braking resistors in parallel and set twice the tripping current on F16 ( $2 \times I_F$ )  
**D** Connect three braking resistors in parallel and set three times the tripping current on F16 ( $3 \times I_F$ )  
**E** Connect four braking resistors in parallel and set four times the tripping current on F16 ( $4 \times I_F$ )  
**F** Connect five braking resistors in parallel and set five times the tripping current on F16 ( $5 \times I_F$ )  
**H** Two filter in parallel

# 4

## Installation

Assignment of braking resistors, chokes and filters

### 4.8.5 AC 230 V devices, sizes 1 – 4

| MOVIDRIVE® MDX61B...-2_3                                |                             |                      |                          | 0015   | 0022 | 0037 | 0055 | 0075 | 0110 | 0150 | 0220 | 0300 |
|---|-----------------------------|----------------------|--------------------------|--|------|------|------|------|------|------|------|------|
| Size  |                             |                      |                          | 1  |      | 2    |      | 3    |      | 4    |      |      |
| Braking resistors<br>BW...../<br>BW.....-T<br>BW.....-P | Tripping current            | Part number<br>BW... | Part number<br>BW.....-T |  |      |      |      |      |      |      |      |      |
| BW039-003   | $I_F = 2.7 \text{ A}$       | 08216878             |                          |  |      |      |      |      |      |      |      |      |
| BW039-006   | $I_F = 3.9 \text{ A}$       | 08216886             |                          |  |      |      |      |      |      |      |      |      |
| BW039-012<br>BW039-012-T                                | $I_F = 5.5 \text{ A}$       | 08216894             | 18201369                 |  |      |      |      |      |      |      |      |      |
| BW039-026-T   | $I_F = 8.1 \text{ A}$       |                      | 18204155                 |  |      |      |      |      |      |      |      |      |
| BW027-006   | $I_F = 4.7 \text{ A}$       | 08224226             |                          |  |      |      |      |      |      |      |      |      |
| BW027-012   | $I_F = 6.6 \text{ A}$       | 08224234             |                          |  |      |      |      |      |      |      |      |      |
| BW018-015-T   | $I_F = 9.1 \text{ A}$       |                      | 18204163                 |  |      |      |      |      | C    | C    | C    | C    |
| BW018-035-T   | $I_F = 13.9 \text{ A}$      |                      | 18201385                 |  |      |      |      |      | C    | C    | C    | C    |
| BW018-075-T   | $I_F = 20.4 \text{ A}$      |                      | 18201393                 |  |      |      |      |      | C    | C    | C    | C    |
| BW915-T   | $I_F = 32.6 \text{ A}$      |                      | 18204139                 |  |      |      |      |      | C    | C    | C    | C    |
| BW012-025-P   | $I_F = 14.4 \text{ A}$      |                      | 18204147                 |  |      |      |      |      |      |      |      |      |
| BW012-050-T   | $I_F = 20.4 \text{ A}$      |                      | 18201407                 |  |      |      |      |      |      |      |      |      |
| BW012-100-T   | $I_F = 28.8 \text{ A}$      |                      | 18201415                 |  |      |      |      |      |      |      |      |      |
| BW106-T   | $I_F = 47.4 \text{ A}$      |                      | 18200834                 |  |      |      |      |      |      |      | C    | C    |
| BW206-T   | $I_F = 54.7 \text{ A}$      |                      | 18204120                 |  |      |      |      |      |      |      | C    | C    |
| Line chokes   |                             | Part number          |                          |  |      |      |      |      |      |      |      |      |
| ND020-013   | Total current = AC<br>20 A  | 08260125             |                          |  |      |      | A    |      |      |      |      |      |
| ND045-013   | Total current = AC 45<br>A  | 08260133             |                          |  |      |      | B    |      | A    |      |      |      |
| ND085-013   | Total current = AC 85<br>A  | 0826014              |                          |  |      |      |      |      | B    |      | A    |      |
| ND150-013   | Total current = AC<br>150 A | 08255482             |                          |  |      |      |      |      |      |      | B    |      |
| Line filter   |                             | Part number          |                          |  |      |      |      |      |      |      |      |      |
| NF009-503   |                             | 08274126             |                          |  | A    |      |      |      |      |      |      |      |
| NF014-503   |                             | 0827116X             |                          |  | B    | A    |      |      |      |      |      |      |
| NF018-503   |                             | 08274134             |                          |  |      | B    |      |      |      |      |      |      |
| NF035-503   |                             | 08271283             |                          |  |      |      |      |      |      |      |      |      |
| NF048-503   |                             | 08271178             |                          |  |      |      |      |      | A    |      |      |      |
| NF063-503   |                             | 08274142             |                          |  |      |      |      |      | B    |      |      |      |
| NF085-503   |                             | 08274150             |                          |  |      |      |      |      |      |      | A    |      |
| NF115-503   |                             | 08274169             |                          |  |      |      |      |      |      |      | B    |      |
| Output chokes   |                             | Part number          |                          |  |      |      |      |      |      |      |      |      |
| HD001   | d = 50 mm                   | 08133255             |                          | For cable cross sections 1.5 – 16 mm <sup>2</sup> (AWG 16 – 6) |      |      |      |      |      |      |      |      |
| HD002   | d = 23 mm                   | 08135576             |                          | For cable cross sections ≤ 1.5 mm <sup>2</sup> (AWG 16)        |      |      |      |      |      |      |      |      |
| HD003   | d = 88 mm                   | 08135584             |                          | For cable cross sections > 16 mm <sup>2</sup> (AWG 6)          |      |      |      |      |      |      |      |      |

**A** In nominal operation (100%)

**B** With variable torque load (125%)

**C** Connect two braking resistors in parallel and set twice the tripping current on F16 ( $2 \times I_F$ )

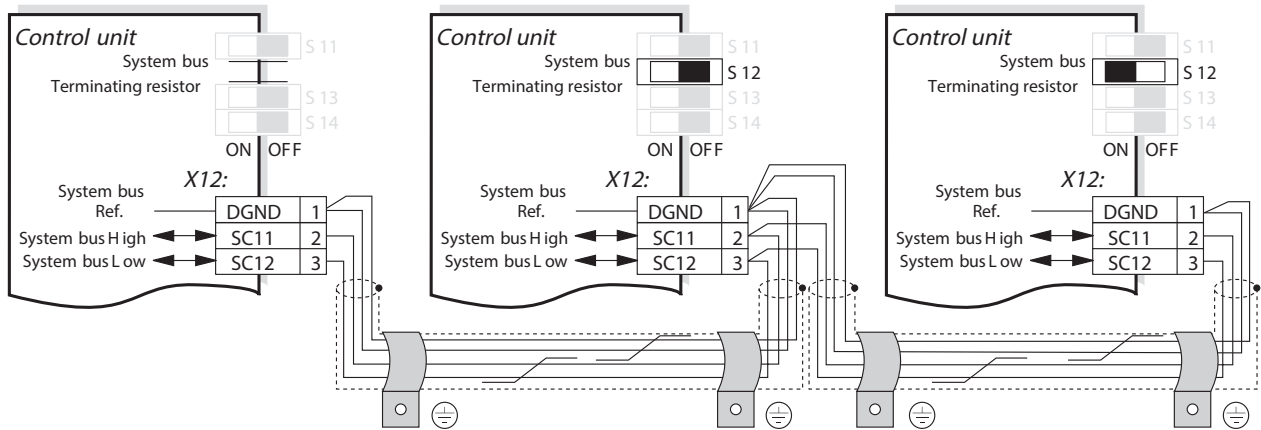
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## 4.9 Connecting the system bus (SBus 1)

Max. 64 CAN bus stations can be addressed via system bus (SBus). Use a repeater after 20 or 30 stations, depending on the length of the cables and the cable capacitance. The SBus supports transmission technology compliant with ISO 11898.

The "Serial Communication" manual contains detailed information about the system bus that can be ordered from SEW-EURODRIVE.

### 4.9.1 SBus wiring diagram



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### Cable specification

- Use a 4-core twisted and shielded copper cable (data transmission cable with braided copper shield). The cable must meet the following specifications:
  - Cable cross section 0.25 – 0.75 mm<sup>2</sup> (AWG 23 – AWG 19)
  - Line resistance 120 Ω at 1 MHz
  - Capacitance per unit length ≤ 40 pF/m at 1 kHz

Suitable cables include CAN bus or DeviceNet™ cables.

# 4 Installation

## Connecting the system bus (SBus 1)

---

### Connecting the shield

- Connect the shield to the electronics shield clamp on the inverter or the master controller and make sure it is connected over a wide area at both ends.

### Cable length

- The permitted total cable length depends on the baud rate setting of the SBus (P884):
  - 125 kBaud → 500 m
  - 250 kBaud → 250 m
  - **500 kBaud → 100 m**
  - 1000 kBaud → 40 m

### Terminating resistor

- Switch on the system bus terminating resistor (S12 = ON) at the start and end of the system bus connection. Switch off the terminating resistor on the other units (S12 = OFF).



### NOTICE

There must not be any potential shift between the devices which are connected together using the SBus. This can restrict the functionality of the device.

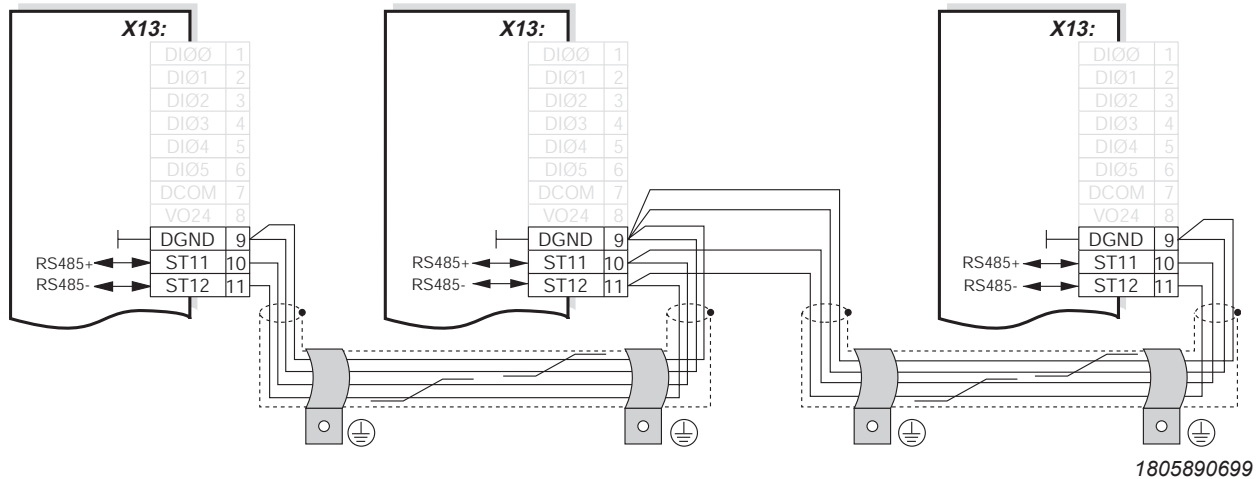
Take suitable measures to avoid potential shift, e.g. by connecting the unit ground connectors using a separate cable.

---

## 4.10 Connecting the RS485 interface

The RS485 interface (X13:ST11, ST12) can be used for connecting max. 32 MOVIDRIVE® devices, e.g. for master/slave operation, or 31 MOVIDRIVE® devices and a higher-level controller (PLC). The baud rate is set to 9.6 baud by default.

### 4.10.1 Wiring diagram of the RS485 interface (X13)



#### Cable specification

- Use a 4-core twisted and shielded copper cable (data transmission cable with braided copper shield). The cable must meet the following specifications:
  - Cable cross section 0.5 mm<sup>2</sup> – 0.75 mm<sup>2</sup> (AWG 23 – AWG 19)
  - Line resistance 100 – 150 Ω at 1 MHz
  - Capacitance per unit length ≤ 40 pF/m at 1 kHz

#### Shield contact

- Connect the shield to the electronics shield clamp on the inverter or higher-level controller and make sure it is connected over a wide area at both ends.

#### Cable length

- The permitted total cable length is 200 m.

#### Terminating resistor

- Dynamic terminating resistors are installed. **Do not connect any external terminating resistors.**

### NOTICE

There must not be any difference of potential between the devices which are connected together using the RS485. This can restrict the functionality of the device.

Take suitable measures to avoid potential shift, e.g. by connecting the device ground connectors using a separate cable.



# 4

## Installation

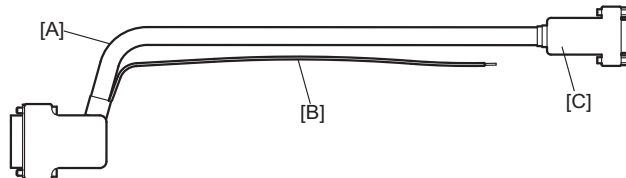
### Connecting the DWE11B/12B interface adapter

#### 4.11 Connecting the DWE11B/12B interface adapter

##### 4.11.1 Part number and description

- DWE11B, part number 01881876

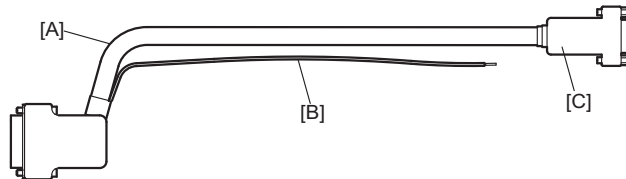
The interface adapter DWE11B (HTL → TTL) in the form of an adapter cable is used to **connect single-ended HTL encoders to the DEH11B/DEH21B options**. Only the A, B and C tracks are connected. The interface adapter is suitable for all HTL encoders that were operated on MOVIDRIVE® A, MDV and MCV and can be connected without any rewiring effort.



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- DWE12B, part number 01881809

The interface adapter DWE12B (HTL → TTL) in the form of an adapter cable is used to **connect push-pull HTL encoders to the DEH11B/DEH21B options**. In addition to the A, B and C track, you will also have to connect the negated tracks. SEW-EURODRIVE recommends using this interface adapter for any new system.



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## 4.12 Connecting the UWS21B interface adapter (RS232 ↔ RS485)

### 4.12.1 Part number

Interface adapter option UWS21B: 18204562

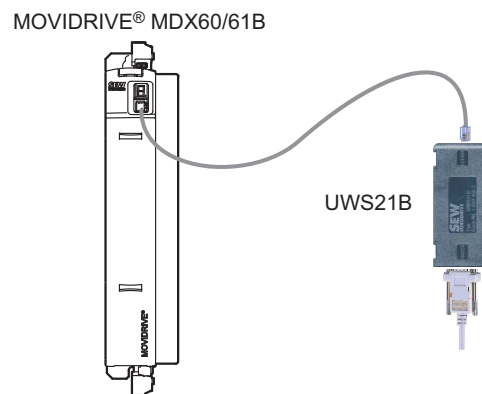
### 4.12.2 Scope of Delivery

The scope of delivery for the UWS21B option includes:

- UWS21B device
- CD-ROM with MOVITOOLS® MotionStudio
- Serial interface cable with 9-pin sub D socket and 9-pin D-sub connector to connect the UWS21B option to the PC.
- Serial interface cable with two RJ10 connectors to connect UWS21B to MOVIDRIVE®

### 4.12.3 MOVIDRIVE® – UWS21B connection

- Use the connection cable included in the delivery to connect the UWS21B option to MOVIDRIVE®.
- Plug the connection cable into the XT terminal socket of MOVIDRIVE®.
- Note that the DBG60B keypad and the UWS21B serial interface cannot be connected to the MOVIDRIVE® at the same time.
- The following figure shows the connection cable between MOVIDRIVE® and UWS21B.



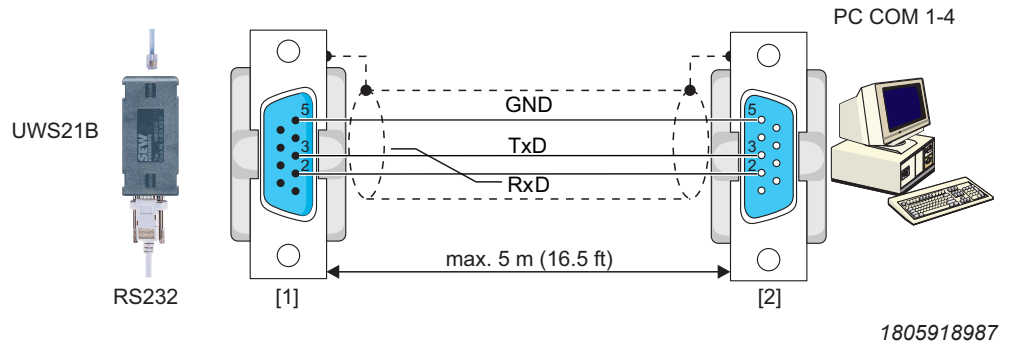
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# 4 Installation

Connecting the UWS21B interface adapter (RS232 ↔ RS485)

## 4.12.4 Connecting UWS21B to PC

- Use the connection cable supplied (shielded RS232 standard interface cable) to connect the UWS21B option to the PC.
- The following figure shows the connection cable between UWS21B and PC (1:1 connection).



[1] 9-pin D-sub connector

[2] 9-pin D-sub socket

## 4.13 Connecting the USB11A interface adapter

### 4.13.1 Part number

Interface adapter option USB11A: 08248311

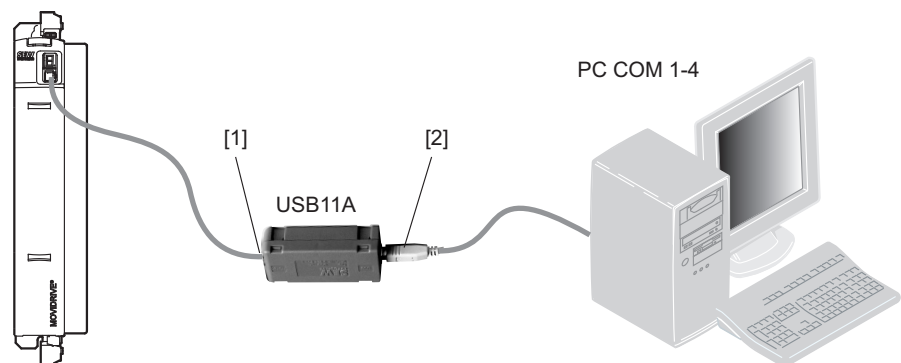
### 4.13.2 Scope of Delivery

- The scope of delivery for the USB11A includes:
  - USB11A interface adapter
  - USB connection cable PC – USB11A (type USB A-B)
  - Connection cable for MOVIDRIVE® MDX60B/61B – USB11A (RJ10 – RJ10 cable)
  - CD-ROM with drivers and MOVITOOLS® MotionStudio
- The USB11A interface adapter supports USB 1.1 and USB 2.0.

### 4.13.3 Connecting MOVIDRIVE®-USB11A – PC

- Use the connection cable [1] (RJ10 – RJ10) supplied to connect the USB11A option to MOVIDRIVE®.
- Plug the connection cable [1] into the XT slot of MOVIDRIVE® MDX60B/61B and into the RS485 slot of the USB11A.
- Note that the DBG60B keypad and the USB11A interface adapter cannot be connected to the MOVIDRIVE® at the same time.
- Use the supplied USB connection cable [2] (type USB A-B) to connect the USB11A to the PC.
- The following figure shows the connection cable between MOVIDRIVE MDX60B/61B and USB11A.

MOVIDRIVE® MDX60/61B



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**4.13.4 Installation**

- Connect the USB11A to a PC and MOVIDRIVE® MDX60B/61B using the connection cables supplied.
- Insert the enclosed CD into the CD drive of your PC and install the driver. The first free COM port on the PC will be assigned to the USB11A interface adapter.

**4.13.5 Operation with MOVITOOLS® MotionStudio**

- After installation, the PC recognizes the USB11A interface converter after approximately 5 – 10 s.
- Start MOVITOOLS® MotionStudio.

**INFORMATION**

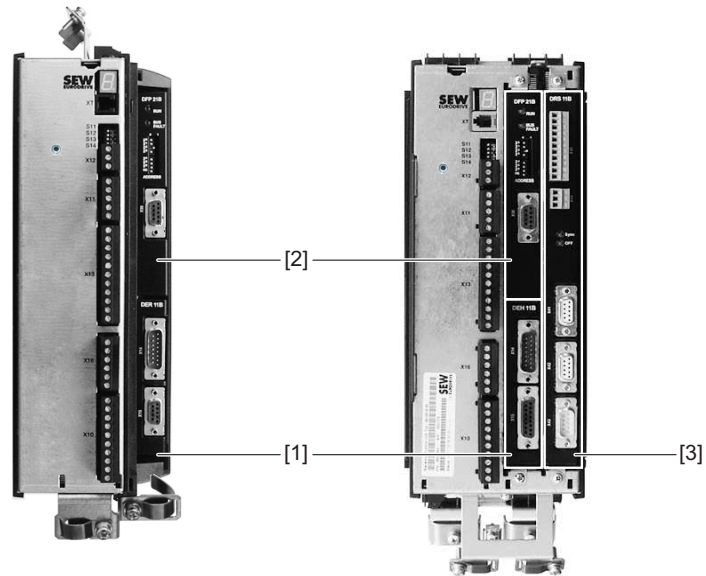
If the connection between the PC and USB11A is interrupted, you have to restart MOVITOOLS® MotionStudio.

---

## 4.14 Option combinations for MDX61B

### 4.14.1 Configuration of option slots

Size 0 (0005 – 0014) Size 1 – 6 (0015 – 1320)



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- [1] Encoder slot for encoder options
- [2] Fieldbus option slot for communication options
- [3] Expansion slot for communication options (only sizes 1 – 6)

# 4

## Installation

### Option combinations for MDX61B

#### 4.14.2 Option card combinations for MDX61B

The option cards are different sizes and can only be installed in the matching option slots. Fieldbus interfaces including DHx cannot be combined with one another. The following list shows the possible combinations of option cards for MOVIDRIVE® MDX61B.

| Option card                    | Designation   | MOVIDRIVE® MDX61B               |                                  |                                   |
|--------------------------------|---|---------------------------------|----------------------------------|-----------------------------------|
|                                |   | Encoder slot<br>Size 0 – size 7 | Fieldbus slot<br>Size 0 – size 7 | Expansion slot<br>Size 1 – size 7 |
| DEH11B                         | Encoder input incr. / HIPERFACE®                          | X                               |                                  |                                   |
| DEH21B <sup>1)</sup>           | Encoder input absolute encoder                            | X                               |                                  |                                   |
| DEU21B <sup>2)</sup>           | Encoder input absolute encoder                            | X                               |                                  |                                   |
| DER11B                         | Encoder input resolver / HIPERFACE®                       | X                               |                                  |                                   |
| DFP21B                         | PROFIBUS fieldbus interface                               |                                 | X                                |                                   |
| DFI11B                         | Interbus fieldbus interface                               |                                 | X                                |                                   |
| DFI21B                         | Interbus FOC fieldbus interface                           |                                 | X                                |                                   |
| DFD11B                         | DeviceNet™ fieldbus interface                             |                                 | X                                |                                   |
| DFC11B                         | CAN/CANopen fieldbus interface                            |                                 | X                                |                                   |
| DFE11B<br>DFE12B<br>DFE13B     | Ethernet fieldbus interface                               |                                 | X                                |                                   |
| DFE32B                         | PROFINET IO fieldbus interface                            |                                 | X                                |                                   |
| DFE33B                         | EtherNet/IP™ fieldbus interface                           |                                 | X                                |                                   |
| DFE24B                         | EtherCAT® fieldbus interface                              |                                 | X                                |                                   |
| DFS11B                         | PROFIBUS fieldbus interface with PROFIsafe (STO)          |                                 | X                                |                                   |
| DFS12B                         | PROFIBUS fieldbus interface with PROFIsafe                |                                 | X                                |                                   |
| DFS21B                         | PROFINET IO fieldbus interface with PROFIsafe (STO)       |                                 | X                                |                                   |
| DCS21B/<br>22B/<br>31B/<br>32B | Safety monitor  |                                 |                                  | X                                 |
| DIO11B                         | I/O expansion   |                                 | X                                | X <sup>3)</sup>                   |
| DRS11B <sup>2)</sup>           | Phase-synchronous operation                               |                                 |                                  | X                                 |
| DIP11B <sup>1)</sup>           | SSI encoder interface                                     |                                 |                                  |                                   |
| DHP11B                         | User-programmable MOVI-PLC®<br><i>basic</i> controller    |                                 | X                                | X <sup>3)</sup>                   |
| DHE41B                         | User-programmable MOVI-PLC®<br><i>advanced</i> controller |                                 | X                                | X <sup>3)</sup>                   |
| DHF41B                         | User-programmable MOVI-PLC®<br><i>advanced</i> controller |                                 |                                  | X                                 |

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| Option card        | Designation  | MOVIDRIVE® MDX61B               |                                  |                                    |
|--------------------|--|---------------------------------|----------------------------------|------------------------------------|
|                    |  | Encoder slot<br>Size 0 – size 7 | Fieldbus slot<br>Size 0 – size 7 | Expansion slot<br>Size 1 – size 7  |
| DHR41B             | User-programmable MOVI-PLC®<br><i>advanced</i> controller                    |                                 |                                  | X                                  |
| DHP11B +<br>OST11B | DHP11B + OST11B (RS485 inter-<br>face, only in combination with DH-<br>P11B) | OST11B                          | DHP11B                           | DHP11B + OS-<br>T11B <sup>4)</sup> |

- 1) The option cards DEH21B and DIP11B cannot be combined.
- 2) The option cards DEU21B and DRS11B cannot be combined.
- 3) When fieldbus option slot is not available
- 4) When encoder slot is not available

## 4.15 Installing and removing option cards

### INFORMATION



- For **MOVIDRIVE® MDX61B size 0**, only **SEW-EURODRIVE** is authorized to install or remove option cards.
  - For **MOVIDRIVE® MDX61B sizes 1 – 7**, you can install or remove the option cards yourself.
- 

#### 4.15.1 Before you start

Observe the following notes before installing or removing an option card:

#### NOTICE

Electrostatic discharge.

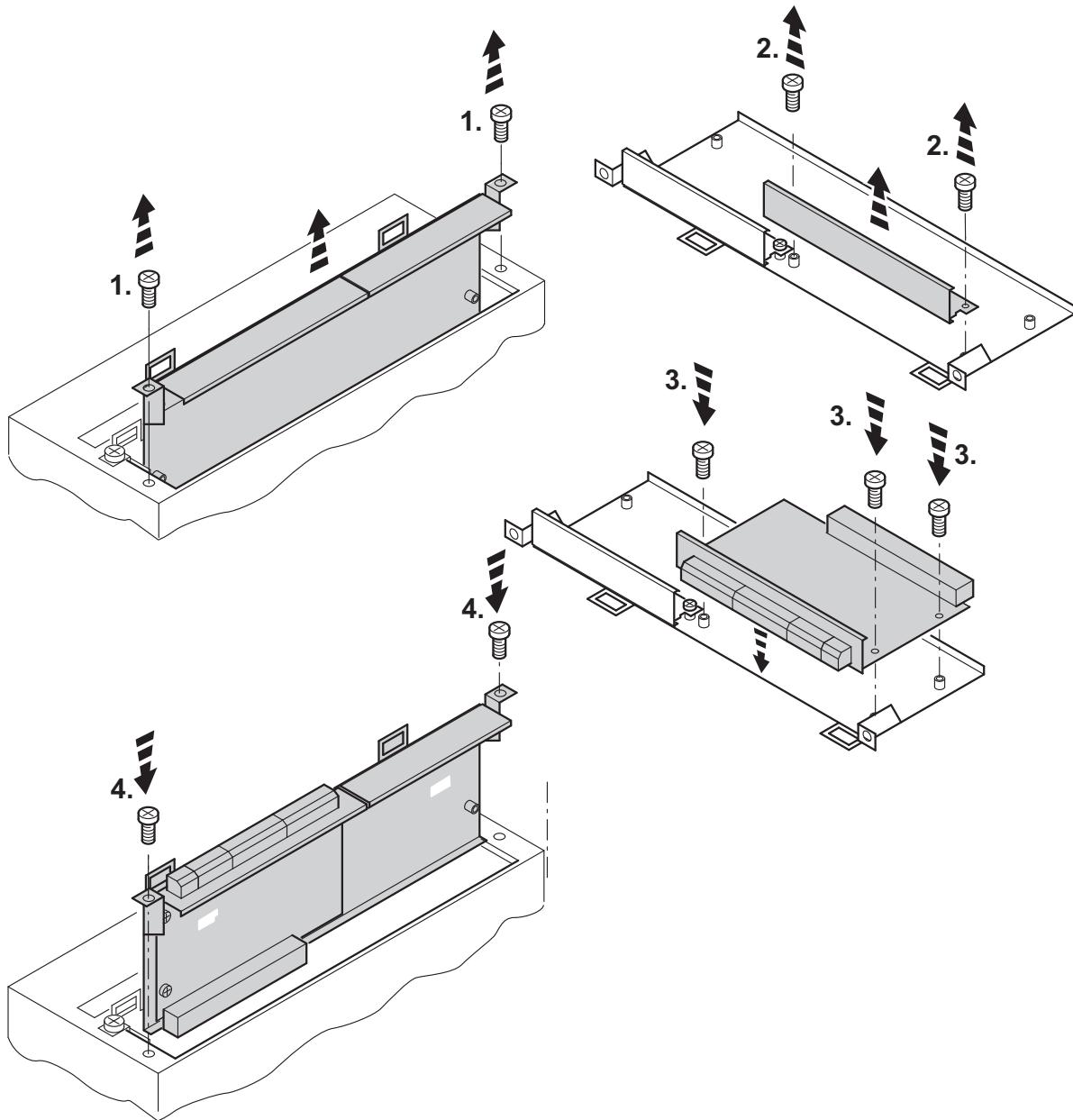
Damage to electronic components.

- Disconnect the inverter from the power. Switch off the DC 24 V and the supply voltage.
  - Take appropriate measures to protect the option card from electrostatic charge (use discharge strap, conductive shoes, etc.) before touching it.
- 
- **Before installing** the option card, remove the keypad (→ chapter "Removing/installing the keypad") and the front cover (→ chapter "Removing/installing the front cover").
  - **After having installed** the option card, replace the keypad (→ chapter "Removing/installing the keypad") and the front cover (→ chapter "Removing/installing the front cover").
  - Keep the option card in its original packaging until immediately before you are ready to install it.
  - Hold the option card by its edges only. Do not touch any of the components.



4.15.2 Basic procedure for installing/removing an option card

The following figure shows the installation of an option card in MOVIDRIVE® MDX61B sizes 1 – 7.



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1. Remove the retaining screws holding the card retaining bracket. Pull the card retaining bracket out evenly from the slot (do not twist!).
2. Remove the retaining screws of the black cover plate on the card retaining bracket. Remove the black cover plate.
3. Position the option card onto the retaining bracket so that the retaining screws fit into the corresponding bores on the card retaining bracket.
4. Insert the retaining bracket with the installed option card into the slot, pressing slightly so it is seated properly. Secure the option card retaining bracket with the retaining screws.
5. To remove the option card, follow the instructions in reverse order.

## 4.16 Connecting encoders and resolvers

### INFORMATION



Folgen

- The following wiring diagrams do not show the view onto the cable end but the view onto the connection to motor or MOVIDRIVE®.
  - The core colors specified in the wiring diagrams are in accordance with IEC 757 and correspond to the core colors used in the prefabricated cables from SEW-EURODRIVE.
- 

#### 4.16.1 General installation notes

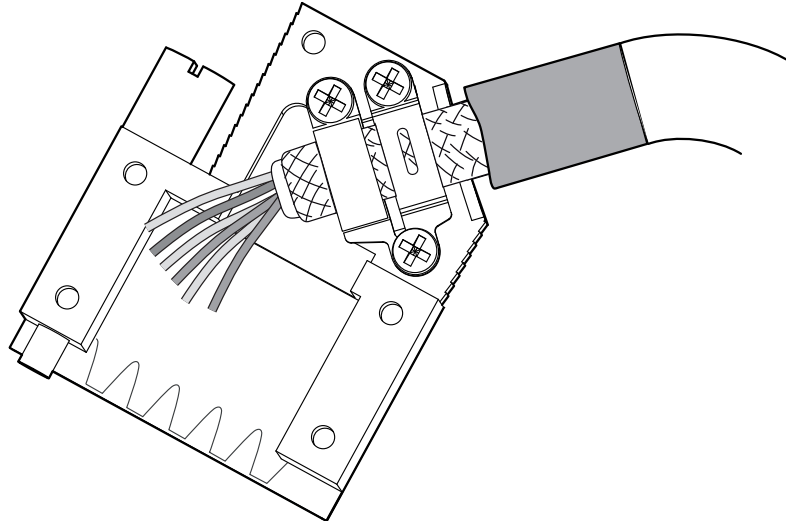
- The D-sub connectors shown in the wiring diagrams have a 4/40 UNC thread.
- Max. line length inverter – encoder/resolver:
  - 50 m at  $70 \text{ nF} < \text{capacitance per unit length} \leq 120 \text{ nF/km}$
  - 100 m at capacitance per unit length  $\leq 70 \text{ nF/km}$  with DER11B, DEH11B, DEH21B, 300 m with DEU21B
- Cable cross section:  $0.20 - 0.5 \text{ mm}^2$  (AWG 24 – 20)
- If you cut a core of the encoder/resolver cable, insulate the cut-off end of the core.
- Use shielded cables with twisted pair conductors and make sure they are grounded on both ends over a large surface area:
  - At the encoder in the cable gland or in the encoder plug
  - At the inverter in the housing of the D-sub connector
- Route the encoder/resolver cables separately from the power cables.

#### 4.16.2 Shield contact

Connect the shield of the encoder/resolver cable over a large area.

##### On the inverter

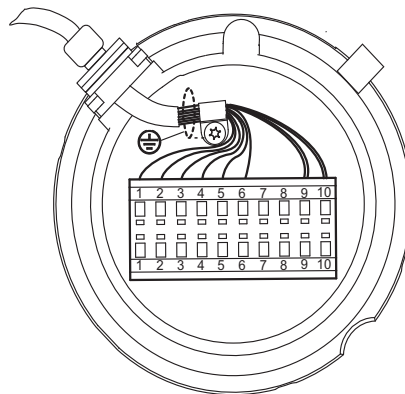
Connect the shield on the inverter end in the housing of the D-sub connector (→ following figure).



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##### On the encoder/resolver

Connect the shield on the encoder/resolver side at the respective grounding clamps (→ following figure). When using an EMC screw fitting, apply the shield over a wide area in the cable gland. For drives with a plug connector, connect the shield on the encoder plug.



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#### 4.16.3 Prefabricated cables

SEW-EURODRIVE offers prefabricated cables for connecting encoders/resolvers. We recommend using these prefabricated cables.

# 4 Installation

Connection and terminal description of the DEH11B (Hiperface) option

## 4.17 Connection and terminal description of the DEH11B option (HIPERFACE®)

### 4.17.1 Part number

Option HIPERFACE® encoder card type DEH11B: 08243107

### INFORMATION



- The DEH11B option can be installed in MOVIDRIVE® MDX61B sizes 0 – 7. Only SEW-EURODRIVE may install or remove the DEH11B option for MOVIDRIVE® MDX61B size 0.
- The DEH11B option must be plugged into the encoder slot.

| Front view of DE-H11B | Description  | Terminal  | Function   |
|-----------------------|--|---|--|
|                       | X14: Input for external encoder or output for incremental encoder simulation<br>Number of pulses of the incremental encoder simulation:<br>• As on X15 | X14:1<br>X14:2<br>X14:3<br>X14:4<br>X14:5/6<br>X14:7<br>X14:8<br>X14:9<br>X14:10<br>X14:11<br>X14:12<br>X14:13/14<br>X14:15               | (COS+) signal track A (K1)<br>(SIN+) signal track B (K2)<br>Signal track C (K0)<br>DATA+<br>Reserved<br>Switch between<br>Reference potential DGND<br>(COS-) Signal track A (K1)<br>(SIN-) Signal track B (K2)<br>Signal track C (K0)<br>DATA-<br>Reserved<br>DC+12 V (tolerance range DC 10.5 – 13 V)<br>(max. load X14:15 and X15:15 = DC 650 mA)  |
|                       | X15: Motor encoder input   | X15:1<br>X15:2<br>X15:3<br>X15:4<br>X15:5<br>X15:6<br>X15:7<br>X15:8<br>X15:9<br>X15:10<br>X15:11<br>X15:12<br>X15:13<br>X15:14<br>X15:15 | (COS+) signal track A (K1)<br>(SIN+) signal track B (K2)<br>Signal track C (K0)<br>DATA+<br>Reserved<br>Reference potential TF/TH/KTY-/PK<br>Reserved<br>Reference potential DGND<br>(COS-) Signal track A (K1)<br>(SIN-) Signal track B (K2)<br>Signal track C (K0)<br>DATA-<br>Reserved<br>TF/TH/KTY+/PK connection<br>DC+12 V (tolerance range DC 10.5 – 13 V)<br>(max. load X14:15 and X15:15 = DC 650 mA) |

### INFORMATION



- If X14 is used as an incremental encoder simulation output, the switch-over (X14:7) must be jumpered with DGND (X14:8).
- The DC 12 V supply voltage from X14 and X15 is sufficient to operate encoders by SEW-EURODRIVE (except HTL encoders) with a DC 24 V supply voltage. With all other encoders, check whether they can be connected to the DC 12 V supply voltage.

### NOTICE



Do not directly connect HTL encoders to X15 of option DEH11B.  
 Doing so can destroy the X15 (motor encoder input) on the DEH11B option.

- Use the DWE11/12 interface adapter

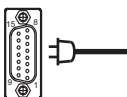
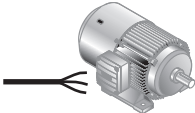

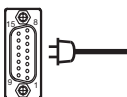
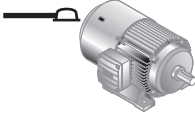

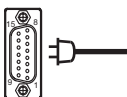
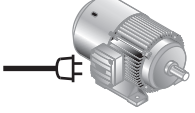

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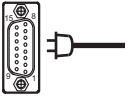
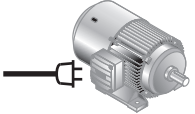

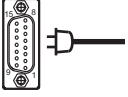
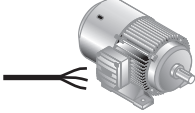
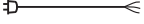
4.17.2 Permissible encoders at X:14

Refer to chapter "Connecting external encoders to X:14" (→ 129).

4.17.3 Permissible encoders at X:15

The following SEW-EURODRIVE encoders can be connected to the option HIPERFACE® encoder card type DEH11B:

| Encoder on DR.. series AC motors – MOVIDRIVE® |         |   |  |   |
|---|---------|---|--|---|
| Motor type                                    | Encoder | MOVIDRIVE® drive inverters  | Motor  | Cable   |
| DR71 – DR132                                  | ES7S    |  |    | <br>13622021<br>13622048   |
|   | ES7R    |   |  |   |
| AS7W  |         |   |  |   |
| DR160 – DR225                                 | EG7S    |   |  |   |
|   | EG7R    |   |  |   |
|   | AG7W    |   |  |   |
| DR71 – DR132                                  | ES7S    |  |   | <br>13617621<br>13617648   |
|   | ES7R    |   |  |   |
|   | AS7W    |   |  |   |
| DR160 – DR225                                 | EG7S    |   |  |   |
|   | EG7R    |   |  |   |
|   | AG7W    |   |  |   |
| DR315   | EH7S    |  |  | <br>13602659<br>13623206 |

| Encoders on DT../DV.. and CM.. series motors – MOVIDRIVE® |         |   |  |   |
|---|---------|---|--|---|
| Motor type  | Encoder | MOVIDRIVE® drive inverters  | Motor  | Cable   |
| CM71 – 112<br>CMP   | AS1H    |  |  | <br>13324535<br>13324551 |
|   | ES1H    |   |  |   |
|   | AK0H    |   |  |   |
|   | EK0H    |   |  |   |
|   | AV1H    |   |  |   |
|   | AF1H    |   |  |   |
|   | EG7C    |   |  |   |
| CM71 – 112  | AS1H    |  |  | <br>13324578<br>13324543 |
|   | ES1H    |   |  |   |
|   | AV1H    |   |  |   |
|   | AF1H    |   |  |   |
|   | EG7C    |   |  |   |

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# 4 Installation

Connection and terminal description of the DEH21B option

## 4.18 Connection and terminal description of the DEH21B option

### 4.18.1 Part number

Encoder card option DEH21B: 18208185

### INFORMATION



- For detailed information on the DEH21B option, refer to the manual "MOVIDRIVE® MDX61B DIP11B/DEH21B absolute encoder cards".
- The DEH21B option can be installed in MOVIDRIVE® MDX61B sizes 0 – 7. Only SEW-EURODRIVE staff may install or remove the DEH21B option for MOVIDRIVE® MDX61B size 0.
- The DEH21B option card must be plugged into the encoder slot.
- The DC 24 V voltage supply of an encoder connected to X62 is ensured when X60 is supplied with DC 24 V. Observe chapter "Project planning" in the MOVIDRIVE® MDX60B/61B system manual.

| Front view of DEH21B                                      | Description                      | Terminal  | Function   |
|---|----------------------------------|---|--|
| <p>1806096139 DEH21B</p> <p>X62</p> <p>X60</p> <p>X15</p> | X62: Absolute encoder connection | X62:1<br>X62:2<br>X62:3<br>X62:4<br>X62:5<br>X62:6<br>X62:7<br>X62:8<br>X62:9   | Data +<br>Reserved<br>Pulse +<br>Reserved<br>DGND<br>Data –<br>Reserved<br>Pulse –<br>DC 24 V output   |
|   | X60: Voltage supply              | X60:1<br>X60:2  | 24VIN<br>DGND  |
|   | X15: Motor encoder input         | X15:1<br>X15:2<br>X15:3<br>X15:4<br>X15:5<br>X15:6<br>X15:7<br>X15:8<br>X15:9<br>X15:10<br>X15:11<br>X15:12<br>X15:13<br>X15:14<br>X15:15 | (COS+) signal track A (K1)<br>(SIN+) signal track B (K2)<br>Signal track C (K0)<br>DATA+<br>Reserved<br>Reference potential TF/TH/KTY–/PK<br>Reserved<br>Reference potential DGND<br>(COS–) Signal track A (K1)<br>(SIN–) Signal track B (K2)<br>Signal track C (K0)<br>DATA–<br>Reserved<br>TF/TH/KTY+/PK connection<br>DC +12 V (tolerance range DC 10.5 – 13 V)<br>(max. load X15:15 = DC 650 mA) |

### INFORMATION



The DC 12 V supply voltage from X15 is sufficient to operate SEW encoders (except HTL encoders) with a DC 24 V supply voltage. With all other encoders, check whether they can be connected to the DC 12 V supply voltage.

### NOTICE



Do not directly connect HTL encoders to X15 of option DEH21B. Doing so can destroy the X15 (motor encoder input) of the DEH21B option.

- Use the DEW11/12 interface adapter

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## 4.19 Connection and terminal description of the DEU21B option

### 4.19.1 Part number

Multi-encoder card option type DEU21B: 01822696

### INFORMATION



- For detailed information on the DEU21B option, refer to the "MOVIDRIVE® MDX61B multi-encoder card DEU21B" manual.
- The DEU21B option can be installed in MOVIDRIVE® MDX61B sizes 0 – 7. Only SEW-EURODRIVE staff may install or remove the DEU21B option for MOVIDRIVE® MDX61B size 0.
- The DEU21B option card must be plugged into the encoder slot.

| Front view of DEU21B | Description   | Terminal   | Function   |
|----------------------|---|--|--|
|                      | <p>X14: Input for external encoder or output for incremental encoder simulation</p> <p>Output for incremental encoder simulation:</p> <ul style="list-style-type: none"> <li>• Signal level to RS422</li> <li>• The number of pulses is the same as on X15 motor encoder input</li> </ul> | <p>X14:1</p> <p>X14:2</p> <p>X14:3</p> <p>X14:4</p> <p>X14:5/6</p> <p>X14:7</p> <p>X14:8</p> <p>X14:9</p> <p>X14:10</p> <p>X14:11</p> <p>X14:12</p> <p>X14:13</p> <p>X14:14</p> <p>X14:15</p>            | <p>(COS+) signal track A (K1)</p> <p>(SIN+) signal track B (K2)</p> <p>Signal track C (K0) / pulse +</p> <p>DATA+ CANHigh</p> <p>Reserved</p> <p>Switch between</p> <p>Reference potential <math>\underline{D}</math>GND</p> <p>(COS-) Signal track <math>\bar{A}</math> (K1)</p> <p>(SIN-) Signal track <math>\bar{B}</math> (K2)</p> <p>Signal track <math>\bar{C}</math> (K0) / pulse –</p> <p>DATA- CANLow</p> <p>DC 24 V encoder supply<sup>1)</sup></p> <p>Reserved</p> <p>DC 12 V encoder supply<sup>2)</sup></p>   |
|                      | X15: Motor encoder input  | <p>X15:1</p> <p>X15:2</p> <p>X15:3</p> <p>X15:4</p> <p>X15:5</p> <p>X15:6</p> <p>X15:7</p> <p>X15:8</p> <p>X15:9</p> <p>X15:10</p> <p>X15:11</p> <p>X15:12</p> <p>X15:13</p> <p>X15:14</p> <p>X15:15</p> | <p>(COS+) signal track A (K1)</p> <p>(SIN+) signal track B (K2)</p> <p>Signal track C (K0) / pulse +</p> <p>DATA+</p> <p>Reserved</p> <p>Reference potential TF/TH/KTY–/PK</p> <p>Reserved</p> <p>Reference potential <math>\underline{D}</math>GND</p> <p>(COS-) Signal track <math>\bar{A}</math> (K1)</p> <p>(SIN-) Signal track <math>\bar{B}</math> (K2)</p> <p>Signal track <math>\bar{C}</math> (K0) / pulse –</p> <p>DATA-</p> <p>DC 24 V encoder supply<sup>1)</sup></p> <p>TF/TH/KTY+/PK connection</p> <p>DC 12 V (tolerance range DC 10.5 – 13 V)<sup>2)</sup></p> |

1) If the overall device load on the 24 V level exceeds 400 mA, you must connect an external DC 24 V supply to X10:9/X10:10. Observe the "Project planning" chapter in the MOVIDRIVE® MDX60B/61B system manual

2) The maximum load on X14:15 and X15:15 is DC 650 mA in total.

### NOTICE

The connections on X14 and X15 must not be installed or removed during operation. Electrical components in the encoder or on the encoder card could be destroyed.



**INFORMATION**

- If X14 is used as an incremental encoder simulation output, the switchover (X14:7) must be jumpered with DGND (X14:8).
  - The 24 V encoders from SEW-EURODRIVE (except HTL and HIPERFACE®) have a wide voltage range (DC 10 V – 30 V) and can be supplied alternatively with DC 24 V (PIN13) or DC 12 V (PIN15).
  - If these option cards are used, electrical isolation between DGND and PE is not possible.
-



## 4.20 Connection and terminal description of the DER11B (resolver) option

### 4.20.1 Part number

Resolver card option type DER11B: 08243077

### INFORMATION



- The DEU21B, DER11B option can be installed in MOVIDRIVE® MDX61B sizes 0 – 7. Only SEW-EURODRIVE may install or remove the DEU21B, DER11B option for MOVIDRIVE® MDX61B size 0.
- The "Resolver card type DER11B" option can only be used with MOVIDRIVE® MDX61B, not with MDX60B.
- The DER11B option must be plugged into the encoder slot.

| Front view of DER11B | Description  | Terminal  | Function  |
|----------------------|--|---|---|
|                      | X14: Input for external encoder or output for incremental encoder simulation<br>The pulse count of the incremental encoder simulation is always 1024 pulses per revolution | X14:1<br>X14:2<br>X14:3<br>X14:4<br>X14:5/6<br>X14:7<br>X14:8<br>X14:9<br>X14:10<br>X14:11<br>X14:12<br>X14:13/14<br>X14:15 | (cos) Signal track A (K1)<br>(sin) Signal track B (K2)<br>Signal track C (K0)<br>DATA+<br>Reserved<br>Switch between<br>DGND reference potential<br>(cos-) Signal track A (K1)<br>(sin-) Signal track B (K2)<br>Signal track C (K0)<br>DATA-<br>Reserved<br>DC+12 V (tolerance range DC 10.5 – 13 V)<br>(max. load DC 650 mA) |
|                      | X15: Resolver input  | X15:1<br>X15:2<br>X15:3<br>X15:4<br>X15:5<br>X15:6<br>X15:7<br>X15:8<br>X15:9   | sin+ (S2)<br>cos+ (S1)<br>Ref.+ (R1)<br>N.C.<br>Reference potential TF/TH/KTY-/PK<br>sin- (S4)<br>cos- (S3)<br>Ref.- (R2)<br>TF/TH/KTY+/PK connection   |

### INFORMATION



- If X14 is used as an incremental encoder simulation output, the switch-over (X14:7) must be jumpered with DGND (X14:8).
- The DC 12 V supply voltage from X14 is sufficient to operate encoders by SEW-EURODRIVE (except HTL encoders) with a DC 24 V supply voltage. With all other encoders, check whether they can be connected to the DC 12 V supply voltage.

### 4.20.2 Permissible encoders at X:14

Refer to chapter "Connecting external encoders to X:14" (→ 129).

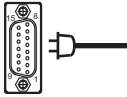
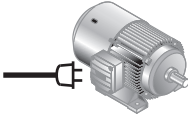

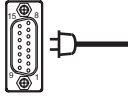
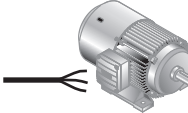

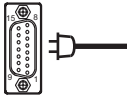
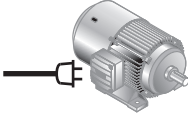

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Connection and terminal description of the DER11B (resolver) option

## 4.20.3 Resolver at X:15

2-pole resolvers, AC 7 V, 7 kHz, can be connected at X15 (resolver input). The gear ratio of the resolver amplitudes must be approximately  $0.5 \pm 10\%$ . The control dynamics decrease if the value is lower; the evaluation may be unstable if the value is higher.

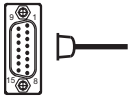

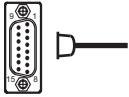

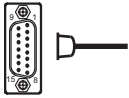

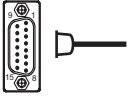
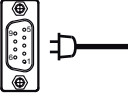

SEW-EURODRIVE offers the following prefabricated cables for connecting resolvers to DER11B:

| Encoders on DT../DV.. and CM.. series motors – MOVIDRIVE® |          |  |   |   |
|---|----------|--|---|---|
| Motor type  | Encoder  | MOVIDRIVE® drive inverters   | Motor   | Cable   |
| CM71 – 112  | Resolver |   |   | <br>01994875<br>01993194 |
| CM71 – 112  | Resolver |   |   | <br>01995898<br>01995901 |
| CMP   | Resolver |  |  | <br>01994875<br>01993194 |

## 4.21 Connecting external encoders to X:14

### 4.21.1 External encoder at DEH11B, DEU21B and DER11B (X:14)

The following external encoders can be connected to connector X14 of the DEH11B option and the DER11B option:

| External encoder at DEH11B and DER11B - MOVIDRIVE® (X:14)    |  |  |         |
|--|--|--|---------|
| Encoder  | MOVIDRIVE® drive inverters   | Cable  | Details |
| AS1H<br>ES1H<br>AV1H   |   | <br>08180156<br>08181659                |         |
| AS1H<br>ES1H<br>AV1H   |   | <br>18106951<br>18106978                |         |
| EH1S<br>ES1S<br>ES2S<br>EV1S<br>ES1R<br>ES2R<br>EV1R<br>EH1R |    | <br>08198691<br>08181683                |         |
| ES1T<br>ES2T<br>EV1T<br>EH1T                                 | <br>DWI11A X2:<br> | <br>01988298<br>0198828X<br>081816403 |         |

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## Connection of encoder options

### 4.22 Connection of encoder options

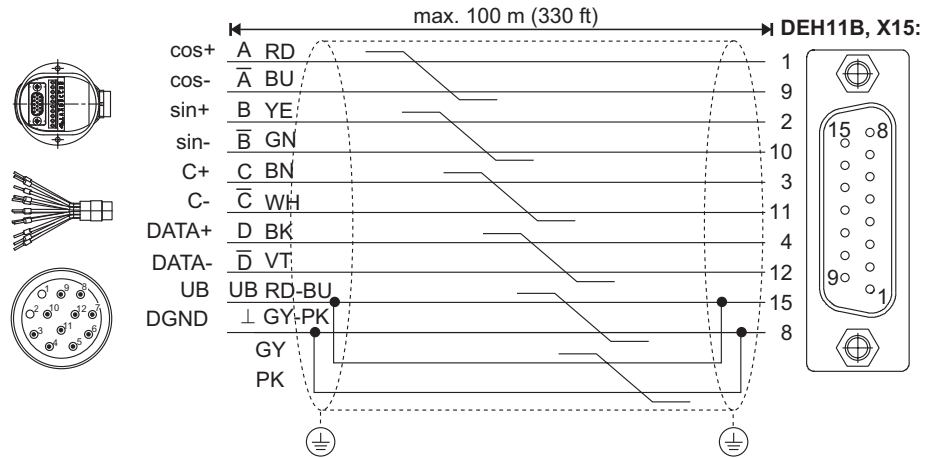
#### 4.22.1 Connection of DEH11B option

##### Encoder connection at X:15

Depending on the motor type and motor configuration, the encoder is connected via plug connector or terminal box.

DR71 – 315

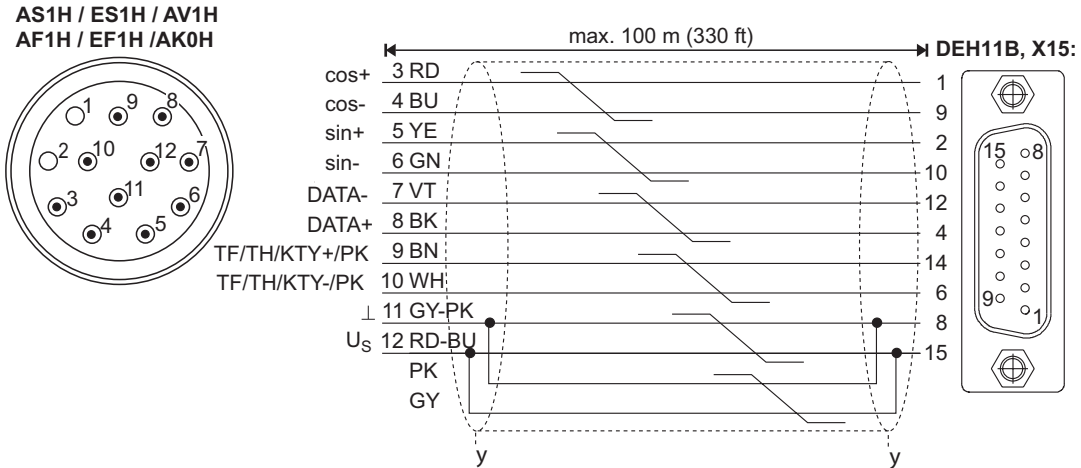
Connect the encoder to the option DEH11B as follows:



18014400817423627

CM71 – 112/CMP with plug connector

Connect the HIPERFACE® encoder to the DEH11B option as follows:

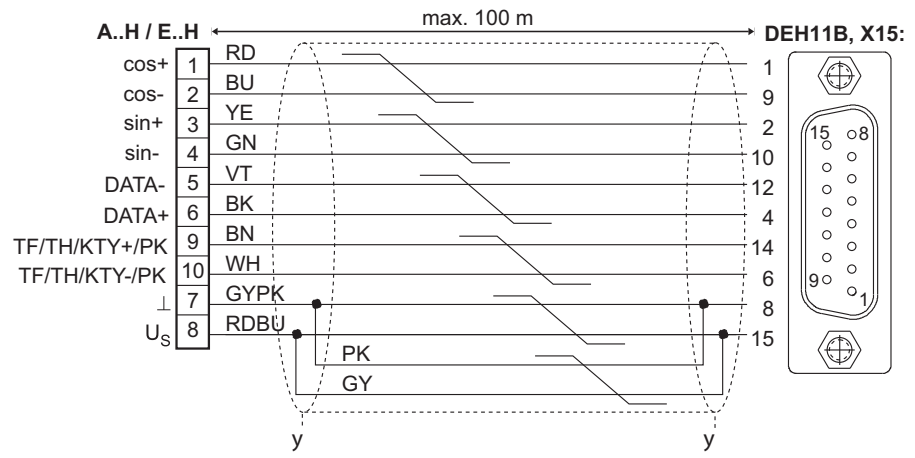


18014400315547531

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CM71 – 112 with terminal box

Connect the HIPERFACE® encoder to the DEH11B option as follows:



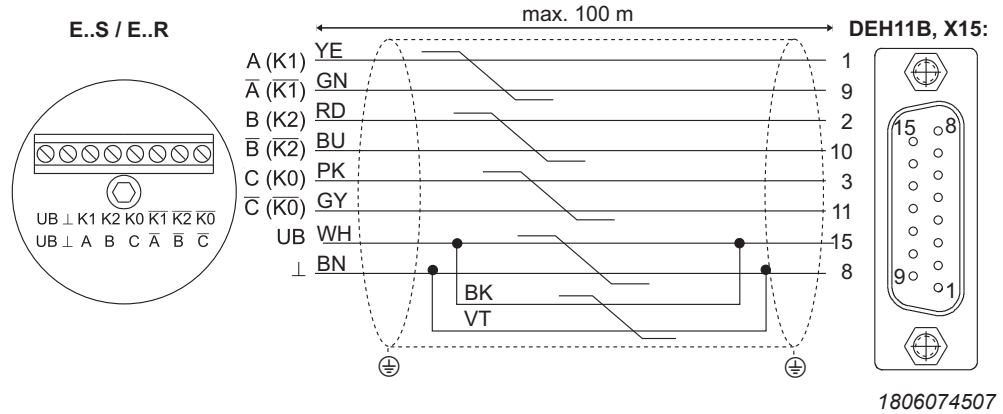
9007201060812171

# 4 Installation

## Connection of encoder options

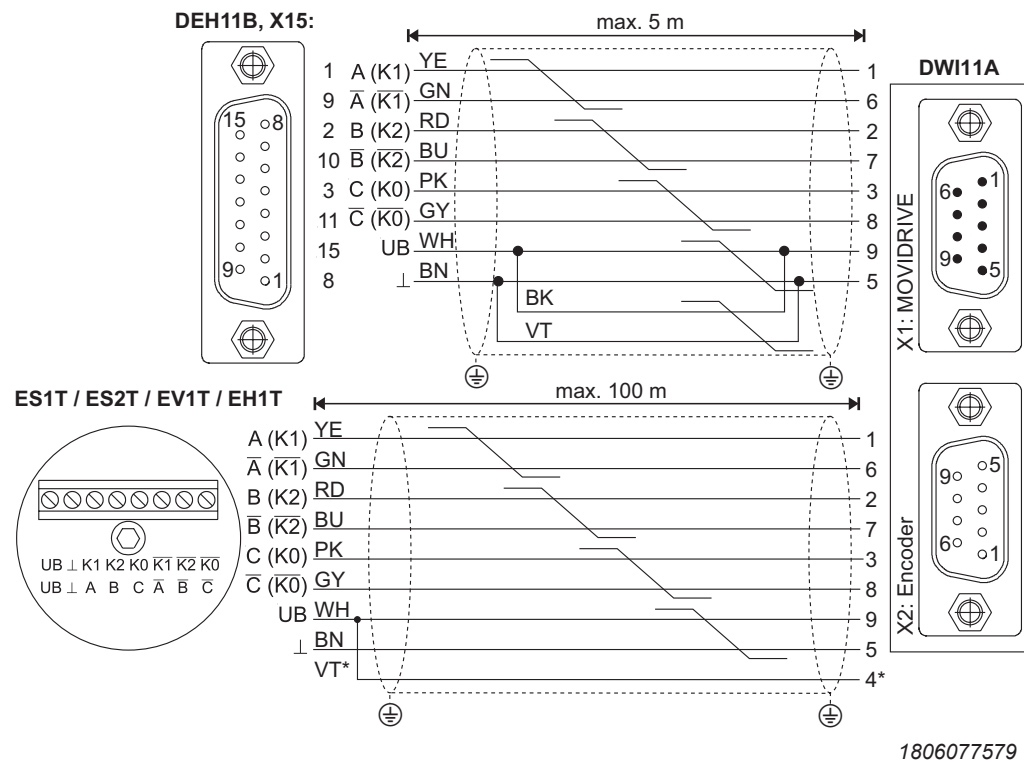
### Connection of sin/cos and TTL encoders (DC 24 V)

The high resolution sin/cos encoders and TTL encoders with DC 24 V supply can also be connected to DEH11B. Proceed as follows to connect sin/cos encoders and TTL encoders with DC 24 V supply to the DEH11B option:



### Connection of TTL encoder (DC 5 V)

Connect the TTL encoders with a DC 5 V voltage supply via the "DC 5 V encoder supply type DWI11A" option (part no. 08227594). The sensor cable must also be connected to correct the supply voltage of the encoder. Connect this encoder as follows:



\* Connect the sensor cable (VT) on the encoder to UB, do not jumper on the DWI11A!

### 4.22.2 Connection of DER11B (resolver) option to X:15

#### Terminal assignment/pin assignment

CM.. motors: The resolver connections are located in a plug connector or on a 10-pin Wago terminal strip.

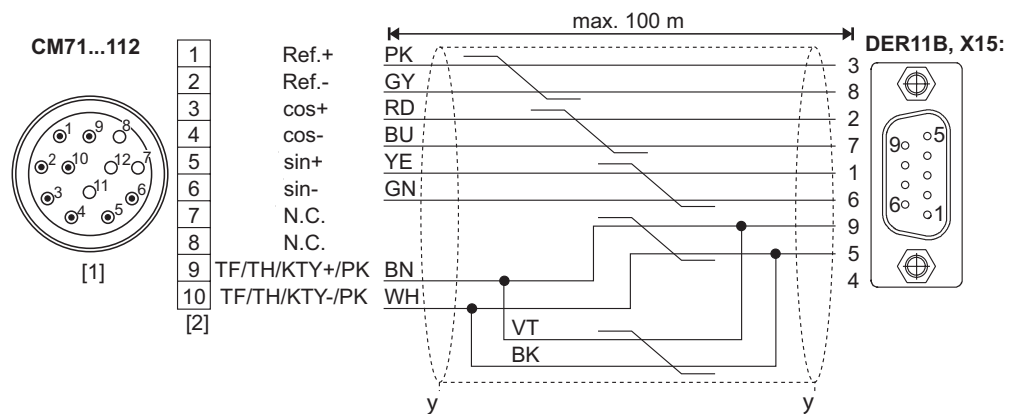
Plug connector CM...: Intercontec, type ASTA021NN00 10 000 5 000

| Terminal/pin | Description       |                       | Core color in prefabricated cable |
|--------------|-------------------|-----------------------|-----------------------------------|
| 1            | Ref.+             | Reference             | Pink (PK)                         |
| 2            | Ref.-             |                       | Gray (GY)                         |
| 3            | cos +             | Cosine signal         | Red (RD)                          |
| 4            | cos-              |                       | Blue (BU)                         |
| 5            | sin+              | Sine signals          | Yellow (YE)                       |
| 6            | sin-              |                       | Green (GN)                        |
| 9            | TF/TH/KTY<br>+/PK | Motor protec-<br>tion | Brown (BN) / violet (VT)          |
| 10           | TF/TH/<br>KTY-/PK |                       | White (WH) / black (BK)           |

The resolver signals have the same numbering on the 10-pin Phoenix terminal strip and in the plug connectors.

#### Connection

Connect the resolver as follows:



9007201060861323

[1] Plug connector

[2] Terminal strip

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## Connection of encoder options

### 4.22.3 Connection of external encoders to the DEH11B and DER11B options

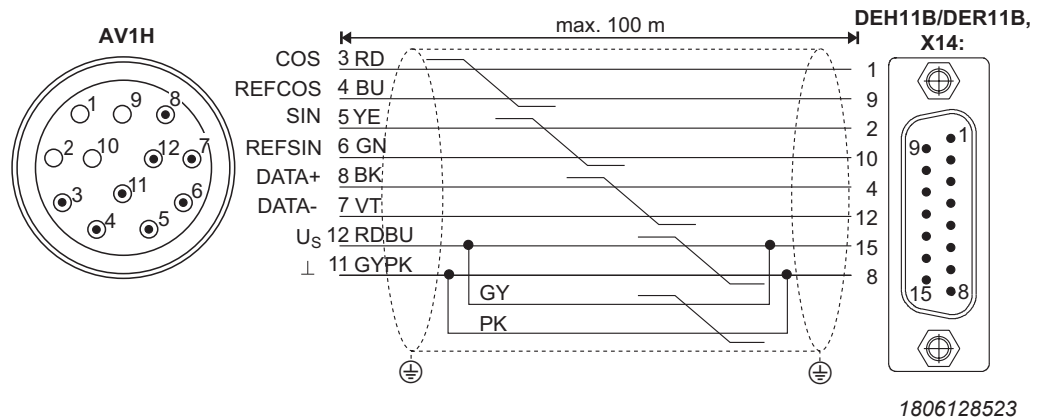
#### Voltage supply

SEW-EURODRIVE encoders with DC 24 V voltage supply (max. DC 180 mA) are connected directly to X14. These SEW-EURODRIVE encoders are then powered by the inverter.

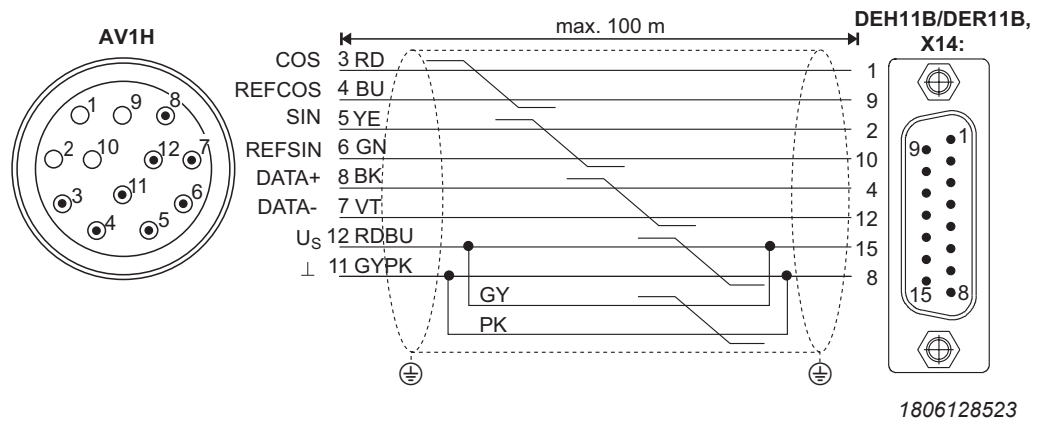
SEW-EURODRIVE encoders with a DC 5 V voltage supply must be connected via the "DC 5 V encoder supply type DWI11A" option (part no. 08227594).

#### HIPERFACE® encoder connection

Connect the HIPERFACE® encoder AV1H as follows:



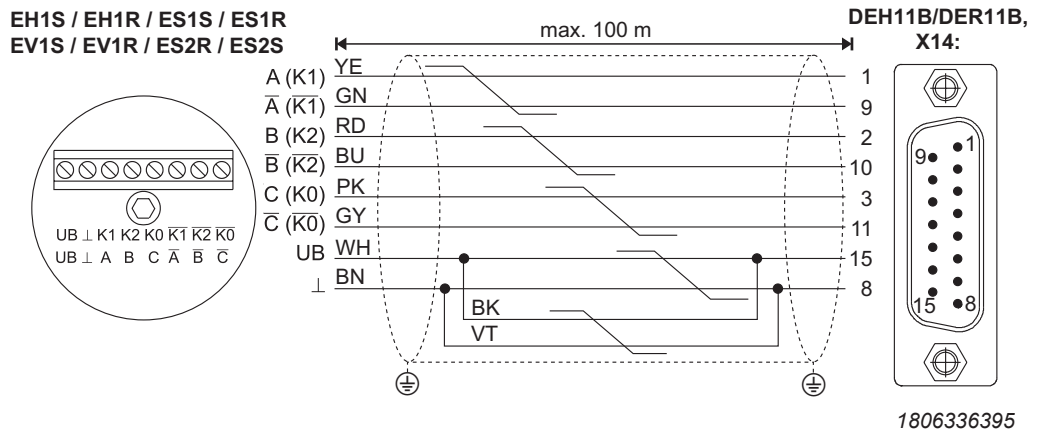
You can still connect HIPERFACE® encoders via a prefabricated cable with conductor end sleeves.





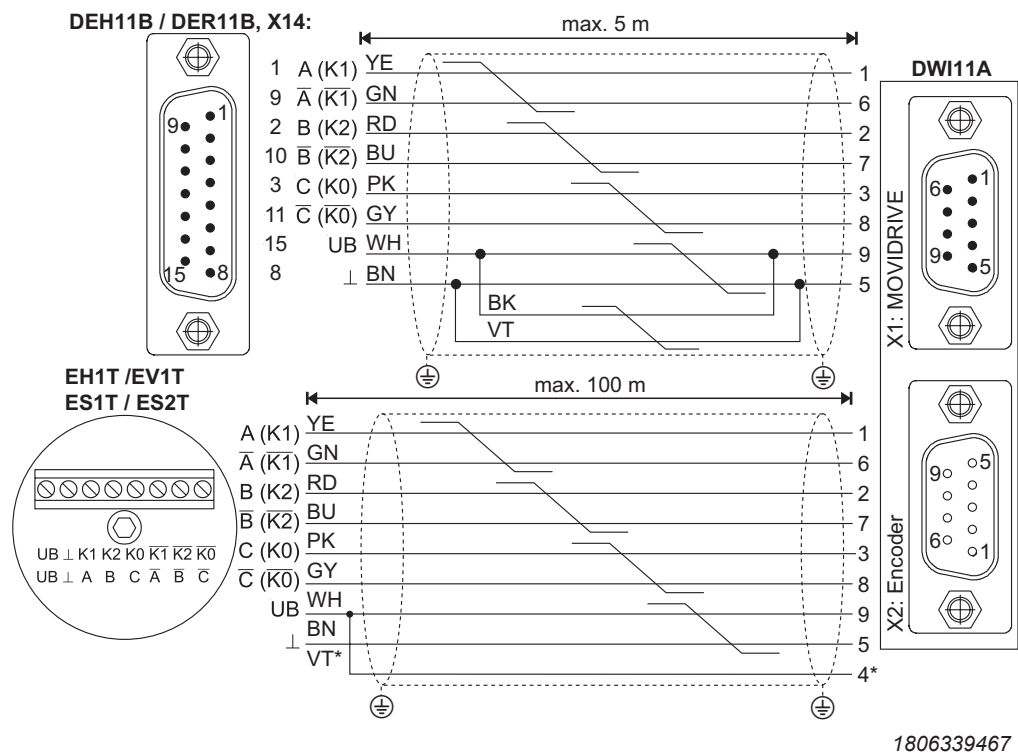
**Connection of sin/cos and TTL encoders (DC 24 V)**

Proceed as follows to connect sin/cos encoders and TTL encoders with DC 24 V supply:



**Connection of TTL encoder (DC 5 V)**

DC 5 V encoders with a DC 5 V voltage supply EV1T, EH1T, ES1T, and ES2T must be connected via the "DC 5 V encoder power supply type DWI11A" option (part number 08227594). The sensor cable must also be connected to correct the supply voltage of the encoder. Connect this encoder as follows:



\* Connect the sensor cable (VT) on the encoder to UB, do not jumper with DWI11A!

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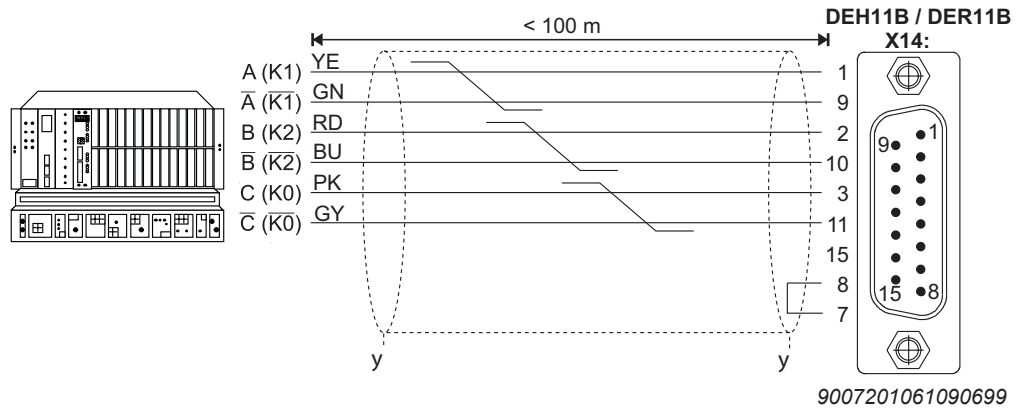
## Connection of incremental encoder simulation

### 4.23 Connection of incremental encoder simulation

#### 4.23.1 Incremental encoder emulation

Connector X14 of the DEH11B or DER11B option can also be used as the incremental encoder simulation output. For this purpose, you must jumper "switchover" (X14:7) with DGND (X14:8). X14 then delivers the incremental encoder signals with a signal level according to RS422. The number of pulses is:

- With DEH11B as on X15 motor encoder input
- With DER11B 1024 pulses/revolution



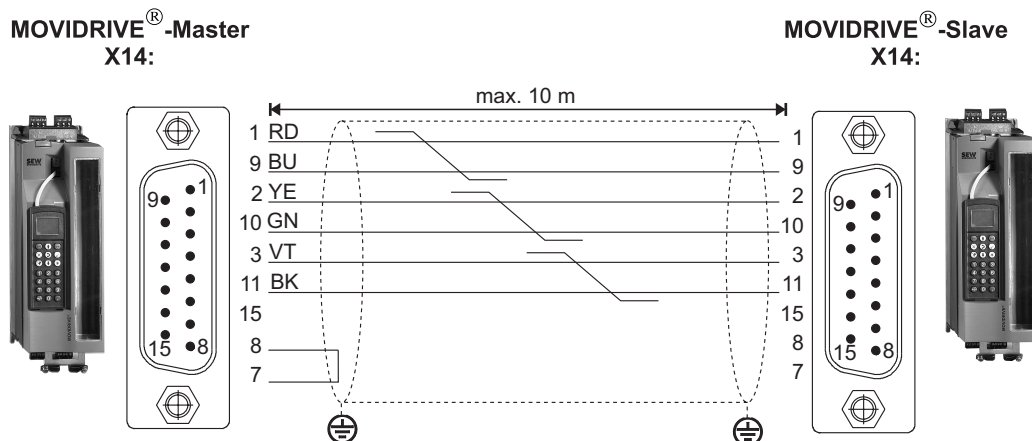
- Option type DEH/DER11B X14: → Incremental encoder simulation
  - For fixed installation: 08197687

## 4.24 Master/slave connection

### 4.24.1 Master/slave connection

Connector X14 of the DEH11B, DEU21B or DER11B option can also be used for the "internal synchronous operation" application (master/slave connection of several MOVIDRIVE® devices). For this purpose, you must jumper "switchover" (X14:7) with DGND (X14:8) on the master end.

The following figure shows an X14-X14 connection (= master/slave connection) between two MOVIDRIVE® devices.



1806354443

Part number of the prefabricated cable:

- For fixed installation: 08179581

## INFORMATION



- **A maximum of 3 slaves can be connected to the MOVIDRIVE® master.**
- Notice: Do **not** connect X14:7 when connecting the individual MOVIDRIVE® slaves together. **Only jumper the connections X14:7 and X14:8 on the MOVIDRIVE® master.**

# 4 Installation

Connection and terminal description of the DIO11B option

## 4.25 Connection and terminal description of the DIO11B option

### 4.25.1 Part number

Option input/output card type DIO11B: 08243085

### INFORMATION



- The "input/output card type DIO11B" option is only possible in conjunction with MOVIDRIVE® MDX61B, not with MDX60B.
- The DIO11B option must be plugged into the fieldbus option slot. If the fieldbus option slot is not available, you can plug the DIO11B input/output card into the expansion slot.
- The **extended handle end** of the plug connectors (terminals X20, X21, X22, X23) may **only be used for removing** the plug connectors (not for plugging them in).

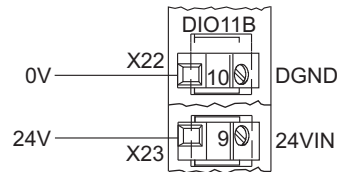
| Front view of DIO11B | Terminal                   | Function   |   |
|----------------------|----------------------------|--|---|
|                      | 1806361739 X20:1/2 AI21/22 | Setpoint input n2, DC-10 V – 0 – 10 V or DC 0 – 10 V (Differential input or input with AGND reference potential)   |   |
|                      | X20:3 AGND                 | Reference potential for analog signals (REF1, REF2, A., AO..)  |   |
|                      | AI21                       | X21:1 AOV1   | Analog voltage output V1, factory setting: "actual speed"   |
|                      | AI22                       | X21:4 AOV2   | Analog voltage output V2, factory set to "output current"<br>Load capacity of the analog voltage outputs: $I_{max} = DC\ 10\ mA$  |
|                      | AGND                       | X21:2 AOC1   | Analog current output C1, factory setting: actual speed   |
|                      | AOV1                       | X21:5 AOC2   | Analog current output C2, factory setting: output current<br>P642/645 "Operating mode AO1/2" sets whether the voltage outputs V1/2 (DC 10 V – 0 – 10 V) or the current outputs C1/2 DC (0(4) – 20 mA) are in effect.<br>Selection options for the analog outputs → Parameter menu P640/643<br>Max. permitted cable length: 10 m / max output voltage: DC 15 V |
|                      | AOC1                       | X21:3/6 AGND   | Reference potential for analog signals (REF1, REF2, AI., AO..)  |
|                      | AGND                       | X22:1 – 8 DI1Ø – 17  | Digital inputs 1 – 8, factory setting: "No function"<br>The digital inputs are electrically isolated by optocouplers.<br>Selection options for the digital inputs → Parameter menu P61_   |
|                      | AOV2                       | X22:9 DCOM   | Reference potential for the digital inputs DI1Ø – 17  |
|                      | AOC2                       | X22:10 DGND  | Reference potential for binary signals<br>• Without jumper X22:9-X22:10 (DCOM-DGND) → Isolated digital inputs<br>• With jumper X22:9-X22:10 (DCOM-DGND) → Non-isolated digital inputs   |
| AGND                 | X23:1 – 8 DO1Ø – 17        | Digital outputs 1 – 8, factory setting: "No function"<br>Current-carrying capacity of the digital outputs: $I_{max} = DC\ 50\ mA$ (short-circuit proof, protected against external voltage to DC 30 V)<br><b>Do not connect external voltage to the digital outputs.</b> |   |
| DI1Ø                 | X23:9 24VIN                | Supply voltage DC +24 V for digital outputs D01Ø - D017, non-isolated (reference potential DGND)   |   |
| DI11                 |                            |  |   |
| DI12                 |                            |  |   |
| DI13                 |                            |  |   |
| DI14                 |                            |  |   |
| DI15                 |                            |  |   |
| DI16                 |                            |  |   |
| DI17                 |                            |  |   |
| DCOM                 |                            |  |   |
| DGND                 |                            |  |   |
| DO1Ø                 |                            |  |   |
| DO11                 |                            |  |   |
| DO12                 |                            |  |   |
| DO13                 |                            |  |   |
| DO14                 |                            |  |   |
| DO15                 |                            |  |   |
| DO16                 |                            |  |   |
| DO17                 |                            |  |   |
| 24VIN                |                            |  |   |

### 4.25.2 Voltage input 24VIN

The 24VIN (X23:9) voltage input serves as DC+24 V supply voltage for the digital outputs DO1Ø – DO17. Reference potential is DGND (X22:10). The digital outputs do not give a level if the DC+24 V supply voltage is not connected. The supply voltage DC +24 V can also be jumpered from the X10:8 connection of the basic device if the load does not exceed DC 400 mA (current limitation in X10:8).

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The following figure shows voltage input 24VIN (X23:9) and reference potential DGND (X22:10).



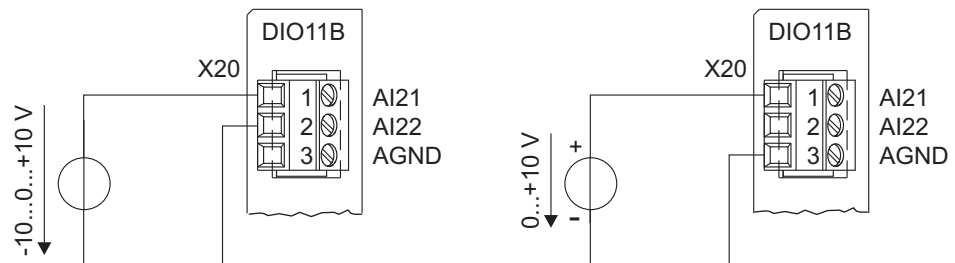
1806364811

### 4.25.3 Voltage input n2

The analog setpoint input n2 (AI21/22) can be used as a differential input or as an input with AGND reference potential.

The following figure shows the n2 setpoint input.

Differential input Input with AGND reference potential



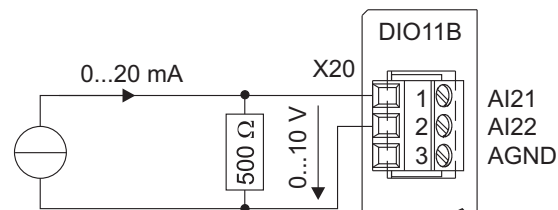
1806367883

### 4.25.4 Current input n2

You must use an external load if the analog setpoint input n2 (AI21/22) should be used as a current input.

For example  $R_B = 500 \Omega \rightarrow DC 0 - 20 \text{ mA} = DC 0 - 10 \text{ V}$

The following figure shows the current input with external load.



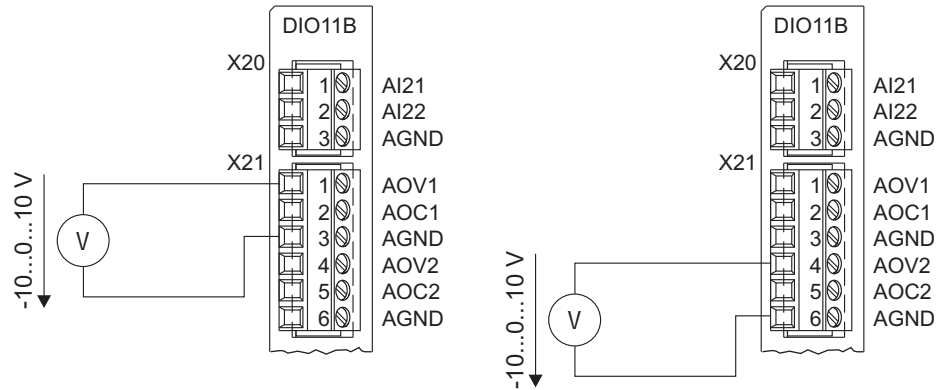
1806370955

# 4 Installation

## Connection and terminal description of the DIO11B option

### 4.25.5 Voltage outputs AOV1 and AOV2

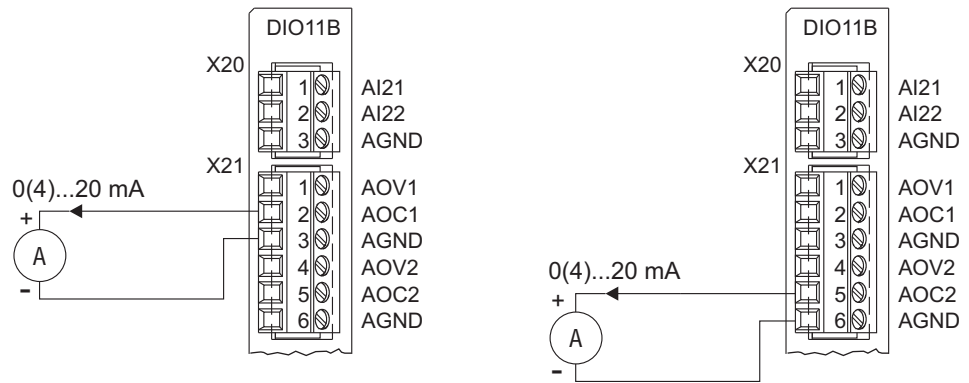
Assign the analog voltage outputs AOV1 and AOV2 in accordance with the following figure:



1806376075

### 4.25.6 Current outputs AOC1 and AOC2

Assign the analog current outputs AOC1 and AOC2 in accordance with the following figure:



1806377995

## 4.26 Connection and terminal description of the DFC11B option

### 4.26.1 Part number

CAN-Bus interface option type DFC11B: 08243174

### INFORMATION



- The "CAN bus interface type DFC11B" option can only be used with MOVIDRIVE® MDX61B, not with MDX60B.
- The DFC11B option must be plugged into the fieldbus option slot.
- The DFC11B option is supplied via MOVIDRIVE® MDX61B. A separate voltage supply is not required.

| Front view of DFC11B | Description   | DIP switch Terminal   | Function  |
|----------------------|---|---|---|
|                      | DIP switch block S1: Sets the terminating resistor  | R<br>nc   | Terminating resistor for the CAN bus cable<br>Reserved  |
|                      | X31: CAN bus connection                             | X31:3<br>X31:2<br>X31:1   | CAN Low (jumpered with X30:2)<br>CAN High (jumpered with X30:7)<br>DGND CAN <sup>1)</sup>   |
|                      | X30: CAN bus connection<br>(Sub D9 to CiA standard) | X30:1<br>X30:2<br>X30:3<br>X30:4<br>X30:5<br>X30:6<br>X30:7<br>X30:8<br>X30:9 | Reserved<br>CAN Low (jumpered with X31:3)<br>DGND CAN <sup>1)</sup><br>Reserved<br>Reserved<br>DGND CAN <sup>1)</sup><br>CAN High (jumpered with X31:2)<br>Reserved |
|                      | 1806384907  |   |   |

1) DGND of the CAN bus interface is independent from DGND of the basic device

### 4.26.2 Connection of MOVIDRIVE® – CAN

The DFC11B option is connected to the CAN bus at X30 or X31 in the same way as the SBus (→ chapter "System bus connection (SBus 1)") in the basic unit (X12). In contrast to the SBus1, SBus2 is electrically isolated and made available via option DFC11B.

## 5 Startup

### 5.1 General startup instructions



#### **⚠ WARNING**

Uncovered power connections.

Severe or fatal injuries from electric shock.

- Install the touch guard according to the regulations.
  - Never start the device if the touch guard is not installed.
- 


#### 5.1.1 Prerequisite

The drive must be configured correctly to ensure that startup is successful. Refer to the MOVIDRIVE® MDX60/61B system manual for detailed project planning notes and an explanation of the parameters.

#### 5.1.2 Parameters of third-party motors

The database stores parameters of SEW-EURODRIVE motors and third-party motors. We do not warrant that the parameter data of the third-party motors is correct and up to date.

#### 5.1.3 VFC operating modes without speed control

MOVIDRIVE® MDX60/61B drive inverters are designed to be taken into operation with the SEW motor which is adapted to the correct power level. The motor can be connected and the drive started immediately in accordance with chapter "Starting the motor" (→  160).

#### **INFORMATION**



The startup functions described in this chapter are used for setting the inverter so it can be adapted optimally to the motor that is connected and to suit the basic conditions.

---



### 5.1.4 Motor/inverter combinations

The following tables indicate which inverter/motor combinations this applies to.

#### 400/500 V devices

| MOVIDRIVE® MDX60/61B<br>In operating mode VFC | SEW-EURODRIVE motor |
|---|---------------------|
| 0005-5A3-4                                    | DRN80M4             |
| 0008-5A3-4                                    | DRN80M4             |
| 0011-5A3-4                                    | DRN90S4             |
| 0014-5A3-4                                    | DRN90L4             |
| 0015-5A3-4                                    | DRN90L4             |
| 0022-5A3-4                                    | DRN100LS4           |
| 0030-5A3-4                                    | DRN100L4            |
| 0040-5A3-4                                    | DRN112M4            |
| 0055-5A3-4                                    | DRN132S4            |
| 0075-5A3-4                                    | DRN132M4            |
| 0110-5A3-4                                    | DRN160M4            |
| 0150-503-4                                    | DRN160L4            |
| 0220-503-4                                    | DRN180L4            |
| 0300-503-4                                    | DRN200L4            |
| 0370-503-4                                    | DRN225S4            |
| 0450-503-4                                    | DRN225M4            |
| 0550-503-4                                    | DRN250M4            |
| 0750-503-4                                    | DRN280S4            |
| 0900-503-4                                    | DRN280M4            |
| 1100-503-4                                    | DRN315S4            |
| 1320-503-4                                    | DRN315M4            |
| 1600-503-4                                    | DRN315L4            |
| 2000-503-4                                    | DRN315H4            |
| 2500-503-4                                    | DRN315H4            |

## 230 V devices

| MOVIDRIVE® MDX60/61B<br>In operating mode VFC | SEW-EURODRIVE motor |
|---|---------------------|
| 0015-2A3-4                                    | DRN90L4             |
| 0022-2A3-4                                    | DRN100LS4           |
| 0037-2A3-4                                    | DRN112M4            |
| 0055-2A3-4                                    | DRN132S4            |
| 0075-2A3-4                                    | DRN132M4            |
| 0110-203-4                                    | DRN160M4            |
| 0150-203-4                                    | DRN160L4            |
| 0220-203-4                                    | DRN180L4            |
| 0300-203-4                                    | DRN200L4            |

## 5.1.5 Lifting applications

**▲ WARNING**

Danger of fatal injury if the hoist falls.  
Severe or fatal injuries.

## 5.2 Preliminary work and resources

- Check the installation.
- **Performing startup with the DBG60B keypad:**



### **⚠ WARNING**

Risk of crushing if the motor starts up unintentionally.

Severe or fatal injuries.

- Ensure that the motor cannot start inadvertently, for example, by removing the electronics terminal block X13.
- Additional safety precautions must be taken depending on the application to avoid injury to people and damage to machinery.

- **Performing startup with the DBG60B keypad:**

Plug the connector of the DBG60B keypad into the XT slot.

- **For startup using a PC and MOVITOOLS® MotionStudio:**

Plug an interface adapter (e.g. USB11A) into the XT slot and connect it to the PC with an interface cable (RS232). Install and start MOVITOOLS® MotionStudio on your PC.

- Switch on the supply voltage and, if necessary, the DC 24 V supply.
- Check that the default parameter settings are correct (e.g. factory setting).
- Check the set terminal assignment (→ P60\_ / P61\_).

### **INFORMATION**



A group of **parameter values** is **changed automatically** at startup.

## 5.3 Startup with DBG60B keypad

### 5.3.1 General information

**Startup with the DBG60B keypad is only possible in operating modes VFC and V/f.** Startup in CFC and SERVO operating modes is only possible using the MOVITOOLS® MotionStudio engineering software.

#### Required data

The following data is required to ensure startup is successful:

- Motor type (SEW-EURODRIVE or third-party motor)
- Motor data
  - Nominal voltage and nominal frequency.
  - Additionally for third-party motors: Nominal current, nominal power, power factor  $\cos \varphi$  and nominal speed.
- Nominal line voltage

The following data is also needed for startup with a speed controller:

- Encoder type and encoder resolution:
- Motor data
  - SEW-EURODRIVE motor: Brake yes or no and flywheel fan (Z fan) yes or no.
  - Third-party motor: Mass moment of inertia of motor, brake and fan
- Stiffness of the closed-loop control system (factory setting = 1; suitable for most applications)

If the drive tends to oscillate → setting < 1

Transient recovery time is too long → Setting > 1

Recommended setting range: 0.80 – 1 – 1.10 (factory setting = 1)

- Converted mass moment of inertia of the load (gear unit + driven machine) on the motor shaft.
- Time required for the shortest ramp

### INFORMATION



- Activate encoder monitoring (P504 = "ON") after completing the startup. The function and voltage supply of the encoder will then be monitored.
- If a Hiperface® encoder is connected, it is always monitored regardless of the setting of parameter P504. Encoder monitoring is not a safety function!

### 5.3.2 Choose the required language

The following text appears on the display when the keypad is switched on for the first time or after activating the start mode:





SEW  
EURODRIVE

The symbol for language selection then appears on the display.



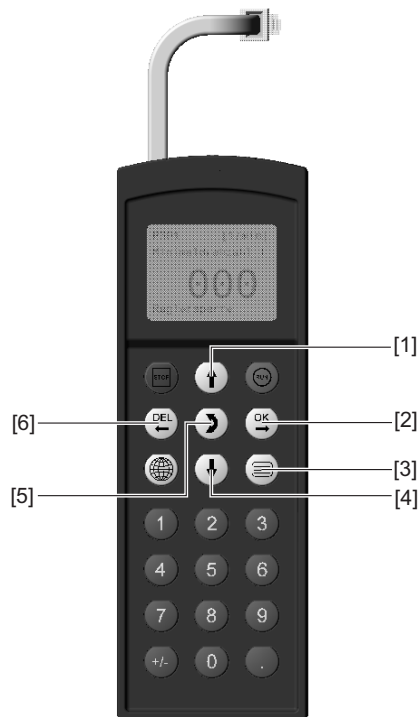
1810055819

Proceed as follows to select the language:







- Press the  key. A list of available languages is displayed on the screen.
- Choose the desired language using the  /  keys.
- Confirm your language selection by pressing the  key. The basic display is now shown in your chosen language.

## 5.3.3 Startup

The figure below shows the keys required for startup.



1810058891

- |     |     |   |   |
|-----|-----|---|---|
| [1] | Key |  | Move up to the next menu item             |
| [2] | Key |  | Confirm entry                             |
| [3] | Key |  | Activate the context menu                 |
| [4] | Key |  | Move down to the next menu item           |
| [5] | Key |  | Change the menu, display mode ↔ edit mode |
| [6] | Key |  | Cancel or abort startup                   |

5.3.4 Startup procedure

**INFORMATION**



This example refers to a 400 V device.

1. "0" signal at terminal X13:1 (DIØØ "/CONTROL.IN-HIBIT"), e.g. by disconnecting the electronics terminal block X13.

0.00rpm  
0.000Amp  
CONTROLLER IN-HIBIT

2. Press the key to activate the context menu.

**BASIC VIEW**  
PARAMETER  
MODE  
VARIABLE MODE

3. Scroll down using the key until you have selected the menu item "STARTUP".

MANUAL MODE  
**STARTUP**  
COPY TO DBG  
COPY TO MDX

4. To commence the startup, press the key. The first parameter appears. The flashing cursor under the parameter number indicates that the keypad is in display mode.

STARTUP  
PREPARE FOR  
STARTUP

- Use the key to switch to edit mode. The flashing cursor disappears.
- Use the or key to select "PARAMETER SET 1" or "PARAMETER SET 2".
- Press the key to confirm your selection.
- Press the key to return to display mode. The flashing cursor appears again.
- Press the key to choose the next parameter.

C00\*STARTUP  
**PARAMETER SET**  
1  
PARAMETER SET  
2

5. Select either stand-alone motor or group drive. Press the key to choose the next parameter.

C22\*MOTORS  
**SINGLE MOTOR**  
IDENT. MOTORS

6. Select the operating mode you require. Press the key to choose the next parameter.

C26\*OPER. MODE  
1  
STANDARD V/F  
**VFC**

7. Select whether an encoder is to be evaluated. Press the key to choose the next parameter.

C29\*encoder  
**NO**  
YES

8. Select the operating mode you require. Press the  $\uparrow$  key to choose the next parameter.

C36\*OPER.MODE  
**SPEED CONTROL**  
 HOIST

9. Select the motor type. If the motor is not listed, select the list "THIRD-PARTY MOTOR".

Press the  $\uparrow$  key to choose the next parameter.

C02\*MOTOR TYPE  
 1  
 DRN80M42  
**DRN90S4**  
 DRN90L4

C02\*MOTOR TYPE  
 1  
**THIRD-PARTY MO-  
 TOR**  
 DT63K4/DR63S4

10. Enter the rated motor voltage for the selected connection type according to the value specified on the nameplate.

Example: Nameplate 230 $\Delta$  / 400 $\sphericalangle$  50 Hz

$\sphericalangle$ Connection  $\rightarrow$  Enter "400 V".

$\Delta$ Connection  $\rightarrow$  Enter "230 V".

The full torque up to 87 Hz is available in  $\Delta$  connection, as voltage reserves are present (400 V device). After startup, first set parameter *P302 Maximum speed 1* to the value 87 Hz, then start the drive.

Example: Nameplate 400 $\Delta$ /690 $\sphericalangle$  50 Hz

$\Delta$ Connection  $\rightarrow$  Enter "400 V".

$\sphericalangle$ Connection not useful. The motor would be subject to field weakening as of 28 Hz.

Press the  $\uparrow$  key to choose the next parameter.

C03\* V  
 MOT. RATED VOLT  
 1  
 400.000

11. Enter the nominal frequency specified on the motor nameplate.

Example: 230 $\Delta$ /400 $\sphericalangle$  50 Hz

Enter "50 Hz" in  $\sphericalangle$  and  $\Delta$  connection.

Press the  $\uparrow$  key to choose the next parameter.

C04\* Hz  
 NOM. MOT. FREQ.  
 1  
 50.000

#### FOR MOTORS FROM SEW-EURODRIVE

12. The motor values are stored for 2- and 4-pole motors from SEW-EURODRIVE and need not be entered.

#### FOR THIRD-PARTY MOTORS



12. Enter the following motor nameplate data:

- C10\* nominal motor current, note the connection type ( $\lambda$  or  $\Delta$ ).
- C11\* nominal motor power
- C12\* power factor  $\cos \varphi$
- C13\* nominal motor speed

13. Enter the nominal power supply voltage (C05\* for motor from SEW-EURODRIVE, C14\* for third-party motor).

C05\* V  
RATED MAINS  
VLTG  
400.000

14. If no TF/TH is connected to X10:1/2 or X15 → Set "NO RESPONSE". If a TF/TH is connected, set the required error response. To select the sensor, set *P530 Sensor type 1* after startup.

835\* RESP. TF-SIG.  
**NO RESPONSE**  
DISPLAY ERROR

15. Start the calculation for the startup data by choosing "YES". The process lasts a few seconds.

C06\*CALCULA-  
TION  
**NO**  
YES

#### FOR MOTORS FROM SEW-EURODRIVE

16. The calculation is performed. After calculation, the next menu item appears automatically.

C06\*SAVE  
**NO**  
YES


#### FOR THIRD-PARTY MOTORS

16. For third-party calibration process is required to perform the calculation:

- When prompted, apply a "1" signal to terminal X13:1 (DIØØ "/CONTROL.INHIBIT").
- Apply a "0" signal to terminal X13:1 again after the calibration is complete.
- After calculation, the next menu item appears automatically.

17. Set "SAVE" to "YES". The data (motor parameters) are copied to the non-volatile memory of MOVIDRIVE®.

STARTUP  
DATA IS  
BEING COPIED...


18. The startup procedure is now complete. Use the  key to return to the context menu.

MANUAL MODE  
**STARTUP**  
COPY TO DBG  
COPY TO MDX


# 5

## Startup

Startup with DBG60B keypad

19. Press the  key to scroll down until the menu item "EXIT" is selected.

SIGNATURE  
**QUIT**  
BASIC VIEW

20. Confirm your selection using the  key. The basic display appears.

0.00rpm  
0.000Amp  
CONTROLLER IN-  
HIBIT

### 5.3.5 Starting up the speed controller

Startup is performed without the speed controller first (→ Section "Startup procedure, steps 1 through 17").

1. The selected operating mode is displayed. If the setting is correct, go to the next menu item.

C00\*STARTUP  
PARAMETER SET  
2  
**VFC n-control**

2. Select the correct encoder type.

C15\*ENCODER  
TYPE  
INCREM. ENCOD.  
TTL  
**SINE ENCODER**  
RESERVED

3. Set the correct encoder resolution.

C16\*ENC. RES-  
OLUT.  
512 inc  
**1024 inc**  
2048 inc

#### FOR MOTORS FROM SEW-EURODRIVE

4. Enter whether the motor has a brake.

C17\*BRAKE  
**WITHOUT**  
WITH

5. Set the stiffness of the closed-loop control system.  
If the drive tends to oscillate → setting < 1  
Transient recovery time is too long → Setting > 1  
Recommended setting range: 0.90 – **1** – 1.10

C18\*  
STIFFNESS  
1.000

6. Enter whether the motor has a flywheel fan (Z fan).

C19\*Z FAN  
**WITHOUT**  
WITH





#### For THIRD-PARTY MOTORS


4. Enter the moment of inertia of the motor.

D00\*  
J0 OF THE MOTOR  
4.600

5. Set the stiffness of the closed-loop control system.  
If the drive tends to oscillate → setting < 1  
Transient recovery time is too long → Setting > 1  
Recommended setting range: 0.90 – **1** – 1.10

C18\*  
STIFFNESS  
1.000

- |   |   |
|---|---|
| 6. Enter the moment of inertia of the brake and fan.  | D00*<br>J BRAKE+FAN<br>1.000                                  |
| 7. Enter the mass moment of inertia of the load (gear unit + driven machine) extrapolated for the motor shaft.  | C20* 10e-4kgm <sup>2</sup><br>LOAD MOMENT OF INERTIA<br>0.200 |
| 8. Enter the time for the shortest ramp you want.   | C21* s<br>SHORTEST RAMP<br>0.100                              |
| 9. Start the calculation for the startup data by choosing "YES". The process lasts a few seconds.   | C06*CALCULATION<br><b>NO</b><br>YES                           |
| 10. The calculation is performed. After calculation, the next menu item appears automatically.  | C06*SAVE<br><b>NO</b><br>YES                                  |
| 11. Set "SAVE" to "YES". The data (motor parameters) are copied to the non-volatile memory of MOVIDRIVE®.   | STARTUP<br>DATA IS<br>BEING COPIED...                         |
| 12. The startup procedure is now complete. Use the  key to return to the context menu. | MANUAL MODE<br><b>STARTUP</b><br>COPY TO DBG<br>COPY TO MDX   |
| 13. Press the  key to scroll down until the menu item "EXIT" is selected.                | SIGNATURE<br><b>QUIT</b><br>BASIC VIEW                        |
| 14. Confirm your selection using the  key. The basic display appears.                    | 0.00rpm<br>0.000Amp<br>CONTROLLER INHIBIT                     |
- Once startup is complete, copy the parameter set from MOVIDRIVE® to the DBG60B keypad. You have the following options:
    - In the context menu, select the menu item "COPY TO DBG". Confirm your selection using the  key. The parameter set is copied from MOVIDRIVE® to the DBG60B.

- In the context menu, select the menu item "PARAMETER MODE". Select parameter P807 "MDX → DBG". The parameter set is copied from MOVIDRIVE® to the DBG60B.
- The parameter set can now be copied to other MOVIDRIVE® devices using the DBG60B. Plug the DBG60B keypad into the other inverter. You have the following options to copy the parameter set from DBG60B to another inverter:
  - In the context menu of the new inverter, choose the "COPY TO MDX" menu item and confirm your entry using the  key. The parameter set is copied from DBG60B to MOVIDRIVE®.
  - In the context menu, select the menu item "PARAMETER MODE". Select parameter P806 "DBG → MDX". The parameter set is copied from DBG60B to MOVIDRIVE®.

### WARNING











Parameter settings incorrect due to unsuitable data sets.

Severe or fatal injuries.

- In the case of third-party motors, set the correct brake application time (P732 / P735).
- Observe the notes for starting the motor in the section "Starting the Motor" (→ page 102).
- Activate encoder monitoring for TTL and sin/cos encoders (P504 = "ON"). **Encoder monitoring is not a safety function.**

#### 5.3.6 Setting parameters

Proceed in this order to set the parameters:

- Use the  key to call up the context menu. In the context menu, select the "PARAMETER MODE" menu item. Press the  key to confirm your selection. The flashing cursor under the parameter number indicates that the keypad is in parameter mode.
- Use the  key to switch to edit mode. The flashing cursor disappears.
- Pressing the  or  key, you can select or set the correct parameter value.
- Press the  key to confirm the selection or setting.
- Press the  key to switch back to parameter mode again. The flashing cursor appears again.
- Press the  key to choose the next parameter.

## 5.4 Operation of MOVITOOLS® MotionStudio

### 5.4.1 About MOVITOOLS® MotionStudio

#### Jobs

The software package enables you to perform the following tasks with consistency:

- Establishing communication with devices
- Executing functions of the devices

#### Establishing communication with devices

The SEW Communication Server is integrated into the MOVITOOLS® MotionStudio software package for establishing communication with the units.

The SEW Communication Server allows you to create **communication channels**. Once the channels are established, the devices communicate via these communication channels using their communication options. You can operate up to four communication channels at the same time.

MOVITOOLS® MotionStudio supports the following types of communication channels:

- Serial (RS485) via interface adapters
- System bus (SBus) via interface adapters
- Ethernet
- EtherCAT®
- Fieldbus (PROFIBUS DP/DP-V1)
- Tool Calling Interface

The available channels can vary depending on the device and its communication options.

#### Executing functions of the devices

The software package enables you to perform the following functions with consistency:

- Parameterization (e. g. in the parameter tree of the device)
- Startup
- Visualization and diagnostics
- Programming

The following basic components are integrated into the MOVITOOLS® MotionStudio software package, allowing you to use the devices to execute functions:

- MotionStudio
- MOVITOOLS®

All functions communicate using **tools**. MOVITOOLS® MotionStudio provides the right tools for every device type.

#### Technical support

SEW-EURODRIVE offers a 24-hour service hotline.

Simply dial **(+49) 0 18 05** and then enter the letters **SEWHELP** via the telephone keypad. Of course, you can also dial **(+49) 0 18 05 - 7 39 43 57**.

## Online help

After installation, the following types of help are available to you:

- The documentation is displayed in a help window after you start the software.  
If the help window does not appear at the start, deactivate the "Display" check box, in the menu under [Settings] / [Options] / [Help].  
If the help window appears again, activate the "Display" check box, in the menu under [Settings] / [Options] / [Help].
- Context-sensitive help is available for the fields which require you to enter values. For example, you can use the <F1> key to display the ranges of values for the device parameters.

### 5.4.2 First steps

#### Starting the software and creating the project

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

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

#### Establishing communication and scanning the network

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

1. Set up a communication channel to communicate with your units.  
For detailed information on how to configure a communication channel, see the section regarding the relevant communication type.
2. Scan your network (unit scan). Press the [Start network scan] button [1] in the toolbar.
3. Select the unit you want to configure.
4. Right-click to open the context menu.  
This will display unit-specific tools used for executing functions with the units.
5. Select the unit you want to configure.
6. Right-click to open the context menu.  
This will display unit-specific tools used for executing functions with the units.

#### Starting up the devices (online)

Do the following to start up the devices (online):

1. Switch to the network view.
2. In the toolbar, click on "Switch to online mode" [1].



- [1] "Switch to online mode" icon
3. Select the unit you want to startup.
  4. Open the context menu and select the [Startup] / [Startup] command.  
The Startup wizard opens.
  5. Follow the instructions of the startup wizard and then load the startup data into your unit.



### Startup for HTL motor encoders

Adhere to the following startup instructions with DEH11/21B for starting an HTL motor encoder (except DEU21B) on MOVIDRIVE® MDX61B.

| Parameter                    | Value             | Callout |
|------------------------------|-------------------|---------|
| Motor type 1                 | DT90S4            |         |
| Motor rated voltage 1 [V]    | 400               |         |
| Motor rated frequency 1 [Hz] | 50                |         |
| Mains rated voltage [V]      | 400               |         |
| SEW encoder type             | NON-SEW ENCODER   | [1]     |
| Encoder type                 | INCR. ENCODER TTL | [2]     |
| Encoder increments [Inc/rev] | 1024              | [3]     |
| 835 Response TF sensor       | NO RESPONSE       |         |
| 530 Sensor type 1            | NO SENSOR         |         |

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- [1] "SEW encoder type" drop-down list
- [2] "Encoder type" drop-down list
- [3] "PPR count" drop-down list

- Select "Third-party encoder" from the "SEW encoder type" list [1].
- Select "INCREM. ENC. TTL" from the "Encoder type" list [2].
- In the dropdown menu "PPR count" [3] select the PPR count (1024 for SEW HTL encoders) printed on the HTL motor encoder.

## 5.5 Starting the motor

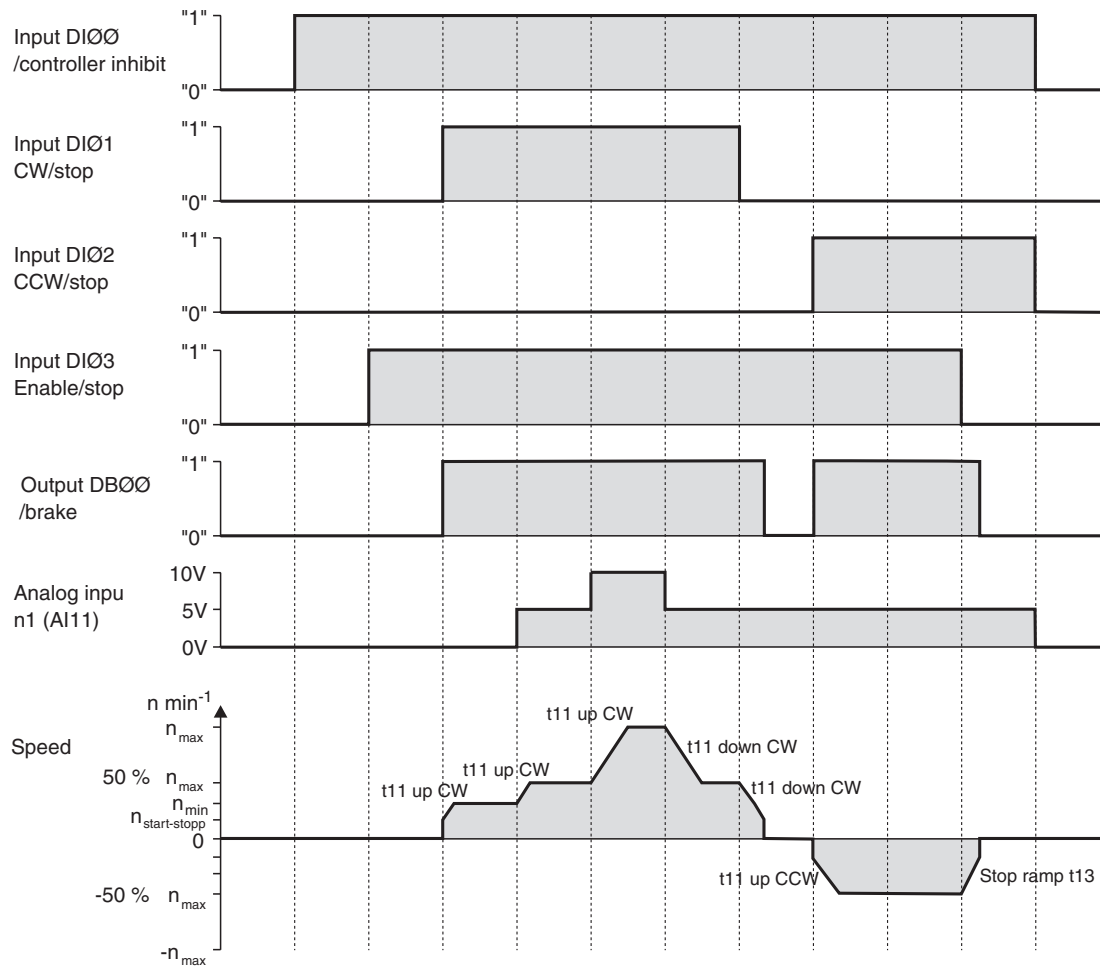
### 5.5.1 Analog setpoint input

The following table shows the signals that must be present on terminals X11:2 (AI1) and X13:1 – X13:6 (DIØØ – DIØ5) when the "UNIPOL/FIX.SETPT" setpoint is selected (P100) to operate the drive with an analog setpoint input.

| Function                             | X11:2<br>(AI11)<br>Analog input n1 | X13:1<br>(DIØØ)<br>/Controller inhibit | X13:2<br>(DIØ1)<br>CW/Stop | X13:3<br>(DIØ2)<br>CCW/<br>stop | X13:4<br>(DIØ3)<br>Enable/<br>stop | X13:5<br>(DIØ4)<br>n11/n21 | X13:6<br>(DIØ5)<br>n12/n22 |
|--------------------------------------|------------------------------------|--|----------------------------|---------------------------------|------------------------------------|----------------------------|----------------------------|
| Controller inhibit                   | X                                  | "0"                                    | X                          | X                               | X                                  | "0"                        | "0"                        |
| Stop                                 | X                                  | "1"                                    | X                          | X                               | "0"                                | "0"                        | "0"                        |
| Enable and stop                      | X                                  | "1"                                    | "0"                        | "0"                             | "1"                                | "0"                        | "0"                        |
| Clockwise at 50%<br>$n_{max}$        | 5 V                                | "1"                                    | "1"                        | "0"                             | "1"                                | "0"                        | "0"                        |
| Clockwise at $n_{max}$               | 10 V                               | "1"                                    | "1"                        | "0"                             | "1"                                | "0"                        | "0"                        |
| Counterclockwise at<br>50% $n_{max}$ | 5 V                                | "1"                                    | "0"                        | "1"                             | "1"                                | "0"                        | "0"                        |
| Counterclockwise at<br>$n_{max}$     | 10 V                               | "1"                                    | "0"                        | "1"                             | "1"                                | "0"                        | "0"                        |

### 5.5.2 Travel diagram

The following travel diagram shows by way of example how the motor is started with the wiring of terminals X13:1 – X13:4 and analog setpoints. Digital output X10:3 (DBØØ "/Brake") is used for switching braking contactor K12.



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### INFORMATION



The motor is not energized in the event of a controller inhibit (DIØØ = "0"). A motor without brake will coast to standstill.

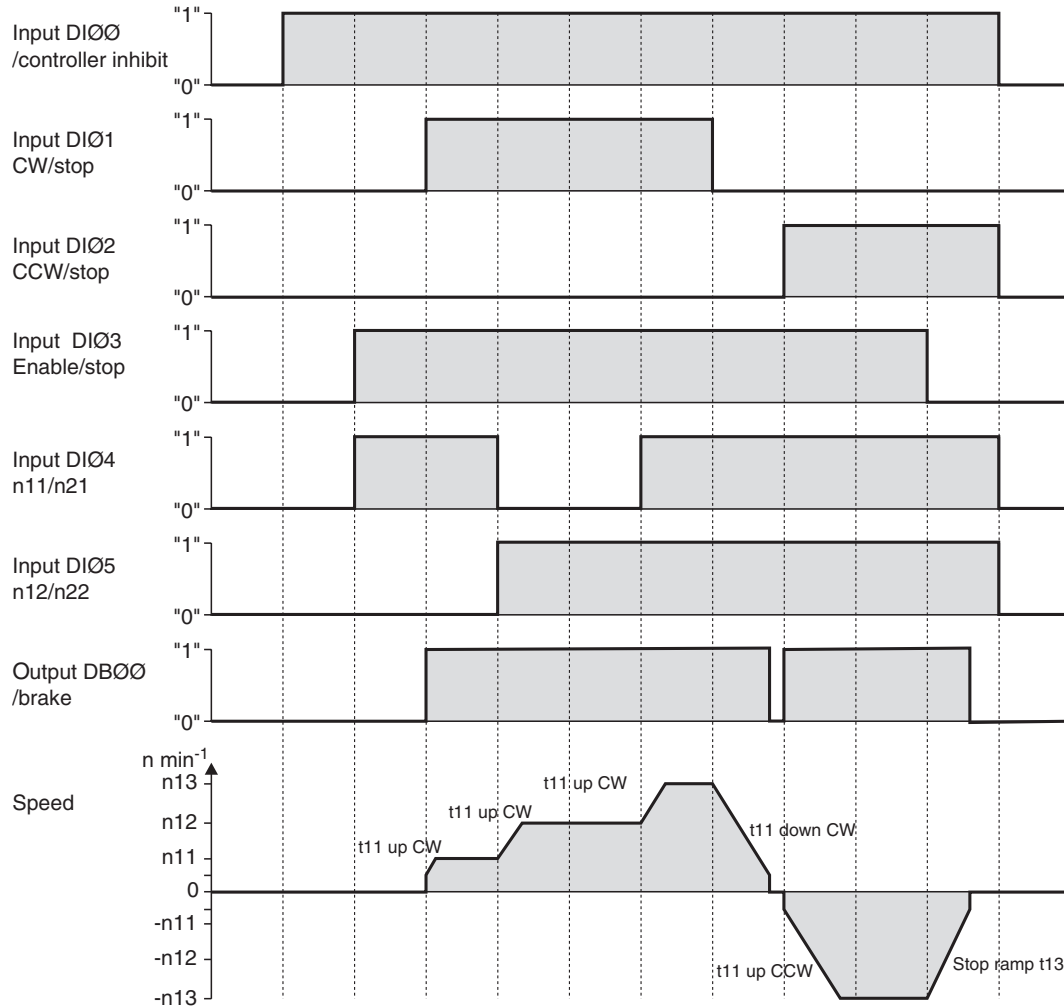
### 5.5.3 Fixed setpoints

The following table shows the signals that must be present on terminals X13:1 – X13:6 (DIØØ – DIØ5) when the "UNIPOL/FIX.SETPT" setpoint is selected (P100) to operate the drive with the fixed setpoints.

| Function                     | X13:1<br>(DIØØ)<br>/Controller<br>inhibit | X13:2<br>(DIØ1)<br>CW/Stop | X13:3<br>(DIØ2)<br>CCW/stop | X13:4 (DIØ3)<br>Enable/stop | X13:5<br>(DIØ4)<br>n11/n21 | X13:6<br>(DIØ5)<br>n12/n22 |
|------------------------------|---|----------------------------|-----------------------------|-----------------------------|----------------------------|----------------------------|
| Controller in-<br>hibit      | "0"                                       | X                          | X                           | X                           | X                          | X                          |
| Stop                         | "1"                                       | X                          | X                           | "0"                         | X                          | X                          |
| Enable and<br>stop           | "1"                                       | "0"                        | "0"                         | "1"                         | X                          | X                          |
| Clockwise at<br>n11          | "1"                                       | "1"                        | "0"                         | "1"                         | "1"                        | "0"                        |
| Clockwise at<br>n12          | "1"                                       | "1"                        | "0"                         | "1"                         | "0"                        | "1"                        |
| Clockwise at<br>n13          | "1"                                       | "1"                        | "0"                         | "1"                         | "1"                        | "1"                        |
| Counterclock-<br>wise at n11 | "1"                                       | "0"                        | "1"                         | "1"                         | "1"                        | "0"                        |

### 5.5.4 Travel diagram

The following travel diagram shows an example of how the drive is started with the wiring of terminals X13:1 – X13:6 and internal fixed setpoints. Digital output X10:3 (DBØØ "/Brake") is used for switching braking contactor K12.



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### INFORMATION



The motor is not energized in the event of a controller inhibit (DIØØ = "0"). A motor without brake will coast to standstill.

### 5.5.5 Manual operation

The inverter can be controlled using the DBG60B keypad/MOVITOOLS® MotionStudio in manual operation (context menu → manual operation). The 7-segment display on the unit shows "H" during manual operation.

The digital inputs are then without any functions for the duration of manual operation, with the exception of X13:1 (DIØØ "/Controller inhibit"). Digital input X13:1 (DIØØ "/Controller inhibit") must get a "1" signal to enable the drive to be started in manual operation. The drive can also be stopped in manual operation by X13:1 = "0".

The direction of rotation is not determined by the "CW/stop" or "CCW/stop" digital inputs. Instead, you select the direction of rotation using the DBG60B keypad/MotionStudio. Enter the required speed and then the direction of rotation (+ = CW / – = CCW) using the sign key (+/–).

Manual operation remains active when the power supply is switched off and on; however, the inverter is then inhibited. Use the "Run" key to enable and start the inverter at  $n_{min}$  in the selected direction of rotation. The speed is increased and decreased using the ↑ and ↓ keys.

### INFORMATION



The signals at the digital inputs take effect as soon as manual operation is finished. Digital input X13:1 (DIØØ) /Controller inhibit does not have to be switched from "1" to "0" and back to "1". The drive can start according to the signals at the digital inputs and the setpoint sources.

### ▲ WARNING



Risk of crushing if the motor starts up unintentionally.

Severe or fatal injuries.

- Ensure that the motor cannot start unintentionally, for example, by removing the signal terminal block X13.
- Additional safety precautions must be taken depending on the application to avoid injury to people and damage to machinery.

### 5.5.6 Startup in operating mode "VFC & flying start function"

The parameter *P320 Automatic adjustment* is deactivated in the mode "VFC & Flying start function". It is important that the stator resistance (*P322 IxR compensation 1*) is set correctly to ensure that the flying start function is performed properly.

#### INFORMATION



Due to exact motor data, the proper function of the flying start function has only been tested with SEW motors. SEW-EURODRIVE does not guarantee a proper function of the flying start function for third-party motors.

Note the following when performing **startup for a motor by SEW-EURODRIVE** with DBG60B or MOVITOOLS® MotionStudio:

The value of the stator resistance (*P322 IxR compensation 1*) is set for a motor by SEW-EURODRIVE at operating temperature (winding temperature 80 °C). For flying start with a cold motor, you have to reduce the stator resistance (*P322 IxR compensation 1*) by 0.34% per Kelvin.

Note the following when performing **startup for a third-party motor** with DBG60B or MOVITOOLS® MotionStudio:

Measure the stator resistance (*P322 IxR compensation 1*) at startup. Proceed as follows:

1. Start up the motor in "VFC" operation mode.
2. Enable the **motor at standstill**.
3. **Note** the value of *P322 IxR compensation 1* (stator resistance) for step 6.
4. Select the operating mode "VFC & Flying start function".
5. Set *P320 "Automatic adjustment 1"* to "Off".
6. In *P322 IxR compensation 1* (stator resistance) enter the **value you noted** in step 3.

## 5.6 Complete parameter list

### 5.6.1 General information

- The parameters contained in the standard user menu are marked by a "\" (= display on the DBG60B keypad).
- The factory setting for the parameter is highlighted in bold.

### 5.6.2 Display values

| Par. | Name                           | Factory setting                    |
|------|--------------------------------|------------------------------------|
| 00.  | Process values                 |                                    |
| 000  | Rotational speed               | -6100 – 0 – 6100 min <sup>-1</sup> |
| \001 | User display                   | "Text"                             |
| 002  | Frequency                      | 0 – 599 Hz                         |
| 003  | Actual position                | 0 – 2 <sup>31</sup> -1 inc.        |
| 004  | Output current                 | 0 – 250% I <sub>N</sub>            |
| 005  | Active current                 | -250 – 0 – 250% I <sub>N</sub>     |
| \006 | Motor utilization 1            | 0 – 200%                           |
| 007  | Motor utilization 2            | 0 – 200%                           |
| 008  | DC link voltage                | 0 – 1000 V                         |
| 009  | Output current                 | A                                  |
| 01.  | Status displays                |                                    |
| 010  | Inverter status                |                                    |
| 011  | Operating state                |                                    |
| 012  | Fault status                   |                                    |
| 013  | Current parameter set          | 1/2                                |
| 014  | Heat sink temperature          | -40 – 0 – 125 °C                   |
| 015  | Power-applied hours            | h                                  |
| 016  | Drive running hours            | h                                  |
| 017  | Work                           | kWh                                |
| 018  | KTY capacity utilization 1     | 0 – 200%                           |
| 019  | KTY capacity utilization 2     | 0 – 200%                           |
| 02.  | Analog setpoints               |                                    |
| 020  | Analog input AI1               | -10 – 0 – 10 V                     |
| 021  | Analog input AI2               | -10 – 0 – 10 V                     |
| 022  | External current limiting      | 0 – 100%                           |
| 03.  | Digital inputs of basic device |                                    |
| 030  | Digital input DIØØ             | /CONTROLLER INHIBIT                |



| Par. | Name  | Factory setting |
|------|---|-----------------|
| 031  | Digital input DIØ1                          | Not in DBG60B   |
| 032  | Digital input DIØ2                          |                 |
| 033  | Digital input DIØ3                          |                 |
| 034  | Digital input DIØ4                          |                 |
| 035  | Digital input DIØ5                          |                 |
| 036  | Digital input DIØ6                          |                 |
| 037  | Digital input DIØ7                          |                 |
| \039 | Status of digital inputs DIØØ – DIØ7        |                 |
| 04.  | Digital input options                       |                 |
| 040  | Digital input DI1Ø                          | Not in DBG60B   |
| 041  | Digital input DI11                          |                 |
| 042  | Digital input DI12                          |                 |
| 043  | Digital input DI13                          |                 |
| 044  | Digital input DI14                          |                 |
| 045  | Digital input DI15                          |                 |
| 046  | Digital input DI16                          |                 |
| 047  | Digital input DI17                          |                 |
| \048 | Status of digital inputs DI1Ø - DI17        |                 |
| 05.  | Digital outputs basic device                |                 |
| 050  | Digital output DBØØ                         | Not in DBG60B   |
| 051  | Digital output DOØ1                         |                 |
| 052  | Digital output DOØ2                         |                 |
| 053  | Digital output DOØ3                         |                 |
| 054  | Digital output DOØ4                         |                 |
| 055  | Digital output DOØ5                         |                 |
| \059 | Status of digital outputs DBØØ, DOØ1 – DOØ5 |                 |
| 06.  | Digital output options                      |                 |
| 060  | Digital output DO1Ø                         | Not in DBG60B   |
| 061  | Digital output DO11                         |                 |
| 062  | Digital output DO12                         |                 |
| 063  | Digital output DO13                         |                 |
| 064  | Digital output DO14                         |                 |
| 065  | Digital output DO15                         |                 |
| 066  | Digital output DO16                         |                 |
| 067  | Digital output DO17                         |                 |
| \068 | Status of digital outputs DO1Ø - DO17       |                 |
| 07.  | Device data                                 |                 |

| Par. | Name                    | Factory setting     |
|------|-------------------------|---------------------|
| 070  | Device type             |                     |
| 071  | Nominal output current  |                     |
| 072  | Option 1 encoder slot   |                     |
| 073  | Option 2 fieldbus slot  |                     |
| 074  | Option 3 expansion slot |                     |
| 076  | Basic device firmware   |                     |
| 077  | DBG firmware            | Only in DBG60B      |
| 078  | Technology function     |                     |
| 079  | Device design           | Standard technology |
| 08.  | Fault memory            |                     |
| \080 | Errors t-0              |                     |
| 081  | Errors t-1              |                     |
| 082  | Errors t-2              |                     |
| 083  | Errors t-3              |                     |
| 084  | Errors t-4              |                     |
| 09.  | Bus diagnostics         |                     |
| 090  | PD configuration        |                     |
| 091  | Fieldbus type           |                     |
| 092  | Fieldbus baud rate      |                     |
| 093  | Fieldbus address        |                     |
| 094  | PO1 Setpoint            |                     |
| 095  | PO2 Setpoint            |                     |
| 096  | PO3 Setpoint            |                     |
| 097  | PI1 Actual value        |                     |
| 098  | PI2 Actual value        |                     |
| 099  | PI3 Actual value        |                     |

### 5.6.3 Parameters

| Par. | Name                                 | Setting range   |
|------|--------------------------------------|---|
|      | Selectable par.<br>Parameter set 1/2 | Factory setting   |
| 1..  | Setpoints/ramp generators            |   |
| 10.  | Setpoint selection                   |   |
| \100 | Setpoint source                      | Bipolar/fixed setpoint<br><b>Unipolar/fixed setpoint</b><br>RS485/fixed setpoint<br>Fieldbus<br>Motor potentiometer/fixed setpoint<br>Motor potentiometer + analog setpoint<br>Fixed setpoint + AI01<br>Fixed setpoint * AI01<br>Master SBus 1<br>Master RS485<br>Frequency setpoint input/fixed setpoint |
| 101  | Control signal source                | <b>Terminals</b>  |
| 102  | Frequency scaling                    | 0.1 – <b>10</b> – 65 kHz  |
| 105  | Error response to wire break AI1     | <b>No response</b><br>Immediate stop/Fault<br>Rapid stop/Fault<br>Rapid stop/warning  |
| 11.  | Analog input AI1                     |   |
| 110  | AI1 scaling                          | -10 – 0 – <b>1</b> – 10   |
| 111  | AI1 Offset                           | -500 – <b>0</b> – 500 mV  |
| 112  | AI1 operating mode                   | <b>10V, reference potential maximum speed</b><br>10V, reference 3000 min <sup>-1</sup><br>Voltage offset, reference maximum speed<br>Speed offset, reference maximum speed<br>Expert characteristic<br>0-20 mA, reference maximum speed<br>4-20 mA, reference maximum speed                               |
| 113  | AI1 voltage offset                   | -10 – <b>0</b> – 10 V   |
| 114  | AI1 speed offset                     | -6000 – <b>0</b> – 6000 min <sup>-1</sup>   |
| 115  | Filter setpoint                      | 0 – <b>5</b> – 100 ms<br>0 = Setpoint filter off  |
| 12.  | Analog inputs (optional)             |   |
| 120  | AI2 operating mode                   | <b>No function</b><br>0 – ±10 V + setpoint 1<br>0 – 10 V current limiting<br>Actual value PID controller  |
| 13.  | Speed ramps 1                        |   |
| \130 | Ramp t11 up CW                       | 0 – <b>2</b> – 2000 s   |
| \131 | Ramp t11 down CW                     | 0 – <b>2</b> – 2000 s   |
| \132 | Ramp t11 up CCW                      | 0 – <b>2</b> – 2000 s   |
| \133 | Ramp t11 down CCW                    | 0 – <b>2</b> – 2000 s   |
| \134 | Ramp t12 UP=DOWN                     | 0 – <b>10</b> – 2000 s  |
| 135  | S pattern t12                        | <b>0</b> – 3  |
| \136 | Stop ramp t13                        | 0 – <b>2</b> – 20 s   |
| \137 | Emergency stop ramp t14              | 0 – <b>2</b> – 20 s   |
| 138  | Ramp limit VFC                       | <b>Yes</b><br>No  |
| 139  | Ramp monitoring 1                    | On<br><b>Off</b>  |
| 14.  | Speed ramps 2                        |   |
| 140  | Ramp t21 up CW                       | 0 – <b>2</b> – 2000 s   |
| 141  | Ramp t21 down CW                     | 0 – <b>2</b> – 2000 s   |
| 142  | Ramp t21 up CCW                      | 0 – <b>2</b> – 2000 s   |
| 143  | Ramp t21 down CCW                    | 0 – <b>2</b> – 2000 s   |
| 144  | Ramp t22 up=down                     | 0 – <b>10</b> – 2000 s  |
| 145  | S pattern t22                        | <b>0</b> – 3  |

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| Par. | Name   | Setting range  |
|------|--|--|
|      | Selectable par.<br>Parameter set 1/2         | Factory setting  |
| 146  | Stop ramp t23                                | 0 – 2 – 20 s   |
| 147  | Emergency stop ramp t24                      | 0 – 2 – 20 s   |
| 149  | Ramp monitoring 2                            | On<br>Off  |
| 15.  | Motor potentiometer (parameter sets 1 and 2) |  |
| 150  | Ramp t3 up                                   | 0.2 – 20 – 50 s  |
| 151  | Ramp t3 down                                 | 0.2 – 20 – 50 s  |
| 152  | Save last<br>Save                            | Yes<br>No  |
| 16.  | Fixed setpoints 1                            |  |
| \160 | Internal setpoint n11                        | -6000 – 150 – 6000 min <sup>-1</sup> (% I <sub>N</sub> )                     |
| \161 | Internal setpoint n12                        | -6000 – 750 – 6000 min <sup>-1</sup> (% I <sub>N</sub> )                     |
| \162 | Internal setpoint n13                        | -6000 – 1500 – 6000 min <sup>-1</sup> (% I <sub>N</sub> )                    |
| 17.  | Fixed setpoints 2                            |  |
| 170  | Internal setpoint n21                        | -6000 – 150 – 6000 min <sup>-1</sup> (% I <sub>N</sub> )                     |
| 171  | Internal setpoint n22                        | -6000 – 750 – 6000 min <sup>-1</sup> (% I <sub>N</sub> )                     |
| 172  | Internal setpoint n23                        | -6000 – 1500 – 6000 min <sup>-1</sup> (% I <sub>N</sub> )                    |
| 2..  | Controller parameters                        |  |
| 20.  | Speed control (only parameter set 1)         |  |
| 200  | P gain<br>n-controller                       | 0.01 – 2 – 32  |
| 201  | Time constant n-controller                   | 0 – 10 – 3000 ms   |
| 202  | Gain<br>Acceleration precontrol              | 0 – 65   |
| 203  | Filter acceleration precontrol               | 0 – 100 ms   |
| 204  | Filter actual speed value                    | 0 – 32 ms  |
| 205  | Load precontrol CFC                          | -150% – 0 – 150%   |
| 206  | Sampling cycle n-controller                  | 1 ms<br>0.5 ms   |
| 207  | Load precontrol VFC                          | -150% – Off – 150%   |
| 21.  | Hold controller                              |  |
| 210  | P gain hold controller                       | 0.1 – 0.5 – 32   |
| 22.  | Synchronous operation control                |  |
| 220  | P-gain DRS                                   | 1 – 10 – 200   |
| 221  | Master gear ratio factor                     | 1 – 3 999 999 999  |
| 222  | Slave gear ratio factor                      | 1 – 3 999 999 999  |
| 223  | Mode selection                               | Mode 1<br>Mode 2<br>Mode 3<br>Mode 4<br>Mode 5<br>Mode 6<br>Mode 7<br>Mode 8 |
| 224  | Slave counter                                | -99 999 999 – 10 – 99 999 999 inc.   |
| 225  | Offset 1                                     | -32767 – 10 – 32767 inc.   |
| 226  | Offset 2                                     | -32767 – 10 – 32767 inc.   |
| 227  | Offset 3                                     | -32767 – 10 – 32767 inc.   |
| 228  | Precontrol filter DRS                        | 0 – 100 ms   |
| 23.  | Synchronous operation with distance encoder  |  |
| 230  | Distance encoder                             | Off<br>Equal-ranked<br>Chain   |
| 231  | Slave-encoder factor                         | 1 – 1000   |
| 232  | Slave-distance-encoder factor                | 1 – 1000   |
| 233  | Distance encoder resolution                  | 128/256/512/1024/2048  |

| Par.     | Name  | Setting range   |
|----------|---|---|
|          | Selectable par.<br>Parameter set 1/2          | Factory setting   |
| 234      | Master encoder PPR count                      | 128/256/512/ <b>1024</b> /2048                              |
| 24.      | Synchronous operation with catch up           |   |
| 240      | Synchronous speed                             | 0 – <b>1500</b> – 6000 min <sup>-1</sup>                    |
| 241      | Synchronous ramp                              | 0 – <b>2</b> – 50 s   |
| 26.      | Process controller parameter                  |   |
| 260      | Operating mode                                | <b>Controller off</b> /control/step response                |
| 261      | Cycle time                                    | 1/5/10 ms   |
| 262      | The current is                                | <b>No response</b> /Move closer to setpoint                 |
| 263      | Factor K <sub>p</sub>                         | 0 – <b>1</b> – 32,767                                       |
| 264      | Integral time T <sub>n</sub>                  | <b>0</b> – 65535 ms   |
| 265      | Derivative time T <sub>v</sub>                | <b>0</b> – 30 ms  |
| 266      | Precontrol                                    | -32767 – <b>0</b> – 32767                                   |
| 27.      | Process controller input values               |   |
| 270      | Setpoint source                               | <b>Parameters</b> /IPOS variable/Analog 1/Analog 2          |
| 271      | Setpoint                                      | -32767 – <b>0</b> – 32767                                   |
| 272      | IPOS setpoint address                         | <b>0</b> – 1023   |
| 273      | Time constant                                 | <b>0</b> – 0.01 – 2000 s                                    |
| 274      | Scaling setpoint                              | -32,767 – <b>1</b> – 32,767                                 |
| 275      | Actual value source                           | <b>Analog 1</b> /analog 2/IPOS variable                     |
| 276      | IPOS actual value address                     | <b>0</b> – 1023   |
| 277      | Actual value scaling                          | -32,767 – <b>1</b> – 32,767                                 |
| 278      | Actual offset value                           | -32767 – <b>0</b> – 32767                                   |
| 279      | Actual time constant                          | <b>0</b> – 500 ms   |
| 28.      | Process controller limits                     |   |
| 280      | Minimum offset + actual value                 | -32767 – <b>0</b> – 32767                                   |
| 281      | Maximum offset + actual value                 | -32767 – <b>10000</b> – 32767                               |
| 282      | Minimum output PID controller                 | -32767 – <b>-1000</b> – 32767                               |
| 283      | PID controller maximum output                 | -32767 – <b>10000</b> – 32767                               |
| 284      | Process controller minimum output             | -32767 – <b>0</b> – 32767                                   |
| 285      | Process controller maximum output             | -32767 – <b>7500</b> – 32767                                |
| 3.       | Motor parameters                              |   |
| 30./31.  | Limits 1 / 2                                  |   |
| \300/310 | Start/stop speed 1 / 2                        | 0 – 150 min <sup>-1</sup>                                   |
| \301/311 | Minimum speed 1 / 2                           | 0 – <b>15</b> – 6100 min <sup>-1</sup>                      |
| \302/312 | Maximum speed 1 / 2                           | 0 – <b>1500</b> – 6100 min <sup>-1</sup>                    |
| \303/313 | Current limit 1 / 2                           | 0 – 150% (size 0: 0 – 200% I <sub>N</sub> )                 |
| 304      | Torque limit                                  | 0 – 150% (size 0: 0 – 200%)                                 |
| 32./33.  | Motor compensation 1/2 (asynchronous)         |   |
| \320/330 | Automatic adjustment 1/2                      | <b>On</b><br>Off  |
| 321/331  | Boost 1/2                                     | <b>0</b> – 100%   |
| 322/332  | IxR adjustment 1                              | 0 – 100%  |
| 323/333  | Premagnetization time 1/2                     | 0 – 20 s  |
| 324/334  | Slip compensation 1 / 2                       | 0 – 500 min <sup>-1</sup>                                   |
| 34.      | Motor protection                              |   |
| 340/342  | Motor protection 1/2                          | <b>Off</b><br>ON asynchronous motor<br>ON synchronous motor |
| 341/343  | Cooling type 1/2                              | <b>Fan cooled</b><br>Forced air cooling                     |
| 344      | Interval for motor protection                 | 0.1 – <b>4</b> – 20 s                                       |
| 345/346  | I <sub>N</sub> -U <sub>L</sub> monitoring 1/2 | 0.1 – 500 A   |
| 35.      | Direction of motor rotation                   |   |

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| Par.    | Name                                     | Setting range  |
|---------|--|--|
|         | Selectable par.<br>Parameter set 1/2     | Factory setting  |
| 350/351 | Change direction of rotation 1/2         | On<br><b>Off</b><br>Terminal (only in parameter set 1)                     |
| 36.     | Startup (only available in DBG60B)       |  |
| 360     | Startup                                  | Yes/ <b>No</b>   |
| 4..     | Reference signals                        |  |
| 40.     | Speed reference message                  |  |
| 400     | Speed reference value                    | 0 – <b>1500</b> – 6000 min <sup>-1</sup>                                   |
| 401     | Hysteresis                               | 0 – <b>100</b> – 500 min <sup>-1</sup>                                     |
| 402     | Delay time                               | 0 – <b>1</b> – 9 s   |
| 403     | Signal = "1" if:                         | $n < n_{ref}$<br>$n > n_{ref}$   |
| 41.     | Speed window signal                      |  |
| 410     | Window center                            | 0 – <b>1500</b> – 6000 min <sup>-1</sup>                                   |
| 411     | Range width                              | <b>0</b> – 6000 min <sup>-1</sup>  |
| 412     | Delay time                               | 0 – <b>1</b> – 9 s   |
| 413     | Signal = "1" if:                         | <b>Internal</b><br>External  |
| 42.     | Speed setpoint / actual value comparison |  |
| 420     | Hysteresis                               | 0 – <b>100</b> – 300 min <sup>-1</sup>                                     |
| 421     | Delay time                               | 0 – <b>1</b> – 9 s   |
| 422     | Signal = "1" if:                         | $n \neq n_{setpoint}$<br>$n = n_{setpoint}$                                |
| 43.     | Current reference signal                 |  |
| 430     | Current reference value                  | 0 – <b>100</b> – 200% I <sub>N</sub>                                       |
| 431     | Hysteresis                               | 0 – <b>5</b> – 30% I <sub>N</sub>  |
| 432     | Delay time                               | 0 – <b>1</b> – 9 s   |
| 433     | Signal = "1" if:                         | $I < I_{ref}$<br>$I > I_{ref}$   |
| 44      | I <sub>max</sub> signal                  |  |
| 440     | Hysteresis                               | <b>5</b> – 50% I <sub>N</sub>  |
| 441     | Delay time                               | 0 – <b>1</b> – 9 s   |
| 442     | Signal = "1" if:                         | $I = I_{max} / I < I_{max}$  |
| 5..     | Control functions                        |  |
| 50.     | Speed monitoring                         |  |
| 500/502 | Speed monitoring 1/2                     | Off<br>Motor mode<br>Regenerative operation<br><b>Motor/generator mode</b> |
| 501/503 | Delay time 1/2                           | 0 – <b>1</b> – 10 s  |
| 504     | Encoder monitoring motor                 | On<br><b>Off</b>   |
| 505     | Distance encoder monitoring              | On<br><b>Off</b>   |
| 51.     | Synchronous operation monitoring         |  |
| 510     | Positional tolerance slave               | 10 – <b>25</b> – 32768 inc.  |
| 511     | Lag error prewarning                     | <b>50</b> – 99 999 999 inc.  |
| 512     | Lag error limit                          | 100 – <b>4000</b> – 99 999 999 inc.  |
| 513     | Delay lag error signal                   | 0 – <b>1</b> – 99 s  |
| 514     | Counter LED display                      | 10 – <b>100</b> – 32 768 inc.  |
| 515     | Delay in-position signal                 | 5 – <b>10</b> – 2000 ms  |
| 516     | X41 Encoder monitoring                   | <b>Off</b><br>On   |
| 517     | X41 Pulse count monitoring               | <b>Off</b><br>On   |

| Par. | Name                                | Setting range   |
|------|-------------------------------------|---|
|      |                                     | Factory setting   |
| 518  | X42 Encoder monitoring              | Off<br>On   |
| 519  | X42 Pulse count monitoring          | Off<br>On   |
| 52.  | Power off monitoring                |   |
| 520  | Power off response time             | 0 – 5 s   |
| 521  | Mains OFF response                  | Controller inhibit<br>Emergency stop  |
| 522  | Phase failure monitoring            | Off<br>On   |
| 53.  | Motor thermal protection            |   |
| 530  | Sensor type 1                       | No sensor<br>TF/TH<br>KTY<br>TF/TH DEU<br>KTY DEU<br>PK<br>PK DEU   |
| 531  | Sensor type 2                       | No sensor<br>TF/TH  |
| 54.  | Gear unit/motor monitoring          |   |
| 540  | Response to drive vibration/warning | Display error   |
| 541  | Response to drive vibration/fault   | Rapid stop/warning  |
| 542  | Response to oil aging/warning       | Display error   |
| 543  | Response to oil aging/error         | Display error   |
| 544  | Response oil aging/over-temperature | Display error   |
| 545  | Response oil aging/ready signal     | Display error   |
| 549  | Response to brake wear              | Display error   |
| 55.  | DCS safety module                   |   |
| 550  | DCS safety module status            | Display value that cannot be changed  |
| 551  | Digital inputs DCS DI1 – DI8        |   |
| 552  | Digital outputs DCS DO0_P – DO2_M   |   |
| 553  | Serial number DCS                   |   |
| 554  | CRC DCS                             |   |
| 555  | DCS error response                  | No response   |
| 556  | DCS alarm response                  | Display error<br>Immediate stop/Fault<br>Emergency stop/Fault<br>Rapid stop/Fault<br>Immediate stop/warning<br>Emergency stop/Warning<br>Rapid stop/warning |
| 557  | DCS source actual position          | Motor encoder (X15)<br>Ext. Encoder (X14)<br>Absolute encoder (X62)   |
| 56.  | Ex-e motor current limiting         |   |
| 560  | Ex-e motor current limit            | On<br>Off   |
| 561  | Frequency A                         | 0 – 5 – 60 Hz   |
| 562  | Current limit A                     | 0 – 50 – 150%   |
| 563  | Frequency B                         | 0 – 10 – 104 Hz   |
| 564  | Current limit B                     | 0 – 80 – 200%   |
| 565  | Frequency C                         | 0 – 25 – 104 Hz   |
| 566  | Current limit C                     | 0 – 100 – 200%  |
| 6..  | Terminal assignment                 |   |
| 60.  | Digital inputs of basic device      |   |
| –    | Digital input DIØØ                  | Fixed assignment with: /CONTROLLER INHIBIT  |
| 600  | Digital input DIØ1                  | CW/stop   |

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| Par. | Name<br>Selectable par.<br>Parameter set 1/2 | Setting range  |
|------|--|--|
|      |  | Factory setting                                      |
| 601  | Digital input DIØ2                           | CCW/stop   |
| 602  | Digital input DIØ3                           | Enable/stop  |
| 603  | Digital input DIØ4                           | n11/n21  |
| 604  | Digital input DIØ5                           | n12/n22  |
| 605  | Digital input DIØ6                           | No function  |
| 606  | Digital input DIØ7                           | No function  |
| 61.  | Digital inputs option                        |  |
| 610  | Digital input DI1Ø                           | No function  |
| 611  | Digital input DI11                           | No function  |
| 612  | Digital input DI12                           | No function  |
| 613  | Digital input DI13                           | No function  |
| 614  | Digital input DI14                           | No function  |
| 615  | Digital input DI15                           | No function  |
| 616  | Digital input DI16                           | No function  |
| 617  | Digital input DI17                           | No function  |
| 62.  | Digital outputs basic device                 |  |
| –    | Digital output DBØØ                          | Fixed assignment with: /brake                        |
| 620  | Digital output DOØ1                          | Ready  |
| 621  | Digital output DOØ2                          | /Failure   |
| 622  | Digital output DOØ3                          | IPOS output  |
| 623  | Digital output DOØ4                          | IPOS output  |
| 624  | Digital output DOØ5                          | IPOS output  |
| 63.  | Digital outputs option                       |  |
| 630  | Digital output DO1Ø                          | No function  |
| 631  | Digital output DO11                          | No function  |
| 632  | Digital output DO12                          | No function  |
| 633  | Digital output DO13                          | No function  |
| 634  | Digital output DO14                          | No function  |
| 635  | Digital output DO15                          | No function  |
| 636  | Digital output DO16                          | No function  |
| 637  | Digital output DO17                          | No function  |
| 64.  | Optional analog outputs                      |  |
| 640  | Analog output AO1                            | Actual speed   |
| 641  | Scaling AO1                                  | -10 – 0 – 1 – 10                                     |
| 642  | Operating mode AO1                           | No function<br>-10V – 10 V<br>0 – 20 mA<br>4 – 20 mA |
| 643  | Analog output AO2                            | Output current                                       |
| 644  | Scaling AO2                                  | -10 – 0 – 1 – 10                                     |
| 645  | Operating mode AO2                           | No function<br>-10V – 10 V<br>0 – 20 mA<br>4 – 20 mA |
| 7..  | Control functions                            |  |
| 70.  | Duty types                                   |  |



| Par.    | Name                                 | Setting range   |
|---------|--------------------------------------|---|
|         | Selectable par.<br>Parameter set 1/2 | Factory setting   |
| 700     | Operating mode 1                     | <b>VFC 1</b><br>VFC 1 & GROUP<br>VFC 1 & HOIST<br>VFC 1 & DC BRAK.<br>VFC 1 &FLY.START<br>VFC n-control<br>VFC-n-CTRL&GRP.<br>VFC-n-CTRL&HOIST<br>VFC-n-CTRL.&SYNC.<br>VFC-n-CTRL.&IPOS<br>CFC<br>CFC&M-CTRL.<br>CFC&IPOS<br>CFC&SYNC.<br>SERVO<br>SERVO&M-CONTROL<br>SERVO&IPOS<br>SERVO&SYNC. |
| 701     | Operating mode 2                     | <b>VFC 2</b><br>VFC 2 & GROUP<br>VFC 2 & HOIST<br>VFC 2 & DC BRAK.<br>VFC 2 &FLY.START  |
| 702     | Motor category                       | <b>Rotary</b><br>Linear   |
| 703     | Control dynamics                     | <b>Standard</b><br>Increased  |
| 704     | VFC-n with output filter             | Yes<br><b>No</b>  |
| 705     | Lower limit of premagnetization time | Yes<br><b>No</b>  |
| 706     | Flow model: Yrq = 0                  | <b>Yes</b><br>No  |
| 71.     | Standstill current                   |   |
| 710/711 | Standstill current 1/2               | <b>0</b> – 50% I <sub>Mot</sub>   |
| 72.     | Stop by setpoint function            |   |
| 720/723 | Setpoint stop function 1/2           | <b>Off</b><br>On  |
| 721/724 | Stop setpoint 1/2                    | 0 – <b>30</b> – 500 min <sup>-1</sup>   |
| 722/725 | Start offset 1 / 2                   | 0 – <b>30</b> – 500 min <sup>-1</sup>   |
| 73.     | Brake function                       |   |
| 730/733 | Brake function 1/2                   | Off<br><b>On</b>  |
| 731/734 | Brake release time 1 / 2             | <b>0</b> – 2 s  |
| 732/735 | Brake application time 1 / 2         | 0 – 2 s   |
| 74.     | Speed skip function                  |   |
| 740/742 | Skip window center 1/2               | 0 – <b>1500</b> – 6000 min <sup>-1</sup>  |
| 741/743 | Skip bandwidth 1/2                   | <b>0</b> – 300 min <sup>-1</sup>  |
| 75.     | Master/slave function                |   |
| 750     | Slave setpoint                       | <b>Master/slave off</b><br>Rotational speed RS485<br>Speed SBus1<br>Speed 485 + SBus1<br>Torque RS485<br>Torque SBus1<br>Torque 485 + SBus1<br>Load distribution RS485<br>Load distribution SBus1<br>Load distribution 485 + SBus1  |
| 751     | Scaling slave setpoint               | -10 – <b>1</b> – 10   |
| 76.     | Manual operation                     |   |

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| Par.     | Name                                   | Setting range   |
|----------|--|---|
|          | Selectable par.<br>Parameter set 1/2   | Factory setting   |
| 760      | Locking Run/Stop keys                  | On<br>Off   |
| 77.      | Energy-saving function                 |   |
| 770      | Energy-saving function                 | On<br>Off   |
| 78.      | Ethernet configuration                 |   |
| 780      | IP address                             | 000.000.000.000 – <b>192.168.10.4</b> – 223.255.255.255     |
| 781      | Subnet mask                            | 000,000,000,000 – <b>255,255,255,000</b> – 223,255,255,255  |
| 782      | Default gateway                        | <b>000.000.000.000</b> – 223.255.255.255                    |
| 783      | Baud rate                              | Display value that cannot be changed (0 – 100 – 1000 MBaud) |
| 784      | MAC address                            | Display value that cannot be changed (00-0F-69-XX-XX-XX)    |
| 785      | EtherNet/IP™ startup configuration     | <b>DHCP</b><br>Saved IP parameters                          |
| 8..      | Device functions                       |   |
| 80.      | Setup                                  |   |
| 800      | User menu                              | On/off (only in DBG60B)                                     |
| 801      | Language                               | Dependent on DBG60B design                                  |
| \802     | Factory setting                        | <b>No</b><br>Standard<br>Delivery state                     |
| \803     | Parameter lock                         | On<br>Off   |
| 804      | Reset statistical data                 | <b>No</b><br>Fault memory<br>kWh COUNTER<br>Operating hours |
| 806      | Copy DBG → MDX                         | Yes/ <b>No</b>  |
| 807      | Copy MDX → DBG                         | Yes/ <b>No</b>  |
| 81.      | Serial communication                   |   |
| 810      | RS485 address                          | <b>0</b> – 99   |
| 811      | RS485 Group address                    | <b>100</b> – 199  |
| 812      | RS485 timeout interval                 | <b>0</b> – 650 s  |
| 819      | Fieldbus timeout interval              | 0 – <b>0.5</b> – 650 s                                      |
| 82.      | Braking operation                      |   |
| \820/821 | 4-quadrant operation 1/2               | On<br>Off   |
| 83.      | Error responses                        |   |
| 830      | Response to "external error"           | <b>Emergency stop/Fault</b>                                 |
| 831      | Response "Fieldbus timeout"            | <b>Rapid stop/warning</b>                                   |
| 832      | Response to "motor overload"           | <b>Emergency stop/Fault</b>                                 |
| 833      | Response to 'RS485 timeout'            | <b>Rapid stop/warning</b>                                   |
| 834      | Response to "lag error"                | <b>Emergency stop/Fault</b>                                 |
| \835     | Response to 'TF signal'                | <b>No response</b>  |
| 836/837  | Response to 'Timeout SBus 1/2'         | <b>Emergency stop/Fault</b>                                 |
| 838      | Response to "SW limit switch"          | <b>Emergency stop/Fault</b>                                 |
| 839      | Response to 'positioning interruption' | <b>Emergency stop/Warning</b>                               |
| 84.      | Reset behavior                         |   |
| \840     | Manual reset                           | Yes<br><b>No</b>  |
| 841      | Auto reset                             | Yes<br><b>No</b>  |
| 842      | Restart time                           | 1 – <b>3</b> – 30 s   |
| 85.      | Scaling actual speed value             |   |
| 850      | Scaling factor numerator               | <b>1</b> – 65535  |
| 851      | Scaling factor denominator             | <b>1</b> – 65535  |
| 852      | User unit                              | <b>1/min</b>  |

| Par.    | Name                                 | Setting range  |
|---------|--------------------------------------|--|
|         | Selectable par.<br>Parameter set 1/2 | Factory setting                                      |
| 86.     | Modulation                           |  |
| 860/861 | PWM frequency 1/2 VFC                | 2.5 kHz<br><b>4 kHz</b><br>8 kHz<br>12 kHz<br>16 kHz |
| 862/863 | PWM fix 1/2                          | On<br><b>Off</b>                                     |
| 864     | PWM frequency CFC                    | 2.5 kHz<br><b>4 kHz</b><br>8 kHz<br>16 kHz           |
| 87.     | Process data description             |  |
| 870     | Setpoint description PO1             | <b>Control word 1</b>                                |
| 871     | Setpoint description PO2             | <b>Setpoint speed</b>                                |
| 872     | Setpoint description PO3             | <b>Ramp</b>  |
| 873     | Actual value description PI1         | <b>Status word 1</b>                                 |
| 874     | Actual value description PI2         | <b>Actual rotational speed</b>                       |
| 875     | Actual value description PI3         | <b>Output current</b>                                |
| 876     | PO data enable                       | <b>Yes</b><br>No                                     |
| 88./89. | Serial communication SBus 1/2        |  |
| 880/890 | Protocol SBus 1/2                    | <b>SBus MOVILINK®</b><br>CANopen<br>Protocol DCS     |
| 881/891 | SBus address 1/2                     | <b>0</b> – 63  |
| 882/892 | Group address SBus 1/2               | <b>0</b> – 63  |
| 883/893 | Timeout delay SBus 1/2               | <b>0</b> – 650 s                                     |
| 884/894 | Baud rate SBus 1/2                   | 125 kBd<br>250 kBd<br><b>500 kBd</b><br>1000 kBd     |
| 885/895 | Synchronization ID SBus 1/2          | <b>0</b> – 2047                                      |
| 886/896 | Address CANopen 1/2                  | <b>1</b> – <b>127</b>                                |
| 887     | Synchronization ext. Controller      | On<br><b>Off</b>                                     |
| 888     | Synchronization time                 | <b>1</b> – <b>5</b> – 10 ms                          |
| 889/899 | Parameter channel 2                  | On<br><b>Off</b>                                     |
| 9..     | IPOS parameters                      |  |
| 90.     | IPOS reference travel                |  |
| 900     | Reference offset                     | $-(2^{31} - 1) - 0 - (2^{31} - 1)$ inc.              |
| 901     | Reference speed 1                    | <b>0</b> – <b>200</b> – 6000 min <sup>-1</sup>       |
| 902     | Reference speed 2                    | <b>0</b> – <b>50</b> – 6000 min <sup>-1</sup>        |
| 903     | Reference travel type                | <b>0</b> – 8   |
| 904     | Reference travel to zero pulse       | <b>Yes</b><br>No                                     |
| 905     | HIPERFACE® offset X15                | $-(2^{31} - 1) - 0 - (2^{31} - 1)$ inc.              |
| 906     | Cam distance                         | $-(2^{31} - 1) - 0 - (2^{31} - 1)$ inc.              |
| 91.     | IPOS Travel parameters               |  |
| 910     | Gain X controller                    | 0.1 – <b>0.5</b> – 32                                |
| 911     | Positioning ramp 1                   | 0.01 – <b>1</b> – 20 s                               |
| 912     | Positioning ramp 2                   | 0.01 – <b>1</b> – 20 s                               |
| 913     | Travel speed CW                      | <b>0</b> – <b>1500</b> – 6000 min <sup>-1</sup>      |
| 914     | Travel speed CCW                     | <b>0</b> – <b>1500</b> – 6000 min <sup>-1</sup>      |
| 915     | Speed precontrol                     | -199.99 – 0 – <b>100</b> – 199.99%                   |

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| Par. | Name                                      | Setting range   |
|------|---|---|
|      | Selectable par.<br>Parameter set 1/2      | Factory setting   |
| 916  | Ramp type                                 | <b>Linear</b><br>Square<br>Sine<br>Bus ramp<br>Jerk-limited<br>Electronic cam<br>I-synchronous operation<br>Cross Cutter<br>Speed interpolation<br>Position interpolation 12 bit<br>Position interpolation 16 bit |
| 917  | Ramp mode                                 | <b>Mode 1</b><br>Mode 2<br>Mode 3   |
| 918  | Bus setpoint source                       | 0 – <b>499</b> – 1023   |
| 92.  | IPOS monitoring                           |   |
| 920  | SW limit switch RIGHT                     | -(2 <sup>31</sup> - 1) – <b>0</b> – (2 <sup>31</sup> - 1) inc.  |
| 921  | SW limit switch LEFT                      | -(2 <sup>31</sup> - 1) – <b>0</b> – (2 <sup>31</sup> - 1) inc.  |
| 922  | Position window                           | 0 – <b>50</b> – 32767 inc.  |
| 923  | Lag error window                          | 0 – <b>5000</b> – (2 <sup>31</sup> - 1) inc.  |
| 924  | 'Position monitoring' detection           | On/ <b>off</b>  |
| 93.  | Special IPOS functions                    |   |
| 930  | Override                                  | On/ <b>off</b>  |
| 931  | IPOS CTRL.W Task 1                        | <b>Stop</b> / Start / Stop  |
| 932  | IPOS CTRL.W Task 2                        | Start/ <b>Stop</b>  |
| 933  | Jerk time                                 | <b>0.005</b> – 2 s  |
| 938  | IPOS speed task 1                         | <b>0</b> – 9 additional commands/ms   |
| 939  | IPOS speed task 2                         | <b>0</b> – 9 additional commands/ms   |
| 94.  | IPOS encoder                              |   |
| 940  | IPOS variables edit                       | On/ <b>off</b>  |
| 941  | Actual position source                    | <b>Motor encoder (X15)</b><br>Ext. Encoder (X14)<br>Absolute encoder (X62)  |
| 942  | Encoder factor numerator                  | <b>1</b> – 32767  |
| 943  | Encoder factor denominator                | <b>1</b> – 32767  |
| 944  | Encoder scaling ext. Encoder (X14)        | <b>x1/x2/x4/x8/x16/x32/x64</b>  |
| 945  | Distance encoder type (X14)               | <b>TTL</b><br>Sin/cos<br>HIPERFACE®<br>RS485  |
| 946  | Distance encoder counting direction (X14) | <b>Normal</b><br>Inverted   |
| 947  | HIPERFACE® offset X14                     | -(2 <sup>31</sup> - 1) – <b>0</b> – (2 <sup>31</sup> - 1) inc.  |
| 948  | Automatic encoder replacement recognition | On/ <b>Off</b>  |
| 95.  | Absolute encoder                          |   |
| 950  | Encoder type                              | <b>No encoder</b>   |
| 951  | Counting direction                        | <b>Normal</b><br>Inverted   |
| 952  | Clock frequency                           | <b>1</b> – 200%   |
| 953  | Position offset                           | -(2 <sup>31</sup> - 1) – <b>0</b> – (2 <sup>31</sup> - 1) inc.  |
| 954  | Zero point offset                         | -(2 <sup>31</sup> - 1) – <b>0</b> – (2 <sup>31</sup> - 1) inc.  |
| 955  | Encoder scaling                           | <b>x1/x2/x4/x8/x16/x32/x64</b>  |
| 96.  | IPOS <sup>PLUS</sup> ® Modulo function    |   |
| 960  | Module function                           | <b>Off</b><br>Short<br>CW<br>CCW  |
| 961  | Module counter                            | <b>1</b> – (2 <sup>31</sup> - 1)  |

| Par. | Name                                 | Setting range             |
|------|--------------------------------------|---------------------------|
|      | Selectable par.<br>Parameter set 1/2 | Factory setting           |
| 962  | Module denominator                   | 1 – (2 <sup>31</sup> – 1) |
| 963  | Modulo encoder resolution            | 0 – <b>4096</b> – 20000   |
| 97.  | IPOS synchronization                 |                           |
| 970  | DRAM synchronization                 | Yes/ <b>No</b>            |
| 971  | Synchronization phase                | -2 – <b>0</b> – 2 ms      |

## 6 Operation

### 6.1 Operating displays

#### 6.1.1 7-segment display

The 7-segment display shows the operating condition of MOVIDRIVE® and, in the event of an error, an error or warning code.

| 7-segment display | Device status<br>(high byte in status word 1) | Meaning                                   |
|-------------------|---|---|
| 0                 | 0   | 24 V operation (inverter not ready)       |
| 1                 | 1   | Controller inhibit active                 |
| 2                 | 2   | No enable                                 |
| 3                 | 3   | Standstill current                        |
| 4                 | 4   | Approval                                  |
| 5                 | 5   | n-control (speed control)                 |
| 6                 | 6   | M-control (torque control)                |
| 7                 | 7   | Position hold control                     |
| 8                 | 8   | Factory setting                           |
| 9                 | 9   | Limit switch hit                          |
| A                 | 10  | Technology option                         |
| c                 | 12  | IPOS <sup>PLUS</sup> ® reference travel   |
| d                 | 13  | Flying start                              |
| E                 | 14  | Calibrate encoder                         |
| F                 | Error number                                  | Fault indication (flashing)               |
| H                 | Status display                                | Manual mode                               |
| t                 | 16  | Inverter is waiting for data              |
| rev               | 17  | "STO" active                              |
| • (blinking dot)  | -   | IPOS <sup>PLUS</sup> ® program is running |
| Flashing display  | -   | STOP via DBG60B                           |
| ⌘                 | -   | RAM defective                             |

#### **⚠ WARNING**



Incorrect interpretation of display U = "STO" active.

Severe or fatal injuries.

- The display U = "STO" is not safety-related and must not be used as a safety function.

6.1.2 DC link voltage display of size 7

**INFORMATION**



The DC link voltage display goes out about 20 seconds after the power off.

6.1.3 DBG60B keypad

**Basic displays:**

0.00rpm  
0.000Amp  
CONTROLLER IN-  
HIBIT

Display when X13:1 (DIØØ "/controller inhibit") = "0".

0.00rpm  
0.000Amp  
NO ENABLE

Display when X13:1 (DIØØ "/controller inhibit") = "1" and in-  
verter is not enabled ("enable/stop" = "0").

950.00rpm  
0.990Amp  
ENABLE (VFC)

Display for enabled inverter.

INFORMATION 6:  
VALUE TOO HIGH

Information message

(DEL)=Quit  
ERROR 9  
STARTUP

Error info

## 6.2 Information messages

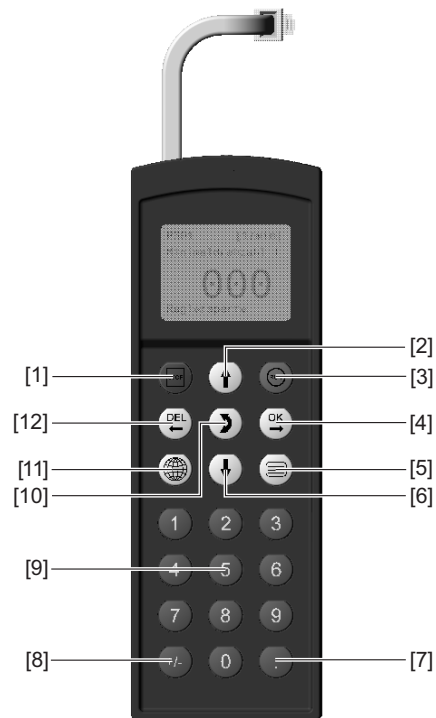
Information messages on the DBG60B (ca. 2 s in duration) or in MOVITOOLS® MotionStudio (message that can be acknowledged):

| No | Text DBG60B/<br>MotionStudio | Description   |
|----|------------------------------|---|
| 1  | ILLEGAL INDEX                | Index addressed via interface not available.  |
| 2  | NOT IMPLEMENT.               | <ul style="list-style-type: none"> <li>Attempt to execute a non-implemented function.</li> <li>An incorrect communication service has been selected.</li> <li>Manual operation selected via invalid interface (e.g. fieldbus).</li> </ul> |
| 3  | READ ONLY<br>VALUE           | Attempt to edit a read-only value.  |
| 4  | PARAM. INHIB-<br>ITED        | Parameter lock P 803 = "ON", parameter cannot be altered.   |
| 5  | SETUP ACTIVE                 | Attempt to alter parameters during active factory setting.  |
| 6  | VALUE TOO HIGH               | Attempt to enter a value that is too high.  |
| 7  | VALUE TOO LOW                | Attempt to enter a value that is too low.   |
| 8  | REQ. CARD MISS-<br>ING       | The option card required for the selected function is missing.  |
| 10 | ONLY VIA ST1                 | Manual mode must be completed using X13:ST11/ST12 (RS485).  |
| 11 | ONLY TERMINAL                | Manual operation must be exited via TERMINAL (DBG60B or USB11/UWS21B).  |
| 12 | NO ACCESS                    | Access to selected parameter denied.  |
| 13 | REG. INHIBIT<br>MISSING      | Set terminal DIØØ "/Controller inhibit" = "0" for the selected function.  |
| 14 | INVALID VALUE                | Attempt to enter an invalid value.  |
| 16 | PARAM. NOT<br>SAVED          | Overflow of EEPROM buffer, e.g. through cyclic write access. Parameter not stored in non-volatile EEPROM.   |
| 17 | INVERTER EN-<br>ABLED        | <ul style="list-style-type: none"> <li>Parameter to be changed can only be set in the state "CONTROLLER INHIBIT".</li> <li>You tried to change to manual mode during live operation.</li> </ul>   |



## 6.3 Functions of the DBG60B keypad

### 6.3.1 Key assignments for DBG60B





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- |      |     |       |  |
|------|-----|-------|--|
| [1]  | Key |       | Stop   |
| [2]  | Key |       | Up arrow, moves up to the next menu item     |
| [3]  | Key |       | Start  |
| [4]  | Key |       | OK, confirms the entry                       |
| [5]  | Key |       | Activate the context menu                    |
| [6]  | Key |       | Down arrow, moves down to the next menu item |
| [7]  | Key |       | Decimal point                                |
| [8]  | Key |       | Sign reversal                                |
| [9]  | Key | 0 – 9 | Digits 0 – 9                                 |
| [10] | Key |       | Change menu                                  |
| [11] | Key |       | Select language                              |
| [12] | Key |       | Delete previous entry                        |











### 6.3.2 Copy function of the DBG60B

The DBG60B keypad can be used for copying complete parameter sets from one MOVIDRIVE® device to other MOVIDRIVE® devices. Proceed as follows:

- In the context menu, select the menu item "COPY TO DBG". Confirm your selection using the  key.
- After the copying process has finished, plug the keypad in the other inverter.
- In the context menu, select the menu item "COPY TO MDX". Confirm your selection using the  key.

### 6.3.3 Parameter mode

Proceed as follows to set the parameters in parameter mode:

1. Press the  key to activate the context menu.
2. Press the  key to start PARAMETER MODE. The first display parameter P000 "SPEED" is displayed. Use the  or  key to select main parameter groups 0 to 9.
3. Use the  or  key to select the desired main parameter group. The flashing cursor is positioned under the number of the main parameter group.
4. Press the  key to activate the parameter subgroup selection in the required main parameter group. The flashing cursor moves one position to the right.
5. Use the  or  key to select the desired parameter subgroup. The flashing cursor is positioned under the number of the parameter subgroup.
6. Press the  key to activate the parameter selection in the required parameter subgroup. The flashing cursor moves one position to the right.

```
BASIC VIEW
PARAMETER
MODE
VARIABLE MODE
WAKE UP PARA-
METER
```















```
P 000 1/min
SPEED
0.0
CONTROLLER IN-
HIBIT
```

```
P 1.. SETPOINTS/
RAMP GENERAT-
ORS
CONTROLLER IN-
HIBIT
```

```
P 1.. SETPOINTS/
RAMP GENERAT-
ORS
CONTROLLER IN-
HIBIT
```




```
\ 13. SPEED
RAMPS 1
CONTROLLER IN-
HIBIT
```

```
\ 13. SPEED
RAMPS 1
CONTROLLER IN-
HIBIT
```

- |   |   |
|---|---|
| <p>7. Use the  or  key to select the desired parameter. The flashing cursor is positioned under the third digit of the parameter number.</p>  | <p>\ 132 s<br/>T11 UP CCW<br/>0.13<br/>CONTROLLER IN-HIBIT</p>                      |
| <p>8. Press the  key to activate the setting mode for the selected parameter. The cursor is positioned under the parameter value.</p>  | <p>\ 132 s<br/>T11 UP CCW<br/>0.13_<br/>CONTROLLER IN-HIBIT</p>                     |
| <p>9. Use the  or  key to set the required parameter value.</p>   | <p>\ 132 s<br/>T11 UP CCW<br/>0.20_<br/>CONTROLLER IN-HIBIT</p>                     |
| <p>10. Press the  key to confirm the setting. To exit the setting mode, press the  key. The flashing cursor is positioned under the third digit of the parameter number again.</p>  | <p>\ 132 s<br/>T11 UP CCW<br/>0.20<br/>CONTROLLER IN-HIBIT</p>                      |
| <p>11. Use the  or  key to select another parameter, or press the  key to switch to the menu of the parameter subgroups.</p>           | <p>\ 13. SPEED<br/>RAMPS 1<br/>CONTROLLER IN-HIBIT</p>                              |
| <p>12. Use the  or  key to select another parameter subgroup or press the  key to switch to the menu of the main parameter groups.</p> | <p>P 1.. SETPOINTS/<br/>RAMP GENERATORS<br/>CONTROLLER IN-HIBIT</p>                 |
| <p>13. Use the  key to return to the context menu.</p>   | <p>BASIC VIEW<br/><b>PARAMETER MODE</b><br/>VARIABLE MODE<br/>WAKE UP PARAMETER</p> |


### 6.3.4 Variable mode

H... variables are displayed in the variable mode. To call up the variable mode, proceed as follows:

- Press the  key to call up the context menu. Select the "VARIABLE MODE" menu item and confirm with the  key. The variable mode display appears.
- Use the  key to edit the variables.





### 6.3.5 User menu

The DBG60B keypad has a standard user menu containing the parameters that are used most often. The parameters in the user menu are displayed with a "\" before the parameter number (→ chapter "Complete parameter list"). You can add or delete parameters. You can save a maximum of 50 parameter entries. The parameters are displayed in the order in which they are stored in the inverter. The parameters are not sorted automatically.

- Press the  key to call up the context menu. Select the menu item "USER MENU" and press the OK key to confirm. The user menu with the most frequently used parameters appears.





#### Adding parameters to the user menu

Proceed in this order to add parameters to the user menu:

- Press the  key to call up the context menu. Select the "PARAMETER MODE" menu item.
- Select desired parameter and press the  key to confirm.
- Use the  key to return to the context menu. In the context menu, select the menu item "ADD Pxxx". "xxx" is the parameter you selected previously. Confirm your selection using the  key. The selected parameter is stored in the user menu.

#### Deleting parameters from the user menu

Proceed in this order to delete parameters from the user menu:


- Press the  key to call up the context menu. Select the menu item "USER MENU".
- Select the parameter that is to be deleted. Confirm your selection using the  key.
- Use the  key to return to the context menu. In the context menu, select the "DELETE Pxxx" menu item. "xxx" is the parameter you selected previously. Confirm your selection using the  key. The selected parameter is deleted from the user menu.

### 6.3.6 Wake-up parameter

The wake up parameter is the parameter that is displayed when the DBG60B is switched on. The factory setting for the wake up parameter is the basic display. You can select which parameter should be the wake up parameter. The following options can be used as the wake up parameter:

- Parameter (→ parameter mode)
- Parameter from the user menu (→ user menu)
- H variable (→ variable mode)
- Basic display

Proceed as follows to save a wake-up parameter:

- First select the required parameter in parameter mode.
- In the context menu, select the "XXXX WAKE-UP PARAM." menu item. "XXXX" is the selected wake-up parameter. Confirm your selection using the  key.

### 6.3.7 IPOS<sup>PLUS</sup>®

MOVITOOLS<sup>®</sup> MotionStudio is required for programming IPOS<sup>PLUS</sup>®. You can only use the DBG60B keypad to edit or change IPOS<sup>PLUS</sup>® variables (H\_\_).

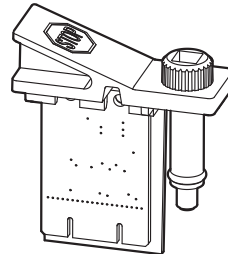
The IPOS<sup>PLUS</sup>® program is also stored in the DBG60B keypad when it is saved and is consequently also transferred when the parameter set is copied to another MOVIDRIVE<sup>®</sup> unit.

Parameter P931 can be used to start and stop the IPOS<sup>PLUS</sup>® program from the DBG60B keypad.

## 6.4 Memory card

The pluggable memory card is installed in the basic unit. The basic data is stored on the memory card and is always up-to-date. If a unit has to be replaced, the system/machine can be operated again quickly without a PC and data backup simply by replugging the memory card. You can install as many option cards as required.

The following figure shows the MDX60B/61B memory card.



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Part number: 08248834

### 6.4.1 Notes for replacing the memory card

- Only plug or remove in the memory card when the MOVIDRIVE® B is switched off.
- You can install the memory card from the original unit in a new inverter. The following combinations are permitted:

| Original device MOVIDRIVE®<br>MDX60B/61B... | New inverter MOVIDRIVE®<br>MDX60B/61B... |
|---|--|
| 00  | 00 or 0T                                 |
| 0T  | 0T                                       |

- The same options that were available in the original unit must be installed in the new inverter.

If this is not the case, the error message "79 HW configuration" (hardware configuration) is displayed. You can remedy the error by calling up the "DELIVERY CONDITION" menu item from the context menu (P802 factory setting). This resets the unit to its initial delivery state. You must then restart the unit.

- The counter status of the DRS11B option and the data of the DH..1B and DC-S21B/22B/31B/32B options are not stored on the memory card. When you replace the memory card, you have to install the DRS11B, DH..1B and DC-S21B/22B/31B/32B option cards from the original unit in the new inverter.

If the original unit was a MOVIDRIVE® B size 0 unit with the option DHP11, you have to use a new DHP11B option card with the configuration data set (file name.sewcopy) that you saved previously.

- If an absolute encoder is used as a motor or distance encoder, you must reference the encoder after you have replaced the unit.
- When replacing an absolute encoder, you have to reference it again.

## 7 Service

### 7.1 Damages to the device

If necessary, all components of the device are replaced. Only SEW-EURODRIVE is authorized to perform repairs.

### 7.2 Fault information

#### 7.2.1 Fault memory

The fault memory (P080) stores the last 5 fault messages (faults t-0 – t-4). The oldest fault message is deleted whenever more than 5 fault messages have occurred. The following information is stored when a fault occurs:

Fault that has occurred · Status of digital inputs/outputs · Operating state of the inverter · Inverter status · Heat sink temperature · Speed · Output current · Active current · Unit utilization · DC link voltage · ON hours · Enable hours · Parameter set · Motor utilization.

#### 7.2.2 Switch-off responses

There are 3 switch-off responses depending on the fault; the inverter remains blocked during a failure:

##### Immediate disconnection

The unit can no longer brake the drive; the output stage goes to high resistance in the event of a fault and the brake is applied immediately (DBØØ "/Brake" = "0").

##### Rapid stop

The drive is braked with the stop ramp t13/t23. Once the stop speed is reached, the brake is applied (DBØØ "/Brake" = "0"). The output stage goes to high resistance after the brake application time has elapsed (P732 / P735).

##### Emergency stop

The drive is braked with the emergency stop ramp t14/t24. Once the stop speed is reached, the brake is applied (DBØØ "/Brake" = "0"). The output stage goes to high resistance after the brake application time has elapsed (P732 / P735).

### 7.2.3 Reset

A fault message can be acknowledged as follows:

- Switch the supply system off and on again
  - Observe a minimum switch-off time of 10 s for the line contactor K11
- Reset via input terminals, i.e. via an appropriately assigned digital input (DIØ1 – DIØ7 with the basic device, DI1Ø – DI17 with the DIO11B option)
- Manual reset in MOVITools® MotionStudio (P840 = "YES").
- Manual reset using the DBG60B.
- Auto reset performs up to 5 device resets with an adjustable restart time.



#### **▲ WARNING**

Risk of crushing if the motor starts up automatically after an auto reset.

Severe or fatal injuries.

- Do not use auto reset with drives where an automatic restart represents a danger to people or units.
- Perform a manual reset.

### 7.2.4 Inverter is waiting for data

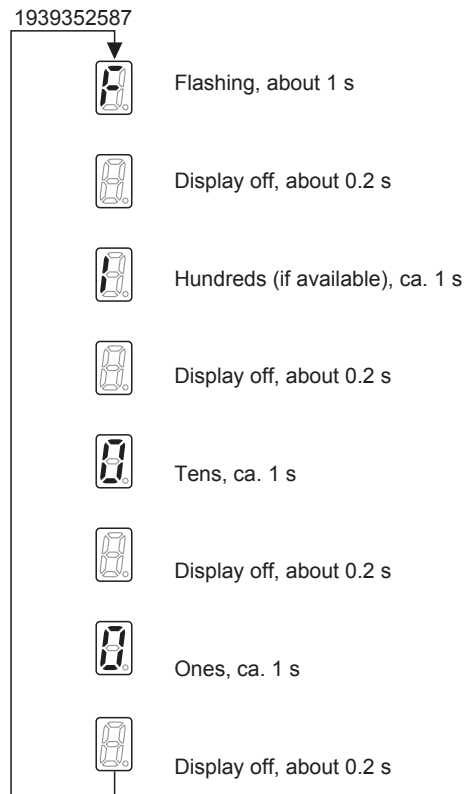
If the inverter is controlled via a communication interface (fieldbus, RS485 or SBus) and the power was switched off and back on again or a fault reset was performed, then the enable remains ineffective until the inverter receives valid data again via the interface, which is monitored with a timeout.



### 7.3 Fault messages and list of faults

#### 7.3.1 Fault message via 7-segment display

The fault code is shown in a 7-segment display. The following display sequence is used (e.g. fault code 100):



Following a reset or if the fault code resumes the value "0", the display switches to the operating display.

#### 7.3.2 Subfault code display

The subfault code is displayed in MOVITOOLS® MotionStudio or in the DBG60B keypad.

### 7.3.3 Fault list

The factory set fault response is listed in the "Response P" column. (P) indicates that the response is programmable (via *P83\_fault response* or with IPOS<sup>PLUS</sup>). In the event of fault 108, (P) indicates that the response can be programmed via *P555 DCS fault response*. In the event of fault 109, (P) indicates that the response can be programmed via *P556 DCS alarm response*.

| Fault |                      | Response (P)   | Subfault |  | Possible cause  | Measure  |                |   |  |   |   |
|-------|----------------------|----------------|----------|--|---|--|----------------|---|--|---|---|
| Code  | Designation          |                | Code     | Designation  |   |  |                |   |  |   |   |
| 00    | No fault             |                |          |  |   |  |                |   |  |   |   |
| 01    | Overcurrent          | Immediate stop | 0        | Output stage   | <ul style="list-style-type: none"> <li>Short circuit at output</li> <li>Motor too large</li> <li>Defective output stage</li> <li>Current supply for current transformer</li> <li>Ramp limit is deactivated and set ramp time is too short</li> <li>Defective phase module</li> <li>Supply voltage 24 V or 24 V generated from it is instable</li> <li>Interruption or short circuit on the signal lines from the phase modules</li> </ul> | <ul style="list-style-type: none"> <li>Rectify the short circuit</li> <li>Connect a smaller motor</li> <li>Contact the SEW Service if the output stage is defective</li> <li>Activate P 138 and/or increase ramp time</li> </ul> |                |   |  |   |   |
|       |                      |                | 1        | V <sub>CE</sub> monitoring or under-voltage monitoring of the gate driver  |   |  |                |   |  |   |   |
|       |                      |                | 5        | Inverter remains in hardware current limit   |   |  |                |   |  |   |   |
|       |                      |                | 6        | V <sub>CE</sub> monitoring or under-voltage monitoring of the gate driver or overcurrent of the current transformer. ..Phase U |   |  |                |   |  |   |   |
|       |                      |                | 7        | ..Phase V  |   |  |                |   |  |   |   |
|       |                      |                | 8        | ..Phase W  |   |  |                |   |  |   |   |
|       |                      |                | 9        | ..Phases U and V   |   |  |                |   |  |   |   |
|       |                      |                | 10       | ..Phases U and W   |   |  |                |   |  |   |   |
|       |                      |                | 11       | ..Phases V and W   |   |  |                |   |  |   |   |
|       |                      |                | 12       | ..Phases U and V and W   |   |  |                |   |  |   |   |
|       |                      |                | 13       | Voltage supply of current transformer in line operation  |   |  |                |   |  |   |   |
|       |                      |                | 14       | MFE signal lines   |   |  |                |   |  |   |   |
|       |                      |                | 03       | Ground fault   |   |  | Immediate stop | 0 | Ground fault                             | Ground fault <ul style="list-style-type: none"> <li>in the motor lead</li> <li>in the inverter</li> <li>in the motor</li> </ul>   | <ul style="list-style-type: none"> <li>Eliminate ground fault</li> <li>Consult SEW Service</li> </ul>   |
|       |                      |                | 04       | Brake chopper  |   |  | Immediate stop | 0 | DC link voltage too high in 4Q operation | <ul style="list-style-type: none"> <li>Too much regenerative power</li> <li>Braking resistor circuit interrupted</li> <li>Short circuit in the braking resistor circuit</li> <li>Braking resistance too high</li> <li>Brake chopper is defective</li> </ul> | <ul style="list-style-type: none"> <li>Extend deceleration ramps</li> <li>Check supply cable to braking resistor</li> <li>Check technical data of braking resistor</li> <li>Install a new MOVDRIVE<sup>®</sup> if the brake chopper is defective</li> </ul> |
| 1     |                      |                |          |  |   |  |                |   |  |   |   |
| 06    | Line phase failure   | Immediate stop | 0        | Voltage for adapting DC link is periodically too low   | <ul style="list-style-type: none"> <li>Phase failure</li> <li>Inadequate line voltage quality</li> </ul>  | <ul style="list-style-type: none"> <li>Check the supply system cable</li> <li>Check configuration of the supply system</li> <li>Check supply (fuses, contactor)</li> </ul>   |                |   |  |   |   |
|       |                      |                | 3        | Line voltage failure   |   |  |                |   |  |   |   |
|       |                      |                | 4        | Line frequency fault   |   |  |                |   |  |   |   |
| 07    | DC link over-voltage | Immediate stop | 0        | DC link voltage too high in 2Q operation   | DC link voltage too high  | <ul style="list-style-type: none"> <li>Extend deceleration ramps</li> <li>Check supply cable to the braking resistor</li> <li>Check technical data of braking resistor</li> </ul>  |                |   |  |   |   |
|       |                      |                | 1        |  |   |  |                |   |  |   |   |
|       |                      |                | 2        | DC link voltage too high in 4Q operation ..Phase U   |   |  |                |   |  |   |   |
|       |                      |                | 3        | ..Phase V  |   |  |                |   |  |   |   |
|       |                      |                | 4        | ..Phase W  |   |  |                |   |  |   |   |

| Fault |                       |                    | Subfault |  | Possible cause   | Measure  |
|-------|-----------------------|--------------------|----------|--|--|--|
| Code  | Designation           | Response (P)       | Code     | Designation  |  |  |
| 08    | Speed monitoring      | Immediate stop (P) | 0        | Inverter in current limiting or in slip limit  | <ul style="list-style-type: none"> <li>Speed controller or current controller (in VFC operating mode without encoder) operating at setting limit due to mechanical overload or phase failure in the power supply or motor</li> <li>Encoder not connected correctly or incorrect direction of rotation</li> <li><math>n_{max}</math> is exceeded during torque control</li> <li>In operating mode VFC: Output frequency <math>\geq 150</math> Hz</li> <li>In operating mode V/f: Output frequency <math>\geq 599</math> Hz</li> </ul> | <ul style="list-style-type: none"> <li>Reduce load</li> <li>Increase deceleration time setting (P501 or P503)</li> <li>Check encoder connection, swap A/A and B/B pairs if necessary</li> <li>Check encoder voltage supply</li> <li>Check current limiting</li> <li>Extend ramps if necessary</li> <li>Check motor cable and motor</li> <li>Check line phases</li> </ul> |
|       |                       |                    | 3        | System limit "actual speed" exceeded. Speed difference between ramp setpoint and actual value for $2 \times$ ramp time higher than expected slip |  |  |
|       |                       |                    | 4        | Maximum rotating field speed exceeded<br>Maximum rotating field frequency (with VFC max 150 Hz and V/f max 599 Hz) exceeded                      |  |  |
| 09    | Startup               | Immediate stop     | 0        | Startup missing  | The inverter has not been taken into operation for the selected operating mode   | Perform startup for the required operating mode  |
|       |                       |                    | 1        | Wrong operating mode selected  |  |  |
|       |                       |                    | 2        | Wrong encoder type or defective encoder card   |  |  |
| 10    | IPOS-ILLOP            | Emergency stop     | 0        | Invalid IPOS <sup>PLUS</sup> ® command   | <ul style="list-style-type: none"> <li>Incorrect command detected during execution of the IPOS<sup>PLUS</sup>® program</li> <li>Incorrect conditions during command execution</li> </ul>   | <ul style="list-style-type: none"> <li>Check the content of the program memory and, if necessary, correct</li> <li>Load the correct program into the program memory</li> <li>Check program sequence (→ IPOS<sup>PLUS</sup>® manual)</li> </ul>   |
| 11    | Overtemperature       | Emergency stop (P) | 0        | Heat sink temperature too high or temperature sensor defective   | <ul style="list-style-type: none"> <li>Thermal overload of inverter</li> <li>Temperature sensor of a phase module faulty (size 7)</li> </ul>   | <ul style="list-style-type: none"> <li>Reduce load and/or ensure adequate cooling</li> <li>Check fan</li> <li>If F-11 is issued even though the temperatures is obviously not too high, this indicates a faulty temperature sensor of the phase module. Replace the phase module (size 7)</li> </ul>   |
|       |                       |                    | 3        | Overtemperature switched-mode power supply   |  |  |
|       |                       |                    | 6        | Heat sink temperature too high or temperature sensor defective..<br>..Phase U (size 7)   |  |  |
|       |                       |                    | 7        | ..Phase V (size 7)   |  |  |
|       |                       |                    | 8        | ..Phase W (size 7)   |  |  |
| 13    | Control signal source | Immediate stop     | 0        | Control signal source not available, e.g. control signal source fieldbus without fieldbus interface  | Control signal source not defined or defined incorrectly   | Set correct control signal source (P101)   |

| Fault |                   |                    | Subfault                            |   | Possible cause  | Measure   |   |  |
|-------|-------------------|--------------------|-------------------------------------|---|---|---|---|--|
| Code  | Designation       | Response (P)       | Code                                | Designation   |   |   |   |  |
| 14    | Encoder           | Immediate stop     | 0                                   | Encoder not connected, defective encoder, defective encoder cable               | <ul style="list-style-type: none"> <li>Encoder cable or shield not connected correctly.</li> <li>Short circuit / broken wire in encoder cable</li> <li>Encoder is defective.</li> <li>When 2 inverters are connected via X14 and P505 is set to YES F14 SubC 27.</li> </ul> | <ul style="list-style-type: none"> <li>Check encoder cable and shield for correct connection, short circuit and broken wire</li> </ul>  |   |  |
|       |                   |                    | 25                                  | Encoder fault X15 – Speed range exceeded Encoder exceeds 6542 min <sup>-1</sup> |   |   |   |  |
|       |                   |                    | 26                                  | Encoder fault X15 – Card is defective Fault in the quadrant evaluation.         |   |   |   |  |
|       |                   |                    | 27                                  | Encoder fault – encoder connection or encoder is defective                      |   |   |   |  |
|       |                   |                    | 28                                  | Encoder fault X15 – Communication fault RS485 channel                           |   |   |   |  |
|       |                   |                    | 29                                  | Encoder fault X14 – Communication fault RS485 channel                           |   |   | <ul style="list-style-type: none"> <li>Encoder cable or shield not connected correctly.</li> <li>Short circuit / broken wire in encoder cable</li> <li>Encoder is defective.</li> <li>When 2 inverters are connected via X14 and P505 is set to YES F14 SubC 27.</li> </ul> | <ul style="list-style-type: none"> <li>Check encoder cable and shield for correct connection, short circuit and broken wire</li> </ul> |
|       |                   |                    | 30                                  | Unknown encoder type at X14/X15   |   |   |   |  |
|       |                   |                    | 31                                  | Plausibility monitoring fault Hiperface® X14/X15 Increments have been lost      |   |   |   |  |
|       |                   |                    | 32                                  | Encoder fault X15 Hiperface® Hiperface® encoder at X15 signals a fault          |   |   |   |  |
|       |                   |                    | 33                                  | Encoder fault X14 Hiperface® Hiperface® encoder at X14 signals a fault          |   |   |   |  |
|       |                   |                    | 34                                  | Encoder fault X15 resolver – Encoder connection or encoder is faulty            |   |   |   |  |
| 17    | System fault      | Immediate stop     | 0                                   | "Stack overflow" fault  | Inverter electronics disrupted, possibly due to EMC influences  | <ul style="list-style-type: none"> <li>Check grounding and shielding and improve, if necessary</li> <li>Consult SEW Service if the fault occurs again.</li> </ul>                               |   |  |
| 18    |                   |                    | "Stack underflow" fault             |   |   |   |   |  |
| 19    |                   |                    | "External NMI" fault                |   |   |   |   |  |
| 20    |                   |                    | "Undefined opcode" fault            |   |   |   |   |  |
| 21    |                   |                    | "Protection fault"                  |   |   |   |   |  |
| 22    |                   |                    | "Illegal word operand access" fault |   |   |   |   |  |
| 23    |                   |                    | "Illegal instruction access" fault  |   |   |   |   |  |
| 24    |                   |                    | "Illegal external bus access" fault |   |   |   |   |  |
| 25    | EEPROM            | for rapid stop     | 0                                   | Read or write fault on EEPROM power section                                     | Access to the EEPROM of the memory card has failed  | <ul style="list-style-type: none"> <li>Restore factory settings, perform reset and reset parameters.</li> <li>Consult SEW service if the fault reoccurs</li> <li>Replace memory card</li> </ul> |   |  |
|       |                   |                    | 11                                  | NV memory read fault NV-RAM inside the unit                                     |   |   |   |  |
|       |                   |                    | 13                                  | NV memory chip card memory module defective                                     |   |   |   |  |
|       |                   |                    | 14                                  | NV memory chip card memory card defective                                       |   |   |   |  |
|       |                   |                    | 16                                  | NV memory initialization fault  |   |   |   |  |
| 26    | External terminal | Emergency stop (P) | 0                                   | External terminal   | Read external fault signal via programmable input   | Eliminate respective cause; reprogram terminal if necessary   |   |  |

| Fault |                        |                 | Subfault |   | Possible cause   | Measure   |
|-------|------------------------|-----------------|----------|---|--|---|
| Code  | Designation            | Response (P)    | Code     | Designation   |  |   |
| 27    | No limit switches      | Emergency stop  | 0        | Limit switches missing or wire break  | <ul style="list-style-type: none"> <li>Wire break/both limit switches missing</li> <li>Limit switches are swapped over in relation to direction of rotation of motor</li> </ul>  | <ul style="list-style-type: none"> <li>Check wiring of limit switches</li> <li>Replace limit switch connections</li> <li>Reprogram terminals</li> </ul>   |
|       |                        |                 | 2        | Limit switches reversed   |  |   |
|       |                        |                 | 3        | Both limit switches are active simultaneously   |  |   |
| 28    | Fieldbus timeout       | Rapid stop (P)  | 0        | "Fieldbus timeout" fault  | No communication between master and slave within the configured response monitoring  | <ul style="list-style-type: none"> <li>Check communications routine of the master</li> <li>Extend fieldbus timeout time (P819)/deactivate monitoring</li> </ul>   |
|       |                        |                 | 2        | Fieldbus interface does not boot  |  |   |
| 29    | Limit switch hit       | Emergency stop  | 0        | Hardware limit switch hit   | A limit switch was hit in IPOS <sup>PLUS</sup> operating mode  | <ul style="list-style-type: none"> <li>Check travel range</li> <li>Correct operator program</li> </ul>  |
| 30    | Emergency stop timeout | Immediate stop  | 0        | Timeout stop emergency stop ramp  | <ul style="list-style-type: none"> <li>Drive overloaded</li> <li>Emergency stop ramp too short</li> </ul>  | <ul style="list-style-type: none"> <li>Project planning check</li> <li>Extend emergency stop ramp</li> </ul>  |
| 31    | TF/TH trigger          | No response (P) | 0        | Thermal motor protection fault  | <ul style="list-style-type: none"> <li>Motor too hot, TF/TH has triggered</li> <li>TF/TH of the motor not connected or connected incorrectly</li> <li>Connection between MOVIDRIVE<sup>®</sup> and TF/TH on motor interrupted</li> </ul>   | <ul style="list-style-type: none"> <li>The motor <b>must</b> cool off, then reset the fault</li> <li>Check connections/link between MOVIDRIVE<sup>®</sup> and TF/TH</li> <li>If no TF/TH is connected: Jumper X10:1 with X10:2</li> <li>Set P835 to "No response".</li> </ul>   |
| 32    | IPOS index overflow    | Emergency stop  | 0        | IPOS program defective  | Programming principles violated leading to system-internal stack overflow  | Check and correct the IPOS <sup>PLUS</sup> user program (→ IPOS <sup>PLUS</sup> manual)   |
| 33    | Setpoint source        | Immediate stop  | 0        | "Setpoint source not available"<br>For example, fieldbus control signal source without fieldbus interface | Setpoint source not defined or defined incorrectly   | Set correct setpoint source (P100)  |
| 34    | Ramp timeout           | Immediate stop  | 0        | Time violation rapid stop ramp  | Downward ramps timeout, e.g. due to overload   | <ul style="list-style-type: none"> <li>Extend the downwards ramps</li> <li>Eliminate overload</li> </ul>  |
| 35    | Operating mode         | Immediate stop  | 0        | Operating mode not available  | <ul style="list-style-type: none"> <li>Operating mode not defined or defined incorrectly</li> <li>P916 was used to set a ramp type that requires a MOVIDRIVE<sup>®</sup> device in technology version</li> <li>P916 was used to set a ramp type that does not match the selected technology function</li> <li>P916 was used to set a ramp type that does not match the selected synchronization time (P888)</li> </ul> | <ul style="list-style-type: none"> <li>Use P700 or P701 to set correct operating mode.</li> <li>Use MOVIDRIVE<sup>®</sup> in technology version (..OT)</li> <li>From the "Startup → Select technology function..." menu, select the technology function that matches P916</li> <li>Check the settings of P916 and P888</li> </ul> |
|       |                        |                 | 1        | Wrong assignment operating mode - hardware  |  |   |
|       |                        |                 | 2        | Wrong assignment operating mode - technology function   |  |   |
| 36    | Option missing         | Immediate stop  | 0        | Hardware is missing or not permitted  | <ul style="list-style-type: none"> <li>Type of option card not allowed</li> <li>Setpoint source, control signal source or operating mode not permitted for this option card</li> <li>Incorrect encoder type set for DIP11B</li> </ul>  | <ul style="list-style-type: none"> <li>Use correct option card</li> <li>Set correct setpoint source (P100)</li> <li>Set correct control signal source (P101)</li> <li>Set correct operating mode (P700 or P701)</li> <li>Set the correct encoder type</li> </ul>  |
| 37    | System watchdog        | Immediate stop  | 0        | "System watchdog overflow" fault  | Fault while executing system software  | Consult SEW Service   |
| 38    | System software        | Immediate stop  | 0        | "System software" fault   | System fault   | Consult SEW Service   |

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| Fault |                      |                    | Subfault |   | Possible cause   | Measure  |
|-------|----------------------|--------------------|----------|---|--|--|
| Code  | Designation          | Response (P)       | Code     | Designation                                 |  |  |
| 39    | Reference travel     | Immediate stop (P) | 0        | "Reference travel" fault                    | <ul style="list-style-type: none"> <li>The reference cam is missing or does not switch</li> <li>Limit switches are connected incorrectly</li> <li>Reference travel type was changed during reference travel</li> </ul>   | <ul style="list-style-type: none"> <li>Check reference cam</li> <li>Check limit switch connection</li> <li>Check reference travel type setting and required parameters.</li> </ul>   |
| 40    | Boot synchronization | Immediate stop     | 0        | Timeout at boot synchronization with option | <ul style="list-style-type: none"> <li>Fault during boot synchronization between inverter and option</li> <li>Synchronization ID not/incorrectly transmitted</li> </ul>  | Install a new option card if this fault reoccurs   |
| 41    | Watchdog option      | Immediate stop     | 0        | Fault – Watchdog timer from/to option       | <ul style="list-style-type: none"> <li>Fault in communication between system software and option software</li> <li>Watchdog in the IPOS<sup>PLUS</sup>® program</li> </ul>   | <ul style="list-style-type: none"> <li>Consult SEW Service</li> </ul>  |
|       |                      |                    | 17       | Watchdog IPOS fault                         | <ul style="list-style-type: none"> <li>An application module has been loaded in a MOVIDRIVE® B unit without technology version</li> <li>The wrong technology function has been set if an application module is used</li> </ul>   | <ul style="list-style-type: none"> <li>Check IPOS program</li> <li>Check whether the unit has been activated for the application version (P079)</li> <li>Check the selected technology function (P078)</li> </ul>  |
| 42    | Lag fault            | Immediate stop (P) | 0        | Positioning lag fault                       | <ul style="list-style-type: none"> <li>Rotary encoder connected incorrectly</li> <li>Acceleration ramps too short</li> <li>P component of positioning controller too small</li> <li>Incorrect speed controller parameters</li> <li>Value of lag fault tolerance too small</li> </ul> | <ul style="list-style-type: none"> <li>Check rotary encoder connection</li> <li>Extend ramps</li> <li>Set P component to higher value</li> <li>Reset speed controller parameters</li> <li>Increase lag fault tolerance</li> <li>Check wiring of encoder, motor and line phase.</li> <li>Check whether mechanical system components can move freely or if they are blocked</li> </ul> |
| 43    | RS485 timeout        | Rapid stop (P)     | 0        | Communication timeout at RS485 interface    | Fault during communication via interface RS485   | Check RS485 connection (e.g. inverter – PC, inverter – DBG60B). Contact SEW Service for advice if necessary  |
| 43    | RS485 timeout        | Rapid stop (P)     | 3        | Manual mode timeout                         | Communication to source that controls manual operation interrupted. (Independent of the used user interface)   | Check connection to control signal source  |
| 44    | Device utilization   | Immediate stop     | 0        | Unit utilization fault                      | <ul style="list-style-type: none"> <li>Device utilization (<math>I \times t</math> value) &gt; 125%</li> </ul>   | <ul style="list-style-type: none"> <li>Decrease power output</li> <li>Extend ramps</li> <li>If suggested actions not possible, use larger inverter</li> <li>Reduce load</li> </ul>   |
|       |                      |                    | 8        | UL monitoring fault                         |  |  |

| Fault Code | Designation           | Response (P)   | Subfault |  | Possible cause   | Measure   |  |  |
|------------|-----------------------|----------------|----------|--|--|---|--|--|
|            |                       |                | Code     | Designation  |  |   |  |  |
| 45         | Initialization        | Immediate stop | 0        | General fault during initialization  | <ul style="list-style-type: none"> <li>No parameters set for EEPROM in power section set incorrectly</li> <li>Option card not in contact with backplane bus</li> </ul>                                       | <ul style="list-style-type: none"> <li>Restore the factory settings. Contact the SEW Service for advice if the fault still cannot be reset</li> <li>Insert the option card correctly</li> </ul>     |  |  |
|            |                       |                | 3        | Data bus fault during RAM check  |  |   |  |  |
|            |                       |                | 6        | CPU clock fault  |  |   |  |  |
|            |                       |                | 7        | Fault in the current detection   |  |   |  |  |
|            |                       |                | 10       | Fault when setting flash protection  |  |   |  |  |
|            |                       |                | 11       | Data bus fault during RAM check  |  |   |  |  |
|            |                       |                | 12       | Parameter setting fault synchronous operation (internal synchronous operation) |  |   |  |  |
| 46         | System bus 2 timeout  | Rapid stop (P) | 0        | Timeout system bus CAN2  | Fault during communication via system bus 2  | Check system bus connection   |  |  |
| 47         | System bus 1 timeout  | Rapid stop (P) | 0        | Timeout system bus CAN1  | Fault during communication via system bus 1  | Check system bus connection   |  |  |
| 48         | Hardware DRS          | Immediate stop | 0        | Hardware synchronous operation   | Only with DRS11B: <ul style="list-style-type: none"> <li>Encoder signal from master/distance encoder faulty</li> <li>Hardware required for synchronous operation is faulty</li> </ul>                        | <ul style="list-style-type: none"> <li>Check encoder signals of master/distance encoder</li> <li>Check encoder wiring</li> <li>Install a new synchronous operation card</li> </ul>                  |  |  |
| 57         | "TTL encoder"         | Immediate stop | 512      | X15: Fault in amplitude control  | <ul style="list-style-type: none"> <li>Encoder cable or shield not connected correctly</li> <li>Short circuit / broken wire in encoder cable</li> <li>Encoder defective</li> <li>EMC interference</li> </ul> | <ul style="list-style-type: none"> <li>Check encoder cable and shield for correct connection, short circuit and broken wire</li> <li>Replace encoder</li> <li>Providing for EMC measures</li> </ul> |  |  |
|            |                       |                | 16896    | X14: Fault in amplitude control  |  |   |  |  |
|            |                       |                | 514      | X15: Incorrectly set numerator/denominator values                              |  |   | Incorrect numerator/denominator values | Correct the numerator/denominator values |
|            |                       |                | 16898    | X14: Incorrectly set numerator/denominator values                              |  |   |  |  |
| 58         | "Sine-cosine encoder" | Immediate stop | 512      | X15: Fault in amplitude control  | <ul style="list-style-type: none"> <li>Encoder cable or shield not connected correctly</li> <li>Short circuit / broken wire in encoder cable</li> <li>Encoder defective</li> <li>EMC interference</li> </ul> | <ul style="list-style-type: none"> <li>Check encoder cable and shield for correct connection, short circuit and broken wire</li> <li>Replace encoder</li> <li>Providing for EMC measures</li> </ul> |  |  |
|            |                       |                | 514      | X15: Track signal fault  |  |   |  |  |
|            |                       |                | 16896    | X14: Fault in amplitude control  |  |   |  |  |
|            |                       |                | 16897    | X14: Initialization  |  |   |  |  |
|            |                       |                | 16898    | X14: Track signal fault  |  |   |  |  |
|            |                       |                | 513      | X15: Initialization  | Encoder defective  | Replace encoder   |  |  |
|            |                       |                | 515      | C15: Incorrectly set numerator/denominator values                              | Incorrect numerator/denominator values   | Correct the numerator/denominator values  |  |  |
|            |                       |                | 16899    | X14: Incorrectly set numerator/denominator values                              |  |   |  |  |

| Fault |                         |                 | Subfault      |   | Possible cause   | Measure   |   |                              |
|-------|-------------------------|-----------------|---------------|---|--|---|---|------------------------------|
| Code  | Designation             | Response (P)    | Code          | Designation   |  |   |   |                              |
| 59    | "Encoder communication" | for rapid stop  | 1             | X15: Track signal fault   | <ul style="list-style-type: none"> <li>Encoder cable or shield not connected correctly</li> <li>Short circuit / broken wire in encoder cable</li> <li>Encoder defective</li> <li>EMC interference</li> </ul>   | <ul style="list-style-type: none"> <li>Check encoder cable and shield for correct connection and broken wire</li> <li>Replace encoder</li> <li>Providing for EMC measures</li> </ul>  |   |                              |
|       |                         |                 | 16            | Data line fault   |  |   |   |                              |
|       |                         |                 | 64 – 576      | X15: RS485 communication  |  |   |   |                              |
|       |                         |                 | 1088 – 1388   | X15: EnDat communication  |  |   |   |                              |
|       |                         |                 | 16385         | X14: Track signal fault   |  |   |   |                              |
|       |                         |                 | 16400         | X14: Data line fault  |  |   |   |                              |
|       |                         |                 | 16448 – 16832 | X14: RS485 communication  |  |   |   |                              |
|       |                         |                 | 17472 – 17772 | X14: EnDat communication  |  |   |   |                              |
|       |                         |                 | 2             | X15: Incorrect calibration of encoder                           |  |   | Incorrect encoder calibration or mechanical offset to motor | Delivery state + new startup |
|       |                         |                 | 16386         | X15: Incorrect calibration of encoder                           |  |   |   |                              |
|       |                         |                 | 1024          | X15: Clocking and/or data line not connected                    | Clocking and/or data line not connected  | Connect clocking and/or data line   |   |                              |
|       |                         |                 | 17408         | X14: Clocking and/or data line not connected                    |  |   |   |                              |
| 77    | IPOS control word       | No response (P) | 0             | Invalid control word IPOS                                       | <p>Only in IPOS<sup>PLUS</sup> mode:</p> <ul style="list-style-type: none"> <li>Attempt was made to set an invalid automatic mode (via external control)</li> <li>P916 = BUS RAMP is set</li> </ul>  | <ul style="list-style-type: none"> <li>Check serial connection to external controller</li> <li>Check write values of external controller</li> <li>Set correct value for P916</li> </ul>   |   |                              |
| 78    | IPOS SW limit switch    | No response (P) | 0             | Software limit switch hit                                       | <p>Only in IPOS<sup>PLUS</sup> mode:</p> <p>Programmed target position is outside travel range delimited by software limit switches</p>  | <ul style="list-style-type: none"> <li>Check user program</li> <li>Check position of the software limit switches</li> </ul>   |   |                              |
| 79    | Hardware configuration  | Immediate stop  | 0             | Deviating hardware configuration when replacing the memory card | <p>The following values no longer match after memory card replacement:</p> <ul style="list-style-type: none"> <li>Power</li> <li>Nominal voltage</li> <li>Variant ID</li> <li>Device family</li> <li>Design as Technology/ Standard unit</li> <li>Option cards</li> </ul>  | Ensure identical hardware or restore delivery state (parameter = factory setting)   |   |                              |
| 80    | RAM test                | Immediate stop  | 0             | "RAM test" fault  | Internal device fault, RAM defective.  | Consult SEW Service   |   |                              |
| 81    | Start condition         | Immediate stop  | 0             | Start condition fault with VFC hoist                            | <p>Only in "VFC hoist" mode:</p> <p>The motor could not be supplied with the correct amount of current during the pre-magnetizing time:</p> <ul style="list-style-type: none"> <li>Nominal motor power too small in relation to rated inverter power</li> <li>Motor cable cross section too small.</li> </ul> <p>Only for operation with a linear motor (as of firmware 18):</p> <ul style="list-style-type: none"> <li>The drive has been set to "Enable" although the commutation offset between linear motor and linear encoder is not known. This means that the inverter cannot set the current indicator correctly.</li> </ul> | <ul style="list-style-type: none"> <li>Check startup data and perform new startup, if necessary.</li> <li>Check connection between inverter and motor</li> <li>Check cross section of motor cable and increase if necessary</li> <li>Perform commutation travel in the "No enable" state and then switch to "Enable" once the inverter has acknowledged in status word bit 25 that commutation was successful.</li> </ul> |   |                              |



| Fault |                        |                    | Subfault |   | Possible cause  | Measure   |
|-------|------------------------|--------------------|----------|---|---|---|
| Code  | Designation            | Response (P)       | Code     | Designation   |   |   |
| 82    | Open output            | Immediate stop     | 0        | Output open with "VFC hoist"  | <ul style="list-style-type: none"> <li>Only in "VFC hoist" mode:</li> <li>• Two or all output phases are interrupted.</li> <li>• Nominal motor power too small in relation to rated inverter power</li> </ul>   | <ul style="list-style-type: none"> <li>• Check connection between inverter and motor</li> <li>• Check startup data and perform new startup, if necessary.</li> </ul>  |
| 84    | Motor protection       | Emergency stop (P) | 0        | "Motor temperature emulation" fault   | <ul style="list-style-type: none"> <li>• Motor utilization too high.</li> <li>• I<sub>N</sub>-U<sub>L</sub> monitoring triggered</li> <li>• P530 set later to "KTY"</li> </ul>  | <ul style="list-style-type: none"> <li>• The motor <b>must</b> cool off, then reset the fault</li> <li>• Reduce load</li> <li>• Extend ramps</li> <li>• Observe longer pause times</li> <li>• Check P345/346</li> <li>• Select a larger motor</li> </ul>  |
|       |                        |                    | 2        | Temperature sensor wire break   |   |   |
|       |                        |                    | 3        | No thermal motor model available  |   |   |
|       |                        |                    | 4        | UL monitoring fault   |   |   |
|       |                        |                    | 11       | Temperature sensor short circuit  |   |   |
| 86    | Memory module          | Immediate stop     | 0        | Fault in connection with memory module  | <ul style="list-style-type: none"> <li>• No memory card</li> <li>• Memory card defective</li> </ul>   | <ul style="list-style-type: none"> <li>• Tighten knurled screw</li> <li>• Insert and secure memory card</li> <li>• Replace memory card</li> <li>• Load delivery status and parameter set</li> </ul>   |
| 87    | Technology function    | Immediate stop     | 0        | Technology function selected with standard unit                                       | A technology function was activated in a standard device  | Disable technology function   |
| 88    | Flying start           | Immediate stop     | 0        | "Flying start" fault  | <p>Only in VFC n-CTRL operating mode:<br/>Actual speed &gt; 6000 rpm when inverter enabled</p>  | Only enable a actual speed ≤ 6000 min <sup>-1</sup>   |
| 92    | DIP encoder problem    | Fault display (P)  | 1        | Stahl WCS3 dirt problem   | Encoder signals a fault   | Possible cause: Encoder is dirty → clean encoder  |
| 93    | DIP encoder fault      | Emergency stop (P) | 0        | "Absolute encoder" fault  | <p>The encoder signals a fault, e.g. power failure</p> <ul style="list-style-type: none"> <li>• Connection cable between the encoder and DIP11B does not meet the requirements (twisted pair, shielded)</li> <li>• Clock frequency too high for cable length</li> <li>• Permitted max. speed/acceleration of encoder exceeded</li> <li>• Encoder defective</li> </ul> | <ul style="list-style-type: none"> <li>• Check absolute encoder connection</li> <li>• Check connection cables</li> <li>• Set correct clock frequency</li> <li>• Reduce maximum travel speed or ramp</li> <li>• Replacing absolute encoders.</li> </ul>  |
| 94    | EEPROM checksum        | Immediate stop     | 0        | Power section parameters  | <p>Inverter electronics disrupted. Possibly due to EMC influence or defect.</p>   | Sending in a device for repair  |
|       |                        |                    | 5        | Control unit data   |   |   |
|       |                        |                    | 6        | Power section data  |   |   |
|       |                        |                    | 7        | Invalid version of the configuration data set   |   |   |
| 95    | DIP plausibility fault | Emergency stop (P) | 0        | Plausibility monitoring of absolute position  | <p>No plausible position could be determined</p> <ul style="list-style-type: none"> <li>• Incorrect encoder type set</li> <li>• IPOS<sup>PLUS</sup>® travel parameter set incorrectly</li> <li>• Numerator/denominator factor set incorrectly</li> <li>• Zero adjustment performed</li> <li>• Encoder defective</li> </ul>  | <ul style="list-style-type: none"> <li>• Set the correct encoder type</li> <li>• Check IPOS<sup>PLUS</sup>® travel parameters.</li> <li>• Check travel speed.</li> <li>• Correct numerator/denominator factor</li> <li>• Reset after zero adjustment</li> <li>• Replacing absolute encoders.</li> </ul> |
| 97    | Copy fault             | Immediate stop     | 0        | Parameter set upload is/was faulty  | <ul style="list-style-type: none"> <li>• Memory card cannot be written or read</li> <li>• Fault during data transmission</li> </ul>   | <ul style="list-style-type: none"> <li>• Repeat copying process</li> <li>• Restore delivery state (P802) and repeat copying process</li> </ul>  |
|       |                        |                    | 1        | Download of parameter set to unit canceled.   |   |   |
|       |                        |                    | 2        | Not possible to adopt parameters<br>Not possible to adopt parameters from memory card |   |   |

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| Fault |                             |                   | Subfault |  | Possible cause   | Measure  |
|-------|-----------------------------|-------------------|----------|--|--|--|
| Code  | Designation                 | Response (P)      | Code     | Designation  |  |  |
| 98    | CRC fault                   | Immediate stop    | 0        | "CRC via internal flash" fault   | Internal device fault flash memory defective.  | Sending in a device for repair   |
| 99    | IPOS ramp calculation       | Immediate stop    | 0        | "Ramp calculation" fault   | Only in IPOS <sup>PLUS</sup> mode: Positioning ramp is sinusoidal or square and an attempt is made to change ramp times and traveling velocities with enabled inverter.          | Rewrite the IPOS <sup>PLUS</sup> program so that ramp times and traveling velocities can only be altered when the inverter is inhibited.   |
| 100   | Vibration – warning         | Display fault (P) | 0        | Vibrations diagnostics warning   | Vibration sensor warning (→ "DUV10A" operating instructions)   | Determine cause of vibrations. Continue operation until F101 occurs.   |
| 101   | Vibration fault             | Rapid stop (P)    | 0        | Vibration diagnostics fault  | Vibration sensor signals fault   | SEW-EURODRIVE recommends that you remedy the cause of the vibrations immediately   |
| 102   | Oil aging warning           | Display fault (P) | 0        | Oil aging warning  | Warning signal from the oil aging sensor   | Schedule oil change  |
| 103   | Oil aging fault             | Display fault (P) | 0        | Oil aging fault  | Fault message from the oil aging sensor  | SEW-EURODRIVE recommends that you change the gear unit oil immediately.  |
| 104   | Oil aging – overtemperature | Display fault (P) | 0        | Oil aging overtemperature  | Overtemperature signal from the oil aging sensor   | <ul style="list-style-type: none"> <li>Let oil cool down</li> <li>Check if the gear unit cools properly</li> </ul>   |
| 105   | Oil aging ready signal      | Display fault (P) | 0        | Oil aging ready signal   | Oil aging sensor is not ready for operation  | <ul style="list-style-type: none"> <li>Check voltage supply of oil aging sensor</li> <li>Check and, if necessary, replace the oil aging sensor</li> </ul>  |
| 106   | Brake wear                  | Display fault (P) | 0        | Brake wear fault   | Brake lining worn  | Replace brake lining (→ "Motors" operating instructions).  |
| 107   | Line components             | Immediate stop    | 1        | For regenerative power supply only: No feedback signal from main contactor | Main contactor defective   | <ul style="list-style-type: none"> <li>Check main contactor</li> <li>Check control cables.</li> </ul>  |
| 108   | DCS fault                   | Display fault     | 0        | DCS fault  |  |  |
|       |                             |                   | 1        | Configuration data not loaded correctly to DCS..B option.                  | Connection interrupted while loading the program to the DCS..B option.   | <ul style="list-style-type: none"> <li>Reload the configuration files.</li> <li>Then switch the DCS..B option off and on again.</li> </ul>   |
|       |                             |                   | 2        | Invalid configuration data for software version of the DCS..B option.      | DCS..B option configured using a wrong software version.   | <ul style="list-style-type: none"> <li>Configure the DCS..B option with the permitted MOVISAFE<sup>®</sup> software version.</li> <li>Then switch the DCS..B option off and on again.</li> </ul>           |
|       |                             |                   | 3        | Unit was programmed with incorrect software interface.                     | Program or configuration data was loaded into the unit with an incorrect MOVISAFE <sup>®</sup> software.   | <ul style="list-style-type: none"> <li>Check the DCS..B version and parameterize it again using a valid MOVISAFE<sup>®</sup> software.</li> <li>Then switch the DCS..B option off and on again.</li> </ul> |
|       |                             |                   | 4<br>5   | Incorrect reference voltage  | <ul style="list-style-type: none"> <li>Incorrect reference voltage</li> <li>Faulty supply voltage of the DCS..B option</li> <li>Faulty component on the DCS..B option</li> </ul> | <ul style="list-style-type: none"> <li>Check supply voltage of DCS..B option.</li> <li>Switch DCS..B option off and on again.</li> </ul>   |
|       |                             |                   | 6<br>7   |  |  |  |
|       |                             |                   | 10       | Incorrect supply voltage.  | <ul style="list-style-type: none"> <li>DC 24 V supply voltage of the DCS..B option is faulty.</li> <li>Faulty component on the DCS..B option</li> </ul>                          | <ul style="list-style-type: none"> <li>Check supply voltage of DCS..B option.</li> <li>Switch DCS..B option off and on again.</li> </ul>   |

| Fault |  |  | Subfault  |  | Possible cause  | Measure   |
|-------|--|--|---|--|---|---|
| Code  | Designation  | Response (P)   | Code  | Designation  |   |   |
| 108   | DCS fault  | Display fault  | 11  | The unit's ambient temperature is not in the defined range         | Temperature at the place of operation is not in the permitted range   | Check the ambient temperature   |
|       |  |  | 12  | Plausibility fault for position changeover                         | For the position changeover, ZSC, JSS or DMC is permanently activated | <ul style="list-style-type: none"> <li>• Check ZSC activation</li> <li>• Check JSS activation</li> <li>• Check DMC activation (only for monitoring via position)</li> </ul> |
|       |  |  | 13  | Faulty switching of the LOSIDE driver DO02_P / DO02_M              | Short circuit of the output   | Check wiring at output  |
|       |  |  | 14  | Faulty switching of the HISIDE driver DO02_P / DO02_M              |   |   |
|       |  |  | 15  | Faulty switching of the LOSIDE driver DO0_M                        |   |   |
|       |  |  | 16  | Faulty switching of the HISIDE driver DO0_P                        |   |   |
|       |  |  | 17  | Faulty switching of the LOSIDE driver DO01_M                       |   |   |
|       |  |  | 18  | Faulty switching of the HISIDE driver DO01_P                       |   |   |
|       |  |  | 19  | Unit was programmed with incorrect software interface.             |   |   |
|       |  |  | 20  |  |   |   |
|       |  |  | 21  | CRC of configuration data invalid.                                 | Configuration data have not been uploaded correctly.                  | Upload configuration data into unit again.  |
| 22    |  |  |   |  |   |   |
| 108   | DCS fault  | Display fault  | 23  | Fault during internal transmission of configuration data.          | -   | <ul style="list-style-type: none"> <li>• Replace DCS..B option.</li> <li>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics.</li> </ul>   |
|       |  |  | 24  |  |   |   |
|       |  |  | 25  | Fault while calculating firmware configuration data.               | -   | <ul style="list-style-type: none"> <li>• Replace DCS..B option.</li> <li>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics.</li> </ul>   |
|       |  |  | 26  |  |   |   |
|       |  |  | 27  | CRC of firmware configuration data invalid.                        | -   | <ul style="list-style-type: none"> <li>• Replace DCS..B option.</li> <li>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics.</li> </ul>   |
|       |  |  | 28  |  |   |   |
|       |  |  | 29  | Fault during internal transmission of firmware configuration data. | -   | <ul style="list-style-type: none"> <li>• Replace DCS..B option.</li> <li>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics.</li> </ul>   |
| 30    |  |  |   |  |   |   |
| 31    | The range check of the device description is faulty. | Faulty configuration data of the device description. | <ul style="list-style-type: none"> <li>• Reload the configuration data. Next switch the DCS..B option off and on again.</li> <li>• If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version.</li> </ul> |  |   |   |

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## Service

### Fault messages and list of faults

| Fault |             |               | Subfault |   | Possible cause                                       | Measure   |
|-------|-------------|---------------|----------|---|--|---|
| Code  | Designation | Response (P)  | Code     | Designation                                   |  |   |
| 108   | DCS fault   | Display fault | 32       | The range check of the access data is faulty. | Faulty configuration data of the device description. | <ul style="list-style-type: none"> <li>Reload the configuration data. Next switch the DCS..B option off and on again.</li> <li>If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version.</li> </ul>   |
|       |             |               | 33       | EMU range check is faulty.                    | Faulty configuration data of the EMU function.       | <ul style="list-style-type: none"> <li>Undo the changes in the EMU configuration or enter new values.</li> <li>Reload the configuration data. Next switch the DCS..B option off and on again.</li> <li>If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version.</li> </ul> |
|       |             |               | 34       | PSC range check is faulty.                    | Faulty configuration data of the PSC function.       | <ul style="list-style-type: none"> <li>Undo the changes in the PSC configuration or enter new values.</li> <li>Reload the configuration data. Next switch the DCS..B option off and on again.</li> <li>If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version.</li> </ul> |

| Fault |             |               | Subfault |                            | Possible cause                                 | Measure   |
|-------|-------------|---------------|----------|----------------------------|--|---|
| Code  | Designation | Response (P)  | Code     | Designation                |  |   |
| 108   | DCS fault   | Display fault | 35       | ESS range check is faulty. | Faulty configuration data of the ESS function. | <ul style="list-style-type: none"> <li>Undo the changes in the ESS configuration or enter new values.</li> <li>Reload the configuration data. Next switch the DCS..B option off and on again.</li> <li>If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version.</li> </ul> |
|       |             |               | 36       | ELC range check is faulty. | Faulty configuration data of the ELC function. | <ul style="list-style-type: none"> <li>Undo the changes in the ELC configuration or enter new values.</li> <li>Reload the configuration data. Next switch the DCS..B option off and on again.</li> <li>If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version.</li> </ul> |
|       |             |               | 37       | OLC range check is faulty. | Faulty configuration data of the OLC function. | <ul style="list-style-type: none"> <li>Undo the changes in the OLC configuration or enter new values.</li> <li>Reload the configuration data. Next switch the DCS..B option off and on again.</li> <li>If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version.</li> </ul> |

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## Service

### Fault messages and list of faults

| Fault |             |               | Subfault |                            | Possible cause                                 | Measure   |
|-------|-------------|---------------|----------|----------------------------|--|---|
| Code  | Designation | Response (P)  | Code     | Designation                |  |   |
| 108   | DCS fault   | Display fault | 38       | ZSC range check is faulty. | Faulty configuration data of the ZSC function. | <ul style="list-style-type: none"> <li>• Undo the changes in the ZSC configuration or enter new values.</li> <li>• Reload the configuration data. Next switch the DCS..B option off and on again.</li> <li>• If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version.</li> </ul> |
|       |             |               | 39       | MSC range check is faulty. | Faulty configuration data of the MSC function. | <ul style="list-style-type: none"> <li>• Undo the changes in the MSC configuration or enter new values.</li> <li>• Reload the configuration data. Next switch the DCS..B option off and on again.</li> <li>• If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version.</li> </ul> |
|       |             |               | 40       | DMC range check is faulty. | Faulty configuration data of the DMC function. | <ul style="list-style-type: none"> <li>• Undo the changes in the DMC configuration or enter new values.</li> <li>• Reload the configuration data. Next switch the DCS..B option off and on again.</li> <li>• If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version.</li> </ul> |

| Fault |             |               | Subfault |   | Possible cause                                 | Measure   |
|-------|-------------|---------------|----------|---|--|---|
| Code  | Designation | Response (P)  | Code     | Designation                             |  |   |
| 108   | DCS fault   | Display fault | 41       | JSS range check is faulty.              | Faulty configuration data of the JSS function. | <ul style="list-style-type: none"> <li>• Undo the changes in the JSS configuration or enter new values.</li> <li>• Reload the configuration data. Next switch the DCS..B option off and on again.</li> <li>• If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version.</li> </ul>             |
|       |             |               | 42       | PLC range check is faulty.              | Incorrect IL application program.              | <ul style="list-style-type: none"> <li>• Compile the application program again, load it, and switch the DCS..B option off and on again.</li> <li>• If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version.</li> </ul>   |
|       |             |               | 43       | Shutdown channel range check is faulty. | Internal configuration data fault.             | <ul style="list-style-type: none"> <li>• Undo the changes in the disconnection (configuration) or enter new values.</li> <li>• Reload the configuration data. Next switch the DCS..B option off and on again.</li> <li>• If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version.</li> </ul> |

# 7 Service

## Fault messages and list of faults

| Fault |             |               | Subfault |                                       | Possible cause                                | Measure   |
|-------|-------------|---------------|----------|---------------------------------------|---|---|
| Code  | Designation | Response (P)  | Code     | Designation                           |   |   |
| 108   | DCS fault   | Display fault | 44       | Digital output range check is faulty. | Faulty configuration data of digital outputs. | <ul style="list-style-type: none"> <li>Undo the changes in the disconnection matrix of the digital outputs or enter new values.</li> <li>Reload the configuration data. Next switch the DCS..B option off and on again.</li> <li>If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version.</li> </ul> |
|       |             |               | 45       | Digital output range check is faulty. | Faulty configuration data of digital outputs. | <ul style="list-style-type: none"> <li>Undo the changes in the disconnection matrix of the digital outputs or enter new values.</li> <li>Reload the configuration data. Next switch the DCS..B option off and on again.</li> <li>If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version.</li> </ul> |
|       |             |               | 46       | Encoder type range check is faulty.   | Incorrectly configured encoder type.          | <ul style="list-style-type: none"> <li>Undo the changes in the encoder configuration or enter new values.</li> <li>Reload the configuration data. Next switch the DCS..B option off and on again.</li> <li>If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version.</li> </ul>                       |



| Fault |             |               | Subfault |   | Possible cause                            | Measure  |
|-------|-------------|---------------|----------|---|---|--|
| Code  | Designation | Response (P)  | Code     | Designation                             |   |  |
| 108   | DCS fault   | Display fault | 47       | Encoder scaling range check is faulty.  | Incorrectly configured encoder distance.  | <ul style="list-style-type: none"> <li>• Undo changes made to the encoder distance (measuring length, resolution or max. speed) or enter new values.</li> <li>• Reload the configuration data. Next switch the DCS..B option off and on again.</li> <li>• If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version.</li> </ul> |
|       |             |               | 48       | Encoder position range check is faulty. | Incorrectly configured encoder distance.  | <ul style="list-style-type: none"> <li>• Undo changes made to the encoder distance (measuring length, resolution or max. speed) or enter new values.</li> <li>• Reload the configuration data. Next switch the DCS..B option off and on again.</li> <li>• If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version.</li> </ul> |
|       |             |               | 49       | PDM range check is faulty.              | Faulty configuration of the PDM function. | <ul style="list-style-type: none"> <li>• Undo the changes in the PDM configuration or enter new values.</li> <li>• Reload the configuration data. Next switch the DCS..B option off and on again.</li> <li>• If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version.</li> </ul>  |

| Fault Code | Designation                                | Response (P)  | Subfault  |  | Possible cause | Measure   |   |   |   |   |  |   |   |   |
|------------|--|---------------|---|--|----------------|---|---|---|---|---|--|---|---|---|
|            |  |               | Code  | Designation                              |                |   |   |   |   |   |  |   |   |   |
| 108        | DCS fault                                  | Display fault | 50  | Fault during internal data transmission. | -              | <ul style="list-style-type: none"> <li>Replace DCS..B option.</li> <li>Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics.</li> </ul> |   |   |   |   |  |   |   |   |
|            |  |               | 51  |  |                |   |   |   |   |   |  |   |   |   |
|            |  |               | 52  | Fault during internal data transmission. |                |   | - | <ul style="list-style-type: none"> <li>Replace DCS..B option.</li> <li>Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics.</li> </ul> |   |   |  |   |   |   |
|            |  |               | 53  |  |                |   |   |   |   |   |  |   |   |   |
|            |  |               | 54  | Internal program fault.                  |                |   |   |   | - | <ul style="list-style-type: none"> <li>Replace DCS..B option.</li> <li>Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics.</li> </ul> |  |   |   |   |
|            |  |               | 55  |  |                |   |   |   |   |   |  |   |   |   |
|            |  |               | 56  | Faulty watchdog test.                    |                |   |   |   |   |   | Faulty feedback of internal shutdown channel of the digital outputs. | - | <ul style="list-style-type: none"> <li>Replace DCS..B option.</li> <li>Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics.</li> </ul>   |   |
|            |  |               | 57  |  |                |   |   |   |   |   |  |   |   |   |
|            |  |               | 58  | Faulty process data.                     |                |   |   |   |   |   | -  |   |   | <ul style="list-style-type: none"> <li>Replace DCS..B option.</li> <li>Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics.</li> </ul>   |
|            |  |               | 59  |  |                |   |   |   |   |   |  |   |   |   |
| 62         | Internal processing fault in user program. | -             | <ul style="list-style-type: none"> <li>Replace DCS..B option.</li> <li>Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics.</li> </ul> |  |                |   |   |   |   |   |  |   |   |   |
| 63         |  |               |   |  |                |   |   |   |   |   |  |   |   |   |
| 108        | DCS fault                                  |               |   | Display fault                            | 64             | Internal processing fault in user program.  | - | <ul style="list-style-type: none"> <li>Replace DCS..B option.</li> <li>Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics.</li> </ul> |   |   |  |   |   |   |
|            |  |               |   |  | 65             |   |   |   |   |   |  |   |   |   |
|            |  |               |   |  | 66             | Internal processing fault in user program.  |   |   | - | <ul style="list-style-type: none"> <li>Replace DCS..B option.</li> <li>Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics.</li> </ul> |  |   |   |   |
|            |  |               |   |  | 67             |   |   |   |   |   |  |   |   |   |
|            |  |               |   |  | 68             | Internal processing fault of input element  |   |   |   |   |  | - | <ul style="list-style-type: none"> <li>Reload the configuration data. Next switch the DCS..B option off and on again.</li> <li>If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version.</li> </ul> |   |
|            |  |               |   |  | 69             |   |   |   |   |   |  |   |   |   |
|            |  |               |   |  | 70             | Internal processing fault of input element  |   |   |   |   | -  |   |   | <ul style="list-style-type: none"> <li>Reload the configuration data. Next switch the DCS..B option off and on again.</li> <li>If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version.</li> </ul> |
|            |  |               |   |  | 71             |   |   |   |   |   |  |   |   |   |
| 72         | Internal processing fault in user program  | -             | <ul style="list-style-type: none"> <li>Replace DCS..B option.</li> <li>Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics.</li> </ul> |  |                |   |   |   |   |   |  |   |   |   |
| 73         |  |               |   |  |                |   |   |   |   |   |  |   |   |   |

| Fault |                                      |               | Subfault |   | Possible cause | Measure   |               |    |                     |   |   |
|-------|--------------------------------------|---------------|----------|---|----------------|---|---------------|----|---------------------|---|---|
| Code  | Designation                          | Response (P)  | Code     | Designation                             |                |   |               |    |                     |   |   |
| 108   | DCS fault                            | Display fault | 74       | Runtime fault.                          | -              | <ul style="list-style-type: none"> <li>• Replace DCS..B option.</li> <li>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics.</li> </ul> |               |    |                     |   |   |
|       |                                      |               | 75       |   |                |   |               |    |                     |   |   |
|       |                                      |               | 80       | Runtime fault                           |                |   |               |    |                     |   |   |
|       |                                      |               | 82       | Interrupt fault during time monitoring. |                |   |               |    |                     |   |   |
|       |                                      |               | 83       |   |                |   |               |    |                     |   |   |
|       |                                      |               | 85       | Runtime fault.                          |                |   |               |    |                     |   |   |
|       |                                      |               | 86       |   |                |   |               |    |                     |   |   |
|       |                                      |               | 87       | Program fault.                          |                |   |               |    |                     |   |   |
|       |                                      |               | 88       |   |                |   |               |    |                     |   |   |
|       |                                      |               | 89       | Internal CPU fault.                     |                |   |               |    |                     |   |   |
|       |                                      |               | 90       |   |                |   |               |    |                     |   |   |
|       |                                      |               | 108      | DCS fault                               |                |   | Display fault | 91 | Internal CPU fault. | - | <ul style="list-style-type: none"> <li>• Replace DCS..B option.</li> <li>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics.</li> </ul> |
|       |                                      |               |          |   |                |   |               | 92 |                     |   |   |
|       |                                      |               |          |   |                |   |               | 93 | Internal CPU fault. |   |   |
| 94    |                                      |               |          |   |                |   |               |    |                     |   |   |
| 95    | Internal RAM fault.                  |               |          |   |                |   |               |    |                     |   |   |
| 96    |                                      |               |          |   |                |   |               |    |                     |   |   |
| 97    | Internal flash fault.                |               |          |   |                |   |               |    |                     |   |   |
| 98    |                                      |               |          |   |                |   |               |    |                     |   |   |
| 99    | Internal CPU fault                   |               |          |   |                |   |               |    |                     |   |   |
| 100   |                                      |               |          |   |                |   |               |    |                     |   |   |
| 101   | Internal processing fault PROFIsafe. |               |          |   |                |   |               |    |                     |   |   |
| 102   |                                      |               |          |   |                |   |               |    |                     |   |   |

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| Fault |  |               | Subfault  |  | Possible cause  | Measure   |     |   |   |   |   |   |
|-------|--|---------------|---|--|---|---|-----|---|---|---|---|---|
| Code  | Designation                              | Response (P)  | Code  | Designation                              |   |   |     |   |   |   |   |   |
| 108   | DCS fault                                | Display fault | 103   | Internal processing fault PROFIsafe.     | -   | <ul style="list-style-type: none"> <li>Replace DCS..B option.</li> <li>Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics.</li> </ul> |     |   |   |   |   |   |
|       |  |               | 104   |  |   |   |     |   |   |   |   |   |
|       |  |               | 105   | Internal processing fault PROFIsafe.     |   |   | -   | <ul style="list-style-type: none"> <li>Replace DCS..B option.</li> <li>Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics.</li> </ul> |   |   |   |   |
|       |  |               | 106   |  |   |   |     |   |   |   |   |   |
|       |  |               | 107   | Fault during internal data transmission. |   |   |     |   | - | <ul style="list-style-type: none"> <li>Replace DCS..B option.</li> <li>Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics.</li> </ul> |   |   |
|       |  |               | 108   |  |   |   |     |   |   |   |   |   |
|       |  |               | 109   | Fault during internal data transmission. |   |   |     |   |   |   | - | <ul style="list-style-type: none"> <li>Replace DCS..B option.</li> <li>Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics.</li> </ul> |
| 110   |  |               |   |  |   |   |     |   |   |   |   |   |
| 111   | Fault during internal data transmission. | -             | <ul style="list-style-type: none"> <li>Replace DCS..B option.</li> <li>Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics.</li> </ul> |  |   |   |     |   |   |   |   |   |
| 112   |  |               |   |  |   |   |     |   |   |   |   |   |
| 108   | DCS fault                                |               |   | Display fault                            | 113   | Fault during internal data transmission.  | -   | <ul style="list-style-type: none"> <li>Replace DCS..B option.</li> <li>Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics.</li> </ul> |   |   |   |   |
|       |  |               |   |  | 114   |   |     |   |   |   |   |   |
|       |  |               |   |  | 117   | Fault during internal data transmission.  |     |   | - | <ul style="list-style-type: none"> <li>Replace DCS..B option.</li> <li>Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics.</li> </ul> |   |   |
|       |  |               |   |  | 118   |   |     |   |   |   |   |   |
|       |  |               |   |  | 119   | Fault during internal data transmission.  |     |   |   |   | - | <ul style="list-style-type: none"> <li>Replace DCS..B option.</li> <li>Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics.</li> </ul> |
|       |  | 140           | Faulty core voltage DMP1.   |  | <ul style="list-style-type: none"> <li>Incorrect core voltage of the DCS..B option.</li> <li>Faulty component on the DCS..B option</li> </ul> | <ul style="list-style-type: none"> <li>Replace DCS..B option.</li> <li>Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics.</li> </ul> |     |   |   |   |   |   |
|       |  | 141           |   |  |   |   |     |   |   |   |   |   |
|       |  | 142           | Faulty core voltage DMPM.   |  |   |   |     |   |   |   |   |   |
| 143   |  |               |   |  |   |   |     |   |   |   |   |   |
| 156   | Faulty RAM test.                         | -             | <ul style="list-style-type: none"> <li>Replace DCS..B option.</li> <li>Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics.</li> </ul> |  |   |   |     |   |   |   |   |   |
| 157   |  |               |   |  |   |   |     |   |   |   |   |   |
| 108   | DCS fault                                |               |   | Display fault                            |   |   | 160 | Faulty test of static registers.  | - | <ul style="list-style-type: none"> <li>Replace DCS..B option.</li> <li>Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics.</li> </ul> |   |   |
|       |  |               |   |  |   |   | 161 |   |   |   |   |   |

| Fault |             |               | Subfault |  |   |  |
|-------|-------------|---------------|----------|--|---|--|
| Code  | Designation | Response (P)  | Code     | Designation                                      | Possible cause  | Measure  |
| 109   | DCS alarm   | Display fault | 0        | DCS alarm  |   |  |
|       |             |               | 1        | Communication fault backplane bus MOVIDRIVE® B.  | The DCS..B option does not receive any valid data from MOVIDRIVE® B.        | <ul style="list-style-type: none"> <li>• Check hardware connection to MOVIDRIVE® B.</li> <li>• Check firmware version of MOVIDRIVE® B.</li> <li>• Apply braided shield of encoder cable, motor cable, and TF cable over a large area.</li> <li>• Establish equipotential bonding.</li> </ul> |
|       |             |               | 2<br>3   | Pulse 1 plausibility fault at digital input DI1. | The configured pulse 1 voltage is not present at digital input DI1 (X81:2). | <ul style="list-style-type: none"> <li>• Check configuration of the DI1 digital input according to configuration and wiring diagram.</li> <li>• Check the wiring.</li> </ul>   |
|       |             |               | 4<br>5   | Pulse 1 plausibility fault at digital input DI2. | The configured pulse 1 voltage is not present at digital input DI2 (X81:3). | <ul style="list-style-type: none"> <li>• Check configuration of the DI2 digital input according to configuration and wiring diagram.</li> <li>• Check the wiring.</li> </ul>   |
|       |             |               | 6<br>7   | Pulse 1 plausibility fault at digital input DI3. | The configured pulse 1 voltage is not present at digital input DI3 (X81:4). | <ul style="list-style-type: none"> <li>• Check configuration of the DI3 digital input according to configuration and wiring diagram.</li> <li>• Check the wiring.</li> </ul>   |
|       |             |               | 8<br>9   | Pulse 1 plausibility fault at digital input DI4. | The configured pulse 1 voltage is not present at digital input DI4 (X81:5). | <ul style="list-style-type: none"> <li>• Check configuration of the DI4 digital input according to configuration and wiring diagram.</li> <li>• Check the wiring.</li> </ul>   |

| Fault |  |   | Subfault   |  | Possible cause   | Measure  |
|-------|--|---|--|--|--|--|
| Code  | Designation                                      | Response (P)  | Code   | Designation                                      |  |  |
| 109   | DCS alarm  | Display fault   | 10   | Pulse 1 plausibility fault at digital input DI5. | The configured pulse 1 voltage is not present at digital input DI5 (X81:7).  | <ul style="list-style-type: none"> <li>• Check configuration of the DI5 digital input according to configuration and wiring diagram.</li> <li>• Check the wiring.</li> </ul> |
|       |  |   | 11   |  |  |  |
|       |  |   | 12   | Pulse 1 plausibility fault at digital input DI6. | The configured pulse 1 voltage is not present at digital input DI6 (X81:8).  | <ul style="list-style-type: none"> <li>• Check configuration digital input DI6 according to configuration and wiring diagram.</li> <li>• Check the wiring.</li> </ul>        |
|       |  |   | 13   |  |  |  |
|       |  |   | 14   | Pulse 1 plausibility fault at digital input DI7. | The configured pulse 1 voltage is not present at digital input DI7 (X81:9).  | <ul style="list-style-type: none"> <li>• Check configuration of the DI7 digital input according to configuration and wiring diagram.</li> <li>• Check the wiring.</li> </ul> |
|       |  |   | 15   |  |  |  |
|       |  |   | 16   | Pulse 1 plausibility fault at digital input DI8. | The configured pulse 1 voltage is not present at digital input DI8 (X81:10). | <ul style="list-style-type: none"> <li>• Check configuration of digital input DI8 according to configuration and wiring diagram.</li> <li>• Check the wiring.</li> </ul>     |
|       |  |   | 17   |  |  |  |
|       |  |   | 18   | Pulse 2 plausibility fault at digital input DI1. | The configured pulse 2 voltage is not present at digital input DI1 (X81:2).  | <ul style="list-style-type: none"> <li>• Check configuration of the DI1 digital input according to configuration and wiring diagram.</li> <li>• Check the wiring.</li> </ul> |
|       |  |   | 19   |  |  |  |
|       |  |   | 20   | Pulse 2 plausibility fault at digital input DI2. | The configured pulse 2 voltage is not present at digital input DI2 (X81:3).  | <ul style="list-style-type: none"> <li>• Check configuration of the DI2 digital input according to configuration and wiring diagram.</li> <li>• Check the wiring.</li> </ul> |
|       |  |   | 21   |  |  |  |
|       |  |   | 22   | Pulse 2 plausibility fault at digital input DI3. | The configured pulse 2 voltage is not present at digital input DI3 (X81:4).  | <ul style="list-style-type: none"> <li>• Check configuration of the DI3 digital input according to configuration and wiring diagram.</li> <li>• Check the wiring.</li> </ul> |
|       |  |   | 23   |  |  |  |
| 24    | Pulse 2 plausibility fault at digital input DI4. | The configured pulse 2 voltage is not present at digital input DI4 (X81:5). | <ul style="list-style-type: none"> <li>• Check configuration of the DI4 digital input according to configuration and wiring diagram.</li> <li>• Check the wiring.</li> </ul> |  |  |  |
| 25    |  |   |  |  |  |  |

| Fault |  |  | Subfault  |  | Possible cause  | Measure   |
|-------|--|--|---|--|---|---|
| Code  | Designation                                | Response (P)   | Code  | Designation                                      |   |   |
| 109   | DCS alarm                                  | Display fault  | 26  | Pulse 2 plausibility fault at digital input DI5. | The configured pulse 2 voltage is not present at digital input DI5 (X81:7).                                   | <ul style="list-style-type: none"> <li>• Check configuration of the DI5 digital input according to configuration and wiring diagram.</li> <li>• Check the wiring.</li> </ul>  |
|       |  |  | 27  |  |   |   |
|       |  |  | 28  | Pulse 2 plausibility fault at digital input DI6. | The configured pulse 2 voltage is not present at digital input DI6 (X81:8).                                   | <ul style="list-style-type: none"> <li>• Check configuration digital input DI6 according to configuration and wiring diagram.</li> <li>• Check the wiring.</li> </ul>   |
|       |  |  | 29  |  |   |   |
|       |  |  | 30  | Pulse 2 plausibility fault at digital input DI7. | The configured pulse 2 voltage is not present at digital input DI7 (X81:9).                                   | <ul style="list-style-type: none"> <li>• Check configuration of the DI7 digital input according to configuration and wiring diagram.</li> <li>• Check the wiring.</li> </ul>  |
|       |  |  | 31  |  |   |   |
|       |  |  | 32  | Pulse 2 plausibility fault at digital input DI8. | The configured pulse 2 voltage is not present at digital input DI8 (X81:10).                                  | <ul style="list-style-type: none"> <li>• Check configuration of digital input DI8 according to configuration and wiring diagram.</li> <li>• Check the wiring.</li> </ul>  |
| 33    |  |  |   |  |   |   |
| 34    | Plausibility fault in the speed detection. | The difference between the two speed sensors is higher than the configured speed switch-off threshold. | <ul style="list-style-type: none"> <li>• Check track again with the set data in the encoder configuration.</li> <li>• Check speed sensor.</li> <li>• Use the SCOPE function to set speed signals so that they are congruent.</li> </ul>                   |  |   |   |
| 35    |  |  |   |  |   |   |
| 109   | DCS alarm                                  | Display fault  | 36  | Plausibility fault in the position detection.    | The difference between the two position signals is higher than the configured increment switch-off threshold. | <ul style="list-style-type: none"> <li>• Check track with the configured data of the encoder setting.</li> <li>• Check position signal.</li> <li>• Are all signals connected to the 9-pin encoder connector?</li> <li>• Check the encoder connector for correct connection.</li> <li>• Use the SCOPE function to set positions signals so that they are congruent.</li> <li>• If the absolute value is to be used via the backplane bus, it may be necessary to adapt the <i>Switch-off Threshold Incr.</i> parameter.</li> </ul> |
|       |  |  | 37  |  |   |   |
|       |  |  | 38  | Plausibility fault incorrect position range.     | The current position is outside the configured measurement range.   | <ul style="list-style-type: none"> <li>• Check track with the configured data of the encoder setting.</li> <li>• Check position signal, correct offset if necessary.</li> <li>• Use the SCOPE function to set positions signals so that they are congruent.</li> </ul>  |
|       |  |  | 39  |  |   |   |
| 40    | Plausibility fault incorrect speed.        | The current speed exceeds the configured maximum speed.  | <ul style="list-style-type: none"> <li>• The drive moves outside the permitted and configured speed range.</li> <li>• Check the configuration (encoder screen: max. set speed).</li> <li>• Analyze the speed profile using the SCOPE function.</li> </ul> |  |   |   |
| 41    |  |  |   |  |   |   |

| Fault |  |  | Subfault                        |  | Possible cause  | Measure  |
|-------|--|--|---------------------------------|--|---|--|
| Code  | Designation  | Response (P)   | Code                            | Designation  |   |  |
| 109   | DCS alarm  | Display fault  | 42                              | Plausibility fault incorrect acceleration.   | The current acceleration exceeds the configured maximum acceleration.   | <ul style="list-style-type: none"> <li>Check the configuration (encoder screen: max. set speed).</li> <li>Analyze the speed/acceleration profile using the SCOPE function.</li> </ul>  |
|       |  |  | 43                              |  |   |  |
|       |  |  | 44                              | Plausibility fault in encoder interface (A3401 = encoder 1 and A3402 = encoder 2). | The encoder interface does not match the configured data  | <ul style="list-style-type: none"> <li>Check encoder type and configuration (SSI/incremental)</li> <li>Check the encoder connection/wiring</li> <li>Check the polarity of the encoder data</li> <li>Check function of the encoder</li> </ul> |
|       |  |  | 45                              |  |   |  |
|       |  |  | 46                              | Voltage supply of encoder faulty (A3403 = encoder 1 and A3404 = encoder 2).        | Encoder voltage supply not within defined range (min. DC 20 V / max. DC 29 V).                                      | <ul style="list-style-type: none"> <li>Overload in the supply voltage of the encoder; internal polyswitch fuse has tripped.</li> <li>Check supply voltage of DCS..B option.</li> </ul>   |
|       |  |  | 47                              |  |   |  |
|       |  |  | 48                              | Fault in reference voltage   | Reference voltage input of the encoder system is outside of the defined range                                       | Check the reference voltage input of the encoder system  |
|       |  |  | 49                              |  |   |  |
|       |  |  | 50                              | Difference level RS485 driver 1. Fault Faulty "B" or "Cycle" signal.               | <ul style="list-style-type: none"> <li>No encoder connection.</li> <li>Incorrect encoder type connected.</li> </ul> | <ul style="list-style-type: none"> <li>Check encoder connection.</li> <li>Check encoder cabling.</li> </ul>  |
|       |  |  | 51                              |  |   |  |
|       |  |  | 52                              | Difference level RS485 driver 2. Fault Faulty "A" or "DATA" signal.                |   |  |
|       |  |  | 53                              |  |   |  |
|       |  |  | 54                              | Difference in incremental counter  |   |  |
| 55    |  |  |                                 |  |   |  |
| 109   | DCS alarm  | Display fault  | 56                              | Plausibility fault in encoder interface (A3401 = encoder 1 and A3402 = encoder 2)  | The encoder interface does not match the configured data  | <ul style="list-style-type: none"> <li>Check encoder type and configuration (SSI/incremental)</li> <li>Check the encoder connection/wiring</li> <li>Check the polarity of the encoder data</li> <li>Check function of the encoder</li> </ul> |
|       |  |  | 57                              |  |   |  |
|       |  |  | 58                              | Plausibility fault SIN/COS encoder connection.                                     | Incorrect encoder type connected.   | Check encoder connection and cabling.  |
|       |  |  | 59                              |  |   |  |
|       |  |  | 60                              | Plausibility fault in the incremental encoder connection                           | Phase fault of the incremental or SIN/COS encoder.  | <ul style="list-style-type: none"> <li>Check encoder connection</li> <li>Replace defective encoder</li> </ul>  |
|       |  |  | 61                              |  |   |  |
|       |  |  | 62                              |  |   |  |
|       |  |  | 63                              | Plausibility fault - SSI encoder connection (master mode).                         | Connected encoder type does not correspond to the configuration.  | <ul style="list-style-type: none"> <li>Check configuration.</li> <li>Check connected encoder.</li> </ul>   |
|       |  |  | 64                              |  |   |  |
|       |  |  | 65                              | Plausibility fault SSI encoder connection (slave mode).                            | Connected encoder type does not correspond to the configuration.  | <ul style="list-style-type: none"> <li>Check configuration.</li> <li>Check connected encoder.</li> </ul>   |
|       |  |  | 66                              |  |   |  |
|       |  |  | 67                              | Faulty switching behavior of the high-side driver DO0_P.                           | DC 24 V short circuit at digital output DO0_P (X82:1).  | Check wiring at digital output.  |
|       |  |  | 68                              |  |   |  |
| 69    | Faulty switching behavior of the low-side driver DO0_M.  | DC 0 V short circuit at digital output DO0_M (X82:2).  | Check wiring at digital output. |  |   |  |
| 70    |  |  |                                 |  |   |  |
| 71    | Faulty switching behavior of the high-side driver DO1_P. | DC 24 V short circuit at digital output DO1_P (X82:3). | Check wiring at digital output. |  |   |  |
| 72    |  |  |                                 |  |   |  |
| 73    |  |  |                                 |  |   |  |



| Fault |   |  | Subfault   |   | Possible cause  | Measure   |
|-------|---|--|--|---|---|---|
| Code  | Designation                             | Response (P)   | Code   | Designation   |   |   |
| 109   | DCS alarm                               | Display fault  | 74   | Faulty switching behavior of the low-side driver DO1_M.                                     | DC 0 V short circuit at digital output DO1_M (X82:4).   | Check wiring at digital output.   |
|       |   |  | 75   |   |   |   |
|       |   |  | 76   | CCW and CW monitoring of DMC safety function activated simultaneously.                      | Multiple activation of the DMC safety function.   | Make sure to activate only one "enable" in the control of the DMC safety function.  |
|       |   |  | 77   |   |   |   |
|       |   |  | 78   | CCW and CW monitoring range of the OLC safety function activated simultaneously.            | Multiple activation of the OLC safety function.   | Make sure to activate only one "enable" in the control of the OLC safety function.  |
|       |   |  | 79   |   |   |   |
|       |   |  | 80   | CCW and CW monitoring of JSS safety function activated simultaneously.                      | Multiple activation of the JSS safety function.   | Make sure to activate only one "enable" in the control of the JSS safety function.  |
|       |   |  | 81   |   |   |   |
|       |   |  | 82   | Timeout fault MET.  | Input element with time monitoring is faulty.   | Check input element wiring.   |
|       |   |  | 83   |   |   |   |
|       |   |  | 84   | Timeout fault MEZ.  | Two-hand control with time monitoring is faulty.  | Check input element wiring.   |
|       |   |  | 85   |   |   |   |
|       |   |  | 86   | EMU1 monitoring fault.  | <ul style="list-style-type: none"> <li>Faulty output control</li> <li>Faulty feedback</li> </ul>  | Check wiring at digital output.   |
|       |   |  | 87   |   |   |   |
|       |   |  | 88   | EMU2 monitoring fault   |   |   |
|       |   |  | 89   |   |   |   |
| 90    | Plausibility fault position changeover. | Position changeover during ZSC, JSS or DMC is permanently activated. | <ul style="list-style-type: none"> <li>Check ZSC (SOS) activation.</li> <li>Check JSS (SDI) activation.</li> <li>Check DMC (SDI) activation only for monitoring the position.</li> </ul> |   |   |   |
| 91    |   |  |  |   |   |   |
| 109   | DCS alarm                               | Display fault  | 92   | SSI encoder fault.  | Encoder step SSI value within one cycle is too large.   | <ul style="list-style-type: none"> <li>Check encoder configuration.</li> <li>Check encoder cabling.</li> </ul>  |
|       |   |  | 93   |   |   |   |
|       |   |  | 94   | SSI encoder fault.  | Plausibility fault for position adjustment.   | <ul style="list-style-type: none"> <li>Check encoder configuration.</li> <li>Check encoder cabling.</li> </ul>  |
|       |   |  | 95   |   |   |   |
|       |   |  | 96   | Plausibility fault of incremental encoder tracks.   | <ul style="list-style-type: none"> <li>Different counting signals on A/B encoder tracks.</li> <li>Defective component at RS485 interface.</li> <li>Encoder operates outside tolerances of encoder interface.</li> </ul> | <ul style="list-style-type: none"> <li>Check encoder configuration.</li> <li>Check encoder cabling.</li> <li>Check encoder signal levels.</li> <li>Check maximum counting frequency of incremental encoder.</li> </ul>                |
|       |   |  | 97   |   |   |   |
|       |   |  | 98   | Plausibility fault analog/digital comparison at Schmitt trigger output – encoder input X84. | <ul style="list-style-type: none"> <li>Connected encoder type does not correspond to the configuration.</li> <li>Faulty encoder signals</li> <li>Hardware defective</li> </ul>  | <ul style="list-style-type: none"> <li>Check configuration.</li> <li>Check connected encoder.</li> <li>Replace DCS..B option.</li> <li>Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics.</li> </ul> |
|       |   |  | 99   |   |   |   |
|       |   |  | 100  | Plausibility fault analog/digital comparison at Schmitt trigger output – encoder input X85. | <ul style="list-style-type: none"> <li>Connected encoder type does not correspond to the configuration.</li> <li>Faulty encoder signals</li> <li>Hardware defective</li> </ul>  | <ul style="list-style-type: none"> <li>Check configuration.</li> <li>Check connected encoder.</li> <li>Replace DCS..B option.</li> <li>Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics.</li> </ul> |
|       |   |  | 101  |   |   |   |
|       |   |  | 110  | Position processing range check for DCS22B/32B.   | Position processing activated for DCS22B/32B options.   | <ul style="list-style-type: none"> <li>Check configuration data.</li> <li>Deactivate position processing.</li> </ul>  |
| 111   |   |  |  |   |   |   |
| 112   | Faulty OSSD input check.                | Faulty OSSD test.  | <ul style="list-style-type: none"> <li>Check DC 24 V input voltage of all OSSD inputs.</li> <li>Switch DCS..B option off and on again.</li> </ul>  |   |   |   |
| 113   |   |  |  |   |   |   |

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| Fault |             |               | Subfault |  | Possible cause   | Measure   |
|-------|-------------|---------------|----------|--|--|---|
| Code  | Designation | Response (P)  | Code     | Designation  |  |   |
| 109   | DCS alarm   | Display fault | 114      | Faulty switching behavior of the high-side driver DO2_P. | DC 24 V short circuit at digital output DO2_P (X83:1).   | Check wiring at digital output.   |
|       |             |               | 115      |  |  |   |
|       |             |               | 116      | Faulty switching behavior of the low-side driver DO2_M.  | DC 0 V short circuit at digital output DO2_M (X83:2).  | Check wiring at digital output.   |
|       |             |               | 117      |  |  |   |
|       |             |               | 118      | Dynamic test for high-side driver DO0_P.                 | DC 24 V short circuit at digital output DO0_P.   | Check wiring at digital output.   |
|       |             |               | 119      | Dynamic test for low-side driver DO0_M.                  | DC 0 V short circuit at digital output DO0_M.  | Check wiring at digital output.   |
|       |             |               | 120      | Dynamic test for high-side driver DO1_P.                 | DC 24 V short circuit at digital output DO1_P.   | Check wiring at digital output.   |
|       |             |               | 121      | Dynamic test for low-side driver DO1_M.                  | DC 0 V short circuit at digital output DO1_M.  | Check wiring at digital output.   |
|       |             |               | 122      | Dynamic test for high-side driver DO2_P.                 | DC 24 V short circuit at digital output DO2_P.   | Check wiring at digital output.   |
|       |             |               | 123      | Dynamic test for low-side driver DO2_M.                  | DC 0 V short circuit at digital output DO2_M.  | Check wiring at digital output.   |
|       |             |               | 124      | Deactivation of digital input test faulty                | Digital inputs are still active after deactivation.  | <ul style="list-style-type: none"> <li>• Check digital input wiring.</li> <li>• Switch DCS..B option off and on again.</li> <li>• Replace DCS..B option.</li> </ul>   |
|       |             |               | 125      |  |  |   |
|       |             |               | 134      | Plausibility fault in the speed recording                | The difference between the two speed sensors is higher than the configured speed switch-off threshold.                         | <ul style="list-style-type: none"> <li>• Check track again with the set data in the encoder configuration.</li> <li>• Check speed sensor.</li> <li>• Use the SCOPE function to set speed signals so that they are congruent.</li> </ul>   |
| 135   |             |               |          |  |  |   |
| 109   | DCS alarm   | Display fault | 136      | Plausibility fault in the position detection.            | The difference between the two position signals is higher than the configured increment switch-off threshold.                  | <ul style="list-style-type: none"> <li>• Check track with the configured data of the encoder setting.</li> <li>• Check position signal.</li> <li>• Are all signals connected correctly to the 9-pin encoder connector?</li> <li>• Check encoder connector for correct connection.</li> <li>• Use the SCOPE function to set positions signals so that they are congruent.</li> </ul> |
|       |             |               | 137      |  |  |   |
|       |             |               | 138      | Plausibility fault incorrect position range.             | The current position is outside the configured measurement range.  | <ul style="list-style-type: none"> <li>• Check track with the configured data of the encoder setting.</li> <li>• Check position signal, correct offset if necessary.</li> <li>• Use the SCOPE function to set positions signals so that they are congruent.</li> </ul>  |
|       |             |               | 139      |  |  |   |
|       |             |               | 140      | Plausibility fault incorrect speed.                      | The current speed exceeds the configured maximum speed.  | <ul style="list-style-type: none"> <li>• The drive moves outside the permitted and configured speed range.</li> <li>• Check the configuration (encoder screen: max. set speed).</li> <li>• Analyze the speed profile using the SCOPE function.</li> </ul>   |
|       |             |               | 141      |  |  |   |
|       |             |               | 142      | Plausibility fault incorrect acceleration.               | The current acceleration is outside the configured acceleration range. The drive has exceeded the permitted acceleration range | <ul style="list-style-type: none"> <li>• Check the configuration (encoder screen: max. set speed).</li> <li>• Analyze the speed/acceleration profile using the SCOPE function.</li> </ul>   |
| 143   |             |               |          |  |  |   |

| Fault |   |  | Subfault  |   | Possible cause  | Measure   |
|-------|---|--|---|---|---|---|
| Code  | Designation   | Response (P)   | Code  | Designation   |   |   |
| 109   | DCS alarm   | Display fault  | 146   | Voltage supply of encoder faulty (E3405 = encoder 1 and E3406 = encoder 2).                 | The voltage supply of the encoder is not within the defined range (min. DC 20 V / max. DC 29 V).  | <ul style="list-style-type: none"> <li>• Overload in the supply voltage of the encoder; internal polyswitch fuse has tripped.</li> <li>• Check supply voltage of DCS..B option.</li> </ul>  |
|       |   |  | 147   |   |   |   |
|       |   |  | 150   | Difference level RS485 driver. Fault Faulty "B" or "Cycle" signal.                          | <ul style="list-style-type: none"> <li>• No encoder connection.</li> <li>• Incorrect encoder type connected.</li> </ul>   | <ul style="list-style-type: none"> <li>• Check encoder connection.</li> <li>• Check encoder cabling.</li> </ul>   |
|       |   |  | 151   |   |   |   |
|       |   |  | 152   | Difference level RS485 driver. Fault Faulty "A" or "DATA" signal.                           | <ul style="list-style-type: none"> <li>• No encoder connection.</li> <li>• Incorrect encoder type connected.</li> </ul>   | <ul style="list-style-type: none"> <li>• Check encoder connection.</li> <li>• Check encoder cabling.</li> </ul>   |
|       |   |  | 153   |   |   |   |
|       |   |  | 158   | Plausibility fault SIN/COS encoder connection.  | Incorrect encoder type connected.   | Check encoder connection and cabling.   |
|       |   |  | 159   |   |   |   |
|       |   |  | 164   | Plausibility fault - SSI encoder connection (master mode).                                  | Connected encoder type does not correspond to the configuration.  | <ul style="list-style-type: none"> <li>• Check encoder connection and cabling.</li> <li>• Check encoder.</li> </ul>   |
|       |   |  | 165   |   |   |   |
|       |   |  | 166   | Plausibility fault SSI encoder connection (slave mode).                                     | Connected encoder type does not correspond to the configuration   | <ul style="list-style-type: none"> <li>• Check encoder connection and cabling.</li> <li>• Check encoder.</li> </ul>   |
|       |   |  | 167   |   |   |   |
|       |   |  | 186   | EMU1 monitoring fault.  | Faulty monitoring of the external shutdown channel.   | <ul style="list-style-type: none"> <li>• Check hardware connections.</li> <li>• Pick-up or release time too short.</li> <li>• Check switch contacts.</li> </ul>   |
|       |   |  | 187   |   |   |   |
| 188   | EMU2 monitoring fault.  | Faulty monitoring of the external shutdown channel.  | <ul style="list-style-type: none"> <li>• Check hardware connections.</li> <li>• Pick-up or release time too short.</li> <li>• Check switch contacts.</li> </ul>   |   |   |   |
| 189   |   |  |   |   |   |   |
| 109   | DCS alarm   | Display fault  | 190   | Plausibility fault position changeover.   | Position changeover during ZSC, JSS or DMC is permanently activated.  | <ul style="list-style-type: none"> <li>• Check ZSC (SOS) activation.</li> <li>• Check JSS (SDI) activation.</li> <li>• Check DMC (SDI) activation only for monitoring the position.</li> </ul>  |
|       |   |  | 191   |   |   |   |
|       |   |  | 192   | SSI encoder fault.  | Encoder step SSI value within one cycle is too large.   | <ul style="list-style-type: none"> <li>• Check encoder configuration.</li> <li>• Check encoder cabling.</li> </ul>  |
|       |   |  | 193   |   |   |   |
|       |   |  | 194   | SSI encoder fault.  | Plausibility fault for position adjustment.   | <ul style="list-style-type: none"> <li>• Check encoder configuration.</li> <li>• Check encoder cabling.</li> </ul>  |
|       |   |  | 195   |   |   |   |
|       |   |  | 196   | Plausibility fault of incremental encoder tracks.   | <ul style="list-style-type: none"> <li>• Different counting signals on A/B encoder tracks.</li> <li>• Defective component at RS485 interface.</li> <li>• Encoder operates outside tolerances of encoder interface.</li> </ul> | <ul style="list-style-type: none"> <li>• Check encoder configuration.</li> <li>• Check encoder cabling.</li> <li>• Check encoder signal levels.</li> <li>• Check maximum counting frequency of incremental encoder.</li> </ul>                |
|       |   |  | 197   |   |   |   |
|       |   |  | 198   | Plausibility fault analog/digital comparison at Schmitt trigger output – encoder input X84. | <ul style="list-style-type: none"> <li>• Connected encoder type does not correspond to the configuration.</li> <li>• Faulty encoder signals</li> <li>• Hardware defective</li> </ul>  | <ul style="list-style-type: none"> <li>• Check configuration.</li> <li>• Check connected encoder.</li> <li>• Replace DCS..B option.</li> <li>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics.</li> </ul> |
|       |   |  | 199   |   |   |   |
| 200   | Plausibility fault analog/digital comparison at Schmitt trigger output – encoder input X85. | <ul style="list-style-type: none"> <li>• Connected encoder type does not correspond to the configuration.</li> <li>• Faulty encoder signals</li> <li>• Hardware defective</li> </ul> | <ul style="list-style-type: none"> <li>• Check configuration.</li> <li>• Check connected encoder.</li> <li>• Replace DCS..B option.</li> <li>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics.</li> </ul> |   |   |   |
| 201   |   |  |   |   |   |   |

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| Fault |                           |                    | Subfault |   | Possible cause   | Measure  |   |   |
|-------|---------------------------|--------------------|----------|---|--|--|---|---|
| Code  | Designation               | Response (P)       | Code     | Designation   |  |  |   |   |
| 110   | "Ex-e protection" fault   | Emergency stop     | 0        | Duration of operation below 5 Hz exceeded                         | Duration of operation below 5 Hz exceeded  | <ul style="list-style-type: none"> <li>• Check configuration</li> <li>• Shorten duration of operation below 5 Hz</li> </ul>  |   |   |
| 113   | Analog input wire break   | No response (P)    | 0        | AI1 analog input wire break                                       | AI1 analog input wire break  | Check wiring   |   |   |
| 116   | "Timeout MOVI-PLC" fault  | Rapid stop/warning | 0        | MOVI-PLC® communication timeout                                   |  | <ul style="list-style-type: none"> <li>• Check startup</li> <li>• Check wiring</li> </ul>  |   |   |
| 122   | "Absolute encoder option" | Immediate stop     | 2        | X15: Unknown encoder type   | Connected encoder type unknown   | <ul style="list-style-type: none"> <li>• Encoder cable or shield not connected correctly</li> <li>• Short circuit / broken wire in encoder cable</li> <li>• Encoder defective</li> <li>• EMC interference</li> </ul> | <ul style="list-style-type: none"> <li>• Check encoder cable and shield for correct connection, short circuit and broken wire</li> <li>• Replace encoder</li> <li>• Providing for EMC measures</li> </ul> |   |
|       |                           |                    | 16386    | X14: Unknown encoder type   |  |  |   |   |
|       |                           |                    | 1        | X15: Plausibility monitoring                                      |  |  |   |   |
|       |                           |                    | 33       | X15: Analog voltages not within tolerance                         |  |  |   |   |
|       |                           |                    | 41 – 45  | X15: RS485 communication  |  |  |   |   |
|       |                           |                    | 60       | X15: Analog voltages not within tolerance                         |  |  |   |   |
|       |                           |                    | 63       | X15: Position fault, excessive speed, unable to generate position | <ul style="list-style-type: none"> <li>• Encoder cable or shield not connected correctly</li> <li>• Short circuit / broken wire in encoder cable</li> <li>• Encoder defective</li> <li>• EMC interference</li> </ul> |  |   | <ul style="list-style-type: none"> <li>• Check encoder cable and shield for correct connection, short circuit and broken wire</li> <li>• Replace encoder</li> <li>• Providing for EMC measures</li> </ul> |
|       |                           |                    | 256      | X15: Voltage dip  |  |  |   |   |
|       |                           |                    | 257      | X15: Interrupted clock or data line                               |  |  |   |   |
|       |                           |                    | 258      | X15: Change of position   |  |  |   |   |
|       |                           |                    | 261      | X15: No high level present  | <ul style="list-style-type: none"> <li>• Encoder cable or shield not connected correctly</li> <li>• Short circuit / broken wire in encoder cable</li> <li>• Encoder defective</li> <li>• EMC interference</li> </ul> |  |   | <ul style="list-style-type: none"> <li>• Check encoder cable and shield for correct connection, short circuit and broken wire</li> <li>• Replace encoder</li> <li>• Providing for EMC measures</li> </ul> |
|       |                           |                    | 513      | X15: Plausibility monitoring                                      |  |  |   |   |
|       |                           |                    | 768      | X15: PDO timeout  |  |  |   |   |
| 770   | X15: Change of position   |                    |          |   |  |  |   |   |

| Fault     |                           |                | Subfault      |   | Possible cause   | Measure   |
|-----------|---------------------------|----------------|---------------|---|--|---|
| Code      | Designation               | Response (P)   | Code          | Designation   |  |   |
| 122       | "Absolute encoder option" | Immediate stop | 16385         | X14: Plausibility monitoring                                      | <ul style="list-style-type: none"> <li>Encoder cable or shield not connected correctly</li> <li>Short circuit / broken wire in encoder cable</li> <li>Encoder defective</li> <li>EMC interference</li> </ul> | <ul style="list-style-type: none"> <li>Check encoder cable and shield for correct connection, short circuit and broken wire</li> <li>Replace encoder</li> <li>Providing for EMC measures</li> </ul> |
|           |                           |                | 16417         | X14: Analog voltages not within tolerance                         |  |   |
|           |                           |                | 16444         | X14: Analog voltages not within tolerance                         |  |   |
|           |                           |                | 16447         | X14: Position fault, excessive speed, unable to generate position |  |   |
|           |                           |                | 16425 – 16429 | X14: RS485 communication  | <ul style="list-style-type: none"> <li>Encoder cable or shield not connected correctly</li> <li>Short circuit / broken wire in encoder cable</li> <li>Encoder defective</li> <li>EMC interference</li> </ul> | <ul style="list-style-type: none"> <li>Check encoder cable and shield for correct connection, short circuit and broken wire</li> <li>Replace encoder</li> <li>Providing for EMC measures</li> </ul> |
|           |                           |                | 16640         | X14: Encoder's fault bit is set                                   |  |   |
|           |                           |                | 16641         | X14: Interrupted clock or data line                               |  |   |
|           |                           |                | 16642         | X14: Change of position   |  |   |
|           |                           |                | 16645         | X14: No high level present  | <ul style="list-style-type: none"> <li>Encoder cable or shield not connected correctly</li> <li>Short circuit / broken wire in encoder cable</li> <li>Encoder defective</li> <li>EMC interference</li> </ul> | <ul style="list-style-type: none"> <li>Check encoder cable and shield for correct connection, short circuit and broken wire</li> <li>Replace encoder</li> <li>Providing for EMC measures</li> </ul> |
|           |                           |                | 16897         | X14: Plausibility monitoring                                      |  |   |
|           |                           |                | 17152         | X14: PDO timeout  |  |   |
|           |                           |                | 17154         | X14: Change of position   |  |   |
|           |                           |                | 34 – 40       | X15: Internal encoder fault                                       | Internal encoder fault   | Replace encoder   |
|           |                           |                | 46 – 50       |   |  |   |
|           |                           |                | 64 – 67       |   |  |   |
| 514 – 544 |                           |                |               |   |  |   |
| 772 – 774 |                           |                |               |   |  |   |
|           |                           |                |               |   |  |   |
| 122       | "Absolute encoder option" | Immediate stop | 16418 – 16424 | X14: Internal encoder fault                                       | Internal encoder fault   | Replace encoder   |
|           |                           |                | 16430 – 16434 | X14: Internal encoder fault                                       |  |   |
|           |                           |                | 16448 – 16451 | X14: Internal encoder fault                                       |  |   |
|           |                           |                | 16898 – 16928 | X14: Internal encoder fault                                       |  |   |
|           |                           |                | 17156 – 17158 | X14: Internal encoder fault                                       |  |   |

# 7 Service

## Fault messages and list of faults

| Fault |                           |                    | Subfault |  | Possible cause  | Measure  |
|-------|---------------------------|--------------------|----------|--|---|--|
| Code  | Designation               | Response (P)       | Code     | Designation                                  |   |  |
| 122   | "Absolute encoder option" | Immediate stop     | 61       | X15: Critical transmitter current            | Soiled, transmitter broken  | Replace encoder  |
|       |                           |                    | 16445    | X14: Critical transmitter current            |   |  |
|       |                           |                    | 62       | X15: Critical encoder temperature            | Encoder temperature too high  | Reduce motor and ambient temperature   |
|       |                           |                    | 16446    | X14: Critical encoder temperature            |   |  |
|       |                           |                    | 259      | X15: Insufficient clock frequency            | Incorrect encoder parameterization  | Check encoder parameterization   |
|       |                           |                    | 260      | X15: Encoder signals programmable fault      |   |  |
|       |                           |                    | 576      | X15: Internal encoder warning                |   |  |
|       |                           |                    | 769      | X15: Encoder signals programmable fault      |   |  |
|       |                           |                    | 16643    | X14: Insufficient clock frequency            |   |  |
|       |                           |                    | 16644    | X14: Encoder signals programmable fault      |   |  |
|       |                           |                    | 16960    | X14: Internal encoder warning                |   |  |
|       |                           |                    | 17153    | X14: Encoder signals programmable fault      |   |  |
|       |                           |                    | 771      | X15: Emergency signal                        |   |  |
| 17155 | X14: Emergency signal     |                    |          |  |   |  |
| 123   | Positioning interruption  | Emergency stop (P) | 0        | Fault "Positioning/Positioning interruption" | Target monitoring when interrupted positioning process is resumed. Target would be overrun. | Perform positioning process without interruption until it is complete  |
| 124   | Ambient condition         | Emergency stop (P) | 1        | Permitted ambient temperature exceeded       | Ambient temperature > 60 °C   | <ul style="list-style-type: none"> <li>• Improve ventilation and cooling conditions</li> <li>• Improve air supply to the control cabinet; check filter mats</li> </ul> |

| Fault Code | Designation                                       | Response (P)  | Subfault |   | Possible cause   | Measure  |
|------------|---|---|----------|---|--|--|
|            |   |   | Code     | Designation   |  |  |
| 196        | Power section                                     | Immediate stop  | 1        | Discharge resistor  | Discharge resistor overload  | Observe waiting time for power on/off  |
|            |   |   | 2        | Hardware ID precharge/discharge control                     | Incorrect precharge/discharge controller variant   | <ul style="list-style-type: none"> <li>Consult SEW Service</li> <li>Replace precharge/discharge control</li> </ul>                               |
|            |   |   | 3        | Inverter coupling   | Defective inverter coupling  | <ul style="list-style-type: none"> <li>Consult SEW Service</li> <li>Replace inverter coupling</li> </ul>   |
|            |   |   | 4        | Inverter coupling reference voltage                         | Defective inverter coupling  | <ul style="list-style-type: none"> <li>Consult SEW Service</li> <li>Replace inverter coupling</li> </ul>   |
|            |   |   | 5        | Power sections configuration                                | Different phase modules installed in the unit  | <ul style="list-style-type: none"> <li>Inform the SEW Service</li> <li>Check and replace phase modules</li> </ul>                                |
|            |   |   | 6        | Control unit configuration                                  | Control unit line inverter or motor inverter incorrect   | Replace or correctly assign the control unit of line and motor inverter  |
|            |   |   | 7        | Communication power section control unit                    | No communication   | Check control unit installation  |
|            |   |   | 8        | Communication precharge/discharge control inverter coupling | No communication   | <ul style="list-style-type: none"> <li>Check the cabling.</li> <li>Consult SEW Service</li> </ul>  |
|            |   |   | 10       | Communication power section control unit                    | The inverter coupling does not support protocol  | Replace inverter coupling  |
|            |   |   | 11       | Communication power section control unit                    | Faulty communication with inverter coupling at power-up (CRC fault)                            | Replace inverter coupling  |
|            |   |   | 12       | Communication power section control unit                    | Inverter coupling uses protocol that does not match control unit                               | Replace inverter coupling  |
|            |   |   | 13       | Communication power section control unit                    | Faulty communication with inverter coupling during operation: more than 1 CRC fault per second | Replace inverter coupling  |
|            |   |   | 196      | Power section   | Immediate stop   | 14   |
| 15         | Inverter coupling fault                           | Inverter coupling processor has signaled internal fault   |          |   |  | <ul style="list-style-type: none"> <li>Consult SEW Service if the fault occurs again.</li> <li>Replace inverter coupling</li> </ul>              |
| 16         | Inverter coupling fault: PLD version incompatible |   |          |   |  | Replace inverter coupling  |
| 17         | Precharge/discharge control fault                 | Precharge/discharge control processor has signaled internal fault                                   |          |   |  | <ul style="list-style-type: none"> <li>Consult SEW Service if the fault occurs again.</li> <li>Replace precharge/discharge controller</li> </ul> |
| 18         | Defective DC link fan                             | Faulty DC link fan  |          |   |  | <ul style="list-style-type: none"> <li>Consult SEW Service</li> <li>Check whether DC link choke fan is connected or faulty</li> </ul>            |
| 19         | Communication power section control unit          | Faulty communication with inverter coupling during operation: more than 1 internal fault per second |          |   |  | <ul style="list-style-type: none"> <li>Consult SEW Service if the fault occurs again.</li> <li>Replace inverter coupling</li> </ul>              |
| 20         | Communication power section control unit          | The control unit has not sent any messages to the inverter coupling for a while                     |          |   |  | <ul style="list-style-type: none"> <li>Consult SEW Service if the fault occurs again.</li> <li>Replace inverter coupling</li> </ul>              |
| 21         | Uz measurement not plausible Phase R              | Defective phase module  |          |   |  | Consult SEW Service if the fault occurs again.   |
| 22         | Ur measurement not plausible Phase S              |   |          |   |  |  |
| 23         | Uz measurement not plausible Phase T              |   |          |   |  |  |

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## Service

### Fault messages and list of faults

| Fault |                  |                | Subfault |   | Possible cause                  | Measure   |
|-------|------------------|----------------|----------|---|---------------------------------|---|
| Code  | Designation      | Response (P)   | Code     | Designation   |                                 |   |
| 197   | Supply system    | Immediate stop | 1        | Line overvoltage (motor inverter only at start of pre-charging process) | Inadequate line voltage quality | <ul style="list-style-type: none"> <li>• Check supply (fuses, contactor)</li> <li>• Check configuration of the supply system</li> </ul>   |
|       |                  |                | 2        | Line undervoltage (only with line inverter)                             |                                 |   |
| 199   | DC link charging | Immediate stop | 4        | Precharging was aborted   | Unable to charge DC link        | <ul style="list-style-type: none"> <li>• Precontrol overload</li> <li>• Connected DC link capacity too high</li> <li>• Short circuit in the DC link; check DC link connection in case of several units</li> </ul> |



## 7.4 SEW-EURODRIVE electronics service

### 7.4.1 Sending a device in for repair

**Please contact the SEW-EURODRIVE electronics service if a fault cannot be rectified** (→ "Customer and spare parts service").

When you contact the SEW-EURODRIVE electronics service, always quote the digits on the status label so that our service personnel can assist you more effectively.

**Provide the following information when sending the device in for repair:**

- Serial number (→ nameplate)
- Type designation
- Standard version or application version
- Digits on the status label
- Short description of application (drive application, control via terminals or serial)
- Connected motor (motor type, motor voltage,  $\Delta$  or  $\star$  connection)
- Nature of the fault
- Accompanying circumstances
- Your own presumptions as to what has happened
- Any unusual events preceding the problem, etc.

## 7.5 Extended storage

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

**Procedure when maintenance has been neglected:**

Electrolytic capacitors are used in the inverters. They are subject to aging effects when de-energized. This effect can damage the capacitors if the device is connected using the rated voltage after a longer period of storage.

If you have not performed maintenance regularly, SEW-EURODRIVE recommends that you increase the line voltage slowly up to the maximum voltage. This can be done, for example, by using a variable transformer for which the output voltage has been set according to the following overview.

The following stages are recommended:

AC 400/500 V devices:

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

AC 230 V devices:

- Stage 1: AC 170 V for 15 minutes
- Stage 2: AC 200 V for 15 minutes
- Stage 3: AC 240 V for 1 hour

After you have completed the regeneration process, the device can be used immediately or stored again for an extended period with maintenance.

## 7.6 Waste disposal

Please follow the current instructions. Dispose of the following materials in accordance with the regulations in force:

- Electronics scrap (printed circuit boards)
- Plastic (housing)
- Sheet metal
- Copper

## 8 Technical data of basic device

### 8.1 CE marking, approvals

#### 8.1.1 CE marking

- Low Voltage Directive

MOVIDRIVE® MDX60B/61B drive inverters comply with the regulations of the Low Voltage Directive 2014/35/EU.

- Electromagnetic compatibility (EMC)

MOVIDRIVE® drive inverters and regenerative power supply units are designed for use as components for installation in machinery and systems. They comply with the EMC product standard EN 61800-3 "Variable-speed electrical drives". Provided that you comply with the installation instructions for the SEW components, the CE marking requirements for the entire machine/system in which they are installed are satisfied on the basis of the EMC directive 2014/30/EU. For detailed information on EMC compliant installation, refer to the documentation "Electromagnetic Compatibility in Drive Engineering" from SEW-EURODRIVE.

- Compliance with limit classes C1, C2 or C3 has been tested in a CE-typical drive system. SEW-EURODRIVE provides detailed information on request.



The CE mark on the nameplate indicates conformity with the low voltage directive 2014/35/EU. We can provide a declaration of conformity on request.

#### 8.1.2 UL / cUL / EAC



UL and cUL approval (USA) has been granted for the entire MOVIDRIVE® device series. Only the MOVIDRIVE® MDR60A1320-503-00 is not UL or cUL approved. cUL is equivalent to the CSA approval.



The MOVIDRIVE® device series meets the requirements of the technical regulations of the Customs Union of Russia, Kazakhstan, and Belarus.

The EAC marking on the nameplate certifies the conformity with the safety requirements of the Custom Union.

#### 8.1.3 RCM



RCM approval has been granted for the entire MOVIDRIVE® device family. RCM certifies conformity with ACMA (Australian Communications and Media Authority) standards.

#### 8.1.4 KC



The KC certificate is approved for size 0– 6 of the MOVIDRIVE® device family. The KC certificate states the registration with the Korean RRA (National Radio Research Agency).

## 8.2 General technical data

The following table lists the technical data applicable to all MOVIDRIVE® MDX60/61B drive inverters, regardless of their type, design, size, and power rating.

| MOVIDRIVE® MDX60B/61B   | All sizes  |
|---|--|
| Interference immunity   | Meets EN 61800-3   |
| Interference emission with EMC compliant installation   | Sizes 0 to 7 meet EN 61800-3<br>Sizes 0 to 5: According to limit value class C1 to EN 61800-3 with a corresponding line filter<br>Sizes 0, 1, 2S, and 2 in accordance with limit value class C2 to EN 61800-3 without additional measures<br>Size 6 and 7 in accordance with limit value class C2 to EN 61800-3 with corresponding line filter   |
| Ambient temperature $\vartheta_{amb}$   | 0 °C – +50 °C at $I_D = 100\% I_N$ and $f_{PWM} = 4$ kHz / size 7: 2.5 kHz<br>0 °C – +40 °C at $I_D = 125\% I_N$ and $f_{PWM} = 4$ kHz / size 7: 2.5 kHz<br>0 °C – +40 °C at $I_D = 100\% I_N$ and $f_{PWM} = 8$ kHz (size 0 – 6)<br>0 °C – +40 °C at $I_D = 100\% I_N$ and $f_{PWM} = 4$ kHz (size 7)   |
| $I_N$ reduction<br>Ambient temperature  | 2.5% $I_N$ per K at 40 °C to 50 °C<br>3% $I_N$ per K at 50 °C to 60 °C   |
| Climate class   | EN 60721-3-3 class 3K3   |
| Storage temperature <sup>1)</sup> $\vartheta_L$   | -25 °C – +70 °C (EN 60721-3-3, class 3K3)<br>DBG keypad: -20 °C – +60 °C   |
| Cooling type (DIN 41751)  | Forced cooling<br>(temperature-controlled fan, response threshold 45 °C)   |
| Degree of protection EN 60529 (NEMA1)<br>Sizes 0 to 2<br>Size 3<br>Sizes 4 to 5<br>Size 6<br>Size 7 | IP20<br>• IP10 without touch guard<br>• IP20 (power connections) with connected cable and installed heat shrink tubing (not included in the delivery) or with the delivered protection caps<br>IP00 (power connections)<br>IP10 (power connections) with<br>• fitted Plexiglas cover supplied as standard and<br>• fitted heat shrink tubing (not included in scope of delivery)<br>IP20 (power connections) with<br>• Mounted option DLB11B<br>IP00 (power connections)<br>IP10 (power connections) with<br>• fitted Plexiglas cover supplied as standard and<br>• fitted heat shrink tubing (not included in scope of delivery)<br>IP00 (power connections)<br>IP20 (power connections) with<br>• installed DLB21B touch guard |
| Operating mode  | Continuous duty with 50% overload capacity (size 0: 100%)  |
| Overvoltage category  | III according to IEC 60664-1 (VDE 0110-1)  |
| Pollution class   | 2 according to IEC 60664-1 (VDE 0110-1)  |
| Protection against mechanically active substances   | 3S1 DIN EN 60721-3-3 / IEC 721-3-3   |
| Protection against chemically active substances   | 3C2 DIN EN 60721-3-3 / IEC 721-3-3   |

| MOVIDRIVE® MDX60B/61B   | All sizes   |
|-------------------------|---|
| Installation altitude h | Up to $h \leq 1000$ m without restrictions.<br>The following restrictions apply at $h \geq 1000$ m: <ul style="list-style-type: none"> <li>• From 1,000 m to max. 4,000 m:                             <ul style="list-style-type: none"> <li>– <math>I_N</math> reduction by 1% per 100 m</li> </ul> </li> <li>• From 2,000 m to max. 4,000 m:                             <ul style="list-style-type: none"> <li>– The safe disconnection of power and electronics connections can no longer be assured above 2000 m. This requires external measures (IEC 60664-1/EN 61800-5-1)</li> <li>– You have to connect an overvoltage protection device in order to reduce the overvoltages from category III to category II.</li> </ul> </li> </ul> |

1) In case of extended storage, connect the device to the power supply for at least 5 minutes every two years, otherwise the device's service life may be reduced.



### 8.3 MOVIDRIVE® MDX60/61B...-5\_3 (AC 400/500 V units)

#### 8.3.1 MOVIDRIVE® MDX60/61B0005/0008/0011/0014 size 0 (AC 400/500 V devices)

| MOVIDRIVE® MDX60/61B  |                    | 0005-5A3-4-0_  | 0008-5A3-4-0_ | 0011-5A3-4-0_       | 0014-5A3-4-0_ |
|---|--------------------|--|---------------|---------------------|---------------|
| Size  |                    | 0S   |               | 0M                  |               |
| INPUT   |                    |  |               |                     |               |
| Nominal supply voltage (to EN 50160)  | $V_{line}$         | 3 × AC 380 V – 500 V   |               |                     |               |
| Line frequency  | $f_{line}$         | 50 Hz – 60 Hz ±5%  |               |                     |               |
| Nominal line current <sup>1)</sup> $I_{line}$   | 100%               | AC 1.8 A   | AC 2.2 A      | AC 2.8 A            | AC 3.6 A      |
| (at $V_{line} = 3 \times AC 400 V$ )  | 125%               | AC 2.3 A   | AC 2.7 A      | AC 3.5 A            | AC 4.5 A      |
| OUTPUT  |                    |  |               |                     |               |
| Apparent output power <sup>2)</sup><br>(at $V_{line} = 3 \times AC 380 - 500 V$ )                       | $S_N$              | 1.4 kVA  | 1.6 kVA       | 2.1 kVA             | 2.8 kVA       |
| Nominal output current <sup>1)</sup><br>(at $V_{line} = 3 \times AC 400 V$ )                            | $I_N$              | AC 2 A   | AC 2.4 A      | AC 3.1 A            | AC 4 A        |
| Continuous output current (= 125% $I_N$ )<br>(at $V_{line} = 3 \times AC 400 V$ and $f_{PWM} = 4 kHz$ ) | $I_D$              | AC 2.5 A   | AC 3 A        | AC 3.8 A            | AC 5 A        |
| Continuous output current (= 100% $I_N$ )<br>(at $V_{line} = 3 \times AC 400 V$ and $f_{PWM} = 8 kHz$ ) | $I_D$              | AC 2 A   | AC 2.4 A      | AC 3.1 A            | AC 4 A        |
| Max. output frequency   | $f_{max}$          | 599 Hz   |               |                     |               |
| Current limiting  | $I_{max}$          | Motor and generator mode 200% $I_N$ , duration depending on the capacity utilization |               |                     |               |
| Internal current limit  |                    | $I_{max} = 0 - 200\%$ adjustable   |               |                     |               |
| Permitted minimum braking resistance value<br>(4Q operation)  | $R_{BWmin}$        | 68 Ω   |               |                     |               |
| Output voltage  | $V_O$              | Max. $V_{line}$  |               |                     |               |
| PWM frequency   | $f_{PWM}$          | Adjustable: 4/8/12/16 kHz  |               |                     |               |
| Speed range/resolution  | $n_R / \Delta n_R$ | -6000 – 0 – +6000 min <sup>-1</sup> / 0.2 min <sup>-1</sup> over the entire range    |               |                     |               |
| GENERAL   |                    |  |               |                     |               |
| Power loss at $S_N$ <sup>2)</sup>   | $P_{Vmax}$         | 42 W   | 48 W          | 58 W                | 74 W          |
| Cooling air consumption   |                    | 3 m <sup>3</sup> /h  |               | 9 m <sup>3</sup> /h |               |
| Cross section of device terminals X1, X2, X3, X4  |                    | Separable terminal strips 4 mm <sup>2</sup> conductor end sleeve DIN 46228           |               |                     |               |
| Tightening torque   |                    | 0.6 Nm   |               |                     |               |

1) The system and output currents must be reduced by 20% from the nominal values for  $V_{line} = 3 \times AC 500 V$ .

2) The performance data applies to  $f_{PWM} = 4 kHz$ .

| MDX61B standard version  |           | 0005-5A3-4-00           | 0008-5A3-4-00      | 0011-5A3-4-00             | 0014-5A3-4-00      |
|--|-----------|-------------------------|--------------------|---------------------------|--------------------|
| Design with coated printed circuit boards  |           | 0005-5A3-4-00/L         | 0008-5A3-4-00/L    | 0011-5A3-4-00/L           | 0014-5A3-4-00/L    |
| Part number  |           | 8277222<br>8289476      | 8277230<br>8289484 | 8277249<br>8289492        | 8277257<br>8289506 |
| MDX61B Application version   |           | 0005-5A3-4-0T           | 0008-5A3-4-0T      | 0011-5A3-4-0T             | 0014-5A3-4-0T      |
| Design with coated printed circuit boards  |           | 0005-5A3-4-0T/L         | 0008-5A3-4-0T/L    | 0011-5A3-4-0T/L           | 0014-5A3-4-0T/L    |
| Part number  |           | 8277265<br>8289514      | 8277273<br>8289522 | 8277281<br>8289530        | 827729X<br>8289549 |
| Recommended motor power  |           |                         |                    |                           |                    |
|  Constant load  | $P_{Mot}$ | 0.55 kW                 | 0.75 kW            | 1.1 kW                    | 1.5 kW             |
|  Variable torque load or constant load without overload | $P_{Mot}$ | 0.75 kW                 | 1.1 kW             | 1.5 kW                    | 2.2 kW             |
| Mass   |           | 2.0 kg                  |                    | 2.5 kg                    |                    |
| Dimensions   | W × H × D | 45 mm × 317 mm × 260 mm |                    | 67.5 mm × 317 mm × 260 mm |                    |
| MDX61B standard version (VFC/CFC/SERVO)  |           | 0005-5A3-4-00           | 0008-5A3-4-00      | 0011-5A3-4-00             | 0014-5A3-4-00      |
| Design with coated printed circuit boards  |           | 0005-5A3-4-00/L         | 0008-5A3-4-00/L    | 0011-5A3-4-00/L           | 0014-5A3-4-00/L    |



|  |  |                                  |                                  |                                  |
|--|--|----------------------------------|----------------------------------|----------------------------------|
| Part number  | 8277303<br>8289557   | 8277311<br>8289565               | 827732X<br>8289573               | 8277338<br>8289581               |
| MDX61B technology version (VFC/CFC/SERVO)<br>Design with coated printed circuit boards | 0005-5A3-4-0T<br>0005-5A3-4-0T/L   | 0008-5A3-4-0T<br>0008-5A3-4-0T/L | 0011-5A3-4-0T<br>0011-5A3-4-0T/L | 0014-5A3-4-0T<br>0014-5A3-4-0T/L |
| Part number  | 8277346<br>8289603   | 8277354<br>8289611               | 8277362<br>8289638               | 8277370<br>8289646               |
| Mass   | 2.3 kg   |                                  | 2.8 kg                           |                                  |
| Dimensions   | W × H × D  | 72.5 mm × 317 mm × 260 mm        |                                  | 95 mm × 317 mm × 260 mm          |
| Recommended motor power  | → MOVIDRIVE® B system manual or catalog, chapter Basic recommendations for motor selection |                                  |                                  |                                  |

## 8.3.2 MOVIDRIVE® MDX61B0015/0022/0030/0040 size 1 (AC 400/500 V devices)

| MOVIDRIVE® MDX61B   |                    | 0015-5A3-4-0_  | 0022-5A3-4-0_ | 0030-5A3-4-0_ | 0040-5A3-4-0_ |
|---|--------------------|--|---------------|---------------|---------------|
| <b>INPUT</b>  |                    |  |               |               |               |
| Nominal supply voltage (to EN 50160)  | $V_{line}$         | 3 × AC 380 V – 500 V   |               |               |               |
| Line frequency  | $f_{line}$         | 50 Hz – 60 Hz ±5%  |               |               |               |
| Nominal line current <sup>1)</sup> $I_{line}$   | 100%               | AC 3.6 A   | AC 5.0 A      | AC 6.3 A      | AC 8.6 A      |
| (at $V_{line} = 3 \times AC 400 V$ )  | 125%               | AC 4.5 A   | AC 6.2 A      | AC 7.9 A      | AC 10.7 A     |
| <b>OUTPUT</b>   |                    |  |               |               |               |
| Apparent output power <sup>2)</sup><br>(at $V_{line} = 3 \times AC 380 - 500 V$ )                       | $S_N$              | 2.8 kVA  | 3.8 kVA       | 4.9 kVA       | 6.6 kVA       |
| Nominal output current <sup>1)</sup><br>(at $V_{line} = 3 \times AC 400 V$ )                            | $I_N$              | AC 4 A   | AC 5.5 A      | AC 7 A        | AC 9.5 A      |
| Continuous output current (= 125% $I_N$ )<br>(at $V_{line} = 3 \times AC 400 V$ and $f_{PWM} = 4 kHz$ ) | $I_D$              | AC 5 A   | AC 6.9 A      | AC 8.8 A      | AC 11.9 A     |
| Continuous output current (= 100% $I_N$ )<br>(at $V_{line} = 3 \times AC 400 V$ and $f_{PWM} = 8 kHz$ ) | $I_D$              | AC 4 A   | AC 5.5 A      | AC 7 A        | AC 9.5 A      |
| Max. output frequency   | $f_{max}$          | 599 Hz   |               |               |               |
| Current limiting  | $I_{max}$          | Motor and generator mode 150% $I_N$ , duration depending on the capacity utilization |               |               |               |
| Internal current limit  |                    | $I_{max} = 0 - 150\%$ adjustable   |               |               |               |
| Permitted minimum braking resistance value<br>(4Q operation)  | $R_{Bwmin}$        | 68 Ω   |               |               |               |
| Output voltage  | $V_O$              | Max. $V_{line}$  |               |               |               |
| PWM frequency   | $f_{PWM}$          | Adjustable: 4/8/12/16 kHz  |               |               |               |
| Speed range/resolution  | $n_R / \Delta n_R$ | -6000 – 0 – +6000 min <sup>-1</sup> / 0.2 min <sup>-1</sup> over the entire range    |               |               |               |
| <b>GENERAL</b>  |                    |  |               |               |               |
| Power loss at $S_N$ <sup>2)</sup>   | $P_{Vmax}$         | 85 W   | 105 W         | 130 W         | 180 W         |
| Cooling air consumption   |                    | 40 m <sup>3</sup> /h   |               |               |               |
| Mass  |                    | 3.5 kg   |               |               |               |
| Dimensions  | W × H × D          | 105 mm × 314 mm × 234 mm   |               |               |               |
| Cross section of device terminals X1, X2, X3, X4  |                    | Separable terminal strips 4 mm <sup>2</sup> conductor end sleeve DIN 46228           |               |               |               |
| Tightening torque   |                    | 0.6 Nm   |               |               |               |

1) The system and output currents must be reduced by 20% from the nominal values for  $V_{line} = 3 \times AC 500 V$ .

2) The performance data applies to  $f_{PWM} = 4 kHz$ .

| MDX61B standard design   |           | 0015-5A3-4-00  | 0022-5A3-4-00   | 0030-5A3-4-00   | 0040-5A3-4-00   |
|--|-----------|--|-----------------|-----------------|-----------------|
| Design with coated printed circuit boards  |           | 0015-5A3-4-00/L  | 0022-5A3-4-00/L | 0030-5A3-4-00/L | 0040-5A3-4-00/L |
| Part number  |           | 08279578   | 08279586        | 08279594        | 08279608        |
|  |           | 18400132   | 18400140        | 18400159        | 18400167        |
| MDX61B application version   |           | 0015-5A3-4-0T  | 0022-5A3-4-0T   | 0030-5A3-4-0T   | 0040-5A3-4-0T   |
| Design with coated printed circuit boards  |           | 0015-5A3-4-0T/L  | 0022-5A3-4-0T/L | 0030-5A3-4-0T/L | 0040-5A3-4-0T/L |
| Part number  |           | 08279756   | 08279764        | 08279772        | 08279780        |
|  |           | 18400310   | 18400329        | 18400337        | 18400345        |
| <b>Recommended motor power</b>   |           |  |                 |                 |                 |
|  Constant load  | $P_{Mot}$ | 1.5 kW   | 2.2 kW          | 3.0 kW          | 4.0 kW          |
|  Variable torque load or constant load without overload | $P_{Mot}$ | 2.2 kW   | 3.0 kW          | 4.0 kW          | 5.5 kW          |
| Recommended motor power  |           | → MOVIDRIVE® B system manual or catalog, chapter Basic recommendations for motor selection |                 |                 |                 |





8.3.3 MOVIDRIVE® MDX61B0055/0075/0110 size 2S, 2 (AC 400/500 V devices)

| MOVIDRIVE® MDX61B  |                    | 0055-5A3-4-0_  | 0075-5A3-4-0_ | 0110-5A3-4-0_   |
|--|--------------------|--|---------------|---|
| Size   |                    | 2S   |               | 2   |
| INPUT  |                    |  |               |   |
| Nominal supply voltage (to EN 50160)   | $V_{line}$         | 3 × AC 380 V – 500 V   |               |   |
| Line frequency   | $f_{line}$         | 50 Hz – 60 Hz ±5%  |               |   |
| Nominal line current <sup>1)</sup> $I_{line}$  | 100%               | AC 11.3 A  | AC 14.4 A     | AC 21.6 A   |
| (at $V_{line} = 3 \times AC 400 V$ )   | 125%               | AC 14.1 A  | AC 18.0 A     | AC 27.0 A   |
| OUTPUT   |                    |  |               |   |
| Apparent output power <sup>2)</sup><br>(at $V_{line} = 3 \times AC 380 - 500 V$ )                        | $S_N$              | 8.7 kVA  | 11.2 kVA      | 16.8 kVA  |
| Nominal output current <sup>1)</sup><br>(at $V_{line} = 3 \times AC 400 V$ )                             | $I_N$              | AC 12.5 A  | AC 16 A       | AC 24 A   |
| Continuous output current (= 125% $I_N$ )<br>(at $V_{line} = 3 \times AC 400 V$ with $f_{PWM} = 4 kHz$ ) | $I_D$              | AC 15.6 A  | AC 20 A       | AC 30 A   |
| Continuous output current (= 100% $I_N$ )<br>(at $V_{line} = 3 \times AC 400 V$ with $f_{PWM} = 8 kHz$ ) | $I_D$              | AC 12.5 A  | AC 16 A       | AC 24 A   |
| Max. output frequency  | $f_{max}$          | 599 Hz   |               |   |
| Current limiting   | $I_{max}$          | Motor and generator mode 150% $I_N$ , duration depending on the capacity utilization |               |   |
| Internal current limit   |                    | $I_{max} = 0 - 150\%$ adjustable   |               |   |
| Permitted minimum braking resistance value<br>(4Q operation)   | $R_{Bwmin}$        | 47 Ω   |               | 22 Ω  |
| Output voltage   | $V_O$              | Max. $V_{line}$  |               |   |
| PWM frequency  | $f_{PWM}$          | Adjustable: 4/8/12/16 kHz  |               |   |
| Speed range/resolution   | $n_R / \Delta n_R$ | -6000 – 0 – +6000 min <sup>-1</sup> / 0.2 min <sup>-1</sup> over the entire range    |               |   |
| GENERAL  |                    |  |               |   |
| Power loss at $S_N$ <sup>2)</sup>  | $P_{Vmax}$         | 180 W  | 230 W         | 400 W   |
| Cooling air consumption  |                    | 80 m <sup>3</sup> /h   |               |   |
| Mass   |                    | 6.6 kg   |               |   |
| Dimensions   | W × H × D          | 105 mm × 335 mm × 294 mm   |               | 130 mm × 315 mm × 285 mm  |
| Cross section of device terminals X1, X2, X3, X4   |                    | Terminal strips 4 mm <sup>2</sup> conductor end sleeve<br>DIN 46228                  |               | M4 screw and washer assembly<br>with terminal clip<br>4 mm <sup>2</sup> conductor end sleeve<br>DIN 46228<br>6 mm <sup>2</sup> crimp cable lug<br>DIN 46234 |
| Tightening torque  |                    | 0.6 Nm   |               | 1.5 Nm  |

1) The system and output currents must be reduced by 20% from the nominal values for  $V_{line} = 3 \times AC 500 V$ .

2) The performance data applies to  $f_{PWM} = 4 kHz$ .

|  |           |                      |                      |                      |
|--|-----------|----------------------|----------------------|----------------------|
| MDX61B standard design   |           | 0055-5A3-4-00        | 0075-5A3-4-00        | 0110-5A3-4-00        |
| Design with coated printed circuit boards  |           | 0055-5A3-4-00/L      | 0075-5A3-4-00/L      | 0110-5A3-4-00/L      |
| Part number  |           | 08279616<br>18400175 | 08279624<br>18400183 | 08279632<br>18400191 |
| MDX61B application version   |           | 0055-5A3-4-0T        | 0075-5A3-4-0T        | 0110-5A3-4-0T        |
| Design with coated printed circuit boards  |           | 0055-5A3-4-0T/L      | 0075-5A3-4-0T/L      | 0110-5A3-4-0T/L      |
| Part number  |           | 08279799<br>18400353 | 08279802<br>18400361 | 08279810<br>18400388 |
| Recommended motor power  |           |                      |                      |                      |
|  Constant load  | $P_{Mot}$ | 5.5 kW               | 7.5 kW               | 11 kW                |
|  Variable torque load or constant load without overload | $P_{Mot}$ | 7.5 kW               | 11 kW                | 15 kW                |

# 8

## Technical data of basic device

MOVIDRIVE® MDX60/61B...-5\_3 (AC 400/500 V units)



|                         |  |
|-------------------------|--|
| Recommended motor power | → MOVIDRIVE® B system manual or catalog, chapter Basic recommendations for motor selection |
|-------------------------|--|

8.3.4 MOVIDRIVE® MDX61B0150/0220/0300 size 3 (AC 400/500 V devices)

| MOVIDRIVE® MDX61B  |                    | 0150-503-4-0_  | 0220-503-4-0_ | 0300-503-4-0_ |
|--|--------------------|--|---------------|---------------|
| <b>INPUT</b>   |                    |  |               |               |
| Nominal supply voltage (to EN 50160)   | $V_{line}$         | 3 × AC 380 V – 500 V   |               |               |
| Line frequency   | $f_{line}$         | 50 Hz – 60 Hz ±5%  |               |               |
| Nominal line current <sup>1)</sup> $I_{line}$  | 100%               | AC 28.8 A  | AC 41.4 A     | AC 54 A       |
| (at $V_{line} = 3 \times AC 400 V$ )   | 125%               | AC 36 A  | AC 51.7 A     | AC 67.5 A     |
| <b>OUTPUT</b>  |                    |  |               |               |
| Apparent output power <sup>2)</sup><br>(at $V_{line} = 3 \times AC 380 - 500 V$ )                        | $S_N$              | 22.2 kVA   | 31.9 kVA      | 41.6 kVA      |
| Nominal output current <sup>1)</sup><br>(at $V_{line} = 3 \times AC 400 V$ )                             | $I_N$              | AC 32 A  | AC 46 A       | AC 60 A       |
| Continuous output current (= 125% $I_N$ )<br>(at $V_{line} = 3 \times AC 400 V$ with $f_{PWM} = 4 kHz$ ) | $I_D$              | AC 40 A  | AC 57.5 A     | AC 75 A       |
| Continuous output current (= 100% $I_N$ )<br>(at $V_{line} = 3 \times AC 400 V$ with $f_{PWM} = 8 kHz$ ) | $I_D$              | AC 32 A  | AC 46 A       | AC 60 A       |
| Max. output frequency  | $f_{max}$          | 599 Hz   |               |               |
| Current limiting   | $I_{max}$          | Motor and generator mode 150% $I_N$ , duration depending on the capacity utilization |               |               |
| Internal current limit   |                    | $I_{max} = 0 - 150\%$ adjustable   |               |               |
| Permitted minimum braking resistance value<br>(4Q operation)   | $R_{Bwmin}$        | 15 Ω   |               | 12 Ω          |
| Output voltage   | $V_O$              | Max. $V_{line}$  |               |               |
| PWM frequency  | $f_{PWM}$          | Adjustable: 4/8/12/16 kHz  |               |               |
| Speed range/resolution   | $n_R / \Delta n_R$ | -6000 – 0 – +6000 min <sup>-1</sup> / 0.2 min <sup>-1</sup> over the entire range    |               |               |
| <b>GENERAL</b>   |                    |  |               |               |
| Power loss at $S_N$ <sup>2)</sup>  | $P_{Vmax}$         | 550 W  | 750 W         | 950 W         |
| Cooling air consumption  |                    | 180 m <sup>3</sup> /h  |               |               |
| Mass   |                    | 15.0 kg  |               |               |
| Dimensions   | W × H × D          | 200 mm × 465 mm × 308 mm   |               |               |
| Cross section of device terminals X1, X2, X3, X4   |                    | M6 bolt with nut, max. 25 mm <sup>2</sup> , crimp cable lug DIN 46235                |               |               |
| Tightening torque  |                    | 3.5 Nm   |               |               |

1) The system and output currents must be reduced by 20% from the nominal values for  $V_{line} = 3 \times AC 500 V$ .

2) The performance data applies to  $f_{PWM} = 4 kHz$ .

| MDX61B standard design   | 0150-503-4-00        | 0220-503-4-00  | 0300-503-4-00        |       |
|--|----------------------|--|----------------------|-------|
| Design with coated printed circuit boards  | 0150-503-4-00/L      | 0220-503-4-00/L  | 0300-503-4-00/L      |       |
| Part number  | 08279640<br>18400205 | 08279659<br>18400213   | 08279667<br>18400221 |       |
| MDX61B application version   | 0150-503-4-0T        | 0220-503-4-0T  | 0300-503-4-0T        |       |
| Design with coated printed circuit boards  | 0150-503-4-0T/L      | 0220-503-4-0T/L  | 0300-503-4-0T/L      |       |
| Part number  | 08279829<br>18400396 | 08279837<br>18400418   | 08279845<br>18400426 |       |
| Recommended motor power  |                      |  |                      |       |
|  Constant load  | $P_{Mot}$            | 15 kW  | 22 kW                | 30 kW |
|  Variable torque load or constant load without overload | $P_{Mot}$            | 22 kW  | 30 kW                | 37 kW |
| Recommended motor power  |                      | → MOVIDRIVE® B system manual or catalog, chapter Basic recommendations for motor selection |                      |       |



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## 8.3.5 MOVIDRIVE® MDX61B0370/0450 size 4 (AC 400/500 V devices)

| MOVIDRIVE® MDX61B  |                    | 0370-503-4-0_  | 0450-503-4-0_ |
|--|--------------------|--|---------------|
| <b>INPUT</b>   |                    |  |               |
| Nominal supply voltage (to EN 50160)   | $V_{line}$         | 3 × AC 380 V – 500 V   |               |
| Line frequency   | $f_{line}$         | 50 Hz – 60 Hz ±5%  |               |
| Nominal line current <sup>1)</sup> $I_{line}$  | 100%               | AC 65.7 A  | AC 80.1 A     |
| (at $V_{line} = 3 \times AC 400 V$ )   | 125%               | AC 81.9 A  | AC 100.1 A    |
| <b>OUTPUT</b>  |                    |  |               |
| Apparent output power <sup>2)</sup><br>(at $V_{line} = 3 \times AC 380 - 500 V$ )                        | $S_N$              | 51.1 kVA   | 62.3 kVA      |
| Nominal output current <sup>1)</sup><br>(at $V_{line} = 3 \times AC 400 V$ )                             | $I_N$              | AC 73 A  | AC 89 A       |
| Continuous output current (= 125% $I_N$ )<br>(at $V_{line} = 3 \times AC 400 V$ with $f_{PWM} = 4 kHz$ ) | $I_D$              | AC 91 A  | AC 111 A      |
| Continuous output current (= 100% $I_N$ )<br>(at $V_{line} = 3 \times AC 400 V$ with $f_{PWM} = 8 kHz$ ) | $I_D$              | AC 73 A  | AC 89 A       |
| Max. output frequency  | $f_{max}$          | 599 Hz   |               |
| Current limiting   | $I_{max}$          | Motor and generator mode 150% $I_N$ , duration depending on the capacity utilization |               |
| Internal current limit   |                    | $I_{max} = 0 - 150\%$ adjustable   |               |
| Permitted minimum braking resistance value<br>(4Q operation)   | $R_{BWmin}$        | 6 Ω  |               |
| Output voltage   | $V_O$              | Max. $V_{line}$  |               |
| PWM frequency  | $f_{PWM}$          | Adjustable: 4/8/12/16 kHz  |               |
| Speed range/resolution   | $n_R / \Delta n_R$ | -6000 – 0 – +6000 min <sup>-1</sup> / 0.2 min <sup>-1</sup> over the entire range    |               |
| <b>GENERAL</b>   |                    |  |               |
| Power loss at $S_N$ <sup>2)</sup>  | $P_{Vmax}$         | 1200 W   | 1450 W        |
| Cooling air consumption  |                    | 180 m <sup>3</sup> /h  |               |
| Mass   |                    | 27 kg  |               |
| Dimensions   | W × H × D          | 280 mm × 522 mm × 307 mm   |               |
| Cross section of device terminals X1, X2, X3, X4   |                    | M10 bolt with nut<br>Max. 70 mm <sup>2</sup><br>Press cable lug DIN 46235            |               |
| Tightening torque  |                    | 14 Nm  |               |

1) The system and output currents must be reduced by 20% from the nominal values for  $V_{line} = 3 \times AC 500 V$ .

2) The performance data applies to  $f_{PWM} = 4 kHz$ .



|   |           |  |                 |
|---|-----------|--|-----------------|
| MDX61B standard design  |           | 0370-503-4-00  | 0450-503-4-00   |
| Design with coated printed circuit boards   |           | 0370-503-4-00/L  | 0450-503-4-00/L |
| Part number   |           | 08279675   | 08279683        |
|   |           | 18400248   | 18400256        |
| MDX61B application version  |           | 0370-503-4-0T  | 0450-503-4-0T   |
| Design with coated printed circuit boards   |           | 0370-503-4-0T/L  | 0450-503-4-0T/L |
| Part number   |           | 08279853   | 08279861        |
|   |           | 18400434   | 18400442        |
| <b>Recommended motor power</b>  |           |  |                 |
|  | $P_{Mot}$ | 37 kW  | 45 kW           |
| Constant load   |           |  |                 |
|  | $P_{Mot}$ | 45 kW  | 55 kW           |
| Variable torque load or constant load without overload                              |           |  |                 |
| Recommended motor power   |           | → MOVIDRIVE® B system manual or catalog, chapter Basic recommendations for motor selection |                 |

8.3.6 MOVIDRIVE® MDX61B0550/0750 size 5 (AC 400/500 V devices)

| MOVIDRIVE® MDX61B  |                    | 0550-503-4-0_  | 0750-503-4-0_ |
|--|--------------------|--|---------------|
| <b>INPUT</b>   |                    |  |               |
| Nominal supply voltage (to EN 50160)   | $V_{line}$         | 3 × AC 380 V – 500 V   |               |
| Line frequency   | $f_{line}$         | 50 Hz – 60 Hz ±5%  |               |
| Nominal line current <sup>1)</sup> $I_{line}$  | 100%               | AC 94.5 A  | AC 117 A      |
| (at $V_{line} = 3 \times AC 400 V$ )   | 125%               | AC 118.1 A   | AC 146.3 A    |
| <b>OUTPUT</b>  |                    |  |               |
| Apparent output power <sup>2)</sup><br>(at $V_{line} = 3 \times AC 380 - 500 V$ )                        | $S_N$              | 73.5 kVA   | 91.0 kVA      |
| Nominal output current <sup>1)</sup><br>(at $V_{line} = 3 \times AC 400 V$ )                             | $I_N$              | AC 105 A   | AC 130 A      |
| Continuous output current (= 125% $I_N$ )<br>(at $V_{line} = 3 \times AC 400 V$ with $f_{PWM} = 4 kHz$ ) | $I_D$              | AC 131 A   | AC 162 A      |
| Continuous output current (= 100% $I_N$ )<br>(at $V_{line} = 3 \times AC 400 V$ with $f_{PWM} = 8 kHz$ ) | $I_D$              | AC 105 A   | AC 130 A      |
| Max. output frequency  | $f_{max}$          | 599 Hz   |               |
| Current limiting   | $I_{max}$          | Motor and generator mode 150% $I_N$ , duration depending on the capacity utilization |               |
| Internal current limit   |                    | $I_{max} = 0 - 150\%$ adjustable   |               |
| Permitted minimum braking resistance value<br>(4Q operation)   | $R_{Bwmin}$        | 6 Ω  | 4 Ω           |
| Output voltage   | $V_O$              | Max. $V_{line}$  |               |
| PWM frequency  | $f_{PWM}$          | Adjustable: 4/8/12/16 kHz  |               |
| Speed range/resolution   | $n_R / \Delta n_R$ | -6000 – 0 – +6000 min <sup>-1</sup> / 0.2 min <sup>-1</sup> over the entire range    |               |
| <b>GENERAL</b>   |                    |  |               |
| Power loss at $S_N$ <sup>2)</sup>  | $P_{Vmax}$         | 1700 W   | 2000 W        |
| Cooling air consumption  |                    | 360 m <sup>3</sup> /h  |               |
| Mass   |                    | 35 kg  |               |
| Dimensions   | W × H × D          | 280 mm × 610 mm × 330 mm   |               |
| Cross section of device terminals X1, X2, X3, X4   |                    | M10 bolt with nut<br>Max. 70 mm <sup>2</sup><br>Press cable lug DIN 46235            |               |
| Tightening torque  |                    | 14 Nm  |               |

1) The system and output currents must be reduced by 20% from the nominal values for  $V_{line} = 3 \times AC 500 V$ .

2) The performance data applies to  $f_{PWM} = 4 kHz$ .



|   |           |  |                 |
|---|-----------|--|-----------------|
| MDX61B standard design  |           | 0550-503-4-00  | 0750-503-4-00   |
| Design with coated printed circuit boards   |           | 0550-503-4-00/L  | 0750-503-4-00/L |
| Part number   |           | 08279691   | 08279705        |
|   |           | 18400264   | 18400272        |
| MDX61B application version  |           | 0550-503-4-0T  | 0750-503-4-0T   |
| Design with coated printed circuit boards   |           | 0550-503-4-0T/L  | 0750-503-4-0T/L |
| Part number   |           | 08279888   | 08279896        |
|   |           | 18400450   | 18400469        |
| <b>Recommended motor power</b>  |           |  |                 |
|  | $P_{Mot}$ | 55 kW  | 75 kW           |
| Constant load   |           |  |                 |
|  | $P_{Mot}$ | 75 kW  | 90 kW           |
| Variable torque load or constant load without overload                              |           |  |                 |
| Recommended motor power   |           | → MOVIDRIVE® B system manual or catalog, chapter Basic recommendations for motor selection |                 |

## 8.3.7 MOVIDRIVE® MDX61B0900/1100/1320 size 6 (AC 400/500 V devices)

| MOVIDRIVE® MDX61B   |                    | 0900-503-4-0_  | 1100-503-4-0_ | 1320-503-4-0_ |
|---|--------------------|--|---------------|---------------|
| <b>INPUT</b>  |                    |  |               |               |
| Nominal supply voltage (to EN 50160)  | $V_{line}$         | 3 × AC 380 V – 500 V   |               |               |
| Line frequency  | $f_{line}$         | 50 Hz – 60 Hz ±5%  |               |               |
| Nominal line current <sup>1)</sup> $I_{line}$   | 100%               | AC 153 A   | AC 180 A      | AC 225 A      |
| (at $V_{line} = 3 \times AC 400 V$ )  | 125%               | AC 191 A   | AC 225 A      | AC 281 A      |
| <b>OUTPUT</b>   |                    |  |               |               |
| Apparent output power <sup>2)</sup><br>(at $V_{line} = 3 \times AC 380 - 500 V$ )   | $S_N$              | 118 kVA  | 139 kVA       | 174 kVA       |
| Nominal output current <sup>1)</sup><br>(at $V_{line} = 3 \times AC 400 V$ )  | $I_N$              | AC 170 A   | AC 200 A      | AC 250 A      |
| Continuous output current (= 125 % $I_N$ )<br>(at $V_{line} = 3 \times AC 400 V$ with $f_{PWM} = 4 kHz$ )<br>Temperature range 0 °C – +40 °C      | $I_D$              | AC 212 A   | AC 250 A      | AC 312 A      |
| Continuous output current (= 100% $I_N$ ) $I_D$<br>(at $V_{line} = 3 \times AC 400 V$ with $f_{PWM} = 8 kHz$ )<br>Temperature range 0 °C – +50 °C | $I_D$              | AC 170 A   | AC 200 A      | AC 250 A      |
| Max. output frequency   | $f_{max}$          | 599 Hz   |               |               |
| Current limiting  | $I_{max}$          | Motor and generator mode 150% $I_N$ , duration depending on the capacity utilization |               |               |
| Internal current limit  |                    | $I_{max} = 0 - 150\%$ adjustable   |               |               |
| Permitted minimum braking resistance value<br>(4Q operation)  | $R_{BWmin}$        | 2.7 Ω  |               |               |
| Output voltage  | $V_O$              | Max. $V_{line}$  |               |               |
| PWM frequency   | $f_{PWM}$          | Adjustable: 4 oder 8 kHz   |               |               |
| Speed range/resolution  | $n_R / \Delta n_R$ | -6000 – 0 – +6000 min <sup>-1</sup> / 0.2 min <sup>-1</sup> over the entire range    |               |               |
| <b>GENERAL</b>  |                    |  |               |               |
| Power loss at $S_N$ <sup>2)</sup>   | $P_{Vmax}$         | 1983 W   | 2240 W        | 2700 W        |
| Cooling air consumption   |                    | 600 m <sup>3</sup> /h  |               |               |
| Mass  |                    | 60 kg  |               |               |
| Dimensions  | W × H × D          | 280 mm × 1000 mm × 382 mm  |               |               |
| Cross section of device terminals X1, X2, X3, X4  |                    | M12 bolt with nut<br>Max. 185 mm <sup>2</sup><br>Press cable lug DIN 46235           |               |               |
| Tightening torque   |                    | 20 Nm  |               |               |

1) The system and output currents must be reduced by 20% from the nominal values for  $V_{line} = 3 \times AC 500 V$ .

2) The performance data applies to  $f_{PWM} = 4 kHz$ .



| MDX61B standard design  |           | 0900-503-4-00  | 1100-503-4-00   | 1320-503-4-00   |
|---|-----------|--|-----------------|-----------------|
| Design with coated printed circuit boards   |           | 0900-503-4-00/L  | 1100-503-4-00/L | 1320-503-4-00/L |
| Part number   |           | 08279713   | 08279721        | 08279748        |
|   |           | 18400280   | 18400299        | 18400302        |
| MDX61B application version  |           | 0900-503-4-0T  | 1100-503-4-0T   | 1320-503-4-0T   |
| Design with coated printed circuit boards   |           | 0900-503-4-0T/L  | 1100-503-4-0T/L | 1320-503-4-0T/L |
| Part number   |           | 08279918   | 08279926        | 08279934        |
|   |           | 18400477   | 18400485        | 18400493        |
| <b>Recommended motor power</b>  |           |  |                 |                 |
|  | $P_{Mot}$ | 90 kW  | 110 kW          | 132 kW          |
| Constant load   |           |  |                 |                 |
|  | $P_{Mot}$ | 110 kW   | 132 kW          | 160 kW          |
| Variable torque load or constant load without overload                              |           |  |                 |                 |
| Recommended motor power   |           | → MOVIDRIVE® B system manual or catalog, chapter Basic recommendations for motor selection |                 |                 |

8.3.8 MOVIDRIVE® MDX61B1600/2000/2500 size 7 (AC 400/500 V devices)

| MOVIDRIVE® MDX61B   |                    | 1600-503-2-0T/L<br>1600-503-4-0T/L  | 2000-503-2-0T/L<br>2000-503-4-0T/L | 2500-503-2-0T/L<br>2500-503-4-0T/L |
|---|--------------------|---|------------------------------------|------------------------------------|
| <b>INPUT</b>  |                    |   |                                    |                                    |
| Nominal supply voltage (to EN 50160)  | $V_{line}$         | 3 × AC 380 V – 500 V  |                                    |                                    |
| Line frequency  | $f_{line}$         | 50 Hz – 60 Hz ±5%   |                                    |                                    |
| Nominal line current <sup>1)</sup> $I_{line}$   | 100%               | AC 280 A  | AC 340 A                           | AC 435 A                           |
| (at $V_{line} = 3 \times AC 400 V$ )  | 125%               | AC 340 A  | AC 425 A                           | AC 535 A                           |
| <b>OUTPUT</b>   |                    |   |                                    |                                    |
| Maximum output voltage  |                    | 599 Hz  | 599 Hz                             | 599 Hz                             |
| Apparent output power <sup>2)</sup><br>(at $V_{line} = 3 \times AC 380 - 500 V$ )   | $S_N$              | 208 kVA   | 263 kVA                            | 326 kVA                            |
| Nominal output current <sup>1)</sup><br>(at $V_{line} = 3 \times AC 400 V$ )  | $I_N$              | AC 300 A  | AC 380 A                           | AC 470 A                           |
| Continuous output current (= 125% $I_N$ )<br>(at $V_{line} = 3 \times AC 400 V$ with $f_{PWM} = 2.5 kHz$ )<br>Temperature range 0 °C – +40 °C | $I_D$              | AC 375 A  | AC 475 A                           | AC 588 A                           |
| Continuous output current (= 100% $I_N$ )<br>(at $V_{line} = 3 \times AC 400 V$ with $f_{PWM} = 2.5 kHz$ )<br>Temperature range 0 °C – +50 °C | $I_D$              | AC 300 A  | AC 380 A                           | AC 470 A                           |
| Max. output frequency   | $f_{max}$          | 599 Hz  |                                    |                                    |
| Current limiting  | $I_{max}$          | Motor and generator mode 150% $I_N$ , duration depending on the capacity utilization  |                                    |                                    |
| Internal current limit  |                    | $I_{max} = 0 - 150\%$ adjustable  |                                    |                                    |
| Permitted minimum braking resistance value<br>(4Q operation)  | $R_{BWmin}$        | 1.1 Ω   |                                    |                                    |
| Output voltage  | $V_O$              | Max. $V_{line}$   |                                    |                                    |
| PWM frequency   | $f_{PWM}$          | Adjustable: 2.5 or 4 kHz possible   |                                    |                                    |
| Speed range/resolution  | $n_R / \Delta n_R$ | -6000 – 0 – +6000 min <sup>-1</sup> / 0.2 min <sup>-1</sup> over the entire range   |                                    |                                    |
| <b>GENERAL</b>  |                    |   |                                    |                                    |
| Power loss at $S_N$ <sup>2)</sup>   | $P_{Vmax}$         | 2691 W  | 3182 W                             | 3880 W                             |
| Cooling air consumption   |                    | 1200 m <sup>3</sup> /h  |                                    |                                    |
| Mass  |                    | 2Q design: 260 kg<br>4Q variant: 280 kg   |                                    |                                    |
| Dimensions  | W × H × D          | 700 mm × 1490 mm × 470 mm   |                                    |                                    |
| Conductor rails X1, X2, X3  |                    | Connection rail with bore for M12<br>Max. 2 × 240 mm <sup>2</sup><br>Press cable lug DIN 46235  |                                    |                                    |
| Tightening torque   |                    | 70 Nm   |                                    |                                    |
| Connections of the DC 24 V power supply unit (PE L1 L2 L3)  |                    | Cross section: 6 mm <sup>2</sup><br>Tightening torque ≤ 4 mm <sup>2</sup> = 0.5 Nm<br>Tightening torque > 4 mm <sup>2</sup> = 0.7 Nm – 0.8 Nm |                                    |                                    |

1) The system and output currents must be reduced by 20% from the nominal values for  $V_{line} = 3 \times AC 500 V$ .

2) The performance data applies to  $f_{PWM} = 2.5 kHz$ .

| MDX61B application version  |           | 1600-503-2-0T/L  | 2000-503-2-0T/L | 2500-503-2-0T/L |
|---|-----------|--|-----------------|-----------------|
| With coated printed circuit boards  |           | 1600-503-4-0T/L  | 2000-503-4-0T/L | 2500-503-4-0T/L |
| Part number   |           | 08299765   | 08299773        | 08299781        |
|   |           | 08299803   | 08299811        | 08299838        |
| <b>Recommended motor power</b>  |           |  |                 |                 |
|  | $P_{Mot}$ | 160 kW   | 200 kW          | 250 kW          |
| Constant load   |           |  |                 |                 |
|  | $P_{Mot}$ | 200 kW   | 250 kW          | 315 kW          |
| Variable torque load or constant load without overload                              |           |  |                 |                 |
| Recommended motor power   |           | → MOVIDRIVE® B system manual or catalog, chapter Basic recommendations for motor selection |                 |                 |



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## 8.4 MOVIDRIVE® MDX61B...-2\_3 (AC 230 V units)

## 8.4.1 MOVIDRIVE® MDX61B0015/0022/0037 size 1 (AC 230 V devices)

| MOVIDRIVE® MDX61B  |                    | 0015-2A3-4-0_  | 0022-2A3-4-0_ | 0037-2A3-4-0_ |
|--|--------------------|--|---------------|---------------|
| INPUT  |                    |  |               |               |
| Nominal supply voltage (to EN 50160)   | $V_{line}$         | 3 × AC 200 V - 240 V   |               |               |
| Line frequency   | $f_{line}$         | 50 Hz – 60 Hz ±5%  |               |               |
| Nominal supply current $I_{line}$  | 100%               | AC 6.7 A   | AC 7.8 A      | AC 12.9 A     |
| (at $V_{line} = 3 \times AC 230 V$ )   | 125%               | AC 8.4 A   | AC 9.8 A      | AC 16.1 A     |
| OUTPUT   |                    |  |               |               |
| Apparent output power <sup>1)</sup><br>(at $V_{line} = 3 \times AC 380 - 240 V$ )                        | $S_N$              | 2.7 kVA  | 3.4 kVA       | 5.8 kVA       |
| Nominal output current<br>(at $V_{line} = 3 \times AC 230 V$ )   | $I_N$              | AC 7.3 A   | AC 8.6 A      | AC 14.5 A     |
| Continuous output current (= 125% $I_N$ )<br>(at $V_{line} = 3 \times AC 230 V$ with $f_{PWM} = 4 kHz$ ) | $I_D$              | AC 9.1 A   | AC 10.8 A     | AC 18.1 A     |
| Continuous output current (= 100% $I_N$ )<br>(at $V_{line} = 3 \times AC 230 V$ with $f_{PWM} = 8 kHz$ ) | $I_D$              | AC 7.3 A   | AC 8.6 A      | AC 14.5 A     |
| Max. output frequency  | $f_{max}$          | 599 Hz   |               |               |
| Current limiting   | $I_{max}$          | Motor and generator mode 150% $I_N$ , duration depending on the capacity utilization |               |               |
| Internal current limit   |                    | $I_{max} = 0 - 150\%$ adjustable   |               |               |
| Minimum permitted braking resistor value<br>(4Q operation)   | $R_{BWmin}$        | 27 $\Omega$  |               |               |
| Output voltage   | $V_O$              | Max. $V_{line}$  |               |               |
| PWM frequency  | $f_{PWM}$          | Adjustable: 4/8/12/16 kHz  |               |               |
| Speed range/resolution   | $n_R / \Delta n_R$ | -6000 – 0 – +6000 $min^{-1}$ / 0.2 $min^{-1}$ over the entire range                  |               |               |
| GENERAL  |                    |  |               |               |
| Power loss at $S_N$ <sup>1)</sup>  | $P_{Vmax}$         | 126 W  | 142 W         | 210 W         |
| Cooling air consumption  |                    | 40 $m^3/h$   |               |               |
| Mass   |                    | 2.8 kg   |               |               |
| Dimensions   | W × H × D          | 105 mm × 314 mm × 234 mm   |               |               |
| Cross section of device terminals X1, X2, X3, X4   |                    | Separable terminal strip<br>4 $mm^2$ conductor end sleeve DIN 46228                  |               |               |
| Tightening torque  |                    | 0.6 Nm   |               |               |

1) The performance data applies to  $f_{PWM} = 4 kHz$ .



| MDX61B standard design   |           | 0015-2A3-4-00   | 0022-2A3-4-00 | 0037-2A3-4-00 |
|--|-----------|---|---------------|---------------|
| Part number  |           | 08279942  | 08279950      | 08279969      |
| MDX61B application version   |           |   |               |               |
| Part number  |           | 0015-2A3-4-0T   | 0022-2A3-4-0T | 0037-2A3-4-0T |
| Part number  |           | 08280037  | 08280045      | 08280053      |
| Recommended motor power  |           |   |               |               |
|  Constant load  | $P_{Mot}$ | 1.5 kW  | 2.2 kW        | 3.7 kW        |
|  Variable torque load or constant load without overload | $P_{Mot}$ | 2.2 kW  | 3.7 kW        | 5.0 kW        |
| Recommended motor power  |           | → MOVIDRIVE® B system manual, chapter Basic recommendations for motor selection |               |               |



8.4.2 MOVIDRIVE® MDX61B0055/0075 size 2 (AC 230 V devices)

| MOVIDRIVE® MDX61B  |                    | 0055-2A3-4-0_  | 0075-2A3-4-0_ |
|--|--------------------|--|---------------|
| <b>INPUT</b>   |                    |  |               |
| Nominal supply voltage (to EN 50160)   | $V_{line}$         | 3 × AC 200 V - 240 V   |               |
| Line frequency   | $f_{line}$         | 50 Hz – 60 Hz ±5%  |               |
| Nominal supply current $I_{line}$  | 100%               | AC 19.5 A  | AC 27.4 A     |
| (at $V_{line} = 3 \times AC 230 V$ )   | 125%               | AC 24.4 A  | AC 34.3 A     |
| <b>OUTPUT</b>  |                    |  |               |
| Apparent output power <sup>1)</sup><br>(at $V_{line} = 3 \times AC 380 - 240 V$ )                        | $S_N$              | 8.8 kVA  | 11.6 kVA      |
| Nominal output current<br>(at $V_{line} = 3 \times AC 230 V$ )   | $I_N$              | AC 22 A  | AC 29 A       |
| Continuous output current (= 125% $I_N$ )<br>(at $V_{line} = 3 \times AC 230 V$ with $f_{PWM} = 4 kHz$ ) | $I_D$              | AC 27.5 A  | AC 36.3 A     |
| Continuous output current (= 100% $I_N$ )<br>(at $V_{line} = 3 \times AC 230 V$ with $f_{PWM} = 8 kHz$ ) | $I_D$              | AC 22 A  | AC 29 A       |
| Max. output frequency  | $f_{max}$          | 599 Hz   |               |
| Current limiting   | $I_{max}$          | Motor and generator mode 150% $I_N$ , duration depending on the capacity utilization   |               |
| Internal current limit   |                    | $I_{max} = 0 - 150\%$ adjustable   |               |
| Permitted minimum braking resistance value<br>(4Q operation)   | $R_{Bwmin}$        | 12 Ω   |               |
| Output voltage   | $V_O$              | Max. $V_{line}$  |               |
| PWM frequency  | $f_{PWM}$          | Adjustable: 4/8/12/16 kHz  |               |
| Speed range/resolution   | $n_R / \Delta n_R$ | -6000 – 0 – +6000 min <sup>-1</sup> / 0.2 min <sup>-1</sup> over the entire range  |               |
| <b>GENERAL</b>   |                    |  |               |
| Power loss at $S_N$ <sup>1)</sup>  | $P_{Vmax}$         | 330 W  | 423 W         |
| Cooling air consumption  |                    | 80 m <sup>3</sup> /h   |               |
| Mass   |                    | 5.9 kg   |               |
| Dimensions   | W × H × D          | 130 mm × 315 mm × 285 mm   |               |
| Cross section of device terminals X1, X2, X3, X4   |                    | M4 screw and washer assembly with terminal clip<br>4 mm <sup>2</sup> conductor end sleeve DIN 46228<br>6 mm <sup>2</sup> crimp cable lug DIN 46234 |               |
| Tightening torque  |                    | 1.5 Nm   |               |



1) The performance data applies to  $f_{PWM} = 4 kHz$ .

|   |           |   |               |
|---|-----------|---|---------------|
| MDX61B standard design  |           | 0055-2A3-4-00   | 0075-2A3-4-00 |
| Part number   |           | 08279977  | 08279985      |
| MDX61B application version  |           | 0055-2A3-4-0T   | 0075-2A3-4-0T |
| Part number   |           | 08280061  | 08280088      |
| <b>Recommended motor power</b>  |           |   |               |
|  | $P_{Mot}$ | 5.5 kW  | 7.5 kW        |
| Constant load   |           |   |               |
|  | $P_{Mot}$ | 7.5 kW  | 11 kW         |
| Variable torque load or constant load without overload                              |           |   |               |
| Recommended motor power   |           | → MOVIDRIVE® B system manual, chapter Basic recommendations for motor selection |               |

## 8.4.3 MOVIDRIVE® MDX61B0110/0150 size 3 (AC 230 V devices)

| MOVIDRIVE® MDX61B  |                    | 0110-203-4-0_  | 0150-203-4-0_ |
|--|--------------------|--|---------------|
| INPUT  |                    |  |               |
| Nominal supply voltage (to EN 50160)   | $V_{line}$         | 3 × AC 200 V - 240 V   |               |
| Line frequency   | $f_{line}$         | 50 Hz – 60 Hz ±5%  |               |
| Nominal supply current $I_{line}$  | 100%               | AC 40 A  | AC 49 A       |
| (at $V_{line} = 3 \times AC 230 V$ )   | 125%               | AC 50 A  | AC 61 A       |
| OUTPUT   |                    |  |               |
| Apparent output power <sup>1)</sup><br>(at $V_{line} = 3 \times AC 380 - 240 V$ )                        | $S_N$              | 17.1 kVA   | 21.5 kVA      |
| Nominal output current<br>(at $V_{line} = 3 \times AC 230 V$ )   | $I_N$              | AC 42 A  | AC 54 A       |
| Continuous output current (= 125% $I_N$ )<br>(at $V_{line} = 3 \times AC 230 V$ with $f_{PWM} = 4 kHz$ ) | $I_D$              | AC 52.5 A  | AC 67.5 A     |
| Continuous output current (= 100% $I_N$ )<br>(at $V_{line} = 3 \times AC 230 V$ with $f_{PWM} = 8 kHz$ ) | $I_D$              | AC 42 A  | AC 54 A       |
| Max. output frequency  | $f_{max}$          | 599 Hz   |               |
| Current limiting   | $I_{max}$          | Motor and generator mode 150% $I_N$ , duration depending on the capacity utilization |               |
| Internal current limit   |                    | $I_{max} = 0 - 150\%$ adjustable   |               |
| Permitted minimum braking resistance value<br>(4Q operation)   | $R_{BWmin}$        | 7.5 Ω  | 5.6 Ω         |
| Output voltage   | $V_O$              | Max. $V_{line}$  |               |
| PWM frequency  | $f_{PWM}$          | Adjustable: 4/8/12/16 kHz  |               |
| Speed range/resolution   | $n_R / \Delta n_R$ | -6000 – 0 – +6000 min <sup>-1</sup> / 0.2 min <sup>-1</sup> over the entire range    |               |
| GENERAL  |                    |  |               |
| Power loss at $S_N$ <sup>1)</sup>  | $P_{Vmax}$         | 580 W  | 760 W         |
| Cooling air consumption  |                    | 180 m <sup>3</sup> /h  |               |
| Mass   |                    | 14.3 kg  |               |
| Dimensions   | W × H × D          | 200 mm × 465 mm × 308 mm   |               |
| Cross section of device terminals X1, X2, X3, X4   |                    | M6 bolt with nut, max. 25 mm <sup>2</sup> , crimp cable lug DIN 46235                |               |
| Tightening torque  |                    | 3.5 Nm   |               |



1) The performance data applies to  $f_{PWM} = 4 kHz$ .

| MDX61B standard design  |           | 0110-203-4-00   | 0150-203-4-00 |
|---|-----------|---|---------------|
| Part number   |           | 08279993  | 08280002      |
| MDX61B application version  |           | 0110-203-4-0T   | 0150-203-4-0T |
| Part number   |           | 08280096  | 08280118      |
| Recommended motor power   |           |   |               |
|  | $P_{Mot}$ | 11 kW   | 15 kW         |
| Constant load   |           |   |               |
|  | $P_{Mot}$ | 15 kW   | 22 kW         |
| Variable torque load or constant load without overload                              |           |   |               |
| Recommended motor power   |           | → MOVIDRIVE® B system manual, chapter Basic recommendations for motor selection |               |

8.4.4 MOVIDRIVE® MDX61B0220/0300 size 4 (AC 230 V devices)

| MOVIDRIVE® MDX61B  |                    | 0220-203-4-0_  | 0300-203-4-0_ |
|--|--------------------|--|---------------|
| <b>INPUT</b>   |                    |  |               |
| Nominal supply voltage (to EN 50160)   | $V_{line}$         | 3 × AC 200 V - 240 V   |               |
| Line frequency   | $f_{line}$         | 50 Hz – 60 Hz ±5%  |               |
| Nominal supply current $I_{line}$  | 100%               | AC 72 A  | AC 86 A       |
| (at $V_{line} = 3 \times AC 230 V$ )   | 125%               | AC 90 A  | AC 107 A      |
| <b>OUTPUT</b>  |                    |  |               |
| Apparent output power <sup>1)</sup><br>(at $V_{line} = 3 \times AC 380 - 240 V$ )                        | $S_N$              | 31.9 kVA   | 37.8 kVA      |
| Nominal output current<br>(at $V_{line} = 3 \times AC 230 V$ )   | $I_N$              | AC 80 A  | AC 95 A       |
| Continuous output current (= 125% $I_N$ )<br>(at $V_{line} = 3 \times AC 230 V$ with $f_{PWM} = 4 kHz$ ) | $I_D$              | AC 100 A   | AC 118 A      |
| Continuous output current (= 100% $I_N$ )<br>(at $V_{line} = 3 \times AC 230 V$ with $f_{PWM} = 8 kHz$ ) | $I_D$              | AC 80 A  | AC 95 A       |
| Max. output frequency  | $f_{max}$          | 599 Hz   |               |
| Current limiting   | $I_{max}$          | Motor and generator mode 150% $I_N$ , duration depending on the capacity utilization |               |
| Internal current limit   |                    | $I_{max} = 0 - 150\%$ adjustable   |               |
| Permitted minimum braking resistance value<br>(4Q operation)   | $R_{Bwmin}$        | 3 Ω  |               |
| Output voltage   | $V_O$              | Max. $V_{line}$  |               |
| PWM frequency  | $f_{PWM}$          | Adjustable: 4/8/12/16 kHz  |               |
| Speed range/resolution   | $n_R / \Delta n_R$ | -6000 – 0 – +6000 min <sup>-1</sup> / 0.2 min <sup>-1</sup> over the entire range    |               |
| <b>GENERAL</b>   |                    |  |               |
| Power loss at $S_N$ <sup>1)</sup>  | $P_{Vmax}$         | 1100 W   | 1300 W        |
| Cooling air consumption  |                    | 180 m <sup>3</sup> /h  |               |
| Mass   |                    | 26.3 kg  |               |
| Dimensions   | W × H × D          | 280 mm × 522 mm × 307 mm   |               |
| Cross section of device terminals X1, X2, X3, X4   |                    | M10 bolt with nut<br>max. 70 mm <sup>2</sup><br>Press cable lug DIN 46235            |               |
| Tightening torque  |                    | 3.5 Nm   |               |

1) The performance data applies to  $f_{PWM} = 4 kHz$ .

|  |           |   |               |
|--|-----------|---|---------------|
| MDX61B standard design   |           | 0220-203-4-00   | 0300-203-4-00 |
| Part number  |           | 08280010  | 08280029      |
| MDX61B application version   |           | 0220-203-4-0T   | 0300-203-4-0T |
| Part number  |           | 08280126  | 08280134      |
| Recommended motor power  |           |   |               |
|  Constant load  | $P_{Mot}$ | 22 kW   | 30 kW         |
|  Variable torque load or constant load without overload | $P_{Mot}$ | 30 kW   | 37 kW         |
| Recommended motor power  |           | → MOVIDRIVE® B system manual, chapter Basic recommendations for motor selection |               |

## 8.5 MOVIDRIVE® MDX60/61B electronics data

| MOVIDRIVE® MDX60/61B  |                         | General electronics data  |   |
|---|-------------------------|---|---|
| Voltage supply<br>X11:1<br>For setpoint input<br>X11:5  |                         | REF1: DC +10 V +5%/-0%, $I_{max} = DC 3 \text{ mA}$<br>REF2: DC -10 V +0%/-5%, $I_{max} = DC 3 \text{ mA}$  | Reference voltages for setpoint potentiometer   |
| Setpoint input n1<br>(differential input)<br>Operating mode AI11/AI12<br>Resolution<br>Accuracy<br>Internal resistance                    | X11:2/X11:3             | AI11/AI12: Voltage or current input, can be set with S11 and P11_, sampling cycle 1 ms<br>Voltage input:<br>n1 = DC 0 – +10 V or DC -10 V – 0 – +10 V<br>12-bit<br>$\pm 0.2\%$ (40 mV)<br>$R_i = 40 \text{ k}\Omega$ (external voltage supply)<br>$R_i = 20 \text{ k}\Omega$ (supply of REF1/REF2)  | Current input:<br>n1 = DC 0 – 20 mA or DC 4 – 20 mA<br>11-bit<br>$\pm 0.2\%$ (40 mV)<br>$R_i = 250 \Omega$  |
| Internal setpoints  |                         | Parameter set 1: n11/n12/n13 = -6000 – 0 – +6000 $\text{min}^{-1}$<br>Parameter set 2: n21/n22/n23 = -6000 – 0 – +6000 $\text{min}^{-1}$  |   |
| Time ranges of the speed ramps with<br>$\Delta n = 3000 \text{ min}^{-1}$   |                         | 1. Ramp $t_{11}/t_{21}$<br>2. Ramp $t_{12}/t_{22}$<br>Stop ramp $t_{13}/t_{23}$<br>Emergency stop ramp $t_{14}/t_{24}$<br>Motor potentiometer $t_3$   | Up: 0 – 2000 s      Down: 0 – 2000 s<br>Up = Down: 0 – 2000 s<br>Down: 0 – 20 s<br>Down: 0 – 20 s<br>Up: 0.2 – 50 s      Down: 0.2 – 50 s   |
| Auxiliary voltage output <sup>1)</sup><br>X13:8/X10:8   |                         | VO24: $V_{OUT} = DC 24 \text{ V}$ , maximum current carrying capacity $I_{max} = DC 400 \text{ mA}$   |   |
| External voltage supply <sup>1)</sup><br>X10:9  |                         | VI24: $V = DC 24 \text{ V} -15\%/+20\%$ to EN 61131-2<br>With size 7, connect 24 V backup voltage via the DC power supply unit.<br>No connection at the control unit  |   |
| Digital inputs<br>X13:1 – X13:6 and X16:1/X16:2<br>Internal resistance<br>Signal level<br>Function<br>X13:1<br>X13:2 – X13:6, X16:1/X16:2 |                         | Isolated (optocoupler), PLC-compatible (EN 61131 type 2), sampling cycle 1 ms<br>DIØØ – DIØ5 and DIØ6/DIØ7<br>$R_i \approx 3 \text{ k}\Omega$ , $IE \approx DC 10 \text{ mA}$<br>DC +13 V – +30 V = "1" = contact closed<br>DC -3 V – +5 V = "0" = contact open   | According to EN 61131   |
| Digital output <sup>1)</sup><br>X10:3/X10:7 and X16:3 – X16:5<br>Signal level<br>Function<br>X10:3<br>X10:7, X16:3 – X16:5                |                         | PLC-compatible (EN 61131-2), response time 1 ms<br>DBØØ/DOØ2 and DOØ3 – DOØ5<br>"0" = DC 0 V "1" = DC +24 V <b>Important:</b> Do not apply external voltage!<br>DBØØ: With fixed assignment "/Brake", $I_{max} = DC 150 \text{ mA}$ , short-circuit proof, protected against external voltage to DC 30 V<br>DOØ2, DOØ3 – DOØ5: Selection option → Parameter menu P62_,<br>$I_{max} = DC 50 \text{ mA}$ , short-circuit proof, protected against external voltage to DC 30 V |   |
| Relay output<br>Function<br>X10:4 – X10:6<br>X10:4<br>X10:5<br>X10:6  | X10:4 – X10:6           | DOØ1: Current-carrying capacity of the relay contacts $V_{max} = DC 30 \text{ V}$ , $I_{max} = DC 800 \text{ mA}$<br>DOØ1-C: Shared relay contact<br>DOØ1-NO: NO contact<br>DOØ1-NC: NC contact   | Selection option → Parameter menu P62_  |
| System bus (SBus)<br>X12:1<br>X12:2<br>X12:3  | X12:1<br>X12:2<br>X12:3 | DGND: Reference potential<br>SC11: SBus high<br>SC12: SBus low  | CAN bus to CAN specification 2.0, parts A and B, transmission technology to ISO 11898, max. 64 participants, terminating resistor (120 $\Omega$ ) can be activated using DIP switches |
| RS485 interface<br>X13:10<br>X13:11   | X13:10<br>X13:11        | ST11: RS485 +<br>ST12: RS485 -  | EIA standard, 9.6 kBaud, max. 32 stations<br>Max. cable length 200 m<br>Dynamic terminating resistor with fixed installation  |
| TF/TH/KTY/PK input<br>X10:1   | X10:1                   | TF1: Response threshold at $R_{TF} \geq 2.9 \text{ k}\Omega \pm 10\%$   |   |

1) The device provides a current of  $I_{max} = DC 400 \text{ mA}$  for the DC+24 V outputs (VO24, digital outputs). If this value is insufficient, a DC 24 V voltage supply must be connected to X10:9 (VI24).

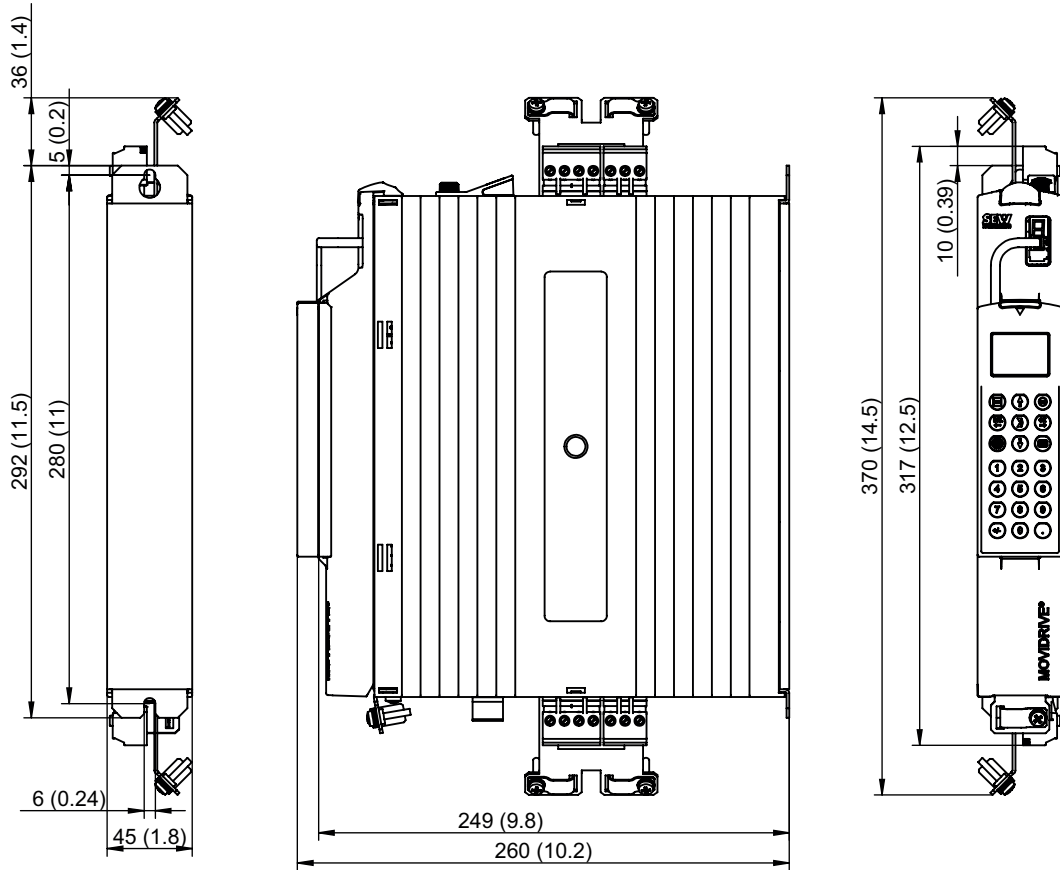
| MOVIDRIVE® MDX60/61B   |   | General electronics data  |  |
|--|---|---|--|
| Reference terminals<br>X11:4<br>X12:1/X13:9/X16:6/X10:2/X10:10 | X11:4<br>X12:1/X13:9/X16:6/X10:2/X10:10 | AGND: Reference potential for analog signals and terminals X11:1 and X11:5 (REF1/REF2)<br>DGND: Reference potential for binary signals, system bus, RS485 interface and TF/TH |  |

| MOVIDRIVE® MDX60/61B          | General electronics data  |
|-------------------------------|---|
| X13:7                         | DCOM: Reference potential of digital inputs X13:1 – X13:6 and X16:1/X16:2 (DIØØ – DIØ5 and DIØ6/DIØ7)   |
| Permitted cable cross section | One core per terminal: 0.20 – 2.5 mm <sup>2</sup> (AWG 24 – 12)   |
|                               | Two cores per terminal: 0.25 – 1 mm <sup>2</sup> (AWG 22 – 17)  |
|                               | Tightening torque: 0.6 Nm   |
| Safety contact X17:1          | DGND: Reference potential for X17:2   |
| Input capacitance X17:2       | VO24: V <sub>OUT</sub> = DC 24 V, only to supply X17:4 of the same device plus maximally 1 BST; <b>must not be used</b> to supply other devices |
|                               | X17:3   |
| X17:4                         | SVI24: DC+24 V "STO" input (safety contact)   |
| Permitted cable cross section | One core per terminal: 0.08 – 1.5 mm <sup>2</sup> (AWG28 – 16)  |
|                               | Two cores per terminal: 0.25 – 1.0 mm <sup>2</sup> (AWG23 – 17)   |
| Power consumption X17:4       | Size 0: 3 W   |
|                               | Size 1: 5 W   |
|                               | Size 2, 2S: 6 W   |
|                               | Size 3: 7.5 W   |
|                               | Size 4: 8 W   |
|                               | Size 5: 10 W  |
|                               | Size 6: 6 W   |
|                               | Size 7: 6 W   |
| Input capacitance X17:4       | Size 0: 27 µF   |
|                               | Sizes 1 – 7: 270 µF   |
| Time for restart              | t <sub>A</sub> = 200 ms   |
| Time to inhibit output stage  | t <sub>S</sub> ≤ 100 ms   |

### 8.6 MOVIDRIVE® MDX60B dimension drawings

#### 8.6.1 MOVIDRIVE® MDX60B size 0S

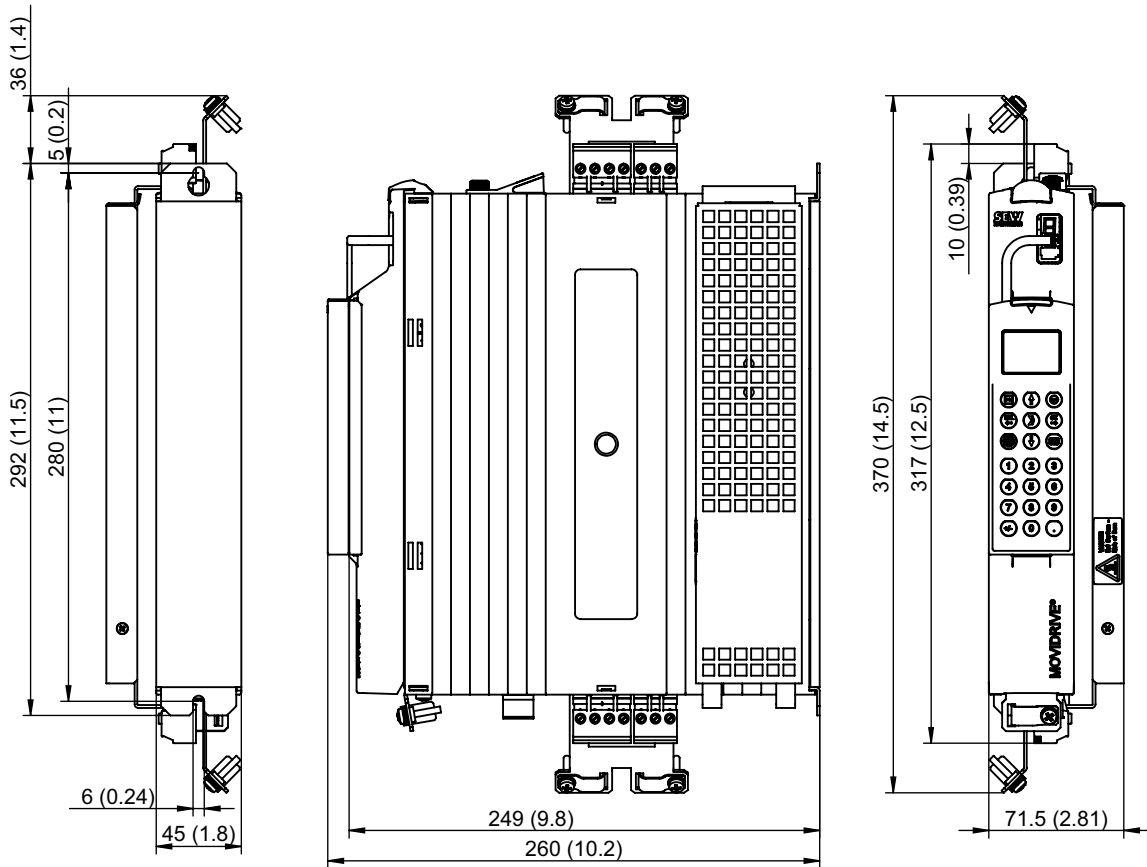
The following dimension drawing shows MDX60B size 0S, dimensions in mm (in)



9007201195536907

8.6.2 MOVIDRIVE® MDX60B, size 0S with mounted braking resistor

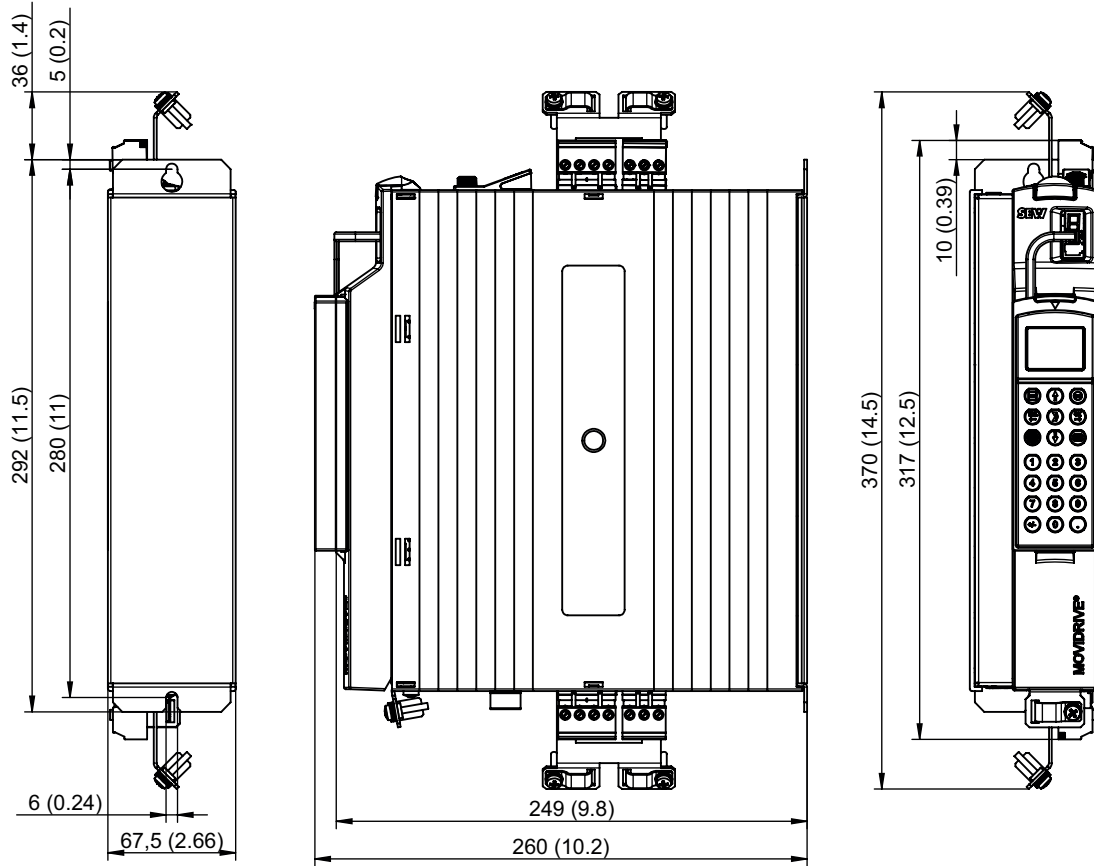
The following dimension drawing shows MDX60B size 0S with braking resistor, dimensions in mm (in)



9007201195539979

#### 8.6.3 MOVIDRIVE® MDX60B size 0M

The following dimension drawing shows MDX60B size 0M, dimensions in mm (in)

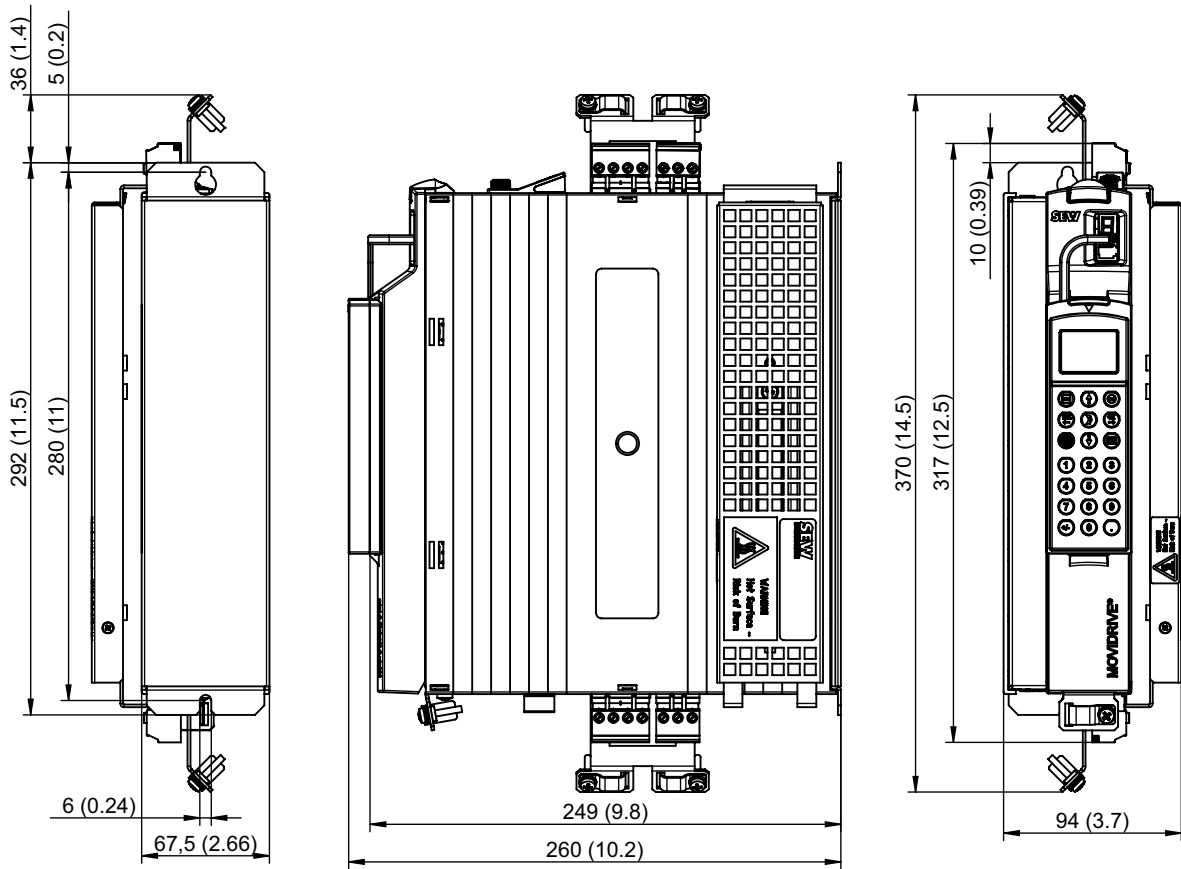


9007201195584907



8.6.4 MOVIDRIVE® MDX60B size 0M with mounted braking resistor

The following dimension drawing shows MDX60B size 0M with braking resistor, dimensions in mm (in)



9007201195587979

## 8.7 MOVIDRIVE® MDX61B dimension drawings

## INFORMATION

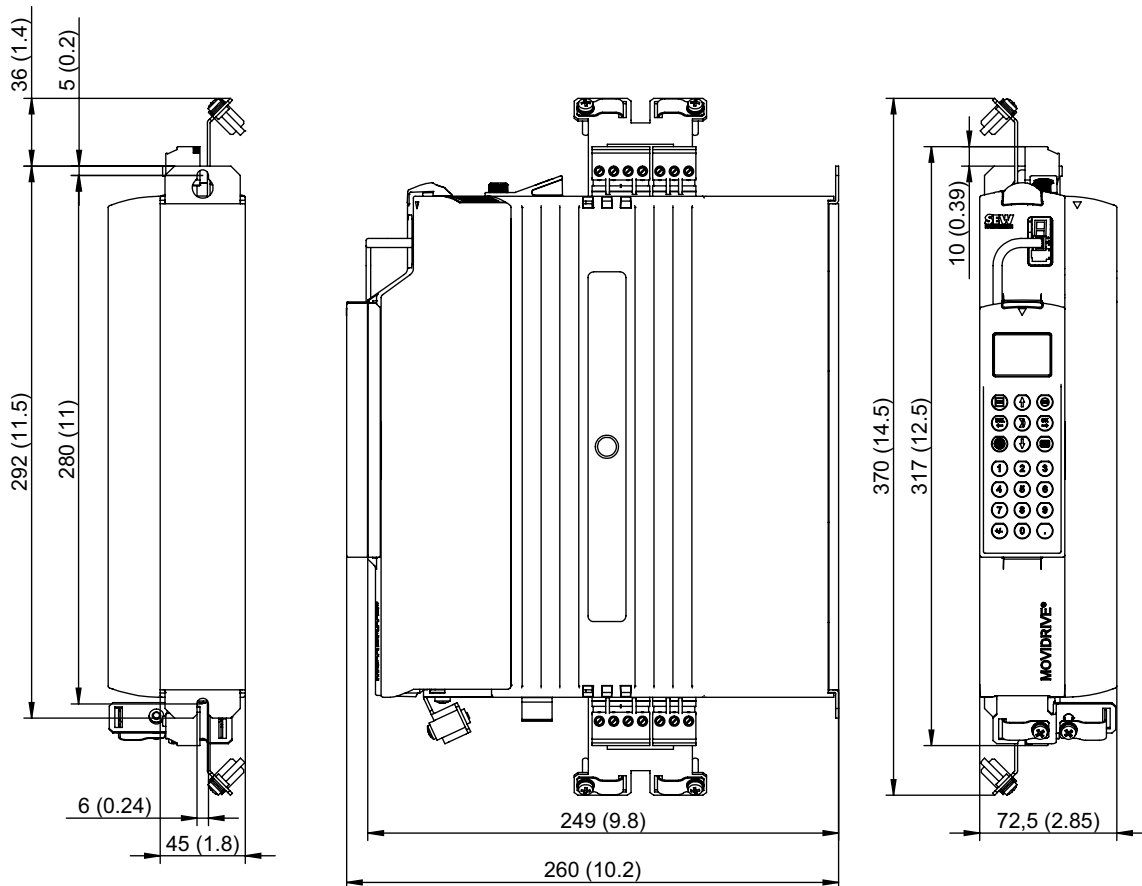


With MOVIDRIVE®

For MOVIDRIVE® MDX61B size 0, installing a braking resistor does not affect the dimensions. Therefore, MOVIDRIVE® MDX61B size 0 dimensions are displayed without an installed braking resistor.

## 8.7.1 MOVIDRIVE® MDX61B size 0S

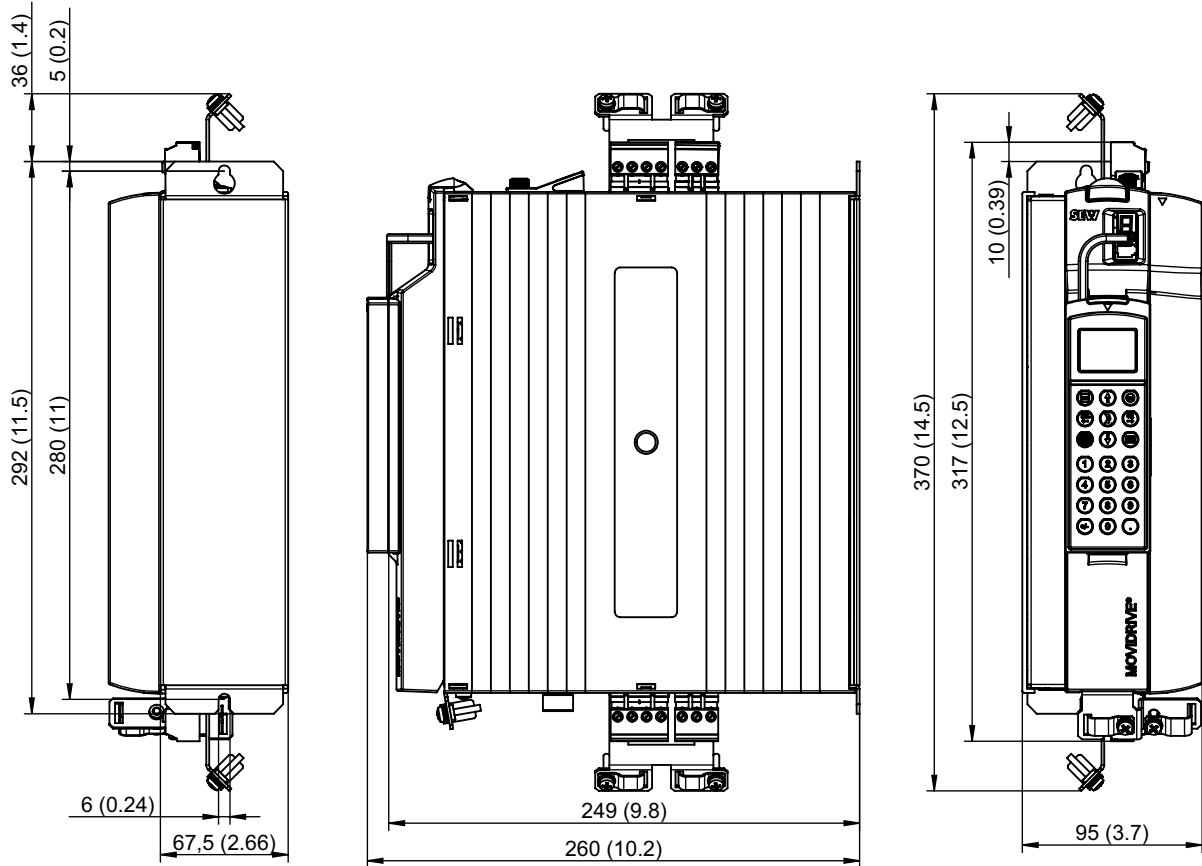
The following dimension drawing shows MDX61B size 0S, dimensions in mm (in)



9007201195592331

8.7.2 MOVIDRIVE® MDX61B size 0M

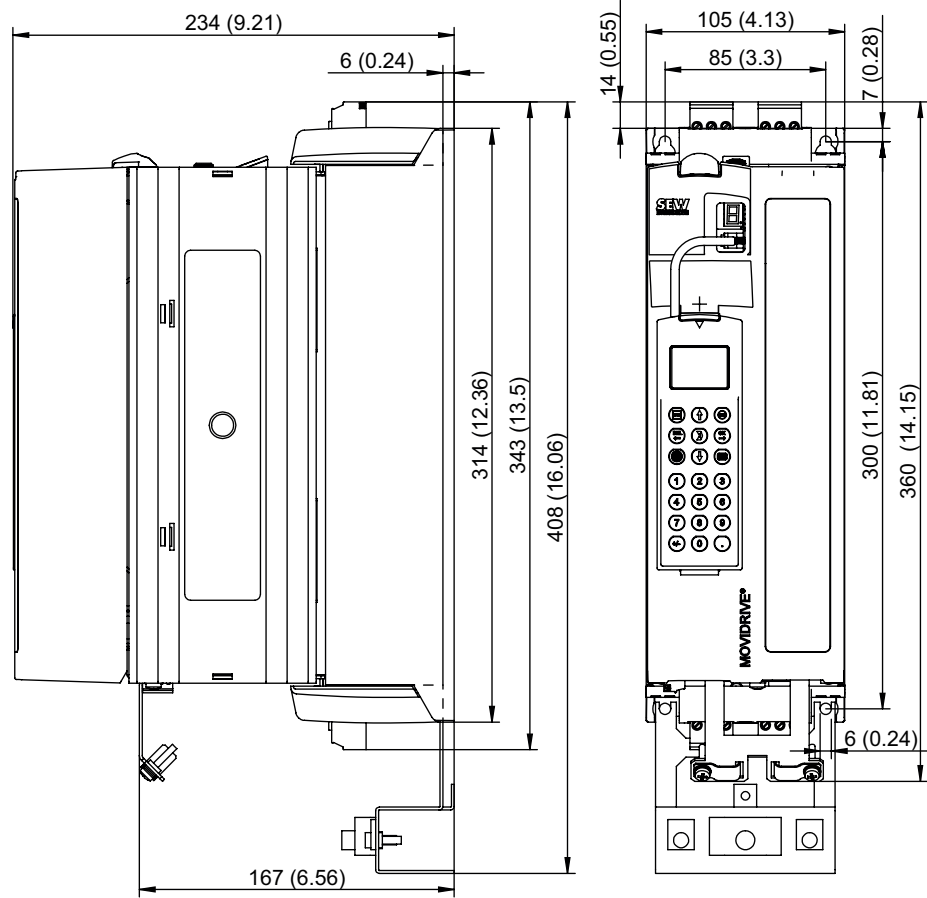
The following dimension drawing shows MDX61B size 0M, dimensions in mm (in)



9007201313669643

**8.7.3 MOVIDRIVE® MDX61B size 1**

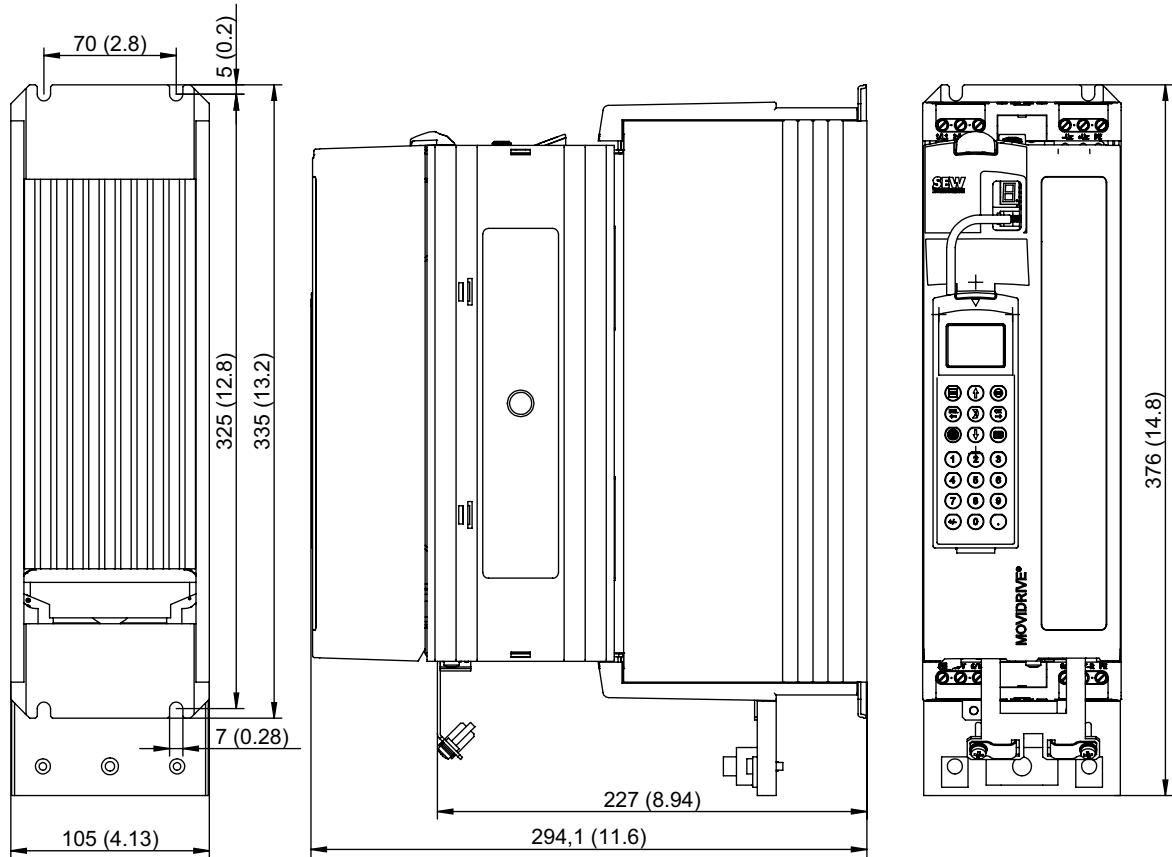
The following dimension drawing shows MDX61B size 1, dimensions in mm (in)



9007201313674123

8.7.4 MOVIDRIVE® MDX61B size 2S

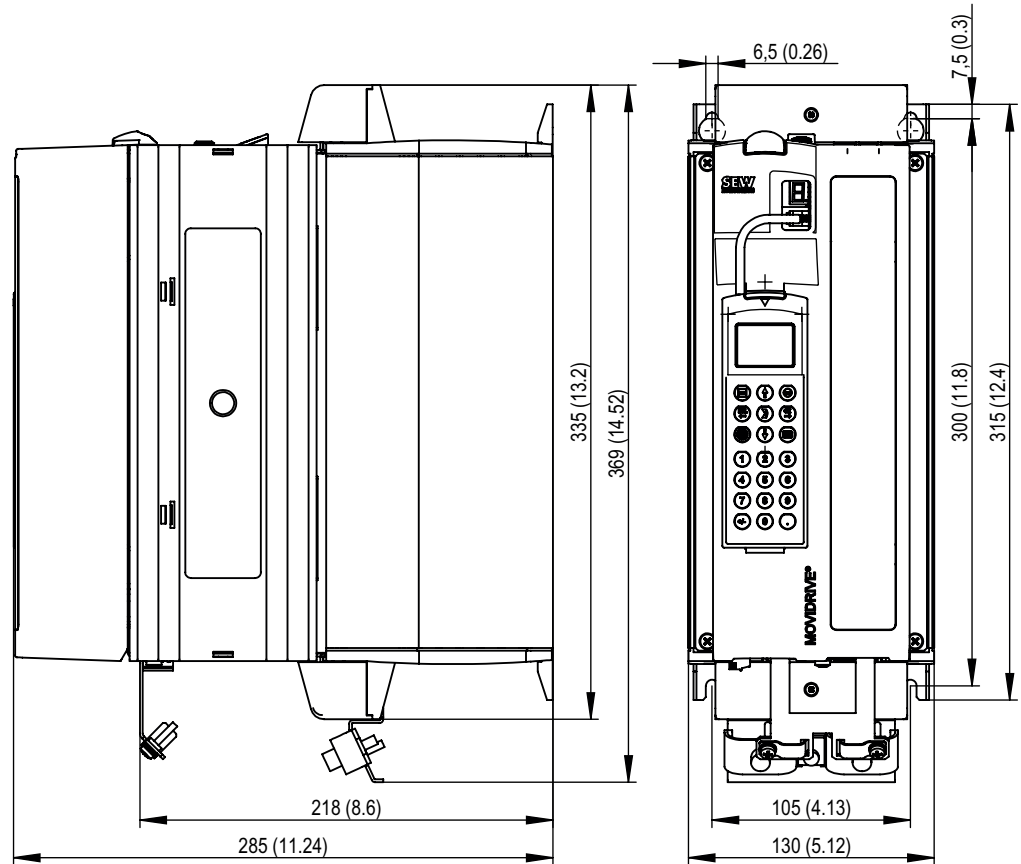
The following dimension drawing shows MDX61B size 2S, dimensions in mm (in)



9007201313689995

## 8.7.5 MOVIDRIVE® MDX61B size 2

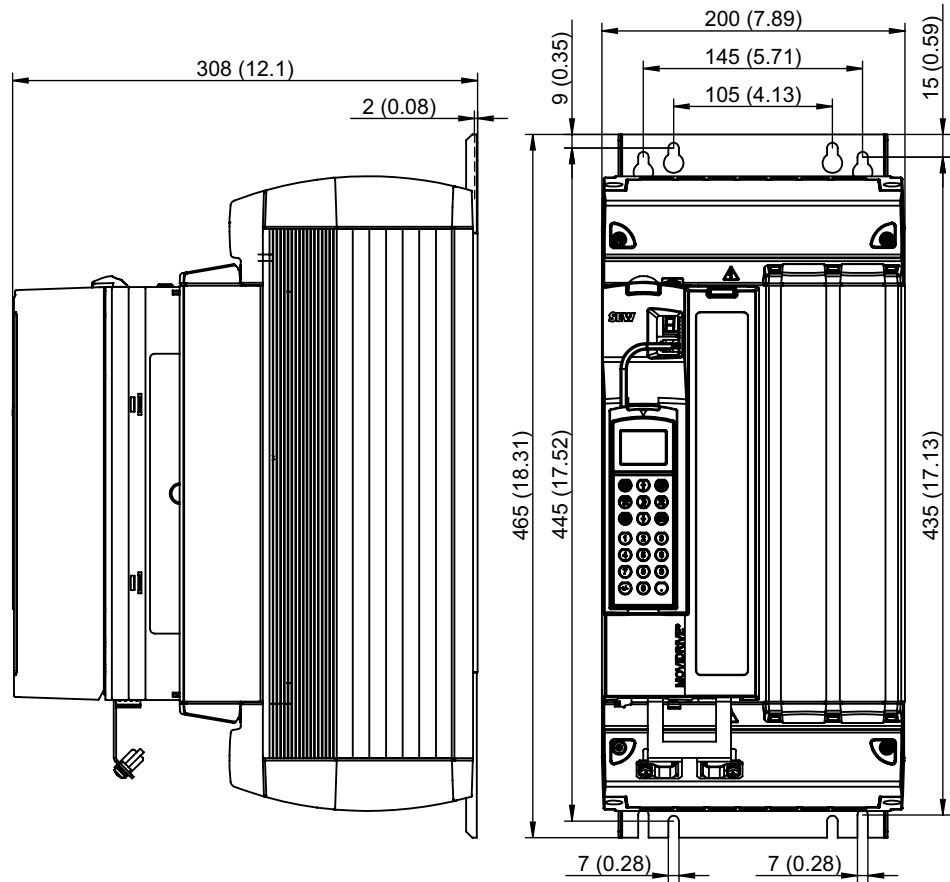
The following dimension drawing shows MDX61B size 2, dimensions in mm (in)



9007201313694091

8.7.6 MOVIDRIVE® MDX61B size 3

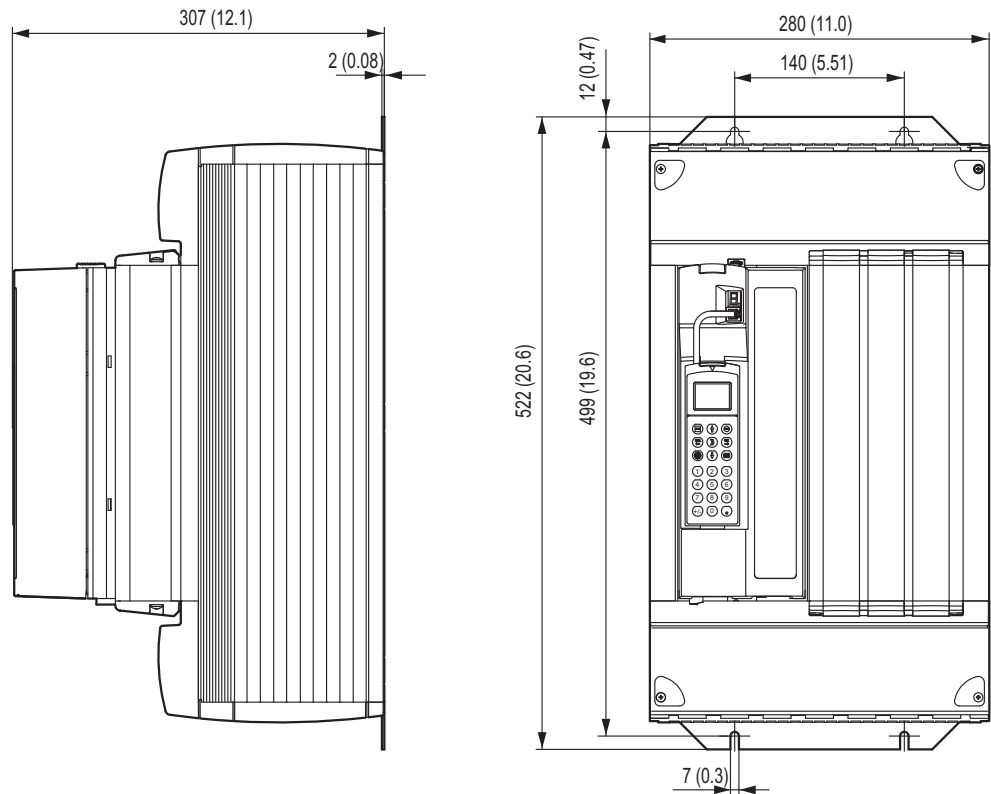
The following dimension drawing shows MDX61B size 3, dimensions in mm (in)



9007201313697675

## 8.7.7 MOVIDRIVE® MDX61B size 4

The following dimension drawing shows MDX61B size 4, dimensions in mm (in)

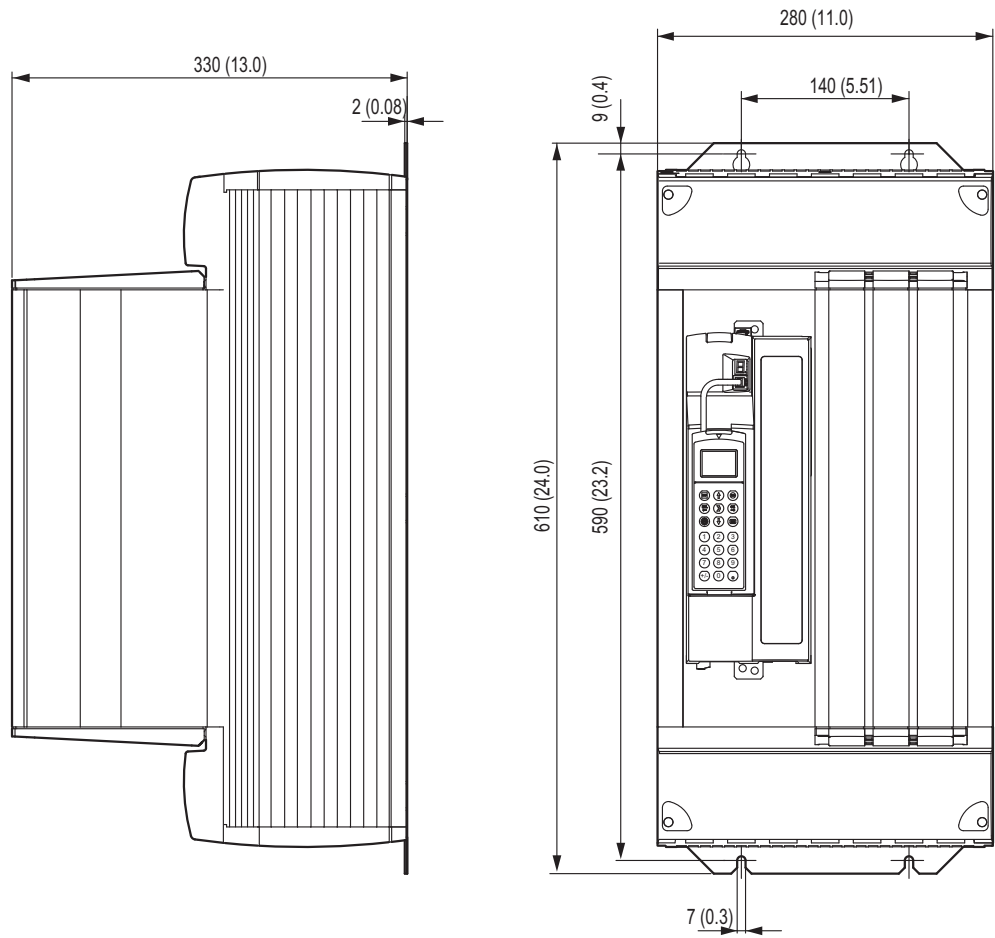


2058960267



8.7.8 MOVIDRIVE® MDX61B size 5

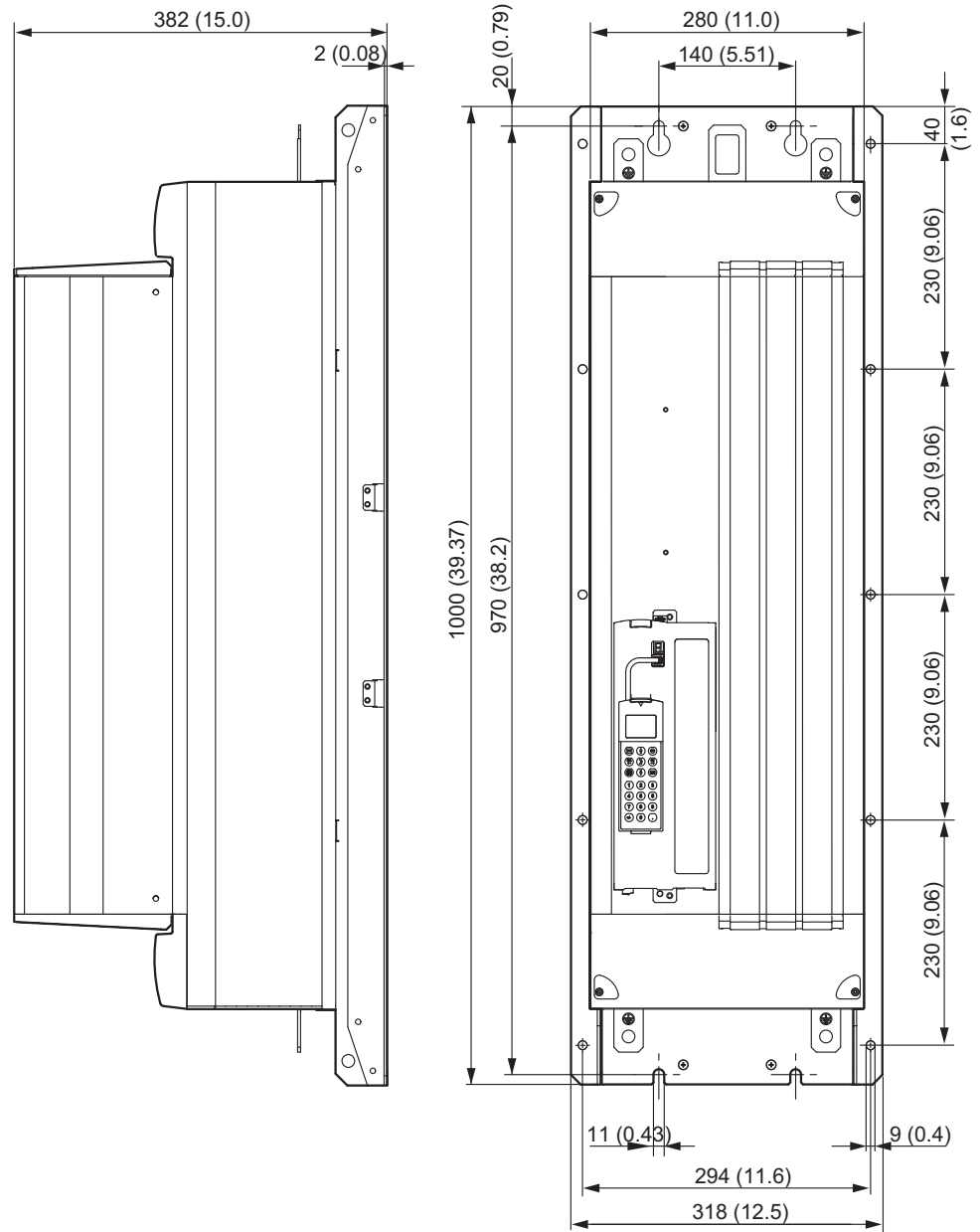
The following dimension drawing shows MDX61B size 5, dimensions in mm (in)



2058963851

### 8.7.9 MOVIDRIVE® MDX61B size 6

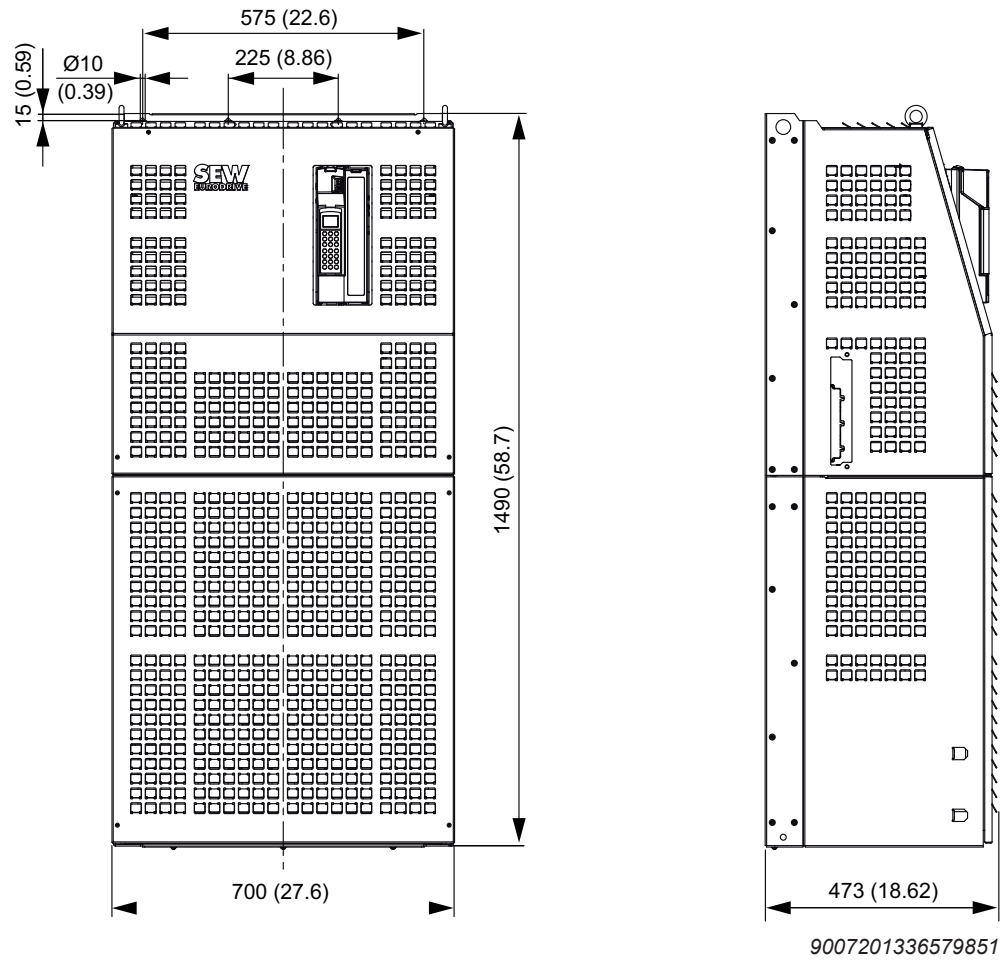
The following dimension drawing shows MDX61B size 6, dimensions in mm (in)



2058967435

8.7.10 MOVIDRIVE® MDX61B size 7

The following dimension drawing shows MDX61B size 7, dimensions in mm (in)



## 8.8 IPOS<sup>PLUS</sup>®

### 8.8.1 Description

IPOS<sup>PLUS</sup>® positioning and sequence control is integrated into every MOVIDRIVE® inverter as standard. With IPOS<sup>PLUS</sup>® control functions and positioning tasks can be performed either simultaneously or independently of one another.

The IPOS<sup>PLUS</sup>® sequence control system makes it possible to run a user program, regardless of any encoder feedback or the selected control mode (VFC, CFC, SERVO). In conjunction with encoder feedback, the IPOS<sup>PLUS</sup>® positioning control provides a high-performance point-to-point positioning capability. The IPOS<sup>PLUS</sup>® program is written using the MOVITOOLS® engineering software. Starting up the inverter, accessing parameters and editing variables are all possible either with the software or the DBG60B keypad (startup in VFC mode only).

### 8.8.2 Properties

- Program execution independent of encoder feedback and operating mode
- The user program is continued even if a device malfunction occurs (troubleshooting is possible in the user program)
- Three user programs can be run in parallel and independently of one another (task 1, task 2 and task 3, each of them interrupt-capable)
- The user programs programmed in assembler can contain up to 3200 program lines
- User-friendly and comprehensive control options for the inverter
- Access to all available options
- Extensive options for communication via system bus (SBus), RS485, and fieldbus (direct communication with MOVIMOT® is possible)
- Processing of digital and analog input/output signals

#### With encoder feedback only


- Positioning with selectable travel speed, positioning ramp and jerk limitation
- Precontrol for position, speed and torque control loops with minimized lag error
- Two touch probe inputs
- Ramp types: Linear, jerk limited, sine, and square
- Status and monitoring functions: Lag error monitoring, position signal, software and hardware limit switches
- 9 types of reference travel
- Possibility of changing the target position, travel speed, positioning ramp and torque while movement is in progress
- "Endless positioning" is possible
- Override function
- Cam switch
- Synchronous operation and electronic cam

| Max. program length of task 1, task 2 and task 3 | Total of ca. 3200 program lines   |
|--|---|
| Command processing time per program line         | Task 1: 1 – 10 commands/ms can be configured<br>Task 2: 2 – 11 commands/ms can be configured<br>Task 3: at least 1 command/ms (typical is 40 commands/ms) |
| Variables  | 1024, of which 128 (0 – 127) can be stored to non-volatile memory; range of values: $-2^{31} - +(2^{31}-1)$   |
| Touch probe inputs                               | 2 inputs, processing time < 100 µs  |
| Sampling cycle of digital and analog inputs      | 1 ms  |
| Digital inputs/outputs                           | 8 inputs/5 outputs  |
| Analog inputs/outputs                            | 1 input (DC 0 – 10 V, DC±10 V, DC 0 – 20 mA, DC 4 – 20 mA)<br>1 input (DC 0 – 10 V, DC±10 V)<br>2 outputs (DC 0 – 20 mA, DC 4 – 20 mA, DC±10 V)           |

## 8.9 DBG60B keypad

### 8.9.1 Description

The basic version of MOVIDRIVE® does not have a DBG60B keypad, but can be upgraded to include the keypad as an option.

| Keypad   | Language variants                   | Part no.   |          |
|--|-------------------------------------|--|----------|
|  | DBG60B-10                           | DE/EN/FR/IT/ES/PT/NL/FI/SV/DA/TR/RU/PL/CS/ZH<br><br>(German/English/French/Italian/Spanish/Portuguese/Dutch/Finnish/Swedish/Danish/Turkish/Russian/Polish/Czech/Chinese) | 28229150 |
|  | Door installation set <sup>1)</sup> | Description (= scope of delivery)  | Part no. |
|  | DBM60B                              | <ul style="list-style-type: none"> <li>Housing for DBG60B (IP65)</li> <li>DKG60B extension cable, length 5 m</li> </ul>  | 08248532 |
|  | Extension cable                     | Description (= scope of delivery)  | Part no. |
|  | DKG60B                              | <ul style="list-style-type: none"> <li>length 5 m</li> <li>4-core, shielded cable</li> </ul>   | 08175837 |

1) The DBG60B keypad is not included in the scope of delivery and must be ordered separately.

### Functions

- Display process values and status
- Status displays of digital inputs/outputs
- Fault memory and error reset queries
- Option to display and set the operating parameters and service parameters
- Data backup and transfer of parameter sets to other MOVIDRIVE® devices
- User-friendly startup menu for VFC mode
- Manual control of MOVIDRIVE® B and MOVITRAC® B
- Manual operation of MOVIMOT® (→ Decentralized technology documentation)

## Features

- Illuminated text display, range of languages
- Keypad with 21 keys
- Selection between user menu, detailed parameter menu and startup menu in VFC mode (CFC and SERVO startup is not possible with the DBG60B)
- Can be plugged into MOVIDRIVE®
- Can be connected via extension cable DKG60B (5 m)
- Degree of protection IP40 (EN 60529)

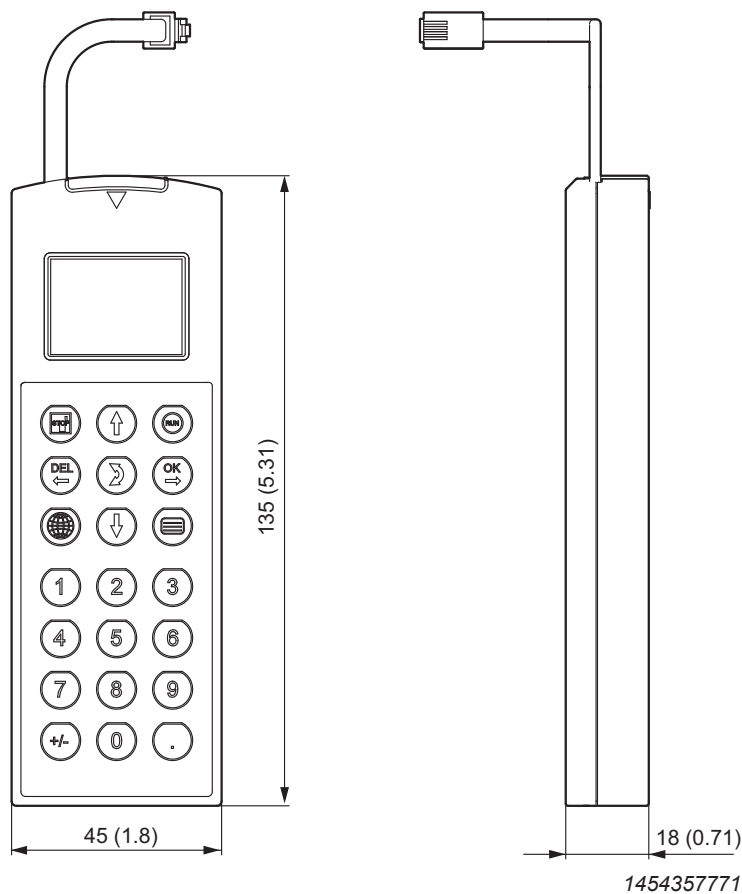
## INFORMATION



The DBG60B keypad option and the interface adapter are plugged into the same inverter slot (XT) and therefore cannot be used at the same time.

### 8.9.2 Dimension drawing for DBG60B

The following figure shows the mechanical dimensions in mm (in).



All dimensions in mm (in)

## 8.10 DBM60B/DKG60B housing for DBG60B

### 8.10.1 Description

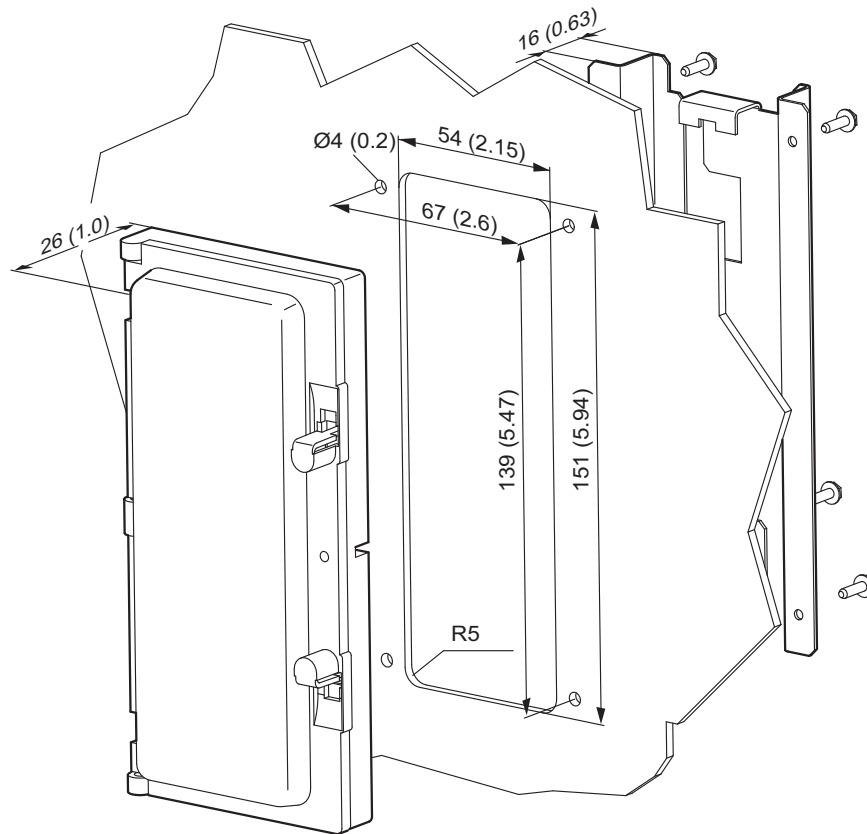
The DBM60B option can be used to mount the keypad close to the inverter (e.g. in the control cabinet door). The DBM60B option consists of a housing in IP65 degree of protection, and a 5 m DKG60B extension cable.

### Part numbers

- DBM60B: 08248532
- DKG60B: 08175837

### 8.10.2 Dimension drawing DBM60B/DKG60B

The following figure shows the mechanical dimensions in mm (in).



1454360843

All dimensions in mm (in)



## 9 Technical data of regenerative power supply unit

### 9.1 MOVIDRIVE® MDR60A/61B regenerative power supply unit

MOVIDRIVE® drive inverters operating in regenerative mode (4Q operation) can use the MOVIDRIVE® MDR60A/61B regenerative power supply unit as an alternative to braking resistors. The prerequisite is a powerful supply system. For more detailed information, refer to the "MOVIDRIVE® MDR60A/61B Regenerative Power Supply Unit" system manual. This manual can be ordered from SEW-EURODRIVE.

MOVIDRIVE® MDR60A/61B supplies the DC link circuit of the connected MOVIDRIVE® drive inverters with electrical power from the supply system in motor operation and returns regenerative power to the supply system in regenerative operation.

#### 9.1.1 UL approval



UL and cUL approval has been granted for MOVIDRIVE® MDR60A0150-503-00, MDR60A0370-503-00, MDR60A0750-503-00, MDR61B1600-503-00, and MDR61B2500-503-00 devices. cUL is equivalent to CSA approval. The MOVIDRIVE® MDR60A1320-503-00 does not have UL or cUL approval.

#### 9.1.2 Protection and monitoring functions

- Monitoring and protection against thermal overload.
- Detection of power failure within one supply system half-wave.
- Overvoltage protection.



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### 9.1.3 Features of a regenerative power supply unit compared to an inverter with braking resistors

- Energy balance: Regenerative power is fed back into the supply system instead of being converted into waste heat.
- Reduced complexity of installation when there are several inverters (mains and braking resistor connections). However, a braking resistor is required for bringing the drive to a controlled stop even when there is a disruption in the supply system.
- Reduction in use of control cabinet space and fan power if the braking resistor was previously installed in the control cabinet.

### 9.1.4 General technical data

#### MOVIDRIVE® MDR60A regenerative power supply unit

| MOVIDRIVE® MDR60A                                     | 0150-503-00 (size 2)<br>0370-503-00 (size 3)<br>0750-503-00 (size 4)  | 1320-503-00 (size 6)  |
|---|---|---|
| Interference immunity                                 | Meets EN 61800-3  | Meets EN 61000-6-1 and EN 61000-6-2   |
| Interference emission with EMC-compliant installation | Meets EN 61800-3: <ul style="list-style-type: none"> <li>• With line filter NF035-503 (MDR60A0150-503-00)</li> <li>• With line filter NF048-503 (MDR60A0150-503-00)</li> <li>• With line filter NF085-503 (MDR60A0370-503-00)</li> <li>• With line filter NF150-503 (MDR60A0750-503-00)</li> </ul>  | Meets EN 61000-6-4 with line filter NF300-503   |
| Ambient temperature $\vartheta_{amb}$                 | 0 °C – +40 °C   | 0 °C – +40°C  |
| Ambient temperature derating                          | $I_N$ reduction: 3% $I_N$ per K up to 60 °C   | $I_N$ reduction: 3% $I_N$ per K up to 55 °C   |
| Climate class   | EN 60721-3-3, class 3K3   |   |
| Storage temperature <sup>1)</sup> $\vartheta_F$       | -25 °C – +70 °C (EN 60721-3-3, class 3K3)   | -25 °C – +55 °C (EN 60721-3-3, class 3K3)   |
| Cooling types (DIN 51751)                             | External cooling<br>(temperature-controlled fan, response threshold 50 °C)  | External cooling<br>(temperature-controlled fan, response threshold 45 °C)                          |
| Degree of protection<br>EN 60529<br>(NEMA1)           | Size 2<br>IP20<br>Size 3<br>IP20<br>Size 4<br>IP00<br>IP10 <ul style="list-style-type: none"> <li>• With fitted plexiglass cover supplied as standard</li> <li>• With fitted heat shrink tubing (not included in delivery)</li> </ul> IP20 <ul style="list-style-type: none"> <li>• With fitted DLB11B touch guard</li> </ul>   | IP20  |
| Operating mode  | Continuous duty   |   |
| Overvoltage category                                  | III according to IEC 60664-1 (VDE 0110-1)   |   |
| Installation altitude                                 | At $h \leq 1000$ m without restrictions<br>At $h \geq 1000$ m, the following restrictions apply: <ul style="list-style-type: none"> <li>• From 1000 m to max. 4000 m: <ul style="list-style-type: none"> <li>– <math>I_N</math> reduction by 1% per 100 m</li> </ul> </li> <li>• From 2000 m to max. 4000 m: <ul style="list-style-type: none"> <li>– The protective separation of power and electronics connections can no longer be assured above 2000 m.<br/>This requires external measures (IEC 60664-1/EN 61800-5-1)</li> <li>– You have to connect an overvoltage protection device in order to reduce the overvoltages from category III to category II.</li> </ul> </li> </ul> | At $h \leq 1000$ m: No limitation<br>From 1000 m to max. 4000 m:<br>$I_N$ reduction: 0.5% per 100 m |

1) In case of extended storage, connect the device to the power supply for at least 5 minutes every two years, otherwise the device's service life may be reduced.

### MOVIDRIVE® MDR61B regenerative power supply unit

| MOVIDRIVE® MDR61B   | 1600-503-00/L (size 7)<br>2500-503-00/L (size 7)  |
|---|---|
| Interference immunity   | Meets EN 61800-3  |
| Interference emission with EMC-compliant installation                 | Meets EN 61800-3:<br>• With NF600-503 line filter   |
| Ambient temperature $\vartheta_{amb}$<br>Ambient temperature derating | 0 °C – +50 °C at $I_D = 100\% I_{DC}$<br>0 °C – +40 °C at $I_D = 125\% I_{DC}$<br>2.5% $I_{DC}$ per K at 40 °C – +50 °C<br>3% $I_{DC}$ per K at 50 °C – +60 °C  |
| Climate class   | EN 60721-3-3, class 3K3   |
| Storage temperature <sup>1)</sup> $\vartheta_F$                       | -25 °C – +70 °C (EN 60721-3-3, class 3K3)   |
| Cooling types (DIN 51751)   | External cooling<br>(temperature-controlled fan, response threshold 50 °C)  |
| Degree of protection<br>EN 60529<br>(NEMA1)                           | IP00<br>IP20<br>• With fitted DLB31B touch guard  |
| Operating mode  | Continuous duty   |
| Overvoltage category  | III according to IEC 60664-1 (VDE 0110-1)   |
| Pollution class   | 2 according to IEC 60664-1 (VDE 0110-1)   |
| Installation altitude   | At $h \leq 1000$ m without restrictions<br>The following restrictions apply at $h \geq 1000$ m:<br>• From 1000 m to max. 4000 m<br>– $I_N$ reduction by 1% per 100 m<br>• From 2000 m to max. 4000 m<br>– Above an installation altitude of 2000 m the protective separation of power and electronic connections is not ensured.<br>In this case, external measures are required:<br>(IEC 60664-1/EN 61800-5-1)<br>– You have to connect an overvoltage protection device in order to reduce the overvoltages from category III to category II. |

1) In case of extended storage, connect the device to the power supply for at least 5 minutes every two years, otherwise the device's service life may be reduced.

## 9.1.5 Technical data of MOVIDRIVE® MDR60A/61B and MDX62B

## MOVIDRIVE® MDR60A0150/0370 size 2 and size 3

| MOVIDRIVE® MDR60A<br>Standard design<br>Design with coated printed circuit boards |   | Size 2<br>0150-503-00<br>0150-503-00/L   | Size 3<br>0370-503-00<br>0370-503-00/L              |
|---|---|--|---|
| Part number   |   | 18252710<br>18252729   | 08266581<br>08296723                                |
| INPUT   |   |  |   |
| Nominal voltage<br>(according to EN 50160)  | $V_{line}$  | 3 × AC 380 V – 500 V   |   |
| Line frequency  | $f_{line}$  | 50 Hz – 60 Hz ± 5%   |   |
| Rated connected load  | $P_N$   | 15 kW  | 37 kW   |
| Nominal line current<br>(at $V_{line} = 3 \times AC 400 V$ )                      | $I_{line}$  | AC 29 A  | AC 66 A   |
| ELECTRONICS TERMINALS   |   |  |   |
| Digital inputs  | PLC-compatible (EN 61131), sampling cycle 1 ms  |  |   |
| Internal resistance   | $R_I \approx 3.0 k\Omega$ , $I_E \approx 10 mA$   |  |   |
| Signal level  | +13 V – +30 V = "1" = contact closed<br>-3 V – +5 V = "0" = contact open                |  |   |
| Digital outputs   | PLC-compatible (EN 61131-2), response time 1 ms, short-circuit proof, $I_{max} = 50 mA$ |  |   |
| Signal level  | "0" = 0 V, "1" = +24 V, <b>Important: Do not apply external voltage</b>                 |  |   |
| DC LINK   |   |  |   |
| Apparent output power<br>(at $V_{line} = 3 \times AC 380 - 500 V$ )               | $S_A$   | 25 kVA   | 50 kVA  |
| DC link voltage<br>(at nominal supply current $I_{line}$ )                        | $V_{DC link}$   | DC 560 V – 780 V   |   |
| Nominal DC link current<br>(at nominal current $I_{line}$ )                       | $I_{DC link}$   | DC 35 A  | DC 70 A   |
| Max. DC link current  | $I_{DC link max}$   | DC 53 A  | DC 105 A  |
| GENERAL   |   |  |   |
| Power loss at $P_N$   | $P_{Vmax}$  | 120 W  | 950 W   |
| Cooling air consumption   |   | 100 m³/h   | 180 m³/h  |
| Connection for power terminals  | X1, X2  | Separable terminal strips<br>Conductor end sleeve DIN 46228  | Screw and washer assembly M6                        |
| <b>Permitted tightening torque</b>  |   | 1.8 Nm   | 3.5 Nm  |
| <b>Permitted cable cross section</b>  |   | 6 mm² (AWG9)<br>PE: M4 with 1.5 Nm   | 25 mm²  |
| Electronics terminals connection  | X3  | Permitted cable cross section<br>• One conductor per terminal: 0.20 – 2.5 mm² (AWG 24 – 13)<br>• Two conductors per terminal: 0.25 – 1 mm² (AWG 23 – 17)<br>Tightening torque 0.6 Nm |   |
| Mass  |   | 4 kg   | 16 kg   |
| Dimensions  | W × H × D   | 118 mm × 320 mm × 127 mm   | 200 mm × 465 mm × 221 mm                            |
| Line choke (always required)  |   | ND045-013,<br>$L_N = 0.1 mH$<br>Part number 08260133   | ND085-013<br>$L_N = 0.1 mH$<br>Part number 08260141 |
| Line filter (optional)  |   | NF035-503 up to 15 kW<br>Part number 8271283<br>NF048-503 up to 22 kW (15 kW × 125%)<br>Part number 08271178   | NF085-503,<br>Part number 08274150                  |
| For MOVIDRIVE® MDX60B/61B...-5_3  |   | 0005 – 0150  | 0005 – 0370   |
| Recommended line fuse   |   | 63 A   | 100 A   |

### MOVIDRIVE® MDR60A0750/1320 size 4 and size 6

| MOVIDRIVE® MDR60A  |                            | Size 4  | Size 6   |
|--|----------------------------|---|--|
| Standard design  |                            | 0750-503-00   | 1320-503-00 <sup>1)</sup>  |
| Design with coated printed circuit boards                        |                            | 0750-503-00/L   | –  |
| Part number  |                            | 08265569<br>08296731  | 08279527   |
| <b>INPUT</b>   |                            |   |  |
| Nominal voltage (according to EN 50160)                          | $V_{line}$                 | 3 × AC 380 V – 500 V  |  |
| Line frequency   | $f_{line}$                 | 50 Hz – 60 Hz ± 5%  | 40 Hz – 60 Hz ± 10%  |
| Rated connected load   | $P_N$                      | 75 kW   | 160 kW   |
| Nominal line current (at $V_{line} = 3 \times AC 400 V$ )        | $I_{line}$                 | AC 117 A  | AC 260 A   |
| <b>ELECTRONICS TERMINALS</b>                                     |                            |   |  |
| Digital inputs   |                            | Isolated (optocoupler), PLC-compatible (EN 61131), sampling cycle 1 ms  | –  |
| Internal resistance  |                            | $R_i \approx 3.0 \text{ k}\Omega$ , $I_E \approx 10 \text{ mA}$   |  |
| Signal level   |                            | +13 V – +30 V = "1"<br>= Contact closed<br>-3 V – +5 V = "0"<br>= Contact open  |  |
| Digital outputs  |                            | PLC-compatible (EN 61131-2), response time 1 ms, short-circuit proof, $I_{max} = 50 \text{ mA}$   |  |
| Signal level   |                            | "0" = 0 V, "1" = +24 V,<br><b>Important: Do not apply external voltage.</b>   |  |
| <b>DC LINK</b>   |                            |   |  |
| Apparent output power (at $V_{line} = 3 \times AC 380 - 500 V$ ) | $S_A$                      | 90 kVA  | 175 kVA  |
| DC link voltage  | $V_{DC \text{ link}}$      | DC 560 V – 780 V  |  |
| Nominal DC link current (at nominal line current $I_{line}$ )    | $I_{DC \text{ link}}$      | DC 141 A  | DC 324 A   |
| Max. DC link current (at nominal line current $I_{line}$ )       | $I_{DC \text{ link\_max}}$ | DC 212 A  | Motor:<br>• DC 486 A<br>regenerative:<br>• DC 410 A  |
| <b>GENERAL</b>   |                            |   |  |
| Power loss at $P_N$  | $P_{Vmax}$                 | 1700 W  | 2400 W   |
| Cooling air consumption  |                            | 360 m <sup>3</sup> /h   | 880 m <sup>3</sup> /h  |
| Connection for power terminals (L1, L2, L3 for size 6)           | X1, X2                     | M10 terminal studs  | M10 terminal studs   |
| <b>Permitted tightening torque</b>                               |                            | 14 Nm   | 25 – 30 Nm <sup>2)</sup>   |
| <b>Permitted cable cross section</b>                             |                            | 70 mm <sup>2</sup> (AWG2/0)   | 185 mm <sup>2</sup> (AWG6/0)   |
| Connection for power terminals SKS 1 – 3                         |                            | –   | Terminals not connected  |
| Connection for electronics terminals (X2 X3 with size 6)         |                            | Permitted cable cross-section:<br>• One conductor per terminal:<br>0.20 – 2.5 mm <sup>2</sup> (AWG 24 – 13)<br>• Two conductors per terminal:<br>0.25 – 1 mm <sup>2</sup> (AWG 23 – 17)<br>Tightening torque 0.6 Nm | Permitted cable cross-section:<br>• 0.75 – 2.5 mm <sup>2</sup> (AWG18 – 14)<br>Terminals A1/A2:<br>• 0.75 – 4 mm <sup>2</sup> (AWG18 – 12)<br>Tightening torque 0.6 Nm |
| Mass   |                            | 24 kg   | 100 kg   |
| Dimensions   | W × H × D                  | 280 mm × 522 mm × 205 mm  | 378 mm × 942 mm × 389.5 mm   |
| Line choke (always required)                                     |                            | ND200-0033<br>$L_N = 0.03 \text{ mH}$<br>Part number 08265798   | Installed in the basic device  |
| Line filter (optional)   |                            | NF150-503,<br>Part number 08274177  | NF300-503,<br>Part number 08274193   |
| For MOVIDRIVE® MDX60B/61B...-5 3                                 |                            | 0005 – 0750   | 0005 – 1600  |

# 9

## Technical data of regenerative power supply unit

MOVIDRIVE® MDR60A/61B regenerative power supply unit

| MOVIDRIVE® MDR60A                         | Size 4        | Size 6                    |
|---|---------------|---------------------------|
| Standard design                           | 0750-503-00   | 1320-503-00 <sup>1)</sup> |
| Design with coated printed circuit boards | 0750-503-00/L | –                         |
| Recommended line fuse                     | 175 A         | 500 A                     |



- 1) The listed technical data applies to devices with serial no. DCV200xxx. For devices of the previous series with no. DCV185xxx, refer to the provided documentation and the data on the nameplate
- 2) Note: Do not apply tightening torque directly at terminals L1, L2, L3 and ±UG; use a second wrench.

MOVIDRIVE® MDR61B1600/2500 size 7

| MOVIDRIVE® MDR61B   |                    | Size 7   |               |
|---|--------------------|--|---------------|
|   |                    | 1600-503-00/L  | 2500-503-00/L |
| Part number   |                    | 18250955   | 18250963      |
| INPUT   |                    |  |               |
| Nominal voltage (according to EN 50160)                               | $V_{line}$         | 3 × AC 380 V – 500 V   |               |
| Line frequency  | $f_{line}$         | 50 Hz – 60 Hz ± 5%   |               |
| Rated connected load  | $P_N$              | 160 kW   | 250 kW        |
| Nominal line current (at $V_{line} = 3 \times AC 400 V$ )             | $I_{line}$         | AC 250 A   | AC 400 A      |
| ELECTRONICS TERMINALS   |                    |  |               |
| Digital inputs  |                    | Isolated (optocoupler), PLC-compatible (EN 61131), sampling cycle 1 ms   |               |
| Internal resistance   |                    | $R_i \approx 3.0 k\Omega$ , $I_E \Omega 10 mA$   |               |
| Signal level  |                    | +13 V – +30 V = "1" = Contact closed<br>-3 V – +5V = "0" = Contact open  |               |
| 3 digital outputs   |                    | PLC-compatible (EN 61131-2), response time 1 ms, short-circuit proof, $I_{max} = 50 mA$  |               |
| Signal level  |                    | "0" = 0 V, "1" = +24 V, <b>Important: Do not apply external voltage.</b>   |               |
| 1 isolated relay contact  |                    | max. load capacity of relay contacts DC 30 V, DC 0.08 A  |               |
| DC LINK   |                    |  |               |
| Apparent output power (at $V_{line} = 3 \times AC 380 - 500 V$ )      | $S_A$              | 173 kVA  | 271 kVA       |
| DC link voltage   | $V_{DC link}$      | DC 620 V – 780 V   |               |
| Nominal DC link current (at nominal line current $I_{line}$ )         | $I_{DC link}$      | DC 255 A   | DC 407 A      |
| Max. DC link current (at nominal line current $I_{line}$ )            | $I_{DClink\_max}$  | DC 382 A   | DC 610 A      |
| Max. continuous DC link current (at nominal line current $I_{line}$ ) | $I_{DClink\_Dmax}$ | DC 318 A   | DC 508 A      |
| GENERAL   |                    |  |               |
| Power loss at $P_N$   | $P_{Vmax}$         | 5000 W   | 6600 W        |
| Cooling air consumption   |                    | 1400 m <sup>3</sup> /h   |               |
| Connection for power terminals  | L1, L2, L3         | Connection rail with bore for M12<br>Max. 2 × 240 mm <sup>2</sup><br>Press cable lug DIN 46235   |               |
| Tightening torque   |                    | 70 Nm  |               |
| DC link coupling option   |                    | <ul style="list-style-type: none"> <li>DLZ11B/100 mm (part number: 18231934)</li> <li>DLZ11B/200 mm (part number: 18235662)</li> <li>DLZ11B/300 mm (part number: 18235670)</li> </ul>  |               |
| Electronics terminals connection X2                                   |                    | Permitted cable cross-section: <ul style="list-style-type: none"> <li>One conductor per terminal:<br/>0.20 – 2.5 mm<sup>2</sup><br/>(AWG 24 – 12)</li> <li>Two conductors per terminal:<br/>0.25 – 1 mm<sup>2</sup><br/>(AWG 22 – 17)</li> </ul> Tightening torque: 0.6 Nm |               |
| External voltage supply   |                    | Connect 24 V backup voltage via the DC power supply unit.<br>No connection at the control unit.  |               |
| Mass  |                    | 385 kg   | 475 kg        |
| Dimensions  | W × H × D          | 899 mm × 1490 mm × 473 mm  |               |
| Choke   |                    | Installed in the basic device  |               |
| Line filter (optional)  |                    | NF600-503<br>Part number 17963389  |               |
| For MOVIDRIVE® MDX60B/61B...-5_3                                      |                    | 0005 – 2500  |               |
| Recommended line fuse   |                    | 315 A (gS)   | 500 A (gS)    |

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## MOVIDRIVE® MDX62B1600/2000/2500 size 7

| MOVIDRIVE® MDX62B  |                       | Size 7  |                      |                      |
|--|-----------------------|---|----------------------|----------------------|
| 2-Q devices (without brake chopper)  |                       | 1600-503-2-0T/L   | 2000-503-2-0T/L      | 2500-503-2-0T/L      |
| 4-Q devices (with brake chopper)   |                       | 1600-503-4-0T/L   | 2000-503-4-0T/L      | 2500-503-4-0T/L      |
| Part number  |                       | 18250459<br>18250483  | 18250467<br>18250491 | 18250475<br>18250505 |
| INPUT  |                       |   |                      |                      |
| DC link voltage  | $V_{DC \text{ link}}$ | Supply via DC link connection<br>DC 537 V – 780 V   |                      |                      |
| OUTPUT   |                       |   |                      |                      |
| Apparent output power <sup>1)</sup><br>(at $V_{line} = 3 \times AC 380 - 500 V$ )  | $S_N$                 | 208 kVA   | 263 kVA              | 326 kVA              |
| Nominal output current <sup>1)</sup><br>(at $V_{line} = 3 \times AC 400 V$ )   | $I_N$                 | AC 300 A  | AC 380 A             | AC 470 A             |
| Continuous output current (= 125% $I_N$ )<br>(at $V_{line} = 3 \times AC 400 V$ with $f_{PWM} = 2.5 \text{ kHz}$ )   | $I_D$                 | AC 375 A  | AC 475 A             | AC 588 A             |
| Continuous output current (= 100% $I_N$ )<br>(at $V_{line} = 3 \times AC 400 V$ with $f_{PWM} = 2.5 \text{ kHz}$<br>Temperature range 0 °C – +50 °C)                     | $I_D$                 | AC 300 A  | AC 380 A             | AC 470 A             |
| Current limiting   | $I_{max}$             | Motor and generator mode 150% $I_N$ , duration depending on the capacity utilization                |                      |                      |
| Internal current limiting  |                       | $I_{max} = 0 - 150\%$ adjustable  |                      |                      |
| Permitted minimum braking resistance value<br>(4Q operation)   | $R_{BWmin}$           | 1.1 $\Omega$  |                      |                      |
| Output voltage   | $V_O$                 | Max. $V_{line}$   |                      |                      |
| PWM frequency  | $f_{PWM}$             | Adjustable: 2.5 or 4 kHz possible   |                      |                      |
| Speed range/resolution   | $n_A/\Delta n_A$      | -6000 – 0 – +6000 $\text{min}^{-1}$ / 0.2 $\text{min}^{-1}$ over the entire range                   |                      |                      |
| GENERAL  |                       |   |                      |                      |
| Power loss at $S_N$ <sup>1)</sup>  | $P_{Vmax}$            | 3000 W  | 3600 W               | 4400 W               |
| Cooling air consumption  |                       | 1200 $\text{m}^3/\text{h}$  |                      |                      |
| Mass   |                       | 2Q design: 180 kg<br>4Q variant: 200 kg   |                      |                      |
| Dimensions   | $W \times H \times D$ | 700 mm $\times$ 1490 mm $\times$ 470 mm   |                      |                      |
| Conductor rails X1, X2, X3   |                       | Connection rail with bore for M12<br>Max. 2 $\times$ 240 $\text{mm}^2$<br>Press cable lug DIN 46235 |                      |                      |
| Tightening torque  |                       | 70 Nm   |                      |                      |
|  Constant load<br>Recommended motor power   | $P_{Mot}$             | 160 kW  | 200 kW               | 250 kW               |
|  Variable torque load or constant load without<br>overload<br>Recommended motor power | $P_{Mot}$             | 200 kW  | 250 kW               | 315 kW               |

1) The performance data applies to  $f_{PWM} = 2.5 \text{ kHz}$

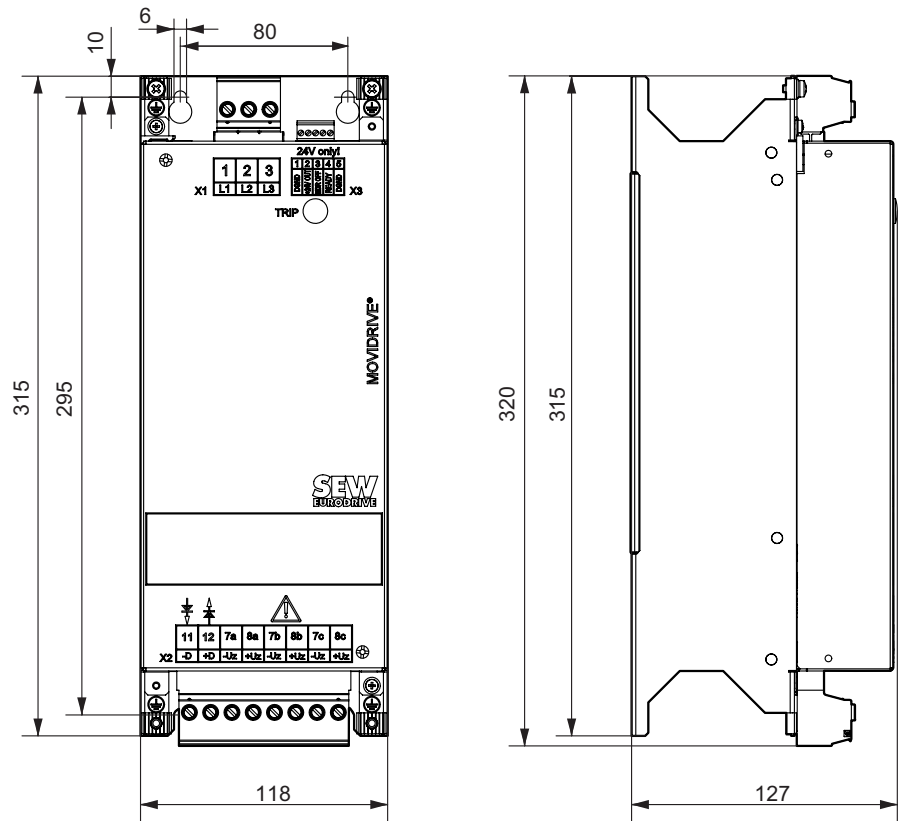


9.1.6 Dimension drawings

MOVIDRIVE® MDR60A0150 size 2

Observe the following minimum clearance for control cabinet installation:

- 100 mm above and below
- No clearance required on the side

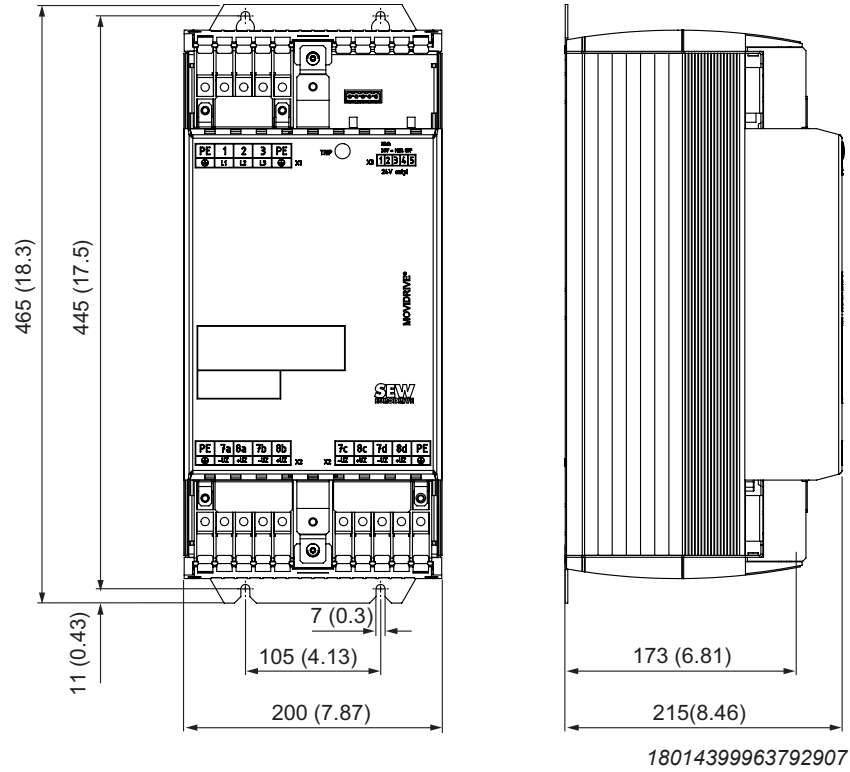


All dimensions in mm (in)

#### MOVIDRIVE® MDR60A0370 size 3

Observe the following minimum clearance for control cabinet installation:

- 100 mm above and below
- No clearance required on the side

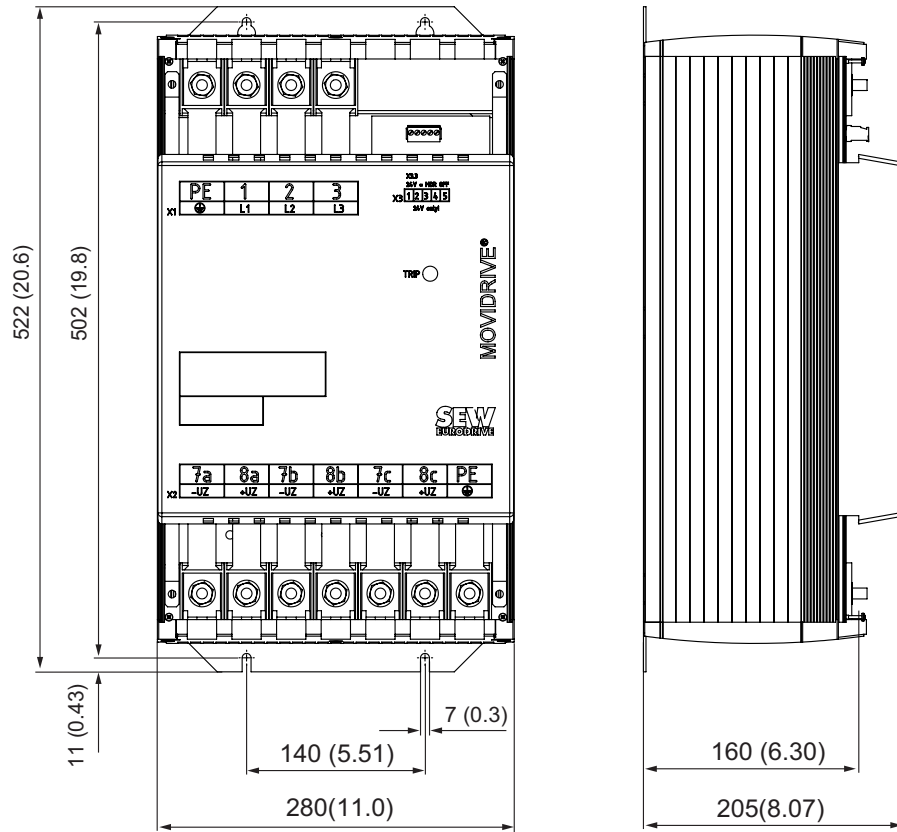


All dimensions in mm (in)

**MOVIDRIVE® MDR60A0750 size 4**

Observe the following minimum clearance for control cabinet installation:

- 100 mm above and below
- The minimum distance above the inverter for installing temperature-sensitive components, such as contactors or fuses, is 300 mm
- No clearance required on the side



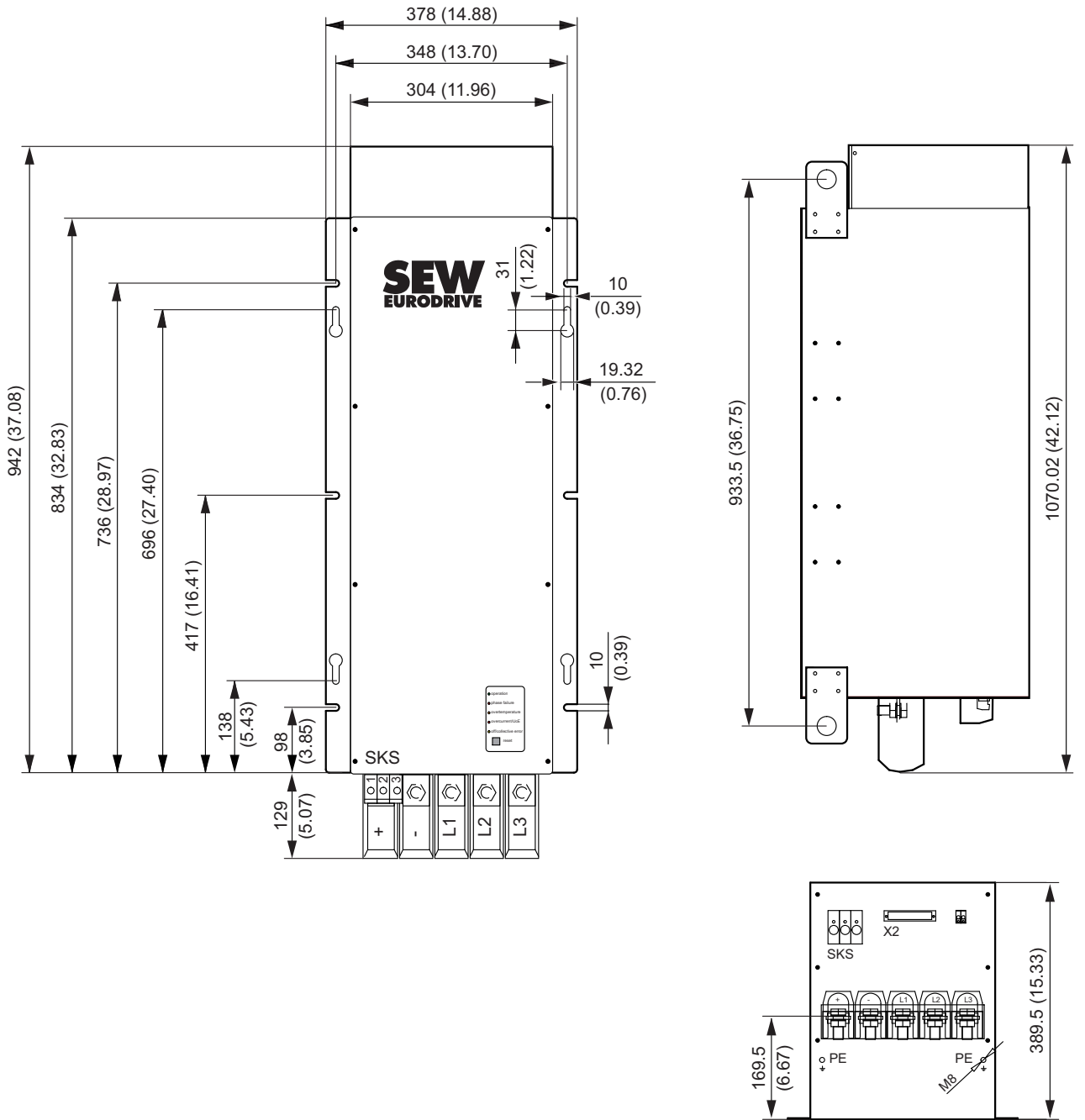
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All dimensions in mm (in)

#### MOVIDRIVE® MDR60A1320 size 6

Observe the following minimum clearance for control cabinet installation:

- 100 mm above
- Do not install any components that are sensitive to high temperatures within 300 mm above the device, for example contactors or fuses
- No clearance required below
- 70 mm on the side



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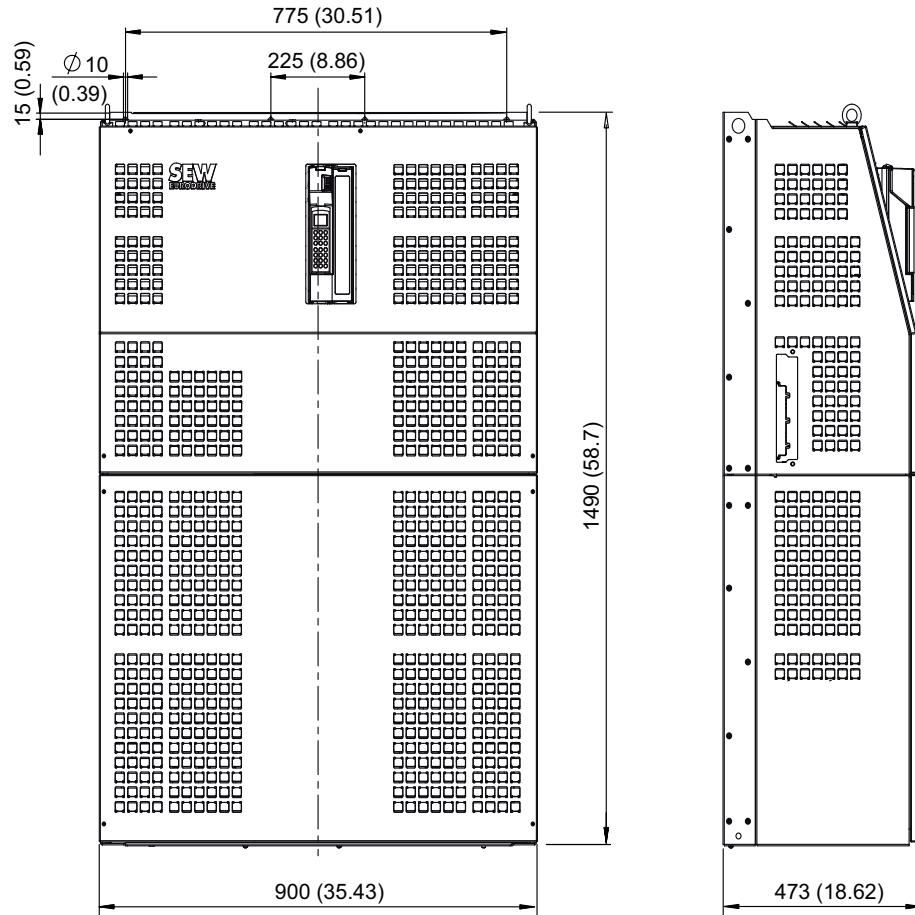
All dimensions in mm (in)

23534850/EN – 11/2017

**MOVIDRIVE® MDR61B1600/2500 size 7**

Observe the following minimum clearance for control cabinet installation:

- 100 mm above
- Do not install any components that are sensitive to high temperatures within 300 mm above the device, for example contactors or fuses
- Mounting on a base (e.g. DLS31B mounting base) is recommended due to the choke ventilation
- No clearance required on the side

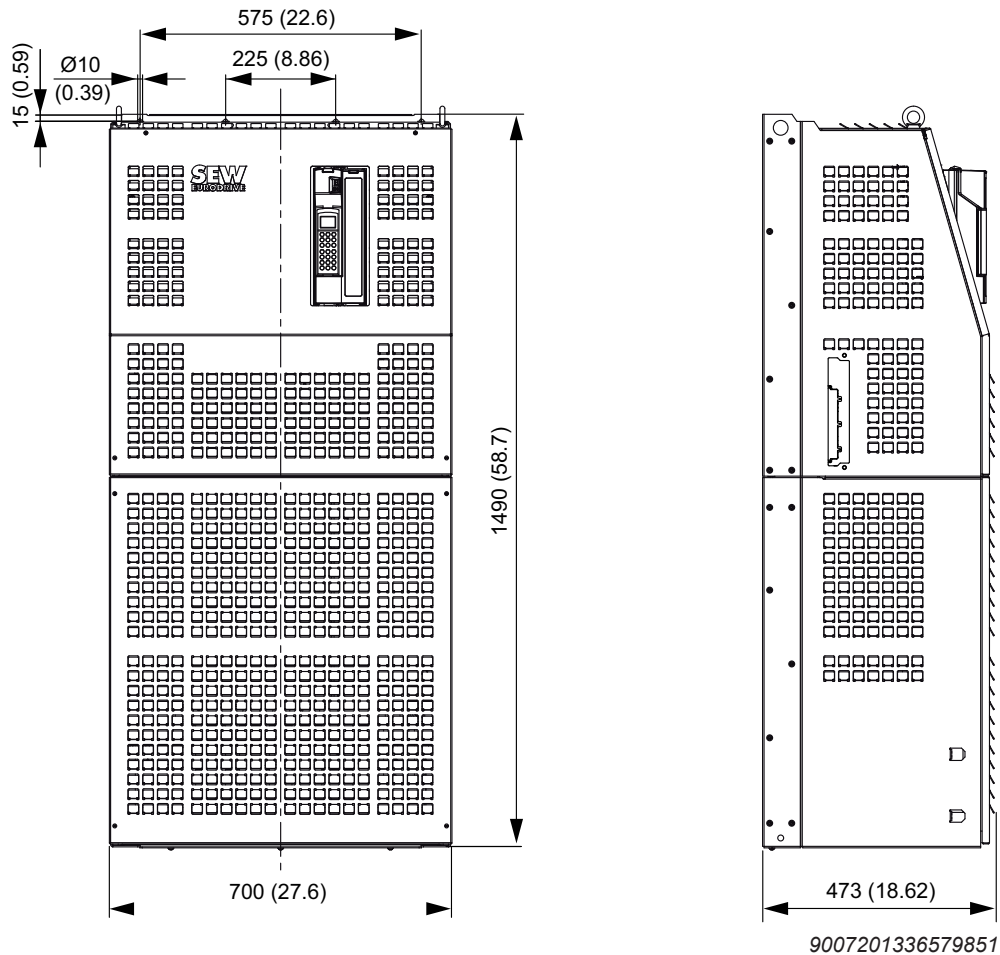


3330429579

### MOVIDRIVE® MDX62B1600/2000/2500 size 7

Observe the following minimum clearance for control cabinet installation:

- 100 mm above
- Do not install any components that are sensitive to high temperatures within 300 mm above the device, for example contactors or fuses
- No clearance required below
- No clearance required on the side



9.1.7 DC link connection

SEW-EURODRIVE recommends using the following cable sets for the DC link connection. These cable sets offer the appropriate dielectric strength and are also color-coded. Color coding is necessary because cross-polarity and ground faults could cause irreparable damage to the connected equipment.

The length of the cables restricts the DC link connection to the permitted length of 5 m. They can also be cut to length by the customer for connecting several devices. The cable lugs for connection to the regenerative power supply unit and an inverter are supplied with the cable set. Use commercially available cable lugs for connecting additional inverters. The inverters must then be connected to the regenerative power supply unit in star configuration.

| Cable set type            | DCP12A         | DCP13A         | DCP15A         | DCP16A         |
|---------------------------|----------------|----------------|----------------|----------------|
| Part number               | 08145679       | 08142505       | 08142513       | 08175934       |
| For connecting MOVIDRIVE® | 0005 –<br>0110 | 0150 –<br>0370 | 0450 –<br>0750 | 0900 –<br>1320 |

**INFORMATION**



Refer to the "MOVIDRIVE® MDR60A/61B Regenerative Power Supply Unit and MDX62B Motor Inverter" system manual for information on the DC link connection. This system manual can be ordered from SEW-EURODRIVE.

## 10 Technical data of options

### 10.1 HIPERFACE® encoder card DEH11B


#### 10.1.1 Part number

08243107

#### 10.1.2 Description

Option-capable MOVIDRIVE® MDX61B devices can be equipped with the HIPERFACE® encoder card type DEH11B. The encoder card offers one input for motor encoder and one input for external encoder, also referred to as a distance encoder. The input for the external encoder can also be used as an output for incremental encoder simulation.

#### 10.1.3 Electronics data

| Option DEH11B  |  |  |  |
|--|--|--|--|
|  | Output for incremental encoder simulation or External encoder input X14: | Output for incremental encoder simulation:<br>• Signal level to RS422<br>• The number of pulses is the same as on X15 motor encoder input  | External encoder input (max. 200 kHz):<br>Permitted encoder types:<br>• HIPERFACE® encoder<br>• Sin/cos encoder $V_{SS} = AC 1 V$<br>• TTL encoder with negated tracks<br>• Encoder with signal level to RS422<br><br>Encoder voltage supply:<br>• DC +12 V (tolerance range DC 10.5 – 13 V)<br>• $I_{max} = DC 650 mA^{1)}$ |
|  | Motor encoder input X15:   | Permitted encoder types:<br>• HIPERFACE® encoder<br>• Sin/cos encoder $V_{SS} = AC 1 V$<br>• TTL encoder with negated tracks<br>• Encoder with signal level to RS422<br>• Permitted pulses per resolution: 128/256/512/1024/2018 increments<br><br>Encoder voltage supply:<br>• DC +12 V (tolerance range DC 10.5 – 13 V)<br>• $I_{max} = DC 650 mA$ |  |

1) Total current load of DC 12 V encoder supply  $\leq DC 650 mA$



## 10.2 Resolver card DER11B


### 10.2.1 Part number

08243077

### 10.2.2 Description

Option-capable MOVIDRIVE® MDX61B devices can be equipped with resolver card type DER11B. The resolver card offers one input for the resolver as motor encoder and one input for external encoder, also referred to as a distance encoder. The input for the external encoder can also be used as an output for incremental encoder simulation.

### 10.2.3 Electronics data

| DER11B option   |   |   |   |
|---|---|---|---|
|  <p>DER 11B</p> <p>X14</p> <p>X15</p> | Output for incremental encoder simulation or External encoder input<br>X14: | Output for incremental encoder simulation:<br>• Signal level to RS422<br>• The number of pulses is 1024 pulses/revolution | External encoder input (max. 200 kHz):<br>Permitted encoder types:<br>• HIPERFACE® encoder<br>• Sin/cos encoder $V_{SS} = AC 1 V$<br>• TTL encoder with negated tracks<br>• Encoder with signal level to RS422<br><br>Encoder voltage supply:<br>• DC +12 V (tolerance range DC 10.5 – 13 V)<br>• $I_{max} = DC 650 mA$ |
|   | Motor encoder input X15:  | Resolvers<br>2-pole, $V_{ref} = AC 7 V, 7 kHz$<br>$V_{in}/V_{ref} = 0.5 \pm 10\%$   |   |
|   | Maximum cable length  | 100 m   |   |

### 10.3 DEU21B multi-encoder card

#### 10.3.1 Part number


18221696

#### 10.3.2 Description

Option-capable MOVIDRIVE® MDX61B units can be equipped with a DEU21B multi-encoder card. The encoder card provides one input for the motor encoder and one input for an external encoder, also referred to as a distance encoder.

Both encoder inputs can evaluate incremental and absolute encoders. The input for the external encoder can also be used as an output for incremental encoder simulation.

#### 10.3.3 Electronics data

| Option DEU21B <sup>1)</sup>  |   |   |
|--|---|---|
|  | <p>External encoder connection<br/>X14:</p> <p>Output for incremental encoder simulation:</p> <ul style="list-style-type: none"> <li>• Signal level to RS422</li> <li>• The number of pulses is the same as on X15 motor encoder input</li> </ul> | <p>Permitted encoder types:</p> <ul style="list-style-type: none"> <li>• HIPERFACE® encoder</li> <li>• Sin/cos encoder <math>V_{SS} = AC 1 V</math></li> <li>• CANopen encoder</li> <li>• TTL encoder with negated tracks</li> <li>• HTL encoder</li> <li>• SSI encoder</li> <li>• SSI Combi encoder</li> <li>• EnDat encoder</li> <li>• Encoder with signal level to RS422</li> <li>• Permitted pulses per resolution: 2-4096 Increments</li> </ul> <p>Encoder voltage supply:</p> <ul style="list-style-type: none"> <li>• DC 24 V encoder supply</li> <li>• DC 12 V encoder supply<sup>2)</sup></li> </ul>           |
|  | <p>Motor encoder connection<br/>X15:</p>  | <p>Permitted encoder types:</p> <ul style="list-style-type: none"> <li>• HIPERFACE® encoder</li> <li>• Sin/cos encoder <math>V_{SS} = AC 1 V</math></li> <li>• TTL encoder with negated tracks</li> <li>• HTL encoder</li> <li>• SSI encoder (not for speed control)</li> <li>• SSI Combi encoder</li> <li>• EnDat encoder</li> <li>• Encoder with signal level to RS422</li> <li>• Permitted pulses per resolution: 2-4096 Increments</li> </ul> <p>Encoder voltage supply:</p> <ul style="list-style-type: none"> <li>• DC 24 V encoder supply<sup>3)</sup></li> <li>• DC 12 V encoder supply<sup>2)</sup></li> </ul> |

1) The card has a fixed DGND-PE connection. Removing the EMC screw at the basic device has no effect.

2) The maximum load on X14:15 and X15:15 is DC 650 mA in total.

3) If the overall device load on the 24 V level exceeds 400 mA, you must connect an external DC 24 V supply to X10:9/X10:10. Observe the "Project planning" chapter in the "MOVIDRIVE® MDX60B/61B" system manual

## 10.4 DEH21B/DIP11B absolute encoder card

### 10.4.1 Part numbers


- DEH21B: 18208185
- DIP11B: 08249695

### 10.4.2 Description


The DEH21B and DIP11B options extend the MOVIDRIVE® B system to include an SSI interface for absolute encoders. This enables the following options for IPOS<sup>PLUS</sup>® positioning:

- No reference travel required when the system is started or after a power failure
- Positioning can take place either with the absolute encoder or the incremental encoder/resolver installed on the motor
- No position switch needed on the travel path, even without motor encoder feedback
- Free processing of the absolute position is possible via the IPOS<sup>PLUS</sup>® program
- In addition to the basic device, 8 digital inputs and 8 digital outputs are available with the DIP11B option
- The absolute encoder can be mounted either on the motor or along the track (e.g. high-bay warehouse)
- Simple encoder adjustment with user-guided startup
- Endless positioning in combination with activated modulo function

### 10.4.3 Electronics data for DEH21B

| DEH21B option   |                          |       |  |
|---|--------------------------|-------|--|
|  | Motor encoder connection | X15:  | Permitted encoder types: <ul style="list-style-type: none"> <li>• HIPERFACE® encoder</li> <li>• Sin/cos encoder <math>V_{SS} = AC\ 1\ V</math></li> <li>• TTL encoder with negated tracks</li> <li>• Encoder with signal level to RS422</li> <li>• Permitted pulses per resolution: 128/256/512/1024/2048 increments</li> </ul> Encoder voltage supply: <ul style="list-style-type: none"> <li>• DC +12 V (tolerance range 10.5 – 13 V)</li> <li>• <math>I_{max} = DC\ 650\ mA</math></li> </ul> |
|   | Encoder connection       | X62:  | SSI encoder input  |
|   | Connection               |       | 24VIN: DC 24 V supply voltage for encoder connected to X62   |
|   | Voltage supply           | X60:1 |  |
|   | Reference terminal       | X60:2 | Reference potential 24VIN  |

## 10.4.4 Electronics data for DIP11B

| DIP11B option  |                               |  |   |
|--|-------------------------------|--|---|
|  | Digital input connection      | X60:1 – 8  | DI10 – DI17 isolated via optocoupler, PLC-compatible (EN 61131), sampling cycle 1 ms  |
|  | Internal resistance           |  | $R_i \approx 3 \text{ k}\Omega$ , $I_E \approx \text{DC } 10 \text{ mA}$  |
|  | Signal level (EN 61131)       |  | DC +13 V – +30 V = "1" / DC -3 V – +5 V = "0"   |
|  | Function                      | X60:1 – 8  | DI10 – DI17; Selection option → Parameter menu P61_   |
|  | Digital input connection      | X61:1 – 8  | DO1 – DO17, PLC-compatible (EN 61131), short-circuit proof and protected against external voltage to DC 30 V<br>Response time 1 ms  |
|  | Signal level (EN 61131)       |  | DC +24 V = "1", DC 0 V = "0" <b>Important:</b> Do not apply external voltage!   |
|  | Function                      | X61:1 – 8  | DO10 – DO17: Selection option → Parameter menu P63_   |
|  | Encoder connection            | X62:   | SSI encoder input   |
|  | Reference terminals           | X60:9<br>X60:10  | DCOM: Reference potential for digital inputs (DI10 – DI17)<br>DGND: Reference potential for binary signals and 24VIN<br>• Without jumper X60:9 – X60:10 (DCOM-DGND) isolated digital inputs<br>• With jumper X60:9 – X60:10 (DCOM-DGND) non-isolated digital inputs |
|  | Permitted cable cross section |  | One core per terminal: 0.08 – 1.5 mm <sup>2</sup> (AWG28 – 16)<br>Two cores per terminal: 0.25 – 1 mm <sup>2</sup> (AWG22 – 17)<br>Tightening torque 0.6 Nm   |
| Voltage input  | X61:9                         | 24VIN: Supply voltage DC +24 V for digital outputs DO10 – DO17 and encoder (mandatory) |   |

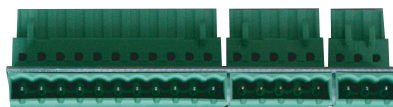
## 10.5 Connector adapter for device replacement MD\_60A - MDX60B/61B

The following adapters are available for quick replacement of a MOVIDRIVE® A with a MOVIDRIVE® B during system operation.

- DAT11B: Terminal adapter, part number 08246718

If the TF/TH option is connected to X10 when using MOVIDRIVE® MD\_A, then X10 can be directly replugged. The jumper between X10:1 and X10:2 must be removed if a TF/TH option is connected to encoder input X15. Three connectors have to be rewired. You can avoid such rewiring work by using the DAT11B terminal adapter. Using this adapter will prevent incorrect connection and save time. The terminal adapter is required for terminals X11 (analog input), X12 (SBus) and X13 (digital inputs).

DAT11B



1454696587

- DAE15B: Encoder adapter X15, part number 08176299

If a motor with encoder on X15 is in operation on an MDV or MCV, the encoder is connected via a 9-pin connector to MOVIDRIVE® A. Since the DEH11B option for MOVIDRIVE® MDX61B comes equipped with a 15-pin socket, you will either have to convert the encoder cable or use the encoder adapter. The encoder adapter DAE15B for connecting sin/cos and TTL encoders can be inserted directly between the existing encoder cable with a 9-pin connector and the 15-pin socket on DEH11B. This step makes for fail-safe and fast connection of existing drives. HTL encoders have to be connected to MOVIDRIVE® B with the option DWE11B/12B (→ chapter "DWE11B/12B interface adapter option").

DAE15B



1454699659

- Length of DAE15B: 200 mm ± 20 mm  
Cable cross section: 6 x 2 x 0.25 mm<sup>2</sup> (AWG 23)
- DAE14B: Encoder adapter X14, part number 08176302

If a distance encoder at X14 is operated on a MOVIDRIVE® MDV, MDS, MCV, or MCS, connection is made using a 9-pin socket. Since the DEH11B and DER11B options for MOVIDRIVE® MDX61B come equipped with a 15-pin connector, you will either have to rework the encoder cable or use the DAE14B encoder adapter. The DAE14B encoder adapter can be plugged directly between the existing encoder cable with 9-pin socket and the 15-pin connector on the DEH11B//DER11B option. This step makes for fail-safe and fast connection of existing drives.

**DAE14B**

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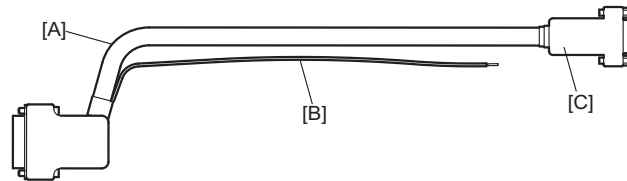
- Length of DAE14B: 200 mm ± 20 mm  
Cable cross section: 6 x 2 x 0.25 mm<sup>2</sup> (AWG 23)

## 10.6 DWE11B/12B interface adapter

### 10.6.1 Part number and description

#### DWE11B, part number 01881876

- The interface adapter DWE11B (HTL→TTL) in the form of an adapter cable is used to **connect single-ended HTL encoders to the DEH11B/DEH21B option**. Only the A, B and C tracks are connected. The interface adapter is suitable for all HTL encoders that were operated on MOVIDRIVE® A, MDV and MCV and can be connected without any rewiring effort.



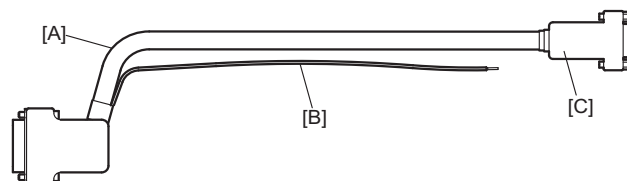
1805896331

- [A] 5 x 2 x 0.25 mm<sup>2</sup> (AWG 23) / length 1000 mm / max. cable length inverter – encoder: 100 m
- [B] DC 24 V connection for HTL encoder; 1 x 0.5 mm<sup>2</sup> (AWG 20) / length 250 mm

| Signal | Terminal of 9-pin D-sub socket [C] (encoder end) |
|--------|--|
| A      | 1  |
| B      | 2  |
| C      | 3  |
| UB     | 9  |
| GND    | 5  |

#### DWE12B, part number 01881809

- The interface adapter DWE12B (HTL → TTL) in the form of an adapter cable is used to **connect push-pull HTL encoders to the DEH11B/DEH21B options**. In addition to the A, B, and C track, you will also have to connect the negated tracks ( $\bar{A}$ ,  $\bar{B}$ ,  $\bar{C}$ ). SEW-EURODRIVE recommends using this interface adapter for any new system.



1805896331

- [A] 4 x 2 x 0.25 mm<sup>2</sup> (AWG 23) / length 1000 mm / max. cable length inverter – encoder: 200 m
- [B] DC 24 V connection for HTL encoder; 1 x 0.5 mm<sup>2</sup> (AWG 20) / length 250 mm

| Signal    | Terminal of 9-pin D-sub socket [C] (encoder end) |
|-----------|--|
| A         | 1  |
| $\bar{A}$ | 6  |
| B         | 2  |
| $\bar{B}$ | 7  |
| C         | 3  |
| $\bar{C}$ | 8  |
| UB        | 9  |
| GND       | 5  |

## 10.7 UWS11A interface adapter

### 10.7.1 Part number

0822689X

### 10.7.2 Description

The UWS11A option converts RS232 signals, for example from the PC, into RS485 signals. These RS485 signals can then be routed to the RS485 interface of the inverter.

The UWS11A option requires a DC 24 V voltage supply.

### 10.7.3 RS232 interface

The connection between UWS11A and PC is made using a commercially available serial interface cable (shielded!).

### 10.7.4 RS485 interface

Max. 32 inverters can be networked for communication (max. line length 200 m) via the RS485 interface of the UWS11A. Do not connect external terminating resistors as dynamic terminating resistors are already installed.

Permitted cable cross-section: 1 core per terminal 0.20 – 2.5 mm<sup>2</sup> (AWG 24 - 12)

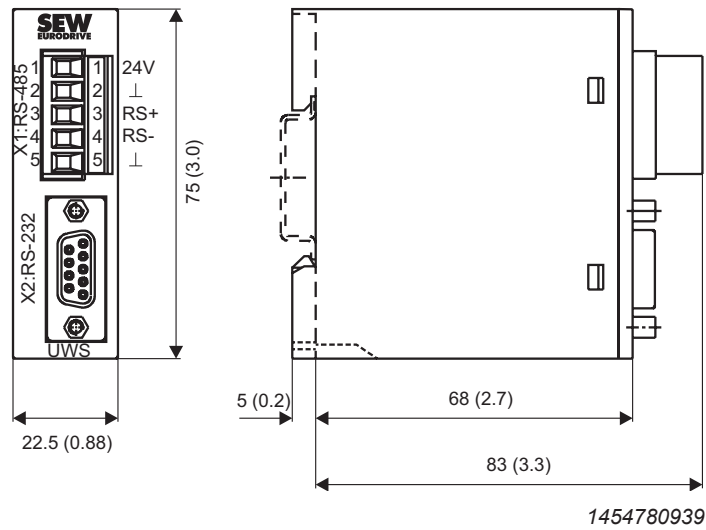
2 cores per terminal 0.20 – 1 mm<sup>2</sup> (AWG 24 – 17)

### 10.7.5 Technical data

| UWS11A               |  |                        |
|----------------------|--|------------------------|
| Part number          | 0822689X   |                        |
| Ambient temperature  | 0 °C to 40 °C  |                        |
| Storage temperature  | -25 °C – +70 °C (according to EN 60721-3-3, class 3K3) |                        |
| Degree of protection | IP20   |                        |
| Voltage supply       | DC 24 V (I <sub>max</sub> = 50 mA)                     |                        |
| Current consumption  | max. DC 50 mA  |                        |
| Mass                 | 150 g  |                        |
| Dimensions           | 83 mm × 75 mm × 22.5 mm                                |                        |
| Terminal assignment  |  |                        |
| X1: RS485            | 1 / 24 V   | DC +24 V voltage input |
|                      | 2 / ⊥  | Reference potential    |
|                      | 3 / RS+  | RS485+                 |
|                      | 4 / RS-  | RS485-                 |
|                      | 5 / ⊥  | Reference potential    |
| X2: RS232            | 1  | No function            |
|                      | 2  | TxD                    |
|                      | 3  | RxD                    |
|                      | 4  | No function            |
|                      | 5  | Reference potential    |
|                      | 6 – 9  | No function            |



Dimension drawing of UWS11A



All dimensions in mm (in)

The UWS11A option is mounted on a mounting rail (EN 50022-35 × 7.5) in the control cabinet.

## 10.8 UWS21B interface adapter

### 10.8.1 Part number

18204562

### 10.8.2 Description

The UWS21B option converts RS232 signals, for example from the PC, into RS485 signals. These RS485 signals can then be routed to the XT slot of the inverter.

### 10.8.3 RS232 interface

The connection between UWS21B and PC is made using a commercially available serial interface cable (shielded!).

### 10.8.4 RS485 interface

UWS21B and inverter are connected using a serial interface cable with RJ10 connectors.

### 10.8.5 Scope of delivery

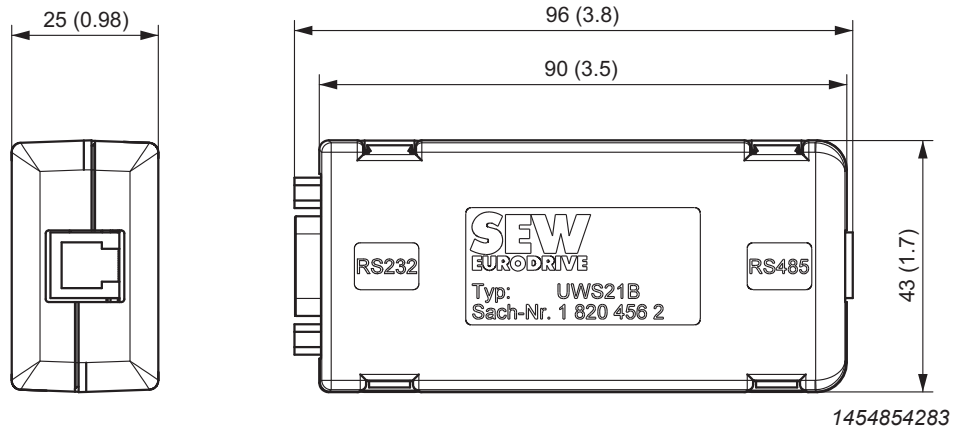
The scope of delivery for the UWS21B option includes:

- UWS21B
- Serial interface cable with 9-pin D-sub socket and 9-pin D-sub connector for the UWS21B – PC connection.
- Serial interface cable with two RJ10 plugs to connect UWS21B and inverter.
- CD-ROM with MOVITOOLS® MotionStudio engineering software

### 10.8.6 Technical data

| UWS21B               |   |
|----------------------|---|
| Part number          | 18204562  |
| Ambient temperature  | 0 °C to 40 °C   |
| Storage temperature  | –25 °C to +70 °C (according to EN 60721-3-3, class 3K3) |
| Degree of protection | IP20  |
| Mass                 | 300 g   |
| Dimensions           | 96 mm × 43 mm × 25 mm                                   |

Dimension drawing for UWS21B



All dimensions in mm (in)

## 10.9 USB11A interface adapter

### 10.9.1 Part number

08248311

### 10.9.2 Description

Option USB11A enables a PC or laptop with a USB interface to be connected to the XT slot of the inverter. The USB11A interface adapter supports USB 1.1 and USB 2.0.

### 10.9.3 USB11A – PC

USB11A is connected to the PC using a commercially available, shielded USB connection cable type USB A-B.

### 10.9.4 MOVIDRIVE® – USB11A

The inverter and USB11A are connected using a serial interface cable with RJ10 connectors.

### 10.9.5 Scope of delivery

The scope of delivery for the USB11A option includes:

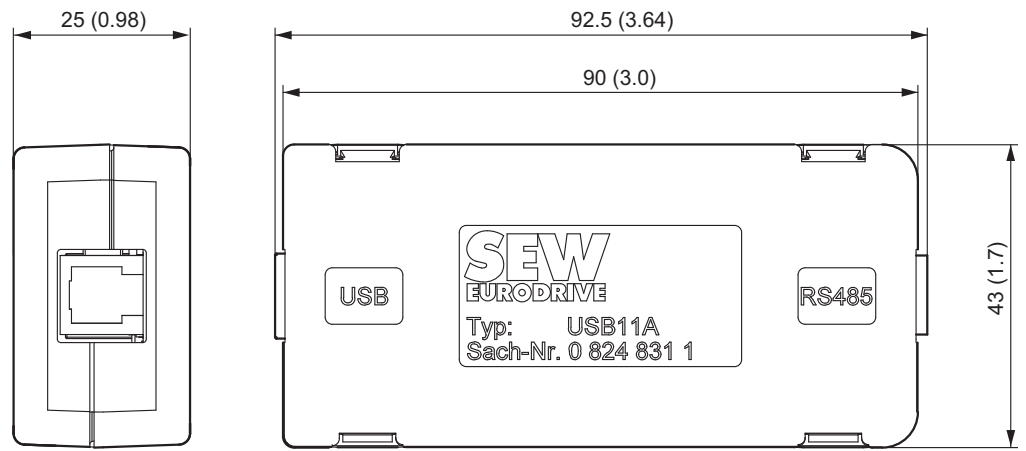
- USB11A interface adapter
- USB connection cable to connect USB11A – PC
- Serial interface cable with two RJ10 plugs to connect inverter and USB11A
- CD-ROM with drivers and MOVITOOLS® MotionStudio engineering software

### 10.9.6 Technical data

| USB11A               |   |
|----------------------|---|
| Part number          | 08248311  |
| Ambient temperature  | 0 – 40 °C   |
| Storage temperature  | –25 °C to +70 °C (according to EN 60721-3-3, class 3K3) |
| Degree of protection | IP20  |
| Mass                 | 300 g   |
| Dimensions           | 92.5 mm × 43 mm × 25 mm                                 |

Dimension drawing

All dimensions in mm (in)



1454863115

## 10.10 DWI11A DC 5 V encoder supply

### 10.10.1 Part number

08227594

### 10.10.2 Description

If you are using an incremental encoder with a DC 5 V encoder supply, install the DC 5 V encoder supply option type DWI11A between the inverter and the incremental encoder. This option provides a regulated DC 5 V power supply for the encoder. For this purpose, the DC 12 V power supply for the encoder inputs is converted to DC 5 V by means of a voltage controller. A sensor line is used to measure the supply voltage at the encoder and compensate the voltage drop along the encoder cable.

Incremental encoders with DC 5 V encoder supply must not be connected directly to the encoder inputs X14: and X15:.. This would cause irreparable damage to the encoder.

### INFORMATION

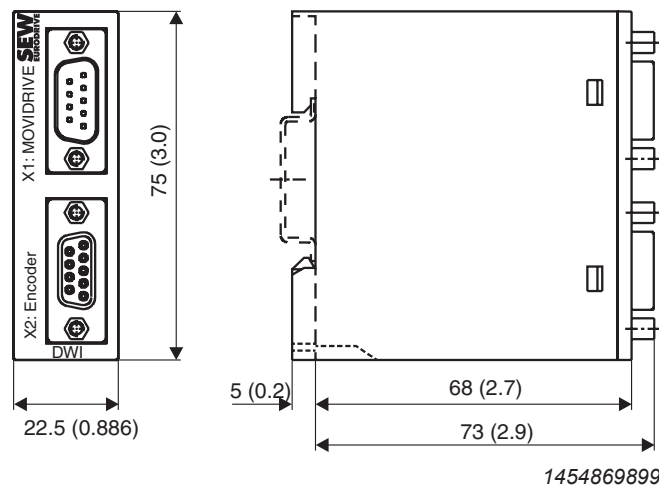


If a short circuit occurs in the sensor cable, the connected encoder may be exposed to a voltage higher than permitted.

### 10.10.3 Recommendation

Use prefabricated cables from SEW-EURODRIVE for the encoder connection.

### 10.10.4 Dimension drawing



All dimensions in mm (in)

The DWI11A option is mounted on a support rail (EN 50022-35 × 7.5) in the control cabinet.

10.10.5 Technical data

| DC 5 V encoder supply option type DWI11A |   |
|--|---|
| Part number                              | 08227594  |
| Voltage input                            | DC 10 – 30 V, $I_{max}$ = DC 120 mA   |
| Encoder voltage supply                   | DC +5 V (to $V_{max} \approx +10$ V), $I_{max}$ = DC 300 mA   |
| Max. line length that can be connected   | 100 m total<br>Use a shielded twisted-pair cable (A and <b>A</b> , B and <b>B</b> , C and <b>C</b> ) for connecting the encoder to the DWI11A and the DWI11A to MOVIDRIVE®. |
| Encoder types that can be connected      | <ul style="list-style-type: none"> <li>• sin/cos encoder VSS = AC 1 V</li> <li>• TTL encoder with negated tracks</li> <li>• Encoder with signal level to RS422</li> </ul>   |

## 10.11 DIO11B input/output board


### 10.11.1 Part number

08243085

### 10.11.2 Description

The number of inputs/outputs of the basic MOVIDRIVE® B device can be expanded with the DIO11B option. The DIO11B option is plugged into the fieldbus slot. If the fieldbus slot is not available, you can plug the DIO11B option into the expansion slot. The programmable signal types of the additional digital inputs/outputs are the same as the basic device (→ parameter group P6\_\_\_, terminal assignment).

### 10.11.3 Electronics data

| Option DIO11B   |   |   |  |   |  |  |   |               |   |                             |                     |  |                              |               |   |                                   |  |                                  |
|---|---|---|--|---|--|--|---|---------------|---|-----------------------------|---------------------|--|------------------------------|---------------|---|-----------------------------------|--|----------------------------------|
|   | <table border="0"> <tr> <td>Setpoint input n2</td> <td>X20:1/X20:2</td> <td>AI21/AI22: Voltage input<br/>Differential input or input with AGND reference potential</td> </tr> <tr> <td>Operating mode</td> <td>AI21/AI22</td> <td>n2 = DC 0 V – +10 V or DC -10 V – +10 V</td> </tr> <tr> <td>Resolution</td> <td></td> <td>12 bit, sampling cycle 1 ms</td> </tr> <tr> <td>Internal resistance</td> <td></td> <td><math>R_i = 40 \text{ k}\Omega</math></td> </tr> <tr> <td>Accuracy</td> <td></td> <td>+/- 100 mV (<math>\pm 0.5\%</math> of 20 V)</td> </tr> </table>  | Setpoint input n2   | X20:1/X20:2  | AI21/AI22: Voltage input<br>Differential input or input with AGND reference potential   | Operating mode                         | AI21/AI22  | n2 = DC 0 V – +10 V or DC -10 V – +10 V | Resolution    |   | 12 bit, sampling cycle 1 ms | Internal resistance |  | $R_i = 40 \text{ k}\Omega$   | Accuracy      |   | +/- 100 mV ( $\pm 0.5\%$ of 20 V) |  |                                  |
|   | Setpoint input n2   | X20:1/X20:2   | AI21/AI22: Voltage input<br>Differential input or input with AGND reference potential  |   |  |  |   |               |   |                             |                     |  |                              |               |   |                                   |  |                                  |
|   | Operating mode  | AI21/AI22   | n2 = DC 0 V – +10 V or DC -10 V – +10 V  |   |  |  |   |               |   |                             |                     |  |                              |               |   |                                   |  |                                  |
|   | Resolution  |   | 12 bit, sampling cycle 1 ms  |   |  |  |   |               |   |                             |                     |  |                              |               |   |                                   |  |                                  |
|   | Internal resistance   |   | $R_i = 40 \text{ k}\Omega$   |   |  |  |   |               |   |                             |                     |  |                              |               |   |                                   |  |                                  |
|   | Accuracy  |   | +/- 100 mV ( $\pm 0.5\%$ of 20 V)  |   |  |  |   |               |   |                             |                     |  |                              |               |   |                                   |  |                                  |
|   | <table border="0"> <tr> <td rowspan="2">Analog outputs</td> <td>X21:1/X21:4</td> <td>AOV1/AOV2: Voltage outputs DC-10 V to 0 to +10 V, <math>I_{\max} = \text{DC } 10 \text{ mA}</math>, short-circuit proof and protected against external voltage to DC 30 V, selection option → parameter menu P64_</td> </tr> <tr> <td>X21:2/X21:5</td> <td>AOC1/AOC2: Current outputs DC 0(4) – 20 mA, max. output voltage DC 15 V, short-circuit proof and protected against external voltages up to DC 30 V, selection option → parameter menu P64_</td> </tr> <tr> <td>Response time</td> <td></td> <td>5 ms</td> </tr> <tr> <td>Resolution</td> <td></td> <td>10 Bit</td> </tr> <tr> <td>Accuracy of the analog input</td> <td></td> <td>0.5% of 20 V <math>\pm 100 \text{ mV}</math></td> </tr> <tr> <td>Accuracy of the analog output</td> <td></td> <td>0.2% of 20 V <math>\pm 40 \text{ mV}</math></td> </tr> </table> | Analog outputs  | X21:1/X21:4  | AOV1/AOV2: Voltage outputs DC-10 V to 0 to +10 V, $I_{\max} = \text{DC } 10 \text{ mA}$ , short-circuit proof and protected against external voltage to DC 30 V, selection option → parameter menu P64_ | X21:2/X21:5                            | AOC1/AOC2: Current outputs DC 0(4) – 20 mA, max. output voltage DC 15 V, short-circuit proof and protected against external voltages up to DC 30 V, selection option → parameter menu P64_ | Response time                           |               | 5 ms  | Resolution                  |                     | 10 Bit   | Accuracy of the analog input |               | 0.5% of 20 V $\pm 100 \text{ mV}$                   | Accuracy of the analog output     |  | 0.2% of 20 V $\pm 40 \text{ mV}$ |
|   | Analog outputs  |   | X21:1/X21:4  | AOV1/AOV2: Voltage outputs DC-10 V to 0 to +10 V, $I_{\max} = \text{DC } 10 \text{ mA}$ , short-circuit proof and protected against external voltage to DC 30 V, selection option → parameter menu P64_ |  |  |   |               |   |                             |                     |  |                              |               |   |                                   |  |                                  |
|   |   | X21:2/X21:5   | AOC1/AOC2: Current outputs DC 0(4) – 20 mA, max. output voltage DC 15 V, short-circuit proof and protected against external voltages up to DC 30 V, selection option → parameter menu P64_ |   |  |  |   |               |   |                             |                     |  |                              |               |   |                                   |  |                                  |
|   | Response time   |   | 5 ms   |   |  |  |   |               |   |                             |                     |  |                              |               |   |                                   |  |                                  |
| Resolution  |   | 10 Bit  |  |   |  |  |   |               |   |                             |                     |  |                              |               |   |                                   |  |                                  |
| Accuracy of the analog input  |   | 0.5% of 20 V $\pm 100 \text{ mV}$   |  |   |  |  |   |               |   |                             |                     |  |                              |               |   |                                   |  |                                  |
| Accuracy of the analog output   |   | 0.2% of 20 V $\pm 40 \text{ mV}$  |  |   |  |  |   |               |   |                             |                     |  |                              |               |   |                                   |  |                                  |
| <table border="0"> <tr> <td>Digital inputs</td> <td></td> <td>Isolated (optocoupler), PLC-compatible (EN 61131)</td> </tr> <tr> <td>X22:1 – X22:8</td> <td></td> <td>DIØ – DI17</td> </tr> <tr> <td>Internal resistance</td> <td></td> <td><math>R_i \approx 3 \text{ k}\Omega</math>, <math>I_E \approx \text{DC } 10 \text{ mA}</math><br/>Sampling cycle 1 ms</td> </tr> <tr> <td>Signal level</td> <td></td> <td>DC +13 V – +30 V = "1" = contact closed<br/>DC -3 V – +5 V = "0" = contact open</td> </tr> <tr> <td>Function</td> <td>X22:1 – X22:8</td> <td>DI10 – DI17: Selection option → Parameter menu P61_</td> </tr> </table> | Digital inputs  |   | Isolated (optocoupler), PLC-compatible (EN 61131)  | X22:1 – X22:8   |  | DIØ – DI17   | Internal resistance                     |               | $R_i \approx 3 \text{ k}\Omega$ , $I_E \approx \text{DC } 10 \text{ mA}$<br>Sampling cycle 1 ms   | Signal level                |                     | DC +13 V – +30 V = "1" = contact closed<br>DC -3 V – +5 V = "0" = contact open | Function                     | X22:1 – X22:8 | DI10 – DI17: Selection option → Parameter menu P61_ |                                   |  |                                  |
| Digital inputs  |   | Isolated (optocoupler), PLC-compatible (EN 61131)   |  |   |  |  |   |               |   |                             |                     |  |                              |               |   |                                   |  |                                  |
| X22:1 – X22:8   |   | DIØ – DI17  |  |   |  |  |   |               |   |                             |                     |  |                              |               |   |                                   |  |                                  |
| Internal resistance   |   | $R_i \approx 3 \text{ k}\Omega$ , $I_E \approx \text{DC } 10 \text{ mA}$<br>Sampling cycle 1 ms   |  |   |  |  |   |               |   |                             |                     |  |                              |               |   |                                   |  |                                  |
| Signal level  |   | DC +13 V – +30 V = "1" = contact closed<br>DC -3 V – +5 V = "0" = contact open  |  |   |  |  |   |               |   |                             |                     |  |                              |               |   |                                   |  |                                  |
| Function  | X22:1 – X22:8   | DI10 – DI17: Selection option → Parameter menu P61_   |  |   |  |  |   |               |   |                             |                     |  |                              |               |   |                                   |  |                                  |
| <table border="0"> <tr> <td>Digital outputs</td> <td>X23:1 – X23:8</td> <td>DO1Ø – DO17: PLC-compatible (EN 61131-2), response time 1 ms</td> </tr> <tr> <td>Signal level</td> <td></td> <td>"0" = DC 0 V      "1" = DC +24 V</td> </tr> <tr> <td>Function</td> <td>X23:1 – X23:8</td> <td>DO10 – DO17: Selection option → Parameter menu P63_<br/><math>I_{\max} = \text{DC } 50 \text{ mA}</math>, short-circuit proof, and protected against external voltage to DC 30 V</td> </tr> </table>   | Digital outputs   | X23:1 – X23:8   | DO1Ø – DO17: PLC-compatible (EN 61131-2), response time 1 ms   | Signal level  |  | "0" = DC 0 V      "1" = DC +24 V   | Function                                | X23:1 – X23:8 | DO10 – DO17: Selection option → Parameter menu P63_<br>$I_{\max} = \text{DC } 50 \text{ mA}$ , short-circuit proof, and protected against external voltage to DC 30 V |                             |                     |  |                              |               |   |                                   |  |                                  |
| Digital outputs   | X23:1 – X23:8   | DO1Ø – DO17: PLC-compatible (EN 61131-2), response time 1 ms  |  |   |  |  |   |               |   |                             |                     |  |                              |               |   |                                   |  |                                  |
| Signal level  |   | "0" = DC 0 V      "1" = DC +24 V  |  |   |  |  |   |               |   |                             |                     |  |                              |               |   |                                   |  |                                  |
| Function  | X23:1 – X23:8   | DO10 – DO17: Selection option → Parameter menu P63_<br>$I_{\max} = \text{DC } 50 \text{ mA}$ , short-circuit proof, and protected against external voltage to DC 30 V |  |   |  |  |   |               |   |                             |                     |  |                              |               |   |                                   |  |                                  |
| <table border="0"> <tr> <td>Reference terminal</td> <td>X20:3/X21:3/X21:6</td> <td>ANGND: Reference potential for analog signals (AI21/AI22/AO_1/AO_2)</td> </tr> <tr> <td></td> <td>X22:9</td> <td>DCOM: Reference potential for digital inputs X22:1 – X22:8 (DI1Ø – DI17)</td> </tr> <tr> <td></td> <td>X22:10</td> <td>DGND: Reference potential for binary signals, reference potential for DC 24 V power supply</td> </tr> </table>   | Reference terminal  | X20:3/X21:3/X21:6   | ANGND: Reference potential for analog signals (AI21/AI22/AO_1/AO_2)  |   | X22:9                                  | DCOM: Reference potential for digital inputs X22:1 – X22:8 (DI1Ø – DI17)   |   | X22:10        | DGND: Reference potential for binary signals, reference potential for DC 24 V power supply  |                             |                     |  |                              |               |   |                                   |  |                                  |
| Reference terminal  | X20:3/X21:3/X21:6   | ANGND: Reference potential for analog signals (AI21/AI22/AO_1/AO_2)   |  |   |  |  |   |               |   |                             |                     |  |                              |               |   |                                   |  |                                  |
|   | X22:9   | DCOM: Reference potential for digital inputs X22:1 – X22:8 (DI1Ø – DI17)  |  |   |  |  |   |               |   |                             |                     |  |                              |               |   |                                   |  |                                  |
|   | X22:10  | DGND: Reference potential for binary signals, reference potential for DC 24 V power supply  |  |   |  |  |   |               |   |                             |                     |  |                              |               |   |                                   |  |                                  |
| <table border="0"> <tr> <td>Voltage input</td> <td>X23:9</td> <td>24VIN: DC +24 V supply voltage for digital outputs DO1Ø – DO17</td> </tr> </table>  | Voltage input   | X23:9   | 24VIN: DC +24 V supply voltage for digital outputs DO1Ø – DO17   |   |  |  |   |               |   |                             |                     |  |                              |               |   |                                   |  |                                  |
| Voltage input   | X23:9   | 24VIN: DC +24 V supply voltage for digital outputs DO1Ø – DO17  |  |   |  |  |   |               |   |                             |                     |  |                              |               |   |                                   |  |                                  |
| <table border="0"> <tr> <td rowspan="3">Permitted cable cross section</td> <td>One core per terminal:</td> <td>0.08 – 1.5 mm<sup>2</sup> (AWG 28 – 16)</td> </tr> <tr> <td>Two cores per terminal:</td> <td>0.25 – 1 mm<sup>2</sup> (AWG 22 – 17)</td> </tr> <tr> <td>Tightening torque:</td> <td>0.6 Nm</td> </tr> </table>  | Permitted cable cross section   | One core per terminal:  | 0.08 – 1.5 mm <sup>2</sup> (AWG 28 – 16)   | Two cores per terminal:   | 0.25 – 1 mm <sup>2</sup> (AWG 22 – 17) | Tightening torque:   | 0.6 Nm                                  |               |   |                             |                     |  |                              |               |   |                                   |  |                                  |
| Permitted cable cross section   |   | One core per terminal:  | 0.08 – 1.5 mm <sup>2</sup> (AWG 28 – 16)   |   |  |  |   |               |   |                             |                     |  |                              |               |   |                                   |  |                                  |
|   |   | Two cores per terminal:   | 0.25 – 1 mm <sup>2</sup> (AWG 22 – 17)   |   |  |  |   |               |   |                             |                     |  |                              |               |   |                                   |  |                                  |
|   | Tightening torque:  | 0.6 Nm  |  |   |  |  |   |               |   |                             |                     |  |                              |               |   |                                   |  |                                  |



#### 10.11.4 Functions

- 8 digital inputs
- 8 digital outputs
- 1 analog differential input (DC 0 – 10 V, DC -10 V – +10 V, DC 0 – 20 mA with corresponding load)
- 2 analog outputs (DC -10 V – +10 V, DC 0 – 20 mA, DC 4 – 20 mA)

## 10.12 PROFIBUS DFP21B fieldbus interface

### 10.12.1 Part number


08242402

### 10.12.2 Description

MOVIDRIVE® B can be equipped with a 12 Mbaud fieldbus interface for the PROFIBUS-DP serial bus system. The device master data (GSD) and type files for MOVIDRIVE® B are available from the SEW website (<http://www.sew-eurodrive.de>) to help with project planning and facilitate startup.

PROFIBUS-DP (Decentralized Periphery) is primarily used at the sensor/actuator level where fast response times are required. The principal task of PROFIBUS-DP is to exchange data, e.g. setpoints or binary commands, in rapid cycles between central automation equipment (PROFIBUS master) and decentralized peripheral devices (e.g. drive inverters). The DFP21B option supports PROFIBUS-DP and DP-V1. Consequently, MOVIDRIVE® B can be controlled via PLC and PROFIBUS-DP/DP-V1.

### 10.12.3 Electronics data

| DFP21B option  |                             |  |  |
|--|-----------------------------|--|--|
|  | Protocol variant            | PROFIBUS-DP and DPV1 to IEC 61158  |  |
|  | Baud rate                   | Automatic detection of baud rate from 9.6 kbaud to 12 Mbaud  |  |
|  | Connection technology       | 9-pin D-sub socket, pin assignment to IEC 61158  |  |
|  | Bus termination             | Not integrated, implement using suitable PROFIBUS connector with terminating resistors that can be activated |  |
|  | station address             | 1 – 125, can be set via DIP switches   |  |
|  | GSD file name               | DP: SEW_6003.GSD<br>DP-V1: SEWA6003.GSD  |  |
|  | DP ID number                | 6003 <sub>hex</sub> (24579 <sub>dec</sub> )  |  |
|  | Max. number of process data | 10 process data entries  |  |
|  |                             |  |  |
|  |                             |  |  |

## 10.13 INTERBUS fieldbus interface DFI11B

### 10.13.1 Part number


08243093

### 10.13.2 Description

MOVIDRIVE® B can be equipped with a fieldbus interface for the non-proprietary and standardized INTERBUS sensor/actuator bus system.

INTERBUS is defined in EN 50254/DIN 19258 and, as far as its function is concerned, it consists of a process data channel and a parameter data channel. Intelligent actuators such as the MOVIDRIVE® B drive inverters can be controlled and configured in a user-friendly way.

### 10.13.3 Electronics data

| DFI11B option  |                             |   |
|--|-----------------------------|---|
|  | Supported baud rates        | 500 kBaud and 2 MBaud, can be selected via DIP switch   |
|  | Connection technology       | Fieldbus input: 9-pin D-sub connector<br>Fieldbus output: 9-pin D-sub socket<br>RS485 transmission technology, 6-core shielded and twisted-pair cable   |
|  | DP identity numbers         | E3 <sub>hex</sub> = 227 <sub>dec</sub> (1 PCP word)<br>E0 <sub>hex</sub> = 224 <sub>dec</sub> (2 PCP words)<br>E1 <sub>hex</sub> = 225 <sub>dec</sub> (4 PCP words)<br>38 <sub>hex</sub> = 56 <sub>dec</sub> (microprocessor not ready)<br>03 <sub>hex</sub> = 3 <sub>dec</sub> (no PCP word) |
|  | Max. number of process data | 6 process data entries  |

#### 10.14 INTERBUS FOC fieldbus interface DFI21B

##### 10.14.1 Part number


08243115

##### 10.14.2 Description

MOVIDRIVE® B can be equipped with a fieldbus interface for the non-proprietary and standardized sensor/actuator bus system INTERBUS/INTERBUS with optical fibers (INTERBUS FOC).

INTERBUS is defined in EN 50254/DIN 19258 and, as far as its function is concerned, it consists of a process data channel and a parameter data channel. Intelligent actuators such as the MOVIDRIVE® B drive inverters can be controlled and configured in a user-friendly way.

##### 10.14.3 Electronics data

| DFI21B option  |                             |   |
|--|-----------------------------|---|
|  | Supported baud rates        | 500 kBaud and 2 MBaud, can be selected via DIP switch   |
|  | Connection technology       | F-SMA connector   |
|  | DP identity numbers         | E3 <sub>hex</sub> = 227 <sub>dec</sub> (1 PCP word)<br>E0 <sub>hex</sub> = 224 <sub>dec</sub> (2 PCP words)<br>E1 <sub>hex</sub> = 225 <sub>dec</sub> (4 PCP words)<br>38 <sub>hex</sub> = 56 <sub>dec</sub> (microprocessor not ready)<br>03 <sub>hex</sub> = 3 <sub>dec</sub> (no PCP word) |
|  | Max. number of process data | 6 process data entries  |

## 10.15 Fieldbus interface PROFINET IO RT DFE32B


### 10.15.1 Part number

18213456

### 10.15.2 Description

The MOVIDRIVE® MDX61B drive inverter enables you to use the DFE32B option to connect to higher-level automation, project planning and visualization systems via Ethernet (PROFINET IO protocol) thanks to its powerful, universal fieldbus interface. You can use option DFS32B to communicate directly with the inverters via Ethernet and operate the MOVITOOLS® MotionStudio engineering software to change parameters and IPOS<sup>PLUS</sup>® programs. An integrated Web server makes it possible for the user to access diagnostic values quickly and easily using a standard browser (e.g. Internet Explorer).

### 10.15.3 Electronics data

| DFE32B option  |                                 |   |  |
|--|---------------------------------|---|--|
|  | Application protocols           | <ul style="list-style-type: none"> <li>• <b>PROFINET IO</b> (Ethernet frames with frame identification 8892<sub>hex</sub>) to control and set parameters for the drive inverter.</li> <li>• <b>HTTP</b> (Hypertext Transfer Protocol) for diagnostics using a web browser.</li> <li>• <b>SMLP</b> (Simple MOVILINK® Protocol), protocol used by MOVITOOLS® MotionStudio.</li> </ul> |  |
|  | Port numbers used               | <ul style="list-style-type: none"> <li>• 300 (SMLP)</li> <li>• 80 (HTTP)</li> </ul>   |  |
|  | Ethernet services               | <ul style="list-style-type: none"> <li>• ARP</li> <li>• ICMP (ping)</li> </ul>  |  |
|  | ISO / OSI layer 2               | Ethernet II   |  |
|  | Baud rate                       | 100 Mbaud in full duplex process  |  |
|  | Connection technology           | Two RJ45 plug connectors with integrated switch and auto-crossing   |  |
|  | Addressing                      | 4 byte IP address or MAC-ID (00:0F:69:xx:xx:xx)   |  |
|  | Manufacturer ID (Vendor ID)     | 010A <sub>hex</sub>   |  |
|  | Tools for startup               | <ul style="list-style-type: none"> <li>• MOVITOOLS® MotionStudio engineering software</li> <li>• DBG60B keypad</li> </ul>   |  |
|  | Maximum number of process data: | 10  |  |
|  |                                 |   |  |

**10.15.4 Functions**

- PROFINET IO protocol
- Two RJ45 plug connectors for star or line type cabling
- Up to 10 process data and PROFINET diagnostic parameter data items can be transferred at the same time
- The PROFINET IO controller assigns the IP address
- Engineering access using MOVITOOLS® MotionStudio via Ethernet TCP/IP
- Inverter diagnostics using a standard browser (e.g. Internet Explorer) via the integrated Web server:
  - Transfer display values
  - DFE32B configuration (after login)

10.16 DFE33B fieldbus interface for EtherNet/IP™ and Modbus TCP


10.16.1 Part number

18213464

10.16.2 Description

The MOVIDRIVE® MDX61B drive inverter enables you to use the DFE33B option to connect to higher-level automation, project planning and visualization systems via Ethernet (EtherNet/IP™ and Modbus TCP protocol) thanks to its powerful, universal fieldbus interface. You can use option DFS33B to communicate directly with the inverters via Ethernet and operate the MOVITOOLS® MotionStudio engineering software to change parameters and IPOS<sup>PLUS</sup>® programs. An integrated Web server makes it possible for the user to access diagnostic values quickly and easily using a standard browser (e.g. Internet Explorer).

10.16.3 Electronics data

| DFE33B option  |   |   |
|--|---|---|
|  <p>DFE33B</p> <p>MODULE STATUS</p> <p>NETWORK STATUS</p> <p>MAC-ID<br/>00-0F-69-00-0F-8B</p> <p>IP</p> <p>X30</p> <p>X32</p> <p>DEF IP AS</p> <p>0 1</p> <p>ETHERNET/IP</p> | <p>Application protocols</p>                          | <ul style="list-style-type: none"> <li>• <b>EtherNet/IP™</b> (Ethernet Industrial Protocol) or <b>Modbus TCP</b> to control and parameterize the drive inverter.</li> <li>• <b>HTTP</b> (Hypertext Transfer Protocol) for diagnostics using a Web browser.</li> <li>• <b>SMLP</b> (Simple MOVILINK® Protocol), protocol used by MOVITOOLS® MotionStudio.</li> <li>• <b>DHCP</b> (Dynamic Host Configuration Protocol) to assign address parameter automatically.</li> </ul> |
|  | <p>Port numbers used</p>                              | <ul style="list-style-type: none"> <li>• 44818 EtherNet/IP™ (TCP)</li> <li>• 2222 EtherNet/IP™ (UDP)</li> <li>• 502 Modbus TCP</li> <li>• 300 SMLP (TCP, UDP)</li> <li>• 80 HTTP</li> <li>• 67 / 68 DHCP</li> </ul>   |
|  | <p>Ethernet services</p>                              | <ul style="list-style-type: none"> <li>• ARP</li> <li>• ICMP (ping)</li> </ul>  |
|  | <p>ISO / OSI layer 1/2</p> <p>ISO / OSI layer 4/5</p> | <p>Ethernet II</p> <p>TCP/IP and UDP/IP</p>   |
|  | <p>Automatic baud rate detection</p>                  | <p>10 MBaud / 100 MBaud</p>   |
|  | <p>Connection technology</p>                          | <p>2 x RJ45 with integrated switch and autocrossing</p>   |
|  | <p>Addressing</p>                                     | <p>4 byte IP address or MAC-ID (00-0F-69-xx-xx-xx)</p>  |
|  | <p>Manufacturer ID (Vendor ID)</p>                    | <ul style="list-style-type: none"> <li>• 013B<sub>hex</sub> (EtherNet/IP™)</li> <li>• "SEW-EURODRIVE" (Modbus TCP)</li> </ul>   |
|  | <p>Tools for startup</p>                              | <ul style="list-style-type: none"> <li>• MOVITOOLS® MotionStudio engineering software</li> <li>• DBG60B keypad</li> </ul>   |
|  | <p>Maximum number of process data:</p>                | <p>10</p>   |

**10.16.4 Functions**

- EtherNet/IP™ protocol
- Two RJ45 plug connectors for star or line type cabling
- Up to 10 process data and parameter data items can be transferred at the same time
- Two ways to allocate the IP address:
  1. Setting via DBG60B keypad and MOVITOOLS® MotionStudio
  2. Use the DHCP server to assign the IP address
- Engineering access using MOVITOOLS® MotionStudio via Ethernet TCP/IP
- Inverter diagnostics using a standard browser (e.g. Internet Explorer) via the integrated Web server:
  - Transfer display values
  - DFE33B configuration (after login)



## 10.17 EtherCAT® DFE24B fieldbus interface


### 10.17.1 Part number

18211267

### 10.17.2 Description

The MOVIDRIVE® MDX61B drive inverter enables you to use the DFE24B option to connect to higher-level automation, project planning and visualization systems via EtherCAT® thanks to its powerful, universal fieldbus interface. You can use the DFE24B option to communicate with the inverters via the EtherCAT® master and operate the MOVITOOLS® MotionStudio engineering software via EtherCAT® to change parameters and IPOS<sup>PLUS</sup>® programs.

### 10.17.3 Electronics data

| DFE24B option  |                                 |  |
|--|---------------------------------|--|
|  | Standards                       | IEC 61158, IEC 61784-2   |
|  | Baud rate                       | 100 MBaud full duplex  |
|  | Connection technology           | Two RJ45 plug connectors   |
|  | Bus termination                 | Not integrated because bus termination is automatically activated.   |
|  | OSI layer                       | Ethernet II  |
|  | station address                 | Setting via EtherCAT® master (→ Display with P093)   |
|  | XML file name                   | SEW_DFE24B.xml   |
|  | Vendor ID                       | 0x59 (CANopenVendor ID)  |
|  | EtherCAT® services              | <ul style="list-style-type: none"> <li>• CoE (CANopen over EtherCAT®)</li> <li>• VoE (Simple MOVILINK® protocol over EtherCAT®)</li> </ul> |
|  | Maximum number of process data: | 10   |
|  | Tools for startup               | <ul style="list-style-type: none"> <li>• MOVITOOLS® MotionStudio engineering software</li> <li>• DBG60B keypad</li> </ul>                  |

### 10.17.4 Functions

- EtherCAT®
- Two RJ45 plug connectors for line type cabling
- Simultaneous communication of up to 10 process data and parameter data as well as access (Rx, Tx) to 8 IPOS<sup>PLUS</sup>® variables
- Automatic addressing via EtherCAT® master
- Engineering access using MOVITOOLS® MotionStudio via EtherCAT®

## 10.18 DeviceNet™ DFD11B fieldbus interface

### 10.18.1 Part number

08249725

### 10.18.2 Description

The MOVIDRIVE® MDX61B drive inverter enables you to use the DFD11B option to connect to higher-level automation, project planning and visualization systems via the non-proprietary and standardized DeviceNet™ fieldbus system.

The type DFD11B DeviceNet™ fieldbus interface can be plugged into the fieldbus slot. The DFD11B option enables communication with the higher-level controller for a maximum of 10 process data. You need an EDS file to be able to integrate the DFD11B in the higher-level control. You can download this file from the SEW-EURODRIVE website.

### 10.18.3 Electronics data

| Option DFD11B |                              |   |
|---------------|------------------------------|---|
|               | Communication protocol       | Master/slave connection set acc. to DeviceNet™ specification version 2.0  |
|               | Number of process data words | Adjustable via DIP switches: <ul style="list-style-type: none"> <li>• 1 – 10 process data words</li> <li>• 1 – 4 process data words with bit-strobe I/O</li> </ul>  |
|               | Baud rate                    | 125, 250 or 500 kBaud, to be set via DIP switches   |
|               | Bus cable length             | For thick cable according to DeviceNet™ specification 2.0 appendix B: <ul style="list-style-type: none"> <li>• 500 m at 125 kbaud</li> <li>• 250 m at 250 kbaud</li> <li>• 100 m at 500 kBaud</li> </ul>  |
|               | Transmission level           | ISO 11 98 - 24 V  |
|               | Connection technology        | <ul style="list-style-type: none"> <li>• 2-wire bus and 2-wire supply voltage DC 24 V with 5-pin Phoenix terminal</li> <li>• Pin assignment according to DeviceNet™ specification</li> </ul>  |
|               | MAC ID                       | 0 – 63, can be set via DIP switch<br>Max. 64 stations   |
|               | Supported services           | <ul style="list-style-type: none"> <li>• Polled I/O: 1 – 10 words</li> <li>• Bit strobe I/O: 1 – 4 words</li> <li>• Explicit messages: <ul style="list-style-type: none"> <li>– Get_Attribute_Single</li> <li>– Set_Attribute_Single</li> <li>– Reset</li> <li>– Allocate_MS_Connection_Set</li> <li>– Release_MS_Connection_Set</li> </ul> </li> </ul> |
|               | Tools for startup            | <ul style="list-style-type: none"> <li>• MOVITOOLS® MotionStudio engineering software</li> <li>• DBG60B keypad</li> </ul>   |

## 10.19 CAN/CANopen DFC11B fieldbus interface

### 10.19.1 Part number


08243174

### 10.19.2 Description

The MOVIDRIVE® MDX61B drive inverter in conjunction with the DFC11B option allows connection to higher-level automation, project planning and visualization systems via the open and standardized CANopen fieldbus system thanks to the option's high-performance universal fieldbus interface. You can also access parameters and process data using the MOVILINK® protocol designed especially for devices from SEW-EURODRIVE.

The DFC11B fieldbus interface can be plugged into the fieldbus slot. In this way, a second system bus (CAN) on MOVIDRIVE® is made available. The DFC11B option enables communication with the higher-level controller for a maximum of 10 process data. You need an EDS file to be able to integrate the DFC11B in the higher-level CANopen control. You can download this file from the SEW-EURODRIVE website.

### 10.19.3 Electronics data

| DFC11B option   |  |   |
|---|--|---|
|  | Communication profile                                  | <ul style="list-style-type: none"> <li>• SEW-MOVILINK®</li> <li>• CANopen</li> <li>• CAN Layer 2</li> </ul>                     |
|   | Number of process data words                           | 1 – 10 process data words   |
|   | Baud rate  | Setting using parameter P894:<br>125 kBaud/250 kBaud/500 kBaud/1 MBaud  |
|   | Connection technology                                  | 9-pole D-sub connector X30 (pin assigned to CIA standard) or terminal X31   |
|   | Permitted cable cross section X31 (CAN bus connection) | One core per terminal: 0.20 – 2.5 mm <sup>2</sup> (AWG24 – 12)<br>Two cores per terminal: 0.25 – 1 mm <sup>2</sup> (AWG22 – 17) |
|   | Terminating resistor                                   | 120 Ω (set using DIP switch S1-R)   |
|   | Addressing   | Setting via parameter P891 (SBus MOVILINK®) or P896 (CANopen)   |
|   | Tools for startup                                      | <ul style="list-style-type: none"> <li>• MOVITOOLS® MotionStudio engineering software</li> <li>• DBG60B keypad</li> </ul>       |

**10.19.4 Functions**

- CAN Layer 2 and communication profile MOVILINK® or CANopen
- Electrical isolation via optocoupler

**INFORMATION**

If electrical isolation is not required, the CAN-Bus can be connected directly to the basic device at X12:SC11/SC12 without the DFC11B option. This does not effect the functionality.

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## 10.20 Synchronous operation card DRS11B


### 10.20.1 Part number

08246726

### 10.20.2 Description

The DSR11B option allows for a group of motors to be operated in phase-synchronous operation in relation to one another, or with an adjustable proportional relationship. For detailed information, refer to the "DRS11B Synchronous Operation Card" manual, which can be ordered from SEW-EURODRIVE. The basis for synchronous operation is the continuous comparison of the rotor angle positions of the master and the slave motors. Therefore, the motors must be equipped with encoders. The DRS11B option is plugged into the expansion slot.

## 10.20.3 Electronics data

| Option DRS11B  |                         |  |   |
|--|-------------------------|--|---|
|  | Digital inputs          | X40:1 – X40:6  | EINGØ – EING5: isolated (optocoupler)<br>PLC-compatible (EN 61131)  |
|  | Internal resistance     |  | $R_i \approx 3 \text{ k}\Omega$ , $I_E \approx \text{DC } 10 \text{ mA}$<br>Sampling cycle 5 ms   |
|  | Signal level            |  | DC +13 V – +30 V = "1" = contact closed<br>DC -3 V – +5 V = "0" = contact open  |
|  | Function                |  | Fixed assignment with: <ul style="list-style-type: none"> <li>• EINGØ = Free-running</li> <li>• EING1 = offset 1</li> <li>• EING2 = offset 2</li> <li>• EING3 = offset 3</li> <li>• EING4 = IPOS<sup>PLUS</sup>® variable H477.0</li> <li>• EING5 = IPOS<sup>PLUS</sup>® variable H477.1</li> </ul> |
|  | Digital outputs         | X40:9/X40:10   | OUTPØ/OUTP1: PLC-compatible (EN 61131-2)<br>Response time 5 ms  |
|  | Signal level            |  | "0" = DC 0 V    "1" = DC +24 V<br><b>Important:</b> Do not apply external voltage!  |
|  | Function                |  | Fixed assignment with: <ul style="list-style-type: none"> <li>• AUSGØ = IPOS<sup>PLUS</sup>® variable H476.0</li> <li>• AUSG1 = IPOS<sup>PLUS</sup>® variable H476.1</li> </ul> $I_{\text{max}} = \text{DC } 50 \text{ mA}$ , short-circuit proof, protected against external voltage to DC 30 V    |
|  | Reference terminals     | X40:11<br>X40:7  | DGND: Reference potential for binary signals<br>DCOM: Reference potential of digital inputs X40:1 – X40:6 (EINGØ – EING5)   |
|  | Voltage output          | X40:8  | VO24: Voltage output DC +24 V, max. DC 100 mA   |
|  | Distance encoder input  | X41:   | Max. 200 kHz, signal level according to RS422 or sin/cos  |
| Encoder voltage supply   |                         | DC +24 V, $I_{\text{max}} = 650 \text{ mA}$ <sup>1)</sup><br>9-pin D-sub socket  |   |
| Master encoder input   | X42:                    | Max. 200 kHz, signal level according to RS422 or sin/cos   |   |
| Encoder voltage supply   |                         | DC +24 V, $I_{\text{max}} = \text{DC } 650 \text{ mA}$<br>9-pin D-sub socket   |   |
| Encoder simulation output  | X43:                    | Signal level to RS422<br>9-pin D-sub connector   |   |
| Voltage input  | X44:1<br>X44:2<br>X44:3 | GND<br>DC +24 V supply voltage for digital outputs X40:9/X40:10 and encoder<br>GND   |   |
| Permitted cable cross section  |                         | One core per terminal: 0.08 – 1.5 mm <sup>2</sup> (AWG28 – 16)<br>Two cores per terminal: 0.25 – 1 mm <sup>2</sup> (AWG22 – 16)<br>Tightening torque: 0.6 Nm |   |

1) Total current load (X41 and X42) of the DC 24 V encoder supply  $\leq$  DC 650 mA

10.21 Fieldbus interface PROFIBUS DP-V1 with PROFIsafe DFS11B

10.21.1 Part number

18238408

10.21.2 Description

MOVIDRIVE® B can be equipped with the 12 Mbaud fieldbus interface DFS11B for the serial bus system PROFIBUS DP-V1 with PROFIsafe. In addition to cyclical and acyclical data exchange, safety-related communication takes place that allows to switch a safe F-DO output. The device master data (GSD) and type files for MOVIDRIVE® B are available from the SEW website (<http://www.sew-eurodrive.de>) to help with project planning and facilitate startup.

For more detailed information, refer to the "DFS11B Fieldbus Interface PROFIBUS DP-V1 with PROFIsafe" manual. You can order this manual from SEW-EURODRIVE.

10.21.3 Electronics data

| DFS11B option |                               |   |  |
|---------------|-------------------------------|---|--|
|               | PROFIBUS protocol variants    | PROFIBUS-DP and DP-V1 to IEC 61158  |  |
|               | Automatic baud rate detection | 9.6 kBaud – 12 MBaud  |  |
|               | Connection technology         | <ul style="list-style-type: none"> <li>• 9-pin D-sub socket</li> <li>• Pin assignment acc. to IEC 61158</li> </ul>        |  |
|               | Bus termination               | Not integrated, implement using suitable PROFIBUS connector with terminating resistors that can be activated.             |  |
|               | Station address               | 1 – 125, can be set via DIP switches  |  |
|               | GSD file name                 | SEW_600C.GSD  |  |
|               | DP ID number                  | 600C = 24588 <sub>hex</sub>   |  |
|               | Diagnostics data              | <ul style="list-style-type: none"> <li>• Max. 8 bytes</li> <li>• Standard diagnostics: 6 bytes</li> </ul>                 |  |
|               | Tools for startup             | <ul style="list-style-type: none"> <li>• MOVITOOLS® MotionStudio engineering software</li> <li>• DBG60B keypad</li> </ul> |  |
|               | F address                     | 1 – 1022 DIP switch for setting the failsafe address  |  |
|               | Ambient temperature           | 0 – 55 °C   |  |
|               |                               |   |  |

## 10.21.4 Safety section

| Safety characteristics                                      |  |
|---|--|
| Maximum possible safety class                               | <ul style="list-style-type: none"> <li>• SIL 3 according to EN 61508</li> <li>• Performance level e according to EN ISO 13849-1</li> </ul> |
| System structure  | 2 channels with diagnostics (1002D)  |
| Operating mode selection                                    | "High demand" rate according to EN 61508   |
| Probability of dangerous failure per hour (PFH value)       | < 1.00E-09 (1 FIT)   |
| Proof test interval (EN 61508)                              | 20 years, after which the component must be replaced with a new one  |
| Repair time   | 100 hours  |
| Safe state  | Value "0" for all safety-related F-DO process values (output disabled)   |
| Safe output   |  |
| Sourcing/sinking (from load voltage supply)                 | DC 24 V output according to EN 61131-2, protected against short circuits and overloads   |
| Rated current   | 1A   |
| Leakage current (for "0" signal)                            | Typically -2 mA (with 2 V / 1 kΩ load resistance)<br>(Information: Current flows from F-DO_M to F-DO_P)                                    |
| Internal voltage drop (P and M output)                      | max. 3 V   |
| Short-circuit protection                                    | Electronic, response value: 2.8 A – 9 A  |
| Overload protection   | Trigger value: 1.4 A – 1.6 A   |
| Load resistance range                                       | 24 kΩ – 1 kΩ   |
| Voltage limitation when switching off inductive loads       | Typically -70 V  |
| Response time (command via PROFIsafe → the output switches) | ≤ 25 ms  |
| Maximum line length   | 30 m   |



10.22 Fieldbus interface PROFIBUS DP-V1 with PROFIsafe DFS12B

10.22.1 Part number


28204239

10.22.2 Description

MOVIDRIVE® B can be equipped with the 12 Mbaud fieldbus interface DFS12B for the serial bus system PROFIBUS DP-V1 with PROFIsafe. In addition to cyclical and acyclical data exchange, safety-related communication takes place in conjunction with the DCS21B/22B option. The device master data (GSD) and type files for MOVIDRIVE® B are available from the SEW website (<http://www.sew-eurodrive.de>) to help with project planning and facilitate startup.

For more detailed information, refer to the "DFS12B Fieldbus Interface PROFIBUS DP-V1 with PROFIsafe" manual. You can order this manual from SEW-EURODRIVE.

10.22.3 Electronics data

| DFS12B option  |                               |   |
|--|-------------------------------|---|
|  | PROFIBUS protocol variants    | PROFIBUS-DP and DP-V1 to IEC 61158  |
|  | Automatic baud rate detection | 9.6 kBaud – 12 MBaud  |
|  | Connection technology         | <ul style="list-style-type: none"> <li>9-pin D-sub socket</li> <li>Pin assignment acc. to IEC 61158</li> </ul>        |
|  | Bus termination               | Not integrated, implement using suitable PROFIBUS connector with terminating resistors that can be activated.         |
|  | station address               | 1 – 125, can be set via DIP switches  |
|  | GSD file name                 | SEW_600C.GSD  |
|  | DP ID number                  | 600C = 24588 <sub>hex</sub>   |
|  | Diagnostics data              | <ul style="list-style-type: none"> <li>Max. 8 bytes</li> <li>Standard diagnostics: 6 bytes</li> </ul>                 |
|  | Tools for startup             | <ul style="list-style-type: none"> <li>MOVITools® MotionStudio engineering software</li> <li>DBG60B keypad</li> </ul> |
|  | F address                     | The failsafe address is set using the DCS21B/22B option   |
|  | Ambient temperature           | 0 – 55 °C   |

## 10.23 PROFINET IO fieldbus interface with PROFIsafe DFS21B

### 10.23.1 Part number


18238637

### 10.23.2 Description

The MOVIDRIVE® MDX61B drive inverter enables you to use the DFE21B option to connect to higher-level automation, project planning and visualization systems via Ethernet (PROFINET IO protocol) thanks to its powerful, universal fieldbus interface. In addition to cyclical and acyclical data exchange, safety-related communication takes place that allows to switch a safe F-DO output. You can use option DFS21B to communicate directly with the inverters via Ethernet and operate the MOVITOOLS® MotionStudio engineering software to change parameters and IPOS<sup>PLUS</sup>® programs. An integrated Web server makes it possible for the user to access diagnostic values quickly and easily using a standard browser (e.g. Internet Explorer).

For more detailed information, refer to the "DFS21B Fieldbus Interface PROFINET IO with PROFIsafe" manual. You can order this manual from SEW-EURODRIVE.

### 10.23.3 Electronics data

| DFS21B option   |                             |   |
|---|-----------------------------|---|
|  | Application protocols       | <ul style="list-style-type: none"> <li>• <b>PROFINET IO</b> (Ethernet frames with frame identification 8892<sub>hex</sub>) to control and set parameters for the drive inverter.</li> <li>• <b>HTTP</b> (Hypertext Transfer Protocol) for diagnostics using a Web browser.</li> <li>• <b>SMLP</b> (Simple MOVILINK® Protocol), protocol used by MOVITOOLS® MotionStudio.</li> </ul> |
|   | Port numbers used           | <ul style="list-style-type: none"> <li>• 300 (SMLP)</li> <li>• 80 (HTTP)</li> </ul>   |
|   | Ethernet services           | <ul style="list-style-type: none"> <li>• ARP</li> <li>• ICMP (ping)</li> </ul>  |
|   | ISO/OSI layer 2             | Ethernet II   |
|   | Baud rate                   | 100 Mbaud in full duplex process  |
|   | Connection technology       | Two RJ45 plug connectors with integrated switch and auto-crossing   |
|   | Addressing                  | 4 byte IP address or MAC-ID (00:0F:69:xx:xx:xx)   |
|   | Manufacturer ID (Vendor ID) | 010A <sub>hex</sub>   |
|   | Tools for startup           | <ul style="list-style-type: none"> <li>• MOVITOOLS® MotionStudio engineering software</li> <li>• DBG60B keypad</li> </ul>   |
|   | F address                   | 1 – 1022 DIP switch for setting the failsafe address  |
| Ambient temperature   | 0 – 55 °C                   |   |

10.23.4 Safety section

| Safety characteristics                                      |  |
|---|--|
| Maximum possible safety class                               | <ul style="list-style-type: none"> <li>• SIL 3 according to EN 61508</li> <li>• Performance level e according to EN ISO 13849-1</li> </ul> |
| System structure  | 2 channels with diagnostics (1oo2D)  |
| Operating mode selection                                    | "High demand" rate according to EN 61508   |
| Probability of dangerous failure per hour (PFH value)       | < 1.00E-09 (1 FIT)   |
| Proof test interval (EN 61508)                              | 20 years, after which the component must be replaced with a new one  |
| Repair time   | 100 hours  |
| Safe state  | Value "0" for all safety-related F-DO process values (output disabled)   |
| Safe output   |  |
| Sourcing/sinking (from load voltage supply)                 | DC 24 V output according to EN 61131-2, protected against short circuits and overloads   |
| Rated current   | 1A   |
| Leakage current (for "0" signal)                            | Typically -2 mA (with 2 V / 1 kΩ load resistance)<br>(Information: Current flows from F-DO_M to F-DO_P)                                    |
| Internal voltage drop (P and M output)                      | max. 3 V   |
| Short-circuit protection                                    | Electronic, response value: 2.8 A – 9 A  |
| Overload protection   | Trigger value: 1.4 A – 1.6 A   |
| Load resistance range                                       | 24 kΩ – 1 kΩ   |
| Voltage limitation when switching off inductive loads       | Typically -70 V  |
| Response time (command via PROFIsafe → the output switches) | ≤ 25 ms  |
| Maximum line length   | 30 m   |

## 10.24 PROFINET IO fieldbus interface with PROFIsafe DFS22B

### 10.24.1 Part number


28204247

### 10.24.2 Description

The MOVIDRIVE® MDX61B drive inverter enables you to use the DFS22B option to connect to higher-level automation, project planning and visualization systems via Ethernet (PROFINET IO RT protocol) thanks to its powerful, universal fieldbus interface. In addition to cyclical and acyclical data exchange, safety-oriented communication takes place in conjunction with the DCS21/22B option. You can use option DFS22B to communicate directly with the inverters via Ethernet and operate the MOVITOOLS® MotionStudio engineering software to change parameters and IPOS<sup>PLUS</sup>® programs. An integrated Web server makes it possible for the user to access diagnostic values quickly and easily using a standard browser (e.g. Internet Explorer).

For more detailed information, refer to the "DFS22B Fieldbus Interface PROFINET IO with PROFIsafe" manual. You can order this manual from SEW-EURODRIVE.

### 10.24.3 Electronics data

| DFS22B option   |                             |   |
|---|-----------------------------|---|
|  | Application protocols       | <ul style="list-style-type: none"> <li>• <b>PROFINET IO</b> (Ethernet frames with frame identification 8892<sub>hex</sub>) to control and set parameters for the drive inverter.</li> <li>• <b>HTTP</b> (Hypertext Transfer Protocol) for diagnostics using a web browser.</li> <li>• <b>SMLP</b> (Simple MOVILINK® Protocol), protocol used by MOVITOOLS® MotionStudio.</li> </ul> |
|   | Port numbers used           | <ul style="list-style-type: none"> <li>• 300 (SMLP)</li> <li>• 80 (HTTP)</li> </ul>   |
|   | Ethernet services           | <ul style="list-style-type: none"> <li>• ARP</li> <li>• ICMP (ping)</li> </ul>  |
|   | ISO/OSI layer 2             | Ethernet II   |
|   | Baud rate                   | 100 Mbaud in full duplex process  |
|   | Connection technology       | Two RJ45 plug connectors with integrated switch and auto-crossing   |
|   | Addressing                  | 4 byte IP address or MAC-ID (00:0F:69:xx:xx:xx)   |
|   | Manufacturer ID (Vendor ID) | 010A <sub>hex</sub>   |
|   | Tools for startup           | <ul style="list-style-type: none"> <li>• MOVITOOLS® MotionStudio engineering software</li> <li>• DBG60B keypad</li> </ul>   |
|   | F address                   | The failsafe address is set using the DCS21B/22B option   |
| Ambient temperature   | 0 – 55 °C                   |   |

## 10.25 MOVISAFE® DCS21B/22B/31B/32B safety module

### 10.25.1 Part numbers

- DCS21B safety module with prefabricated DAE34B cable: 28200993
- DCS21B safety module for replacement (without DAE34B): 28200977
- DCS22B safety module with prefabricated DAE34B cable: 28207572
- DCS22B safety module for replacement (without DAE34B): 18247369
- DCS31B safety module: 28200985
- DCS32B safety module: 18247377

### 10.25.2 Description

The DCS21B/22B and DCS31B/32B options of the MOVISAFE® series are designed as expansion options for functional safety. They are capable of performing various drive monitoring functions, such as standstill, speed, direction of rotation or position monitoring. Additionally, sensor signals can be processed via safe inputs and outputs and MOVIDRIVE® B can be switched off according to stop categories 0, 1, or 2.

To being able to communicate with a higher-level safety controller in a safety-related manner, the DCS21B/22B option must be used together with the DFS12B fieldbus interface (PROFIBUS DP-V1) or DFS21B (PROFINET IO). The DCS2.B/3.B option is plugged into the expansion slot.

For more detailed information refer to the manual "MOVIDRIVE® MDX61B Safety Module Option MOVISAFE® DCS21B/22B/31B/32B" that can be ordered from SEW-EURODRIVE or downloaded from the official website.

## INFORMATION



EMC screw

Removing the EMC screw is without effect as this card has a fixed DGND-PE connection.

For more detailed information on prefabricated cables for connecting MOVIDRIVE® B, refer to the manual "MOVIDRIVE® MDX61B Safety Module Option MOVISAFE® DCS21B/22B/31B/32B" that can be ordered from SEW-EURODRIVE or downloaded from the official website.

#### 10.25.3 Electronics data

##### Option DCS21B/22B/31B/32B

|  |  |   |
|--|--|---|
|  |  | <p>LED alarm/error<br/>LED watchdog<br/>LED system B<br/>LED system A</p> <p>X80: Voltage supply connection<br/>X81: Digital input connection<br/>X82: Connection of digital outputs DO0, DO1<br/>X83: Connection of digital output DO2<br/>X84: Connection of incremental, sin/cos, HTL, or absolute encoder (encoder 1)<br/>X85: Connection of incremental, sin/cos, HTL, or absolute encoder (encoder 2)<br/>X86: CAN bus connection (only for DCS21B/22B)<br/>X87: Connection for service interface</p> |
|--|--|---|

## 10.26 MOVI-PLC® basic DHP11B controller

### 10.26.1 Part numbers

The MOVI-PLC® *basic* controller DHP11B.. is available in 3 versions, which differ in the modules available from a range of libraries.

| Part number | MOVI-PLC® basic DHP11B device design | Description  |
|-------------|--------------------------------------|--|
| 18204724    | DHP11B-T0                            | MOVI-PLC® <i>basic</i> controller  |
| 18208223    | DHP11B-T1                            | Application version I (in addition to version T0, enables additional functions including electronic cam and synchronous operation) |
| 18208231    | DHP11B-T2                            | Application version II (in addition to version T1, enables additional functions including handling)                                |


### 10.26.2 Description

MOVI-PLC® is a series of controllers available from SEW-EURODRIVE. MOVI-PLC® can be programmed by users according to IEC 61131-3 and PLCopen.

The MOVI-PLC® *basic* controller DHP11B is equipped with a PROFIBUS DP-V1 slave interface, two SBus interfaces (CAN), RS485 and eight digital inputs/outputs, five of which are interrupt-capable. MOVI-PLC® *basic* DHP11B can control 12 devices at the same time (MOVIDRIVE® B/compact, MOVITRAC® B, MOVIAXIS®, MOVIMOT®).

### 10.26.3 Electronics data

#### MOVI-PLC® basic DHP11B option

|   |                        |   |
|---|------------------------|---|
|  | Status displays        | LEDs for the voltage supply to the I/Os, firmware, program, PROFIBUS, system bus  |
|   | Fieldbus               | <ul style="list-style-type: none"> <li>PROFIBUS DP and DP-V1 acc. to IEC 61158</li> <li>Automatic detection of baud rate from 9.6 kbaud to 12 Mbaud</li> <li>Bus connection implemented with suitable connector</li> <li>GSD file SEW_6007.GSD</li> <li>DP ID number 6007<sub>hex</sub> (24579<sub>dec</sub>)</li> <li>Maximum 32 process data</li> </ul> |
|   | System bus             | <ul style="list-style-type: none"> <li>2 system buses (CAN) to control 12 inverters and CANopen I/O modules</li> <li>CAN layer 2 (SCOM cyclic, acyclic) or via the SEW MOVILINK® protocol</li> <li>Baud rate: 125 kBaud – 1 MBaud</li> <li>External bus terminator</li> <li>Address range: 0 – 127</li> </ul>   |
|   | Engineering            | Via RS485, PROFIBUS and the system buses  |
|   | Panel operation        | via RS485   |
|   | Connection technology  | <ul style="list-style-type: none"> <li>PROFIBUS: 9-pole D-sub connector according to IEC 61158</li> <li>System buses and I/Os: Plug-in terminals</li> <li>RS485: RJ10</li> </ul>  |
|   | Digital inputs/outputs | <ul style="list-style-type: none"> <li>8 I/Os to IEC 61131-2; can be configured as inputs or outputs. Five are interrupt-capable</li> </ul>   |
|   | Memory                 | <ul style="list-style-type: none"> <li>Program: 512 kByte</li> <li>Data: 128 kB</li> <li>Retain: 24 kB</li> </ul>   |
|   | Tools for startup      | MOVITOOLS® MotionStudio with integrated PLC Editor (programming languages IL, ST, LD, FBD, CFC, SFC; libraries for optimized inverter control)  |

23534850/EN – 11/2017

## 10.27 OST11B

### 10.27.1 Part number


18205445

### 10.27.2 Description

Option OST11B provides an additional RS485 interface (COM2) for MOVI-PLC® *basic* DHP11B in terminal design or as an engineering interface. Only use option OST11B in conjunction with the MOVI-PLC® *basic* controller DHP11B.

When the MOVI-PLC® *basic* DHP11B option is plugged into the fieldbus slot, option OST11B is plugged into the encoder slot. When the MOVI-PLC® *basic* DHP11B option is plugged into the expansion slot, option OST11B is installed in the expansion slot above the option MOVI-PLC® *basic* DHP11B.

### 10.27.3 Electronics data

| OST11B option  |  |  |
|--|--|--|
|  | RS485 interface COM2<br>X35:1 – X35:4<br>X36:1 – X36:3 | <ul style="list-style-type: none"> <li>For connection of an Engineering PC, a DOP11A/B operator terminal or a gearmotor with integrated frequency inverter MOVIMOT®</li> <li>I/O standard, 57.6 kBd, max. total cable length 200 m, integrated dynamic terminating resistor permanently installed</li> </ul> |
|  | Potential level  | COM2 is galvanically isolated from the MOVI-PLC® <i>basic</i> DHP11B controller.   |



## 10.28 DHE/DHF/DHR21 and DHE/DHF/DHR41B controller

Three types of DH.21B/41B controllers are available, which differ in the fieldbus interfaces:

| DH.21B/41B design | Fieldbus interfaces  |
|-------------------|--|
| DHE21B/41B        | Ethernet TCP/IP, UDP                                       |
| DHF21B/41B        | Ethernet TCP/IP, UDP, PROFIBUS DP-V1, DeviceNet™           |
| DHR21B/41B        | Ethernet TCP/IP, UDP, PROFINET, EtherNet/IP™, ModbusTCP/IP |

### 10.28.1 Description

#### Freely programmable motion and logic controller (MOVI-PLC®)

The controller can be operated as freely programmable motion and logic controller MOVI-PLC® when using SD memory cards of the type OMH41B. MOVI-PLC® is a series of programmable motion and logic controllers. It allows drive solutions, logic processes and sequence controls to be automated simply and efficiently using IEC 61131-3 compliant programming languages.

- MOVI-PLC® is a **universal** solution because it is able to control the entire portfolio of SEW inverters and offers a simple upgrade to a more powerful MOVI-PLC® version thanks to the universal execution of the programs.
- MOVI-PLC® is **scalable** due to several different hardware platforms (standard, advanced, etc.) and modular software concepts (libraries for numerous applications).
- MOVI-PLC® is **powerful** due to extensive technologies (such as electronic cam, synchronous operation) and the control of demanding applications (such as material handling).

#### MOVI-PLC® standard performance class

- DH.21B controllers enable coordinated single axis movements and integration of external inputs/outputs as well as Drive Operator Panels (DOP). The DH.21B.. option is therefore suitable for use as a module controller or stand-alone controller for machines of medium complexity.

#### MOVI-PLC® advanced performance class

- The DH.41B controller is characterized by a greater variety of interfaces and a higher performance level, which allows complex calculations and interpolated movements, for example. The DH.41B option is therefore suitable for the automation of cells and machines. The integrated Ethernet interface enables direct connection of the DH.41B controller to the control level.

#### Configurable application controller (CCU)

The controller can be used as configurable application controller (CCU) by using SD memory cards of the type OMC41B. Only standardized application modules created by SEW-EURODRIVE can be executed. The application modules can be started up quickly and conveniently by graphical configuration. A defined process data interface provides this functionality to a higher-level controller. A process data monitor with control mode is available to support the startup procedure.

*CCU standard performance class*

The "CCU standard" performance class is intended for application modules with single-axis functionality and medium response times. A maximum of 16 axes can be connected to a configurable application controller. The following application modules are available and can be started up using the *AxisConfigurator* tool.

- Velocity control
- Cam positioning
- Bus positioning with 6 process data
- Single-axis universal module

*CCU advanced performance class*

The "CCU advanced" performance class is intended for application modules with single-axis and multi-axis functionality and fast response times. The following application modules are available:

- Single-axis functionality:
  - Velocity control
  - Cam positioning
  - Bus positioning with 6 process data words
  - Single-axis universal module
- Multi-axis functionality:
  - SyncCrane
  - Energy-efficient SRS

10.28.2 DHE21B/41B electronics data

DHE21B/41B option



|  |   |
|--|---|
| Part number  | DHE21B option: 18236073<br>DHE41B option: 18211607  |
| Potential levels   | Option DHE21B/41B has the following potential levels: <ul style="list-style-type: none"> <li>• Potential control / CAN 1 / COM1</li> <li>• Potential COM2</li> <li>• Potential digital inputs and outputs</li> <li>• Potential system bus CAN 2</li> </ul>  |
| Memory   | <ul style="list-style-type: none"> <li>• Retain data: 32 kB</li> <li>• System variables (retain): 8 kB</li> </ul> Program memory: <ul style="list-style-type: none"> <li>• DHE21B: 2 MB (for user program, incl. IEC libraries)</li> <li>• DHE41B: 6 MB (for user program, incl. IEC libraries)</li> </ul> Data memory: <ul style="list-style-type: none"> <li>• DHE21B: 4 MByte (for IEC application)</li> <li>• DHE41B: 8 MB (for IEC application)</li> </ul>   |
| CAN 2 system bus<br>X32:1 – X32:3<br>System bus CAN 1<br>X33:1 – X33:3 | <ul style="list-style-type: none"> <li>• System bus CAN 1 and CAN 2 to CAN specification 2.0, part A and B, transmission technology to ISO 11898</li> <li>• The CAN 2 system bus is electrically isolated</li> <li>• Max. 64 stations per CAN system bus</li> <li>• Max. 64 SCOM transmit objects / 32 receive objects per CAN system bus</li> <li>• Address range 0 – 127</li> <li>• Baud rate: 125 kBaud – 1 MBaud</li> <li>• If X32 or X33 is the bus terminator, you must connect a terminating resistor (120 Ω) externally</li> <li>• You can remove connector X32 or X33 without interrupting the system bus</li> <li>• The system bus can be run in layer 2 (SCOM cyclic, acyclic) or in accordance with the SEW MOVILINK® protocol</li> </ul> |
| Ethernet 1 X36   | System bus, reserved  |
| Ethernet 2 X37   | <ul style="list-style-type: none"> <li>• TCP/IP</li> <li>• Possible connections: engineering PC, other control, intranet</li> </ul>   |
| USB  | USB 1.0 to connect an engineering PC (in preparation)   |
| RS485 Interface<br>COM1/2<br>X34:1 – C34:4                             | <ul style="list-style-type: none"> <li>• For connection of a DOP11A/B operator terminal or a gearmotor with integrated MOVIMOT® frequency inverter</li> <li>• E/A standard, 57.6 / 9.6 kBaud, max. cable length 200 m</li> <li>• Dynamic terminating resistor with fixed installation</li> </ul>  |
| SD memory card   | <ul style="list-style-type: none"> <li>• PC-readable</li> <li>• Contents                             <ul style="list-style-type: none"> <li>– Firmware</li> <li>– IEC program</li> <li>– Data</li> </ul> </li> <li>• At least 128 MB memory</li> </ul>  |
| Engineering  | Engineering takes place via one of the following interfaces: <ul style="list-style-type: none"> <li>• Ethernet 2 (X37)</li> <li>• USB (X35)</li> </ul> Engineering for all SEW-EURODRIVE components connected to the MOVI-PLC® <i>advanced</i> DHE41B control card can be performed using the MOVI-PLC® <i>advanced</i> DHE41B control card.<br>Engineering of the MOVI-PLC® <i>advanced</i> DHE41B controller cannot be performed via the inverters. <ul style="list-style-type: none"> <li>• MOVITOOLS® engineering software</li> <li>• MotionStudio with PLC Editor</li> </ul>   |

#### 10.28.3 DHF21B/41B electronics data

### INFORMATION



For connections identical with DHE41B, refer to the "DHE41B electronics data" section.

| DHF21B/41B option |                                       |  |
|-------------------|---------------------------------------|--|
|                   | Part number                           | <ul style="list-style-type: none"> <li>DHF21B: 18236081</li> <li>DHF41B: 18211615</li> </ul>   |
|                   | Potential levels                      | Option DHF21B/41B has the following potential levels: <ul style="list-style-type: none"> <li>Potential control / CAN 1 / COM1</li> <li>Potential COM2</li> <li>Potential digital inputs and outputs</li> <li>Potential system bus CAN 2</li> <li>Potential PROFIBUS</li> </ul> |
|                   | PROFIBUS connection X30P:1 - X30P:9   | Via 9-pin D-sub connector, pin assignment according to IEC 61158   |
|                   | Automatic baud rate detection         | 9.6 kBaud - 12 MBaud   |
|                   | SD memory card                        | <ul style="list-style-type: none"> <li>PC-readable</li> <li>Contents               <ul style="list-style-type: none"> <li>Firmware</li> <li>IEC program</li> <li>Data</li> </ul> </li> <li>At least 128 MB memory</li> </ul>   |
|                   | DeviceNet™ connection X30D:1 – X30D:5 | <ul style="list-style-type: none"> <li>2-wire bus and 2-wire supply voltage DC 24 V with 5-pole Phoenix terminal</li> <li>Pin assignment according to DeviceNet™ specification</li> </ul>  |

10.28.4 DHR21B/41B electronics data

**INFORMATION**



Connections identical with those of the DHE21B/41B and DHF21B/41B options are described chapters "DHE21B/41B option" and "DHF21B/41B option".

| DHR21B/41B option |   |
|-------------------|---|
|                   | <p>Part number</p> <ul style="list-style-type: none"> <li>DHR21B: 18236103</li> <li>DHR41B: 18216323</li> </ul>   |
|                   | <p>Electrical supply</p> <p>Installed in MOVIDRIVE® MDX61B:<br/>                     • Power consumption: <math>P_{max} = 9.5\text{ W}</math><br/>                     Installed in the MOVIAXIS® master module (MXM):<br/>                     • Power consumption: <math>P_{max} = 12\text{ W}</math></p> |
|                   | <p>Ethernet connection<br/>X30-1, X30-2</p> <p>Via RJ45 socket, pin assignment according to IEC 11801<br/>                     Integrated Ethernet switch with auto-crossing and auto-negotiation functionality.</p>  |
|                   | <p>SD memory card</p> <ul style="list-style-type: none"> <li>PC-readable</li> <li>Contents                             <ul style="list-style-type: none"> <li>Firmware</li> <li>IEC program</li> <li>Data</li> </ul> </li> <li>At least 128 MB memory</li> </ul>  |
|                   | <p>Engineering</p> <p>Additional engineering access via PROFINET, EtherNet/IP™ and Modbus TCP/IP interface (X30:1/2)</p>  |

## 10.29 Safety-related BST brake module

### 10.29.1 Part numbers

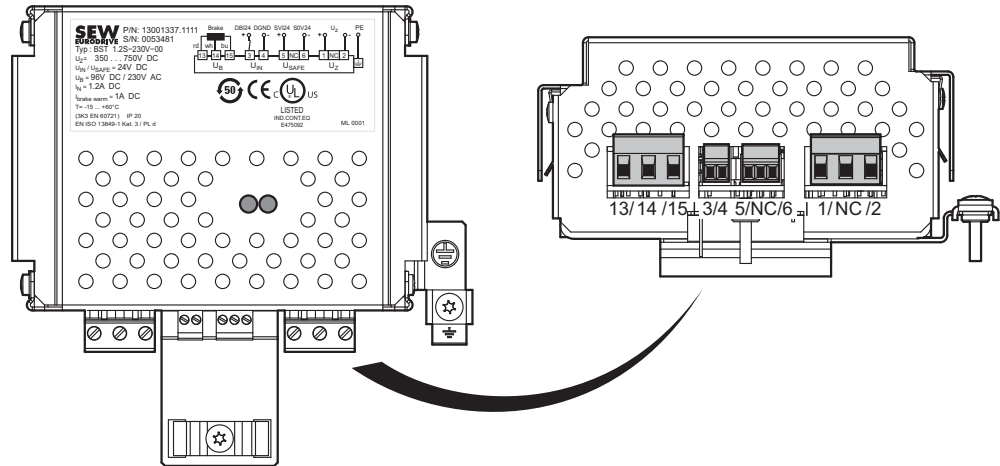
The safety-related brake module is available in three variants:

| Type designation | Part number | Approved SEW disk brakes  |
|------------------|-------------|---|
| BST 0.6S-460V-00 | 08299714    | All brake coils with a brake coil voltage of AC 460 V and a coil power $\leq 120$ W. Several brake coils can be connected for redundant systems. In this case, the total power must not exceed 120 W. |
| BST 0.7S-400V-00 | 13000772    | All brake coils with a brake coil voltage of AC 400 V and a coil power $\leq 120$ W. Several brake coils can be connected for redundant systems. In this case, the total power must not exceed 120 W. |
| BST 1.2S-230V-00 | 13001337    | All brake coils with a brake coil voltage of AC 230 V and a coil power $\leq 120$ W. Several brake coils can be connected for redundant systems. In this case, the total power must not exceed 120 W. |

### 10.29.2 Description

- The safety-related BST brake module enables the connection of an external fail-safe safety switching device/safety controller. The safety switching device disconnects the safety-related control voltage  $V_{\text{safe}}$  when a connected control device (e.g. emergency stop device) is activated.
- UL approved
- Disconnecting the safety-related control voltage  $V_{\text{safe}}$  means the connected brake is disconnected from the power supply. The power supply required for releasing the connected brake is interrupted safely.
- Instead of separating the brake control galvanically from the power supply using contactors or switches, the disconnection procedure described here prevents the power semiconductors in the safety-related BST brake module from being activated, in this way ensuring safe disconnection. This means that all connected brakes are de-energized although the supply voltage is still present at the safety-related BST brake module.

10.29.3 Electronics data



9007202044464779

| Terminal |                 | Function   |
|----------|-----------------|--|
| 1        | +U <sub>Z</sub> | DC link voltage input +  |
| 2        | +U <sub>Z</sub> | DC link voltage input -  |
| 5        | SVI24           | Input for safety-related control voltage V <sub>safe</sub>               |
| 6        | S0V24           | Reference potential for safety-related control voltage V <sub>safe</sub> |
| 3        | DBI24           | Functional control voltage V <sub>IN</sub> input                         |
| 4        | DGND            | Reference potential for functional control voltage V <sub>IN</sub>       |
| 13       | RD              | Brake output   |
| 14       | WH              |  |
| 15       | BU              |  |
| ⊕        |                 | Ground connection  |

## 11 Technical data of external accessories

### 11.1 DMP11B mounting panel

#### 11.1.1 Part number

08183988

#### 11.1.2 Description

**DMP11B**



1454393867

If a MOVIDRIVE® MD\_60A size 2 device is to be replaced by MOVIDRIVE® MDX61B size 2S, the MDX61B size 2S can be fitted on the existing mounting plate with the DMP11B mounting panel. New retaining holes do not have to be drilled.

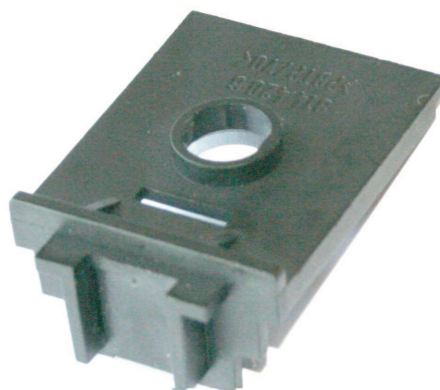


## 11.2 DLB11B touch guard

### 11.2.1 Part number

08231117 (Scope of delivery 12 pieces)

### 11.2.2 Description



1454399115

Degree of protection IP20 can be achieved for the following devices with DLB11B touch guard:

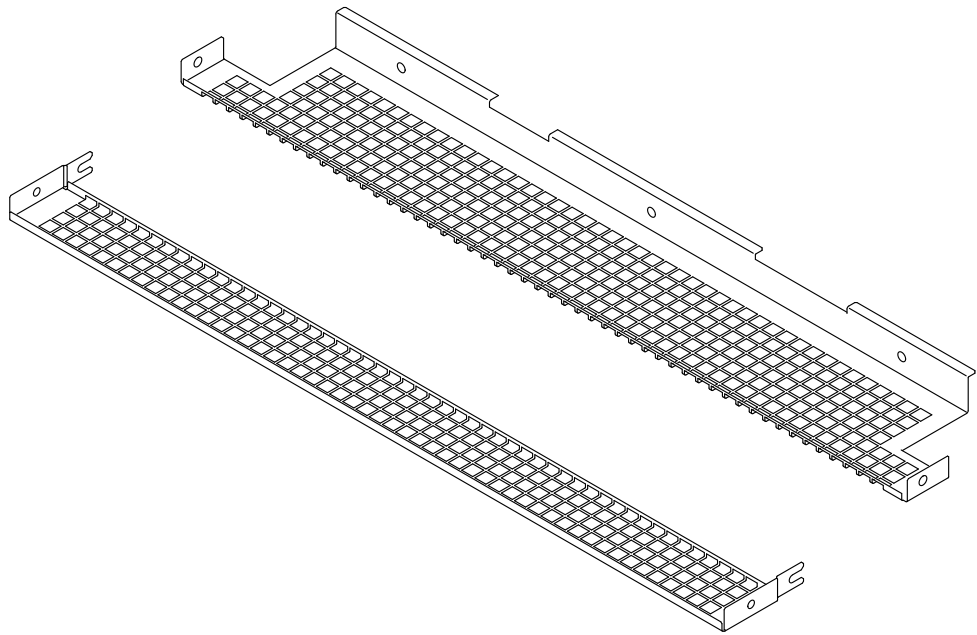
- MOVIDRIVE® MDX61B size 4 (AC 500 V devices: MDX61B0370/0450; AC 230 V devices: MDX61B0220/0300)
- MOVIDRIVE® MDX61B size 5 (AC 500 V devices: MDX61B0550/0750)
- Regenerative power supply MOVIDRIVE® MDR60A size 4 (MDR600750-503-00)

### 11.3 DLB21B touch guard (for size 7)

#### 11.3.1 Part number

18226086

#### 11.3.2 Description



2422310283

You can use the DLB21B touch guard to achieve degree of protection IP20 for the following devices:

- MOVIDRIVE® MDX61B size 7  
(AC 500 V devices: MDX61B1600/2000/2500)

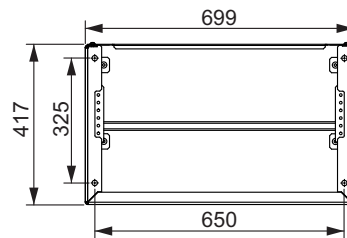
Fixing material for the touch guard is included in the scope of delivery. The customer must adapt the touch guard to the individual cable routing (cutting the hole matrix for supply system and motor cables).

11.4 DLS11B mounting base (for size 7)

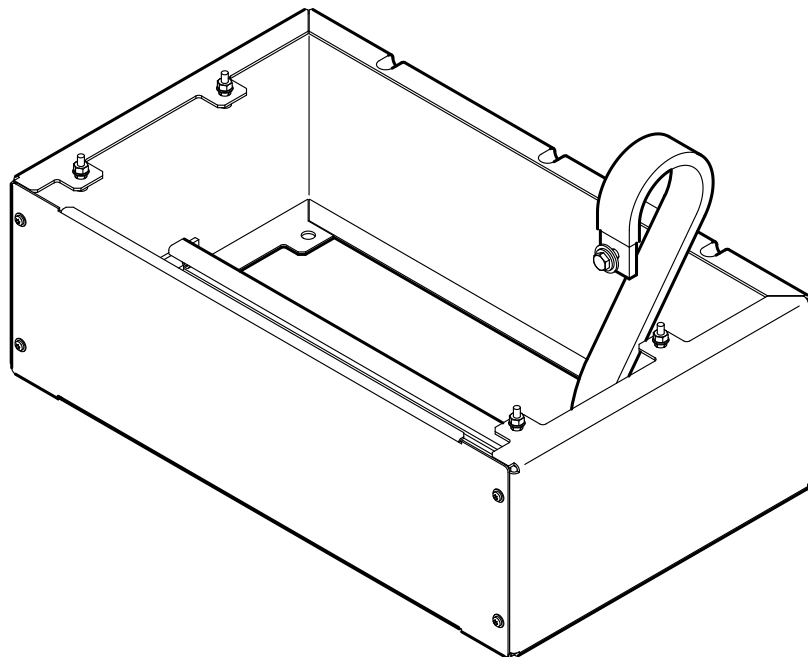
11.4.1 Part number

18226027

11.4.2 Description



2076984331



2422224267

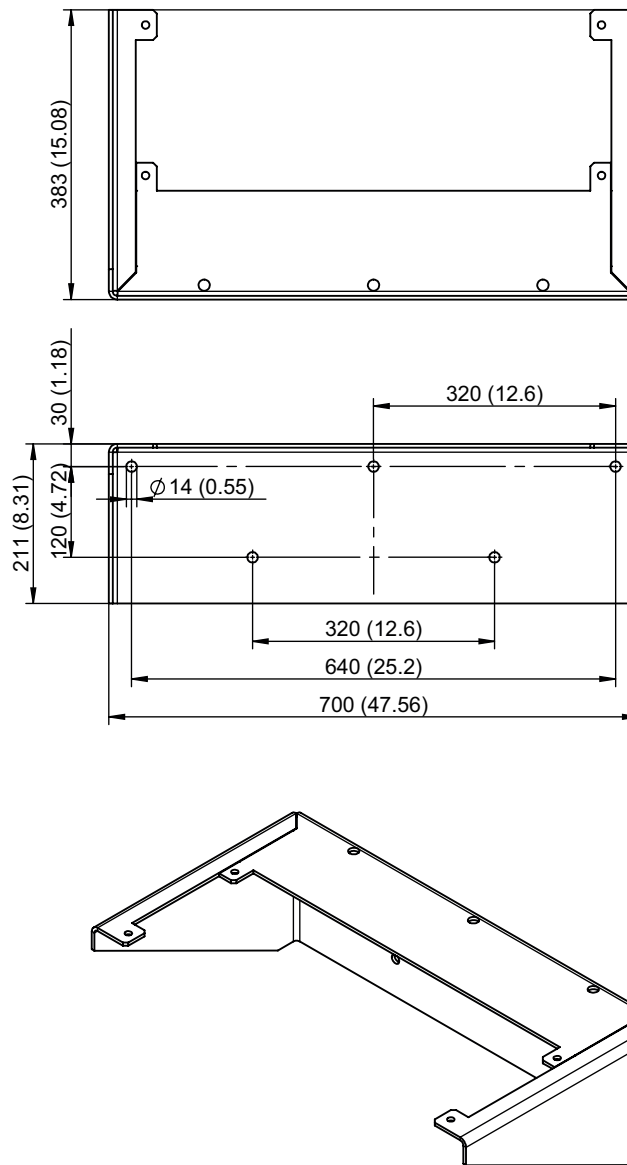
The mounting base is designed specifically for installation of MOVIDRIVE® B size 7 (MDX61B1600/2000/2500) in the control cabinet. The base is equipped with an integrated cable clamping rail. It ensures sufficient space for connecting the supply system and motor cables. The front cover can be removed for installation work. Fixing material for mounting the inverter to the mounting base is included in the scope of delivery.

## 11.5 DLH11B wall bracket (for size 7)

## 11.5.1 Part number

18226108

## 11.5.2 Description



9007201676959499

The wall bracket is used for attaching MOVIDRIVE® B size 7 (MDX61B1600/2000/2500) to a wall. The fixing material for mounting the inverter to the wall bracket is included in the scope of delivery. The fixing material for mounting the bracket to the wall is not included in the scope of delivery.

## 11.6 DLA11B connection kit (for size 7)

### 11.6.1 Part number

18223125

### 11.6.2 Description

Connection material for connecting supply system and motor cables with cross sections up to 240 mm<sup>2</sup> to the following devices:

- MOVIDRIVE® MDX61B size 7  
(AC 500 V devices: MDX61B1600/2000/2500)

The connection kit includes the following material:

- 9 × bolts M12×30
- 9 × M12 nuts
- Lock washers
- Washers
- 3 × PE terminals for PE busbar (up to 240 mm<sup>2</sup>)

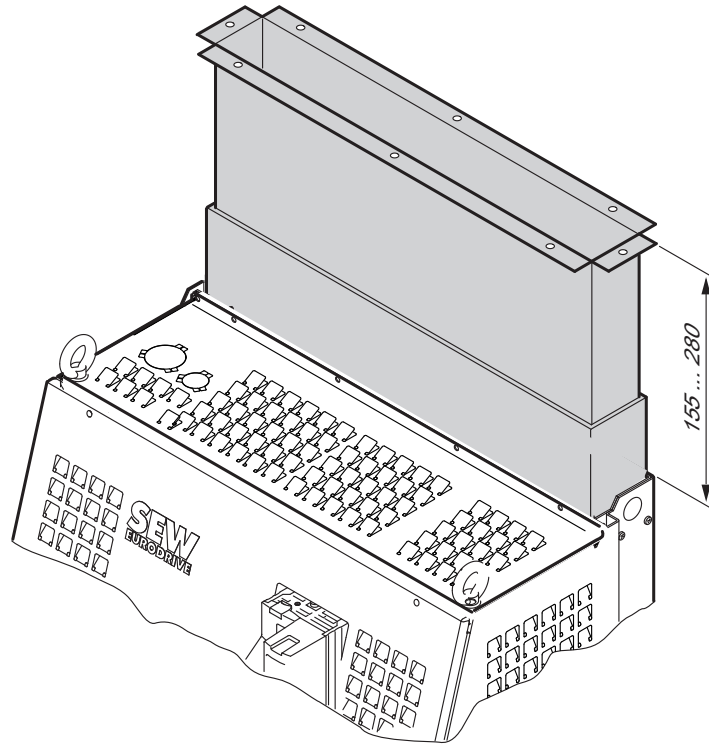
## 11.7 DLK11B air duct (for size 7)

### 11.7.1 Part number

18226035

### 11.7.2 Description

The following figure shows the air duct for dissipating heat from MOVIDRIVE® B size 7 (MDX61B1600/2000/2500):



18014400586472715

The air duct extends the integrated device air duct of size 7 to the control cabinet roof to dissipate heat from the control cabinet. It improves the temperature management. A prerequisite is that air can be dissipated via the control cabinet roof (dust protection, etc.).

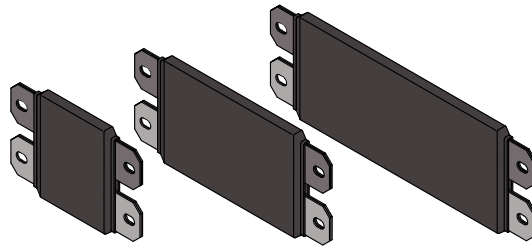
## 11.8 DLZ11B DC link coupling (for size 7)

### 11.8.1 Part number

The DLZ11B DC link coupling is available in three different lengths:

| Type            | Part number |
|-----------------|-------------|
| DLZ11B / 100 mm | 18231934    |
| DLZ11B / 200 mm | 18235662    |
| DLZ11B / 300 mm | 18235670    |

### 11.8.2 Description



9007201677055883

DC link connection to connect inverters and size 7 regenerative power supply unit side by side.

- MOVIDRIVE® MDX61B size 7 (MDX61B1600/2000/2500)
- MOVIDRIVE® MDR61B regenerative power supply size 7 (MDR61B1600/2500)
- MOVIDRIVE® MDX62B motor inverter size 7

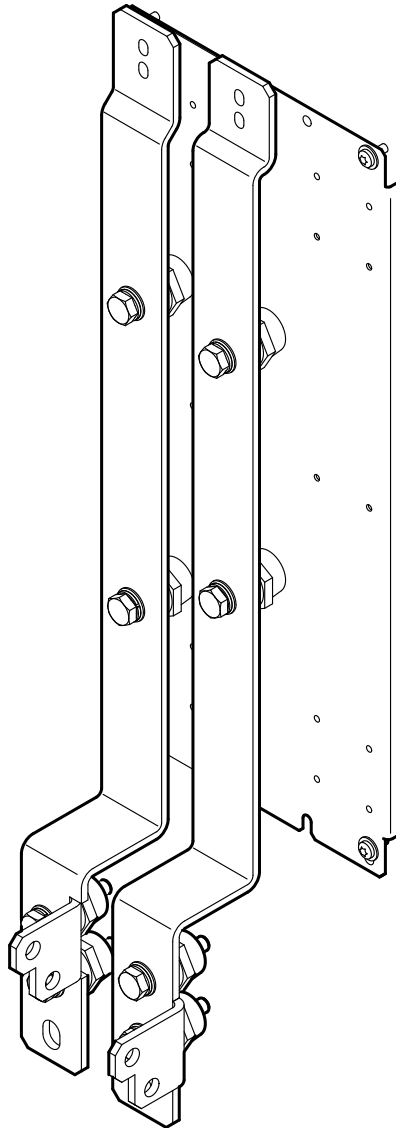
The DC link connection (+U<sub>z</sub>; -U<sub>z</sub>) of size 7 can be connected on the side as standard. The DLZ11B DC link coupling can be used to connect two size 7 MOVIDRIVE® B devices. Depending on the DC link coupling, the devices must be installed at a distance of 100 mm, 200 mm, or 300 mm; tolerance range: approx. 4 mm. Two insulated conductor rails and fixing material are included in the delivery.

## 11.9 2Q DLZ12B DC link adapter (for size 7)

### 11.9.1 Part number

18227295

### 11.9.2 Description



2422222347

DC link adapter for routing the DC link connection to the bottom of the device.

For devices:

- MDX61B1600-503-2-0T/L
  - MDX61B2000-503-2-0T/L
  - MDX61B2500-503-2-0T/L
- and
- MDX62B1600-503-2-0T/L



- MDX62B2000-503-2-0T/L
- MDX62B2500-503-2-0T/L

The DC link connection (+U<sub>z</sub>; -U<sub>z</sub>) of size 7 can be connected on the side as standard. The 2Q DC link adapter provides a connection option for +U<sub>z</sub> and -U<sub>z</sub> at the bottom of the device.

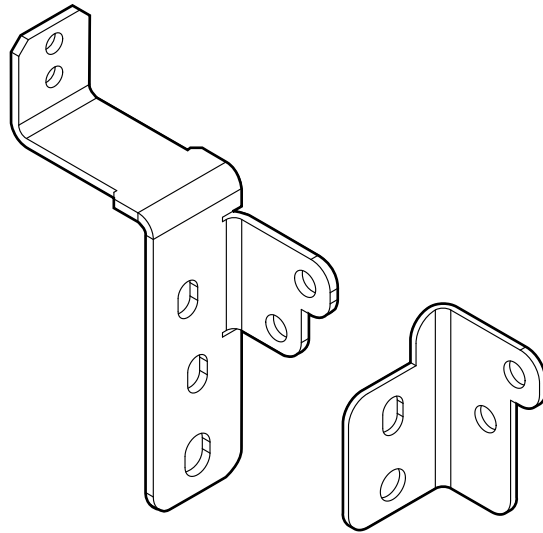
The DC link adapter can be used for DC link coupling with MOVIDRIVE® B sizes 0 – 6.

### 11.10 4Q DLZ14B DC link adapter (for size 7)

#### 11.10.1 Part number

18227287

#### 11.10.2 Description



2435823499

DC link adapter for routing the DC link connection to the bottom of the device.

For devices:

- MDX61B1600-503-4-0T/L
- MDX61B2000-503-4-0T/L
- MDX61B2500-503-4-0T/L

and

- MDX62B1600-503-4-0T/L
- MDX62B2000-503-4-0T/L
- MDX62B2500-503-4-0T/L

The DC link connection (+U<sub>z</sub>; -U<sub>z</sub>) of size 7 can be connected on the side as standard. The 4Q DC link adapter provides a connection option for +U<sub>z</sub> and -U<sub>z</sub> at the bottom of the device. The DC link adapter should be used for DC link coupling with MOVIDRIVE® B sizes 0 – 6.

## 12 Technical data of braking resistors, chokes and filters

### 12.1 Braking resistors BW.. / BW...-T / BW...-P

#### 12.1.1 General information

- Braking resistors BW... / BW...-T and BW...-P match the technical features of the MOVIDRIVE® drive inverters.
- Take account of a power reduction of 4% per 10 K from an ambient temperature of 40 °C. Do not exceed a maximum ambient temperature of 80 °C.

#### PTC resistor BW090-P52B

- Direct installation on MOVIDRIVE® MDX60B/61B size 0 (0005 – 0014) (→ chapter "Dimensions drawings for MOVIDRIVE® MDX60B")
- The MOVIDRIVE® devices can be lined up even with mounted braking resistor BW090-P52B.
- The resistor protects itself (reversible) against regenerative overload by changing abruptly to high resistance and no longer consuming any more energy. The inverter then switches off and signals a brake chopper fault (F04).

#### Flatpack resistors

- Protection against contact (IP54)
- In the documented assignments of drive inverters and flat-design resistors, flat-design resistors have an internal thermal protection (non-replaceable fuse) that interrupts the current circuit in the event of overload. The project planning guidelines and the documented assignments of drive inverter and braking resistor must be adhered to.
- Touch guard and mounting rail attachment available from SEW-EURODRIVE as accessories

### Wire and grid resistors

- Perforated sheet cover (IP20) open to mounting surface
- The short-term load capacity of the wire and grid resistors is higher than in the flat-type braking resistors (→ MOVIDRIVE® MDX60B/61B system manual, chapter "Braking resistor selection")
- A temperature switch is integrated in the BW...-T braking resistor
- A thermal overcurrent relay is integrated in the BW...-P braking resistor

SEW-EURODRIVE recommends implementing additional protection against overload for the wire and grid resistors by using a bimetallic relay with trip characteristics of trip class 10 or 10 A (in accordance with EN 60947-4-1). Set the tripping current to the value  $I_F$  (→ following tables). Do not use electronic or electromagnetic fuses because these can be triggered even in case of short-term excess currents that are still within the tolerance range.

For braking resistors in the BW..-T / BW...-P series, you can connect the integrated temperature sensor / overcurrent relay using a 2-core, shielded cable as an alternative to a bimetallic relay. The cable entry for the BW...-T and BW...-P braking resistors can be run from the front or the back (→ dimension drawing for BW... / BW...-T / BW...-P braking resistors). Use filler plugs for tapped holes that are not connected.

The surfaces of the resistors get very hot if loaded with  $P_N$ . Make sure that you select an installation site that will accommodate these high temperatures. For this reason, braking resistors are usually mounted on top of the control cabinet.

The performance data listed in the tables below show the load capacity of the braking resistors according to their cyclic duration factor (cyclic duration factor = cdf of the braking resistor in % in relation to a cycle duration  $\leq 120$  s).

#### 12.1.2 UL and cUL approval

Type BW... braking resistors are UL and cUL approved in conjunction with MOVIDRIVE® B drive inverters. SEW-EURODRIVE will provide certification on request. The BW...T and BW...-P braking resistors have cRUus approval independent of the MOVIDRIVE® inverter.

#### 12.1.3 Parallel connection

Two braking resistors with the same value must be connected in parallel for some inverter/resistor combinations. In this case, the tripping current must be set on the bimetallic relay to twice the value of  $I_F$  entered in the table. For the BW...-T BW...-P braking resistors, the temperature switch/overcurrent relay must be connected in series.

#### 12.1.4 Mounting position

Only horizontal mounting positions are permitted for BW braking resistors, with the exception of flatpack design.

Make sure to provide a clearance of 20 cm on the sides and 30 cm above the braking resistors.

## 12.1.5 Assignment to AC 400/500 V devices (...-5\_3)

| Braking resistor type BW...  | BW090-P52B        | BW100-005   | BW100-006  | BW072-003   | BW072-005 | BW168  | BW268       |
|--|-------------------|-------------|--|-------------|-----------|--|-------------|
| Part number  | 08245630          | 08262691    | 08217017   | 08260583    | 08260605  | 0820604X   | 08207151    |
| Braking resistor type BW...-T  |                   |             | BW100-006-T  |             |           | BW168-T  | BW268-T     |
| Part number  |                   |             | 18204198   |             |           | 18201334   | 18204171    |
| Continuous braking power (= 100% cdf)  | 0.10 kW           | 0.45 kW     | 0.6 kW   | 0.23 kW     | 0.45 kW   | 0.8 kW   | 1.2 kW      |
| Load capacity 50% cdf <sup>1)</sup>  | 0.15 kW           | 0.60 kW     | 1.1 kW   | 0.31 kW     | 0.60 kW   | 1.4 kW   | 2.2 kW      |
| At 25% cdf   | 0.2 kW            | 0.83 kW     | 1.9 kW   | 0.42 kW     | 0.83 kW   | 2.6 kW   | 3.8 kW      |
| 12% cdf  | 0.4 kW            | 1.11 kW     | 3.6 kW   | 0.58 kW     | 1.11 kW   | 4.8 kW   | 7.2 kW      |
| 6% cdf   | 0.7 kW            | 2.00 kW     | 5.7 kW   | 1.00 kW     | 2.00 kW   | 7.6 kW   | 11 kW       |
| Observe the <b>regenerative power limit</b> of the inverter.<br>(= 150% of the recommended motor power → Technical Data) |                   |             |  |             |           |  |             |
| Resistance value R <sub>BW</sub>   | 90 Ω ±35%         | 100 Ω ±10%  |  | 72 Ω ±10%   |           | 68 Ω ±10%  |             |
| Tripping current (of F16) I <sub>F</sub>   | -                 | 1 A         | 2.4 A  | 0.6 A       | 1 A       | 3.4 A  | 4.2 A       |
| Design   | PTC               | Flat design | Wire resistor on ceramic core                        | Flat design |           | Wire resistor on ceramic core                        |             |
| Connections / Tightening torque  | Cables            | Cables      | Ceramic terminals 2.5 mm <sup>2</sup> (AWG13) 0.5 Nm | Cables      |           | Ceramic terminals 2.5 mm <sup>2</sup> (AWG13) 0.5 Nm |             |
| Degree of protection   | IP20              | IP54        | IP20 (when installed)                                | IP54        |           | IP20 (when installed)                                |             |
| Ambient temperature θ <sub>amb</sub>   | -20 – +40 °C      |             |  |             |           |  |             |
| Type of cooling  | KS = self-cooling |             |  |             |           |  |             |
| For MOVIDRIVE® (recommended)   | 0005 – 0014       | 0005 – 0022 | 0015 – 0040  | 0005 – 0014 |           | 0005 – 0040  | 0015 – 0040 |

1) cdf = Cyclic duration factor of the braking resistor in relation to a cycle duration T D ≤ 120 s.

| Braking resistor type BW...  | BW147   | BW247    | BW347               | BW039-012   |             |                       |
|--|---|----------|---------------------|-------------|-------------|-----------------------|
| Part number  | 08207135  | 08207143 | 08207984            | 08216894    |             |                       |
| Braking resistor type BW...-T  | BW147-T   | BW247-T  | BW347-T             | BW039-012-T | BW039-026-T | BW039-050-T           |
| Part number  | 18201342  | 18200842 | 18201350            | 18201369    | 18204155    | 18201377              |
| Continuous braking power (= 100% cdf)  | 1.2 kW  | 2.0 kW   | 4.0 kW              | 1.2 kW      | 2.6 kW      | 5.0 kW                |
| Load capacity 50% cdf <sup>1)</sup>  | 2.2 kW  | 3.6 kW   | 7.2 kW              | 2.1 kW      | 4.7 kW      | 8.5 kW                |
| At 25% cdf   | 3.8 kW  | 6.4 kW   | 12.8 kW             | 3.8 kW      | 8.3 kW      | 15.0 kW               |
| 12% cdf  | 7.2 kW  | 12 kW    | 20 kW <sup>2)</sup> | 7.2 kW      | 15.6 kW     | 24.0 kW <sup>2)</sup> |
| 6% cdf   | 11 kW   | 19 kW    | 20 kW <sup>2)</sup> | 11.4 kW     | 24.0 kW     | 24.0 kW <sup>2)</sup> |
| Observe the <b>regenerative power limit</b> of the inverter.<br>(= 150% of the recommended motor power → Technical Data) |   |          |                     |             |             |                       |
| Resistance value R <sub>BW</sub>   | 47 Ω ±10%   |          |                     | 39 Ω ±10%   |             |                       |
| Tripping current (of F16) I <sub>F</sub>   | 5 A   | 6.5 A    | 9.2 A               | 5.5 A       | 8.1 A       | 11.3 A                |
| Design   | Wire resistor on ceramic core   |          |                     |             |             | Grid resistor         |
| Connections / Tightening torque  | Ceramic terminals 2.5 mm <sup>2</sup> (AWG13) / 0.5 Nm<br>BW347-T: Ceramic terminals 10 mm <sup>2</sup> (AWG8) / 1.6 Nm |          |                     |             |             | M8 stud / 6 Nm        |
| Degree of protection   | IP20 (when installed)   |          |                     |             |             |                       |
| Ambient temperature θ <sub>amb</sub>   | -20 – +40 °C  |          |                     |             |             |                       |
| Type of cooling  | KS = self-cooling   |          |                     |             |             |                       |
| For MOVIDRIVE® (recommended)   | 0055/0075   |          |                     | 0110        |             |                       |

1) cdf = Cyclic duration factor of the braking resistor in relation to a cycle duration T D ≤ 120 s.

2) Physical power limit due to DC link voltage and resistance value

| Braking resistor type BW...           | BW018-015   |             |             |          |
|---------------------------------------|-------------|-------------|-------------|----------|
| Part number                           | 08216843    |             |             |          |
| Braking resistor type BW...-T/P       | BW018-015-P | BW018-035-T | BW018-075-T | BW915-T  |
| Part number                           | 18204163    | 18201385    | 18201393    | 18204139 |
| Continuous braking power (= 100% cdf) | 1.5 kW      | 3.5 kW      | 7.5 kW      | 16 kW    |

| Braking resistor type BW...  | BW018-015  |               |                       |                       |
|--|--|---------------|-----------------------|-----------------------|
| Load capacity 50% cdf <sup>1)</sup>  | 2.5 kW   | 5.9 kW        | 12.7 kW               | 27.2 kW               |
| At 25% cdf   | 4.5 kW   | 10.5 kW       | 22.5 kW               | 48 kW                 |
| 12% cdf  | 6.7 kW   | 15.7 kW       | 33.7 kW               | 62.7 kW <sup>2)</sup> |
| 6% cdf   | 11.4 kW  | 26.6 kW       | 52.2 kW <sup>2)</sup> | 62.7 kW <sup>2)</sup> |
| Observe the <b>regenerative power limit</b> of the inverter.<br>(= 150% of the recommended motor power → Technical Data) |  |               |                       |                       |
| Resistance value R <sub>BW</sub>   | 18 Ω ±10%  |               |                       | 15 Ω ±10%             |
| Tripping current (of F16) I <sub>F</sub>   | 9.1 A  | 13.9 A        | 20.4 A                | 32.6 A                |
| Design   | Wire resistor on ceramic core  | Grid resistor |                       |                       |
| Connections / Tightening torque  | BW018-015: -Ceramic terminals<br>2.5 mm <sup>2</sup> (AWG13) / 0.5 Nm<br>BW018-015-P: Terminal<br>2.5 mm <sup>2</sup> (AWG13) / 1 Nm | M8 bolts/6 Nm |                       |                       |
| Degree of protection   | IP20 (when installed)  |               |                       |                       |
| Ambient temperature $\vartheta_{amb}$  | -20 – +40 °C   |               |                       |                       |
| Type of cooling  | KS = self-cooling  |               |                       |                       |
| For MOVIDRIVE® (recommended)   | 0150/0220 and 2 × parallel with 0370/0450 <sup>3)</sup>  |               |                       | 0220                  |

1) cdf = Cyclic duration factor of the braking resistor in relation to a cycle duration T D ≤ 120 s.

2) Physical power limit due to DC link voltage and resistance value

3) When connected in parallel, the load capacity and trip current are doubled.

| Braking resistor type BW...-   | BW012-025             |             |             |
|--|-----------------------|-------------|-------------|
| Part number  | 08216800              |             |             |
| Braking resistor type BW...-T/-P   | BW012-025-P           | BW012-050-T | BW012-100-T |
| Part number  | 18204147              | 18201407    | 18201415    |
| Continuous braking power (= 100% cdf)  | 2.5 kW                | 5.0 kW      | 10 kW       |
| Load capacity 50% cdf <sup>1)</sup>  | 4.2 kW                | 8.5 kW      | 17 kW       |
| At 25% cdf   | 7.5 kW                | 15.0 kW     | 30 kW       |
| 12% cdf  | 11.2 kW               | 22.5 kW     | 45 kW       |
| 6% cdf   | 19.0 kW               | 38.0 kW     | 76 kW       |
| Observe the <b>regenerative power limit</b> of the inverter.<br>(= 150% of the recommended motor power → Technical Data) |                       |             |             |
| Resistance value R <sub>BW</sub>   | 12 Ω ±10%             |             |             |
| Tripping current (of F16) I <sub>F</sub>   | 14.4 A                | 20.4 A      | 28.8 A      |
| Design   | Grid resistor         |             |             |
| Connections / Tightening torque  | M8 bolts/6 Nm         |             |             |
| Degree of protection   | IP20 (when installed) |             |             |
| Ambient temperature $\vartheta_{amb}$  | -20 – +40 °C          |             |             |
| Type of cooling  | KS = self-cooling     |             |             |
| For MOVIDRIVE® (recommended)   | 0300                  |             |             |

1) cdf = Cyclic duration factor of the braking resistor in relation to a cycle duration T D ≤ 120 s.

| Braking resistor type BW...-T/-P      | BW106-T   | BW206-T  | BW1.4-170   | BW003-420-T |
|---------------------------------------|-----------|----------|-------------|-------------|
| Part number                           | 18200834  | 18204120 | 13301527    | 13302345    |
| Continuous braking power (= 100% cdf) | 13.5 kW   | 18 kW    | 17 kW       | 42 kW       |
| Load capacity 50% cdf <sup>1)</sup>   | 23 kW     | 30.6 kW  | 29 kW       | 71 kW       |
| At 25% cdf                            | 40 kW     | 54 kW    | 51 kW       | 126 kW      |
| 12% cdf                               | 61 kW     | 81 kW    | 76 kW       | 189 kW      |
| 6% cdf                                | 102 kW    | 136.8 kW | 129 kW      | 319 kW      |
| Resistance value R <sub>BW</sub>      | 6 Ω ± 10% |          | 1.4 Ω ± 10% | 2.5 Ω ± 10% |

| Braking resistor type BW...-T/-P      | BW106-T   | BW206-T | BW1.4-170          | BW003-420-T |
|---------------------------------------|---|---------|--------------------|-------------|
| Tripping current (of F16) $I_F$       | 47.4 A  | 54.7 A  | 110 A              | 129 A       |
| Design                                | Grid resistor   |         |                    |             |
| Connections /<br>Tightening torque    | M8 bolts/6 Nm   |         | Bolt M12 / 15.5 Nm |             |
| Degree of protection                  | IP20 (when installed)   |         |                    |             |
| Ambient temperature $\vartheta_{amb}$ | -20 °C – +40 °C   |         |                    |             |
| Type of cooling                       | KS = self-cooling   |         |                    |             |
| For MOVIDRIVE® (recommended)          | 0370 – 0750 and 2 × parallel with<br>0900/1100/1320 <sup>2)</sup> |         | 1600/2000/2500     |             |

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

2) When connected in parallel, the load capacity and tripping current are doubled.

## 12.1.6 Assignment to AC 230 V devices (...-2\_3)

| Braking resistor type BW...              | BW039-0<br>03  | BW039-0<br>06 | BW039-01<br>2        |                      | BW027-00<br>6 | BW027-01<br>2 |                                      |                       |
|--|--|---------------|----------------------|----------------------|---------------|---------------|--------------------------------------|-----------------------|
| Part number                              | 08216878   | 08216886      | 0821689 4            |                      | 8224226       | 8224234       |                                      |                       |
| Braking resistor type BW...-T            |  |               | BW039-012<br>-T      | BW039-026<br>-T      |               |               | BW018-015<br>-P                      | BW018-035<br>-T       |
| Part number                              |  |               | 18201369             | 18204155             |               |               | 18204163                             | 18201385              |
| Continuous braking power (= 100% cdf)    | 0.3 kW   | 0.6 kW        | 1.2 kW               | 2.6 kW               | 0.6 kW        | 1.2 kW        | 1.5 kW                               | 3.5 kW                |
| Load capacity 50% cdf <sup>1)</sup>      | 0.5 kW   | 1.1 kW        | 2.1 kW               | 4.6 kW               | 1.1 kW        | 2.1 kW        | 2.5 kW                               | 5.9 kW                |
| At 25% cdf                               | 1.0 kW   | 1.9 kW        | 3.8 kW               | 6.0 kW <sup>2)</sup> | 1.9 kW        | 3.8 kW        | 4.5 kW                               | 10.5 kW               |
| 12% cdf                                  | 1.8 kW   | 3.6 kW        | 6.0 kW <sup>2)</sup> | 6.0 kW <sup>2)</sup> | 3.6 kW        | 7.2 kW        | 6.7 kW                               | 13.0 kW <sup>2)</sup> |
| 6% cdf                                   | 2.8 kW   | 5.7 kW        | 6.0 kW               | 6.0 kW <sup>2)</sup> | 5.7 kW        | 8.7 kW        | 11.4 kW                              | 13.0 kW <sup>2)</sup> |
|  | Observe the <b>regenerative power limit</b> of the inverter.<br>(= 150% of the recommended motor power → Technical Data) |               |                      |                      |               |               |                                      |                       |
| Resistance value R <sub>BW</sub>         | 39 Ω ±10%  |               |                      | 27 Ω ±10%            |               | 18 Ω ±10%     |                                      |                       |
| Tripping current (of F16) I <sub>F</sub> | 2.7 A  | 3.9 A         | 5.5 A                | 8.1 A                | 4.7 A         | 6.6 A         | 9.1 A                                | 13.9 A                |
| Design                                   | Wire resistor  |               |                      |                      |               |               | Grid resistor                        |                       |
| Connections / Tightening torque          | Ceramic terminals 2.5 mm <sup>2</sup> (AWG12) / 0.5 Nm   |               |                      |                      |               |               |                                      | M8 stud / 6 Nm        |
| Degree of protection                     | IP20 (when installed)  |               |                      |                      |               |               |                                      |                       |
| Ambient temperature $\vartheta_{amb}$    | -20 – +40 °C   |               |                      |                      |               |               |                                      |                       |
| Type of cooling                          | KS = self-cooling  |               |                      |                      |               |               |                                      |                       |
| For MOVIDRIVE® (recommended)             | 0015/0022  |               |                      |                      | 0015 – 0037   |               | 2 × parallel with 0110 <sup>3)</sup> |                       |

1) cdf = Cyclic duration factor of the braking resistor in relation to a cycle duration of TD ≤ 120 s.

2) Physical power limit due to DC link voltage and resistance value

3) When connected in parallel, the load capacity and trip current are doubled.

| Braking resistor type BW...-T/-P         | BW018-075-T  | BW915-T               | BW012-025-P | BW012-050-T           | BW012-100-T           | BW106-T  | BW206-T               |
|--|--|-----------------------|-------------|-----------------------|-----------------------|--|-----------------------|
| Part number                              | 18201393   | 18204139              | 18204147    | 18201407              | 18201415              | 18200834   | 18204120              |
| Continuous braking power (= 100% cdf)    | 7.5 kW   | 15.6 kW               | 2.5 kW      | 5.0 kW                | 10 kW                 | 13.5 kW  | 18 kW                 |
| Load capacity 50% cdf <sup>1)</sup>      | 12.7 kW  | 15.6 kW <sup>2)</sup> | 4.2 kW      | 8.5 kW                | 17 kW                 | 23 kW  | 30.6 kW               |
| At 25% cdf                               | 13.0 kW  | 15.6 kW <sup>2)</sup> | 7.5 kW      | 15.0 kW               | 19.6 kW <sup>2)</sup> | 39.2 kW <sup>2)</sup>                              | 39.2 kW <sup>2)</sup> |
| 12% cdf                                  | 13.0 kW <sup>2)</sup>  | 15.6 kW <sup>2)</sup> | 11.2 kW     | 19.6 kW               | 19.6 kW <sup>2)</sup> | 39.2 kW <sup>2)</sup>                              | 39.2 kW <sup>2)</sup> |
| 6% cdf                                   | 13.0 kW <sup>2)</sup>  | 15.6 kW <sup>2)</sup> | 19.0 kW     | 19.6 kW <sup>2)</sup> | 19.6 kW <sup>2)</sup> | 39.2 kW <sup>2)</sup>                              | 39.2 kW <sup>2)</sup> |
|  | Observe the <b>regenerative power limit</b> of the inverter.<br>(= 150% of the recommended motor power → Technical Data) |                       |             |                       |                       |  |                       |
| Resistance value R <sub>BW</sub>         | 18 Ω ±10%  | 15 Ω ±10%             | 12 Ω ±10%   |                       |                       | 6 Ω ±10%   |                       |
| Tripping current (of F16) I <sub>F</sub> | 20.4 A   | 32.6 A                | 14.4 A      | 20.4 A                | 28.8 A                | 47.4 A   | 54.7 A                |
| Design                                   | Grid resistor  |                       |             |                       |                       |  |                       |
| Connections / Tightening torque          | M8 stud / 6 Nm   |                       |             |                       |                       |  |                       |
| Degree of protection                     | IP20 (when installed)  |                       |             |                       |                       |  |                       |
| Ambient temperature $\vartheta_{amb}$    | -20 – +40 °C   |                       |             |                       |                       |  |                       |
| Type of cooling                          | KS = self-cooling  |                       |             |                       |                       |  |                       |
| For MOVIDRIVE® (recommended)             | 2 × parallel with 0110   |                       | 0055/0075   |                       |                       | 0150 and 2 × parallel with 0220/0300 <sup>3)</sup> |                       |

1) cdf = Cyclic duration factor of the braking resistor in relation to a cycle duration T D ≤ 120 s.

2) Physical power limit due to DC link voltage and resistance value

3) When connected in parallel, the load capacity and tripping current are doubled.

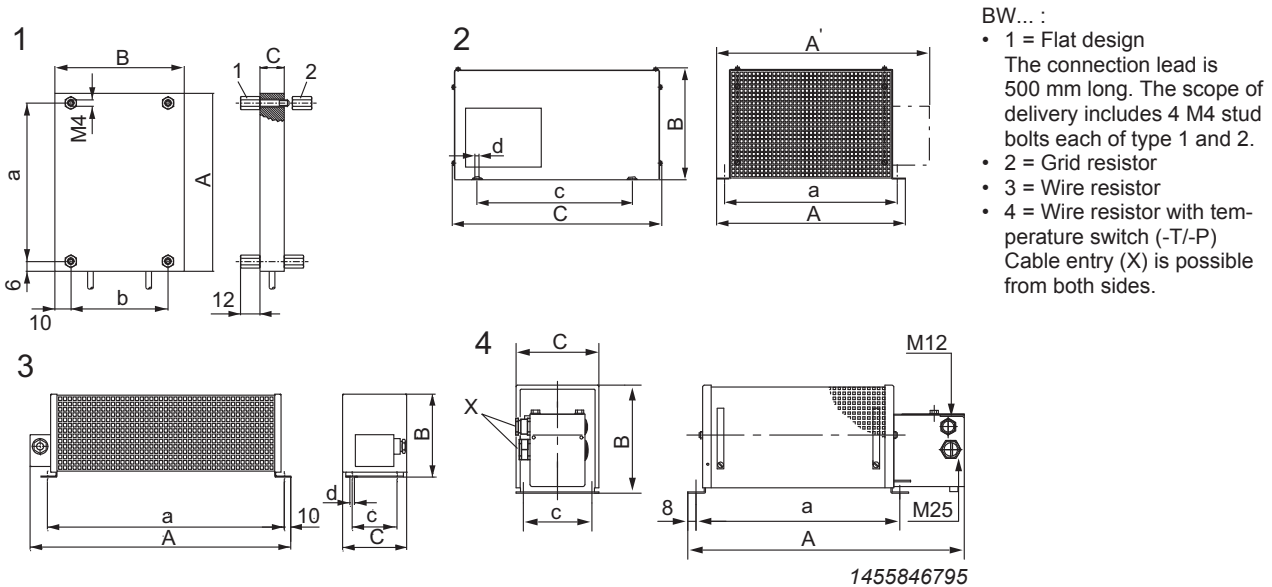


12.1.7 Technical data of BW...-T / BW...-P braking resistors

| BW...-T / BW...-P   |   |
|---|---|
| Connection cross section for signal contact/tightening torque | 1 x 2.5 mm <sup>2</sup> / 1 Nm  |
| Switching capacity of the temperature switch signal contact   | <ul style="list-style-type: none"> <li>• DC 2 A / DC 24 V (DC11)</li> <li>• AC 2 A / AC 230 V (AC11)</li> </ul> |
| Switch contact (NC contact)                                   | According to EN 60730   |

#### 12.1.8 Dimension drawing of BW.../BW...-T/BW...-P braking resistors

The following figure shows the mechanical dimensions in mm (in).



#### Mounting position 1

| BW... type | Main dimensions in mm |    |    | Fastening parts mm |     |   | Cable gland | Mass kg |
|------------|-----------------------|----|----|--------------------|-----|---|-------------|---------|
|            | A/A'                  | B  | C  | a                  | b/c | d |             |         |
| BW072-003  | 110                   | 80 | 15 | 98                 | 60  | – | –           | 0.3     |
| BW072-005  | 216                   | 80 | 15 | 204                | 60  | – | –           | 0.6     |
| BW100-005  | 216                   | 80 | 15 | 204                | 60  | – | –           | 0.6     |
| BW047-005  | 216                   | 80 | 15 | 204                | 60  | – | –           | 0.6     |

#### Mounting position 2

| BW... type  | Main dimensions in mm |     |     | Fastening parts mm |     |      | Cable gland | Mass kg |
|-------------|-----------------------|-----|-----|--------------------|-----|------|-------------|---------|
|             | A/A'                  | B   | C   | a                  | b/c | d    |             |         |
| BW106-T     | 795                   | 270 | 490 | 770                | 380 | 10.5 | –           | 32      |
| BW206-T     | 995                   | 270 | 490 | 970                | 380 | 10.5 | –           | 40      |
| BW012-025   | 295                   | 260 | 490 | 270                | 380 | 10.5 | M12 + M25   | 8.0     |
| BW012-025-P | 295/355               | 260 | 490 | 270                | 380 | 10.5 | M12 + M25   | 8.0     |
| BW012-050-T | 395                   | 260 | 490 | 370                | 380 | 10.5 | –           | 12      |
| BW012-100-T | 595                   | 270 | 490 | 570                | 380 | 10.5 | –           | 21      |
| BW915-T     | 795                   | 270 | 490 | 770                | 380 | 10.5 | –           | 30      |
| BW018-035-T | 295                   | 270 | 490 | 270                | 380 | 10.5 | –           | 9.0     |
| BW018-075-T | 595                   | 270 | 490 | 570                | 380 | 10.5 | –           | 18.5    |
| BW039-050-T | 395                   | 260 | 490 | 370                | 380 | 10.5 | –           | 12      |
| BW206-120-T | 595                   | 270 | 490 | 570                | 380 | 10.5 | 2×2×M8      | 22.0    |

**Mounting position 3**

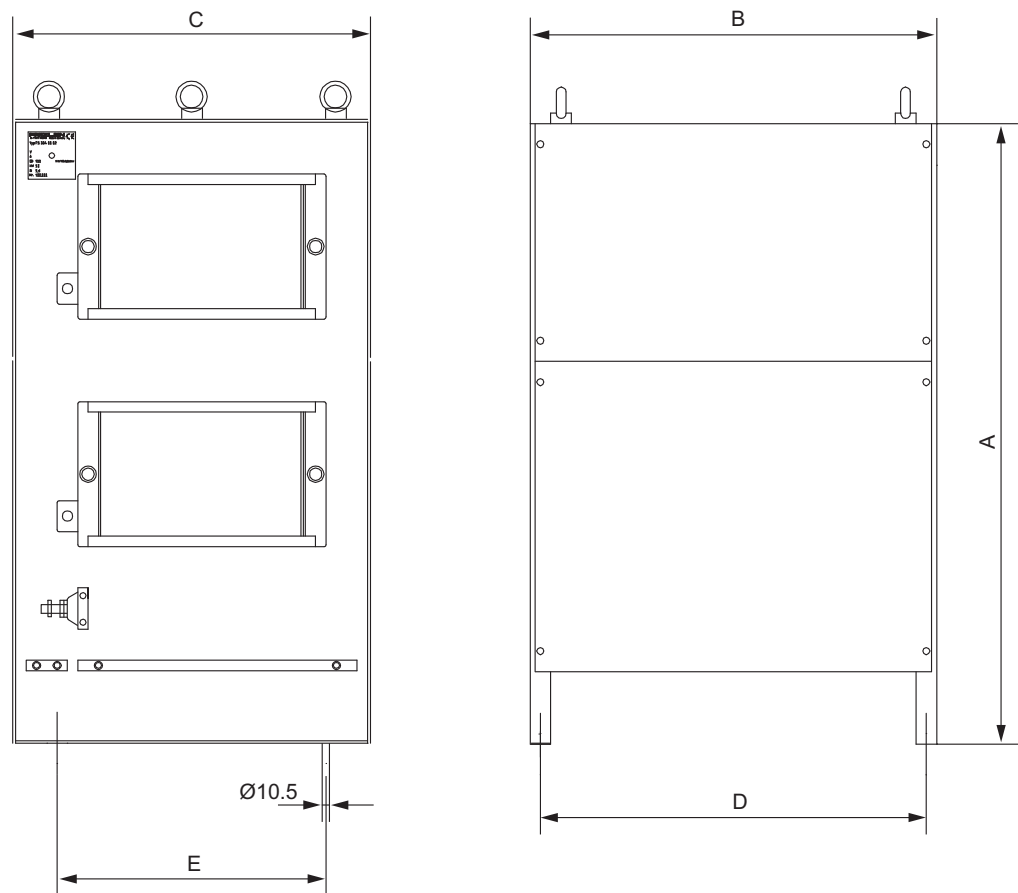
| BW... type<br>BW...-T/BW...-P | Main dimensions in mm |     |     | Fastening parts mm |     |     | Cable gland | Mass<br>kg |
|-------------------------------|-----------------------|-----|-----|--------------------|-----|-----|-------------|------------|
|                               | A/A'                  | B   | C   | a                  | b/c | d   |             |            |
| BW018-015                     | 620                   | 120 | 92  | 544                | 64  | 6.5 | PG11        | 4.0        |
| BW027-006                     | 486                   | 120 | 92  | 430                | 64  | 6.5 | PG11        | 2.2        |
| BW027-012                     | 486                   | 120 | 185 | 426                | 150 | 6.5 | PG11        | 4.3        |
| BW039-003                     | 286                   | 120 | 92  | 230                | 64  | 6.5 | PG11        | 1.5        |
| BW039-006                     | 486                   | 120 | 92  | 430                | 64  | 6.5 | PG11        | 2.2        |
| BW039-012                     | 486                   | 120 | 185 | 426                | 150 | 6.5 | PG11        | 4.3        |
| BW147                         | 465                   | 120 | 185 | 426                | 150 | 6.5 | PG13.5      | 4.3        |
| BW247                         | 665                   | 120 | 185 | 626                | 150 | 6.5 | PG13.5      | 6.1        |
| BW347                         | 670                   | 145 | 340 | 630                | 300 | 6.5 | PG13.5      | 13.2       |
| BW168                         | 365                   | 120 | 185 | 326                | 150 | 6.5 | PG13.5      | 3.5        |
| BW268                         | 465                   | 120 | 185 | 426                | 150 | 6.5 | PG13.5      | 4.3        |

**Mounting position 4**

| BW... type<br>BW...-T/BW...-P | Main dimensions in mm |     |     | Fastening parts mm |     |     | Cable gland | Mass<br>kg |
|-------------------------------|-----------------------|-----|-----|--------------------|-----|-----|-------------|------------|
|                               | A/A'                  | B   | C   | a                  | b/c | d   |             |            |
| BW018-015-P                   | 649                   | 120 | 185 | 530                | 150 | 6.5 | M12 + M25   | 5.8        |
| BW039-012-T                   | 549                   | 120 | 185 | 426                | 150 | 6.5 | M12 + M25   | 4.9        |
| BW039-026-T                   | 649                   | 120 | 275 | 530                | 240 | 6.5 | M12 + M25   | 7.5        |
| BW147-T                       | 549                   | 120 | 185 | 426                | 150 | 6.5 | M12 + M25   | 4.9        |
| BW247-T                       | 749                   | 120 | 185 | 626                | 150 | 6.5 | M12 + M25   | 9.2        |
| BW347-T                       | 749                   | 210 | 185 | 630                | 150 | 6.5 | M12 + M25   | 12.4       |
| BW168-T                       | 449                   | 120 | 185 | 326                | 150 | 6.5 | M12 + M25   | 3.6        |
| BW268-T                       | 549                   | 120 | 185 | 426                | 150 | 6.5 | M12 + M25   | 4.9        |
| BW100-006                     | 486                   | 120 | 92  | 430                | 64  | 6.5 | PG11        | 2.2        |
| BW100-006-T                   | 549                   | 120 | 92  | 430                | 80  | 6.5 | M12 + M25   | 3.0        |

#### 12.1.9 Dimension drawings of BW1.4-170 and BW003-420-T braking resistors

The following figure shows the mechanical dimensions in mm.



2649275275

| BW... type  | Main dimensions in mm |     |     |     |     | Mass<br>kg |
|-------------|-----------------------|-----|-----|-----|-----|------------|
|             | A                     | B   | C   | D   | E   |            |
| BW1.4-170   | 460                   | 795 | 490 | 770 | 380 | 51         |
| BW003-420-T | 710                   | 995 | 490 | 970 | 380 | 93         |

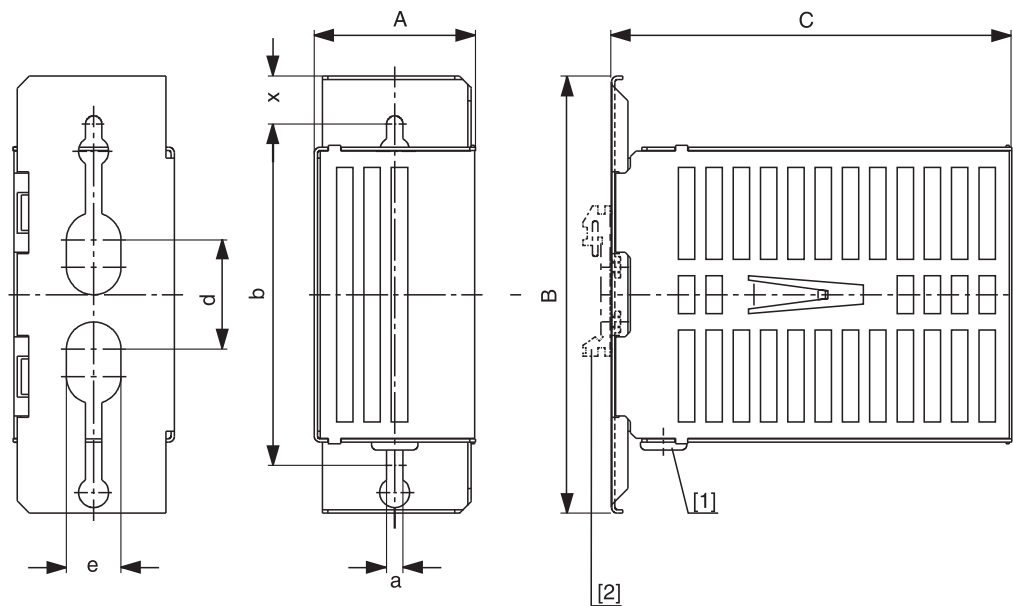
12.1.10 BS... touch guard

Description

A BS.. touch guard is available for braking resistors in flat design.

| Touch guard          | BS003                  | BS005                               |
|----------------------|------------------------|-------------------------------------|
| Part number          | 08131511               | 0813152X                            |
| for braking resistor | BW027-003<br>BW072-003 | BW027-005<br>BW072-005<br>BW100-005 |

Dimension drawing for BS...



1455849867

- [1] Grommet
- [2] Support rail mounting

| Type   | Main dimensions in mm |     |     | Mounting dimensions mm |    |    |   |      | Mass kg |
|--------|-----------------------|-----|-----|------------------------|----|----|---|------|---------|
|        | A                     | B   | C   | b                      | d  | e  | a | x    |         |
| BS-003 | 60                    | 160 | 146 | 125                    | 40 | 20 | 6 | 17.5 | 0.35    |
| BS-005 | 60                    | 160 | 252 | 125                    | 4  | 20 | 6 | 17.5 | 0.5     |

Mounting rail installation

A mounting rail attachment HS001 is available from SEW-EURODRIVE, part number 8221944, for mounting the touch guard on a mounting rail.

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## 12.1.11 DKB11A heat sink for braking resistors in flatpack design

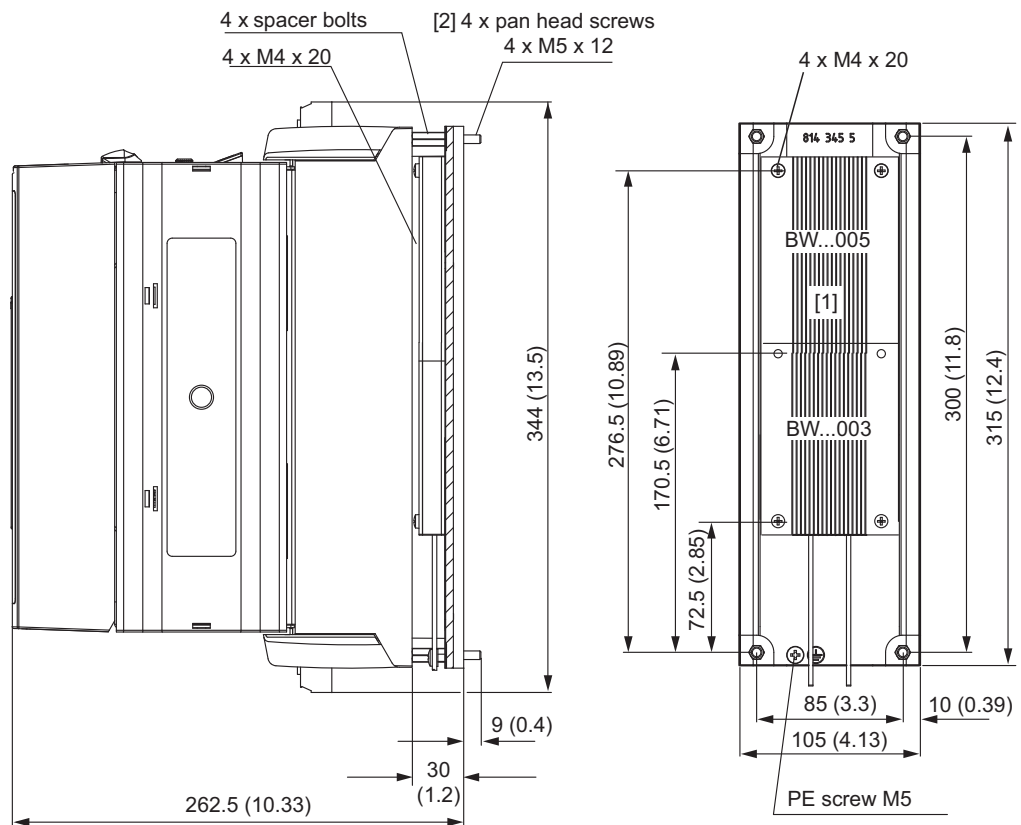
## Part number

08143455

## Description

The DKB11A heat sink for braking resistors in flatpack design provides a compact means for mounting the braking resistors (BW072-005, BW100 – 005) beneath MOVIDRIVE® B size 1 (400/500 V devices: 0015 – 0040; 230 V devices: 0015 – 0037). The resistor is inserted into the heat sink and attached using the supplied screws (M4 × 20).

## Dimension drawing



1455852939

All dimensions in mm (in)

- [1] Mounting surface for the braking resistor  
 [2] You need 4 × M5 × 12 screws to mount the device on the heat sink. These screws are not included in the scope of delivery.

## 12.2 ND.. line chokes

Using line chokes is optional:

- To support overvoltage protection
- To smoothen the line current, to reduce harmonics
- For protection in the event of distorted line voltage
- To limit the charging current when several inverters are connected together in parallel on the input end with a shared line contactor (nominal current of line choke = total of inverter currents).

ND.. line chokes have cRUus approval independent of the inverter.

Use is required under the following circumstances:

- When operating 5 or more inverters that are switched on simultaneously. The line choke limits overvoltages caused by the switching.

The following use is recommended:

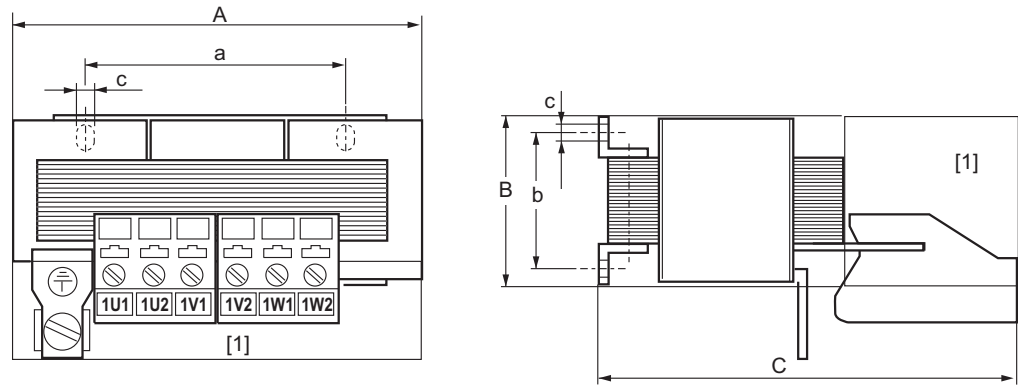
- In supply systems with many switching elements such as regenerative power supply units or thyristor controllers

| Line choke type                                       | ND020-013                                    | ND030-023 <sup>1)</sup>   | ND045-013                                       | ND085-013                                       | ND150-013                   | ND200-0033                        | ND300-0053  |
|---|--|---|---|---|-----------------------------|-----------------------------------|-------------|
| Part number   | 08260125                                     | 08271518  | 08260133  | 08260141  | 08255482                    | 08265798                          | 08277214    |
| Nominal line voltage $V_N$<br>(according to EN 50160) | 3 × AC 380 V – 500 V, 50/60 Hz               |   |   |   |                             |                                   |             |
| Rated current <sup>2)</sup> $I_N$                     | AC 20 A                                      | AC 30 A   | AC 45 A   | AC 85 A   | AC 150 A                    | AC 200 A                          | AC 300 A    |
| Power loss at $I_N$ $P_V$                             | 10 W   | 30 W  | 15 W  | 25 W  | 65 W                        | 100 W                             | 280 W       |
| Inductance $L_N$                                      | 0.1 mH                                       | 0.2 mH  | 0.1 mH  | 0.1 mH  | 0.1 mH                      | 0.03 mH                           | 0.05 mH     |
| Ambient temperature $\vartheta_{amb}$                 | -25 – +45 °C                                 |   |   |   |                             |                                   |             |
| Degree of protection                                  | IP00 (EN 60529)                              |   |   |   |                             |                                   |             |
| Connections   | Terminal strips<br>4 mm <sup>2</sup> (AWG12) | Terminal strips<br>2.5 mm <sup>2</sup> – 10 mm <sup>2</sup><br>(AWG13 – AWG8) | Terminal strips<br>10 mm <sup>2</sup><br>(AWG8) | Terminal strips<br>35 mm <sup>2</sup><br>(AWG2) | M10 stud<br>PE: M8 stud     | M12 stud<br>PE: 2 × M10           |             |
| Tightening torque                                     | 0.6 – 0.8 Nm                                 | max. 2.5 Nm   |   | 3.2 – 3.7 Nm                                    | M10 stud: 10 Nm<br>PE: 6 Nm | M12 stud:<br>15.5 Nm<br>PE: 10 Nm |             |
| Assignment to AC 400/500 V devices (MDX60/61B...-5_3) |  |   |   |   |                             |                                   |             |
| Nominal operation (100%)                              | 0005 – 0075                                  | 0110/0150   | 0110 – 0220<br>and<br>MDR60A0150                | 0300 – 0450<br>and<br>MDR60A0370                | 0550/0750                   | MDR60A<br>0750                    | 0900 – 1320 |
| Increased power (125%)                                | 0005 – 0075                                  | 0110  | 0110/0150                                       | 0220 – 0370                                     | 0450 –<br>0750              |                                   |             |
| Assignment to AC 230 V devices (MDX61B...-2_3)        |  |   |   |   |                             |                                   |             |
| Nominal operation (100%)                              | 0015 – 0055                                  | -   | 0075/0110                                       | 0150/0220                                       | 0300                        | -                                 | -           |
| Increased power (125%)                                | 0015 – 0037                                  | -   | 0055/0075                                       | 0110/0150                                       | 0220/0300                   | -                                 | -           |

1) Use ND030-023 for DC link connection without regenerative power supply unit with connection type A or B

2) If more than one MOVIDRIVE® device is connected to a line choke, the total value of the rated currents of the connected devices must not exceed the nominal current of the line choke.

#### 12.2.1 Dimension drawing for line chokes ND020.. / ND030.. / ND045.. / ND085..



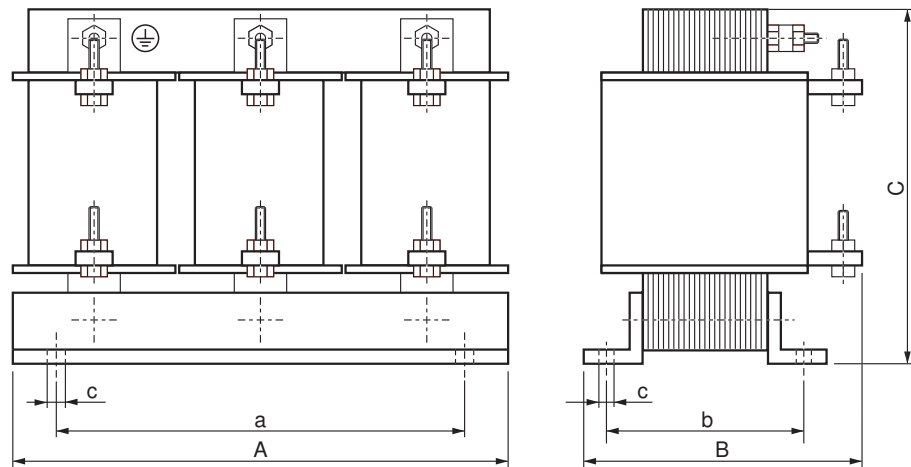
1455926923

[1] Space for installation terminals  
Any mounting position

Input: 1U1, 1V1, 1W1  
Output: 1U1, 1V2, 1W2

| Line choke type        | Main dimensions in mm |     |     | Mounting dimensions mm |         | Hole dimension mm | Mass |
|------------------------|-----------------------|-----|-----|------------------------|---------|-------------------|------|
|                        | A                     | B   | C   | a                      | b       | c                 | kg   |
| ND020-013              | 85                    | 60  | 120 | 50                     | 31 - 42 | 5 - 10            | 0.5  |
| ND030-023<br>ND045-013 | 125                   | 95  | 170 | 84                     | 55-75   | 6                 | 2.5  |
| ND085-013              | 185                   | 115 | 235 | 136                    | 56 - 88 | 7                 | 7    |

#### 12.2.2 Dimension drawing for line chokes ND150.. / ND200.. / ND300..



1455933707

| Line choke type | Connection screws      | Main dimensions in mm |     |     | Mounting dimensions mm |     | Hole dimension mm | Mass |
|-----------------|------------------------|-----------------------|-----|-----|------------------------|-----|-------------------|------|
|                 |                        | A                     | B   | C   | a                      | b   | c                 | kg   |
| ND150-013       | M10 × 40               | 255                   | 140 | 230 | 170                    | 77  | 8                 | 17   |
| ND200-0033      | M10 × 40               | 250                   | 160 | 230 | 180                    | 98  | 8                 | 15   |
| ND300-0053      | M12 × 40 <sup>1)</sup> | 300                   | 190 | 295 | 255                    | 145 | 11                | 35   |

1) Except PE: M10 × 30



## 12.3 NF...-... line filters

- To suppress interference emission on the line side of inverters.
- Do not switch between the NF... line filter and inverter.
- NF.. line filters have cRUus approval independent of inverter.

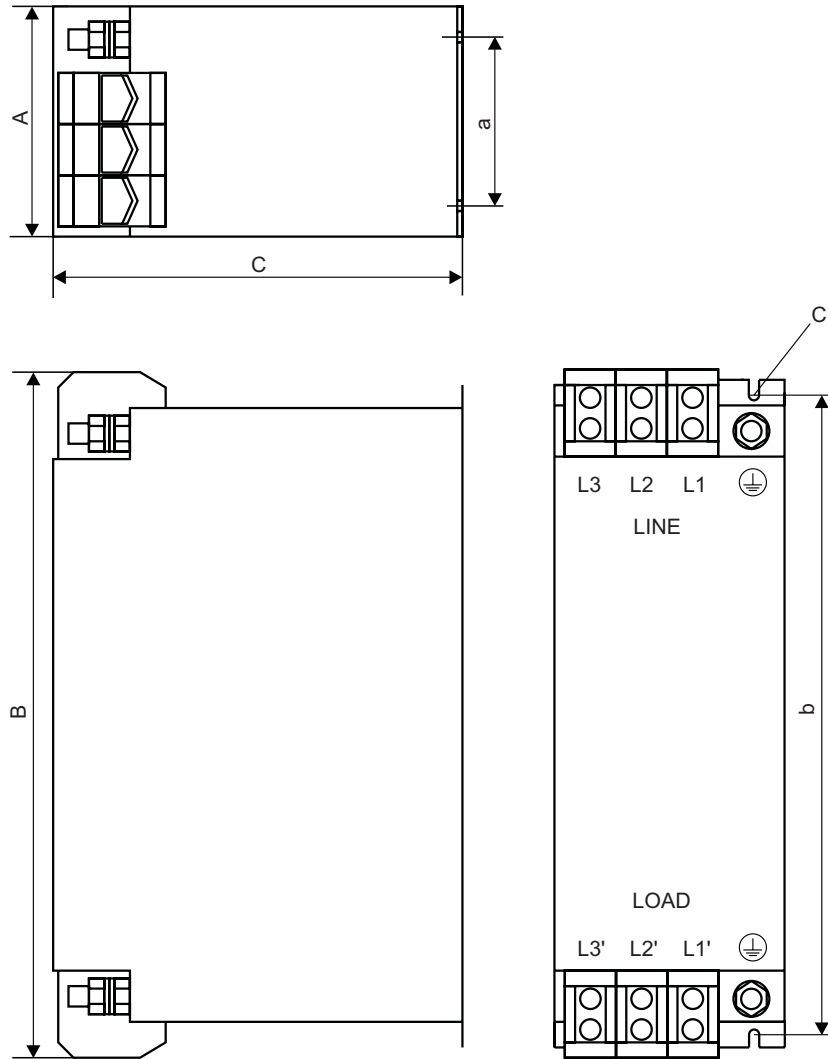
| Line filter type                                      | NF009-503                      | NF014-503 | NF018-503 | NF035-503                  | NF048-503                  |
|---|--------------------------------|-----------|-----------|----------------------------|----------------------------|
| Part number   | 08274126                       | 0827116X  | 08274134  | 08271283                   | 08271178                   |
| Nominal line voltage $V_N$<br>(according to EN 50160) | 3 × AC 200 V – 500 V, 50/60 Hz |           |           |                            |                            |
| Nominal current $I_N$                                 | AC 9 A                         | AC 14 A   | AC 18 A   | AC 35 A                    | AC 48 A                    |
| Power loss at $I_N P_V$                               | 6 W                            | 9 W       | 12 W      | 15 W                       | 22 W                       |
| Leakage current at $V_N$                              | < 25 mA                        | < 25 mA   | < 25 mA   | < 25 mA                    | < 40 mA                    |
| Ambient temperature $\vartheta_{amb}$                 | -25 – +40 °C                   |           |           |                            |                            |
| Degree of protection                                  | IP20 (EN 60529)                |           |           |                            |                            |
| Connections L1-L3/L1'-L3'                             | 4 mm <sup>2</sup> (AWG 10)     |           |           | 10 mm <sup>2</sup> (AWG 8) | 10 mm <sup>2</sup> (AWG 8) |
| Tightening torque L1-L3/L1'-L3'                       | 0.8 Nm                         |           |           | 1.8 Nm                     | 1.8 Nm                     |
| Connection PE   | M5 stud                        |           |           | M5 stud                    | M6 stud                    |
| Tightening torque PE                                  | 3.4 Nm                         |           |           | 3.4 Nm                     | 5.5 Nm                     |
| Assignment to AC 400/500 V devices (MDX60/61B...-5_3) |                                |           |           |                            |                            |
| Nominal operation (100%)                              | 0005 – 0040                    | 0055/0075 | -         | 0110/0150                  | 0220                       |
| Increased power (125%)                                | 0005 – 0030                    | 0040/0055 | 0075      | 0110                       | 0150                       |
| Assignment to AC 230 V devices (MDX61B...-2_3)        |                                |           |           |                            |                            |
| Nominal operation (100%)                              | 0015/0022                      | 0037      | -         | 0055/0075                  | 0110                       |
| Increased power (125%)                                | 0015                           | 0022      | 0037      | 0055/0075                  | -                          |

| Line filter type                                      | NF063-503                      | NF085-503                     | NF115-503                      | NF150-503                      | NF210-503                      |
|---|--------------------------------|-------------------------------|--------------------------------|--------------------------------|--------------------------------|
| Part number   | 08274142                       | 08274150                      | 08274169                       | 08274177                       | 08274185                       |
| Nominal line voltage $V_N$<br>(according to EN 50160) | 3 × AC 200 V – 500 V, 50/60 Hz |                               |                                |                                |                                |
| Nominal current $I_N$                                 | AC 63 A                        | AC 85 A                       | AC 115 A                       | AC 150 A                       | AC 210 A                       |
| Power loss at $I_N P_V$                               | 30 W                           | 35 W                          | 60 W                           | 90 W                           | 150 W                          |
| Leakage current at $V_N$                              | < 30 mA                        | < 30 mA                       | < 30 mA                        | < 30 mA                        | < 40 mA                        |
| Ambient temperature $\vartheta_{amb}$                 | -25 – +40 °C                   |                               |                                |                                |                                |
| Degree of protection                                  | IP20 (EN 60529)                |                               |                                |                                |                                |
| Connections L1-L3/L1'-L3'                             | 16 mm <sup>2</sup><br>(AWG 6)  | 35 mm <sup>2</sup><br>(AWG 2) | 50 mm <sup>2</sup><br>(AWG1/0) | 50 mm <sup>2</sup><br>(AWG1/0) | 95 mm <sup>2</sup><br>(AWG4/0) |
| Tightening torque L1-L3/L1'-L3'                       | 4 Nm                           | 4.5 Nm                        | 6 Nm                           | 6 Nm                           | 12 Nm                          |
| Connection PE   | M6                             | M8                            | M10                            | M10                            | M10                            |
| Tightening torque PE                                  | 3.9 Nm                         | 9 Nm                          | 17 Nm                          | 17 Nm                          | 17 Nm                          |
| Assignment to AC 400/500 V devices (MDX60/61B...-5_3) |                                |                               |                                |                                |                                |
| Nominal operation (100%)                              | 0300                           | 0370/0450                     | 0550                           | 0750                           | 0900/1100                      |
| Increased power (125%)                                | 0220                           | 0300/0370                     | 0450                           | 0550/0750                      | 0750/0900                      |
| Assignment to AC 230 V devices (MDX61B...-2_3)        |                                |                               |                                |                                |                                |
| Nominal operation (100%)                              | 0150                           | 0220                          | 0300                           | -                              | -                              |
| Increased power (125%)                                | 0110/0150                      | -                             | 0220/0300                      | -                              | -                              |

| Line filter type                                      | NF300-503                      | NF600-503       |
|---|--------------------------------|-----------------|
| Part number   | 08274193                       | 17963389        |
| Nominal line voltage $V_N$<br>(according to EN 50160) | 3 × AC 380 V – 500 V, 50/60 Hz |                 |
| Nominal current $I_N$                                 | AC 300 A                       | AC 600 A        |
| Power loss at $I_N P_V$                               | 180 W                          | 44 W            |
| Leakage current at $V_N$                              | < 45 mA                        | < 6 mA          |
| Ambient temperature $\vartheta_{amb}$                 | -25 – +40 °C                   |                 |
| Degree of protection                                  | IP20 (EN 60529)                | IP00 (EN 60529) |

| Line filter type                                      | NF300-503                         | NF600-503   |
|---|-----------------------------------|---|
| Connections L1-L3/L1'-L3'                             | 150 mm <sup>2</sup><br>(AWG300-2) | Connection rail with bore for M12<br>Max. 2 × 240 mm <sup>2</sup> |
| Tightening torque L1-L3/L1'-L3'                       | 20 Nm                             | 70 Nm   |
| Connection PE   | M12                               | M12   |
| Tightening torque PE                                  | 17 Nm                             | 36 Nm   |
| Assignment to AC 400/500 V devices (MDX60/61B...-5_3) |                                   |   |
| Nominal operation (100%)                              | 1320/1600                         | 2000/2500   |
| Increased power (125%)                                | 1100/1320                         | 1600/2000/2500  |
| Assignment to AC 230 V devices (MDX61B...-2_3)        |                                   |   |
| Nominal operation (100%)                              | -                                 | -   |
| Increased power (125%)                                | -                                 | -   |

12.3.1 Dimension drawing of NF009-503 – NF300-503 line filter



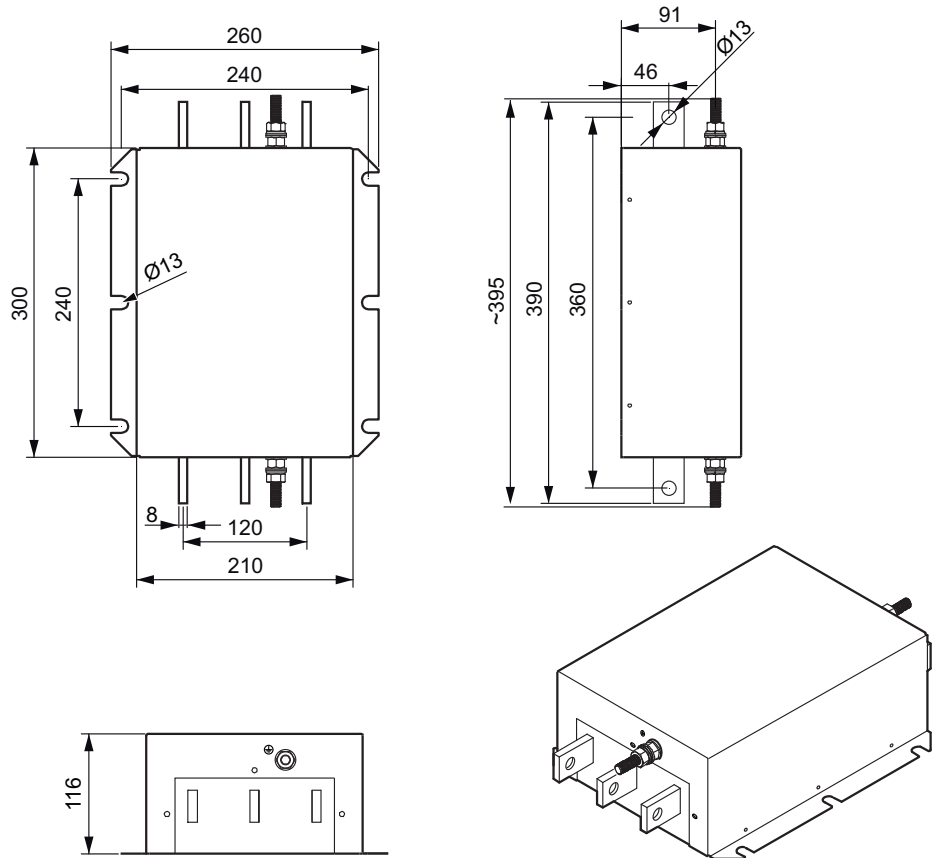
9007200711128075

Any mounting position

| Line filter type | Main dimensions in mm |     |     | Mounting dimensions mm |     | Hole dimension mm | PE connection | Mass kg |     |
|------------------|-----------------------|-----|-----|------------------------|-----|-------------------|---------------|---------|-----|
|                  | A                     | B   | C   | a                      | b   |                   |               |         |     |
| NF009-503        | 55                    | 195 | 80  | 20                     | 180 | 5.5               | M5            | 0.8     |     |
| NF014-503        |                       | 225 |     |                        | 210 |                   |               | 0.9     |     |
| NF018-503        |                       | 255 |     |                        | 240 |                   |               | 1.1     |     |
| NF035-503        | 60                    | 275 | 100 | 30                     | 255 |                   | 6.5           | M6      | 1.7 |
| NF048-503        |                       | 315 |     |                        | 295 |                   |               |         | 2.1 |
| NF063-503        | 90                    | 260 | 140 | 60                     | 235 |                   |               | M8      | 2.4 |
| NF085-503        |                       | 320 |     |                        | 255 | 3.5               |               |         |     |
| NF115-503        | 100                   | 330 | 155 | 65                     | 255 | M10               | 4.8           |         |     |
| NF150-503        |                       |     |     |                        |     |                   | 5.6           |         |     |
| NF210-503        | 140                   | 450 | 190 | 102                    | 365 |                   | M12           | 8.9     |     |
| NF300-503        | 170                   | 540 | 230 | 125                    | 435 |                   | 12.2          |         |     |

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#### 12.3.2 Dimension drawing of NF600-503 line filter



Any mounting position

| Line filter type | PE connection | Mass |
|------------------|---------------|------|
|                  |               | kg   |
| NF600-503        | M12           | 16.8 |

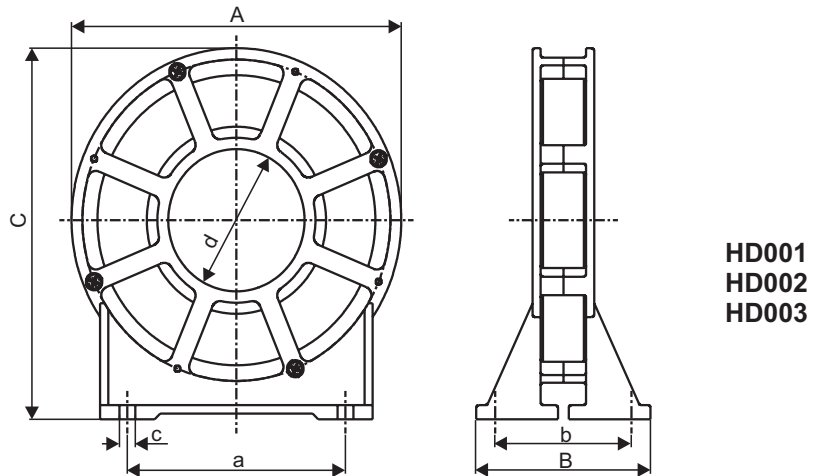
12.4 HD... output chokes

- For suppression of interference from the unshielded motor cable. For HD001 to HD003 we recommend routing the motor cable through the output choke with 5 loops. Less than 5 loops are possible if the cable has a large diameter. To make up for this, 2 or 3 output chokes should be connected in series. If you use 4 loops, connect 2 output chokes in series, and if you use 3 loops, connect 3 output chokes.
- Output chokes HD001 to HD003 are allocated using the cable cross sections of the motor cables. Consequently, there is no separate assignment table for the AC 230 V devices.
- The HD004 output choke is assigned to size 6 devices (0900 – 1320).
- The HD005 output choke is assigned to size 7 devices (1600 – 2500).

| Output choke type  | HD001                                    | HD002                             | HD003                           | HD004                         | HD005  |
|--|--|-----------------------------------|---------------------------------|-------------------------------|--|
| Part number  | 08133255                                 | 08135576                          | 08135584                        | 08168857                      | 17963362   |
| Maximum power loss Power loss $P_{Vmax}$                   | 15 W                                     | 8 W                               | 30 W                            | 100 W                         | 162  |
| For cable cross sections/connections/<br>Tightening torque | 1.5 – 16 mm <sup>2</sup><br>(AWG 16 – 6) | ≤ 1.5 mm <sup>2</sup><br>(AWG 16) | ≥ 16 mm <sup>2</sup><br>(AWG 6) | Terminal stud<br>M12<br>36 Nm | M12 cable lugs<br>70 Nm<br>PE connection<br>M12<br>36 Nm |
| Degree of protection                                       | -  | -                                 | -                               | IP10                          | IP00   |
| UL/cUL approval  | No UL/cUL relevant component             |                                   |                                 | Yes                           | Yes  |

12.4.1 Dimension drawing HD001 – HD003

The following figure shows the mechanical dimensions in mm (in):



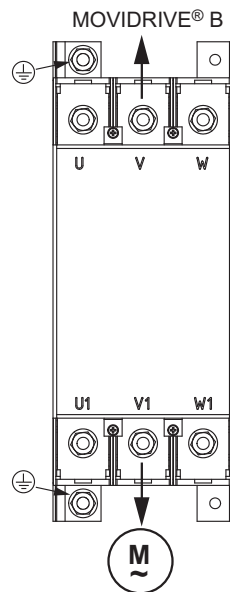
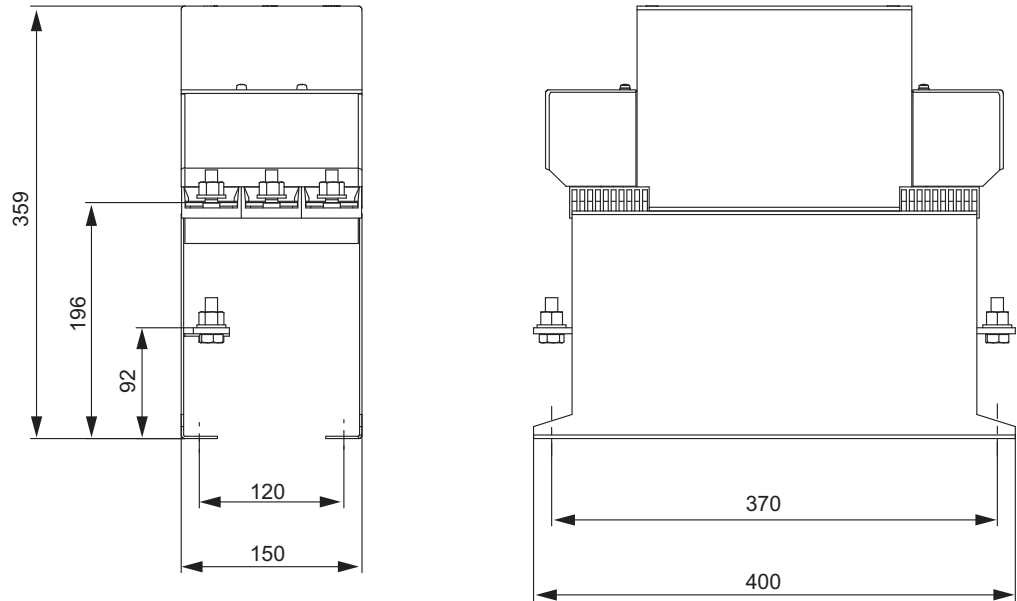
1456392203

| Output choke type | Main dimensions in mm |    |     | Mounting dimensions mm |    | Inner diameter in mm | Hole dimension mm | Weight kg |
|-------------------|-----------------------|----|-----|------------------------|----|----------------------|-------------------|-----------|
|                   | A                     | B  | C   | a                      | b  |                      |                   |           |
| HD001             | 121                   | 64 | 131 | 80                     | 50 | 50                   | 5.8               | 0.5       |
| HD002             | 66                    | 49 | 73  | 44                     | 38 | 23                   |                   | 0.2       |
| HD003             | 170                   | 64 | 185 | 120                    | 50 | 88                   | 7.0               | 1.1       |

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#### 12.4.2 Dimension drawing of HD004

The following figure shows the mechanical dimensions in mm (in):



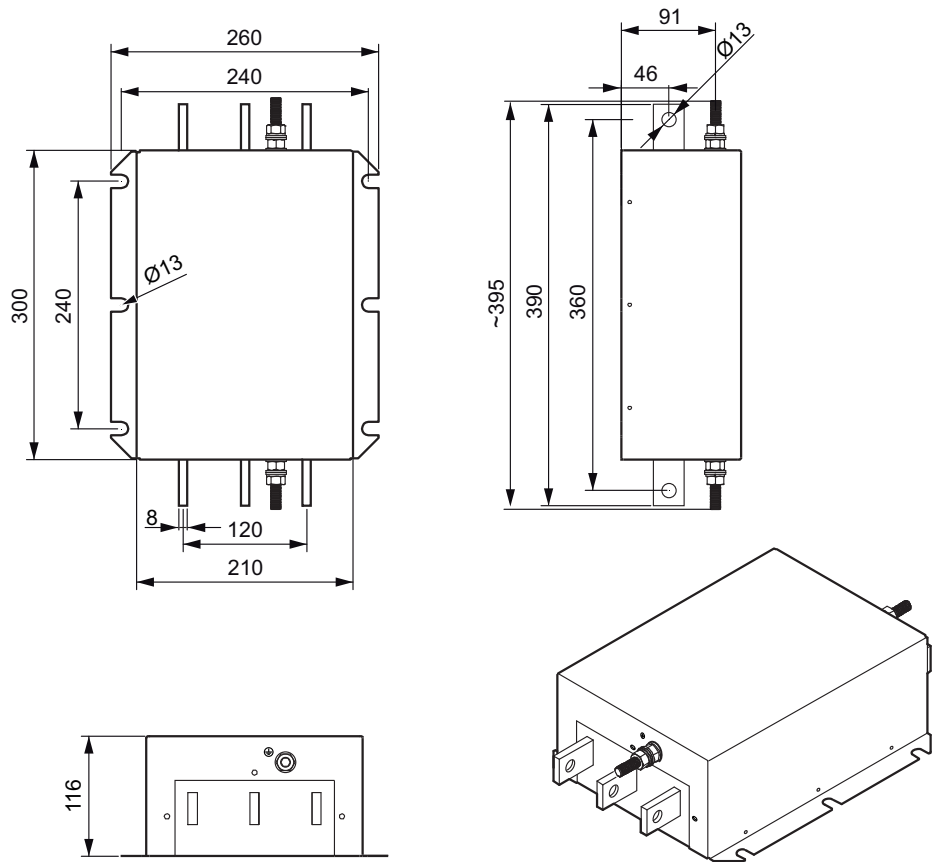
**HD004**

1457368587

| Output choke type | Main dimensions in mm |     |     | Mounting dimensions mm |     | Inner diameter in mm | Hole dimension mm | Mass kg |
|-------------------|-----------------------|-----|-----|------------------------|-----|----------------------|-------------------|---------|
|                   | A                     | B   | C   | a                      | b   |                      |                   |         |
| HD004             | 150                   | 400 | 360 | 120                    | 370 | –                    | 9.0               | 12.5    |

12.4.3 Dimension drawing of HD005

The following figure shows the mechanical dimensions in mm (in).



9007201690562571

| Output choke type | PE connection | Mass |
|-------------------|---------------|------|
|                   |               | kg   |
| HD005             | M12           | 16   |

## 12.5 HF... output filter

HF... output filters are sine filters used to smooth output voltage of inverters. HF... output filters (with the exception of HF450-503, HF180-403, HF325-403) are approved to UL/cUL in combination inverters.

HF... output filters are used in the following cases:

- In group drives (several motor leads in parallel); the discharge currents in the motor cables are suppressed.
- To protect the motor winding insulation of third-party motors which are not suitable for inverters.
- For protection against overvoltage peaks in long motor cables (> 100 m).

Observe the following notes:

### INFORMATION



- Output filters must only be operated in V/f and VFC operating modes.
- Do not use output filters in hoist applications.
- During project planning of the drive, take the voltage drop in the output filter into account and the reduced motor torque that results. This applies particularly to AC 230 V devices with output filters.

| Output filter type  | HF008-503 <sup>1)</sup>   | HF015-503 <sup>1)</sup>                                     | HF022-503 <sup>1)</sup> | HF030-503 <sup>1)</sup> | HF040-503 <sup>1)</sup> | HF055-503 <sup>1)</sup> |
|---|---|---|-------------------------|-------------------------|-------------------------|-------------------------|
| Part number   | 0826029X  | 08260303  | 08260311                | 0826032X                | 08263116                | 08263124                |
| Nominal voltage $V_N$   | 3 × AC 230 V – 500 V, 50/60 Hz <sup>2)</sup>                                      |   |                         |                         |                         |                         |
| Leakage current at $V_N \Delta I$   | 0 mA  |   |                         |                         |                         |                         |
| Power loss at $I_N P_V$   | 25 W  | 35 W  | 55 W                    | 65 W                    | 90 W                    | 115 W                   |
| Interference emission via unshielded motor cable  | According to limit value class C1/C2 in accordance with EN 61800-3 <sup>3)</sup>  |   |                         |                         |                         |                         |
| Ambient temperature $\vartheta_{amb}$   | 0 – +45 °C (reduction: 3% $I_N$ per K to max. 60 °C)                              |   |                         |                         |                         |                         |
| Degree of protection (EN 60529)   | IP20  |   |                         |                         |                         |                         |
| Connections / Tightening torque   | M4 terminal stud<br>1.6 Nm ± 20%  |   |                         |                         |                         |                         |
| Mass  | 3.1 kg  | 4.4 kg  |                         |                         | 10.8 kg                 |                         |
| Assignment to AC 400/500 V devices (MDX60/61B...-5_3)                                       |   |   |                         |                         |                         |                         |
| Voltage drop at $I_N \Delta U$  | < 6.5% (7.5%) at AC 400 V / < 4% (5%) at AC 500 V with $f_{Amax} = 50$ Hz (60 Hz) |   |                         |                         |                         |                         |
| Nominal through current <sup>4)</sup> $I_{N 400 V}$<br>(at $V_{line} = 3 \times AC 400 V$ ) | AC 2.5 A  | AC 4 A  | AC 6 A                  | AC 8 A                  | AC 10 A                 | AC 12 A                 |
| Nominal throughput current $I_{N 500 V}$<br>(at $V_{line} = 3 \times AC 500 V$ )            | AC 2 A  | AC 3 A  | AC 5 A                  | AC 6 A                  | AC 8 A                  | AC 10 A                 |
| Nominal operation (100%) <sup>3)</sup>  | 0005 – 0011   | 0014 / 0015   | 0022                    | 0030                    | 0040                    | 0055                    |
| Increased power (125%) <sup>3)</sup>  | 0005  | 0008 / 0011   | 0014 / 0015             | 0022                    | 0030                    | 0040                    |
| Assignment to AC 230 V devices (MDX61B...-2_3)  |   |   |                         |                         |                         |                         |
| Voltage drop at $I_N \Delta U$  | -   | < 18.5 % (19 %) at AC 230 V with $f_{Amax} = 50$ Hz (60 Hz) |                         |                         |                         |                         |
| Nominal throughput current $I_{N 230 V}$<br>(at $V_{line} = 3 \times AC 230 V$ )            | AC 4.3 A  | AC 6.5 A  | AC 10.8 A               | AC 13 A                 | AC 17.3 A               | AC 22 A                 |
| Nominal operation (100%) <sup>3)</sup>  | -   | -   | 0015/0022               | -                       | 0037                    | 0055                    |
| Increased power (125%) <sup>3)</sup>  | -   | -   | 0015/0022               | -                       | -                       | 0037                    |

1) UL/cUL approved in combination with MOVIDRIVE® drive inverters. SEW-EURODRIVE will provide certification on request.

2) A reduction of 6%  $I_N$  per 10 Hz applies above  $f_A = 60$  Hz for the nominal through current  $I_N$ .

3) Observe the chapter on EMC-compliant installation according to EN 61800-3 in the SEW documentation

4) Only applies for operation without VDC link connection. For operating the inverter with VDC link connection, observe the project planning notes in the system manual of the respective inverter.



| Output filter type   | HF075-503 <sup>1)</sup>   | HF023-403 <sup>1)</sup>              | HF033-403 <sup>1)</sup> | HF047-403 <sup>1)</sup> | HF450-503  | HF180-403   | HF325-403          |
|--|---|--------------------------------------|-------------------------|-------------------------|--|---|--------------------|
| Part number  | 08263132  | 08257841                             | 0825785X                | 08257868                | 08269483   | 08299099  | 08299102           |
| Nominal voltage $V_N$  | 3 × AC 230 V – 500 V, 50/60 Hz <sup>2)</sup>                                      |                                      |                         |                         |  |   |                    |
| Leakage current at $V_N \Delta I$  | 0 mA  |                                      |                         |                         |  |   |                    |
| Power loss at $I_N P_V$  | 135 W   | 90 W                                 | 120 W                   | 200 W                   | 400 W  | 860 W   | 1430 W             |
| Interference emission via unshielded motor cable   | According to limit value class C1/C2 in accordance with EN 61800-3 <sup>3)</sup>  |                                      |                         |                         |  |   |                    |
| Ambient temperature $\vartheta_{amb}$  | 0 – +45 °C (reduction: 3% $I_N$ per K to max. 60 °C)                              |                                      |                         |                         |  | -25 – +85 °C  |                    |
| Degree of protection (EN 60529)  | IP 20   | IP20                                 |                         |                         | IP 10  | IP00  | IP00               |
| Connections / Tightening torque  | M4 terminal stud<br>1.6 Nm ± 20 %   | 35 mm <sup>2</sup> (AWG 2)<br>3.2 Nm |                         |                         |  | M10 terminal studs /<br>70 mm <sup>2</sup> (AWG 3/0)30 Nm |                    |
| Mass   | 10.8 kg   | 15.9 kg                              | 16.5 kg                 | 23 kg                   | 32 kg  | 85.3 kg   | 170 kg             |
| Assignment to AC 400/500 V devices (MDX60/61B...-5_3)  |   |                                      |                         |                         |  |   |                    |
| Voltage drop at $I_N \Delta U$   | < 6.5% (7.5%) at AC 400 V / < 4% (5%) at AC 500 V with $f_{Amax} = 50$ Hz (60 Hz) |                                      |                         |                         |  |   |                    |
| Nominal through current <sup>4)</sup> $I_{N 400 V}$<br>(at $V_{line} = 3 \times AC 400 V$ )                              | AC 16 A   | AC 23 A                              | AC 33 A                 | AC 47 A                 | AC 90 A  | AC 180 A  | AC 325 A           |
| (at $V_{line} = 3 \times AC 400 V$ )<br>Nominal throughput current $I_{N 500 V}$<br>(at $V_{line} = 3 \times AC 500 V$ ) | AC 13 A   | AC 19 A                              | AC 26 A                 | AC 38 A                 | AC 72 A  | AC 180 A  | AC 325 A           |
| Nominal operation (100%) <sup>3)</sup>   | 0075  | 0110                                 | 0150/0300 <sup>5)</sup> | 0220                    | 0370/0450/<br>0550 <sup>5)</sup> /0750 <sup>5)</sup><br>/ 0900 <sup>5)</sup> | 0550/0750/0<br>900  | 1100/1320          |
| Increased power (125%) <sup>3)</sup>   | 0055  | 0075                                 | 0110/0220 <sup>5)</sup> | 0150                    | 0300/0370/0<br>450<br>/0550 <sup>5)</sup> /0750 <sup>5)</sup>                | 0550/0750   | 0900/1100/1<br>320 |
| Assignment to AC 230 V devices (MDX61B...-2_3)   |   |                                      |                         |                         |  |   |                    |
| Voltage drop at $I_N \Delta U$   | < 18.5% (19%) at AC 230 V with $f_{Amax} = 50$ Hz (60 Hz)                         |                                      |                         |                         |  |   |                    |
| Nominal throughput current $I_{N 230 V}$<br>(at $V_{line} = 3 \times AC 230 V$ )   | AC 29 A   | AC 42 A                              | AC 56.5 A               | AC 82.6 A               | AC 156 A   | –   | –                  |
| Nominal operation (100%) <sup>3)</sup>   | 0075  | 0110                                 | 0150/0300 <sup>5)</sup> | 0220                    | 0300   | –   | –                  |
| Increased power (125%) <sup>3)</sup>   | 0055  | 0075                                 | 0110/0220 <sup>5)</sup> | 0150                    | 0220/0300  | –   | –                  |

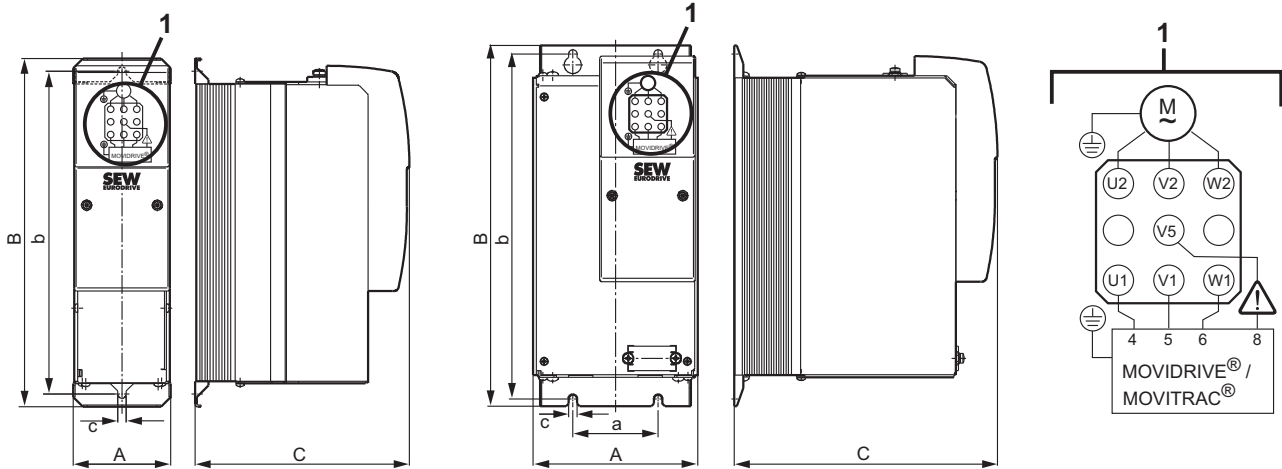
- 1) Approved to UL/cUL in combination with MOVIDRIVE® drive inverters. SEW-EURODRIVE will provide certification on request.
- 2) A reduction of 6%  $I_N$  per 10 Hz applies above  $f_A = 60$  Hz for the nominal through current  $I_N$ .
- 3) Observe the chapter on EMC-compliant installation according to EN 61800-3 in the SEW documentation
- 4) Only applies for operation without  $U_z$  connection. For operation with  $U_z$  connection, observe the project planning notes in the MOVIDRIVE® MDX60/61B system manual, section "Project Planning/Connecting the optional power components".
- 5) Connect two HF...-... output filters in parallel for operation with these MOVIDRIVE® devices.

#### 12.5.1 Dimension drawings of HF...-503 output filters

The following figures show the mechanical dimensions in mm (in).

HF008/015/022/030-503

HF040/055/075-503



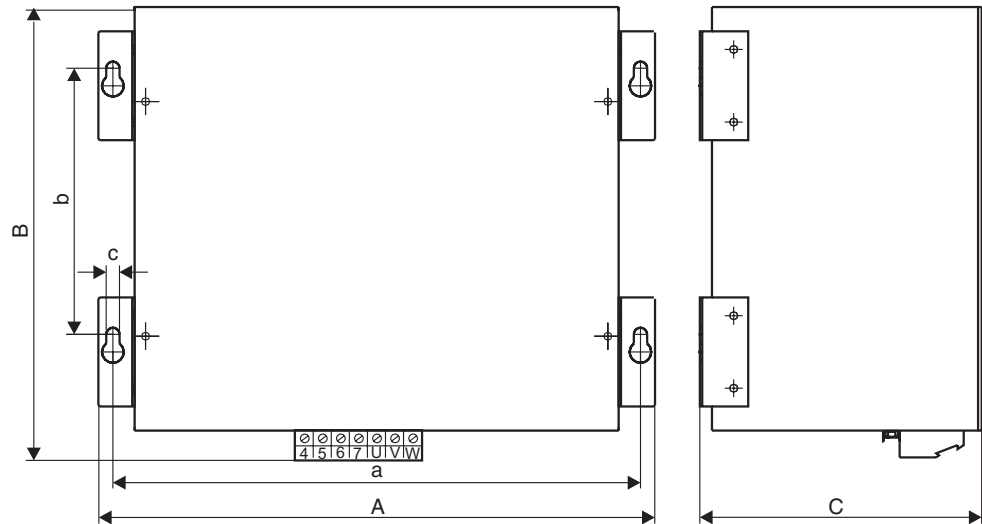
9007200727565579

Only the mounting position shown in the dimension drawing is permitted.

| Output filter type    | Main dimensions in mm |     |     | Mounting dimensions mm |     | Hole dimension mm | Ventilation clearances <sup>1)</sup> mm |        |
|-----------------------|-----------------------|-----|-----|------------------------|-----|-------------------|---|--------|
|                       | A                     | B   | C   | a                      | b   |                   | Top                                     | Bottom |
| HF008/015/022/030-503 | 80                    | 286 | 176 | —                      | 265 | 7                 | 100                                     | 100    |
| HF040/055/075-503     | 135                   | 296 | 216 | 70                     | 283 |                   |   |        |

1) There is no need for clearance at the sides. You can line up the devices next to one another.

HF450-503



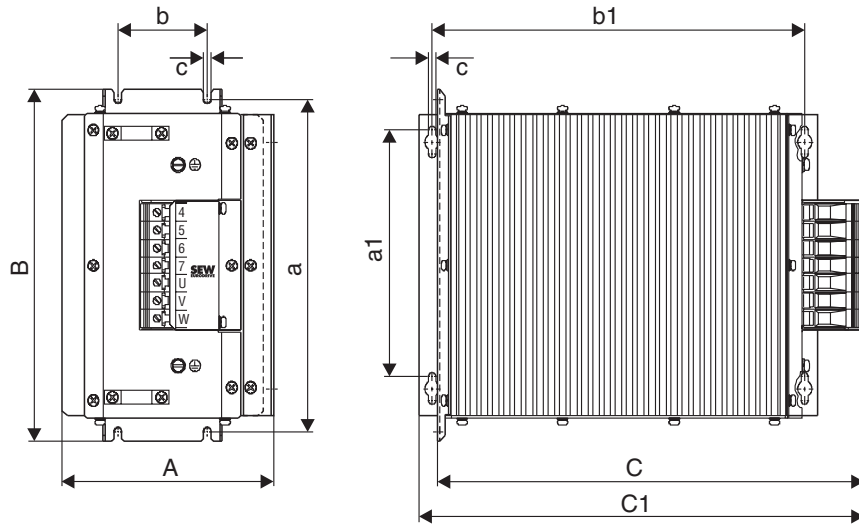
1472827659

Only the mounting position shown in the dimension drawing is permitted.

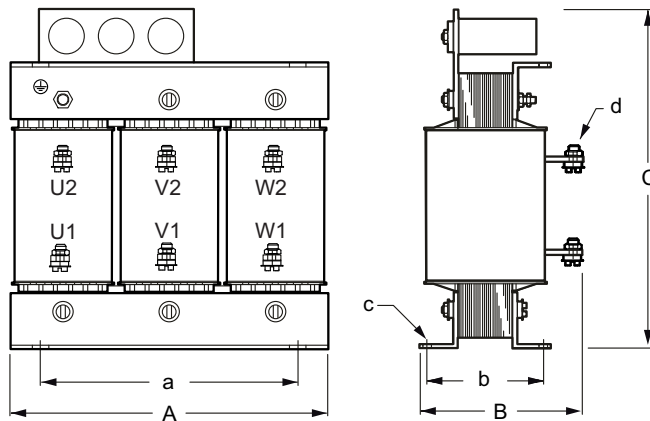
| Output filter type | Main dimensions in mm |     |     | Mounting dimensions mm |     | Hole dimension mm | Ventilation clearances mm |        |
|--------------------|-----------------------|-----|-----|------------------------|-----|-------------------|---------------------------|--------|
|                    | A                     | B   | C   | a                      | b   |                   | Top                       | Bottom |
| HF450-503          | 465                   | 385 | 240 | 436                    | 220 | 8.5               | 100                       | 100    |

12.5.2 Dimension drawings of HF...-403 output filters

The following figures show the mechanical dimensions in mm (in).



| Type      | Main dimensions in mm |     |         | Mounting dimensions mm |    |                              |     | Hole dimension mm | Ventilation clearances mm |     |        |
|-----------|-----------------------|-----|---------|------------------------|----|------------------------------|-----|-------------------|---------------------------|-----|--------|
|           |                       |     |         | Standard installation  |    | Horizontal mounting position |     |                   | On the side               | Top | Bottom |
|           | A                     | B   | C/C1    | a                      | b  | a1                           | b1  | c                 |                           |     |        |
| HF023-403 | 145                   | 284 | 365/390 | 268                    | 60 | 210                          | 334 | 6.5               | 30 each                   | 150 | 150    |
| HF033-403 |                       |     |         |                        |    |                              |     |                   |                           |     |        |
| HF047-403 | 190                   | 300 | 385/400 | 284                    | 80 |                              |     |                   |                           |     |        |



The ring cable lug must be attached directly to the copper clip.  
Only the mounting positions depicted in the dimension drawing are permitted

| Output filter type | Main dimensions in mm |     |     | Mounting dimensions mm |     | Hole dimension mm |    | Ventilation clearances mm |     |        |
|--------------------|-----------------------|-----|-----|------------------------|-----|-------------------|----|---------------------------|-----|--------|
|                    | A                     | B   | C   | a                      | b   | c                 | d  | On the side               | Top | Bottom |
| HF180-403          | 480                   | 260 | 510 | 430                    | 180 | 18 x 13           | 11 | 192 each                  | 510 | 510    |
| HF325-403          | 480                   | 300 | 730 | 430                    | 230 | 18 x 13           | 11 | 192 each                  | 730 | 730    |

23534850/EN – 11/2017

## 13 Declarations of conformity

### 13.1 MOVIDRIVE®

#### 13.1.1 Declaration of conformity

## EU Declaration of Conformity



Translation of the original text

900230310/EN

**SEW-EURODRIVE GmbH & Co. KG**  
**Ernst-Blickle-Straße 42, D-76646 Bruchsal**

declares under sole responsibility that the following products

**Frequency inverters of the product family** MOVIDRIVE® MDX6.B.....-...-.../.

**in accordance with**

**Machinery Directive** 2006/42/EC  
 (L 157, 09.06.2006, 24-86)

This includes the fulfillment of the protection targets for "electrical power supply" in accordance with annex I No. 1.5.1 according to the Low Voltage Directive 73/23/EEC -- Note: 2014/35/EU is currently valid

**EMC Directive** 2014/30/EU 4)  
 (L 96, March 29, 2014, 79-106)

**RoHS Directive** 2011/65/EU  
 (L 174, July 1, 2011, 88-110)

**Applied harmonized standards:** EN ISO 13849-1:2008/AC:2009  
 EN 61800-5-1:2007  
 EN 61800-3:2004/A1:2012  
 EN 50581:2012

4) According to the EMC Directive, the listed products are not independently operable products. EMC assessment is only possible after these products have been integrated in an overall system. For the assessment, the product was installed in a typical plant configuration.

Bruchsal 21.06.2017

Place Date

  
 Johann Soder  
 Managing Director Technology

a) b)

- a) Authorized representative for issuing this declaration on behalf of the manufacturer  
 b) Authorized representative for compiling the technical documents

13.2 MOVIDRIVE® with DFS11B/DFS21B

13.2.1 Declaration of conformity

EU Declaration of Conformity



Translation of the original text

900010510/EN

**SEW-EURODRIVE GmbH & Co. KG**  
**Ernst-Blickle-Straße 42, D-76646 Bruchsal**

declares under sole responsibility that the following products

**Frequency inverters of the product family** MOVIDRIVE® MDX6.B....-3-.../.  
**with built-in** DFS11B PROFIBUS-DP-V1 with PROFIsafe  
 DFS21B PROFINET IO with PROFIsafe

**in accordance with**

**Machinery Directive** 2006/42/EC  
 (L 157, 09.06.2006, 24-86)

This includes the fulfillment of the protection targets for "electrical power supply" in accordance with annex I No. 1.5.1 according to the Low Voltage Directive 73/23/EEC -- Note: 2014/35/EU is currently valid.

**EMC Directive** 2014/30/EU 4)  
 (L 96, March 29, 2014, 79-106)

**RoHS Directive** 2011/65/EU  
 (L 174, July 1, 2011, 88-110)

**Applied harmonized standards:** EN ISO 13849-1:2008/AC:2009  
 EN 61800-5-1:2007  
 EN 61800-3:2004/A1:2012  
 EN 50581:2012

**Other applied standards:** EN 61508:2001 (part 1-7)  
 EN 62061:2005

4) According to the EMC Directive, the listed products are not independently operable products. EMC assessment is only possible after these products have been integrated in an overall system. For the assessment, the product was installed in a typical plant configuration.

|          |            |   |
|----------|------------|---|
| Bruchsal | 19.06.2017 |  |
| Place    | Date       | Johann Soder<br>Managing Director Technology  |

a) b)

- a) Authorized representative for issuing this declaration on behalf of the manufacturer
- b) Authorized representative for compiling the technical documents

**13.3 MOVIDRIVE® with DCS2.B/DCS3.B**
**13.3.1 Declaration of conformity**

## EU Declaration of Conformity

**SEW**  
**EURODRIVE**

Translation of the original text

901920513/EN

**SEW-EURODRIVE GmbH & Co. KG**  
**Ernst-Blickle-Straße 42, D-76646 Bruchsal**

declares under sole responsibility that the following products

|  |  |
|--|--|
| <b>Frequency inverters of the product family</b> | <b>MOVIDRIVE® MDX6.B....-3-.../.</b>   |
| <b>with built-in</b>                             | <b>DCS2.B with DFS12B PROFIBUS-DP-V1 with PROFIsafe</b><br><b>DCS2.B with DFS22B PROFINET IO with PROFIsafe</b><br><b>DCS3.B</b> |

in accordance with

|                            |  |
|----------------------------|--|
| <b>Machinery Directive</b> | <b>2006/42/EC</b><br><b>(L 157, 09.06.2006, 24-86)</b> |
|----------------------------|--|

This includes the fulfillment of the protection targets for "electrical power supply" in accordance with annex I No. 1.5.1 according to the Low Voltage Directive 73/23/EEC -- Note: 2014/35/EU is currently valid

|                      |  |           |
|----------------------|--|-----------|
| <b>EMC Directive</b> | <b>2014/30/EU</b><br><b>(L 96, March 29, 2014, 79-106)</b> | <b>4)</b> |
|----------------------|--|-----------|

|                       |   |
|-----------------------|---|
| <b>RoHS Directive</b> | <b>2011/65/EU</b><br><b>(L 174, July 1, 2011, 88-110)</b> |
|-----------------------|---|

|                                      |  |
|--------------------------------------|--|
| <b>Applied harmonized standards:</b> | <b>EN ISO 13849-1:2008/AC:2009</b><br><b>EN 61800-3:2004/A1:2012</b><br><b>EN 61800-5-1:2007</b><br><b>EN 61800-5-2:2007</b><br><b>EN 50581:2012</b> |
|--------------------------------------|--|

|                                 |   |
|---------------------------------|---|
| <b>Other applied standards:</b> | <b>EN 61508:2001 (part 1-7)</b><br><b>EN 62061:2005</b> |
|---------------------------------|---|

4) According to the EMC Directive, the listed products are not independently operable products. EMC assessment is only possible after these products have been integrated in an overall system. For the assessment, the product was installed in a typical plant configuration.

Freely programmable safety controller for monitoring drive systems, suitable for SIL 3 IEC 61508:2010 and PL e according to EN ISO 13849-1:2008. An EC type examination was carried out for the safety module by the following testing institute: TÜV Rheinland Industrie Service GmbH, Alboinstr. 56, 12103 Berlin, Germany. ID of notified body NB 0035

 Bruchsal                      **23.06.2017**

Place                              Date



 Johann Soder  
 Managing Director Technology

a) b)

- a) Authorized representative for issuing this declaration on behalf of the manufacturer  
 b) Authorized representative for compiling the technical documents

## 14 Address list

| <b>Algeria</b>                 |                     |   |  |
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| Sales                          | Algiers             | REDUCOM Sarl<br>16, rue des Frères Zaghroune<br>Bellevue<br>16200 El Harrach Alger  | Tel. +213 21 8214-91<br>Fax +213 21 8222-84<br><a href="http://www.reducom-dz.com">http://www.reducom-dz.com</a><br><a href="mailto:info@reducom-dz.com">info@reducom-dz.com</a>                                 |
| <b>Argentina</b>               |                     |   |  |
| Assembly<br>Sales              | Buenos Aires        | SEW EURODRIVE ARGENTINA S.A.<br>Ruta Panamericana Km 37.5, Lote 35<br>(B1619IEA) Centro Industrial Garín<br>Prov. de Buenos Aires                 | Tel. +54 3327 4572-84<br>Fax +54 3327 4572-21<br><a href="http://www.sew-eurodrive.com.ar">http://www.sew-eurodrive.com.ar</a><br><a href="mailto:sewar@sew-eurodrive.com.ar">sewar@sew-eurodrive.com.ar</a>     |
| <b>Australia</b>               |                     |   |  |
| Assembly<br>Sales<br>Service   | Melbourne           | SEW-EURODRIVE PTY. LTD.<br>27 Beverage Drive<br>Tullamarine, Victoria 3043  | Tel. +61 3 9933-1000<br>Fax +61 3 9933-1003<br><a href="http://www.sew-eurodrive.com.au">http://www.sew-eurodrive.com.au</a><br><a href="mailto:enquires@sew-eurodrive.com.au">enquires@sew-eurodrive.com.au</a> |
|                                | Sydney              | SEW-EURODRIVE PTY. LTD.<br>9, Sleigh Place, Wetherill Park<br>New South Wales, 2164   | Tel. +61 2 9725-9900<br>Fax +61 2 9725-9905<br><a href="mailto:enquires@sew-eurodrive.com.au">enquires@sew-eurodrive.com.au</a>  |
| <b>Austria</b>                 |                     |   |  |
| Assembly<br>Sales<br>Service   | Vienna              | SEW-EURODRIVE Ges.m.b.H.<br>Richard-Strauss-Straße 24<br>1230 Wien  | Tel. +43 1 617 55 00-0<br>Fax +43 1 617 55 00-30<br><a href="http://www.sew-eurodrive.at">http://www.sew-eurodrive.at</a><br><a href="mailto:sew@sew-eurodrive.at">sew@sew-eurodrive.at</a>                      |
| <b>Bangladesh</b>              |                     |   |  |
| Sales                          | Bangladesh          | SEW-EURODRIVE INDIA PRIVATE LIMITED<br>345 DIT Road<br>East Rampura<br>Dhaka-1219, Bangladesh   | Tel. +88 01729 097309<br><a href="mailto:salesdhaka@seweurodrivebangladesh.com">salesdhaka@seweurodrivebangladesh.com</a>  |
| <b>Belarus</b>                 |                     |   |  |
| Sales                          | Minsk               | Foreign unitary production enterprise SEW-<br>EURODRIVE<br>RybalkoStr. 26<br>220033 Minsk   | Tel. +375 17 298 47 56 / 298 47 58<br>Fax +375 17 298 47 54<br><a href="http://www.sew.by">http://www.sew.by</a><br><a href="mailto:sales@sew.by">sales@sew.by</a>   |
| <b>Belgium</b>                 |                     |   |  |
| Assembly<br>Sales<br>Service   | Brussels            | SEW-EURODRIVE n.v./s.a.<br>Researchpark Haasrode 1060<br>Evenementenlaan 7<br>3001 Leuven   | Tel. +32 16 386-311<br>Fax +32 16 386-336<br><a href="http://www.sew-eurodrive.be">http://www.sew-eurodrive.be</a><br><a href="mailto:info@sew-eurodrive.be">info@sew-eurodrive.be</a>                           |
| Service Competence<br>Center   | Industrial<br>Gears | SEW-EURODRIVE n.v./s.a.<br>Rue de Parc Industriel, 31<br>6900 Marche-en-Famenne   | Tel. +32 84 219-878<br>Fax +32 84 219-879<br><a href="http://www.sew-eurodrive.be">http://www.sew-eurodrive.be</a><br><a href="mailto:service-IG@sew-eurodrive.be">service-IG@sew-eurodrive.be</a>               |
| <b>Brazil</b>                  |                     |   |  |
| Production<br>Sales<br>Service | São Paulo           | SEW-EURODRIVE Brasil Ltda.<br>Estrada Municipal José Rubim, 205 – Rodovia<br>Santos Dumont Km 49<br>Indaiatuba – 13347-510 – SP                   | Tel. +55 19 3835-8000<br><a href="mailto:sew@sew.com.br">sew@sew.com.br</a>  |
| Assembly<br>Sales<br>Service   | Rio Claro           | SEW-EURODRIVE Brasil Ltda.<br>Rodovia Washington Luiz, Km 172<br>Condomínio Industrial Conpark<br>Caixa Postal: 327<br>13501-600 – Rio Claro / SP | Tel. +55 19 3522-3100<br>Fax +55 19 3524-6653<br><a href="mailto:montadora.rc@sew.com.br">montadora.rc@sew.com.br</a>  |
|                                | Joinville           | SEW-EURODRIVE Brasil Ltda.<br>Rua Dona Francisca, 12.346 – Pirabeiraba<br>89239-270 – Joinville / SC  | Tel. +55 47 3027-6886<br>Fax +55 47 3027-6888<br><a href="mailto:filial.sc@sew.com.br">filial.sc@sew.com.br</a>  |
| <b>Bulgaria</b>                |                     |   |  |
| Sales                          | Sofia               | BEVER-DRIVE GmbH<br>Bogdanovetz Str.1<br>1606 Sofia   | Tel. +359 2 9151160<br>Fax +359 2 9151166<br><a href="mailto:bever@bever.bg">bever@bever.bg</a>  |

| <b>Cameroon</b>                            |                   |   |   |
|--|-------------------|---|---|
| Sales                                      | Douala            | SEW-EURODRIVE S.A.R.L.<br>Ancienne Route Bonabéri<br>P.O. Box<br>B.P 8674<br>Douala-Cameroun  | Tel. +237 233 39 02 10<br>Fax +237 233 39 02 10<br>sew@sew-eurodrive-cm   |
| <b>Canada</b>                              |                   |   |   |
| Assembly<br>Sales<br>Service               | Toronto           | SEW-EURODRIVE CO. OF CANADA LTD.<br>210 Walker Drive<br>Bramalea, ON L6T 3W1  | Tel. +1 905 791-1553<br>Fax +1 905 791-2999<br><a href="http://www.sew-eurodrive.ca">http://www.sew-eurodrive.ca</a><br>l.watson@sew-eurodrive.ca |
|  | Vancouver         | SEW-EURODRIVE CO. OF CANADA LTD.<br>Tilbury Industrial Park<br>7188 Honeyman Street<br>Delta, BC V4G 1G1  | Tel. +1 604 946-5535<br>Fax +1 604 946-2513<br>b.wake@sew-eurodrive.ca  |
|  | Montreal          | SEW-EURODRIVE CO. OF CANADA LTD.<br>2555 Rue Leger<br>Lasalle, PQ H8N 2V9   | Tel. +1 514 367-1124<br>Fax +1 514 367-3677<br>a.peluso@sew-eurodrive.ca  |
| <b>Chile</b>                               |                   |   |   |
| Assembly<br>Sales<br>Service               | Santiago de Chile | SEW-EURODRIVE CHILE LTDA<br>Las Encinas 1295<br>Parque Industrial Valle Grande<br>LAMP<br>Santiago de Chile<br>P.O. Box<br>Casilla 23 Correo Quilicura - Santiago - Chile | Tel. +56 2 2757 7000<br>Fax +56 2 2757 7001<br><a href="http://www.sew-eurodrive.cl">http://www.sew-eurodrive.cl</a><br>ventas@sew-eurodrive.cl   |
| <b>China</b>                               |                   |   |   |
| Production<br>Assembly<br>Sales<br>Service | Tianjin           | SEW-EURODRIVE (Tianjin) Co., Ltd.<br>No. 78, 13th Avenue, TEDA<br>Tianjin 300457  | Tel. +86 22 25322612<br>Fax +86 22 25323273<br><a href="http://www.sew-eurodrive.cn">http://www.sew-eurodrive.cn</a><br>info@sew-eurodrive.cn     |
| Assembly<br>Sales<br>Service               | Suzhou            | SEW-EURODRIVE (Suzhou) Co., Ltd.<br>333, Suhong Middle Road<br>Suzhou Industrial Park<br>Jiangsu Province, 215021   | Tel. +86 512 62581781<br>Fax +86 512 62581783<br>suzhou@sew-eurodrive.cn  |
|  | Guangzhou         | SEW-EURODRIVE (Guangzhou) Co., Ltd.<br>No. 9, JunDa Road<br>East Section of GETDD<br>Guangzhou 510530   | Tel. +86 20 82267890<br>Fax +86 20 82267922<br>guangzhou@sew-eurodrive.cn   |
|  | Shenyang          | SEW-EURODRIVE (Shenyang) Co., Ltd.<br>10A-2, 6th Road<br>Shenyang Economic Technological Development Area<br>Shenyang, 110141   | Tel. +86 24 25382538<br>Fax +86 24 25382580<br>shenyang@sew-eurodrive.cn  |
|  | Taiyuan           | SEW-EURODRIVE (Taiyuan) Co., Ltd.<br>No.3, HuaZhang Street,<br>TaiYuan Economic & Technical Development Zone<br>ShanXi, 030032  | Tel. +86-351-7117520<br>Fax +86-351-7117522<br>taiyuan@sew-eurodrive.cn   |
|  | Wuhan             | SEW-EURODRIVE (Wuhan) Co., Ltd.<br>10A-2, 6th Road<br>No. 59, the 4th Quanli Road, WEDA<br>430056 Wuhan   | Tel. +86 27 84478388<br>Fax +86 27 84478389<br>wuhan@sew-eurodrive.cn   |
|  | Xi'An             | SEW-EURODRIVE (Xi'An) Co., Ltd.<br>No. 12 Jinye 2nd Road<br>Xi'An High-Technology Industrial Development Zone<br>Xi'An 710065   | Tel. +86 29 68686262<br>Fax +86 29 68686311<br>xian@sew-eurodrive.cn  |
| Sales<br>Service                           | Hong Kong         | SEW-EURODRIVE LTD.<br>Unit No. 801-806, 8th Floor<br>Hong Leong Industrial Complex<br>No. 4, Wang Kwong Road<br>Kowloon, Hong Kong  | Tel. +852 36902200<br>Fax +852 36902211<br>contact@sew-eurodrive.hk   |



| <b>Colombia</b>                |   |   |  |
|--------------------------------|---|---|--|
| Assembly<br>Sales<br>Service   | Bogota  | SEW-EURODRIVE COLOMBIA LTDA.<br>Calle 17 No. 132-18<br>Interior 2 Bodega 6, Manzana B<br>Santafé de Bogotá        | Tel. +57 1 54750-50<br>Fax +57 1 54750-44<br><a href="http://www.sew-eurodrive.com.co">http://www.sew-eurodrive.com.co</a><br><a href="mailto:sew@sew-eurodrive.com.co">sew@sew-eurodrive.com.co</a> |
| <b>Croatia</b>                 |   |   |  |
| Sales<br>Service               | Zagreb  | KOMPEKS d. o. o.<br>Zeleni dol 10<br>10 000 Zagreb  | Tel. +385 1 4613-158<br>Fax +385 1 4613-158<br><a href="mailto:kompeks@inet.hr">kompeks@inet.hr</a>  |
| <b>Czech Republic</b>          |   |   |  |
| Assembly<br>Sales<br>Service   | Hostivice                                     | SEW-EURODRIVE CZ s.r.o.<br>Floriánova 2459<br>253 01 Hostivice  | Tel. +420 255 709 601<br>Fax +420 235 350 613<br><a href="http://www.sew-eurodrive.cz">http://www.sew-eurodrive.cz</a><br><a href="mailto:sew@sew-eurodrive.cz">sew@sew-eurodrive.cz</a>             |
|                                | Drive Service<br>Hotline / 24<br>Hour Service | +420 800 739 739 (800 SEW SEW)  | Service<br>Tel. +420 255 709 632<br>Fax +420 235 358 218<br><a href="mailto:servis@sew-eurodrive.cz">servis@sew-eurodrive.cz</a>   |
| <b>Denmark</b>                 |   |   |  |
| Assembly<br>Sales<br>Service   | Copenhagen                                    | SEW-EURODRIVEA/S<br>Geminivej 28-30<br>2670 Greve   | Tel. +45 43 95 8500<br>Fax +45 43 9585-09<br><a href="http://www.sew-eurodrive.dk">http://www.sew-eurodrive.dk</a><br><a href="mailto:sew@sew-eurodrive.dk">sew@sew-eurodrive.dk</a>                 |
| <b>Egypt</b>                   |   |   |  |
| Sales<br>Service               | Cairo   | Copam Egypt<br>for Engineering & Agencies<br>Building 10, Block 13005, First Industrial Zone,<br>Obour City Cairo | Tel. +202 44812673 / 79 (7 lines)<br>Fax +202 44812685<br><a href="http://www.copam-egypt.com">http://www.copam-egypt.com</a><br><a href="mailto:copam@copam-egypt.com">copam@copam-egypt.com</a>    |
| <b>Estonia</b>                 |   |   |  |
| Sales                          | Tallin  | ALAS-KUUL AS<br>Reti tee 4<br>75301 Peetri küla, Rae vald, Harjumaa   | Tel. +372 6593230<br>Fax +372 6593231<br><a href="http://www.alas-kuul.ee">http://www.alas-kuul.ee</a><br><a href="mailto:veiko.soots@alas-kuul.ee">veiko.soots@alas-kuul.ee</a>                     |
| <b>Finland</b>                 |   |   |  |
| Assembly<br>Sales<br>Service   | Hollola                                       | SEW-EURODRIVE OY<br>Vesimäentie 4<br>15860 Hollola  | Tel. +358 201 589-300<br>Fax +358 3 780-6211<br><a href="http://www.sew-eurodrive.fi">http://www.sew-eurodrive.fi</a><br><a href="mailto:sew@sew.fi">sew@sew.fi</a>                                  |
| Service                        | Hollola                                       | SEW-EURODRIVE OY<br>Keskikankaantie 21<br>15860 Hollola   | Tel. +358 201 589-300<br>Fax +358 3 780-6211<br><a href="http://www.sew-eurodrive.fi">http://www.sew-eurodrive.fi</a><br><a href="mailto:sew@sew.fi">sew@sew.fi</a>                                  |
| Production<br>Assembly         | Karkkila                                      | SEW Industrial Gears Oy<br>Santasalonkatu 6, PL 8<br>03620 Karkkila, 03601 Karkkila                               | Tel. +358 201 589-300<br>Fax +358 201 589-310<br><a href="http://www.sew-eurodrive.fi">http://www.sew-eurodrive.fi</a><br><a href="mailto:sew@sew.fi">sew@sew.fi</a>                                 |
| <b>France</b>                  |   |   |  |
| Production<br>Sales<br>Service | Hagenau                                       | SEW-USOCOME<br>48-54 route de Soufflenheim<br>B. P. 20185<br>67506 Hagenau Cedex                                  | Tel. +33 3 88 73 67 00<br>Fax +33 3 88 73 66 00<br><a href="http://www.usocom.com">http://www.usocom.com</a><br><a href="mailto:sew@usocom.com">sew@usocom.com</a>                                   |
| Production                     | Forbach                                       | SEW-USOCOME<br>Zone industrielle<br>Technopôle Forbach Sud<br>B. P. 30269<br>57604 Forbach Cedex                  | Tel. +33 3 87 29 38 00   |
|                                | Brumath                                       | SEW-USOCOME<br>1 Rue de Bruxelles<br>67670 Mommenheim Cedex   | Tel. +33 3 88 37 48 00   |
| Assembly<br>Sales<br>Service   | Bordeaux                                      | SEW-USOCOME<br>Parc d'activités de Magellan<br>62 avenue de Magellan – B. P. 182<br>33607 Pessac Cedex            | Tel. +33 5 57 26 39 00<br>Fax +33 5 57 26 39 09  |

| France                              |                             |   |   |
|-------------------------------------|-----------------------------|---|---|
|                                     | Lyon                        | SEW-USOCOME<br>75 rue Antoine Condorcet<br>38090 Vaulx-Milieu                                 | Tel. +33 4 74 99 60 00<br>Fax +33 4 74 99 60 15   |
|                                     | Nantes                      | SEW-USOCOME<br>Parc d'activités de la forêt<br>4 rue des Fontenelles<br>44140 Le Bignon       | Tel. +33 2 40 78 42 00<br>Fax +33 2 40 78 42 20   |
|                                     | Paris                       | SEW-USOCOME<br>Zone industrielle<br>2 rue Denis Papin<br>77390 Verneuil l'Étang               | Tel. +33 1 64 42 40 80<br>Fax +33 1 64 42 40 88   |
| Gabon                               |                             |   |   |
| Sales                               | Libreville                  | SEW-EURODRIVE SARL<br>183, Rue 5.033.C, Lalala à droite<br>P.O. Box 15682<br>Libreville       | Tel. +241 03 28 81 55<br>+241 06 54 81 33<br><a href="http://www.sew-eurodrive.cm">http://www.sew-eurodrive.cm</a><br><a href="mailto:sew@sew-eurodrive.cm">sew@sew-eurodrive.cm</a>  |
| Germany                             |                             |   |   |
| Headquarters<br>Production<br>Sales | Bruchsal                    | SEW-EURODRIVE GmbH & Co KG<br>Ernst-Blickle-Straße 42<br>76646 Bruchsal                       | Tel. +49 7251 75-0<br>Fax +49 7251 75-1970<br><a href="http://www.sew-eurodrive.de">http://www.sew-eurodrive.de</a><br><a href="mailto:sew@sew-eurodrive.de">sew@sew-eurodrive.de</a> |
| Production / Industrial<br>Gears    | Bruchsal                    | SEW-EURODRIVE GmbH & Co KG<br>Christian-Pähr-Str. 10<br>76646 Bruchsal                        | Tel. +49 7251 75-0<br>Fax +49 7251 75-2970  |
| Production                          | Graben                      | SEW-EURODRIVE GmbH & Co KG<br>Ernst-Blickle-Straße 1<br>76676 Graben-Neudorf                  | Tel. +49 7251 75-0<br>Fax +49 7251-2970   |
|                                     | Östringen                   | SEW-EURODRIVE GmbH & Co KG, Werk<br>Östringen<br>Franz-Gurk-Straße 2<br>76684 Östringen       | Tel. +49 7253 9254-0<br>Fax +49 7253 9254-90<br><a href="mailto:oestringen@sew-eurodrive.de">oestringen@sew-eurodrive.de</a>  |
| Service Competence<br>Center        | Mechanics /<br>Mechatronics | SEW-EURODRIVE GmbH & Co KG<br>Ernst-Blickle-Straße 1<br>76676 Graben-Neudorf                  | Tel. +49 7251 75-1710<br>Fax +49 7251 75-1711<br><a href="mailto:scc-mechanik@sew-eurodrive.de">scc-mechanik@sew-eurodrive.de</a>   |
|                                     | Electronics                 | SEW-EURODRIVE GmbH & Co KG<br>Ernst-Blickle-Straße 42<br>76646 Bruchsal                       | Tel. +49 7251 75-1780<br>Fax +49 7251 75-1769<br><a href="mailto:scc-elektronik@sew-eurodrive.de">scc-elektronik@sew-eurodrive.de</a>   |
| Drive Technology<br>Center          | North                       | SEW-EURODRIVE GmbH & Co KG<br>Alte Ricklinger Straße 40-42<br>30823 Garbsen (Hannover)        | Tel. +49 5137 8798-30<br>Fax +49 5137 8798-55<br><a href="mailto:dtc-nord@sew-eurodrive.de">dtc-nord@sew-eurodrive.de</a>   |
|                                     | East                        | SEW-EURODRIVE GmbH & Co KG<br>Dänkritzer Weg 1<br>08393 Meerane (Zwickau)                     | Tel. +49 3764 7606-0<br>Fax +49 3764 7606-30<br><a href="mailto:dtc-ost@sew-eurodrive.de">dtc-ost@sew-eurodrive.de</a>  |
|                                     | South                       | SEW-EURODRIVE GmbH & Co KG<br>Domagkstraße 5<br>85551 Kirchheim (München)                     | Tel. +49 89 909552-10<br>Fax +49 89 909552-50<br><a href="mailto:dtc-sued@sew-eurodrive.de">dtc-sued@sew-eurodrive.de</a>   |
|                                     | West                        | SEW-EURODRIVE GmbH & Co KG<br>Siemensstraße 1<br>40764 Langenfeld (Düsseldorf)                | Tel. +49 2173 8507-30<br>Fax +49 2173 8507-55<br><a href="mailto:dtc-west@sew-eurodrive.de">dtc-west@sew-eurodrive.de</a>   |
| Drive Center                        | Berlin                      | SEW-EURODRIVE GmbH & Co KG<br>Alexander-Meißner-Straße 44<br>12526 Berlin                     | Tel. +49 306331131-30<br>Fax +49 306331131-36<br><a href="mailto:dc-berlin@sew-eurodrive.de">dc-berlin@sew-eurodrive.de</a>   |
|                                     | Ludwigshafen                | SEW-EURODRIVE GmbH & Co KG<br>c/o BASF SE<br>Gebäude W130 Raum 101<br>67056 Ludwigshafen      | Tel. +49 7251 75 3759<br>Fax +49 7251 75 503759<br><a href="mailto:dc-ludwigshafen@sew-eurodrive.de">dc-ludwigshafen@sew-eurodrive.de</a>   |
|                                     | Saarland                    | SEW-EURODRIVE GmbH & Co KG<br>Gottlieb-Daimler-Straße 4<br>66773 Schwalbach Saar – Hülzweiler | Tel. +49 6831 48946 10<br>Fax +49 6831 48946 13<br><a href="mailto:dc-saarland@sew-eurodrive.de">dc-saarland@sew-eurodrive.de</a>   |
|                                     | Ulm                         | SEW-EURODRIVE GmbH & Co KG<br>Dieselstraße 18<br>89160 Dornstadt                              | Tel. +49 7348 9885-0<br>Fax +49 7348 9885-90<br><a href="mailto:dc-ulm@sew-eurodrive.de">dc-ulm@sew-eurodrive.de</a>  |

| <b>Germany</b>                                    |           |   |   |
|---|-----------|---|---|
|   | Würzburg  | SEW-EURODRIVE GmbH & Co KG<br>Nürnbergerstraße 118<br>97076 Würzburg-Lengfeld   | Tel. +49 931 27886-60<br>Fax +49 931 27886-66<br>dc-wuerzburg@sew-eurodrive.de  |
| Drive Service Hotline / 24 Hour Service           |           |   | 0 800 SEWHELP<br>0 800 7394357  |
| <b>Great Britain</b>                              |           |   |   |
| Assembly<br>Sales<br>Service                      | Normanton | SEW-EURODRIVE Ltd.<br>DeVilliers Way<br>Trident Park<br>Normanton<br>West Yorkshire<br>WF6 1GX  | Tel. +44 1924 893-855<br>Fax +44 1924 893-702<br><a href="http://www.sew-eurodrive.co.uk">http://www.sew-eurodrive.co.uk</a><br>info@sew-eurodrive.co.uk  |
| Drive Service Hotline / 24 Hour Service           |           |   | Tel. 01924 896911   |
| <b>Greece</b>                                     |           |   |   |
| Sales   | Athens    | Christ. Boznos & Son S.A.<br>12, K. Mavromichali Street<br>P.O. Box 80136<br>18545 Piraeus  | Tel. +30 2 1042 251-34<br>Fax +30 2 1042 251-59<br><a href="http://www.boznos.gr">http://www.boznos.gr</a><br>info@boznos.gr  |
| <b>Hungary</b>                                    |           |   |   |
| Sales<br>Service                                  | Budapest  | SEW-EURODRIVE Kft.<br>Csillaghegyi út 13.<br>1037 Budapest  | Tel. +36 1 437 06-58<br>Fax +36 1 437 06-50<br><a href="http://www.sew-eurodrive.hu">http://www.sew-eurodrive.hu</a><br>office@sew-eurodrive.hu   |
| <b>Iceland</b>                                    |           |   |   |
| Sales   | Reykjavik | Varma & Vélaverk ehf.<br>Knarrarvogi 4<br>104 Reykjavik   | Tel. +354 585 1070<br>Fax +354 585)1071<br><a href="http://www.varmaverk.is">http://www.varmaverk.is</a><br>vov@vov.is  |
| <b>India</b>                                      |           |   |   |
| Registered Office<br>Assembly<br>Sales<br>Service | Vadodara  | SEW-EURODRIVE India Private Limited<br>Plot No. 4, GIDC<br>POR Ramangamdi • Vadodara - 391 243<br>Gujarat   | Tel. +91 265 3045200<br>Fax +91 265 3045300<br><a href="http://www.seweurodriveindia.com">http://www.seweurodriveindia.com</a><br>salesvadodara@seweurodriveindia.com   |
| Assembly<br>Sales<br>Service                      | Chennai   | SEW-EURODRIVE India Private Limited<br>Plot No. K3/1, Sipcot Industrial Park Phase II<br>Mambakkam Village<br>Sriperumbudur - 602105<br>Kancheepuram Dist, Tamil Nadu | Tel. +91 44 37188888<br>Fax +91 44 37188811<br>saleschennai@seweurodriveindia.com   |
|   | Pune      | SEW-EURODRIVE India Private Limited<br>Plant: Plot No. D236/1,<br>Chakan Industrial Area Phase- II,<br>Warale, Tal- Khed,<br>Pune-410501, Maharashtra                 | Tel. +91 21 35 628700<br>Fax +91 21 35 628715<br>salespune@seweurodriveindia.com  |
| <b>Indonesia</b>                                  |           |   |   |
| Sales   | Medan     | PT. Serumpun Indah Lestari<br>Jl.Pulau Solor no. 8, Kawasan Industri Medan<br>II<br>Medan 20252   | Tel. +62 61 687 1221<br>Fax +62 61 6871429 / +62 61 6871458 / +62<br>61 30008041<br>sil@serumpunindah.com<br>serumpunindah@yahoo.com<br><a href="http://www.serumpunindah.com">http://www.serumpunindah.com</a> |
|   | Jakarta   | PT. Cahaya Sukses Abadi<br>Komplek Rukan Puri Mutiara Blok A no 99,<br>Sunter<br>Jakarta 14350  | Tel. +62 21 65310599<br>Fax +62 21 65310600<br>csajkt@cbn.net.id  |
|   | Jakarta   | PT. Agrindo Putra Lestari<br>JL.Pantai Indah Selatan, Komplek Sentra In-<br>dustri Terpadu, Pantai indah Kapuk Tahap III,<br>Blok E No. 27<br>Jakarta 14470           | Tel. +62 21 2921-8899<br>Fax +62 21 2921-8988<br>aplindo@indosat.net.id<br><a href="http://www.aplindo.com">http://www.aplindo.com</a>  |

| Indonesia                    |             |  |   |
|------------------------------|-------------|--|---|
|                              | Surabaya    | PT. TRIAGRI JAYA ABADI<br>Jl. Sukosemolo No. 63, Galaxi Bumi Permai<br>G6 No. 11<br>Surabaya 60111             | Tel. +62 31 5990128<br>Fax +62 31 5962666<br>sales@triagri.co.id<br><a href="http://www.triagri.co.id">http://www.triagri.co.id</a>   |
|                              | Surabaya    | CV. Multi Mas<br>Jl. Raden Saleh 43A Kav. 18<br>Surabaya 60174   | Tel. +62 31 5458589<br>Fax +62 31 5317220<br>sianhwa@sby.centrin.net.id<br><a href="http://www.cvmultimas.com">http://www.cvmultimas.com</a>  |
| Ireland                      |             |  |   |
| Sales<br>Service             | Dublin      | Alperton Engineering Ltd.<br>48 Moyle Road<br>Dublin Industrial Estate<br>Glasnevin, Dublin 11                 | Tel. +353 1 830-6277<br>Fax +353 1 830-6458<br><a href="http://www.alperton.ie">http://www.alperton.ie</a><br>info@alperton.ie  |
| Israel                       |             |  |   |
| Sales                        | Tel Aviv    | Liraz Handasa Ltd.<br>Ahofer Str 34B / 228<br>58858 Holon  | Tel. +972 3 5599511<br>Fax +972 3 5599512<br><a href="http://www.liraz-handasa.co.il">http://www.liraz-handasa.co.il</a><br>office@liraz-handasa.co.il                                    |
| Italy                        |             |  |   |
| Assembly<br>Sales<br>Service | Milan       | SEW-EURODRIVE di R. Blickle & Co.s.a.s.<br>Via Bernini,14<br>20020 Solaro (Milano)                             | Tel. +39 02 96 980229<br>Fax +39 02 96 980 999<br><a href="http://www.sew-eurodrive.it">http://www.sew-eurodrive.it</a><br>milano@sew-eurodrive.it  |
| Ivory Coast                  |             |  |   |
| Sales                        | Abidjan     | SEW-EURODRIVE SARL<br>Ivory Coast<br>Rue des Pêcheurs, Zone 3<br>26 BP 916 Abidjan 26                          | Tel. +225 21 21 81 05<br>Fax +225 21 25 30 47<br>info@sew-eurodrive.ci<br><a href="http://www.sew-eurodrive.ci">http://www.sew-eurodrive.ci</a>   |
| Japan                        |             |  |   |
| Assembly<br>Sales<br>Service | Iwata       | SEW-EURODRIVE JAPAN CO., LTD<br>250-1, Shimoman-no,<br>Iwata<br>Shizuoka 438-0818                              | Tel. +81 538 373811<br>Fax +81 538 373814<br><a href="http://www.sew-eurodrive.co.jp">http://www.sew-eurodrive.co.jp</a><br>sewjapan@sew-eurodrive.co.jp<br>hamamatsu@sew-eurodrive.co.jp |
| Kazakhstan                   |             |  |   |
| Sales                        | Almaty      | SEW-EURODRIVE LLP<br>291-291A, Tole bi street<br>050031, Almaty  | Tel. +7 (727) 350 5156<br>Fax +7 (727) 350 5156<br><a href="http://www.sew-eurodrive.kz">http://www.sew-eurodrive.kz</a><br>sew@sew-eurodrive.kz  |
|                              | Tashkent    | SEW-EURODRIVE LLP<br>Representative office in Uzbekistan<br>96A, Sharaf Rashidov street,<br>Tashkent, 100084   | Tel. +998 71 2359411<br>Fax +998 71 2359412<br><a href="http://www.sew-eurodrive.uz">http://www.sew-eurodrive.uz</a><br>sew@sew-eurodrive.uz  |
|                              | Ulaanbaatar | IM Trading LLC<br>Narny zam street 62<br>Sukhbaatar district,<br>Ulaanbaatar 14230                             | Tel. +976-77109997<br>Fax +976-77109997<br>imt@imt.mn   |
| Kenya                        |             |  |   |
| Sales                        | Nairobi     | SEW-EURODRIVE Pty Ltd<br>Transnational Plaza, 5th Floor<br>Mama Ngina Street<br>P.O. Box 8998-00100<br>Nairobi | Tel. +254 791 398840<br><a href="http://www.sew-eurodrive.co.tz">http://www.sew-eurodrive.co.tz</a><br>info@sew.co.tz   |
| Latvia                       |             |  |   |
| Sales                        | Riga        | SIA Alas-Kuul<br>Katlakalna 11C<br>1073 Riga   | Tel. +371 6 7139253<br>Fax +371 6 7139386<br><a href="http://www.alas-kuul.lv">http://www.alas-kuul.lv</a><br>info@alas-kuul.com  |

**Lebanon**

|  |        |   |   |
|--|--------|---|---|
| Sales (Lebanon)  | Beirut | Gabriel Acar & Fils sarl<br>B. P. 80484<br>Bourj Hammoud, Beirut              | Tel. +961 1 510 532<br>Fax +961 1 494 971<br>ssacar@inco.com.lb   |
| Sales (Jordan, Kuwait , Beirut<br>Saudi Arabia, Syria) |        | Middle East Drives S.A.L. (offshore)<br>Sin El Fil.<br>B. P. 55-378<br>Beirut | Tel. +961 1 494 786<br>Fax +961 1 494 971<br><a href="http://www.medrives.com">http://www.medrives.com</a><br>info@medrives.com |

**Lithuania**

|       |        |   |  |
|-------|--------|---|--|
| Sales | Alytus | UAB Irseva<br>Statybininku 106C<br>63431 Alytus | Tel. +370 315 79204<br>Fax +370 315 56175<br><a href="http://www.irseva.lt">http://www.irseva.lt</a><br>irmantas@irseva.lt |
|-------|--------|---|--|

**Luxembourg**

representation: Belgium

**Macedonia**

|       |        |  |  |
|-------|--------|--|--|
| Sales | Skopje | Boznos DOOEL<br>Dime Anicin 2A/7A<br>1000 Skopje | Tel. +389 23256553<br>Fax +389 23256554<br><a href="http://www.boznos.mk">http://www.boznos.mk</a> |
|-------|--------|--|--|

**Malaysia**

|                              |       |   |   |
|------------------------------|-------|---|---|
| Assembly<br>Sales<br>Service | Johor | SEW-EURODRIVE SDN BHD<br>No. 95, Jalan Seroja 39, Taman Johor Jaya<br>81000 Johor Bahru, Johor<br>West Malaysia | Tel. +60 7 3549409<br>Fax +60 7 3541404<br>sales@sew-eurodrive.com.my |
|------------------------------|-------|---|---|

**Mexiko**

|                              |           |  |   |
|------------------------------|-----------|--|---|
| Assembly<br>Sales<br>Service | Quéretaro | SEW-EURODRIVE MEXICO S.A. de C.V.<br>SEM-981118-M93<br>Tequisquiapan No. 102<br>Parque Industrial Quéretaro<br>C.P. 76220<br>Querétaro, México | Tel. +52 442 1030-300<br>Fax +52 442 1030-301<br><a href="http://www.sew-eurodrive.com.mx">http://www.sew-eurodrive.com.mx</a><br>scmexico@sew-eurodrive.com.mx |
| Sales<br>Service             | Puebla    | SEW-EURODRIVE MEXICO S.A. de C.V.<br>Calzada Zavaleta No. 3922 Piso 2 Local 6<br>Col. Santa Cruz Buenavista<br>C.P. 72154<br>Puebla, México    | Tel. +52 (222) 221 248<br><a href="http://www.sew-eurodrive.com.mx">http://www.sew-eurodrive.com.mx</a><br>scmexico@sew-eurodrive.com.mx                        |

**Mongolia**

|                  |             |   |  |
|------------------|-------------|---|--|
| Technical Office | Ulaanbaatar | IM Trading LLC<br>Naryn zam street 62<br>Union building, Suite A-403-1<br>Sukhbaatar district,<br>Ulaanbaatar 14230 | Tel. +976-77109997<br>Tel. +976-99070395<br>Fax +976-77109997<br><a href="http://imt.mn/">http://imt.mn/</a><br>imt@imt.mn |
|------------------|-------------|---|--|

**Morocco**

|                  |           |  |  |
|------------------|-----------|--|--|
| Sales<br>Service | Bouskoura | SEW-EURODRIVE Morocco<br>Parc Industriel CFCIM, Lot 55 and 59<br>Bouskoura | Tel. +212 522 88 85 00<br>Fax +212 522 88 84 50<br><a href="http://www.sew-eurodrive.ma">http://www.sew-eurodrive.ma</a><br>sew@sew-eurodrive.ma |
|------------------|-----------|--|--|

**Namibia**

|       |            |  |  |
|-------|------------|--|--|
| Sales | Swakopmund | DB Mining & Industrial Services<br>Einstein Street<br>Strauss Industrial Park<br>Unit1<br>Swakopmund | Tel. +264 64 462 738<br>Fax +264 64 462 734<br>anton@dbminingnam.com |
|-------|------------|--|--|

**Netherlands**

|                              |           |   |  |
|------------------------------|-----------|---|--|
| Assembly<br>Sales<br>Service | Rotterdam | SEW-EURODRIVE B.V.<br>Industrieweg 175<br>3044 AS Rotterdam<br>Postbus 10085<br>3004 AB Rotterdam | Tel. +31 10 4463-700<br>Fax +31 10 4155-552<br>Service: 0800-SEWHELP<br><a href="http://www.sew-eurodrive.nl">http://www.sew-eurodrive.nl</a><br>info@sew-eurodrive.nl |
|------------------------------|-----------|---|--|

| <b>New Zealand</b>           |                     |  |   |
|------------------------------|---------------------|--|---|
| Assembly<br>Sales<br>Service | Auckland            | SEW-EURODRIVE NEW ZEALAND LTD.<br>P.O. Box 58-428<br>82 Greenmount drive<br>East Tamaki Auckland   | Tel. +64 9 2745627<br>Fax +64 9 2740165<br><a href="http://www.sew-eurodrive.co.nz">http://www.sew-eurodrive.co.nz</a><br>sales@sew-eurodrive.co.nz         |
|                              | Christchurch        | SEW-EURODRIVE NEW ZEALAND LTD.<br>30 Lodestar Avenue, Wigram<br>Christchurch   | Tel. +64 3 384-6251<br>Fax +64 3 384-6455<br>sales@sew-eurodrive.co.nz  |
| <b>Nigeria</b>               |                     |  |   |
| Sales                        | Lagos               | Greenpeg Nig. Ltd<br>Plot 296A, Adeyemo Akapo Str. Omole GRA<br>Ikeja Lagos-Nigeria  | Tel. +234-701-821-9200-1<br><a href="http://www.greenpeg ltd.com">http://www.greenpeg ltd.com</a><br>bolaji.adekunle@greenpeg ltd.com                       |
| <b>Norway</b>                |                     |  |   |
| Assembly<br>Sales<br>Service | Moss                | SEW-EURODRIVE A/S<br>Solgaard skog 71<br>1599 Moss   | Tel. +47 69 24 10 20<br>Fax +47 69 24 10 40<br><a href="http://www.sew-eurodrive.no">http://www.sew-eurodrive.no</a><br>sew@sew-eurodrive.no                |
| <b>Pakistan</b>              |                     |  |   |
| Sales                        | Karachi             | Industrial Power Drives<br>Al-Fatah Chamber A/3, 1st Floor Central Com-<br>mercial Area,<br>Sultan Ahmed Shah Road, Block 7/8,<br>Karachi    | Tel. +92 21 452 9369<br>Fax +92-21-454 7365<br>sew eurodrive@cyber.net.pk   |
| <b>Paraguay</b>              |                     |  |   |
| Sales                        | Fernando de la Mora | SEW-EURODRIVE PARAGUAY S.R.L<br>De la Victoria 112, Esquina nueva Asunción<br>Departamento Central<br>Fernando de la Mora, Barrio Bernardino | Tel. +595 991 519695<br>Fax +595 21 3285539<br>sewpy@sew-eurodrive.com.py   |
| <b>Peru</b>                  |                     |  |   |
| Assembly<br>Sales<br>Service | Lima                | SEW EURODRIVE DEL PERU S.A.C.<br>Los Calderos, 120-124<br>Urbanizacion Industrial Vulcano, ATE, Lima   | Tel. +51 1 3495280<br>Fax +51 1 3493002<br><a href="http://www.sew-eurodrive.com.pe">http://www.sew-eurodrive.com.pe</a><br>sewperu@sew-eurodrive.com.pe    |
| <b>Philippines</b>           |                     |  |   |
| Sales                        | Makati              | P.T. Cerna Corporation<br>4137 Ponte St., Brgy. Sta. Cruz<br>Makati City 1205  | Tel. +63 2 519 6214<br>Fax +63 2 890 2802<br>mech_drive_sys@ptcerna.com<br><a href="http://www.ptcerna.com">http://www.ptcerna.com</a>                      |
| <b>Poland</b>                |                     |  |   |
| Assembly<br>Sales<br>Service | Łódź                | SEW-EURODRIVE Polska Sp.z.o.o.<br>ul. Techniczna 5<br>92-518 Łódź  | Tel. +48 42 293 00 00<br>Fax +48 42 293 00 49<br><a href="http://www.sew-eurodrive.pl">http://www.sew-eurodrive.pl</a><br>sew@sew-eurodrive.pl              |
|                              | Service             | Tel. +48 42 293 0030<br>Fax +48 42 293 0043  | 24 Hour Service<br>Tel. +48 602 739 739 (+48 602 SEW SEW)<br>serwis@sew-eurodrive.pl  |
| <b>Portugal</b>              |                     |  |   |
| Assembly<br>Sales<br>Service | Coimbra             | SEW-EURODRIVE, LDA.<br>Av. da Fonte Nova, n.º 86<br>3050-379 Mealhada  | Tel. +351 231 20 9670<br>Fax +351 231 20 3685<br><a href="http://www.sew-eurodrive.pt">http://www.sew-eurodrive.pt</a><br>info sew@sew-eurodrive.pt         |
| <b>Romania</b>               |                     |  |   |
| Sales<br>Service             | Bucharest           | Sialco Trading SRL<br>str. Brazilia nr. 36<br>011783 Bucuresti   | Tel. +40 21 230-1328<br>Fax +40 21 230-7170<br>sialco@sialco.ro   |
| <b>Russia</b>                |                     |  |   |
| Assembly<br>Sales<br>Service | St. Petersburg      | ЗАО «СЕВ-ЕВРОДРАЙФ»<br>а. я. 36<br>195220 Санкт-Петербург  | Tel. +7 812 3332522 / +7 812 5357142<br>Fax +7 812 3332523<br><a href="http://www.sew-eurodrive.ru">http://www.sew-eurodrive.ru</a><br>sew@sew-eurodrive.ru |

**Sambia**

representation: South Africa

**Senegal**

|       |       |   |  |
|-------|-------|---|--|
| Sales | Dakar | SENEMECA<br>Mécanique Générale<br>Km 8, Route de Rufisque<br>B.P. 3251, Dakar | Tel. +221 338 494 770<br>Fax +221 338 494 771<br><a href="http://www.senemeca.com">http://www.senemeca.com</a><br>senemeca@senemeca.sn |
|-------|-------|---|--|

**Serbia**

|       |          |   |   |
|-------|----------|---|---|
| Sales | Belgrade | DIPAR d.o.o.<br>Ustanička 128a<br>PC Košum, IV floor<br>11000 Beograd | Tel. +381 11 347 3244 / +381 11 288 0393<br>Fax +381 11 347 1337<br>office@dipar.rs |
|-------|----------|---|---|

**Singapore**

|                              |           |   |  |
|------------------------------|-----------|---|--|
| Assembly<br>Sales<br>Service | Singapore | SEW-EURODRIVE PTE. LTD.<br>No 9, Tuas Drive 2<br>Jurong Industrial Estate<br>Singapore 638644 | Tel. +65 68621701<br>Fax +65 68612827<br><a href="http://www.sew-eurodrive.com.sg">http://www.sew-eurodrive.com.sg</a><br>sewsingapore@sew-eurodrive.com |
|------------------------------|-----------|---|--|

**Slovakia**

|       |            |  |  |
|-------|------------|--|--|
| Sales | Bratislava | SEW-Eurodrive SK s.r.o.<br>Rybničná 40<br>831 06 Bratislava    | Tel. +421 2 33595 202, 217, 201<br>Fax +421 2 33595 200<br><a href="http://www.sew-eurodrive.sk">http://www.sew-eurodrive.sk</a><br>sew@sew-eurodrive.sk |
|       | Košice     | SEW-Eurodrive SK s.r.o.<br>Slovenská ulica 26<br>040 01 Košice | Tel. +421 55 671 2245<br>Fax +421 55 671 2254<br>Mobile +421 907 671 976<br>sew@sew-eurodrive.sk   |

**Slovenia**

|                  |       |  |  |
|------------------|-------|--|--|
| Sales<br>Service | Celje | Pakman - Pogonska Tehnika d.o.o.<br>Ul. XIV. divizije 14<br>3000 Celje | Tel. +386 3 490 83-20<br>Fax +386 3 490 83-21<br>pakman@siol.net |
|------------------|-------|--|--|

**South Africa**

|                              |              |   |  |
|------------------------------|--------------|---|--|
| Assembly<br>Sales<br>Service | Johannesburg | SEW-EURODRIVE (PROPRIETARY) LIMITED<br>Eurodrive House<br>Cnr. Adcock Ingram and Aerodrome Roads<br>Aeroton Ext. 2<br>Johannesburg 2013<br>P.O.Box 90004<br>Bertsham 2013 | Tel. +27 11 248-7000<br>Fax +27 11 248-7289<br><a href="http://www.sew.co.za">http://www.sew.co.za</a><br>info@sew.co.za |
|                              | Cape Town    | SEW-EURODRIVE (PROPRIETARY) LIMITED<br>Rainbow Park<br>Cnr. Racecourse & Omuramba Road<br>Montague Gardens<br>Cape Town<br>P.O.Box 36556<br>Chempet 7442                  | Tel. +27 21 552-9820<br>Fax +27 21 552-9830<br>Telex 576 062<br>bgriffiths@sew.co.za                                     |
|                              | Durban       | SEW-EURODRIVE (PROPRIETARY) LIMITED<br>48 Prospecton Road<br>Isipingo<br>Durban<br>P.O. Box 10433, Ashwood 3605   | Tel. +27 31 902 3815<br>Fax +27 31 902 3826<br>cdejager@sew.co.za  |
|                              | Nelspruit    | SEW-EURODRIVE (PROPRIETARY) LIMITED<br>7 Christie Crescent<br>Vintonia<br>P.O.Box 1942<br>Nelspruit 1200  | Tel. +27 13 752-8007<br>Fax +27 13 752-8008<br>robermeyer@sew.co.za  |

**South Korea**

|                              |       |  |  |
|------------------------------|-------|--|--|
| Assembly<br>Sales<br>Service | Ansan | SEW-EURODRIVE KOREA CO., LTD.<br>7, Dangjaengi-ro,<br>Danwon-gu,<br>Ansan-si, Gyeonggi-do, Zip 425-839 | Tel. +82 31 492-8051<br>Fax +82 31 492-8056<br><a href="http://www.sew-eurodrive.kr">http://www.sew-eurodrive.kr</a><br>master.korea@sew-eurodrive.com |
|------------------------------|-------|--|--|



| <b>South Korea</b>           |               |  |   |
|------------------------------|---------------|--|---|
|                              | Busan         | SEW-EURODRIVE KOREA CO., LTD.<br>28, Noksansandan 262-ro 50beon-gil,<br>Gangseo-gu,<br>Busan, Zip 618-820                      | Tel. +82 51 832-0204<br>Fax +82 51 832-0230   |
| <b>Spain</b>                 |               |  |   |
| Assembly<br>Sales<br>Service | Bilbao        | SEW-EURODRIVE ESPAÑA, S.L.<br>Parque Tecnológico, Edificio, 302<br>48170 Zamudio (Vizcaya)                                     | Tel. +34 94 43184-70<br><a href="http://www.sew-eurodrive.es">http://www.sew-eurodrive.es</a><br><a href="mailto:sew.spain@sew-eurodrive.es">sew.spain@sew-eurodrive.es</a>                               |
| <b>Sri Lanka</b>             |               |  |   |
| Sales                        | Colombo       | SM International (Pte) Ltd<br>254, Galle Raod<br>Colombo 4, Sri Lanka  | Tel. +94 1 2584887<br>Fax +94 1 2582981   |
| <b>Swaziland</b>             |               |  |   |
| Sales                        | Manzini       | C G Trading Co. (Pty) Ltd<br>PO Box 2960<br>Manzini M200   | Tel. +268 2 518 6343<br>Fax +268 2 518 5033<br><a href="mailto:engineering@cgtrading.co.sz">engineering@cgtrading.co.sz</a>   |
| <b>Sweden</b>                |               |  |   |
| Assembly<br>Sales<br>Service | Jönköping     | SEW-EURODRIVE AB<br>Gnejsvägen 6-8<br>553 03 Jönköping<br>Box 3100 S-550 03 Jönköping  | Tel. +46 36 34 42 00<br>Fax +46 36 34 42 80<br><a href="http://www.sew-eurodrive.se">http://www.sew-eurodrive.se</a><br><a href="mailto:jonkoping@sew.se">jonkoping@sew.se</a>                            |
| <b>Switzerland</b>           |               |  |   |
| Assembly<br>Sales<br>Service | Basel         | Alfred Imhof A.G.<br>Jurastrasse 10<br>4142 Münchenstein bei Basel   | Tel. +41 61 417 1717<br>Fax +41 61 417 1700<br><a href="http://www.imhof-sew.ch">http://www.imhof-sew.ch</a><br><a href="mailto:info@imhof-sew.ch">info@imhof-sew.ch</a>                                  |
| <b>Taiwan</b>                |               |  |   |
| Sales                        | Taipei        | Ting Shou Trading Co., Ltd.<br>6F-3, No. 267, Sec. 2<br>Tung Huw S. Road<br>Taipei   | Tel. +886 2 27383535<br>Fax +886 2 27368268<br>Telex 27 245<br><a href="mailto:sewtwn@ms63.hinet.net">sewtwn@ms63.hinet.net</a><br><a href="http://www.tingshou.com.tw">http://www.tingshou.com.tw</a>    |
|                              | Nan Tou       | Ting Shou Trading Co., Ltd.<br>No. 55 Kung Yeh N. Road<br>Industrial District<br>Nan Tou 540                                   | Tel. +886 49 255353<br>Fax +886 49 257878<br><a href="mailto:sewtwn@ms63.hinet.net">sewtwn@ms63.hinet.net</a><br><a href="http://www.tingshou.com.tw">http://www.tingshou.com.tw</a>                      |
| <b>Tanzania</b>              |               |  |   |
| Sales                        | Daressalam    | SEW-EURODRIVE PTY LIMITED TANZANIA<br>Plot 52, Regent Estate<br>PO Box 106274<br>Dar Es Salaam                                 | Tel. +255 0 22 277 5780<br>Fax +255 0 22 277 5788<br><a href="http://www.sew-eurodrive.co.tz">http://www.sew-eurodrive.co.tz</a><br><a href="mailto:info@sew.co.tz">info@sew.co.tz</a>                    |
| <b>Thailand</b>              |               |  |   |
| Assembly<br>Sales<br>Service | Chonburi      | SEW-EURODRIVE (Thailand) Ltd.<br>700/456, Moo.7, Donhuaroh<br>Muang<br>Chonburi 20000  | Tel. +66 38 454281<br>Fax +66 38 454288<br><a href="mailto:sewthailand@sew-eurodrive.com">sewthailand@sew-eurodrive.com</a>   |
| <b>Tunisia</b>               |               |  |   |
| Sales                        | Tunis         | T. M.S. Technic Marketing Service<br>Zone Industrielle Mghira 2<br>Lot No. 39<br>2082 Fouchana                                 | Tel. +216 79 40 88 77<br>Fax +216 79 40 88 66<br><a href="http://www.tms.com.tn">http://www.tms.com.tn</a><br><a href="mailto:tms@tms.com.tn">tms@tms.com.tn</a>  |
| <b>Turkey</b>                |               |  |   |
| Assembly<br>Sales<br>Service | Kocaeli-Gebze | SEW-EURODRIVE Hareket<br>Sistemleri San. Ve TIC. Ltd. Sti<br>Gebze Organize Sanayi Böl. 400 Sok No. 401<br>41480 Gebze Kocaeli | Tel. +90 262 9991000 04<br>Fax +90 262 9991009<br><a href="http://www.sew-eurodrive.com.tr">http://www.sew-eurodrive.com.tr</a><br><a href="mailto:sew@sew-eurodrive.com.tr">sew@sew-eurodrive.com.tr</a> |



**Ukraine**

|                              |                |   |  |
|------------------------------|----------------|---|--|
| Assembly<br>Sales<br>Service | Dnipropetrovsk | ООО «СЕВ-Евродрайв»<br>ул. Рабочая, 23-В, офис 409<br>49008 Днепр | Tel. +380 56 370 3211<br>Fax +380 56 372 2078<br><a href="http://www.sew-eurodrive.ua">http://www.sew-eurodrive.ua</a><br><a href="mailto:sew@sew-eurodrive.ua">sew@sew-eurodrive.ua</a> |
|------------------------------|----------------|---|--|

**Uruguay**

|                   |            |   |   |
|-------------------|------------|---|---|
| Assembly<br>Sales | Montevideo | SEW-EURODRIVE Uruguay, S. A.<br>Jose Serrato 3569 Esqina Corumbe<br>CP 12000 Montevideo | Tel. +598 2 21181-89<br>Fax +598 2 21181-90<br><a href="mailto:sewuy@sew-eurodrive.com.uy">sewuy@sew-eurodrive.com.uy</a> |
|-------------------|------------|---|---|

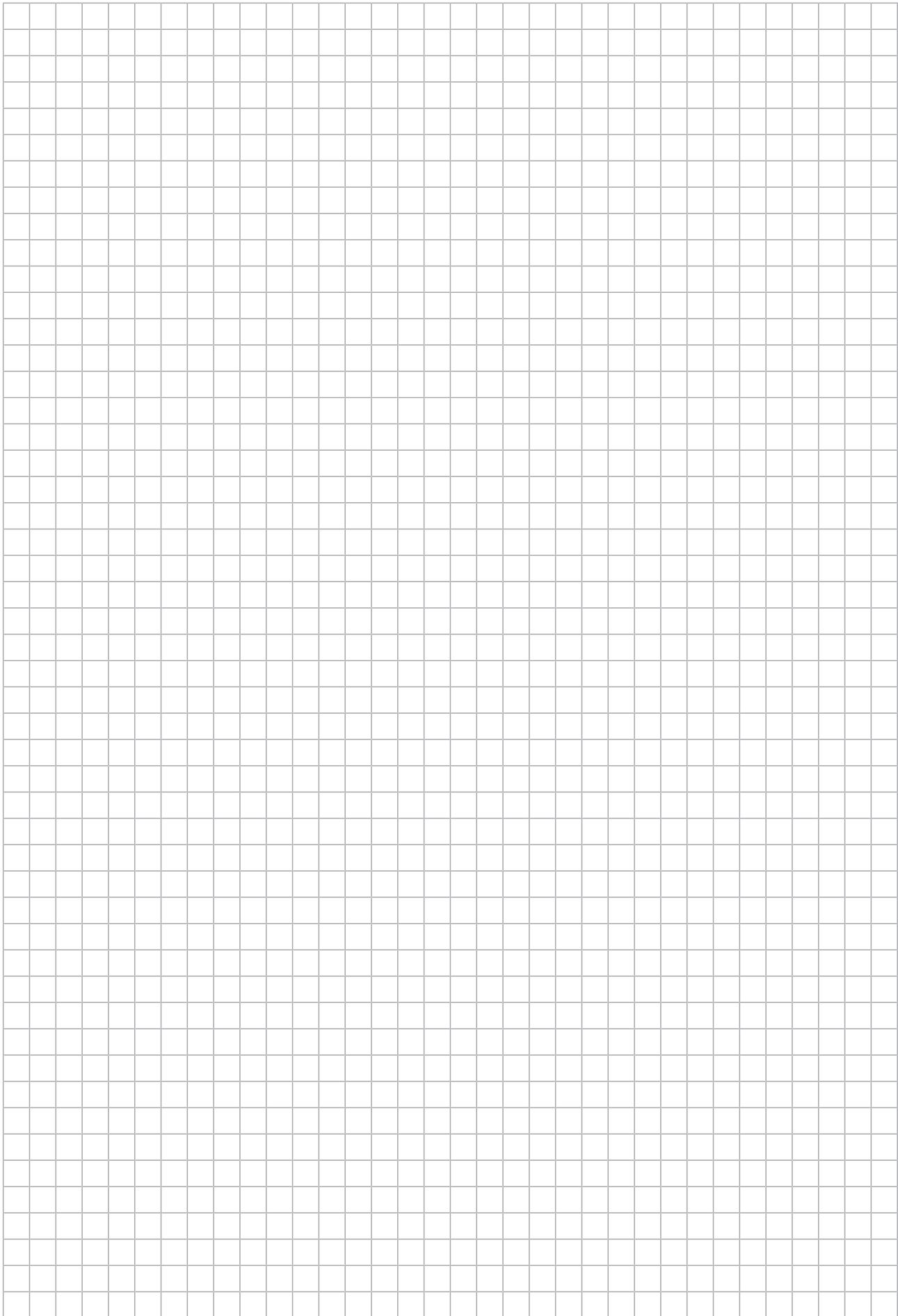
**USA**

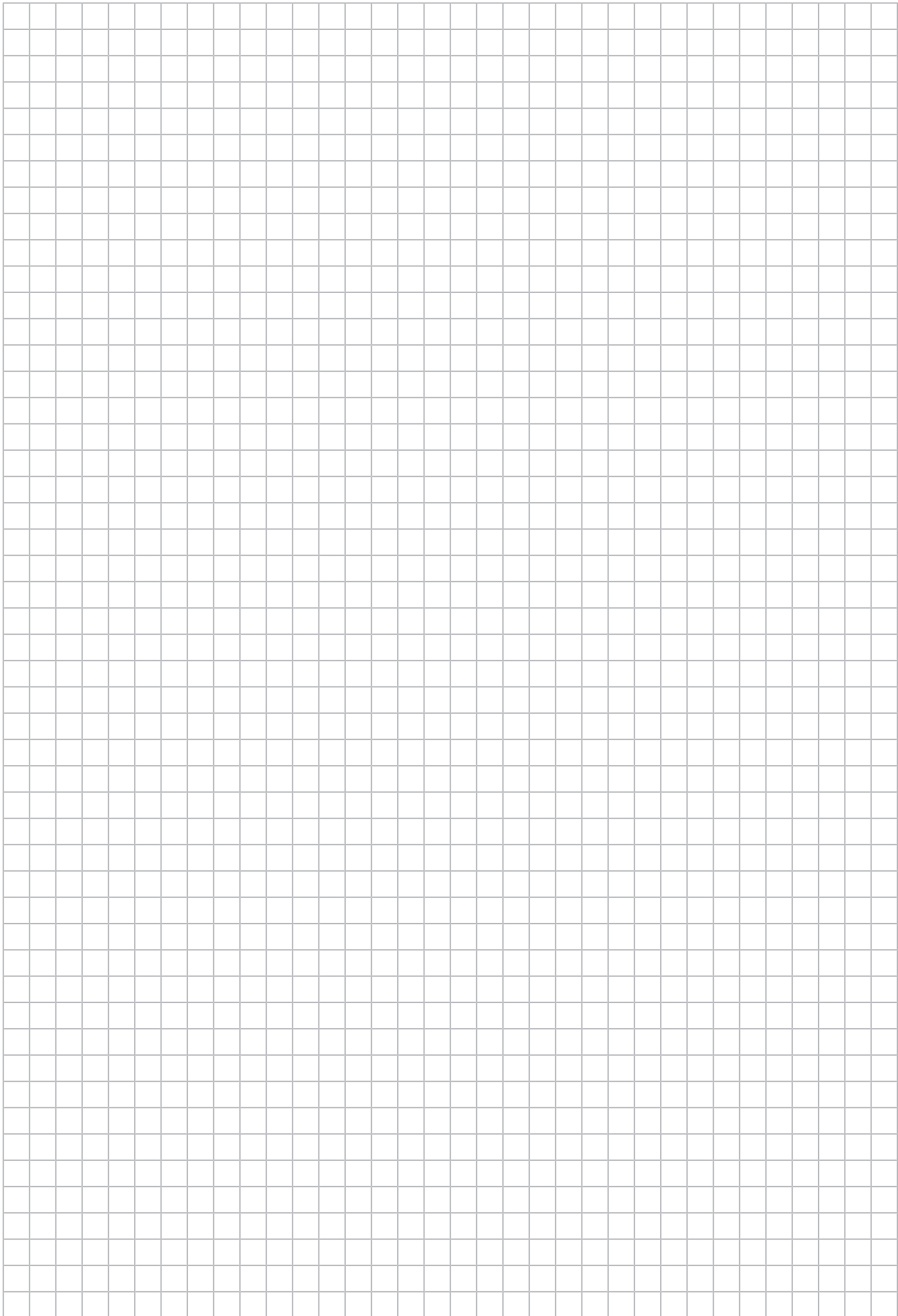
|  |                     |  |   |
|--|---------------------|--|---|
| Production<br>Assembly<br>Sales<br>Service | Southeast<br>Region | SEW-EURODRIVE INC.<br>1295 Old Spartanburg Highway<br>P.O. Box 518<br>Lyman, S.C. 29365                          | Tel. +1 864 439-7537<br>Fax Sales +1 864 439-7830<br>Fax Production +1 864 439-9948<br>Fax Assembly +1 864 439-0566<br>Fax Confidential/HR +1 864 949-5557<br><a href="http://www.seweurodrive.com">http://www.seweurodrive.com</a><br><a href="mailto:cslyman@seweurodrive.com">cslyman@seweurodrive.com</a> |
| Assembly<br>Sales<br>Service               | Northeast<br>Region | SEW-EURODRIVE INC.<br>Pureland Ind. Complex<br>2107 High Hill Road, P.O. Box 481<br>Bridgeport, New Jersey 08014 | Tel. +1 856 467-2277<br>Fax +1 856 845-3179<br><a href="mailto:csbridgeport@seweurodrive.com">csbridgeport@seweurodrive.com</a>   |
|  | Midwest<br>Region   | SEW-EURODRIVE INC.<br>2001 West Main Street<br>Troy, Ohio 45373  | Tel. +1 937 335-0036<br>Fax +1 937 332-0038<br><a href="mailto:cstroy@seweurodrive.com">cstroy@seweurodrive.com</a>   |
|  | Southwest<br>Region | SEW-EURODRIVE INC.<br>3950 Platinum Way<br>Dallas, Texas 75237   | Tel. +1 214 330-4824<br>Fax +1 214 330-4724<br><a href="mailto:csdallas@seweurodrive.com">csdallas@seweurodrive.com</a>   |
|  | Western<br>Region   | SEW-EURODRIVE INC.<br>30599 San Antonio St.<br>Hayward, CA 94544   | Tel. +1 510 487-3560<br>Fax +1 510 487-6433<br><a href="mailto:cshayward@seweurodrive.com">cshayward@seweurodrive.com</a>   |
|  | Wellford            | SEW-EURODRIVE INC.<br>148/150 Finch Rd.<br>Wellford, S.C. 29385  | Tel. +1 864 439-7537<br>Fax +1 864 661 1167<br><a href="mailto:IGOrders@seweurodrive.com">IGOrders@seweurodrive.com</a>   |

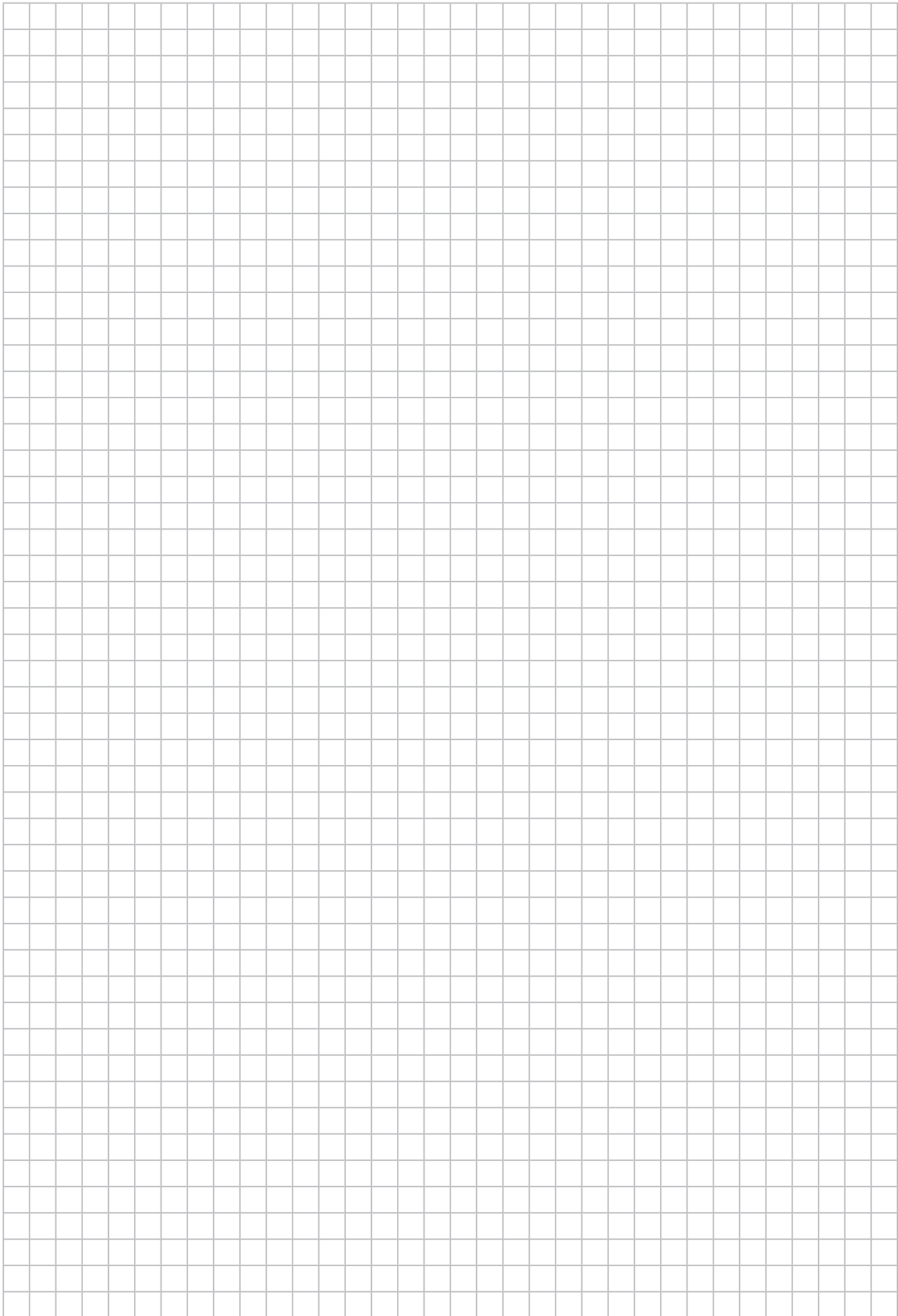
Additional addresses for service provided on request!

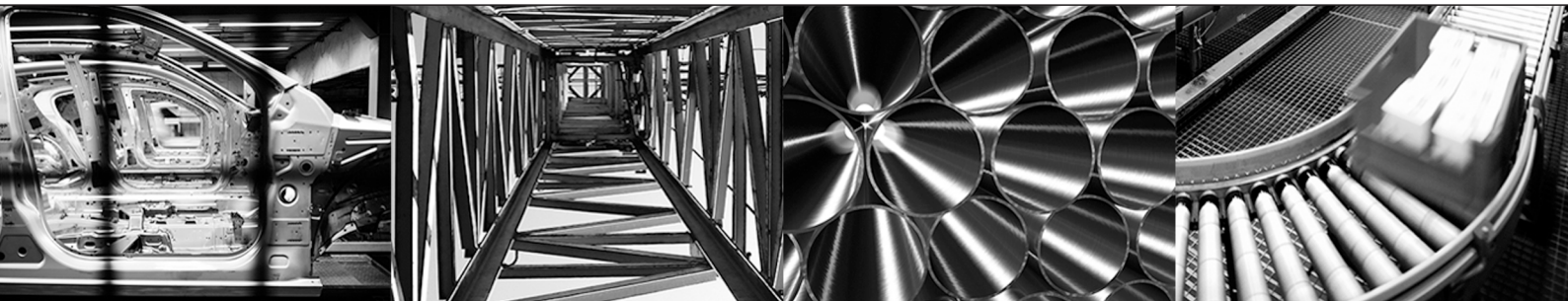
**Vietnam**

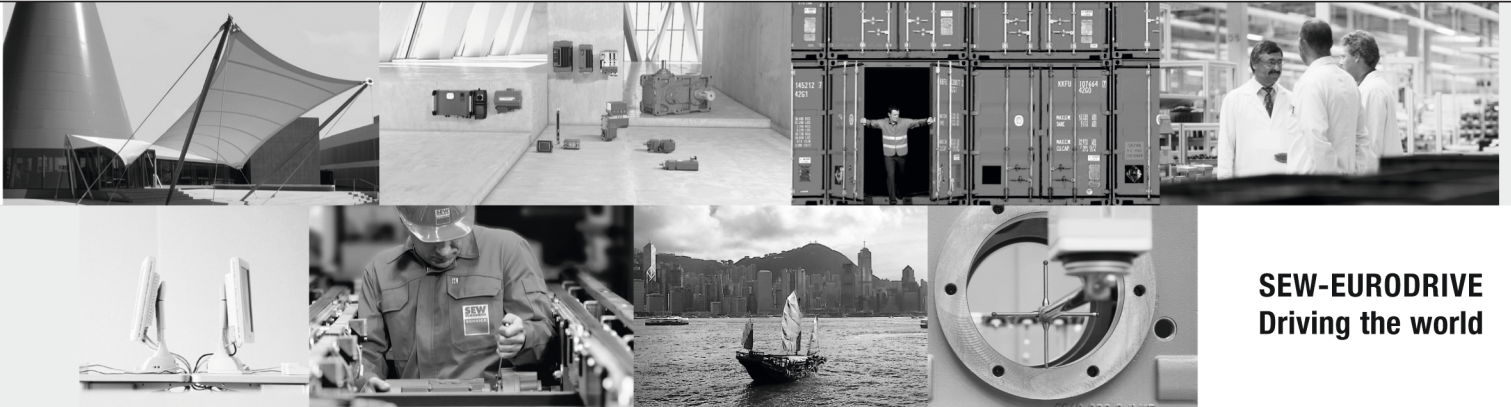
|       |                     |   |  |
|-------|---------------------|---|--|
| Sales | Ho Chi Minh<br>City | Nam Trung Co., Ltd<br>Huế - South Vietnam / Construction Materials<br>250 Binh Duong Avenue, Thu Dau Mot Town,<br>Binh Duong Province<br>HCM office: 91 Tran Minh Quyen Street<br>District 10, Ho Chi Minh City | Tel. +84 8 8301026<br>Fax +84 8 8392223<br><a href="mailto:khanh-nguyen@namtrung.com.vn">khanh-nguyen@namtrung.com.vn</a><br><a href="http://www.namtrung.com.vn">http://www.namtrung.com.vn</a> |
|       | Hanoi               | MICO LTD<br>Quảng Trị - North Vietnam / All sectors except<br>Construction Materials<br>8th Floor, Ocean Park Building, 01 Dao Duy<br>Anh St, Ha Noi, Viet Nam  | Tel. +84 4 39386666<br>Fax +84 4 3938 6888<br><a href="mailto:nam_ph@micogroup.com.vn">nam_ph@micogroup.com.vn</a><br><a href="http://www.micogroup.com.vn">http://www.micogroup.com.vn</a>      |











**SEW-EURODRIVE**  
Driving the world

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**EURODRIVE**

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