SEW EURODRIVE

# System Manual



## MOVIDRIVE® MDX60B/61B

Edition 08/2022

27793230/EN



# Table of contents


**1 System description ..... 8**
1.1 System overview of MOVIDRIVE® MDX60B/61B ..... 8
1.2 Functions/features ..... 21
1.3 Additional functions of the application variants ..... 24
1.4 Application modules for MOVIDRIVE® MDX61B ..... 28
1.5 MOVITOOLS® MotionStudio engineering software ..... 36
1.6 SEW-Workbench ..... 37

**2 Technical data of basic device ..... 38**
2.1 CE marking, approvals ..... 38
2.2 General technical data ..... 39
2.3 MOVIDRIVE® MDX60/61B...-5_3 (AC 400/500 V units) ..... 41
2.4 MOVIDRIVE® MDX61B...-2_3 (AC 230 V units) ..... 50
2.5 MOVIDRIVE® MDX60/61B electronics data ..... 54
2.6 MOVIDRIVE® MDX60B dimension drawings ..... 56
2.7 MOVIDRIVE® MDX61B dimension drawings ..... 60
2.8 IPOS$^{PLUS®}$ ..... 73
2.9 DBG60B keypad ..... 75
2.10 DBM60B/DKG60B housing for DBG60B ..... 77

**3 Technical data of regenerative power supply unit ..... 78**
3.1 MOVIDRIVE® MDR60A/61B regenerative power supply unit ..... 78

**4 Technical data of options ..... 93**
4.1 HIPERFACE® encoder card DEH11B ..... 93
4.2 Resolver card DER11B ..... 94
4.3 DEU21B multi-encoder card ..... 95
4.4 DEH21B/DIP11B absolute encoder card ..... 96
4.5 Connector adapter for device replacement MD_60A - MDX60B/61B ..... 98
4.6 DWE11B/12B interface adapter ..... 100
4.7 UWS11A interface adapter ..... 101
4.8 UWS21B interface adapter ..... 103
4.9 USB11A interface adapter ..... 105
4.10 DWI11A DC 5 V encoder supply ..... 107
4.11 DIO11B input/output board ..... 109
4.12 PROFIBUS DFP21B fieldbus interface ..... 111
4.13 INTERBUS fieldbus interface DFI11B ..... 112
4.14 INTERBUS FOC fieldbus interface DFI21B ..... 113
4.15 Fieldbus interface PROFINET IO RT DFE32B ..... 114
4.16 DFE33B fieldbus interface for EtherNet/IP™ and Modbus TCP ..... 116
4.17 EtherCAT® DFE24B fieldbus interface ..... 118
4.18 DeviceNet™ DFD11B fieldbus interface ..... 119
4.19 CAN/CANopen DFC11B fieldbus interface ..... 120
4.20 Synchronous operation card DRS11B ..... 122
4.21 Fieldbus interface PROFIBUS DP-V1 with PROFIsafe DFS11B ..... 124
4.22 Fieldbus interface PROFIBUS DP-V1 with PROFIsafe DFS12B ..... 126


27793230/EN – 08/2022

4.23 PROFINET IO fieldbus interface with PROFIsafe DFS21B ..... 127
4.24 PROFINET IO fieldbus interface with PROFIsafe DFS22B ..... 129
4.25 MOVISAFE® DCS21B/22B/31B/32B safety module ..... 130
4.26 MOVI-PLC® basic DHP11B controller ..... 132
4.27 OST11B ..... 133
4.28 DHE/DHF/DHR21 and DHE/DHF/DHR41B controller ..... 134
4.29 Safety-related BST brake module ..... 139

**5 Technical data of external accessories ..... 141**
5.1 DMP11B mounting panel ..... 141
5.2 DLB11B touch guard ..... 142
5.3 DLB21B touch guard (for size 7) ..... 143
5.4 DLS11B mounting base (for size 7) ..... 144
5.5 DLH11B wall bracket (for size 7) ..... 145
5.6 DLA11B connection kit (for size 7) ..... 146
5.7 DLK11B air duct (for size 7) ..... 147
5.8 DLZ11B DC link coupling (for size 7) ..... 148
5.9 2Q DLZ12B DC link adapter (for size 7) ..... 149
5.10 4Q DLZ14B DC link adapter (for size 7) ..... 151

**6 Technical data of braking resistors, chokes and filters ..... 152**
6.1 Braking resistors BW.. / BW...-T / BW...-P ..... 152
6.2 ND.. line chokes ..... 164
6.3 NF...-... line filters ..... 166
6.4 HD... output chokes ..... 170
6.5 HF... output filter ..... 173

**7 Prefabricated cables ..... 177**
7.1 Overview ..... 177
7.2 DC link connection ..... 177
7.3 Power cables for CFM.. motors ..... 179
7.4 Power cables for CMP.. motors ..... 184
7.5 Encoder cable selection: Meaning of the icons ..... 192
7.6 Encoder cable for DR.. motors on X15 DEH11B/DEH21B/DEU21B ..... 194
7.7 Encoder cable for CMP.., CM.., motors on X15 DEH11B/DEH21B and DEU21B ..... 199
7.8 Encoder cable for distance encoders on X14, DEH11B/DER11B/DEU21B ..... 202
7.9 Encoder cable for resolvers on X15 DER11B ..... 204

**8 Parameters ..... 206**
8.1 Structure of the DBG60B menu ..... 206
8.2 Overview of parameters ..... 207
8.3 Explanation of the parameters ..... 218
8.4 Operating modes ..... 330

**9 Project planning ..... 347**
9.1 Schematic procedure ..... 347
9.2 Control characteristics ..... 348
9.3 Description of the applications ..... 350
9.4 Basic recommendations for motor selection ..... 353

27793230/EN – 08/2022

9.5 Motor selection for asynchronous AC motors (VFC) ... 354
9.6 Motor selection for asynchronous AC and servomotors (CFC) ... 359
9.7 Motor selection for synchronous servomotors (SERVO) ... 423
9.8 SL2 synchronous linear motors ... 437
9.9 Overload capacity of the inverter ... 437
9.10 Braking resistor selection ... 475
9.11 Connecting AC brakemotors ... 485
9.12 Permitted voltage systems for MOVIDRIVE® B ... 486
9.13 Line contactors and line fuses ... 486
9.14 Power connection for size 7 ... 487
9.15 Line and motor cables ... 490
9.16 Group drive in VFC mode ... 497
9.17 Connecting explosion-proof AC motors ... 498
9.18 EMC-compliant installation in accordance with EN 61800-3 ... 498
9.19 HF… output filter type ... 501
9.20 Electronics Cables and Signal Generation ... 506
9.21 External voltage supply DC 24 V ... 507
9.22 Parameter set switchover ... 510
9.23 Priority of the operating states and link between control signals ... 511
9.24 Limit switches ... 512

**10 General information ... 513**
10.1 About this documentation ... 513
10.2 Structure of the safety notes ... 513
10.3 Rights to claim under limited warranty ... 514
10.4 Exclusion of liability ... 514
10.5 Other applicable documentation ... 514
10.6 Product names and trademarks ... 515
10.7 Copyright notice ... 515

**11 Safety notes ... 516**
11.1 General ... 516
11.2 Target group ... 516
11.3 Designated use ... 517
11.4 Transportation and storage ... 517
11.5 Setup ... 517
11.6 Electrical connection ... 518
11.7 Protective separation ... 518
11.8 Operation ... 518

**12 Device structure ... 520**
12.1 Type designation, nameplates and scope of delivery ... 520
12.2 Scope of Delivery ... 522
12.3 Size 0 ... 524
12.4 Size 1 ... 525
12.5 Size 2S ... 527
12.6 Size 2 ... 529
12.7 Size 3 ... 531

27793230/EN – 08/2022

12.8 Size 4 ... 535
12.9 Size 5 ... 537
12.10 Size 6 ... 539
12.11 Size 7 ... 541
12.12 MOVIDRIVE® MDX62B motor inverter size 7 ... 544

**13 Installation ... 547**
13.1 Installation instructions for the basic unit ... 547
13.2 Removing/installing the keypad ... 583
13.3 Removing/installing the front cover ... 584
13.4 Information regarding UL ... 586
13.5 Shield clamps ... 590
13.6 Touch guard for power terminals ... 594
13.7 Wiring diagrams for basic device ... 601
13.8 Assignment of braking resistors, chokes and filters ... 608
13.9 Connecting the system bus (SBus 1) ... 613
13.10 Connecting the RS485 interface ... 615
13.11 Connecting the DWE11B/12B interface adapter ... 616
13.12 Connecting the UWS21B interface adapter (RS232 ↔ RS485) ... 617
13.13 Connecting the USB11A interface adapter ... 619
13.14 Option combinations for MDX61B ... 621
13.15 Installing and removing option cards ... 624
13.16 Connecting encoders and resolvers ... 626
13.17 Connection and terminal description of the DEH11B option (HIPERFACE®) ... 628
13.18 Connection and terminal description of the DEH21B option ... 630
13.19 Connection and terminal description of the DEU21B option ... 631
13.20 Connection and terminal description of the DER11B (resolver) option ... 633
13.21 Connecting external encoders to X:14 ... 635
13.22 Connection of encoder options ... 636
13.23 Connection of incremental encoder simulation ... 642
13.24 Master/slave connection ... 643
13.25 Connection and terminal description of the DIO11B option ... 644
13.26 Connection and terminal description of the DFC11B option ... 647

**14 Startup ... 648**
14.1 General startup instructions ... 648
14.2 Preliminary work and resources ... 651
14.3 Startup with DBG60B keypad ... 652
14.4 Operation of MOVITOOLS® MotionStudio ... 662
14.5 Starting the motor ... 666

**15 Operation ... 672**
15.1 Operating displays ... 672
15.2 Information messages ... 674
15.3 Functions of the DBG60B keypad ... 675
15.4 Memory card ... 680

**16 Service ... 681**

27793230/EN – 08/2022

16.1 Damages to the device ..... 681
16.2 Fault information ..... 681
16.3 Fault messages and list of faults ..... 683
16.4 SEW-EURODRIVE electronics service ..... 715
16.5 Extended storage ..... 715
16.6 Waste disposal ..... 716

**17 Declarations of conformity ..... 717**
17.1 MOVIDRIVE® ..... 717
17.2 MOVIDRIVE® with DFS11B/DFS21B ..... 718
17.3 MOVIDRIVE® with DCS2.B/DCS3.B ..... 719

**18 Address list ..... 720**

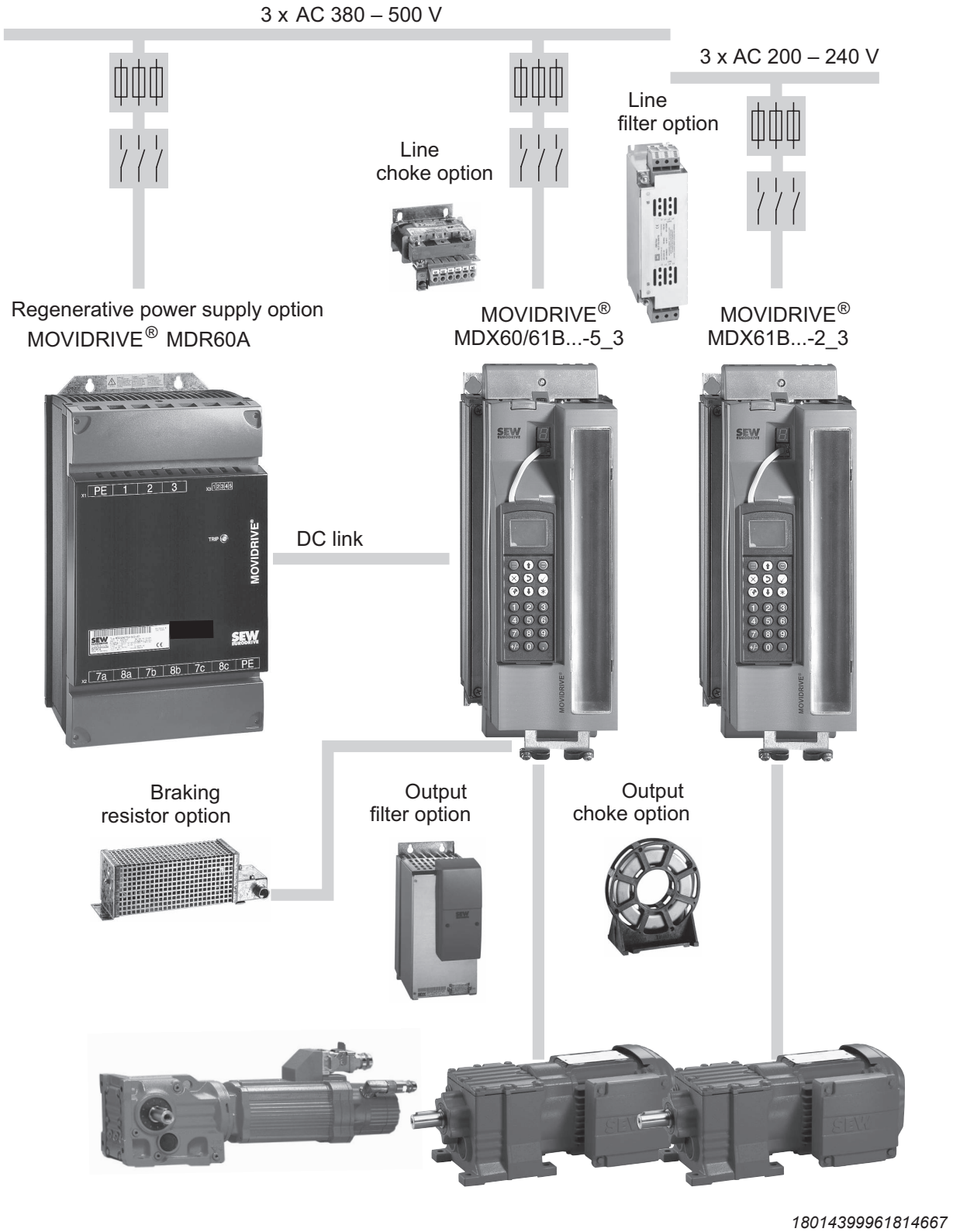
**Index ..... 731**

27793230/EN – 08/2022

# 1 System description

## 1.1 System overview of MOVIDRIVE® MDX60B/61B

### 1.1.1 Power components

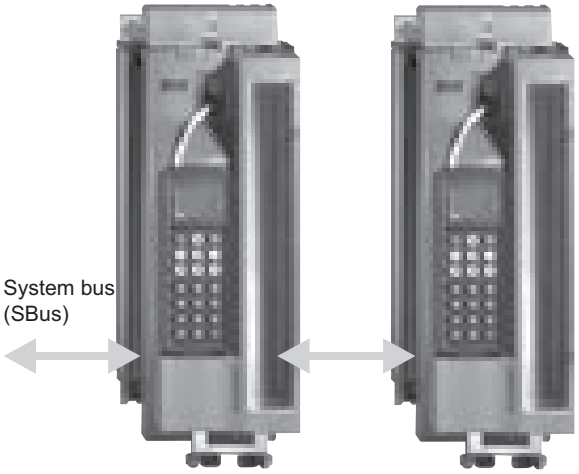




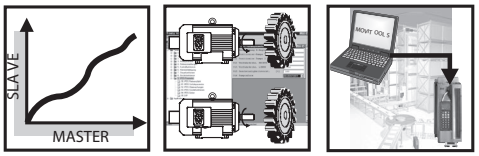

27793230/EN – 08/2022

### 1.1.2 Encoder and communication options

MDX60/61B standard variant with IPOS$^{PLUS®}$



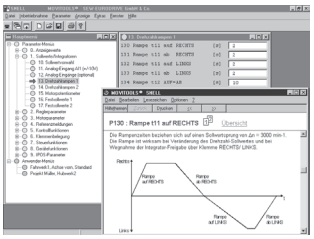

MDX60/61B application version for the use of "electronic cam", "Internal synchronous operation" or the application modules.




DBG60B keypad option



MOVITOOLS® engineering software



**Encoder options:**

DEU 21B




DEH 11B




DEH 21B




DER 11B




DIP 11B




DIO 11B




DRS 11B




**Interface adapter option:**



UWS 21B



UWS 11A



USB 11A

*9007200707110283*

### 1.1.3 Fieldbus options

DFC 11B




DFD 11B




DFI 11B




DFI 21B




DFP 21B




DFE 24B




DFE 32B




DFE 33B

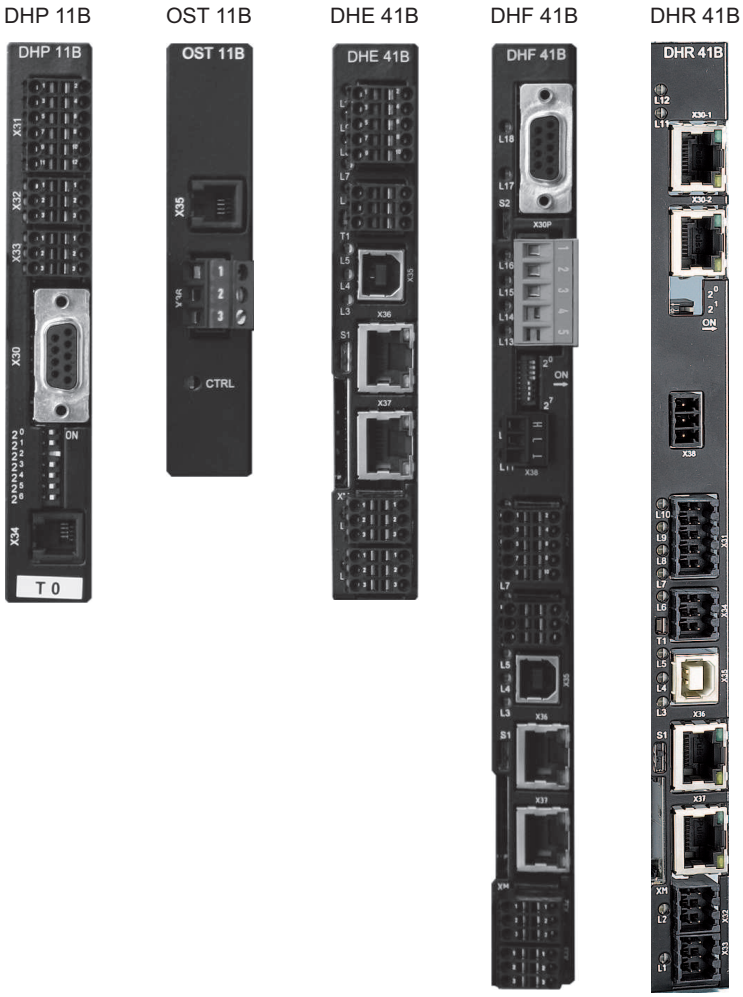



*1452375307*

27793230/EN – 08/2022

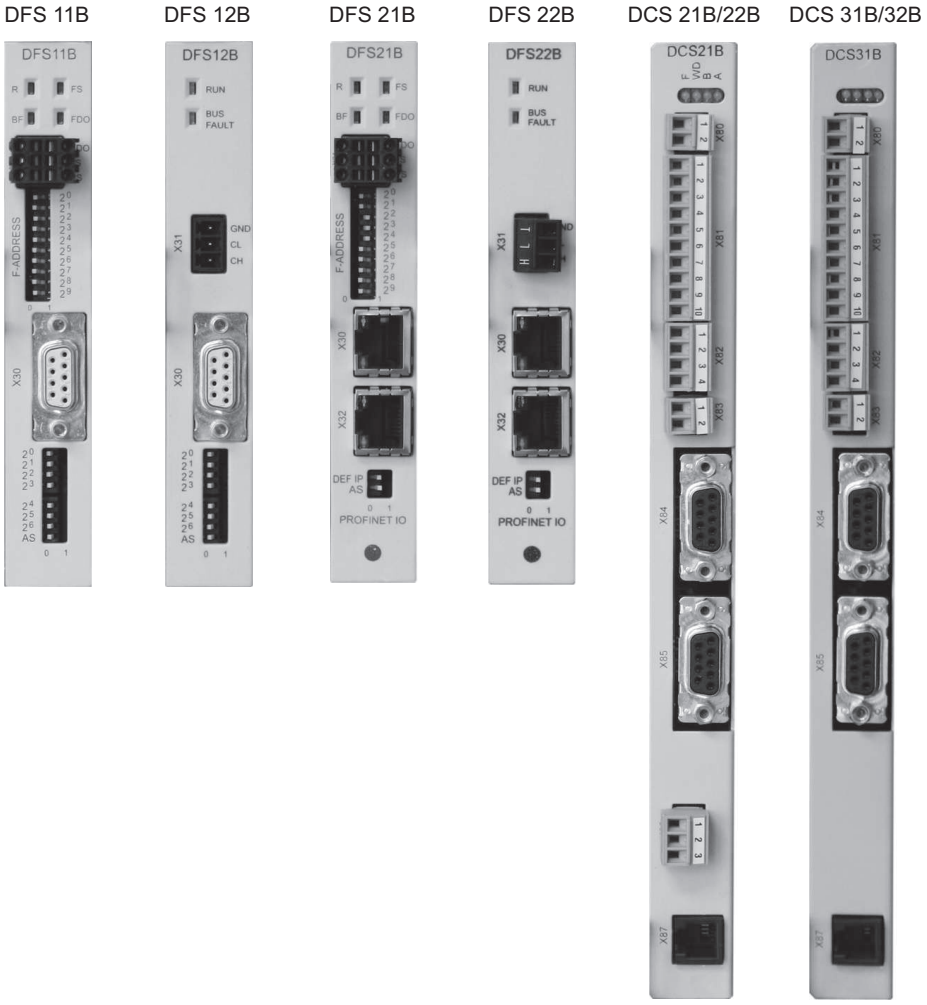
### 1.1.4 Control options

**MOVI-PLC®**




*1452634507*

### 1.1.5 Safety options




*9007200707381899*

### 1.1.6 Description

This documentation describes the **MOVIDRIVE® MDX60B/61B** drive inverters by SEW-EURODRIVE. The drive inverters of the MOVIDRIVE® B series impress with their proven basic functions and the modular device concept.

Three-phase drives in the power range 0.55 – 315 kW can be flexibly operated in combination with inverter technology. The levels of dynamic performance and control quality that can now be achieved with MOVIDRIVE® for asynchronous AC motors were only possible using servo drives or DC motors in the past. The integrated control functionality and the option to extend the drive using technology and communication options creates drive systems that are designed to be particularly cost-effective with regard to the diversity of applications, project planning, startup and operation.

27793230/EN – 08/2022

### 1.1.7 Low-emission

The MOVIDRIVE® MDX60B/61B drive inverters are produced according to particularly low-emission regulations, but with the usual high level of quality. One particular feature is the consistent use of lead-free soldering materials in the production of electronics products. These lead-free soldering processes are in line with the RoHS 2011/65/EU Directive and the law on electronic equipment.

### 1.1.8 Product family

The **MOVIDRIVE®** device family includes three series:

- MOVIDRIVE® MDX60B: Drive inverter for asynchronous AC motors without encoder feedback. The devices are not option-capable.
- MOVIDRIVE® MDX61B: Drive inverter for asynchronous AC motors with or without encoder feedback, or for asynchronous and synchronous servomotors. The devices are option-capable.
- MOVIDRIVE® MDR60A/61B: Regenerative power supply; MOVIDRIVE® drive inverters (400/500 V devices) operate in regenerative mode to feed energy back into the supply system.

### 1.1.9 Device variants

MOVIDRIVE® MDX60B/61B size 0 – 6 drive inverters are available in two variants, namely the standard version and the technology version. MOVIDRIVE® MDX60B/61B size 7 drive inverters are only available as technology version with coated PCBs (-0T/L).

#### Standard version

The devices are equipped with integrated IPOS$^{PLUS®}$ positioning and sequence control as standard. MOVIDRIVE® MDX61B can be expanded with the available options.

The standard version is indicated by the "00" digits at the end of the type designation.

#### Technology version

In addition to the features of the standard version, these devices include the electronic cam and internal synchronous operation technology functions. Furthermore, you can use all the application modules available in the MOVITOOLS® MotionStudio engineering software with the devices in application version.

The technology version is indicated by "0T" following the type designation.

#### Variants with coated printed circuit boards

The devices are designed for use in harsh environments. The coating of the printed circuit boards increases their resistivity against environmental influences.

The design with coated PCBs is indicated by "/L" at the end of the type designation.

### 1.1.10 Modular unit concept

The option-capable MOVIDRIVE® MDX61B devices have the following option card slots:

- Size 0 (0005 – 0014) → 2 option card slots

27793230/EN – 08/2022

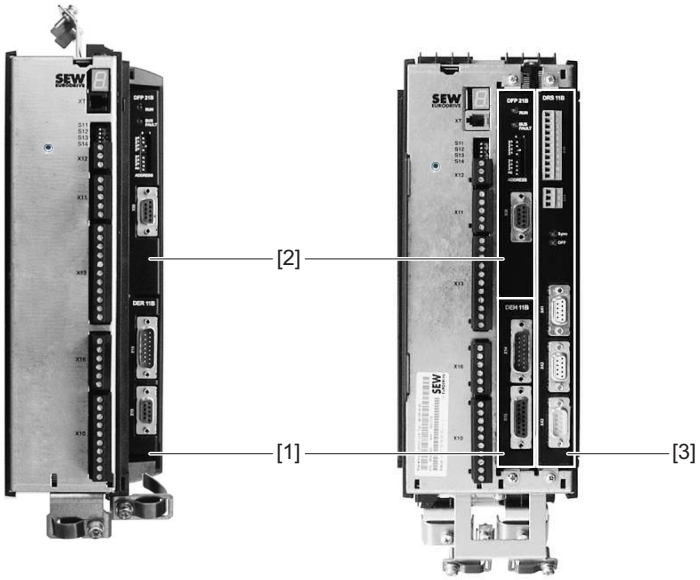
  - 1 option card slot for encoder connection
  - 1 option card slot for a communication option
- Size 1 – 7 (0015 – 2500) → 3 option card slots
  - 1 option card slot for encoder connection
  - 1 option card slot for a communication option
  - 1 option card slot for an expansion option

## INFORMATION

- **Customers can only install or remove option cards later on in MDX61B sizes 1 to 7. The firmware of the option cards and the basic device must be compatible.**
- For **MDX61B devices in size 0, option cards can only be installed and removed later on by SEW-EURODRIVE.** Please take this aspect into account when you place your order/perform project planning.

### 1.1.11 Option card slots of MOVIDRIVE® MDX61B

Size 0 (0005 – 0014) Size 1 – 7 (0015 – 2500)




*1806023691*

[1] Encoder slot for encoder option

[2] Fieldbus slot for communication option

[3] Expansion slot for communication option (only sizes 1 – 7)

The modular device concept allows you to choose the right option according to your application. For example, when you have an asynchronous AC motor with encoder feedback (HIPERFACE®, sin/cos, or TTL), you would need the HIPERFACE® encoder card type option DEH11B.

| Application | Required option | Option card slot |
|---|---|---|
| Encoder option | | |

27793230/EN – 08/2022

| Application | Required option | Option card slot |
|---|---|---|
| Asynchronous AC motor with encoder feedback (HIPERFACE®, sin/cos, TTL) | HIPERFACE® encoder card DEH11B | 1 |
| Asynchronous or synchronous servomotor with HIPERFACE® encoder | | |
| Synchronous servomotor with resolver | Resolver card type DER11B | |
| Asynchronous or synchronous motors with absolute encoder | DEU21B multi-encoder card | |
| SSI encoder interface | DEH21B absolute encoder card | |
| Communication options (fieldbus, control) | | |
| User-programmable MOVI-PLC® controller | MOVI-PLC®*basic* DHP11B controller | 2<br>(3 only if slot 2 is occupied) |
| Additional RS485 interface (only in combination with option DHP11B) | DHP11B + OST11B | • DHP11B in 2, OST11B in 1<br>• If 1 is occupied:<br>DHP11B + OST11B in 3 |
| Freely programmable motion and logic controller (MOVI-PLC®) | Controller<br>• DHE21B (standard)<br>• DHE41B (advanced) | 2<br>(3 only if slot 2 is occupied) |
| | Controller<br>• DHF21B (standard)<br>• DHF41B (advanced) | 3 |
| | Controller<br>• DHR21B (standard)<br>• DHR41B (advanced) | 3 |
| Additional analog and digital inputs/outputs are required | Input/output card type DIO11B | 2<br>(3 only if slot 2 is occupied) |

27793230/EN – 08/2022

| Application | Required option | Option card slot |
|---|---|---|
| Integration into an PROFIBUS system | PROFIBUS interface type DFP21B | 2 |
| Integration into a PROFIBUS system with PROFIsafe | DFS11B fieldbus interface | |
| Integration into an INTERBUS system | INTERBUS interface type DFI11B / DFI21B | |
| Integration into an Ethernet system with PROFIsafe | DFS21B fieldbus interface | |
| Integration into an EtherCAT® system | EtherCAT® interface type DFE24B | |
| Integration into an DeviceNet system | DeviceNet™ interface type DFD11B | |
| Integration into an CANopen system | CANopen interface type DFC11B | |
| Expansion option | | |
| SSI encoder interface | DIP11B absolute encoder card | 3 |
| Phase-synchronous operation | Synchronous operation card DRS11B | |
| Safety module | DCS21B/22B option (only in combination with DFS12B/22B option) / DCS31B/32B | |

### 1.1.12 Control modes

The VFC (Voltage Mode Flux Control) and CFC (Current Mode Flux Control)/SERVO control modes are features of MOVIDRIVE® MDX60B/61B drive inverters. The continuous calculation of the complete motor model forms the basis for both control modes.

| VFC control mode (Voltage Mode Flux Control) | Control mode CFC (Current Mode Flux Control)/SERVO |
|---|---|
| Voltage-controlled control mode for asynchronous AC motors with and without encoder feedback.<br>• With encoder feedback<br>– At least 150% torque, with a power-matched, stopped motor<br>– Characteristics similar to servo operation<br>• Without encoder feedback<br>– At least 150% torque up to 0.5 Hz, with a power-matched motor | Current-controlled control mode for asynchronous and synchronous servomotors. Encoder feedback is always required.<br>• At least 160% torque, with a power-matched, stopped motor<br>• Maximum precision and concentric running characteristics right down to standstill<br>• Servo characteristics and torque control even for asynchronous AC motors<br>• Reacts to load changes within a few milliseconds |

27793230/EN – 08/2022

### 1.1.13 System bus (SBus)

The system bus (SBus), which is installed as standard, allows several MOVIDRIVE® drive inverters to be networked together. This system bus enables fast data exchange between the devices. The MOVILINK® device profile is used for communication via the SBus. MOVILINK® is the universal SEW-EURODRIVE standard for serial communication. The SBus can be switched to CANopen.

### 1.1.14 MOVILINK®

MOVILINK® always uses the same message format independent of the selected interface (SBus, RS485, fieldbus interfaces). As a result, the control software is independent of the selected interface.

### 1.1.15 IPOS$^{PLUS®}$

A significant feature of MOVIDRIVE® drive inverters is that the IPOS$^{PLUS®}$ positioning and sequence control system is integrated as a standard. IPOS$^{PLUS®}$ enables you to control sequences of motion directly in the inverter, right on the plant floor. The load on the higher-level controller is reduced and modular concepts are easier to implement.

27793230/EN – 08/2022

### 1.1.16 Device overview

**MOVIDRIVE® MDX60/61B for 3 × AC 380 – 500 V connection voltage (400/500 V devices):**

| Recommended motor power (VFC) | | Continuous output current | MOVIDRIVE® type | | Size |
|---|---|---|---|---|---|
|  | | | MDX60B not option-capable | MDX61B Option-capable | |
| 4Q devices (with brake chopper) | | | | | |
| 0.55 kW | 0.75 kW | AC 2.0 A | 0005-5A3-4-.. | 0005-5A3-4-.. | 0 |
| 0.75 kW | 1.1 kW | AC 2.4 A | 0008-5A3-4-.. | 0008-5A3-4-.. | |
| 1.1 kW | 1.5 kW | AC 3.1 A | 0011-5A3-4-.. | 0011-5A3-4-.. | |
| 1.5 kW | 2.2 kW | AC 4.0 A | 0014-5A3-4-.. | 0014-5A3-4-.. | |
| 1.5 kW | 2.2 kW | AC 4.0 A | – | 0015-5A3-4-.. | 1 |
| 2.2 kW | 3.0 kW | AC 5.5 A | – | 0022-5A3-4-.. | |
| 3.0 kW | 4.0 kW | AC 7.0 A | – | 0030-5A3-4-.. | |
| 4.0 kW | 5.5 kW | AC 9.5 A | – | 0040-5A3-4-.. | |
| 5.5 kW | 7.5 kW | AC 12.5 A | – | 0055-5A3-4-.. | 2S, 2 |
| 7.5 kW | 11 kW | AC 16 A | – | 0075-5A3-4-.. | |
| 11 kW | 15 kW | AC 24 A | – | 0110-5A3-4-.. | |
| 15 kW | 22 kW | AC 32 A | – | 0150-503-4-.. | 3 |
| 22 kW | 30 kW | AC 46 A | – | 0220-503-4-.. | |
| 30 kW | 37 kW | AC 60 A | – | 0300-503-4-.. | |
| 37 kW | 45 kW | AC 73 A | – | 0370-503-4-.. | 4 |
| 45 kW | 55 kW | AC 89 A | – | 0450-503-4-.. | |
| 55 kW | 75 kW | AC 105 A | – | 0550-503-4-.. | 5 |
| 75 kW | 90 kW | AC 130 A | – | 0750-503-4-.. | |
| 90 kW | 110 kW | AC 170 A | – | 0900-503-4-.. | 6 |
| 110 kW | 132 kW | AC 200 A | – | 1100-503-4-.. | |
| 132 kW | 160 kW | AC 250 A | – | 1320-503-4-.. | |
| | | | | | |
| 2Q devices (without brake chopper) | | | | | |
| 160 kW | 200 kW | AC 300 A | – | 1600-503-2-0T/L | 7 |
| 200 kW | 250 kW | AC 380 A | – | 2000-503-2-0T/L | |
| 250 kW | 315 kW | AC 470 A | – | 2500-503-2-0T/L | |
| | | | | | |
| 4Q devices (with brake chopper) | | | | | |

27793230/EN – 08/2022

| Recommended motor power (VFC) | | Continuous output current | MOVIDRIVE® type | | Size |
|---|---|---|---|---|---|
|  | | | MDX60B not option-capable | MDX61B Option-capable | |
| 160 kW | 200 kW | AC 300 A | – | 1600-503-4-0T/L | 7 |
| 200 kW | 250 kW | AC 380 A | – | 2000-503-4-0T/L | |
| 250 kW | 315 kW | AC 470 A | – | 2500-503-4-0T/L | |

**MOVIDRIVE® MDX60/61B for 3 × AC 200 – 240 V connection voltage (230 V devices):**

| Recommended motor power (VFC) | | Continuous output current | MOVIDRIVE® type | Size |
|---|---|---|---|---|
|  | | | MDX61B Option-capable | |
| 1.5 kW | 2.2 kW | AC 7.3 A | 0015-2A3-4-.. | 1 |
| 2.2 kW | 3.7 kW | AC 8.6 A | 0022-2A3-4-.. | |
| 3.7 kW | 5.0 kW | AC 14.5 A | 0037-2A3-4-.. | |
| 5.5 kW | 7.5 kW | AC 22 A | 0055-2A3-4-.. | 2 |
| 7.5 kW | 11 kW | AC 29 A | 0075-2A3-4-.. | |
| 11 kW | 15 kW | AC 42 A | 0110-203-4-.. | 3 |
| 15 kW | 22 kW | AC 54 A | 0150-203-4-.. | |
| 22 kW | 30 kW | AC 80 A | 0220-203-4-.. | 4 |
| 30 kW | 37 kW | AC 95 A | 0300-203-4-.. | |

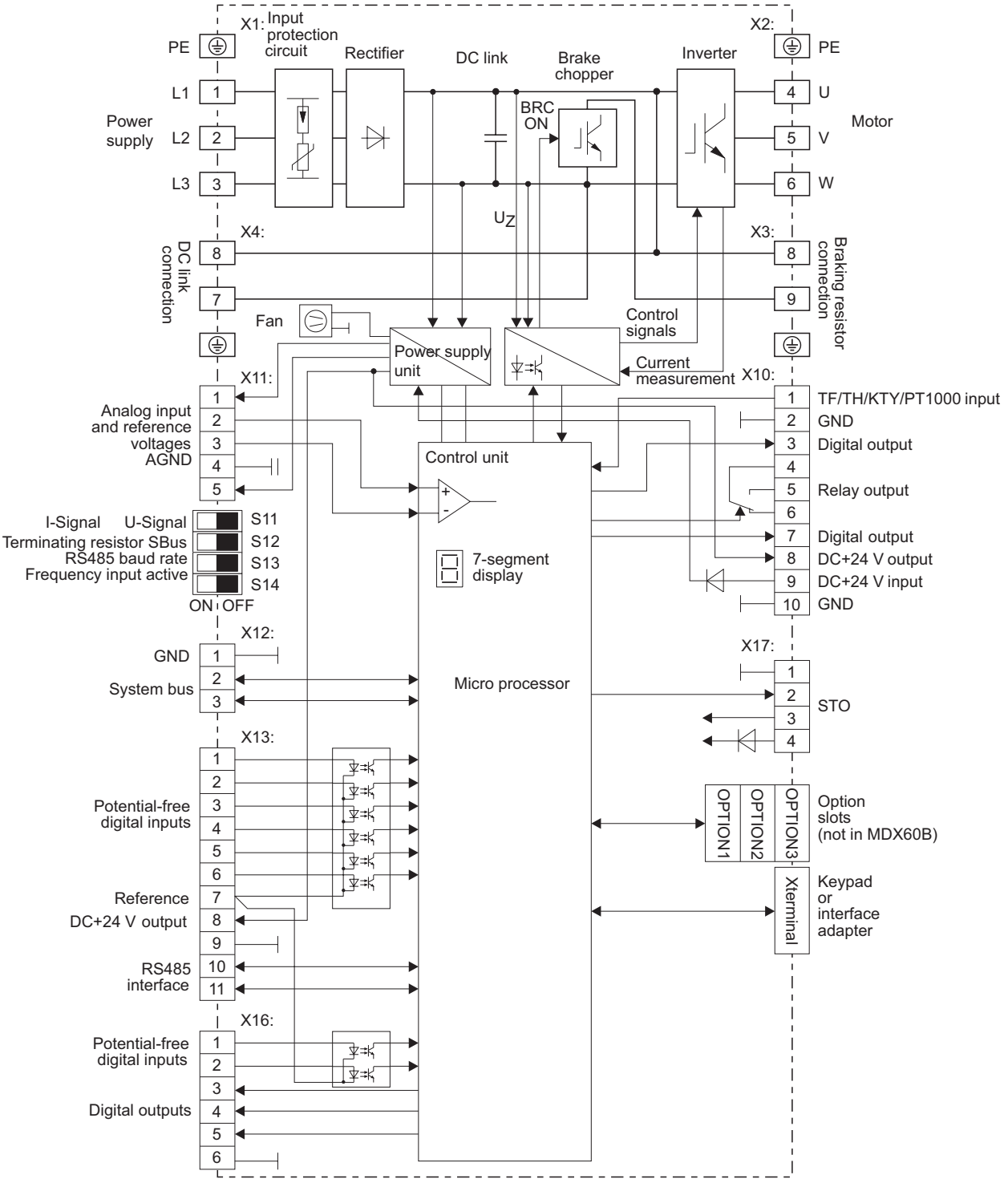
**MOVIDRIVE® MDR60A/61B regenerative power supply units for 400/500 V devices:**

| MOVIDRIVE® MDR60A/61B regenerative power supply unit | | Size | MOVIDRIVE®MDX60B/61B ...-5_3 |
|---|---|---|---|
| 0150-503-00 | $I_{line}$ = AC 29 A, $I_{DC}$ = DC 35 A | 2, 3, 4, 6 | 0005 – 0150 |
| 0370-503-00 | $I_{line}$ = AC 66 A, $I_{DC}$ = DC 70 A | | 0005 – 0370 |
| 0750-503-00 | $I_{line}$ = AC 117 A, $I_{DC}$ = DC 141 A | | 0005 – 0750 |
| 1320-503-00<br>As of series no. DCV2000100 | $I_{line}$ = AC 260 A, $I_{DC}$ = DC 324 A | | 0005 – 1600 |
| 1600-503-00/L | $I_{line}$ = AC 250 A, $I_{DC}$ = DC 255 A | 7 | 0005 – 1600 |
| 2500-503-00/L | $I_{line}$ = AC 400 A, $I_{DC}$ = DC 407 A | | 0005 – 2500 |

27793230/EN – 08/2022

### 1.1.17 Block circuit diagram

The following block diagram shows the basic structure and theory of operation of MOVIDRIVE® MDX60B/61B drive inverters.




*18014399962320907*

## 1.2 Functions/features

### 1.2.1 Device properties

- Wide voltage range
  - 400/500 V devices for the voltage range 3 × AC 380 – 500 V
  - 230 V devices for the voltage range 3 × AC 200 – 240 V
- High overload capacity
  - Size 0: 200% $I_N$ for at least 60 s
  - Size 1 – 7: 150% $I_N$ for at least 60 s
  - All sizes: 125% $I_N$, continuous operation without overload (pumps, fans)
- Size 0 – 6:
  - With 4 kHz switching frequency, $I_N$ is permitted for an ambient temperature of $\vartheta$ = 50 °C
  - 4Q capability due to integrated brake chopper installed as standard
- Size 7:
  - With 2.5 kHz switching frequency, $I_N$ is permitted for an ambient temperature of $\vartheta$ = 50 °C
  - 2Q devices without brake chopper or 4Q devices with brake chopper can be selected
- Compact device design for minimum control cabinet space requirement and optimum utilization of control cabinet volume
- Integrated line filter fitted as standard in sizes 0, 1, 2S and 2, adherence to class C2 limit on the input side without any additional measures
- 8 isolated digital inputs and 6 digital outputs, one of which is a relay output; programmable inputs/outputs
- 1 TF/TH/KTY input for motor protection using a PTC thermistor or thermo contact
- 7-segment display for operating and fault states
- Separate DC 24 V voltage input for powering the inverter electronics (parameter setting, diagnostics and data storage even when the supply system is switched off)
- Separable electronic terminals
- Separable power terminals for devices in size 0 and 1
- STO in accordance with EN 61800-5-2, up to
  - Category 3 performance level d according to EN ISO 13849-1

27793230/EN – 08/2022

### 1.2.2 Control functions

- VFC or CFC control modes for field-oriented operation (asynchronous servo)
- IPOS$^{PLUS®}$ positioning and sequence control system integrated as standard
- 2 complete parameter sets
- Automatic brake control by the inverter
- DC braking to decelerate the motor even in 1Q mode
- Energy-saving function for optimizing the magnetization current automatically
- Slip compensation for high stationary speed accuracy, even without encoder feedback
- Flying restart circuit for synchronizing the inverter to an already rotating motor
- Hoist capability with all motor systems that can be connected
- Motor stall prevention through sliding current limitation in the field weakening range
- Function to hide speed window to avoid mechanical resonances
- Heating current to avoid condensation build-up in the motor
- Parameter lock for protection against changes to parameters
- Speed controller and encoder input for incremental, HIPERFACE® or SSI encoders and resolvers. User-friendly controller setting tool in the operator interface.
- Protective feature for complete protection of the inverter and motor (short circuit, overload, overvoltage/undervoltage, low-impedance ground fault, excess temperature in the inverter, motor stall prevention, excess temperature in the motor)
- Speed monitoring and monitoring of the motor and regenerative limit power
- Programmable signal range monitoring (speed, current, maximum current)
- Memory for displaying X/t diagrams using SCOPE process data visualization four channels (8 channels, real-time capable)
- Fault memory (5 memory slots) with all relevant operating data at the moment of the fault
- Elapsed-time counter for operating hours (device connected to supply system or DC 24 V) and enable hours (output stage energized)
- Modular option technology for application-specific device configuration
- Uniform operation, identical parameter setting and the same device connection technology for the entire MOVIDRIVE® B device family

### 1.2.3 Setpoint technology

- Ramp set changeover (total of 4 ramps)
- Motor potentiometer, can be combined with analog setpoint and internal fixed setpoints
- External setpoint selections: DC (0 – +10 V, -10 V – +10 V, 0 – 20 mA, 4 – 20 mA)
- S pattern for jerk-free speed changes
- Programmable input characteristic for flexible setpoint processing
- 6 bipolar fixed setpoints which can be mixed with external setpoints and motor potentiometer function
- Primary frequency input
- Adjustable jerk limitation

27793230/EN – 08/2022

### 1.2.4 Communication/operation

- System bus for networking max. 64 MOVIDRIVE® devices to one another
- RS485 interface for communication between one PLC/IPC and up to 31 inverters
- Simple startup and parameter setting using keypad or PC
- Pluggable memory module for quick device replacement during service

### 1.2.5 System expansion

- Extensive expansion options, for example:
  - Removable plain text keypad with parameter memory
  - Interface adapter USB11A, UWS21A
  - Fieldbus interface, optionally PROFIBUS, INTERBUS, Ethernet, DeviceNet™, CAN/CANopen, PROFINET, EtherCAT®, Modbus TCP, Ethernet/IP™
  - Input/output card
  - Braking resistors, line filters, line chokes, output chokes, output filters
- MOVITOOLS® MotionStudio with SCOPE process data visualization
- Technology version with access to technology functions and to application modules allows for comfortable solutions of drive tasks.
- MOVIDRIVE® MDR60A/61B regenerative power supply unit. Regenerative energy is fed back into the supply system, which removes the thermal load from the control cabinet and saves costs.

### 1.2.6 Standards and approvals

- UL, cUL, and RCM approval. MOVIDRIVE® MDR60A1320-503-00 is not UL, cUL or RCM approved.
- EAC certificate has been granted for the entire MOVIDRIVE® device family.
- Safe disconnection of power and electronic connections according to EN 61800-5-1
- Compliance with all the requirements for CE marking of machines and plants equipped with MOVIDRIVE® on the basis of the Low Voltage Directive 2014/35/EU and the EMC Directive 2014/30/EU. Complies with the EMC product standard EN 61800-3.
- STO in accordance with EN 61800-5-2, up to
  - Category 3 performance level d according to EN ISO 13849-1

27793230/EN – 08/2022

## 1.3 Additional functions of the application variants

SEW-EURODRIVE offers additional functions for special applications. You can use these additional functions with the MOVIDRIVE® devices of the technology version (...-0T).

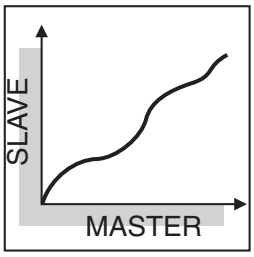
The following additional functions are available:

- Electronic cam
- Internal synchronous operation

### INFORMATION

Please refer to the "Electronic Cam" and "Internal Synchronous Operation" manuals for detailed information about the additional functions.

### 1.3.1 Electronic cam




You can use the MOVIDRIVE® product series with the "electronic cam" module whenever you need to harmonize complex sequences of motion in cyclical machines. This solution gives you much greater flexibility in comparison to the mechanical cam. As a result, it meets the needs of modern production and processing lines.

A user-friendly cam editor supports you during startup. Existing cam data can also be imported. You can also set application-specific parameters for the engagement and disengagement phases using the cam editor.

Note the following points:

- The "electronic cam" can only be implemented with the MOVIDRIVE® MDX61B technology version (...-0T).
- Encoder feedback is mandatory. This is why the "electronic cam" can only be realized in "CFC", "SERVO" and "VFC-n control" operating modes with master/slave connection via X14-X14 or with an SBus connection.
- "Electronic cam" is only available in parameter set 1.
- The "DRS11B synchronous operation card" option cannot be used together with the "electronic cam" function.

#### Motors and encoders

Use the following motor types:

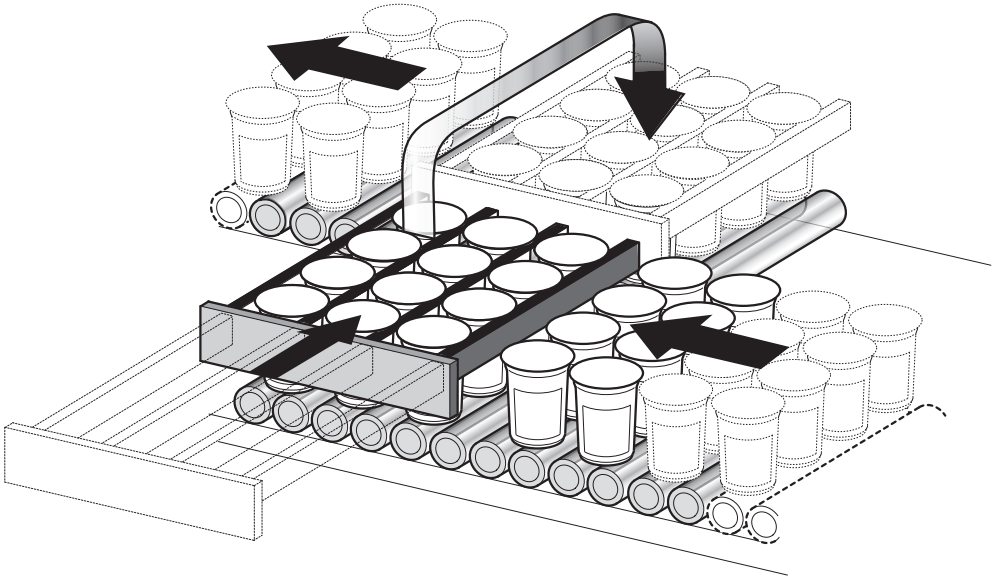
- For operation with MOVIDRIVE® MDX61B...-4-0T:
  - DRL asynchronous servomotor, high-resolution sin/cos encoder installed as standard or HIPERFACE® encoder
  - DR.. AC motor with incremental encoder, preferably high-resolution sin/cos encoder or HIPERFACE® encoder.
  - CM../CMP.. synchronous servomotors, resolver (installed as standard) or HIPERFACE® encoder

27793230/EN – 08/2022

High-resolution speed measurement is required for optimum operation of the electronic cam. The encoders installed as standard on DRL.. and CM../CMP.. motors meet these requirements. SEW-EURODRIVE recommends using high-resolution sin/cos encoders as incremental encoders if DR.. motors are used.

**Example**

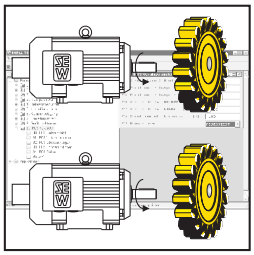
The figure below shows a typical application example for the "electronic cam." Filled yogurt cups are transported for further processing. The "electronic cam" enables smooth movement, which is an important requirement for this application.



*1453201035*

27793230/EN – 08/2022

### 1.3.2 Internal synchronous operation



You can always use the MOVIDRIVE® device series with "internal synchronous operation" whenever a group of motors has to be operated phase-synchronously in relation to one another or with an adjustable proportional ratio (electronic gear unit). A user-friendly editor guides you through the startup procedure.

Note the following points:

- "Internal synchronous operation" can only be implemented with MOVIDRIVE® MDX61B of the technology version (...-0T).
- Encoder feedback is mandatory. For this reason "internal synchronization operation" can only be realized in "CFC", "SERVO" and "VFC-n control" operating modes with master/slave connection via X14-X14 or with an SBus connection.
- "Internal synchronous operation" is only available in parameter set 1.
- The "DRS11B synchronous operation card" option cannot be used together with "internal synchronous operation".

#### Motors and encoders

Use the following motor types for operation with MOVIDRIVE® MDX61B...-4-0T:

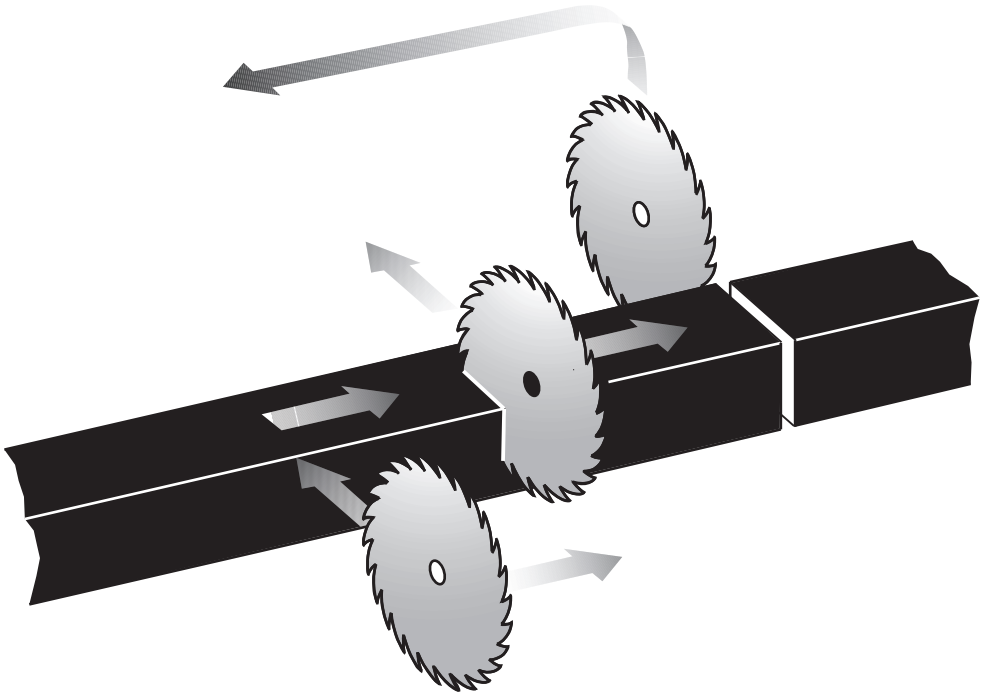
- DRL.. asynchronous servomotor, high-resolution sin/cos encoder installed as standard or HIPERFACE® encoder
- DR.. AC motor with incremental encoder, preferably high-resolution sin/cos encoder or HIPERFACE® encoder.
- CM../CMP.. synchronous servomotors, resolver (installed as standard) or HIPERFACE® encoder

High-resolution speed measurement is required for optimum "internal synchronous operation". The encoders installed as standard with DRL.. and CM../CMP.. motors meet these requirements. SEW-EURODRIVE recommends using high-resolution sin/cos encoders as incremental encoders if DR.. motors are used.

27793230/EN – 08/2022

**Example**

The figure below shows a typical application with "internal synchronous operation". Extruder material must be cut to length. The saw receives a start signal and synchronizes with the material. During the sawing process, the saw moves synchronously with the material. At the end of the sawing process the saw moves back to its starting position.



*41692939*

27793230/EN – 08/2022

## 1.4 Application modules for MOVIDRIVE® MDX61B

### 1.4.1 The drive task

The drive application often involves more than just adjusting the speed of a motor. The inverter often has to control motion sequences and take on typical PLC tasks. More and more complex drive applications have to be solved, without this resulting in lengthy project planning and startup.

### 1.4.2 The solution using MOVIDRIVE®

SEW-EURODRIVE offers various standardized control programs specifically for "positioning," "winding," and "controlling" applications. These programs are called application modules. The application modules are incorporated into MOVITOOLS® MotionStudio and can be used with the technology version.

A user-friendly user interface guides you through the process of setting the parameters. All you have to do is enter the parameters you need for your application. The application module uses this information to create the control program, then loads it onto the inverter. MOVIDRIVE® takes over complete control of the motion processes, the load is taken off the higher-level controller and decentralized concepts are easier to implement.

**The advantages at a glance**

- Wide range of functions
- User-friendly user interface
- You only have to enter the parameters needed for the application
- Guided parameter setting instead of complicated programming
- No programming experience required
- No lengthy training, therefore quick project planning and startup
- All motions are controlled directly via MOVIDRIVE®
- Decentralized concepts can be implemented more easily

### 1.4.3 Scope of delivery and documentation

The application modules are part of the MOVITOOLS® MotionStudio engineering software and can be used with MOVIDRIVE® MDX61B in the technology version (...-0T). The individual application manuals can also be downloaded as PDF from the SEW-EURODRIVE website.

### 1.4.4 Available application modules

The application modules currently available are listed below. These application modules are explained in the following pages.

**Positioning**

Linear movement; the inverter manages the movement records:

- Table positioning via terminal or fieldbus

Linear movement; the PLC manages the movement records:

- Bus positioning

27793230/EN – 08/2022

- Extended positioning via bus
- Absolute positioning (rapid/creep speed positioning)

Rotary motion:

- Modulo positioning via terminals: The inverter manages the movement records
- Modulo positioning via fieldbus: The PLC manages the movement records

**Winding**

- Center winder

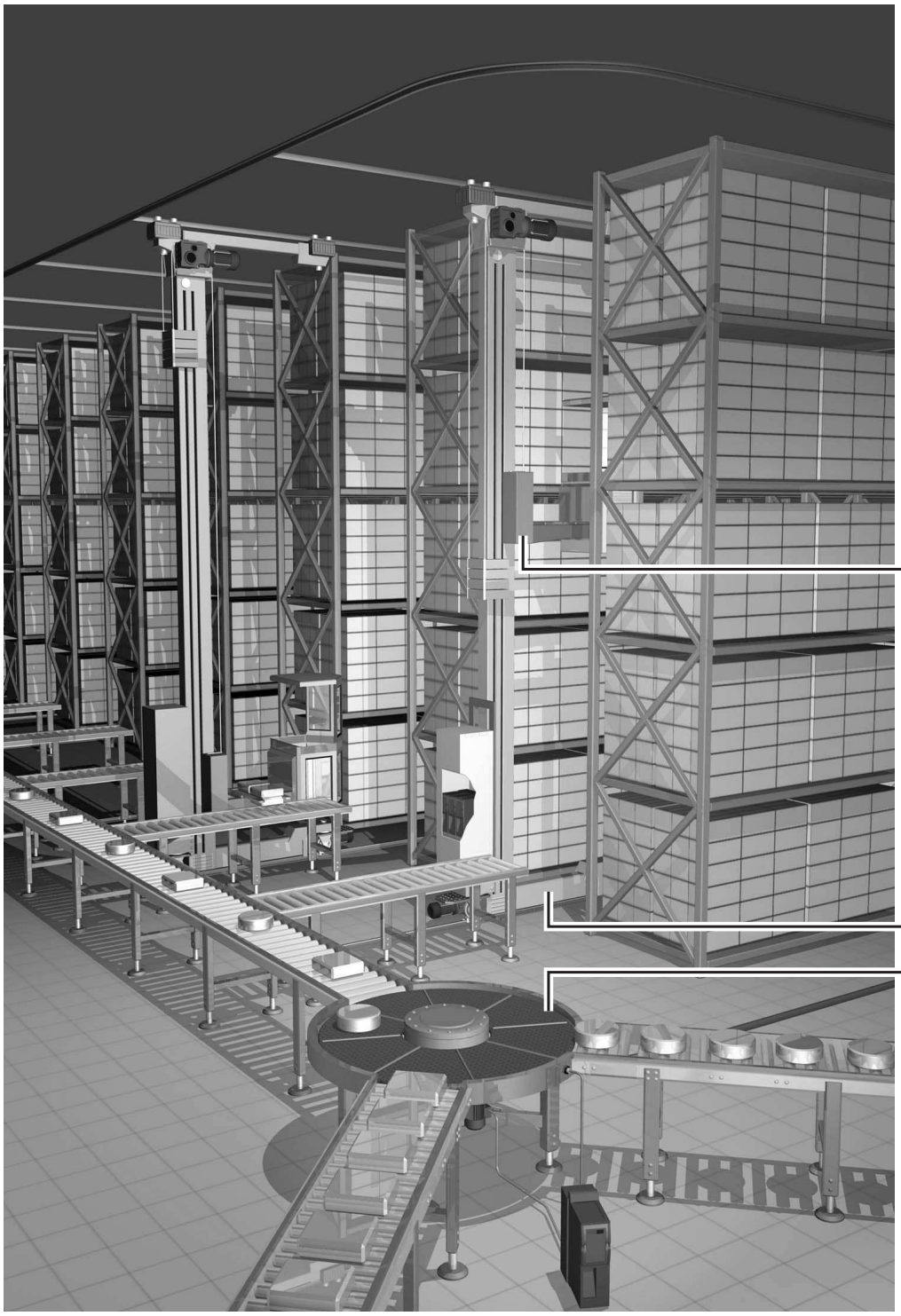
**Control**

- Flying saw
- DriveSync via fieldbus
- Sensor-based positioning

27793230/EN – 08/2022

### 1.4.5 Application

The following illustration shows an example of how the various SEW-EURODRIVE application modules are used in a high-bay warehouse.




*1453256971*

1. Hoist: Table positioning
2. Travel axis: Absolute or bus positioning
3. Rotary distributor: Modulo positioning

27793230/EN – 08/2022

### 1.4.6 Positioning

The application modules for the “Positioning” application are suited to all applications in which target positions are specified and movement then takes place to those positions. Movement can either be linear or rotatory.

For example, horizontal drives, hoists, gantries, rotary tables, swiveling devices as well as storage/retrieval units.

### 1.4.7 Linear positioning

In the case of application modules for linear positioning, SEW-EURODRIVE distinguishes between whether the movement records are administered in the inverter or in the higher-level PLC.

**Movement records in the inverter**

- **Table positioning via terminals**
- **Table positioning via fieldbus**

This application modules are suited to applications in which movement only has to take place to a limited number of target positions and in which the highest possible degree of independence from the higher-level controller is required.

Up to 32 movement records can be managed in the inverter in these application modules. A movement record comprises target position, speed and ramp. The target position to which movement is to take place is selected using binary code, by means of the digital inputs of the inverter or via the virtual terminals (fieldbus, system bus). The application modules offer the following features:

- Up to 32 table positions can be defined and selected.
- The travel speed can be selected for each positioning movement.
- The ramp can be set separately for each positioning movement.
- Software limit switches can be defined and evaluated.
- Either incremental encoders or absolute encoders can be evaluated as encoders.
- Guided startup and diagnostics.

Four operating modes are available for controlling the machine:

- Jog mode: The machine can be moved manually.
- Reference travel: The machine zero is determined automatically for incremental position measurement.
- Teach-In: The saved position can be corrected without a programming device.
- Automatic mode: The higher-level PLC controls the process automatically.

27793230/EN – 08/2022

### Movement records in the PLC

#### Bus positioning and extended bus positioning

These application modules are suited to applications in which movement to various of target positions is required.

The movement records are managed in the PLC for these application modules. The target position and travel speed are specified via the fieldbus or system bus. The application modules offer the following features:

- Any number of target positions can be defined and selected via fieldbus/system bus.
- The traveling velocity can be selected as required via the fieldbus/system bus for each positioning movement.
- Software limit switches can be defined and evaluated.
- Either incremental encoders or absolute encoders can be evaluated as encoders.
- Straightforward connection to the higher-level controller.
- Guided startup and diagnostics.

Three operating modes are available for controlling the machine:

- Jog mode: The machine can be moved manually.
- Reference travel: The machine zero is determined automatically for incremental position measurement.
- Automatic mode: The higher-level PLC controls the process automatically.

#### Absolute positioning (rapid/creep speed positioning)

In this application module, the movement records are also managed in the PLC and specified via the fieldbus or system bus. No motor encoder is required. The absolute encoder mounted on the travel path is used for positioning. This application module has the following features:

- Any number of target positions can be defined and selected via fieldbus/system bus.
- Software limit switches can be defined and evaluated.
- Only absolute encoders are used for position measurement.
- No motor encoder is required.
- Straightforward connection to the higher-level controller.
- Guided startup and diagnostics.

The following operating modes are available for controlling the machine:

- Jog mode: The machine can be moved manually.
- Automatic mode: The higher-level PLC controls the process automatically.

27793230/EN – 08/2022

### 1.4.8 Rotary positioning

**Modulo positioning**

A large number of movements have to be controlled in automated conveyor and logistics applications in order to transport the material. Linear movements of vertical drives or hoists, and rotary movements via rotary tables are important in these applications.

Rotary movements are often synchronized (rotary tables); the material is fed at a specific degree value. However, there are also many rotary applications in which the material has to be moved to its destination by the shortest possible route (distance-optimized positioning) or in which movement to the target position is only permitted in a defined direction of rotation (positioning with fixed direction of rotation).

The position axis is represented on a numbered circle from 0° to 360° to meet these requirements. The actual position is always in this range.

The "modulo positioning" application module accomplishes these tasks using various operating modes which are selected via digital inputs (16 table positions) or virtual terminals (control via fieldbus, variable positions).

The following operating modes are available for controlling the machine:

- Jog mode
- Teach mode (terminal control only)
- Referencing mode
- Automatic mode with position optimization
- Automatic mode with direction of rotation inhibit (clockwise – counterclockwise)
- Synchronous automatic mode

**The "modulo positioning" module offers the following advantages:**

- User-friendly user interface
- Only the parameters required for Modulo positioning (number of teeth in the gear unit, speed) have to be entered
- Guided parameter setting instead of complicated programming
- Monitor mode for optimum diagnostics
- Users do not need any programming experience
- Rapid familiarization with the system

27793230/EN – 08/2022

### 1.4.9 Winding

**Center winder**

The "center winder" application module is suitable for applications in which endless material, such as paper, plastic, fabrics, sheet metal or wire, must be wound, unwound or rewound continuously.

The system is controlled by means of the digital inputs of the inverter or via the virtual terminals (fieldbus, system bus).

The "central winder" application module has the following features:

- Constant tensile force or path velocity independent of the diameter.
- Automatic calculation of the speed-dependent friction factors via a teach-in run.
- Winding characteristics to prevent the winding material from becoming loose.
- Binary selection of 4 different winding cores.
- Diameter can be determined using a diameter calculator (master encoder required) or an analog input (distance sensor required).
- Free-running function (jog).
- CW/CCW winding, winding/unwinding.
- Simple connection to the higher-level controller (PLC).
- Guided startup and diagnostics.

Four operating modes are available for controlling the machine:

- Jog mode: The machine can be moved to the right or the left manually.
- Teach-in run: The speed-dependent friction factors are determined automatically.
- Automatic mode with constant tension.
- Automatic mode with constant velocity.

### 1.4.10 Controlling

**Flying saw**

The "Flying saw" application module is suited to applications in which endless material has to be cut, sawn or pressed, for example in diagonal saws or flying punches.

This application module is used to control the sequence of motion according to specific values. This application module has the following features:

- Choice of fieldbus or terminal control.
- Cut edge protection or singling using the “Draw gap” function.
- Immediate cut function in the form of manual interrupt.
- Counter for material length.
- Straightforward connection to the higher-level controller.
- Guided startup and diagnostics.

Four operating modes are available for controlling the machine:

- Jog mode: The machine can be moved manually.
- Reference travel: The system reference point is determined.
- Positioning mode
- Automatic mode

27793230/EN – 08/2022

### DriveSync via fieldbus

The "DriveSync via fieldbus" application module makes it possible to implement conveyor systems and machinery with drives that occasionally or permanently have to move phase-synchronously.

The program can be used for the master drive and the slave drive. The master works in the "Jog" and "Positioning" operating modes, while the slave drives are operated in "synchronous operation" mode.

If the "Synchronous operation" mode is deselected for the slave drives, they can be operated with free-running in "Jog" and "Positioning" operating modes.

The "DriveSync via fieldbus" application module has the following features:

- Guided startup as well as extensive diagnostic functions.
- High degree of similarity with "Extended positioning via bus".
- One program module for master and slave drive.
- The selected IPOS$^{PLUS®}$ encoder source is also effective in synchronous operation.
- The master value for "synchronous operation" mode can be adjusted.
- A mechanical vertical shaft can be replaced by transferring the virtual master value via an SBus connection.
- Endless rotation is supported by the modulo function.

Four operating modes are available for controlling the application:

- Jog mode
- Reference travel
- Positioning mode
- Synchronous mode
  - The electrical connection of the master/slave can be made using the X14 encoder connection or an SBus connection.
  - If the SBus connection is used, the content of the send object can be adjusted.
  - Time or position-related sequence of motion for synchronization processes.
  - The startup cycle process can also be started with interrupt control.

### Sensor-based positioning

This application module is used to position the drive using an external sensor signal plus an adjustable remaining distance. This application module is especially suitable for applications in the following industrial sectors:

- Materials handling technology
  - Trolleys
  - Hoists
  - Rail vehicles
- Logistics
  - Storage and retrieval systems
  - Transverse carriage

27793230/EN – 08/2022

## 1.5 MOVITOOLS® MotionStudio engineering software

### 1.5.1 Tasks

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

- Establishing communication with devices
- Executing functions of the devices

### 1.5.2 Establishing communication with the units

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

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 4 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.

### 1.5.3 Executing functions with the units

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.

### 1.5.4 Technical support

SEW-EURODRIVE offers a 24-hour service hotline.

Simply dial **(+49) 0800** and enter the letters **SEWHELP** using the telephone keypad. Of course, you can also dial **(+49) 0800 - 7 39 43 57**.

27793230/EN – 08/2022

### 1.5.5 Online help

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

- This 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" control field, 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.

## 1.6 SEW-Workbench

The SEW-Workbench is the central configuration software for inverters by SEW-EURODRIVE.

All necessary configurations can be processed, from entering the application to gear unit, motor and inverter calculations. Other features are optimization of the various axis cycles including the selection of accessories and a fault check of the entire drive system configuration.

Of course, the workbench can also be used to select and dimension all other products from SEW-EURODRIVE (such as decentralized drives and gearmotors). This means the SEW-Workbench allows for specifying drive solutions from the entire range of products from SEW-EURODRIVE. The straightforward operation saves a lot of time and minimizes complexity.

The key features of the SEW-Workbench are:

- Application selection.
- Calculation of gear unit and motor.
- Price-optimized project planning.
- Comparison of different solutions.
- Inverter calculation.
- Multi-axis optimization.
- Parameterization of cable and accessories selection.
- Dimensioning faults check.
- Parts list generation.
- Electronic catalog with all products.

The project planning software SEW-Workbench is available for download from the official SEW-EURODRIVE website.

To use SEW-Workbench, all you need to do is to register via the Online Support once you have downloaded the software or received the data DVD. An Internet update service ensures that products and functions are always up-to-date.

27793230/EN – 08/2022

# 2 Technical data of basic device

## 2.1 CE marking, approvals

### 2.1.1 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.

### 2.1.2 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.

### 2.1.3 RCM

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

### 2.1.4 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).

27793230/EN – 08/2022

## 2.2 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[1] $\vartheta_L$ | -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) | |
| Sizes 0 to 2 | IP20 |
| Size 3 | • 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 |
| Sizes 4 to 5 | 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 |
| Size 6 | 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) |
| Size 7 | 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 |

27793230/EN – 08/2022

| MOVIDRIVE® MDX60B/61B | All sizes |
|---|---|
| Installation altitude h | Up to h ≤ 1000 m without restrictions.<br>The following restrictions apply at h ≥ 1000 m:<br>• From 1,000 m to max. 4,000 m:<br>– $I_N$ reduction by 1% per 100 m<br>• From 2,000 m to max. 4,000 m:<br>– 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)<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.

27793230/EN – 08/2022

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

### 2.3.1 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[1] $I_{line}$ | 100% | AC 1.8 A | AC 2.2 A | AC 2.8 A | AC 3.6 A |
| (at $V_{line}$ = 3 × AC 400 V) | 125% | AC 2.3 A | AC 2.7 A | AC 3.5 A | AC 4.5 A |
| OUTPUT | | | | | |
| Apparent output power[2] (at $V_{line}$ = 3 × AC 380 – 500 V) | $S_N$ | 1.4 kVA | 1.6 kVA | 2.1 kVA | 2.8 kVA |
| Nominal output current[1] (at $V_{line}$ = 3 × AC 400 V) | $I_N$ | AC 2 A | AC 2.4 A | AC 3.1 A | AC 4 A |
| Continuous output current (= 125% $I_N$) (at $V_{line}$ = 3 × 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% $I_N$) (at $V_{line}$ = 3 × 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 (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 $min^{-1}$ / 0.2 $min^{-1}$ over the entire range | | | |
| GENERAL | | | | | |
| Power loss at $S_N$[2] | $P_{Vmax}$ | 42 W | 48 W | 58 W | 74 W |
| Cooling air consumption | | 3 $m^3$/h | | 9 $m^3$/h | |
| Cross section of device terminals X1, X2, X3, X4 | | Separable terminal strips 4 $mm^2$ 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 × 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 | 8277230 | 8277249 | 8277257 |
| | | 8289476 | 8289484 | 8289492 | 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 | 8277273 | 8277281 | 827729X |
| | | 8289514 | 8289522 | 8289530 | 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) Design with coated printed circuit boards | | 0005-5A3-4-00 0005-5A3-4-00/L | 0008-5A3-4-00 0008-5A3-4-00/L | 0011-5A3-4-00 0011-5A3-4-00/L | 0014-5A3-4-00 0014-5A3-4-00/L |
| Part number | | 8277303 8289557 | 8277311 8289565 | 827732X 8289573 | 8277338 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" (→ 353) | | | |

27793230/EN – 08/2022

### 2.3.2 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_ |
|---|---|---|---|---|---|
| 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[1] $I_{line}$ | 100% | AC 3.6 A | AC 5.0 A | AC 6.3 A | AC 8.6 A |
| (at $V_{line}$ = 3 × AC 400 V) | 125% | AC 4.5 A | AC 6.2 A | AC 7.9 A | AC 10.7 A |
| OUTPUT | | | | | |
| Apparent output power[2] (at $V_{line}$ = 3 × AC 380 – 500 V) | $S_N$ | 2.8 kVA | 3.8 kVA | 4.9 kVA | 6.6 kVA |
| Nominal output current[1] (at $V_{line}$ = 3 × AC 400 V) | $I_N$ | AC 4 A | AC 5.5 A | AC 7 A | AC 9.5 A |
| Continuous output current (= 125% $I_N$) (at $V_{line}$ = 3 × 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% $I_N$) (at $V_{line}$ = 3 × 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 (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 $min^{-1}$ / 0.2 $min^{-1}$ over the entire range | | | |
| GENERAL | | | | | |
| Power loss at $S_N$[2] | $P_{Vmax}$ | 85 W | 105 W | 130 W | 180 W |
| Cooling air consumption | | 40 $m^3$/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 $mm^2$ 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 × 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 |
| Recommended motor power | | | | |

| | | | | | |
|---|---|---|---|---|---|
|  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" (→ 🗎 353) | | | |

### 2.3.3 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[1] $I_{line}$ | 100% | AC 11.3 A | AC 14.4 A | AC 21.6 A |
| (at $V_{line}$ = 3 × AC 400 V) | 125% | AC 14.1 A | AC 18.0 A | AC 27.0 A |
| OUTPUT | | | | |
| Apparent output power[2] (at $V_{line}$ = 3 × AC 380 – 500 V) | $S_N$ | 8.7 kVA | 11.2 kVA | 16.8 kVA |
| Nominal output current[1] (at $V_{line}$ = 3 × AC 400 V) | $I_N$ | AC 12.5 A | AC 16 A | AC 24 A |
| Continuous output current (= 125% $I_N$) (at $V_{line}$ = 3 × AC 400 V with $f_{PWM}$ = 4 kHz) | $I_D$ | AC 15.6 A | AC 20 A | AC 30 A |
| Continuous output current (= 100% $I_N$) (at $V_{line}$ = 3 × 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 (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 $min^{-1}$ / 0.2 $min^{-1}$ over the entire range | | |
| GENERAL | | | | |
| Power loss at $S_N$[2] | $P_{Vmax}$ | 180 W | 230 W | 400 W |
| Cooling air consumption | | 80 $m^3/h$ | | |
| 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 $mm^2$ conductor end sleeve DIN 46228 | | M4 screw and washer assembly with terminal clip<br>4 $mm^2$ conductor end sleeve DIN 46228<br>6 $mm^2$ crimp cable lug 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 × 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 | 08279624 | 08279632 |
| | | 18400175 | 18400183 | 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 | 08279802 | 08279810 |
| | | 18400353 | 18400361 | 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 |
| Recommended motor power | | → MOVIDRIVE® B system manual or catalog, chapter "Basic recommendations for motor selection" (→ 🗎 353) | | |

27793230/EN – 08/2022

### 2.3.4 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_ |
|---|---|---|---|---|
| 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[1] $I_{line}$ | 100% | AC 28.8 A | AC 41.4 A | AC 54 A |
| (at $V_{line}$ = 3 × AC 400 V) | 125% | AC 36 A | AC 51.7 A | AC 67.5 A |
| OUTPUT | | | | |
| Apparent output power[2] (at $V_{line}$ = 3 × AC 380 – 500 V) | $S_N$ | 22.2 kVA | 31.9 kVA | 41.6 kVA |
| Nominal output current[1] (at $V_{line}$ = 3 × AC 400 V) | $I_N$ | AC 32 A | AC 46 A | AC 60 A |
| Continuous output current (= 125% $I_N$) (at $V_{line}$ = 3 × AC 400 V with $f_{PWM}$ = 4 kHz) | $I_D$ | AC 40 A | AC 57.5 A | AC 75 A |
| Continuous output current (= 100% $I_N$) (at $V_{line}$ = 3 × 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 (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 $min^{-1}$ / 0.2 $min^{-1}$ over the entire range | | |
| GENERAL | | | | |
| Power loss at $S_N$[2] | $P_{Vmax}$ | 550 W | 750 W | 950 W |
| Cooling air consumption | | 180 $m^3$/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 $mm^2$, 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 × 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 | 08279659 | 08279667 |
| | | 18400205 | 18400213 | 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 | 08279837 | 08279845 |
| | | 18400396 | 18400418 | 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" (→ 🖹 353) | | |

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

| MOVIDRIVE® MDX61B | | 0370-503-4-0_ | 0450-503-4-0_ |
|---|---|---|---|
| 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[1] $I_{line}$ | 100% | AC 65.7 A | AC 80.1 A |
| (at $V_{line}$ = 3 × AC 400 V) | 125% | AC 81.9 A | AC 100.1 A |
| OUTPUT | | | |
| Apparent output power[2] (at $V_{line}$ = 3 × AC 380 – 500 V) | $S_N$ | 51.1 kVA | 62.3 kVA |
| Nominal output current[1] (at $V_{line}$ = 3 × AC 400 V) | $I_N$ | AC 73 A | AC 89 A |
| Continuous output current (= 125% $I_N$) (at $V_{line}$ = 3 × AC 400 V with $f_{PWM}$ = 4 kHz) | $I_D$ | AC 91 A | AC 111 A |
| Continuous output current (= 100% $I_N$) (at $V_{line}$ = 3 × 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 (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 $min^{-1}$ / 0.2 $min^{-1}$ over the entire range | |
| GENERAL | | | |
| Power loss at $S_N$[2] | $P_{Vmax}$ | 1200 W | 1450 W |
| Cooling air consumption | | 180 $m^3/h$ | |
| 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 $mm^2$<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 × 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 |
| Recommended motor power | | | |
|  Constant load | $P_{Mot}$ | 37 kW | 45 kW |
|  Variable torque load or constant load without overload | $P_{Mot}$ | 45 kW | 55 kW |
| Recommended motor power | | → MOVIDRIVE® B system manual or catalog, chapter "Basic recommendations for motor selection" (→ 353) | |

27793230/EN – 08/2022

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

| MOVIDRIVE® MDX61B | | 0550-503-4-0_ | 0750-503-4-0_ |
|---|---|---|---|
| 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[1] $I_{line}$ | 100% | AC 94.5 A | AC 117 A |
| (at $V_{line}$ = 3 × AC 400 V) | 125% | AC 118.1 A | AC 146.3 A |
| OUTPUT | | | |
| Apparent output power[2] (at $V_{line}$ = 3 × AC 380 – 500 V) | $S_N$ | 73.5 kVA | 91.0 kVA |
| Nominal output current[1] (at $V_{line}$ = 3 × AC 400 V) | $I_N$ | AC 105 A | AC 130 A |
| Continuous output current (= 125% $I_N$) (at $V_{line}$ = 3 × AC 400 V with $f_{PWM}$ = 4 kHz) | $I_D$ | AC 131 A | AC 162 A |
| Continuous output current (= 100% $I_N$) (at $V_{line}$ = 3 × 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 (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 $min^{-1}$ / 0.2 $min^{-1}$ over the entire range | |
| GENERAL | | | |
| Power loss at $S_N$[2] | $P_{Vmax}$ | 1700 W | 2000 W |
| Cooling air consumption | | 360 $m^3/h$ | |
| 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 $mm^2$<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 × 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 |
| Recommended motor power | | | |
|  Constant load | $P_{Mot}$ | 55 kW | 75 kW |
|  Variable torque load or constant load without overload | $P_{Mot}$ | 75 kW | 90 kW |
| Recommended motor power | | → MOVIDRIVE® B system manual or catalog, chapter "Basic recommendations for motor selection" (→ 353) | |

### 2.3.7 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_ |
|---|---|---|---|---|
| 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[1] $I_{line}$ | 100% | AC 153 A | AC 180 A | AC 225 A |
| (at $V_{line}$ = 3 × AC 400 V) | 125% | AC 191 A | AC 225 A | AC 281 A |
| OUTPUT | | | | |
| Apparent output power[2] (at $V_{line}$ = 3 × AC 380 – 500 V) | $S_N$ | 118 kVA | 139 kVA | 174 kVA |
| Nominal output current[1] (at $V_{line}$ = 3 × AC 400 V) | $I_N$ | AC 170 A | AC 200 A | AC 250 A |
| Continuous output current (= 125 % $I_N$) (at $V_{line}$ = 3 × AC 400 V with $f_{PWM}$ = 4 kHz) Temperature range 0 °C – +40 °C | $I_D$ | AC 212 A | AC 250 A | AC 312 A |
| Continuous output current (= 100% $I_N$) $I_D$ (at $V_{line}$ = 3 × AC 400 V with $f_{PWM}$ = 8 kHz) 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 (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 $min^{-1}$ / 0.2 $min^{-1}$ over the entire range | | |
| GENERAL | | | | |
| Power loss at $S_N$[2] | $P_{Vmax}$ | 1983 W | 2240 W | 2700 W |
| Cooling air consumption | | 600 $m^3$/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 $mm^2$<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 × 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 |
| Recommended motor power | | | | |
|  Constant load | $P_{Mot}$ | 90 kW | 110 kW | 132 kW |
|  Variable torque load or constant load without overload | $P_{Mot}$ | 110 kW | 132 kW | 160 kW |
| Recommended motor power | | → MOVIDRIVE® B system manual or catalog, chapter "Basic recommendations for motor selection" (→ 🗎 353) | | |

27793230/EN – 08/2022

### 2.3.8 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 |
|---|---|---|---|---|
| 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[1] $I_{line}$ | 100% | AC 280 A | AC 340 A | AC 435 A |
| (at $V_{line}$ = 3 × AC 400 V) | 125% | AC 340 A | AC 425 A | AC 535 A |
| OUTPUT | | | | |
| Maximum output voltage | | 599 Hz | 599 Hz | 599 Hz |
| Apparent output power[2]<br>(at $V_{line}$ = 3 × AC 380 – 500 V) | $S_N$ | 208 kVA | 263 kVA | 326 kVA |
| Nominal output current[1]<br>(at $V_{line}$ = 3 × 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 × 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 × 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 (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 $min^{-1}$ / 0.2 $min^{-1}$ over the entire range | | |
| GENERAL | | | | |
| Power loss at $S_N$[2] | $P_{Vmax}$ | 2691 W | 3182 W | 3880 W |
| Cooling air consumption | | 1200 $m^3$/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 $mm^2$<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 $mm^2$<br>Tightening torque ≤ 4 $mm^2$ = 0.5 Nm<br>Tightening torque > 4 $mm^2$ = 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 × 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 |
| Recommended motor power | | | | |
|  <br>Constant load | $P_{Mot}$ | 160 kW | 200 kW | 250 kW |
|  <br>Variable torque load or constant load without overload | $P_{Mot}$ | 200 kW | 250 kW | 315 kW |
| Recommended motor power | | → MOVIDRIVE® B system manual or catalog, chapter "Basic recommendations for motor selection" (→ 🗎 353) | | |

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

### 2.4.1 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 × AC 230 V) | 125% | AC 8.4 A | AC 9.8 A | AC 16.1 A |
| OUTPUT | | | | |
| Apparent output power[1)]<br>(at $V_{line}$ = 3 × AC 380 – 240 V) | $S_N$ | 2.7 kVA | 3.4 kVA | 5.8 kVA |
| Nominal output current<br>(at $V_{line}$ = 3 × 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 × 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 × 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 (4Q operation) | $R_{BWmin}$ | 27 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 $min^{-1}$ / 0.2 $min^{-1}$ over the entire range | | |
| GENERAL | | | | |
| Power loss at $S_N$[1)] | $P_{Vmax}$ | 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 | | 0015-2A3-4-0T | 0022-2A3-4-0T | 0037-2A3-4-0T |
| Part number | | 08280037 | 08280045 | 08280053 |
| Recommended motor power | | | | |
|  <br>Constant load | $P_{Mot}$ | 1.5 kW | 2.2 kW | 3.7 kW |
|  <br>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" (→ 353) | | |

27793230/EN – 08/2022

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

| MOVIDRIVE® MDX61B | | 0055-2A3-4-0_ | 0075-2A3-4-0_ |
|---|---|---|---|
| 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 19.5 A | AC 27.4 A |
| (at $V_{line}$ = 3 × AC 230 V) | 125% | AC 24.4 A | AC 34.3 A |
| OUTPUT | | | |
| Apparent output power[1)] (at $V_{line}$ = 3 × AC 380 – 240 V) | $S_N$ | 8.8 kVA | 11.6 kVA |
| Nominal output current (at $V_{line}$ = 3 × AC 230 V) | $I_N$ | AC 22 A | AC 29 A |
| Continuous output current (= 125% $I_N$) (at $V_{line}$ = 3 × AC 230 V with $f_{PWM}$ = 4 kHz) | $I_D$ | AC 27.5 A | AC 36.3 A |
| Continuous output current (= 100% $I_N$) (at $V_{line}$ = 3 × 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 (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 $min^{-1}$ / 0.2 $min^{-1}$ over the entire range | |
| GENERAL | | | |
| Power loss at $S_N$[1)] | $P_{Vmax}$ | 330 W | 423 W |
| Cooling air consumption | | 80 $m^3$/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 $mm^2$ conductor end sleeve DIN 46228<br>6 $mm^2$ 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 |
| Recommended motor power | | | |
|  Constant load | $P_{Mot}$ | 5.5 kW | 7.5 kW |
|  Variable torque load or constant load without overload | $P_{Mot}$ | 7.5 kW | 11 kW |
| Recommended motor power | | → MOVIDRIVE® B system manual, chapter "Basic recommendations for motor selection" (→ 353) | |

### 2.4.3 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 × AC 230 V) | 125% | AC 50 A | AC 61 A |
| OUTPUT | | | |
| Apparent output power[1)] (at $V_{line}$ = 3 × AC 380 – 240 V) | $S_N$ | 17.1 kVA | 21.5 kVA |
| Nominal output current (at $V_{line}$ = 3 × AC 230 V) | $I_N$ | AC 42 A | AC 54 A |
| Continuous output current (= 125% $I_N$) (at $V_{line}$ = 3 × AC 230 V with $f_{PWM}$ = 4 kHz) | $I_D$ | AC 52.5 A | AC 67.5 A |
| Continuous output current (= 100% $I_N$) (at $V_{line}$ = 3 × 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 (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 $min^{-1}$ / 0.2 $min^{-1}$ over the entire range | |
| GENERAL | | | |
| Power loss at $S_N$[1)] | $P_{Vmax}$ | 580 W | 760 W |
| Cooling air consumption | | 180 $m^3/h$ | |
| 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 $mm^2$, 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 | | | |
|  Constant load | $P_{Mot}$ | 11 kW | 15 kW |
|  Variable torque load or constant load without overload | $P_{Mot}$ | 15 kW | 22 kW |
| Recommended motor power | | → MOVIDRIVE® B system manual, chapter "Basic recommendations for motor selection" (→ 353) | |

27793230/EN – 08/2022

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

| MOVIDRIVE® MDX61B | | 0220-203-4-0_ | 0300-203-4-0_ |
|---|---|---|---|
| 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 72 A | AC 86 A |
| (at $V_{line}$ = 3 × AC 230 V) | 125% | AC 90 A | AC 107 A |
| OUTPUT | | | |
| Apparent output power[1)] (at $V_{line}$ = 3 × AC 380 – 240 V) | $S_N$ | 31.9 kVA | 37.8 kVA |
| Nominal output current (at $V_{line}$ = 3 × AC 230 V) | $I_N$ | AC 80 A | AC 95 A |
| Continuous output current (= 125 % $I_N$) (at $V_{line}$ = 3 × AC 230 V with $f_{PWM}$ = 4 kHz) | $I_D$ | AC 100 A | AC 118 A |
| Continuous output current (= 100% $I_N$) (at $V_{line}$ = 3 × 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 (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 $min^{-1}$ / 0.2 $min^{-1}$ over the entire range | |
| GENERAL | | | |
| Power loss at $S_N$[1)] | $P_{Vmax}$ | 1100 W | 1300 W |
| Cooling air consumption | | 180 $m^3/h$ | |
| 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 $mm^2$<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" (→ 353) | |

## 2.5 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 mA<br>REF2: DC -10 V +0%/-5%, $I_{max}$ = DC 3 mA | | Reference voltages for setpoint potentiometer | |
| Setpoint input n1 | X11:2/X11:3 | AI11/AI12: Voltage or current input, can be set with S11 and P11_, sampling cycle 1 ms | | | |
| (differential input) | | Voltage input: | | Current input: | |
| Operating mode AI11/AI12 | | n1 = DC 0 – +10 V or DC -10 V – 0 – +10 V | | n1 = DC 0 – 20 mA or DC 4 – 20 mA | |
| Resolution | | 12-bit | | 11-bit | |
| Accuracy | | ±0.2% (40 mV) | | ±0.2% (40 mV) | |
| Internal resistance | | $R_i$ 40 kΩ (external voltage supply)<br>$R_i$ = 20 kΩ (supply of REF1/REF2) | | $R_i$ = 250 Ω | |
| Internal setpoints | | Parameter set 1: n11/n12/n13 = -6000 – 0 – +6000 $min^{-1}$<br>Parameter set 2: n21/n22/n23 = -6000 – 0 – +6000 $min^{-1}$ | | | |
| Time ranges of the speed ramps with Δn = 3000 $min^{-1}$ | | 1. Ramp | t11/t21 | Up: 0 – 2000 s | Down: 0 – 2000 s |
| | | 2. Ramp | t12/t22 | Up = Down: 0 – 2000 s | |
| | | Stop ramp | t13/t23 | Down: 0 – 20 s | |
| | | Emergency stop ramp | t14/t24 | Down: 0 – 20 s | |
| | | Motor potentiometer | t3 | Up: 0.2 – 50 s | Down: 0.2 – 50 s |
| Auxiliary voltage output[1]<br>X13:8/X10:8 | | VO24: $V_{OUT}$ = DC 24 V, maximum current carrying capacity $I_{max}$ = DC 400 mA | | | |
| External voltage supply[1]<br>X10:9 | | VI24: V = DC 24 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 | | Isolated (optocoupler), PLC-compatible (EN 61131 type 2), sampling cycle 1 ms | | | |
| X13:1 – X13:6 and X16:1/X16:2 | | DIØØ – DIØ5 and DIØ6/DIØ7 | | | |
| Internal resistance | | $R_i$ ≈ 3 kΩ, IE ≈ DC 10 mA | | | |
| Signal level | | DC +13 V – +30 V = "1" = contact closed<br>DC -3 V – +5 V = "0" = contact open | | According to EN 61131 | |
| Function | X13:1 | DIØØ: With fixed assignment "/Controller inhibit" | | | |
| X13:2 – X13:6, X16:1/X16:2 | | DIØ1 – DIØ5, DIØ6/DIØ7: Selection option → Parameter menu P60_ | | | |
| Digital output[1] | | PLC-compatible (EN 61131-2), response time 1 ms | | | |
| X10:3/X10:7 and X16:3 – X16:5 | | DBØØ/DOØ2 and DOØ3 – DOØ5 | | | |
| Signal level | | "0" = DC 0 V "1" = DC +24 V **Important**: Do not apply external voltage! | | | |
| Function | X10:3 | DBØØ: With fixed assignment "/Brake", $I_{max}$ = DC 150 mA, short-circuit proof, protected against external voltage to DC 30 V | | | |
| | | DOØ2, DOØ3 – DOØ5: Selection option → Parameter menu P62_, | | | |
| X10:7, X16:3 – X16:5 | | $I_{max}$ = DC 50 mA, short-circuit proof, protected against external voltage to DC 30 V | | | |
| Relay output | X10:4 – X10:6 | DOØ1: Current-carrying capacity of the relay contacts $V_{max}$ = DC 30 V, $I_{max}$ = DC 800 mA | | | |
| Function | X10:4 | DOØ1-C: Shared relay contact | | Selection option → Parameter menu P62_ | |
| | X10:5 | DOØ1-NO: NO contact | | | |
| | X10:6 | DOØ1-NC: NC contact | | | |
| System bus (SBus) | X12:1 | DGND: Reference potential | CAN bus to CAN specification 2.0, parts A and B, transmission technology to ISO 11898, max. 64 participants, terminating resistor (120 Ω) can be activated using DIP switches | | |
| | X12:2 | SC11: SBus high | | | |
| | X12:3 | SC12: SBus low | | | |
| RS485 interface | X13:10 | ST11: RS485 + | EIA standard, 9.6 kBaud, max. 32 stations<br>Max. cable length 200 m<br>Dynamic terminating resistor with fixed installation | | |
| | X13:11 | ST12: RS485 - | | | |
| TF/TH/KTY/PK input | X10:1 | TF1: Response threshold at $R_{TF}$ ≥ 2.9 kΩ ±10% | | | |

1) The device provides a current of Imax = DC 400 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 | X11:4 | AGND: Reference potential for analog signals and terminals X11:1 and X11:5 (REF1/REF2) |
| X12:1/X13:9/X16:6/X10:2/X10:10 | | DGND: Reference potential for binary signals, system bus, RS485 interface and TF/TH |

27793230/EN – 08/2022

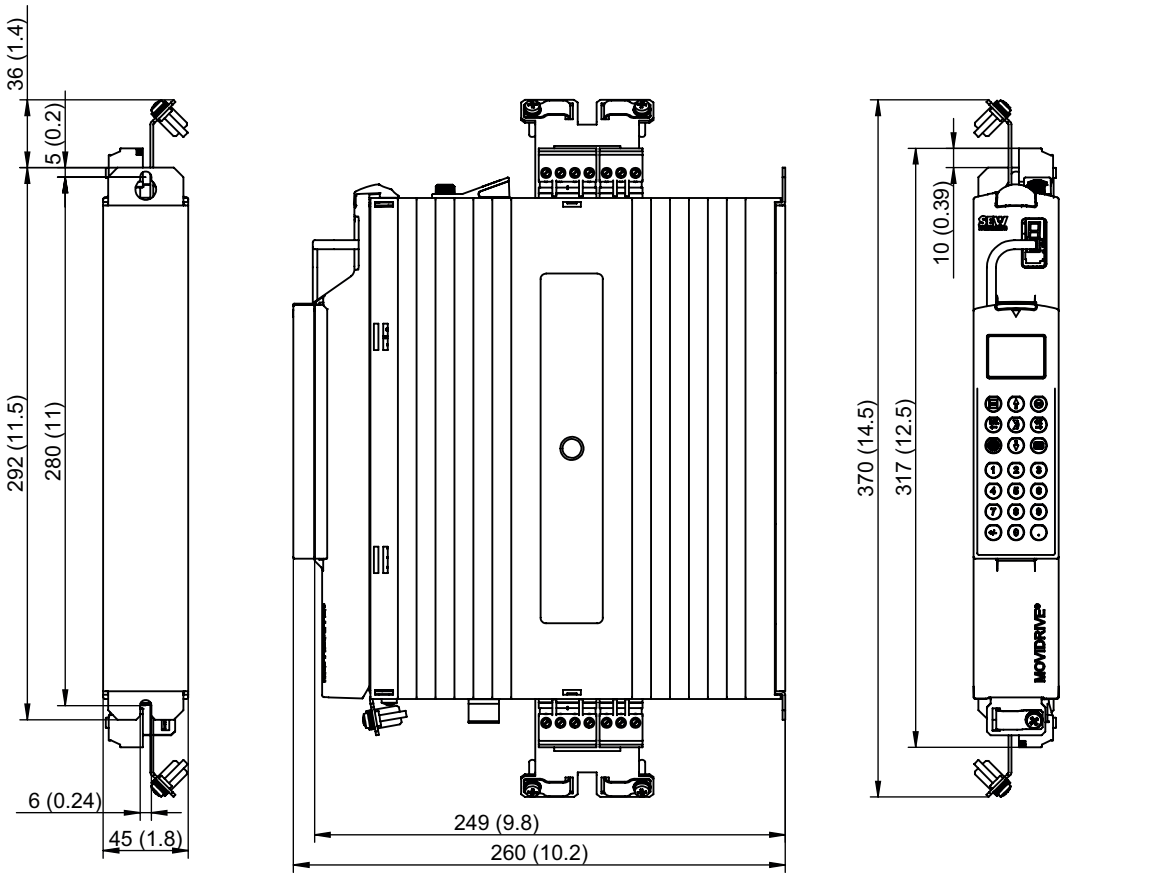
| MOVIDRIVE® MDX60/61B | | General electronics data | |
|---|---|---|---|
| | X13:7 | DCOM: Reference potential of digital inputs X13:1 – X13:6 and X16:1/X16:2 (DIØØ – DIØ5 and DIØ6/DIØ7) | |
| Permitted cable cross section | | One core per terminal: | 0.20 – 2.5 mm² (AWG 24 – 12) |
| | | Two cores per terminal: | 0.25 – 1 mm² (AWG 22 – 17) |
| | | Tightening torque: | 0.6 Nm |
| Safety contact | X17:1 | DGND: Reference potential for X17:2 | |
| Input capacitance | X17:2 | VO24: $V_{OUT}$ = DC 24 V, only to supply X17:4 of the same device plus maximally 1 BST; **must not be used** to supply other devices | |
| | X17:3 | SOV24: Reference potential for DC +24 V "STO" input (safety contact) | |
| | X17:4 | SVI24: DC+24 V "STO" input (safety contact) | |
| Permitted cable cross section | | One core per terminal: | 0.08 – 1.5 mm² (AWG28 – 16) |
| | | Two cores per terminal: | 0.25 – 1.0 mm² (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 | | $t_A$ = 200 ms | |
| Time to inhibit output stage | | $t_S$ ≤ 100 ms | |

27793230/EN – 08/2022

## 2.6 MOVIDRIVE® MDX60B dimension drawings

### 2.6.1 MOVIDRIVE® MDX60B size 0S

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

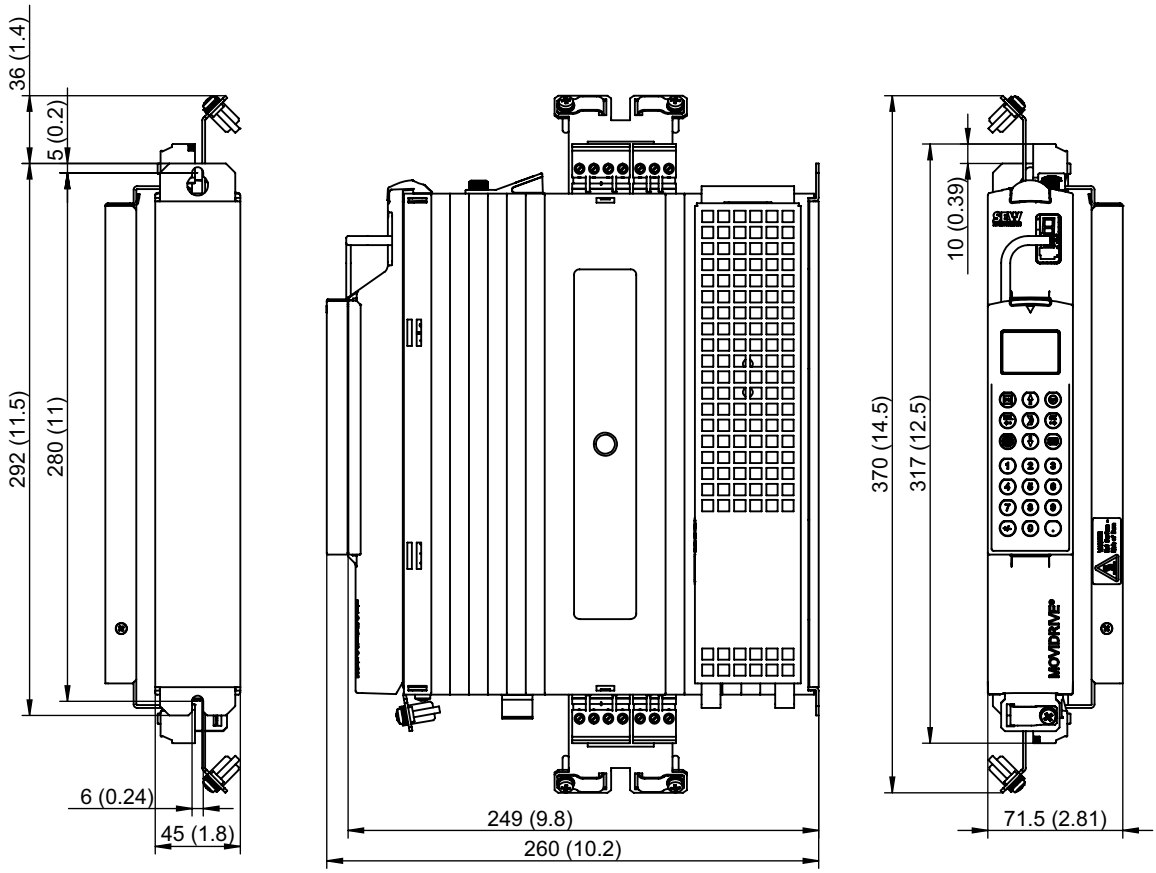



*9007201195536907*

27793230/EN – 08/2022

### 2.6.2 MOVIDRIVE® MDX60B, size 0S with mounted braking resistor

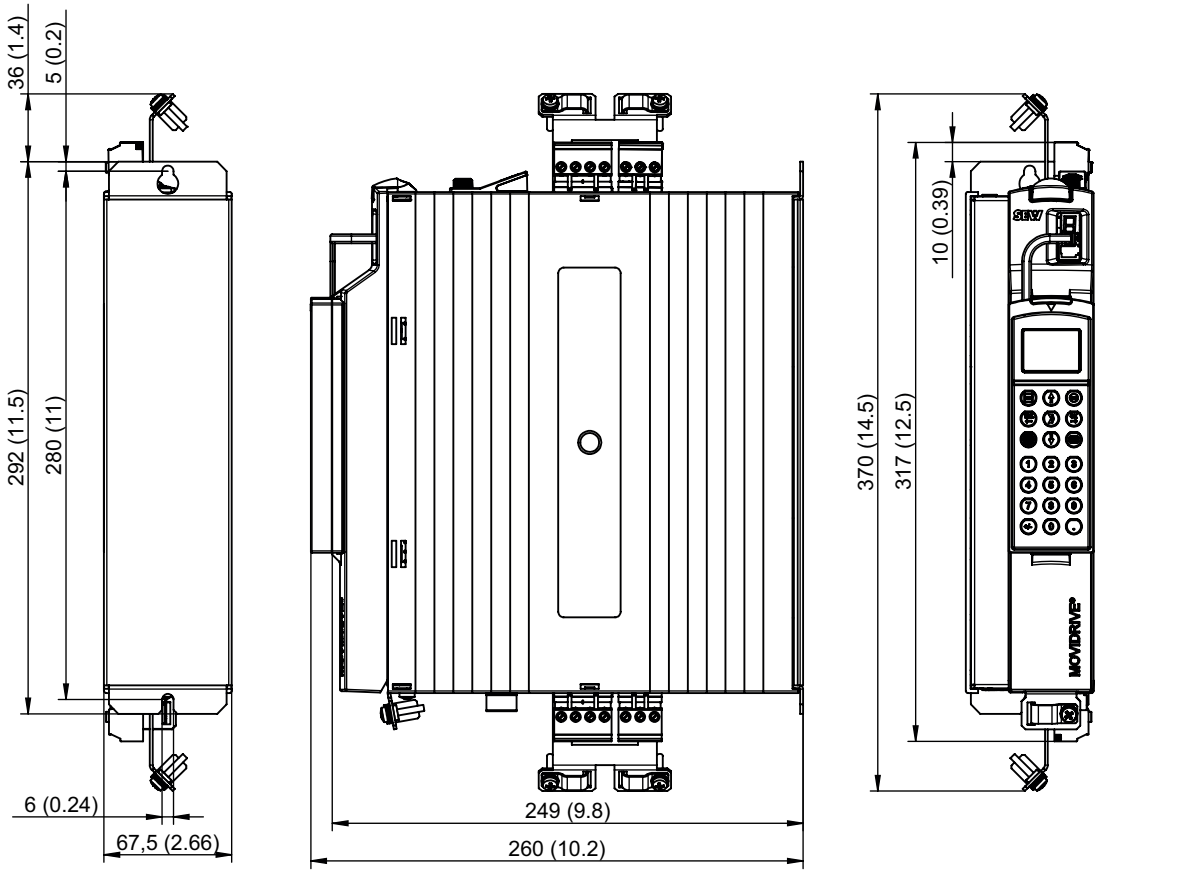
The following dimension drawing shows MDX60B size 0S with braking resistor, dimensions in mm (in)




*9007201195539979*

### 2.6.3 MOVIDRIVE® MDX60B size 0M

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

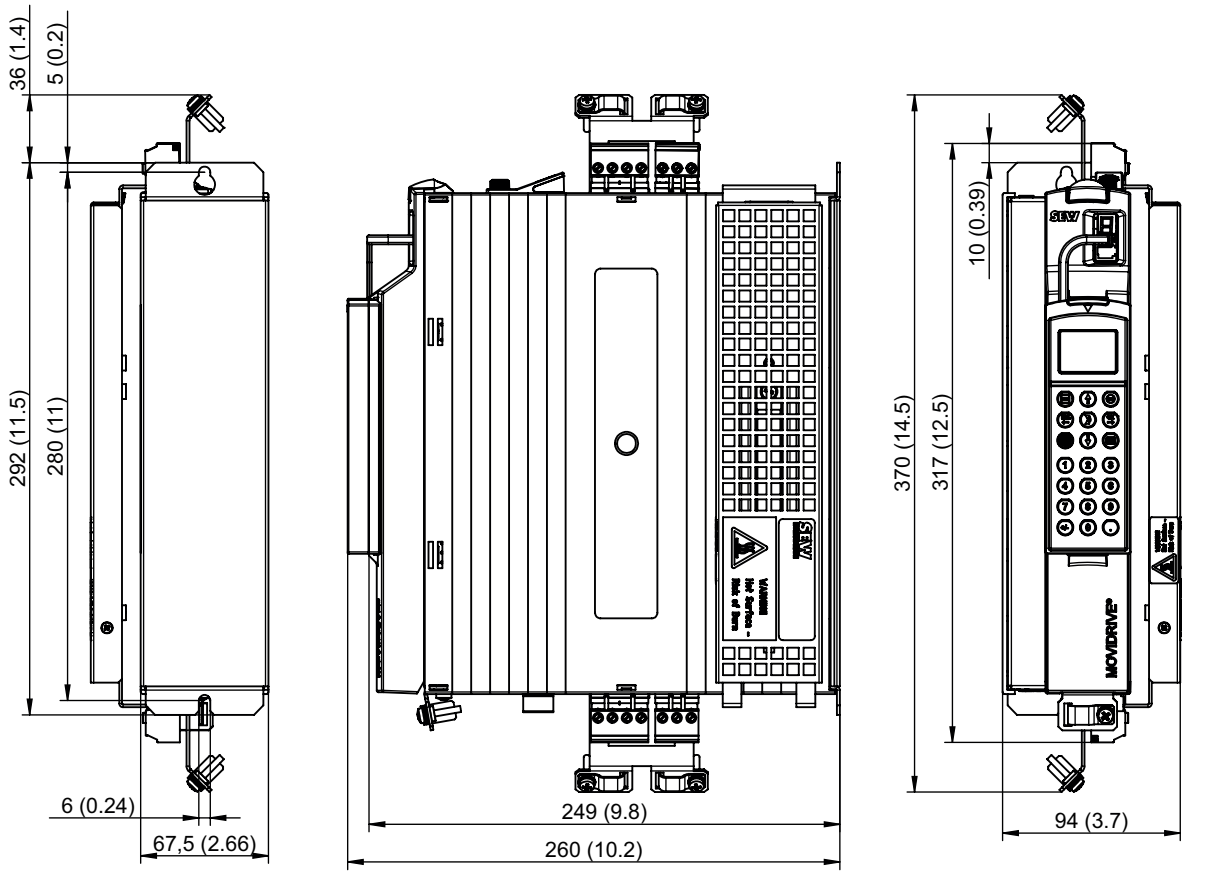



*9007201195584907*

27793230/EN – 08/2022

### 2.6.4 MOVIDRIVE® MDX60B size 0M with mounted braking resistor

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




*9007201195587979*

## 2.7 MOVIDRIVE® MDX61B dimension drawings

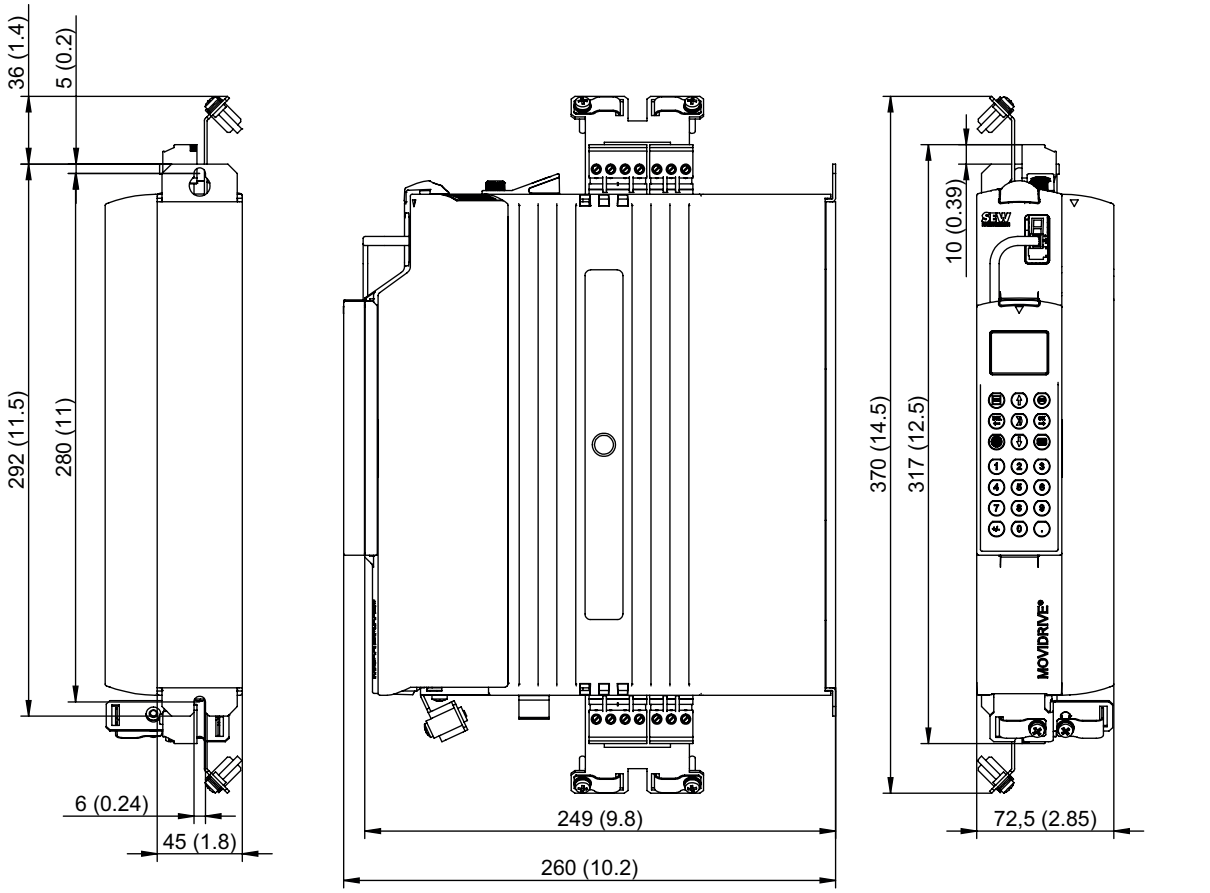
### INFORMATION

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.

### 2.7.1 MOVIDRIVE® MDX61B size 0S

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

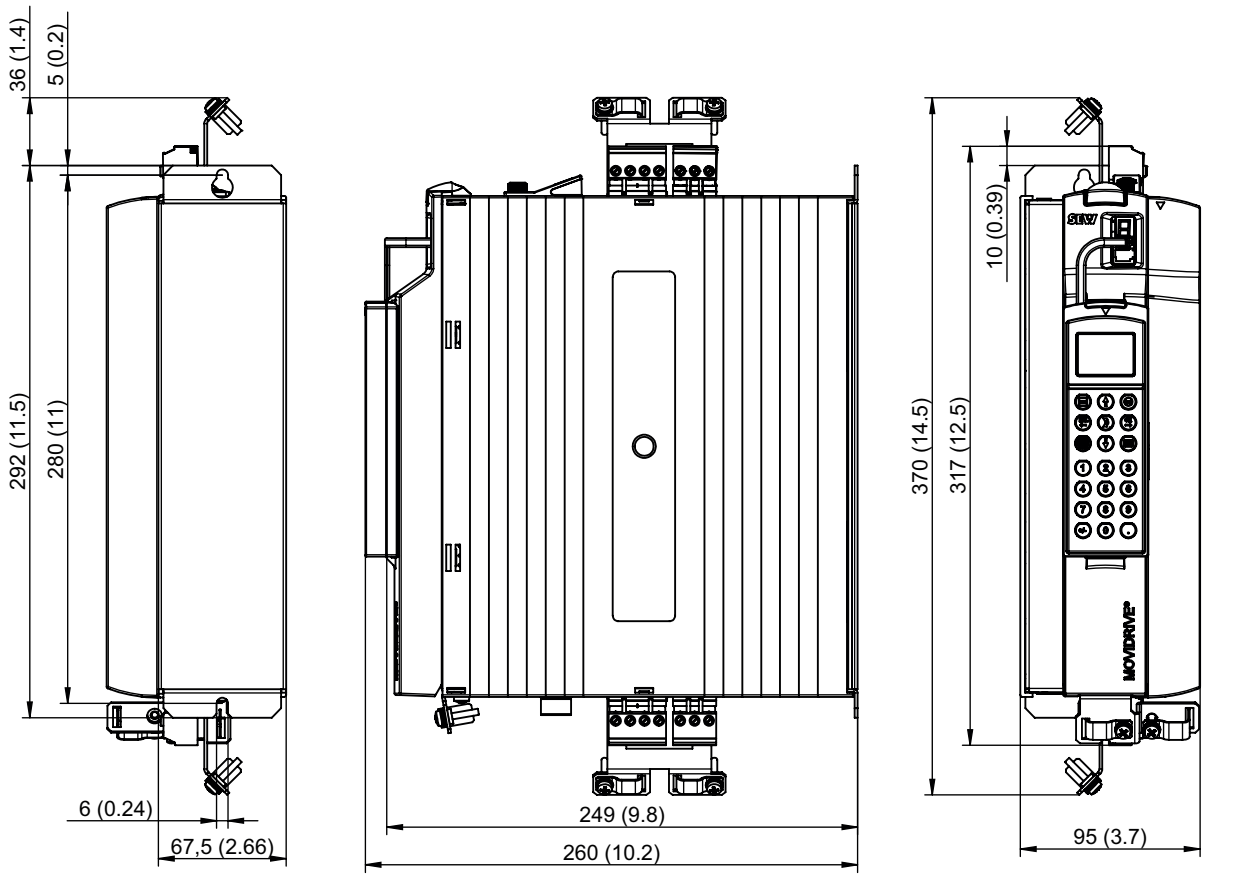



*9007201195592331*

27793230/EN – 08/2022

### 2.7.2 MOVIDRIVE® MDX61B size 0M

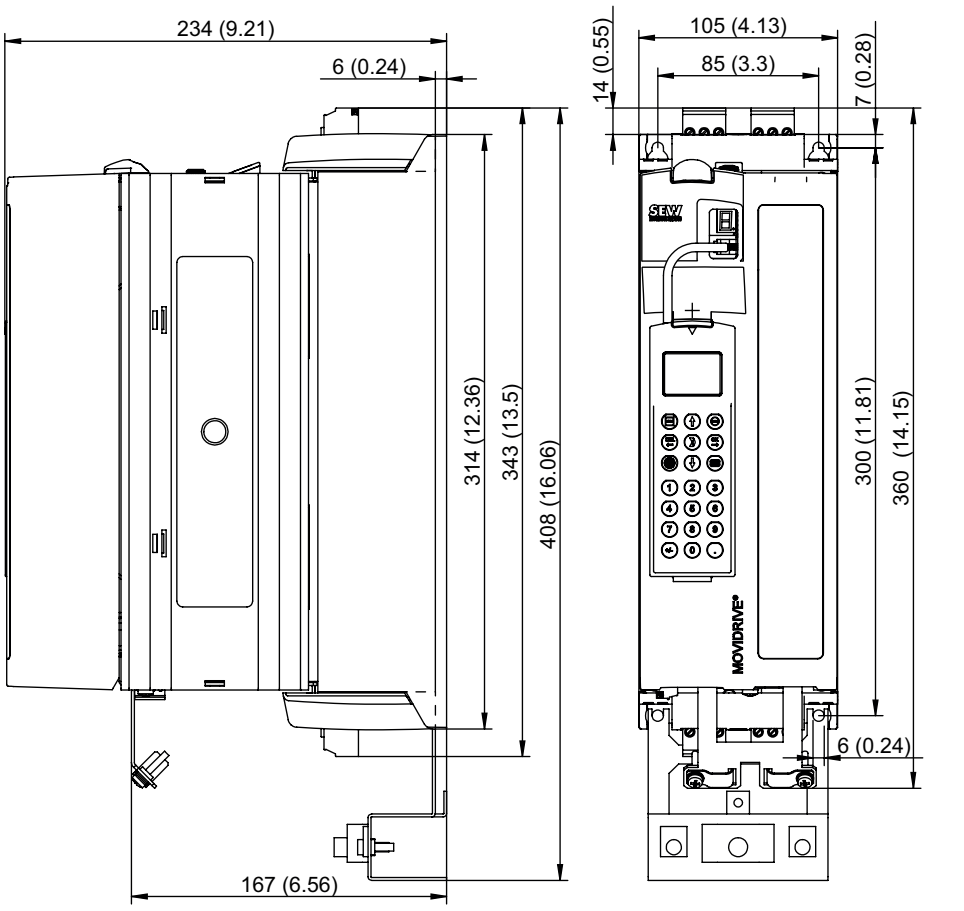
The following dimension drawing shows MDX61B size 0M, dimensions in mm (in)




*9007201313669643*

### 2.7.3 MOVIDRIVE® MDX61B size 1

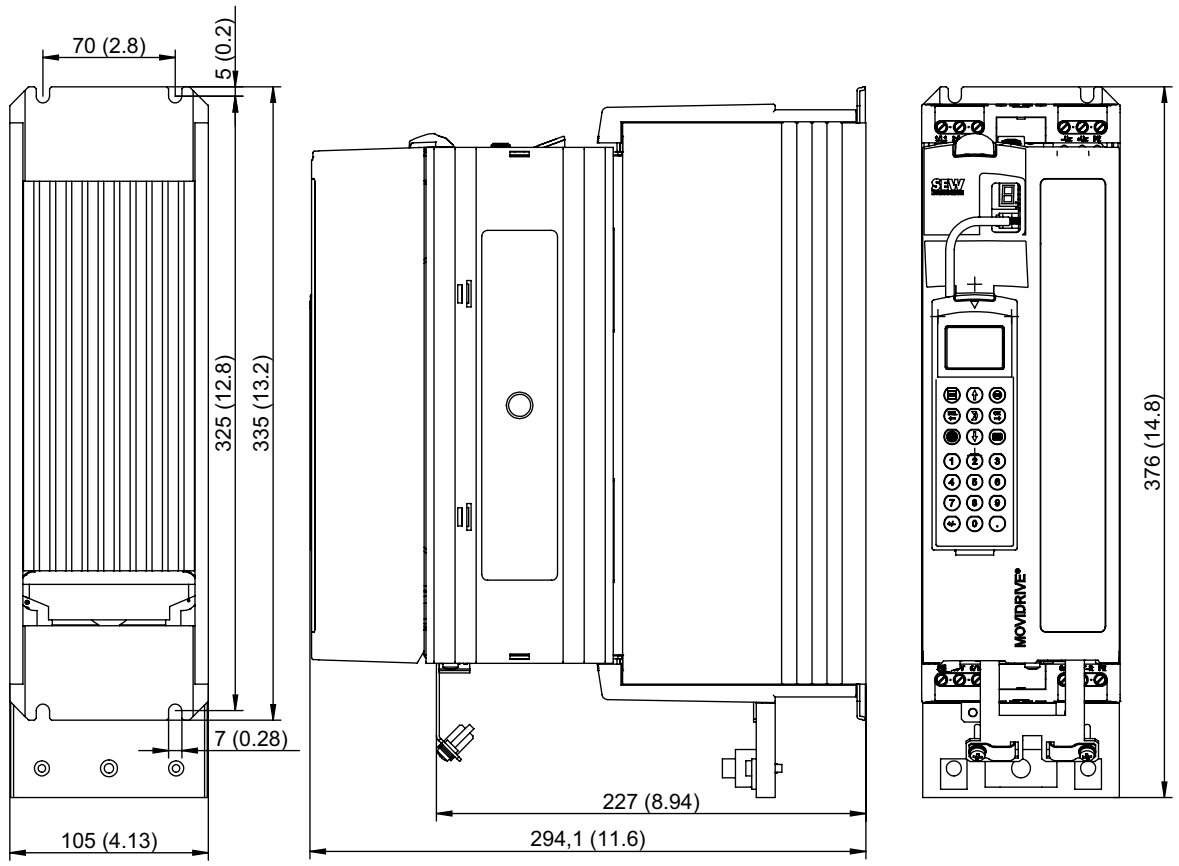
The following dimension drawing shows MDX61B size 1, dimensions in mm (in)




*9007201313674123*

### 2.7.4 MOVIDRIVE® MDX61B size 2S

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



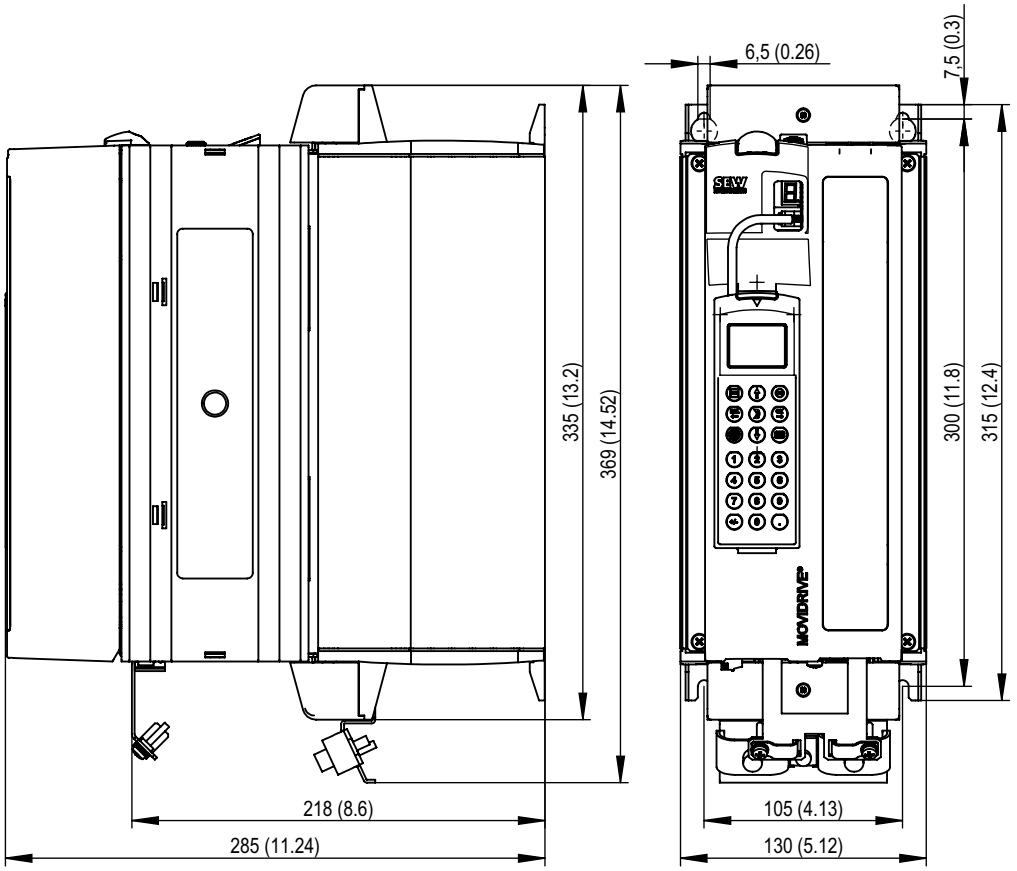

*9007201313689995*

### 2.7.5 MOVIDRIVE® MDX61B size 2

27793230/EN – 08/2022

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

27793230/EN – 08/2022



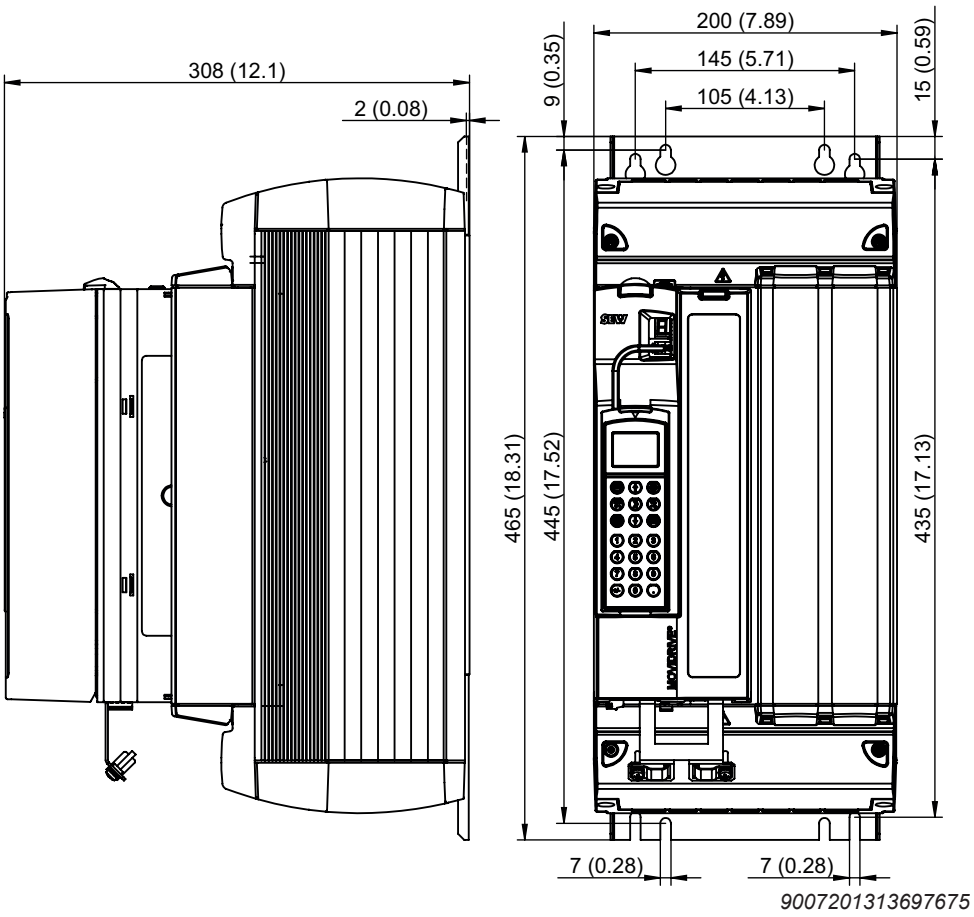

27793230/EN – 08/2022

*9007201313694091*

27793230/EN – 08/2022

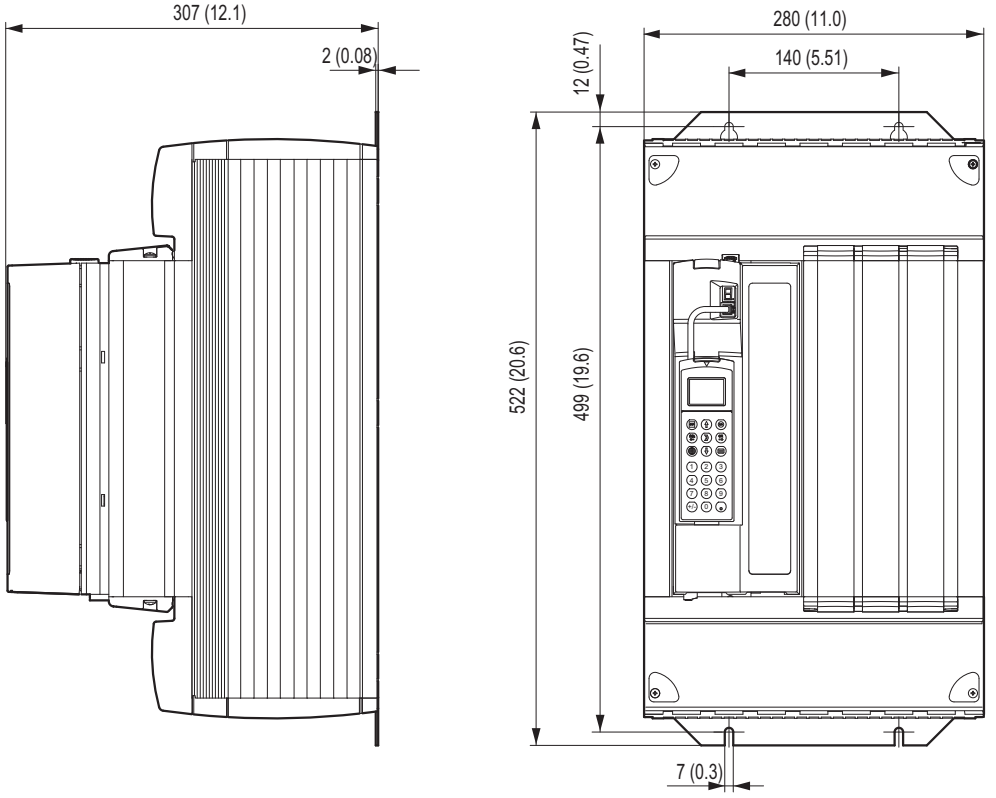
### 2.7.6 MOVIDRIVE® MDX61B size 3

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



### 2.7.7 MOVIDRIVE® MDX61B size 4

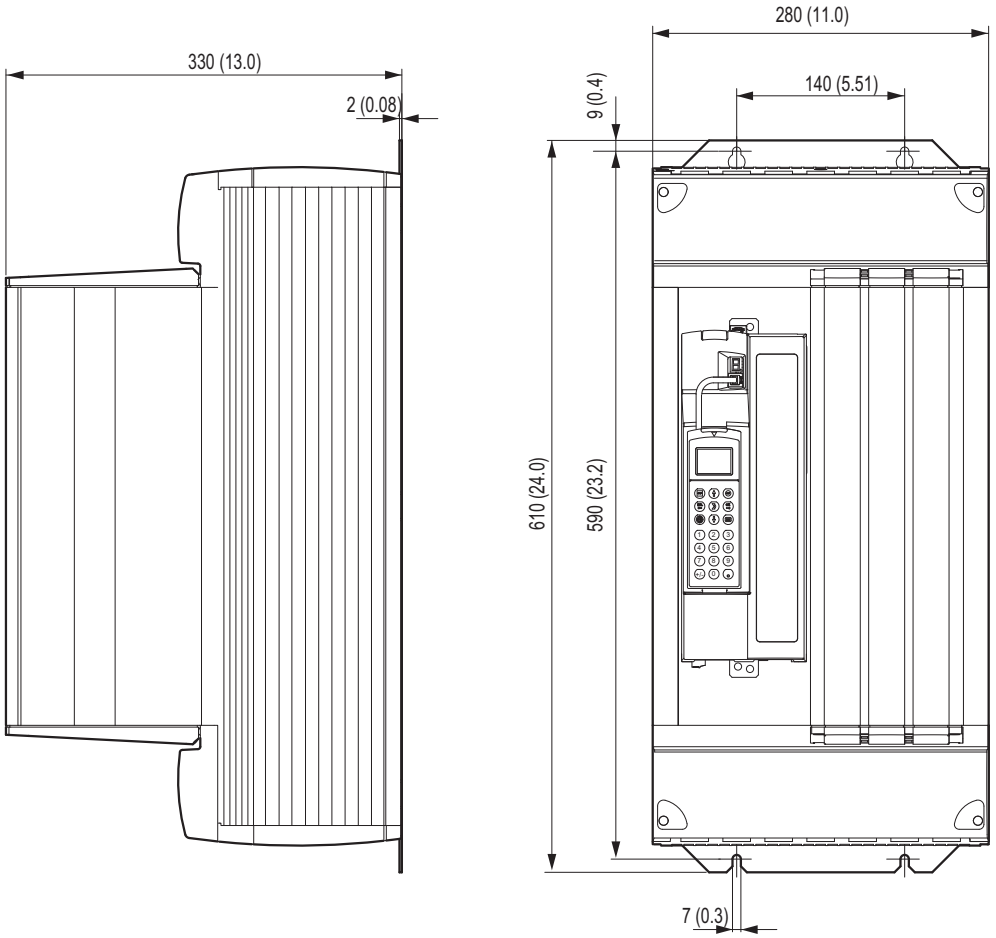
The following dimension drawing shows MDX61B size 4, dimensions in mm (in)




*2058960267*

### 2.7.8 MOVIDRIVE® MDX61B size 5

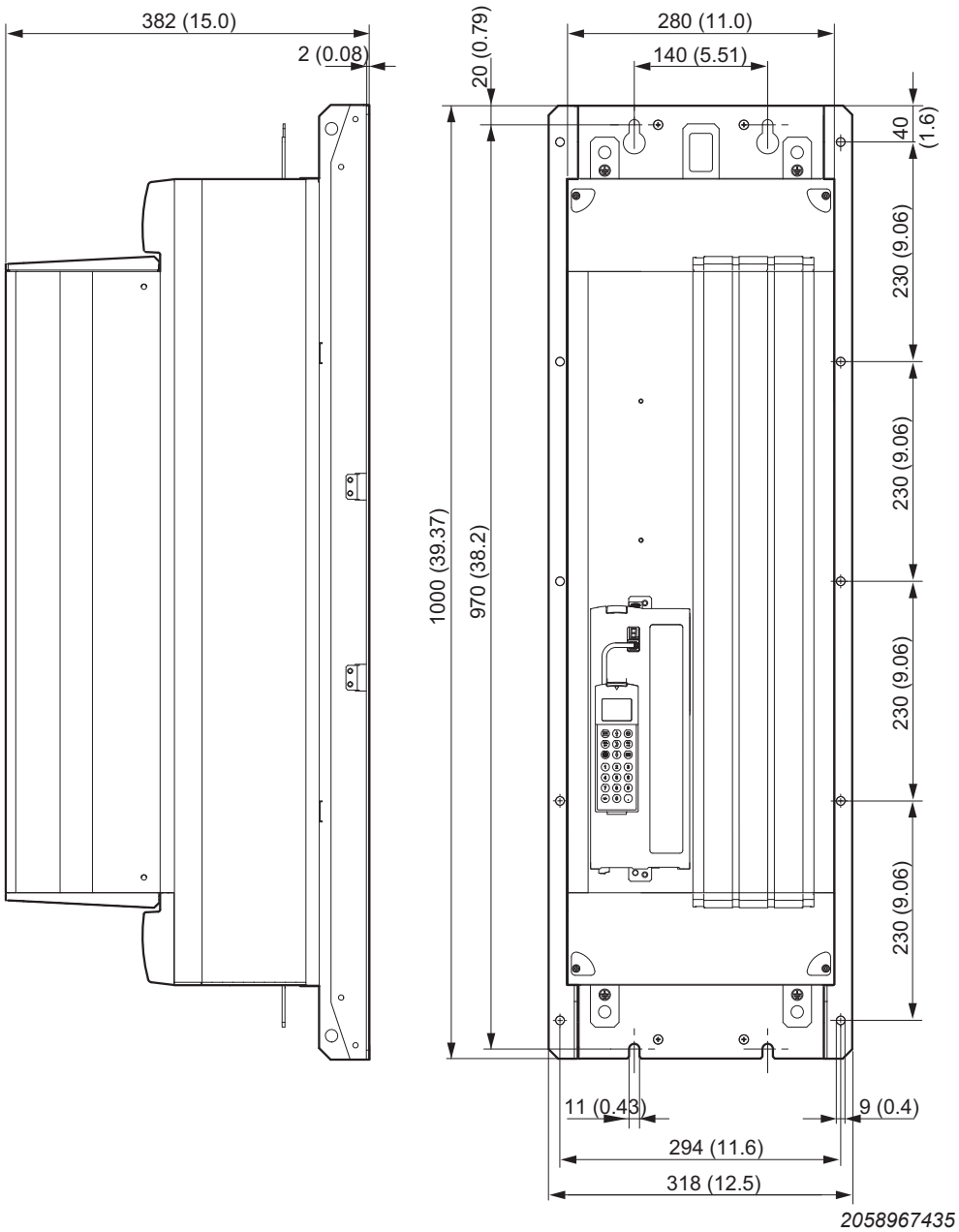
The following dimension drawing shows MDX61B size 5, dimensions in mm (in)




*2058963851*

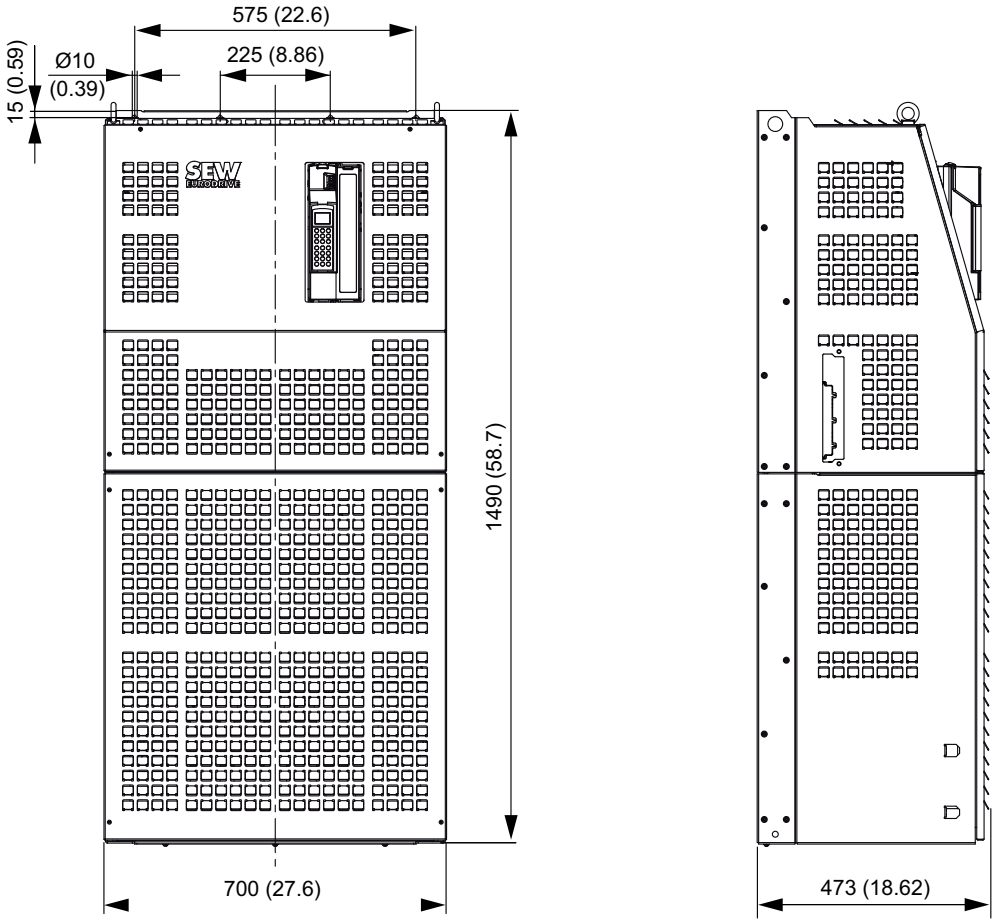
### 2.7.9 MOVIDRIVE® MDX61B size 6

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



### 2.7.10 MOVIDRIVE® MDX61B size 7

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




*9007201336579851*

27793230/EN – 08/2022

## 2.8 IPOS$^{PLUS®}$

### 2.8.1 Description

IPOS$^{PLUS®}$ positioning and sequence control is integrated into every MOVIDRIVE® inverter as standard. With IPOS$^{PLUS®}$ control functions and positioning tasks can be performed either simultaneously or independently of one another.

The IPOS$^{PLUS®}$ 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$^{PLUS®}$ positioning control provides a high-performance point-to-point positioning capability. The IPOS$^{PLUS®}$ 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).

### 2.8.2 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

27793230/EN – 08/2022

| 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) |

27793230/EN – 08/2022

## 2.9 DBG60B keypad

### 2.9.1 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>(German/English/French/Italian/Spanish/Portuguese/Dutch/Finnish/Swedish/Danish/Turkish/Russian/Polish/Czech/Chinese) | 28229150 |
| | Door installation set[1] | Description (= scope of delivery) | Part no. |
| | DBM60B | • Housing for DBG60B (IP65)<br>• DKG60B extension cable, length 5 m | 08248532 |
| | Extension cable | Description (= scope of delivery) | Part no. |
| | DKG60B | • length 5 m<br>• 4-core, shielded cable | 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)

27793230/EN – 08/2022

**Features**

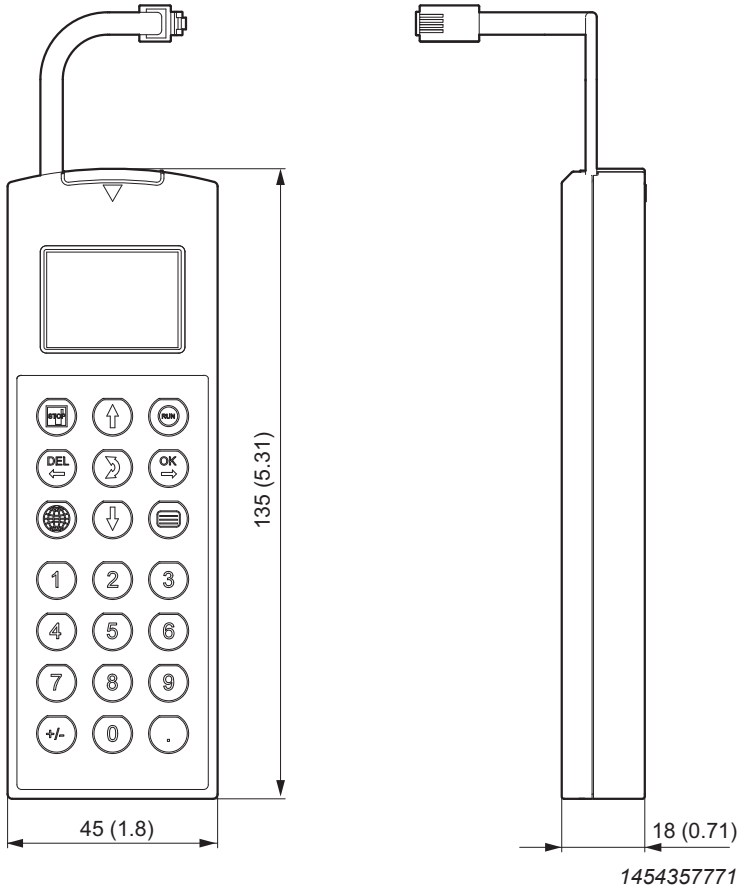
- Illuminated text display, range of languages
- Keypad with 21 keys
- Selection between user menu, detailed parameter menu and startup menu in VFC mode (CFC and SERVO startup is not possible with the DBG60B)
- Can be plugged into MOVIDRIVE®
- Can be connected via extension cable DKG60B (5 m)
- Degree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

### 2.9.2 Dimension drawing for DBG60B

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




*All dimensions in mm (in)*

## 2.10 DBM60B/DKG60B housing for DBG60B

### 2.10.1 Description

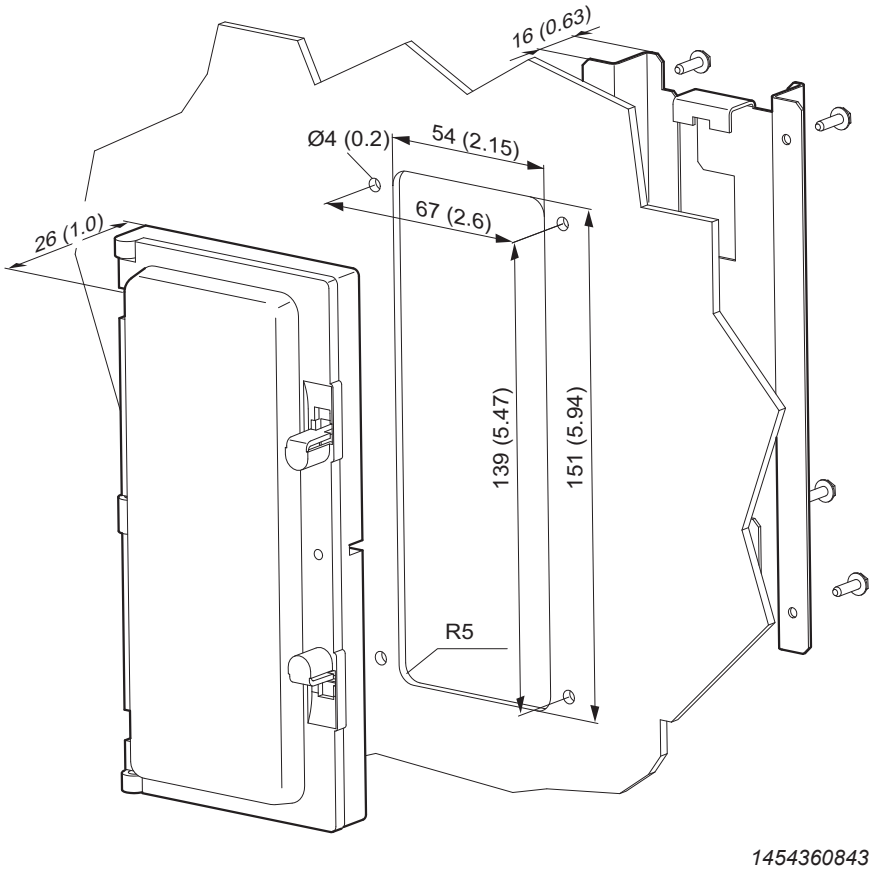
The DBM60B option can be used to mount the keypad close to the inverter (e.g. in the control cabinet door). The DBM60B option consists of a housing in IP65 degree of protection, and a 5 m DKG60B extension cable.

**Part numbers**

- DBM60B: 08248532
- DKG60B: 08175837

### 2.10.2 Dimension drawing DBM60B/DKG60B

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




*All dimensions in mm (in)*

27793230/EN – 08/2022

# 3 Technical data of regenerative power supply unit

## 3.1 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.

### 3.1.1 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.

### 3.1.2 Protection and monitoring functions

- Monitoring and protection against thermal overload.
- Detection of power failure within one supply system half-wave.
- Overvoltage protection.




*9007200709048587*

27793230/EN – 08/2022

### 3.1.3 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.

### 3.1.4 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:<br>• With line filter NF035-503 (MDR60A0150-503-00)<br>• With line filter NF048-503 (MDR60A0150-503-00)<br>• With line filter NF085-503 (MDR60A0370-503-00)<br>• With line filter NF150-503 (MDR60A0750-503-00) | 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[1] $\vartheta_F$ | | -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 EN 60529 (NEMA1) | Size 2 | IP20 | IP20 |
| | Size 3 | IP20 | |
| | Size 4 | IP00<br>IP10<br>• With fitted plexiglass cover supplied as standard<br>• With fitted heat shrink tubing (not included in delivery)<br>IP20<br>• With fitted DLB11B touch guard | |
| Operating mode | | Continuous duty | |
| Overvoltage category | | III according to IEC 60664-1 (VDE 0110-1) | |
| Installation altitude | | At h ≤ 1000 m without restrictions<br>At h ≥ 1000 m, the following restrictions apply:<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>– The protective separation of power and electronics connections can no longer be assured above 2000 m. This requires external measures (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. | At h ≤ 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[1] $\vartheta_F$ | -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 EN 60529 (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 ≤ 1000 m without restrictions<br>The following restrictions apply at h ≥ 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.

27793230/EN – 08/2022

### 3.1.5 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 × AC 400 V) | $I_{line}$ | AC 29 A | AC 66 A |
| ELECTRONICS TERMINALS | | | |
| Digital inputs<br>Internal resistance | | PLC-compatible (EN 61131), sampling cycle 1 ms<br>$R_I \approx 3.0\ k\Omega$, $I_E \approx 10$ 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, **Important: Do not apply external voltage** | |
| DC LINK | | | |
| Apparent output power<br>(at $V_{line}$ = 3 × 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 | $I_{DClink\_max}$ | DC 53 A | DC 105 A |
| GENERAL | | | |
| Power loss at $P_N$ | $P_{Vmax}$ | 120 W | 950 W |
| Cooling air consumption | | 100 $m^3/h$ | 180 $m^3/h$ |
| Connection for power terminals | X1, X2 | Separable terminal strips<br>Conductor end sleeve DIN 46228 | Screw and washer assembly M6 |
| **Permitted tightening torque** | | 1.8 Nm | 3.5 Nm |
| **Permitted cable cross section** | | 6 $mm^2$ (AWG9)<br>PE: M4 with 1.5 Nm | 25 $mm^2$ |
| Electronics terminals connection | X3 | Permitted cable cross section<br>• One conductor per terminal: 0.20 – 2.5 $mm^2$ (AWG 24 – 13)<br>• Two conductors per terminal: 0.25 – 1 $mm^2$ (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 |

27793230/EN – 08/2022

### MOVIDRIVE® MDR60A0750/1320 size 4 and size 6

| MOVIDRIVE® MDR60A | | Size 4 | Size 6 |
|---|---|---|---|
| **Standard design** | | **0750-503-00** | **1320-503-00**[1)] |
| **Design with coated printed circuit boards** | | **0750-503-00/L** | **–** |
| Part number | | 08265569<br>08296731 | 08279527 |
| INPUT | | | |
| 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 × AC 400 V) | $I_{line}$ | AC 117 A | AC 260 A |
| ELECTRONICS TERMINALS | | | |
| Digital inputs | | Isolated (optocoupler), PLC-compatible (EN 61131), sampling cycle 1 ms | – |
| Internal resistance | | $R_I$ ≈ 3.0 kΩ, $I_E$ ≈ 10 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,<br>$I_{max}$ = 50 mA | |
| Signal level | | "0" = 0 V, "1" = +24 V,<br>**Important: Do not apply external voltage.** | |
| DC LINK | | | |
| Apparent output power (at $V_{line}$ = 3 × AC 380 – 500 V) | $S_A$ | 90 kVA | 175 kVA |
| DC link voltage | $V_{DC\ link}$ | DC 560 V – 780 V | |
| Nominal DC link current (at nominal line current $I_{line}$) | $I_{DC\ link}$ | DC 141 A | DC 324 A |
| Max. DC link current (at nominal line current $I_{line}$) | $I_{DClink\_max}$ | DC 212 A | Motor:<br>• DC 486 A<br>regenerative:<br>• DC 410 A |
| GENERAL | | | |
| Power loss at $P_N$ | $P_{Vmax}$ | 1700 W | 2400 W |
| Cooling air consumption | | 360 $m^3$/h | 880 $m^3$/h |
| Connection for power terminals (L1, L2, L3 for size 6) | X1, X2 | M10 terminal studs | M10 terminal studs |
| **Permitted tightening torque** | | 14 Nm | 25 – 30 Nm[2)] |
| **Permitted cable cross section** | | 70 $mm^2$ (AWG2/0) | 185 $mm^2$ (AWG6/0) |
| Connection for power terminals SKS 1 – 3 | | – | Terminals not connected |
| Connection for electronics terminals (X2 with size 6) | X3 | Permitted cable cross-section:<br>• One conductor per terminal:<br>0.20 – 2.5 $mm^2$ (AWG 24 – 13)<br>• Two conductors per terminal:<br>0.25 – 1 $mm^2$ (AWG 23 – 17)<br>Tightening torque 0.6 Nm | Permitted cable cross-section:<br>• 0.75 – 2.5 $mm^2$ (AWG18 – 14)<br>Terminals A1/A2:<br>• 0.75 – 4 $mm^2$ (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 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 |

27793230/EN – 08/2022

| MOVIDRIVE® MDR60A | Size 4 | Size 6 |
|---|---|---|
| **Standard design** | **0750-503-00** | **1320-503-00**[1] |
| **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.

27793230/EN – 08/2022

### 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 × 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 | | $R_I$ ≈ 3.0 kΩ, $I_E$ Ω 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, **Important: Do not apply external voltage.** | |
| 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 × 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 $m^3/h$ | |
| Connection for power terminals | L1, L2, L3 | Connection rail with bore for M12<br>Max. 2 × 240 $mm^2$<br>Press cable lug DIN 46235 | |
| Tightening torque | | 70 Nm | |
| DC link coupling option | | • DLZ11B/100 mm (part number: 18231934)<br>• DLZ11B/200 mm (part number: 18235662)<br>• DLZ11B/300 mm (part number: 18235670) | |
| Electronics terminals connection X2 | | Permitted cable cross-section:<br>• One conductor per terminal:<br>0.20 – 2.5 $mm^2$<br>(AWG 24 – 12)<br>• Two conductors per terminal:<br>0.25 – 1 $mm^2$<br>(AWG 22 – 17)<br>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) |

27793230/EN – 08/2022

### 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 | $V_{DC\ link}$ | Supply via DC link connection<br>DC 537 V – 780 V | | |
| OUTPUT | | | | |
| Apparent output power[1)]<br>(at $V_{line}$ = 3 × AC 380 – 500 V) | $S_N$ | 208 kVA | 263 kVA | 326 kVA |
| Nominal output current[1)]<br>(at $V_{line}$ = 3 × 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 × AC 400 V with $f_{PWM}$ = 2.5 kHz | $I_D$ | AC 375 A | AC 475 A | AC 588 A |
| Continuous output current (= 100% $I_N$)<br>(at $V_{line}$ = 3 × 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 |
| 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 (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 | $n_A/\Delta n_A$ | -6000 – 0 – +6000 $min^{-1}$ / 0.2 $min^{-1}$ over the entire range | | |
| GENERAL | | | | |
| Power loss at $S_N$[1)] | $P_{Vmax}$ | 3000 W | 3600 W | 4400 W |
| Cooling air consumption | | 1200 $m^3/h$ | | |
| Mass | | 2Q design: 180 kg<br>4Q variant: 200 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 $mm^2$<br>Press cable lug DIN 46235 | | |
| Tightening torque | | 70 Nm | | |
|  <br>Constant load<br>Recommended motor power | $P_{Mot}$ | 160 kW | 200 kW | 250 kW |
| Variable torque load or constant load without overload<br>  <br>Recommended motor power | $P_{Mot}$ | 200 kW | 250 kW | 315 kW |

1) The performance data applies to f PWM = 2.5 kHz

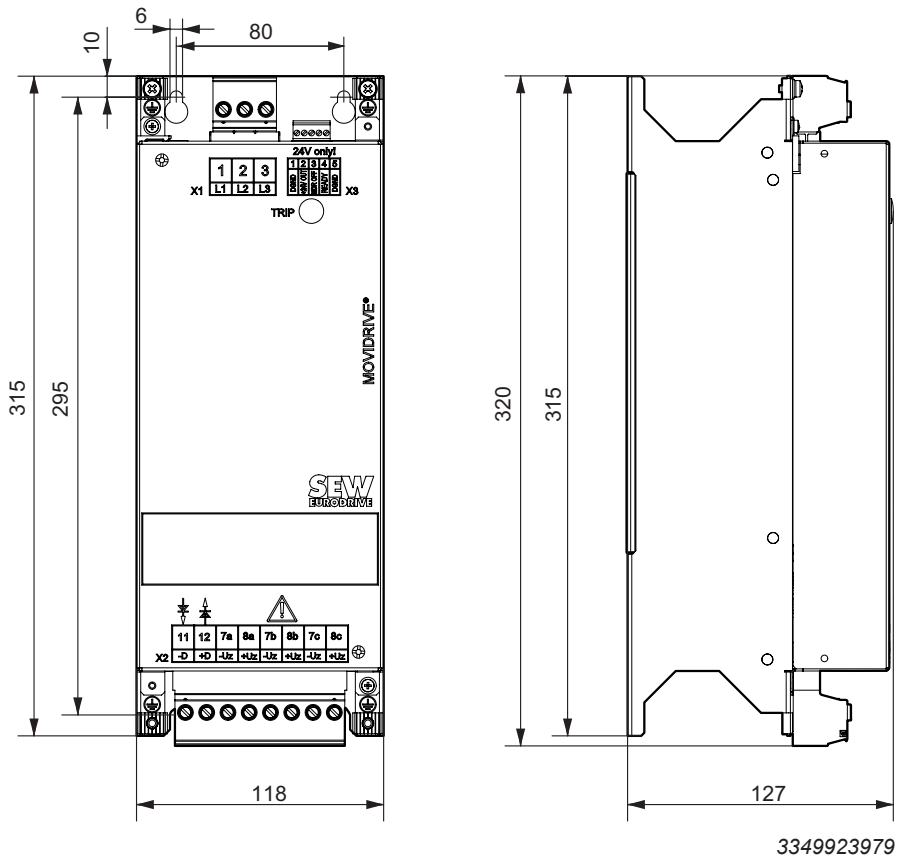
27793230/EN – 08/2022

### 3.1.6 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



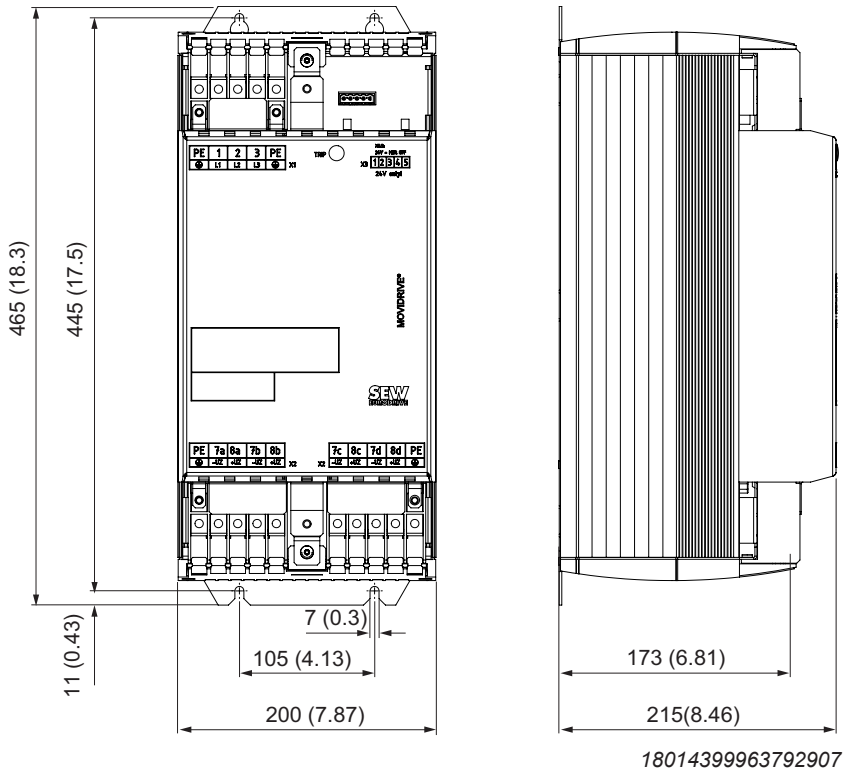

*All dimensions in mm (in)*

27793230/EN – 08/2022

### MOVIDRIVE® MDR60A0370 size 3

Observe the following minimum clearance for control cabinet installation:

- 100 mm above and below
- No clearance required on the side

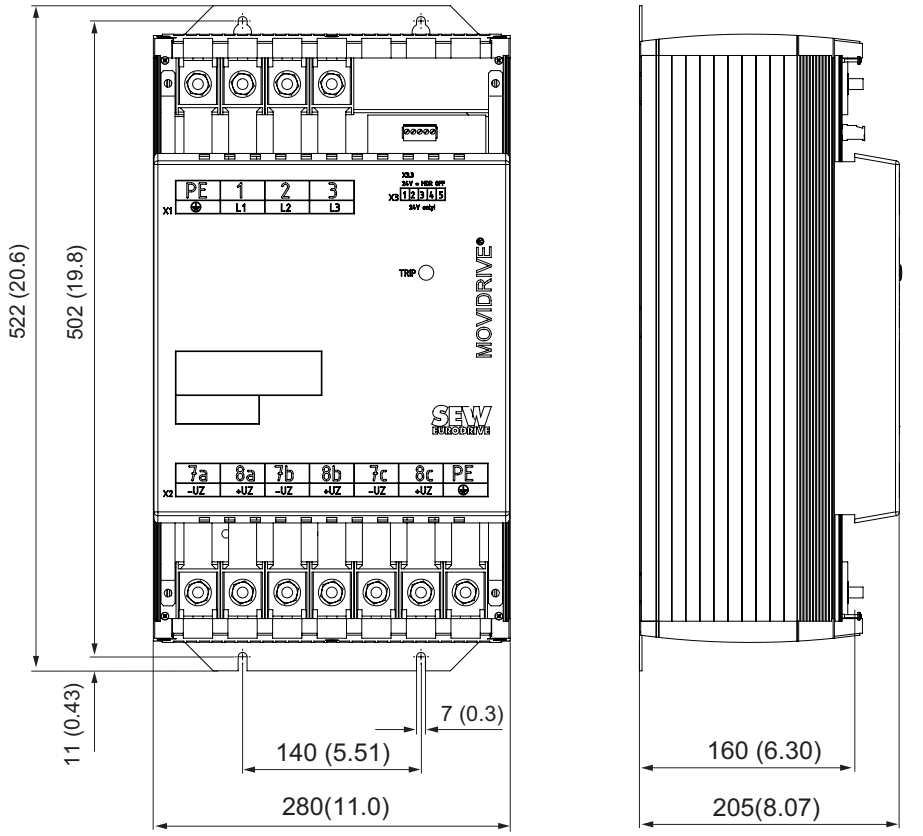



*All dimensions in mm (in)*

### 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




*18014399963821579*

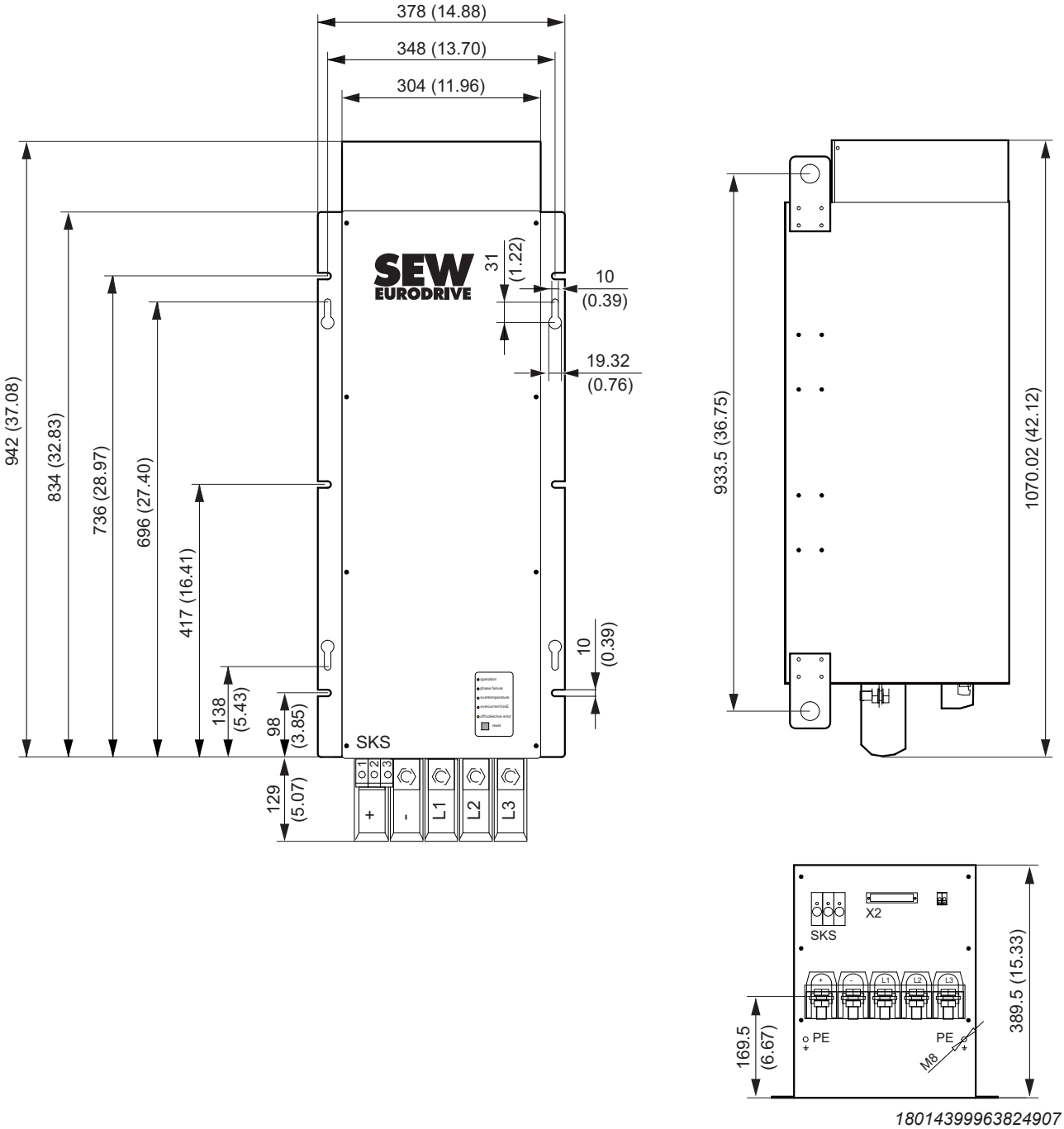
*All dimensions in mm (in)*

27793230/EN – 08/2022

### 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



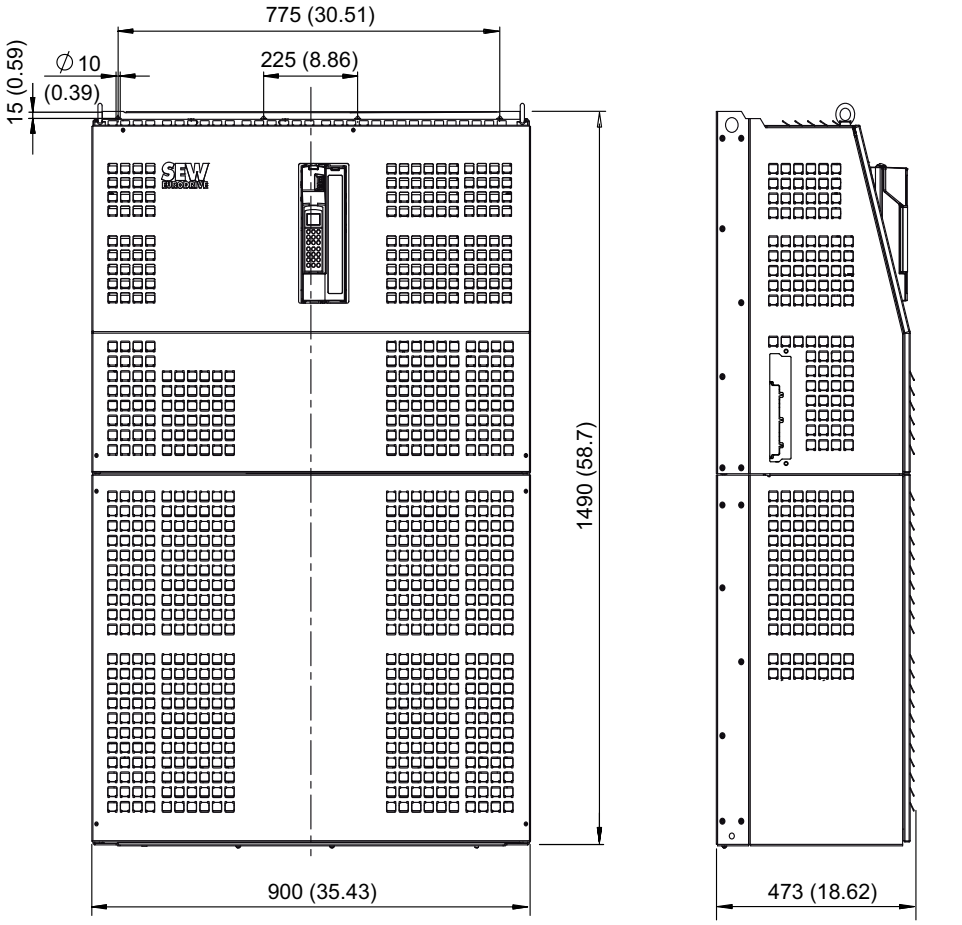

*18014399963824907*

*All dimensions in mm (in)*

### 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



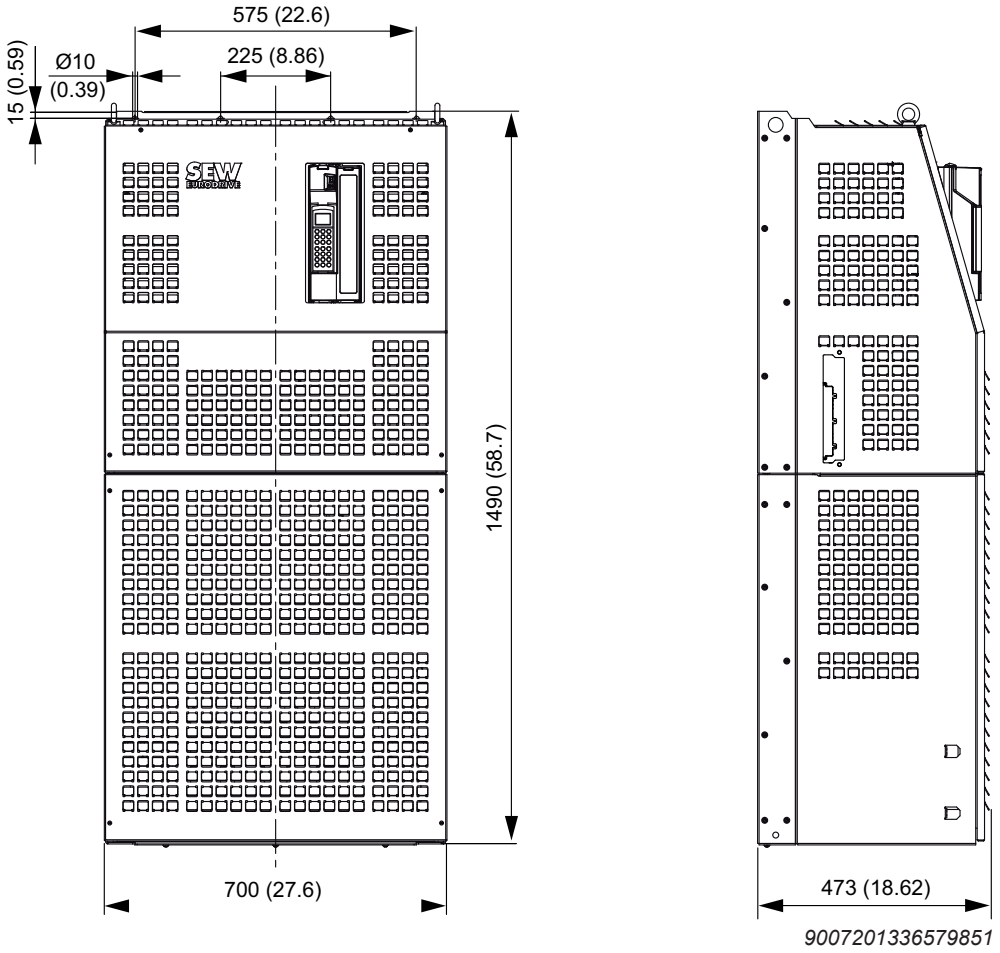

*3330429579*

27793230/EN – 08/2022

### 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




*9007201336579851*

### 3.1.7 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 – 0110 | 0150 – 0370 | 0450 – 0750 | 0900 – 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.

27793230/EN – 08/2022

# 4 Technical data of options

## 4.1 HIPERFACE® encoder card DEH11B

### 4.1.1 Part number

08243107 or 28297806

### 4.1.2 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.

### 4.1.3 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 ≤ DC 650 mA

27793230/EN – 08/2022

## 4.2 Resolver card DER11B

### 4.2.1 Part number

08243077

### 4.2.2 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.

### 4.2.3 Electronics data

| DER11B option | | | |
|---|---|---|---|
|  | 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 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 ± 10% | |
| | Maximum cable length | 100 m | |

27793230/EN – 08/2022

## 4.3 DEU21B multi-encoder card

### 4.3.1 Part number

18221696

### 4.3.2 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.

### 4.3.3 Electronics data

| Option DEU21B[1] | | |
|---|---|---|
|  | External encoder connection<br>X14:<br><br>Output for incremental encoder simulation:<br>• Signal level to RS422<br>• The number of pulses is the same as on X15 motor encoder input | Permitted encoder types:<br>• HIPERFACE® encoder<br>• Sin/cos encoder $V_{SS}$ = AC 1 V<br>• CANopen encoder<br>• TTL encoder with negated tracks<br>• HTL encoder<br>• SSI encoder<br>• SSI Combi encoder<br>• EnDat encoder<br>• Encoder with signal level to RS422<br>• Permitted pulses per resolution: 2-4096 Increments<br><br>Encoder voltage supply:<br>• DC 24 V encoder supply<br>• DC 12 V encoder supply[2] |
| | Motor encoder connection<br>X15: | Permitted encoder types:<br>• HIPERFACE® encoder<br>• Sin/cos encoder $V_{SS}$ = AC 1 V<br>• TTL encoder with negated tracks<br>• HTL encoder<br>• SSI encoder (not for speed control)<br>• SSI Combi encoder<br>• EnDat encoder<br>• Encoder with signal level to RS422<br>• Permitted pulses per resolution: 2-4096 Increments<br><br>Encoder voltage supply:<br>• DC 24 V encoder supply[3]<br>• DC 12 V encoder supply[2] |

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

27793230/EN – 08/2022

## 4.4 DEH21B/DIP11B absolute encoder card

### 4.4.1 Part numbers

- DEH21B: 18208185
- DIP11B: 08249695

### 4.4.2 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$^{PLUS®}$ 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$^{PLUS®}$ 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

### 4.4.3 Electronics data for DEH21B

| DEH21B option | | | |
|---|---|---|---|
|  | Motor encoder connection | 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: 128/256/512/1024/2048 increments<br><br>Encoder voltage supply:<br>• DC +12 V (tolerance range 10.5 – 13 V)<br>• $I_{max}$ = DC 650 mA |
| | Encoder connection | X62: | SSI encoder input |
| | Connection<br>Voltage supply | <br>X60:1 | 24VIN: DC 24 V supply voltage for encoder connected to X62 |
| | Reference terminal | X60:2 | Reference potential 24VIN |

27793230/EN – 08/2022

### 4.4.4 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 | | $R_i$ ≈ 3 kΩ, $I_E$ ≈ DC 10 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 | D01 – 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" **Important**: 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 | DCOM: Reference potential for digital inputs (DI10 – DI17) |
| | | X60:10 | 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 mm² (AWG28 – 16)<br>Two cores per terminal: 0.25 – 1 mm² (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) |

27793230/EN – 08/2022

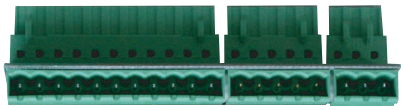
## 4.5 Connector adapter for device replacement MD_60A - MDX60B/61B

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 $mm^2$ (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.

27793230/EN – 08/2022

**DAE14B**



*1454702731*

- Length of DAE14B: 200 mm ± 20 mm
  Cable cross section: 6 x 2 x 0.25 $mm^2$ (AWG 23)

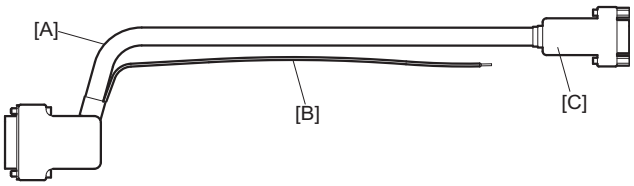
27793230/EN – 08/2022

## 4.6 DWE11B/12B interface adapter

### 4.6.1 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*

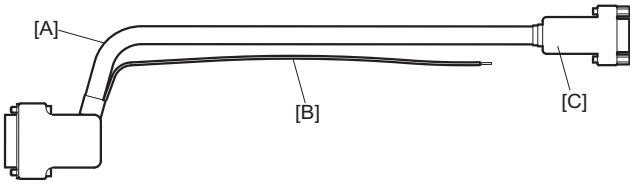
[A] 5 x 2 x 0.25 mm² (AWG 23) / length 1000 mm / max. cable length inverter – encoder: 100 m

[B] DC 24 V connection for HTL encoder; 1 x 0.5 mm² (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 ($\overline{A}$, $\overline{B}$, $\overline{C}$). SEW-EURODRIVE recommends using this interface adapter for any new system.




*1805896331*

[A] 4 x 2 x 0.25 mm² (AWG 23) / length 1000 mm / max. cable length inverter – encoder: 200 m

[B] DC 24 V connection for HTL encoder; 1 x 0.5 mm² (AWG 20) / length 250 mm

| Signal | Terminal of 9-pin D-sub socket [C] (encoder end) |
|---|---|
| A | 1 |
| $\overline{A}$ | 6 |
| B | 2 |
| $\overline{B}$ | 7 |
| C | 3 |
| $\overline{C}$ | 8 |
| UB | 9 |
| GND | 5 |

27793230/EN – 08/2022

## 4.7 UWS11A interface adapter

### 4.7.1 Part number

0822689X

### 4.7.2 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.

### 4.7.3 RS232 interface

The connection between UWS11A and PC is made using a commercially available serial interface cable (shielded!).

### 4.7.4 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 $mm^2$ (AWG 24 - 12)

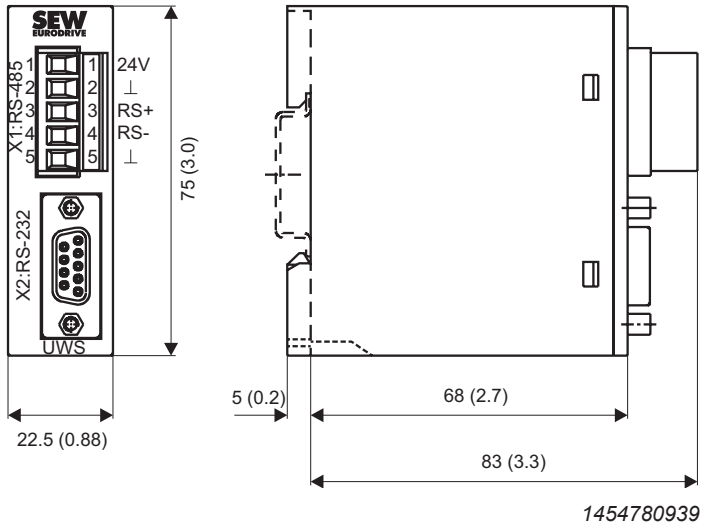
2 cores per terminal 0.20 – 1 $mm^2$ (AWG 24 – 17)

### 4.7.5 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 ($I_{max}$ = 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 |

27793230/EN – 08/2022

### 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.

27793230/EN – 08/2022

## 4.8 UWS21B interface adapter

### 4.8.1 Part number

18204562

### 4.8.2 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.

### 4.8.3 RS232 interface

The connection between UWS21B and PC is made using a commercially available serial interface cable (shielded!).

### 4.8.4 RS485 interface

UWS21B and inverter are connected using a serial interface cable with RJ10 connectors.

### 4.8.5 Scope of delivery

The scope of delivery for the UWS21B option includes:

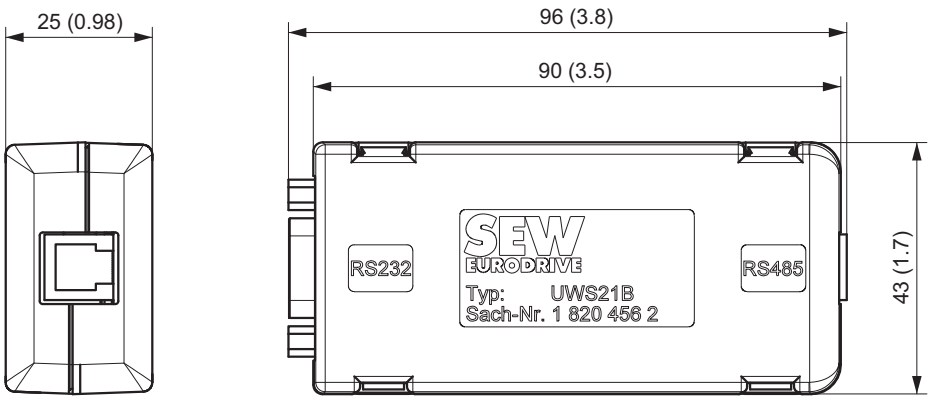
- UWS21B
- Serial interface cable with 9-pin D-sub socket and 9-pin D-sub connector for the UWS21B – PC connection.
- Serial interface cable with two RJ10 plugs to connect UWS21B and inverter.
- CD-ROM with MOVITOOLS® MotionStudio engineering software

### 4.8.6 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 |

27793230/EN – 08/2022

### Dimension drawing for UWS21B




*All dimensions in mm (in)*

## 4.9 USB11A interface adapter

### 4.9.1 Part number

08248311

### 4.9.2 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.

### 4.9.3 USB11A – PC

USB11A is connected to the PC using a commercially available, shielded USB connection cable type USB A-B.

### 4.9.4 MOVIDRIVE® – USB11A

The inverter and USB11A are connected using a serial interface cable with RJ10 connectors.

### 4.9.5 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

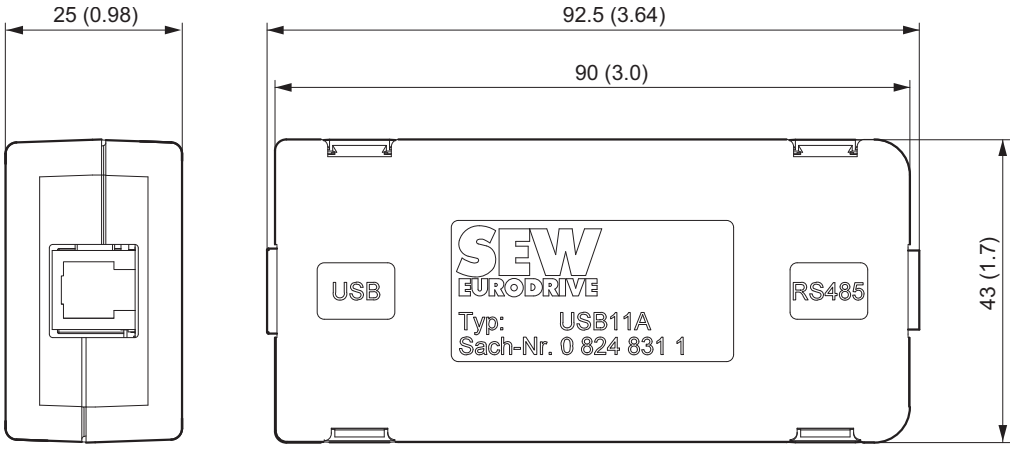
### 4.9.6 Technical data

| 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 |

27793230/EN – 08/2022

### Dimension drawing

All dimensions in mm (in)




*1454863115*

27793230/EN – 08/2022

## 4.10 DWI11A DC 5 V encoder supply

### 4.10.1 Part number

08227594

### 4.10.2 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.

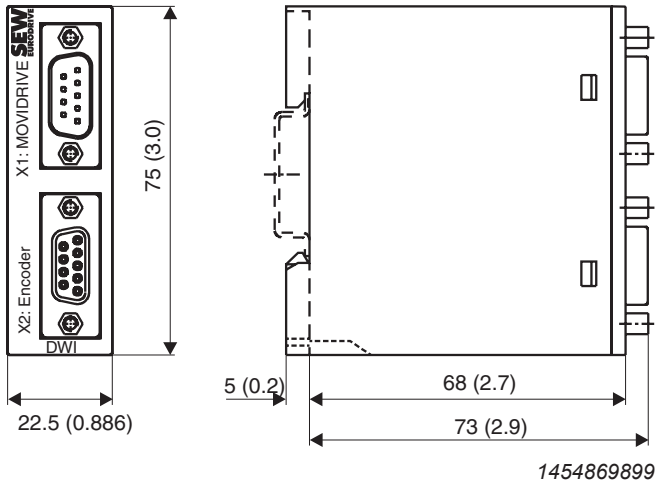
**INFORMATION**

If a short circuit occurs in the sensor cable, the connected encoder may be exposed to a voltage higher than permitted.

### 4.10.3 Recommendation

Use prefabricated cables from SEW-EURODRIVE for the encoder connection.

### 4.10.4 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.

### 4.10.5 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 $V_{max}$ ≈ +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 **A**, B and **B**, C and **C**) for connecting the encoder to the DWI11A and the DWI11A to MOVIDRIVE®. |
| Encoder types that can be connected | • sin/cos encoder VSS = AC 1 V<br>• TTL encoder with negated tracks<br>• Encoder with signal level to RS422 |

27793230/EN – 08/2022

## 4.11 DIO11B input/output board

### 4.11.1 Part number

08243085 or 28300130

### 4.11.2 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).

### 4.11.3 Electronics data




| Option DIO11B | | | |
|---|---|---|---|
| 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 kΩ | |
| Accuracy | | +/- 100 mV (≙ 0.5% of 20 V) | |
| Analog outputs | X21:1/X21:4 | AOV1/AOV2: Voltage outputs DC-10 V to 0 to +10 V, $I_{max}$ = DC 10 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 ≙ 100 mV | |
| Accuracy of the analog output | | 0.2% of 20 V ≙ 40 mV | |
| Digital inputs | | Isolated (optocoupler), PLC-compatible (EN 61131) | |
| X22:1 – X22:8 | | DIØ – DI17 | |
| Internal resistance | | $R_i$ ≈ 3 kΩ, $I_E$ ≈ DC 10 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 | According to EN 61131 |
| Function | X22:1 – X22:8 | DI10 – DI17: Selection option → Parameter menu P61_ | |
| 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>$I_{max}$ = DC 50 mA, short-circuit proof, and protected against external voltage to DC 30 V | |
| 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 | |
| Voltage input | X23:9 | 24VIN: DC +24 V supply voltage for digital outputs D01Ø – DO17 | |
| Permitted cable cross section | | One core per terminal: | 0.08 – 1.5 mm² (AWG 28 – 16) |
| | | Two cores per terminal: | 0.25 – 1 mm² (AWG 22 – 17) |
| | | Tightening torque: | 0.6 Nm |

27793230/EN – 08/2022

### 4.11.4 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)

27793230/EN – 08/2022

## 4.12 PROFIBUS DFP21B fieldbus interface

### 4.12.1 Part number

08242402

### 4.12.2 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.

### 4.12.3 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 | $6003_{hex}$ ($24579_{dec}$) |
| | Max. number of process data | 10 process data entries |

27793230/EN – 08/2022

## 4.13 INTERBUS fieldbus interface DFI11B

### 4.13.1 Part number

08243093

### 4.13.2 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.

### 4.13.3 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 | $E3_{hex} = 227_{dec}$ (1 PCP word)<br>$E0_{hex} = 224_{dec}$ (2 PCP words)<br>$E1_{hex} = 225_{dec}$ (4 PCP words)<br>$38_{hex} = 56_{dec}$ (microprocessor not ready)<br>$03_{hex} = 3_{dec}$ (no PCP word) |
| | Max. number of process data | 6 process data entries |

27793230/EN – 08/2022

## 4.14 INTERBUS FOC fieldbus interface DFI21B

### 4.14.1 Part number

08243115

### 4.14.2 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.

### 4.14.3 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 | $E3_{hex} = 227_{dec}$ (1 PCP word)<br>$E0_{hex} = 224_{dec}$ (2 PCP words)<br>$E1_{hex} = 225_{dec}$ (4 PCP words)<br>$38_{hex} = 56_{dec}$ (microprocessor not ready)<br>$03_{hex} = 3_{dec}$ (no PCP word) |
| | Max. number of process data | 6 process data entries |

27793230/EN – 08/2022

## 4.15 Fieldbus interface PROFINET IO RT DFE32B

### 4.15.1 Part number

18213456

### 4.15.2 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$^{PLUS®}$ 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).

### 4.15.3 Electronics data

| DFE32B option | | |
|---|---|---|
|  | Application protocols | • **PROFINET IO** (Ethernet frames with frame identification $8892_{hex}$) to control and set parameters for the drive inverter.<br>• **HTTP** (Hypertext Transfer Protocol) for diagnostics using a web browser.<br>• **SMLP** (Simple MOVILINK® Protocol), protocol used by MOVITOOLS® MotionStudio. |
| | Port numbers used | • 300 (SMLP)<br>• 80 (HTTP) |
| | Ethernet services | • ARP<br>• ICMP (ping) |
| | 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) | $010A_{hex}$ |
| | Tools for startup | • MOVITOOLS® MotionStudio engineering software<br>• DBG60B keypad |
| | Maximum number of process data: | 10 |

27793230/EN – 08/2022

### 4.15.4 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)

27793230/EN – 08/2022

## 4.16 DFE33B fieldbus interface for EtherNet/IP™ and Modbus TCP

### 4.16.1 Part number

18213464

### 4.16.2 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$^{PLUS®}$ 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).

### 4.16.3 Electronics data

| DFE33B option | | |
|---|---|---|
|  | Application protocols | • **EtherNet/IP™** (Ethernet Industrial Protocol) or **Modbus TCP** to control and parameterize the drive inverter.<br>• **HTTP** (Hypertext Transfer Protocol) for diagnostics using a Web browser.<br>• **SMLP** (Simple MOVILINK® Protocol), protocol used by MOVITOOLS® MotionStudio.<br>• **DHCP** (Dynamic Host Configuration Protocol) to assign address parameter automatically. |
| | Port numbers used | • 44818 EtherNet/IP™ (TCP)<br>• 2222 EtherNet/IP™ (UDP)<br>• 502 Modbus TCP<br>• 300 SMLP (TCP, UDP)<br>• 80 HTTP<br>• 67 / 68 DHCP |
| | Ethernet services | • ARP<br>• ICMP (ping) |
| | ISO / OSI layer 1/2<br>ISO / OSI layer 4/5 | Ethernet II<br>TCP/IP and UDP/IP |
| | Automatic baud rate detection | 10 MBaud / 100 MBaud |
| | Connection technology | 2 x RJ45 with integrated switch and autocrossing |
| | Addressing | 4 byte IP address or MAC-ID (00-0F-69-xx-xx-xx) |
| | Manufacturer ID<br>(Vendor ID) | • $013B_{hex}$ (EtherNet/IP™)<br>• "SEW-EURODRIVE" (Modbus TCP) |
| | Tools for startup | • MOVITOOLS® MotionStudio engineering software<br>• DBG60B keypad |
| | Maximum number of process data: | 10 |

27793230/EN – 08/2022

### 4.16.4 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)

27793230/EN – 08/2022

## 4.17 EtherCAT® DFE24B fieldbus interface

### 4.17.1 Part number

18211267

### 4.17.2 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$^{PLUS®}$ programs.

### 4.17.3 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 | • CoE (CANopen over EtherCAT®)<br>• VoE (Simple MOVILINK® protocol over EtherCAT®) |
| | Maximum number of process data: | 10 |
| | Tools for startup | • MOVITOOLS® MotionStudio engineering software<br>• DBG60B keypad |

### 4.17.4 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$^{PLUS®}$ variables
- Automatic addressing via EtherCAT® master
- Engineering access using MOVITOOLS® MotionStudio via EtherCAT®

27793230/EN – 08/2022

## 4.18 DeviceNet™ DFD11B fieldbus interface

### 4.18.1 Part number

08249725

### 4.18.2 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.

### 4.18.3 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:<br>• 1 – 10 process data words<br>• 1 – 4 process data words with bit-strobe I/O |
| | 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:<br>• 500 m at 125 kbaud<br>• 250 m at 250 kbaud<br>• 100 m at 500 kBaud |
| | Transmission level | ISO 11 98 - 24 V |
| | Connection technology | • 2-wire bus and 2-wire supply voltage DC 24 V with 5-pin Phoenix terminal<br>• Pin assignment according to DeviceNet™ specification |
| | MAC ID | 0 – 63, can be set via DIP switch<br>Max. 64 stations |
| | Supported services | • Polled I/O: 1 – 10 words<br>• Bit strobe I/O: 1 – 4 words<br>• Explicit messages:<br>– Get_Attribute_Single<br>– Set_Attribute_Single<br>– Reset<br>– Allocate_MS_Connection_Set<br>– Release_MS_Connection_Set |
| | Tools for startup | • MOVITOOLS® MotionStudio engineering software<br>• DBG60B keypad |

27793230/EN – 08/2022

## 4.19 CAN/CANopen DFC11B fieldbus interface

### 4.19.1 Part number

08243174

### 4.19.2 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.

### 4.19.3 Electronics data

| DFC11B option | | |
|---|---|---|
|  | Communication profile | • SEW-MOVILINK®<br>• CANopen<br>• CAN Layer 2 |
| | 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 mm² (AWG24 – 12)<br>Two cores per terminal: 0.25 – 1 mm² (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 | • MOVITOOLS® MotionStudio engineering software<br>• DBG60B keypad |

27793230/EN – 08/2022

### 4.19.4 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.

27793230/EN – 08/2022

## 4.20 Synchronous operation card DRS11B

### 4.20.1 Part number

08246726

### 4.20.2 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.

27793230/EN – 08/2022

### 4.20.3 Electronics data

| Option DRS11B | | | |
|---|---|---|---|
|  | Digital inputs | X40:1 – X40:6 | EINGØ – EING5: isolated (optocoupler)<br>PLC-compatible (EN 61131) |
| | Internal resistance | | $R_i$ ≈ 3 kΩ, $I_E$ ≈ DC 10 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:<br>• EINGØ = Free-running<br>• EING1 = offset 1<br>• EING2 = offset 2<br>• EING3 = offset 3<br>• EING4 = IPOS$^{PLUS®}$ variable H477.0<br>• EING5 = IPOS$^{PLUS®}$ variable H477.1 |
| | 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>**Important:** Do not apply external voltage! |
| | Function | | Fixed assignment with:<br>• AUSGØ = IPOS$^{PLUS®}$ variable H476.0<br>• AUSG1 = IPOS$^{PLUS®}$ variable H476.1<br>$I_{max}$ = DC 50 mA, short-circuit proof, protected against external voltage to DC 30 V |
| | Reference terminals | X40:11 | DGND: Reference potential for binary signals |
| | | X40:7 | 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, $I_{max}$ = 650 mA[1)]<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, $I_{max}$ = DC 650 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 | GND |
| | | X44:2 | DC +24 V supply voltage for digital outputs X40:9/X40:10 and encoder |
| | | X44:3 | GND |
| | Permitted cable cross section | | One core per terminal: 0.08 – 1.5 mm$^2$ (AWG28 – 16)<br>Two cores per terminal: 0.25 – 1 mm$^2$ (AWG22 – 16)<br>Tightening torque: 0.6 Nm |

1) Total current load (X41 and X42) of the DC 24 V encoder supply ≤ DC 650 mA

27793230/EN – 08/2022

## 4.21 Fieldbus interface PROFIBUS DP-V1 with PROFIsafe DFS11B

### 4.21.1 Part number

18238408

### 4.21.2 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.

### 4.21.3 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 | • 9-pin D-sub socket<br>• Pin assignment acc. 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 | SEW_600C.GSD |
| | DP ID number | 600C = $24588_{hex}$ |
| | Diagnostics data | • Max. 8 bytes<br>• Standard diagnostics: 6 bytes |
| | Tools for startup | • MOVITOOLS® MotionStudio engineering software<br>• DBG60B keypad |
| | F address | 1 – 1022 DIP switch for setting the failsafe address |
| | Ambient temperature | 0 – 55 °C |

27793230/EN – 08/2022

### 4.21.4 Safety section

| Safety characteristics | |
|---|---|
| Maximum possible safety class | • SIL 3 according to EN 61508<br>• Performance level e according to EN ISO 13849-1 |
| 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 |

27793230/EN – 08/2022

## 4.22 Fieldbus interface PROFIBUS DP-V1 with PROFIsafe DFS12B

### 4.22.1 Part number

28204239

### 4.22.2 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.

### 4.22.3 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 | • 9-pin D-sub socket<br>• Pin assignment acc. 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 | SEW_600C.GSD |
| | DP ID number | 600C = $24588_{hex}$ |
| | Diagnostics data | • Max. 8 bytes<br>• Standard diagnostics: 6 bytes |
| | Tools for startup | • MOVITOOLS® MotionStudio engineering software<br>• DBG60B keypad |
| | F address | The failsafe address is set using the DCS21B/22B option |
| | Ambient temperature | 0 – 55 °C |

27793230/EN – 08/2022

## 4.23 PROFINET IO fieldbus interface with PROFIsafe DFS21B

### 4.23.1 Part number

18238637

### 4.23.2 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$^{PLUS®}$ 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.

### 4.23.3 Electronics data

| DFS21B option | | |
|---|---|---|
|  | Application protocols | • **PROFINET IO** (Ethernet frames with frame identification $8892_{hex}$) to control and set parameters for the drive inverter.<br>• **HTTP** (Hypertext Transfer Protocol) for diagnostics using a Web browser.<br>• **SMLP** (Simple MOVILINK® Protocol), protocol used by MOVITOOLS® MotionStudio. |
| | Port numbers used | • 300 (SMLP)<br>• 80 (HTTP) |
| | Ethernet services | • ARP<br>• ICMP (ping) |
| | 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) | $010A_{hex}$ |
| | Tools for startup | • MOVITOOLS® MotionStudio engineering software<br>• DBG60B keypad |
| | F address | 1 – 1022 DIP switch for setting the failsafe address |
| | Ambient temperature | 0 – 55 °C |

27793230/EN – 08/2022

### 4.23.4 Safety section

| Safety characteristics | |
|---|---|
| Maximum possible safety class | • SIL 3 according to EN 61508<br>• Performance level e according to EN ISO 13849-1 |
| 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 |

27793230/EN – 08/2022

## 4.24 PROFINET IO fieldbus interface with PROFIsafe DFS22B

### 4.24.1 Part number

28204247

### 4.24.2 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$^{PLUS®}$ 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.

### 4.24.3 Electronics data

| DFS22B option | | |
|---|---|---|
|  | Application protocols | • **PROFINET IO** (Ethernet frames with frame identification $8892_{hex}$) to control and set parameters for the drive inverter.<br>• **HTTP** (Hypertext Transfer Protocol) for diagnostics using a web browser.<br>• **SMLP** (Simple MOVILINK® Protocol), protocol used by MOVITOOLS® MotionStudio. |
| | Port numbers used | • 300 (SMLP)<br>• 80 (HTTP) |
| | Ethernet services | • ARP<br>• ICMP (ping) |
| | 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) | $010A_{hex}$ |
| | Tools for startup | • MOVITOOLS® MotionStudio engineering software<br>• DBG60B keypad |
| | F address | The failsafe address is set using the DCS21B/22B option |
| | Ambient temperature | 0 – 55 °C |

27793230/EN – 08/2022

## 4.25 MOVISAFE® DCS21B/22B/31B/32B safety module

### 4.25.1 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

### 4.25.2 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.

27793230/EN – 08/2022

### 4.25.3 Electronics data

| Option DCS21B/22B/31B/32B | | |
|---|---|---|
|  |  | LED alarm/error<br>LED watchdog<br>LED system B<br>LED system A |
| | | X80: Voltage supply connection |
| | | X81: Digital input connection |
| | | X82: Connection of digital outputs DO0, DO1 |
| | | X83: Connection of digital output DO2 |
| | | X84: Connection of incremental, sin/cos, HTL, or absolute encoder (encoder 1) |
| | | X85: Connection of incremental, sin/cos, HTL, or absolute encoder (encoder 2) |
| | | X86: CAN bus connection (only for DCS21B/22B) |
| | | X87: Connection for service interface |

27793230/EN – 08/2022

## 4.26 MOVI-PLC® basic DHP11B controller

### 4.26.1 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® *basic* 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) |

### 4.26.2 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®).

### 4.26.3 Electronics data

| MOVI-PLC® basic DHP11B option | | |
|---|---|---|
|  | Status displays | LEDs for the voltage supply to the I/Os, firmware, program, PROFIBUS, system bus |
| | Fieldbus | • PROFIBUS DP and DP-V1 acc. to IEC 61158<br>• Automatic detection of baud rate from 9.6 kbaud to 12 Mbaud<br>• Bus connection implemented with suitable connector<br>• GSD file SEW_6007.GSD<br>• DP ID number $6007_{hex}$ ($24579_{dec}$)<br>• Maximum 32 process data |
| | System bus | • 2 system buses (CAN) to control 12 inverters and CANopen I/O modules<br>• CAN layer 2 (SCOM cyclic, acyclic) or via the SEW MOVILINK® protocol<br>• Baud rate: 125 kBaud – 1 MBaud<br>• External bus terminator<br>• Address range: 0 – 127 |
| | Engineering | Via RS485, PROFIBUS and the system buses |
| | Panel operation | via RS485 |
| | Connection technology | • PROFIBUS: 9-pole D-sub connector according to IEC 61158<br>• System buses and I/Os: Plug-in terminals<br>• RS485: RJ10 |
| | Digital inputs/outputs | • 8 I/Os to IEC 61131-2; can be configured as inputs or outputs. Five are interrupt-capable |
| | Memory | • Program: 512 kByte<br>• Data: 128 kB<br>• Retain: 24 kB |
| | Tools for startup | MOVITOOLS® MotionStudio with integrated PLC Editor (programming languages IL, ST, LD, FBD, CFC, SFC; libraries for optimized inverter control) |

27793230/EN – 08/2022

## 4.27 OST11B

### 4.27.1 Part number

18205445

### 4.27.2 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.

### 4.27.3 Electronics data

| OST11B option | | |
|---|---|---|
|  | RS485 interface COM2<br>X35:1 – X35:4<br>X36:1 – X36:3 | • For connection of an Engineering PC, a DOP11A/B operator terminal or a gearmotor with integrated frequency inverter MOVIMOT®<br>• I/O standard, 57.6 kBd, max. total cable length 200 m, integrated dynamic terminating resistor permanently installed |
| | Potential level | COM2 is galvanically isolated from the MOVI-PLC® *basic* DHP11B controller. |

27793230/EN – 08/2022

## 4.28 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 |

### 4.28.1 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.

27793230/EN – 08/2022

*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

27793230/EN – 08/2022

### 4.28.2 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:<br>• Potential control / CAN 1 / COM1<br>• Potential COM2<br>• Potential digital inputs and outputs<br>• Potential system bus CAN 2 |
| | Memory | • Retain data: 32 kB<br>• System variables (retain): 8 kB<br>Program memory:<br>• DHE21B: 2 MB (for user program, incl. IEC libraries)<br>• DHE41B: 6 MB (for user program, incl. IEC libraries)<br>Data memory:<br>• DHE21B: 4 MByte (for IEC application)<br>• DHE41B: 8 MB (for IEC application) |
| | CAN 2 system bus<br>X32:1 – X32:3<br>System bus CAN 1<br>X33:1 – X33:3 | • System bus CAN 1 and CAN 2 to CAN specification 2.0, part A and B, transmission technology to ISO 11898<br>• The CAN 2 system bus is electrically isolated<br>• Max. 64 stations per CAN system bus<br>• Max. 64 SCOM transmit objects / 32 receive objects per CAN system bus<br>• Address range 0 – 127<br>• Baud rate: 125 kBaud – 1 MBaud<br>• If X32 or X33 is the bus terminator, you must connect a terminating resistor (120 Ω) externally<br>• You can remove connector X32 or X33 without interrupting the system bus<br>• The system bus can be run in layer 2 (SCOM cyclic, acyclic) or in accordance with the SEW MOVILINK® protocol |
| | Ethernet 1 X36 | System bus, reserved |
| | Ethernet 2 X37 | • TCP/IP<br>• Possible connections: engineering PC, other control, intranet |
| | USB | USB 1.0 to connect an engineering PC (in preparation) |
| | RS485 Interface<br>COM1/2<br>X34:1 – C34:4 | • For connection of a DOP11A/B operator terminal or a gearmotor with integrated MOVIMOT® frequency inverter<br>• E/A standard, 57.6 / 9.6 kBaud, max. cable length 200 m<br>• Dynamic terminating resistor with fixed installation |
| | SD memory card | • PC-readable<br>• Contents<br>– Firmware<br>– IEC program<br>– Data<br>• At least 128 MB memory |
| | Engineering | Engineering takes place via one of the following interfaces:<br>• Ethernet 2 (X37)<br>• USB (X35)<br>Engineering for all SEW-EURODRIVE components connected to the MOVI-PLC® *advanced* DHE41B control card can be performed using the MOVI-PLC® *advanced* DHE41B control card.<br>Engineering of the MOVI-PLC® *advanced* DHE41B controller cannot be performed via the inverters.<br>• MOVITOOLS® engineering software<br>MotionStudio with PLC Editor |

27793230/EN – 08/2022

### 4.28.3 DHF21B/41B electronics data

## INFORMATION

For connections identical with DHE41B, refer to the "DHE41B electronics data" section.

| DHF21B/41B option | | |
|---|---|---|
|  | Part number | • DHF21B: 18236081<br>• DHF41B: 18211615 |
| | Potential levels | Option DHF21B/41B has the following potential levels:<br>• Potential control / CAN 1 / COM1<br>• Potential COM2<br>• Potential digital inputs and outputs<br>• Potential system bus CAN 2<br>• Potential PROFIBUS |
| | 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 | • PC-readable<br>• Contents<br>– Firmware<br>– IEC program<br>– Data<br>• At least 128 MB memory |
| | DeviceNet™ connection X30D:1 – X30D:5 | • 2-wire bus and 2-wire supply voltage DC 24 V with 5-pole Phoenix terminal<br>• Pin assignment according to DeviceNet™ specification |

27793230/EN – 08/2022

### 4.28.4 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 | | |
|---|---|---|
|  | Part number | • DHR21B: 18236103<br>• DHR41B: 18216323 |
| | Electrical supply | Installed in MOVIDRIVE® MDX61B:<br>• Power consumption: $P_{max}$ = 9.5 W<br>Installed in the MOVIAXIS® master module (MXM):<br>• Power consumption: $P_{max}$ = 12 W |
| | Ethernet connection X30-1, X30-2 | Via RJ45 socket, pin assignment according to IEC 11801<br>Integrated Ethernet switch with auto-crossing and auto-negotiation functionality. |
| | SD memory card | • PC-readable<br>• Contents<br>– Firmware<br>– IEC program<br>– Data<br>• At least 128 MB memory |
| | Engineering | Additional engineering access via PROFINET, EtherNet/IP™ and Modbus TCP/IP interface (X30:1/2) |

27793230/EN – 08/2022

## 4.29 Safety-related BST brake module

### 4.29.1 Part numbers

The safety-related brake module is available in three variants:

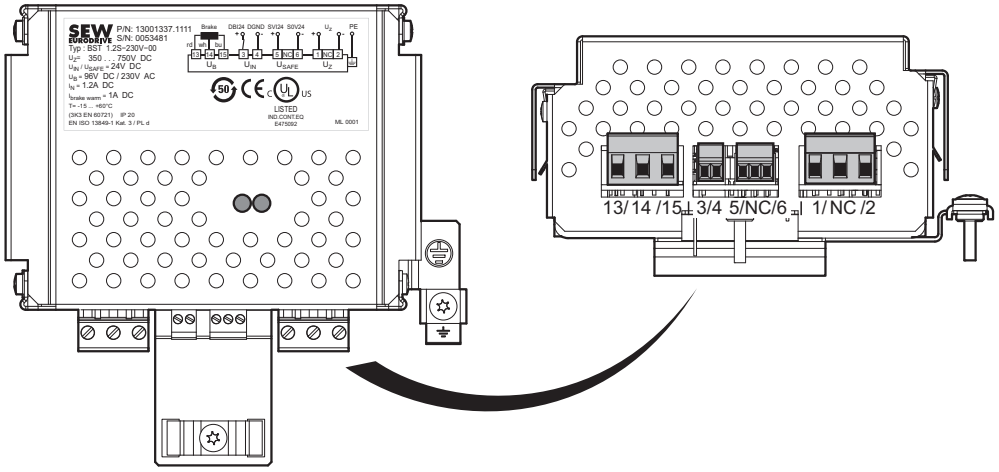
| Type designation | Part number | Approved SEW disk brakes |
|---|---|---|
| BST 0.6S-460V-00 | 08299714 | All brake coils with a brake coil voltage of AC 460 V and a coil power ≤ 120 W. Several brake coils can be connected for redundant systems. In this case, the total power must not exceed 120 W. |
| BST 0.7S-400V-00 | 13000772 | All brake coils with a brake coil voltage of AC 400 V and a coil power ≤ 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 ≤ 120 W. Several brake coils can be connected for redundant systems. In this case, the total power must not exceed 120 W. |

### 4.29.2 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 $V_{safe}$ when a connected control device (e.g. emergency stop device) is activated.
- UL approved
- Disconnecting the safety-related control voltage $V_{safe}$ 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.

27793230/EN – 08/2022

### 4.29.3 Electronics data




*9007202044464779*

| Terminal | | Function |
|---|---|---|
| 1 | $+U_Z$ | DC link voltage input + |
| 2 | $+U_Z$ | DC link voltage input - |
| 5 | SVI24 | Input for safety-related control voltage $V_{safe}$ |
| 6 | S0V24 | Reference potential for safety-related control voltage $V_{safe}$ |
| 3 | DBI24 | Functional control voltage $V_{IN}$ input |
| 4 | DGND | Reference potential for functional control voltage $V_{IN}$ |
| 13 | RD | Brake output |
| 14 | WH | |
| 15 | BU | |
| ⏚ | | Ground connection |

27793230/EN – 08/2022

# 5 Technical data of external accessories

## 5.1 DMP11B mounting panel

### 5.1.1 Part number

08183988

### 5.1.2 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.

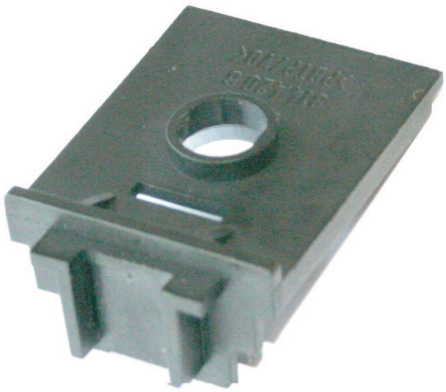
27793230/EN – 08/2022

## 5.2 DLB11B touch guard

### 5.2.1 Part number

08231117 (Scope of delivery 12 pieces)

### 5.2.2 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)

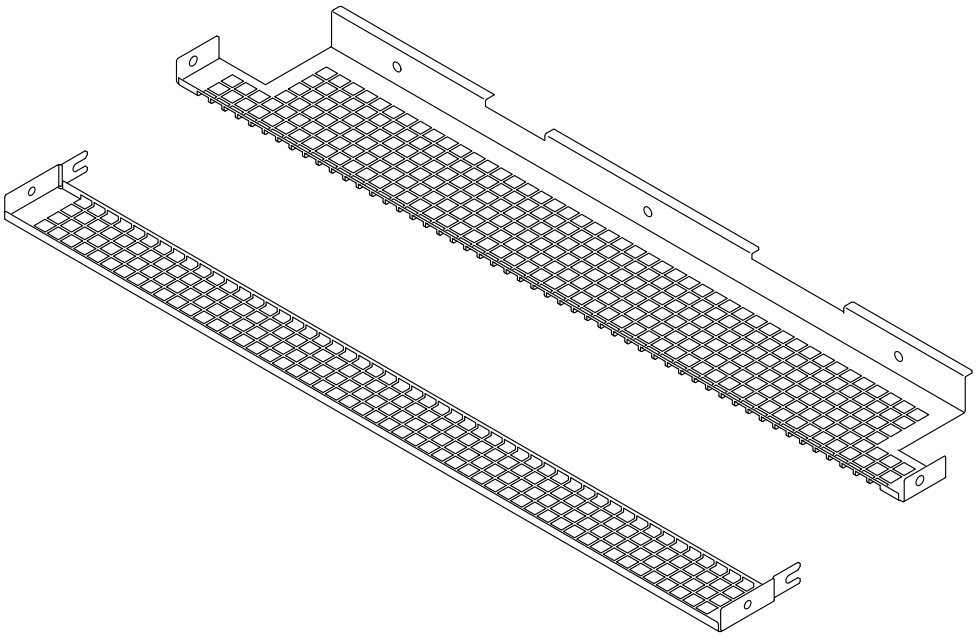
27793230/EN – 08/2022

## 5.3 DLB21B touch guard (for size 7)

### 5.3.1 Part number

18226086

### 5.3.2 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).

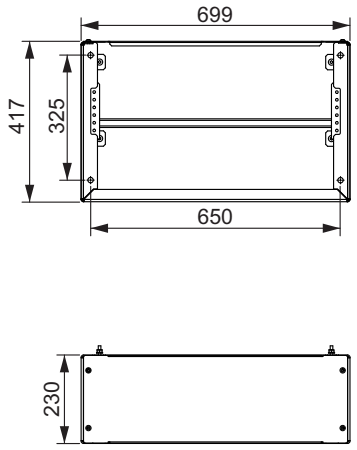
27793230/EN – 08/2022

## 5.4 DLS11B mounting base (for size 7)

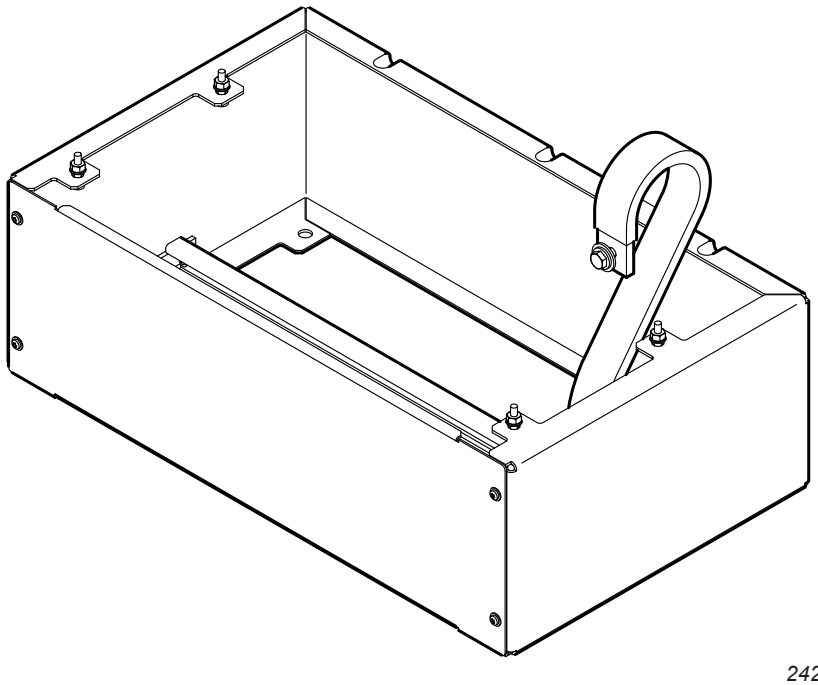
### 5.4.1 Part number

18226027

### 5.4.2 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.

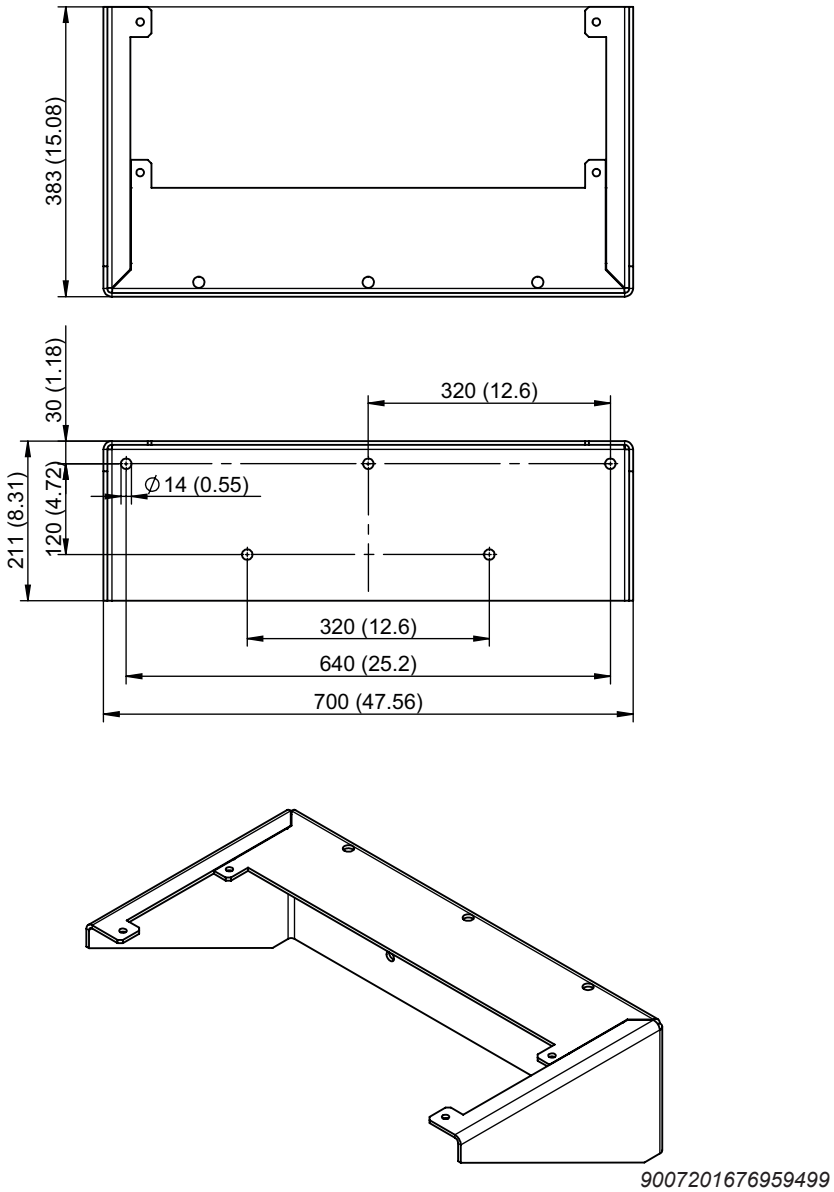
27793230/EN – 08/2022

## 5.5 DLH11B wall bracket (for size 7)

### 5.5.1 Part number

18226108

### 5.5.2 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.

## 5.6 DLA11B connection kit (for size 7)

### 5.6.1 Part number

18223125

### 5.6.2 Description

Connection material for connecting supply system and motor cables with cross sections up to 240 $mm^2$ 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 $mm^2$)

27793230/EN – 08/2022

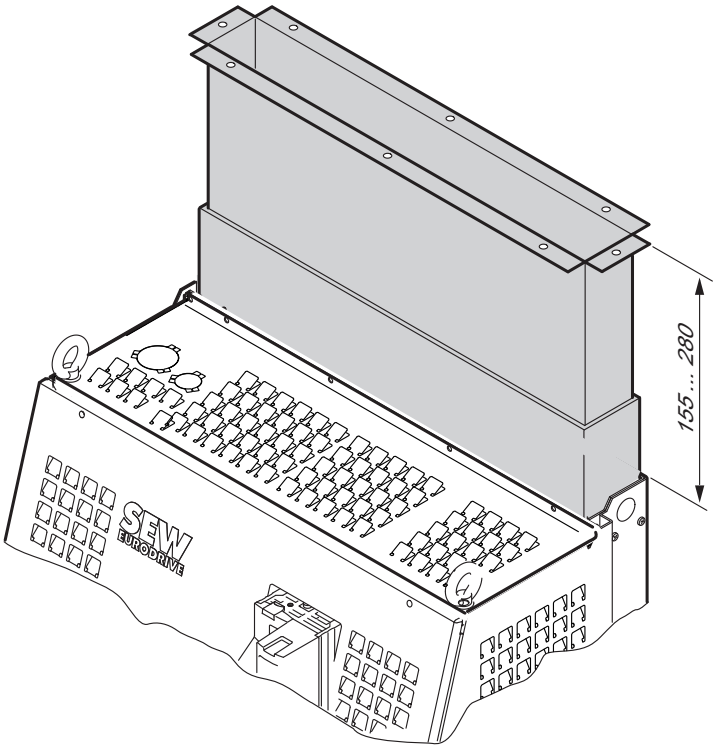
## 5.7 DLK11B air duct (for size 7)

### 5.7.1 Part number

18226035

### 5.7.2 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.).

27793230/EN – 08/2022

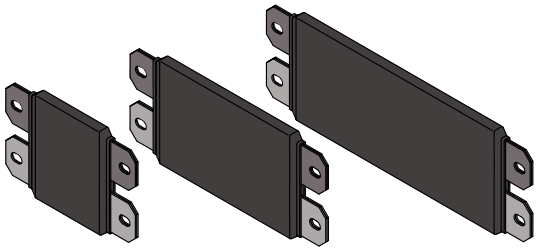
## 5.8 DLZ11B DC link coupling (for size 7)

### 5.8.1 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 |

### 5.8.2 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 ($+U_z$; $-U_z$) 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.

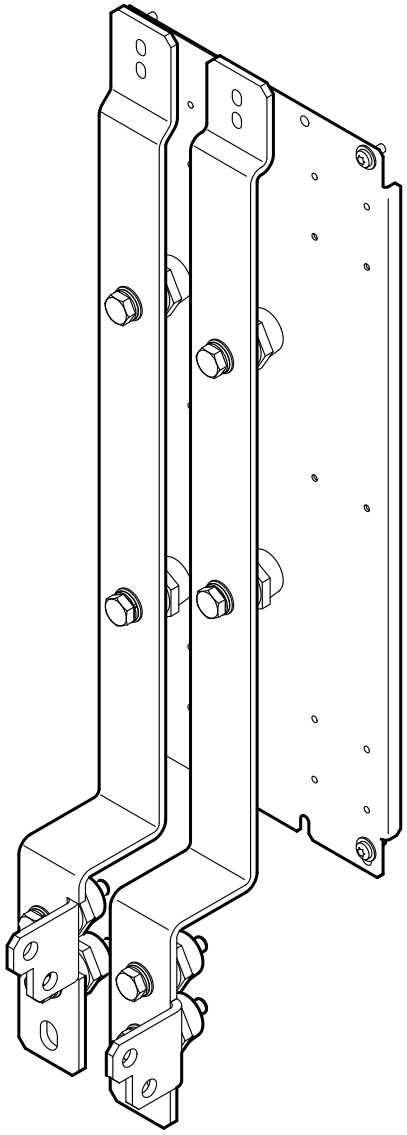
27793230/EN – 08/2022

## 5.9 2Q DLZ12B DC link adapter (for size 7)

### 5.9.1 Part number

18227295

### 5.9.2 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

27793230/EN – 08/2022

- MDX62B2000-503-2-0T/L
- MDX62B2500-503-2-0T/L

The DC link connection ($+U_z$; $-U_z$) of size 7 can be connected on the side as standard. The 2Q DC link adapter provides a connection option for $+U_z$ and $-U_z$ at the bottom of the device.

The DC link adapter can be used for DC link coupling with MOVIDRIVE® B sizes 0 – 6.

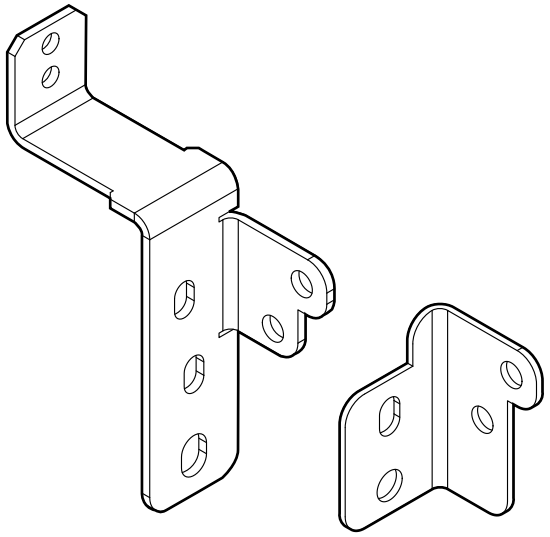
27793230/EN – 08/2022

## 5.10 4Q DLZ14B DC link adapter (for size 7)

### 5.10.1 Part number

18227287

### 5.10.2 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 ($+U_z$; $-U_z$) of size 7 can be connected on the side as standard. The 4Q DC link adapter provides a connection option for $+U_z$ and $-U_z$ at the bottom of the device. The DC link adapter should be used for DC link coupling with MOVIDRIVE® B sizes 0 – 6.

27793230/EN – 08/2022

# 6 Technical data of braking resistors, chokes and filters

## 6.1 Braking resistors BW.. / BW...-T / BW...-P

### 6.1.1 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

27793230/EN – 08/2022

**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 ≤ 120 s).

### 6.1.2 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.

### 6.1.3 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.

### 6.1.4 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.

27793230/EN – 08/2022

### 6.1.5 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[1] | 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 **regenerative power limit** of the inverter. (= 150% of the recommended motor power → Technical Data) | | | | | | |
| Resistance value $R_{BW}$ | 90 Ω ±35% | 100 Ω ±10% | | 72 Ω ±10% | | 68 Ω ±10% | |
| Tripping current (of F16) $I_F$ | - | 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 mm² (AWG13) 0.5 Nm | Cables | | Ceramic terminals 2.5 mm² (AWG13) 0.5 Nm | |
| Degree of protection | IP20 | IP54 | IP20 (when installed) | IP54 | | IP20 (when installed) | |
| Ambient temperature $\vartheta_{amb}$ | -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[1] | 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[2]. | 7.2 kW | 15.6 kW | 24.0 kW[2] |
| 6% cdf | 11 kW | 19 kW | 20 kW[2] | 11.4 kW | 24.0 kW | 24.0 kW[2] |
| | Observe the **regenerative power limit** of the inverter. (= 150% of the recommended motor power → Technical Data) | | | | | |
| Resistance value $R_{BW}$ | 47 Ω ±10% | | | 39 Ω ±10% | | |
| Tripping current (of F16) $I_F$ | 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 mm² (AWG13) / 0.5 Nm BW347-T: Ceramic terminals 10 mm² (AWG8) / 1.6 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) | 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 |
| Load capacity 50% cdf[1] | 2.5 kW | 5.9 kW | 12.7 kW | 27.2 kW |

27793230/EN – 08/2022

| **Braking resistor type BW...** | **BW018-015** | | | |
|---|---|---|---|---|
| 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[2)] |
| 6% cdf | 11.4 kW | 26.6 kW | 52.2 kW[2)] | 62.7 kW[2)] |
| | Observe the **regenerative power limit** of the inverter. (= 150% of the recommended motor power → Technical Data) | | | |
| Resistance value $R_{BW}$ | 18 Ω ±10% | | | 15 Ω ±10% |
| Tripping current (of F16) $I_F$ | 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 2.5 mm² (AWG13) / 0.5 Nm BW018-015-P: Terminal 2.5 mm² (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 [3)] | | | 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[1)] | 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 **regenerative power limit** of the inverter. (= 150% of the recommended motor power → Technical Data) | | |
| Resistance value $R_{BW}$ | 12 Ω ±10% | | |
| Tripping current (of F16) $I_F$ | 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[1)] | 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 $R_{BW}$ | 6 Ω ± 10% | | 1.4 Ω ± 10% | 2.5 Ω ± 10% |
| Tripping current (of F16) $I_F$ | 47.4 A | 54.7 A | 110 A | 129 A |
| Design | Grid resistor | | | |

| Braking resistor type BW..-T/-P | BW106-T | BW206-T | BW1.4-170 | BW003-420-T |
|---|---|---|---|---|
| Connections / 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 0900/1100/1320[2)] | | 1600/2000/2500 | |

1) cdf = Cyclic duration factor of the braking resistor in relation to a cycle duration T D ≤ 120 s

2) When connected in parallel, the load capacity and tripping current are doubled.

27793230/EN – 08/2022

### 6.1.6 Assignment to AC 230 V devices (...-2_3)

| **Braking resistor type BW...** | **BW039-003** | **BW039-006** | **BW039-012** | | **BW027-006** | **BW027-012** | | |
|---|---|---|---|---|---|---|---|---|
| Part number | 08216878 | 08216886 | 0821689 4 | | 8224226 | 8224234 | | |
| Braking resistor type BW...-T | | | BW039-012-T | BW039-026-T | | | BW018-015-P | BW018-035-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[1] | 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[2] | 1.9 kW | 3.8 kW | 4.5 kW | 10.5 kW |
| 12% cdf | 1.8 kW | 3.6 kW | 6.0 kW[2]. | 6.0 kW[2] | 3.6 kW | 7.2 kW | 6.7 kW | 13.0 kW[2] |
| 6% cdf | 2.8 kW | 5.7 kW | 6.0 kW | 6.0 kW[2] | 5.7 kW | 8.7 kW | 11.4 kW | 13.0 kW[2] |
| | Observe the **regenerative power limit** of the inverter. (= 150% of the recommended motor power → Technical Data) | | | | | | | |
| Resistance value $R_{BW}$ | 39 Ω ±10% | | | | 27 Ω ±10% | | 18 Ω ±10% | |
| Tripping current (of F16) $I_F$ | 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 mm² (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[3] | |

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[1] | 12.7 kW | 15.6 kW[2] | 4.2 kW | 8.5 kW | 17 kW | 23 kW | 30.6 kW |
| At 25% cdf | 13.0 kW | 15.6 kW[2] | 7.5 kW | 15.0 kW | 19.6 kW[2] | 39.2 kW[2] | 39.2 kW[2] |
| 12% cdf | 13.0 kW[2]. | 15.6 kW[2] | 11.2 kW | 19.6 kW | 19.6 kW[2] | 39.2 kW[2] | 39.2 kW[2] |
| 6% cdf | 13.0 kW[2] | 15.6 kW[2] | 19.0 kW | 19.6 kW[2] | 19.6 kW[2] | 39.2 kW[2] | 39.2 kW[2] |
| | Observe the **regenerative power limit** of the inverter. (= 150% of the recommended motor power → Technical Data) | | | | | | |
| Resistance value $R_{BW}$ | 18 Ω ±10% | 15 Ω ±10% | 12 Ω ±10% | | | 6 Ω ±10% | |
| Tripping current (of F16) $I_F$ | 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[3] | |

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.

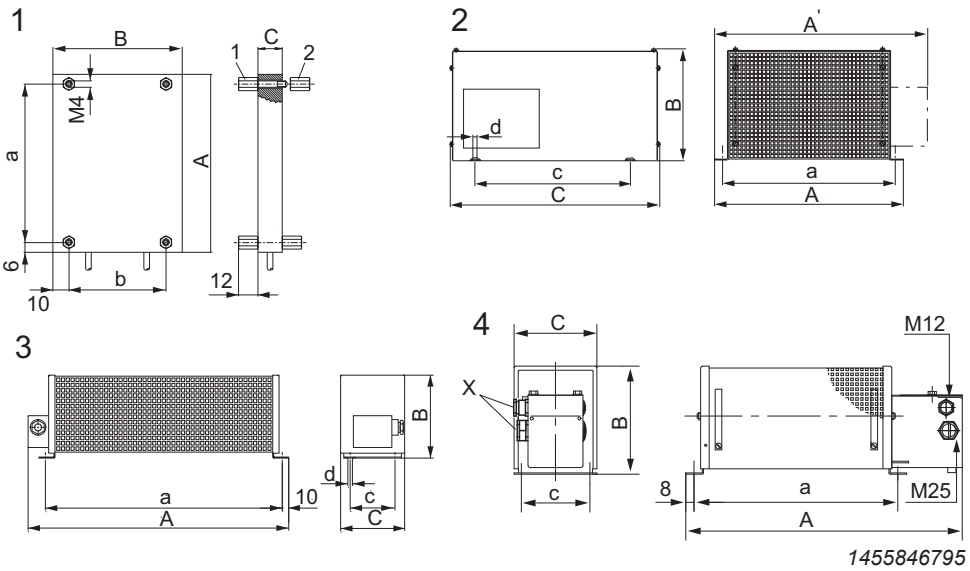
### 6.1.7 Technical data of BW...-T / BW...-P braking resistors

| BW...-T / BW...-P | |
|---|---|
| Connection cross section for signal contact/tightening torque | 1 x 2.5 $mm^2$/ 1 Nm |
| Switching capacity of the temperature switch signal contact | • DC 2 A / DC 24 V (DC11)<br>• AC 2 A / AC 230 V (AC11) |
| Switch contact (NC contact) | According to EN 60730 |

27793230/EN – 08/2022

### 6.1.8 Dimension drawing of BW.../BW...-T/BW...-P braking resistors

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




BW... :
- 1 = Flat design
  The connection lead is 500 mm long. The scope of delivery includes 4 M4 stud bolts each of type 1 and 2.
- 2 = Grid resistor
- 3 = Wire resistor
- 4 = Wire resistor with temperature switch (-T/-P)
  Cable entry (X) is possible from both sides.

#### Design 1

| BW... type | Main dimensions in mm | | | Fastening parts mm | | | Cable gland | Mass kg |
|---|---|---|---|---|---|---|---|---|
| BW..-T/BW...-P | 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 |
|---|---|---|---|---|---|---|---|---|
| BW..-T/BW...-P | 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 |

27793230/EN – 08/2022

### Design 3

| BW... type | Main dimensions in mm | | | Fastening parts mm | | | Cable gland | Mass kg |
|---|---|---|---|---|---|---|---|---|
| BW..-T/BW...-P | 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 |

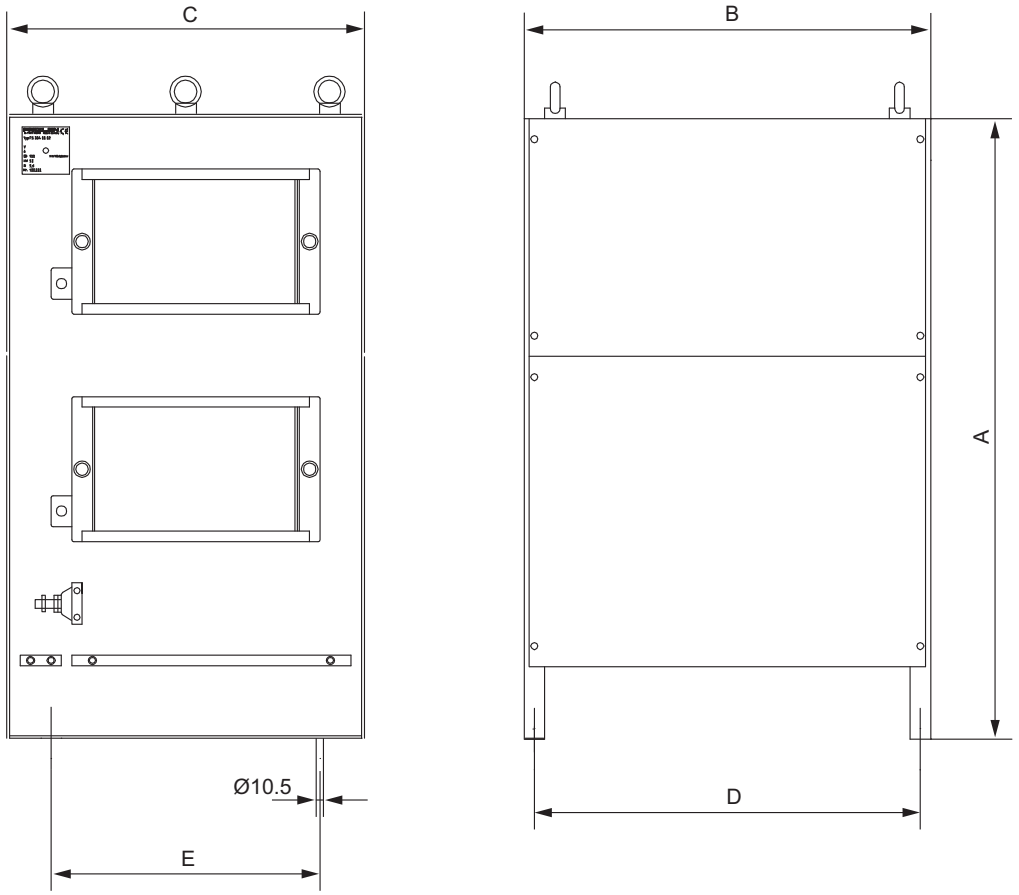
### Design 4

| BW... type | Main dimensions in mm | | | Fastening parts mm | | | Cable gland | Mass kg |
|---|---|---|---|---|---|---|---|---|
| BW..-T/BW...-P | 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 |

27793230/EN – 08/2022

### 6.1.9 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 kg |
|---|---|---|---|---|---|---|
| BW..-T/BW...-P | A | B | C | D | E | |
| BW1.4-170 | 460 | 795 | 490 | 770 | 380 | 51 |
| BW003-420-T | 710 | 995 | 490 | 970 | 380 | 93 |

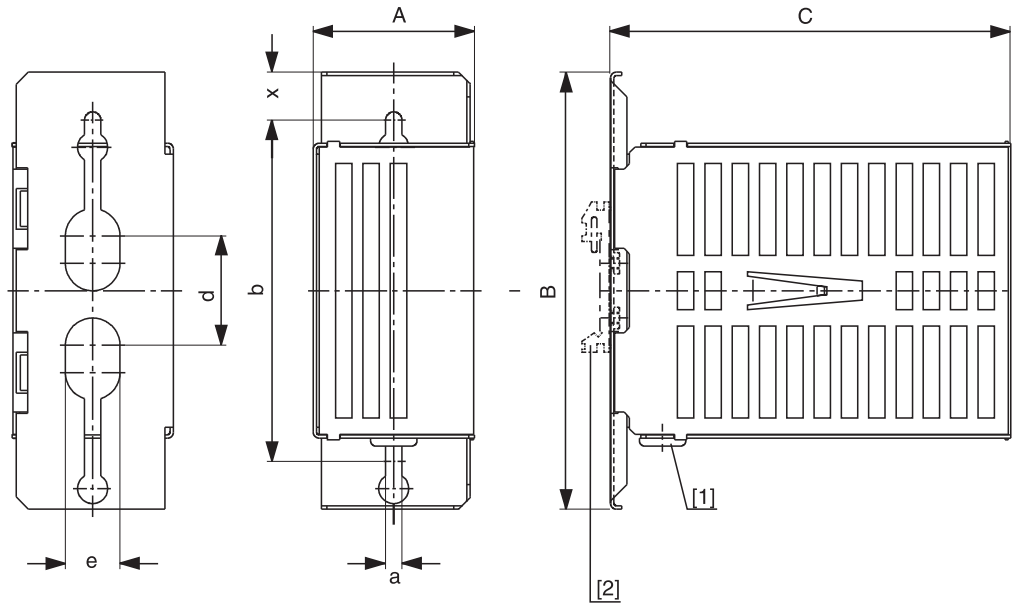
### 6.1.10 BS... touch guard

#### 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.

27793230/EN – 08/2022

### 6.1.11 DKB11A heat sink for braking resistors in flatpack design

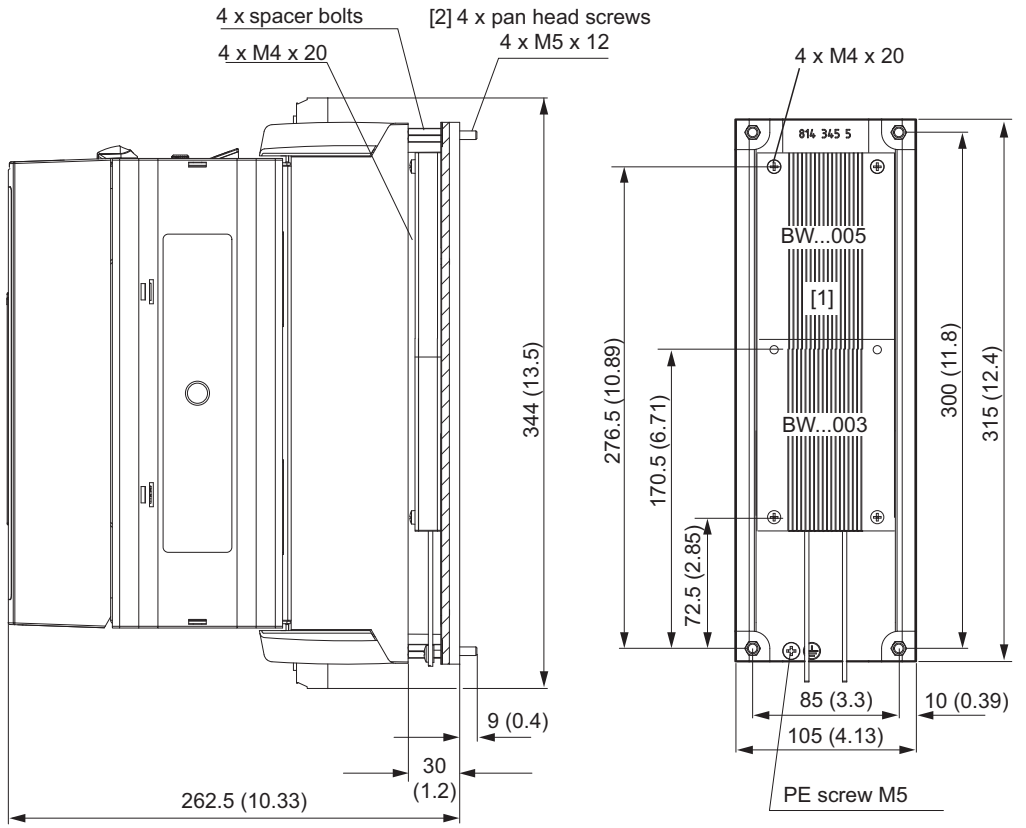
**Part number**

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.

## 6.2 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

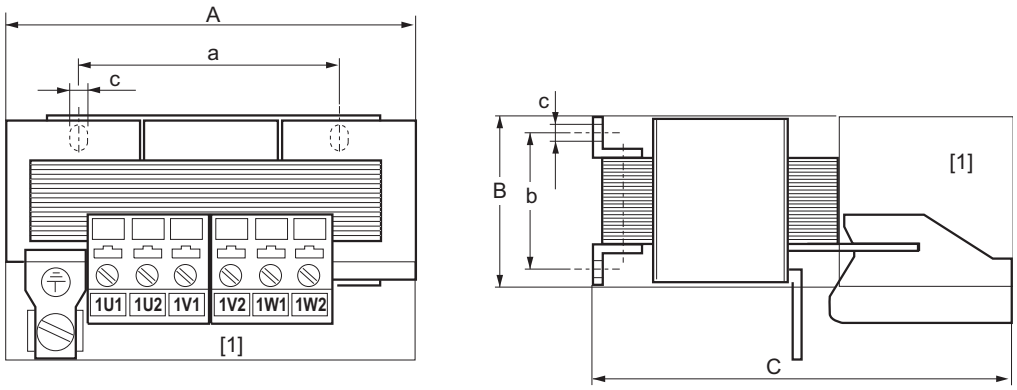
| Line choke type | ND020-013 | ND030-023[1] | ND045-013 | ND085-013 | ND150-013 | ND200-0033 | ND300-0053 |
|---|---|---|---|---|---|---|---|
| Part number | 08260125 | 08271518 | 08260133 | 08260141 | 08255482 | 08265798 | 08277214 |
| Nominal line voltage $V_N$ (according to EN 50160) | 3 × AC 380 V – 500 V, 50/60 Hz | | | | | | |
| Rated current[2] $I_N$ | 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 4 mm² (AWG12) | Terminal strips 2.5 mm² – 10 mm² (AWG13 – AWG8) | Terminal strips 10 mm² (AWG8) | Terminal strips 35 mm² (AWG2) | M10 stud PE: M8 stud | | M12 stud PE: 2 × M10 |
| Tightening torque | 0.6 – 0.8 Nm | max. 2.5 Nm | | 3.2 – 3.7 Nm | M10 stud: 10 Nm PE: 6 Nm | | M12 stud: 15.5 Nm PE: 10 Nm |
| Assignment to AC 400/500 V devices (MDX60/61B...-5_3) | | | | | | | |
| Nominal operation (100%) | 0005 – 0075 | 0110/0150 | 0110 – 0220 and MDR60A0150 | 0300 – 0450 and MDR60A0370 | 0550/0750 | MDR60A 0750 | 0900 – 1320 |
| Increased power (125%) | 0005 – 0075 | 0110 | 0110/0150 | 0220 – 0370 | 0450 – 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.

27793230/EN – 08/2022

### 6.2.1 Dimension drawing for line chokes ND020.. / ND030.. / ND045.. / ND085..

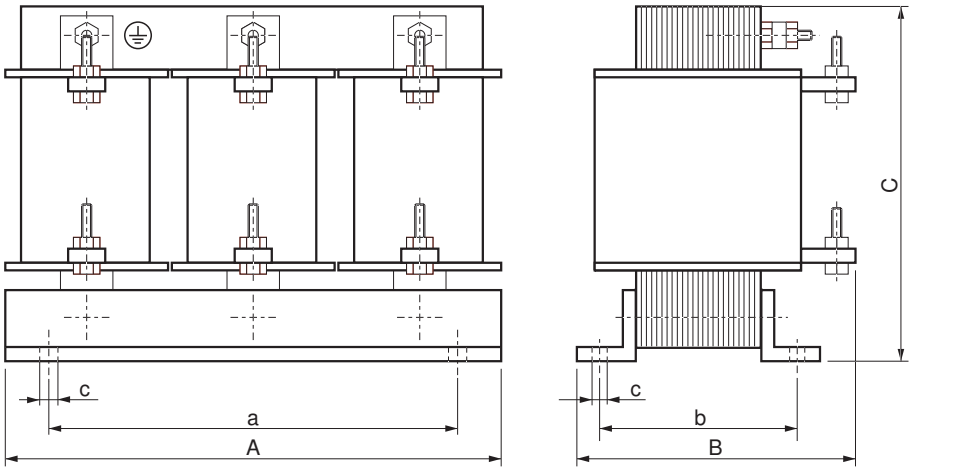



[1] Space for installation terminals
Any mounting position

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 |

### 6.2.2 Dimension drawing for line chokes ND150.. / ND200.. / ND300..




| 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[1)] | 300 | 190 | 295 | 255 | 145 | 11 | 35 |

1) Except PE: M10 × 30

27793230/EN – 08/2022

## 6.3 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 $V_N$ (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 mm² (AWG 10) | | | 10 mm² (AWG 8) | 10 mm² (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 $V_N$ (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 mm² (AWG 6) | 35 mm² (AWG 2) | 50 mm² (AWG1/0) | 50 mm² (AWG1/0) | 95 mm² (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 | - | - |

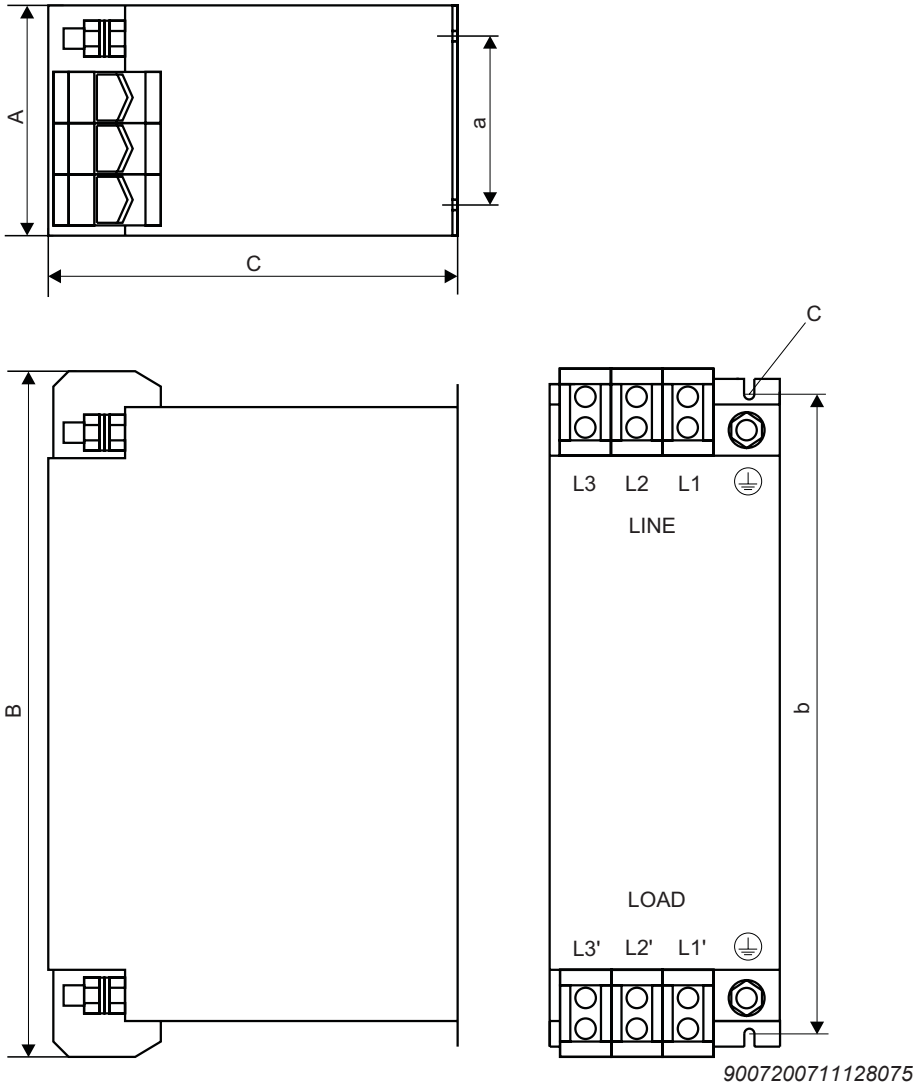
| Line filter type | NF300-503 | NF600-503 |
|---|---|---|
| Part number | 08274193 | 17963389 |
| Nominal line voltage $V_N$ (according to EN 50160) | 3 × AC 380 V – 500 V, 50/60 Hz | |
| Nominal current $I_N$ | AC 300 A | AC 600 A |
| Power loss at $I_N$ $P_V$ | 180 W | 44 W |
| Leakage current at $V_N$ | < 45 mA | < 6 mA |
| Ambient temperature $\vartheta_{amb}$ | -25 – +40 °C | |
| Degree of protection | IP20 (EN 60529) | IP00 (EN 60529) |

27793230/EN – 08/2022

| Line filter type | NF300-503 | NF600-503 |
|---|---|---|
| Connections L1-L3/L1'-L3' | 150 mm² (AWG300-2) | Connection rail with bore for M12 Max. 2 × 240 mm² |
| 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%) | - | - |

27793230/EN – 08/2022

### 6.3.1 Dimension drawing of NF009-503 – NF300-503 line filter



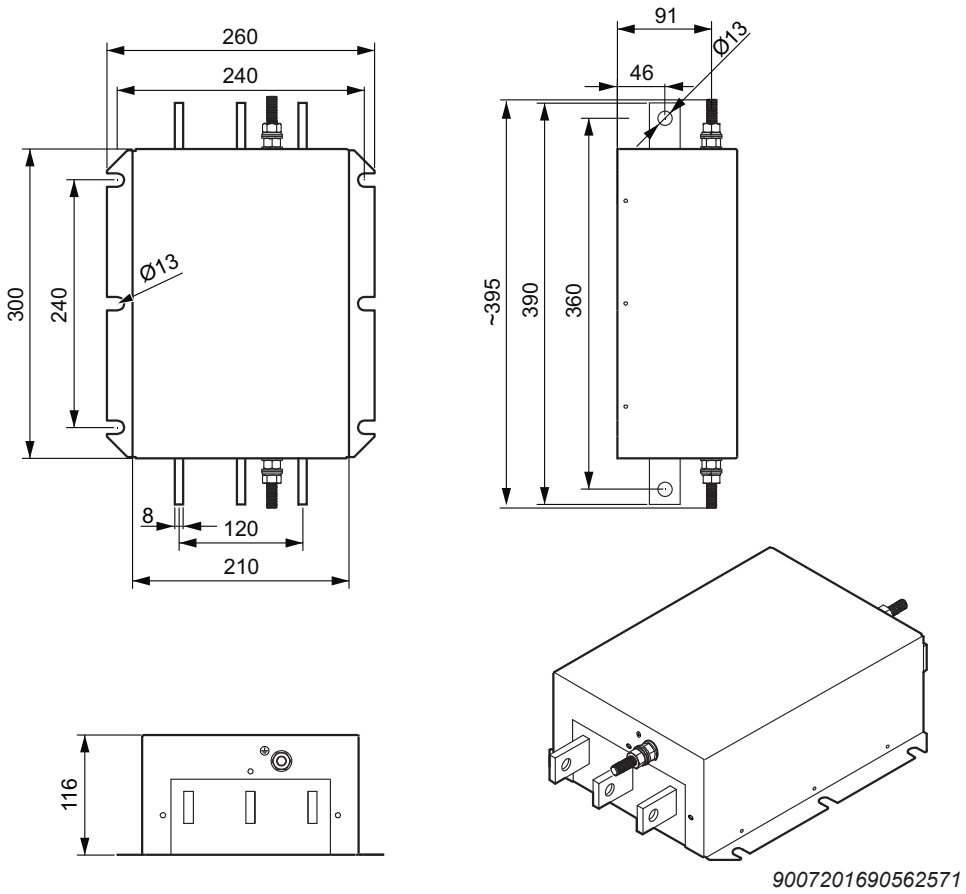

9007200711128075

Any mounting position

| Line filter type | Main dimensions in mm | | | Mounting dimensions mm | | Hole dimension mm | PE connection | Mass |
|---|---|---|---|---|---|---|---|---|
| | A | B | C | a | b | c | | kg |
| NF009-503 | 55 | 195 | 80 | 20 | 180 | 5.5 | M5 | 0.8 |
| NF014-503 | | 225 | | | 210 | | | 0.9 |
| NF018-503 | 50 | 255 | | | 240 | | | 1.1 |
| NF035-503 | 60 | 275 | 100 | 30 | 255 | | | 1.7 |
| NF048-503 | | 315 | | | 295 | | M6 | 2.1 |
| NF063-503 | 90 | 260 | | 60 | 235 | 6.5 | | 2.4 |
| NF085-503 | | 320 | 140 | | 255 | | M8 | 3.5 |
| NF115-503 | 100 | 330 | 155 | 65 | | | M10 | 4.8 |
| NF150-503 | | | | | | | | 5.6 |
| NF210-503 | 140 | 450 | 190 | 102 | 365 | | | 8.9 |
| NF300-503 | 170 | 540 | 230 | 125 | 435 | | M12 | 12.2 |

27793230/EN – 08/2022

### 6.3.2 Dimension drawing of NF600-503 line filter




Any mounting position

| Line filter type | PE connection | Mass |
|---|---|---|
| | | kg |
| NF600-503 | M12 | 16.8 |

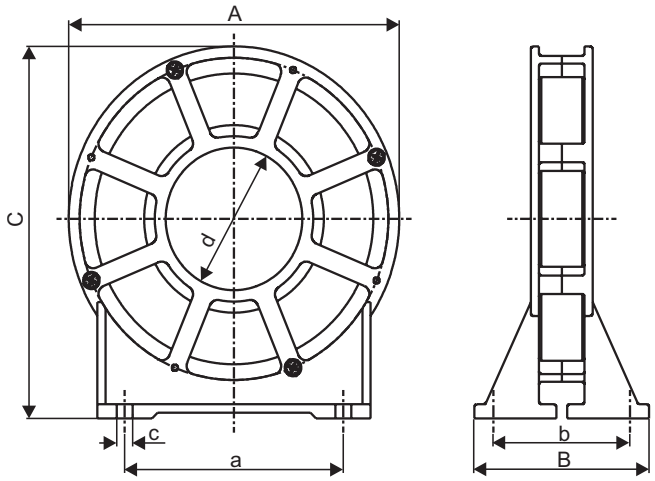
## 6.4 HD... output chokes

- 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/ Tightening torque | 1.5 – 16 mm² (AWG 16 – 6) | ≤ 1.5 mm² (AWG 16) | ≥ 16 mm² (AWG 6) | Terminal stud M12 36 Nm | M12 cable lugs 70 Nm PE connection M12 36 Nm |
| Degree of protection | - | - | - | IP10 | IP00 |
| UL/cUL approval | No UL/cUL relevant component | | | Yes | Yes |

### 6.4.1 Dimension drawing HD001 – HD003

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




**HD001**
**HD002**
**HD003**

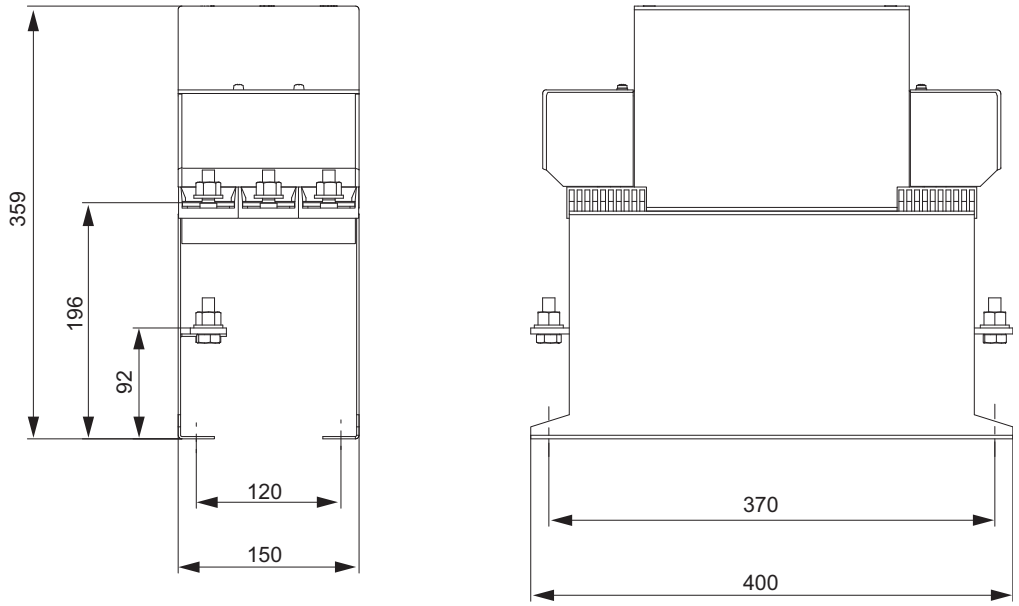
*1456392203*

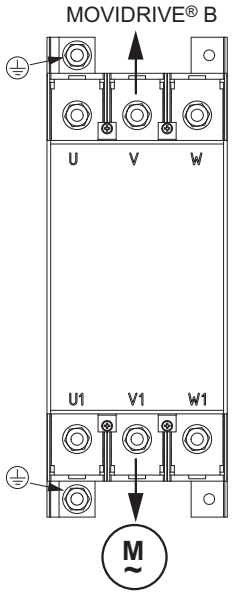
| Output choke type | Main dimensions in mm | | | Mounting dimensions mm | | Inner diameter in mm | Hole dimension mm | Weight |
|---|---|---|---|---|---|---|---|---|
| | A | B | C | a | b | d | c | kg |
| HD001 | 121 | 64 | 131 | 80 | 50 | 50 | 5.8 | 0.5 |
| HD002 | 66 | 49 | 73 | 44 | 38 | 23 | | 0.2 |
| HD003 | 170 | 64 | 185 | 120 | 50 | 88 | 7.0 | 1.1 |

27793230/EN – 08/2022

### 6.4.2 Dimension drawing of HD004

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



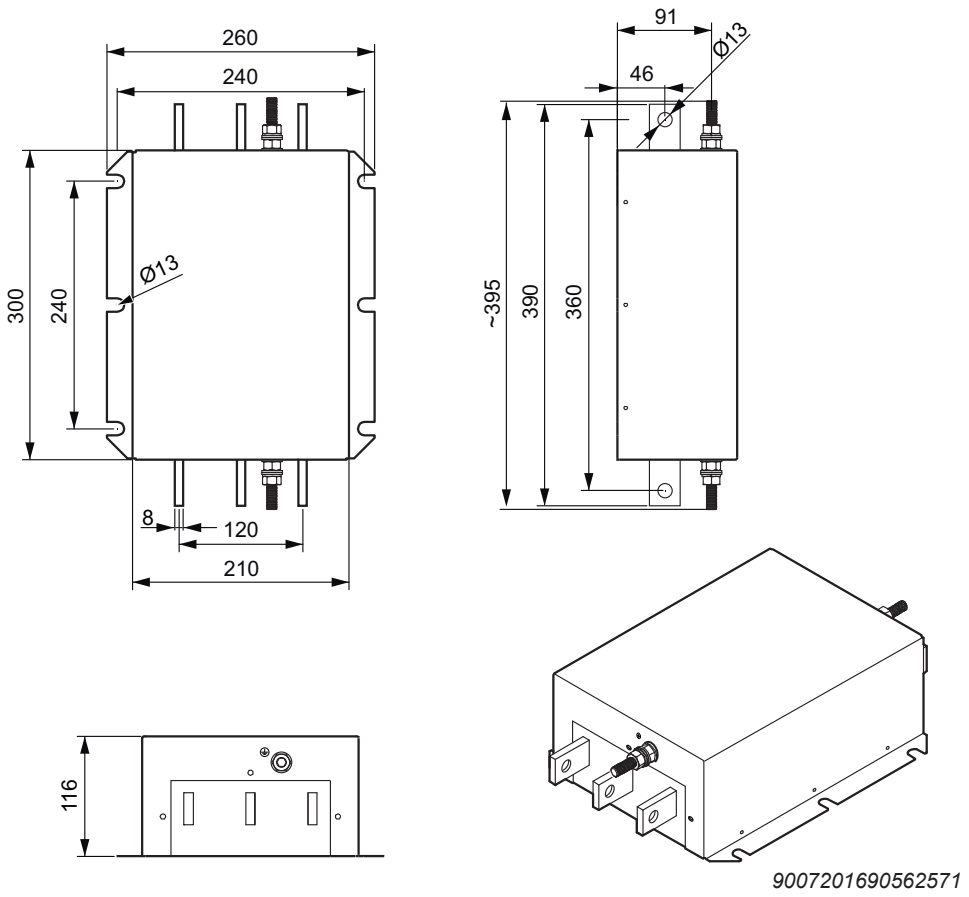

**HD004**

*1457368587*

| Output choke type | Main dimensions in mm | | | Mounting dimensions mm | | Inner diameter in mm | Hole dimension mm | Mass |
|---|---|---|---|---|---|---|---|---|
| | A | B | C | a | b | d | c | kg |
| HD004 | 150 | 400 | 360 | 120 | 370 | – | 9.0 | 12.5 |

### 6.4.3 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 |

## 6.5 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[1)]** | **HF015-503[1)]** | **HF022-503[1)]** | **HF030-503[1)]** | **HF040-503[1)]** | **HF055-503[1)]** |
|---|---|---|---|---|---|---|
| Part number | 0826029X | 08260303 | 08260311 | 0826032X | 08263116 | 08263124 |
| Nominal voltage $V_N$ | 3 × AC 230 V – 500 V, 50/60 Hz[2)] | | | | | |
| Leakage current at $V_N$ ΔI | 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[3)] | | | | | |
| 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 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 $I_N$ ΔU | < 6.5% (7.5%) at AC 400 V / < 4% (5%) at AC 500 V with $f_{Amax}$ = 50 Hz (60 Hz) | | | | | |
| Nominal through current[4)] $I_{N\ 400\ V}$ (at $V_{line}$ = 3 × 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 $I_{N\ 500\ V}$ (at $V_{line}$ = 3 × AC 500 V) | AC 2 A | AC 3 A | AC 5 A | AC 6 A | AC 8 A | AC 10 A |
| Nominal operation (100%)[3)] | 0005 – 0011 | 0014 / 0015 | 0022 | 0030 | 0040 | 0055 |
| Increased power (125%)[3)] | 0005 | 0008 / 0011 | 0014 / 0015 | 0022 | 0030 | 0040 |
| Assignment to AC 230 V devices (MDX61B...-2_3) | | | | | | |
| Voltage drop at $I_N$ ΔU | - | < 18.5 % (19 %) at AC 230 V with $f_{Amax}$ = 50 Hz (60 Hz) | | | | |
| Nominal throughput current $I_{N\ 230\ V}$ (at $V_{line}$ = 3 × 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%)[3)] | – | – | 0015/0022 | – | 0037 | 0055 |
| Increased power (125%)[3)] | – | – | 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 IN.
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.

27793230/EN – 08/2022

| Output filter type | HF075-503[1] | HF023-403[1] | HF033-403[1] | HF047-403[1] | 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[2] | | | | | | |
| Leakage current at $V_N$ ΔI | 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[3] | | | | | | |
| 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 1.6 Nm ± 20 % | 35 mm² (AWG 2) 3.2 Nm | | | | M10 terminal studs / 70 mm² (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 $I_N$ ΔU | < 6.5% (7.5%) at AC 400 V / < 4% (5%) at AC 500 V with $f_{Amax}$ = 50 Hz (60 Hz) | | | | | | |
| Nominal through current[4] $I_{N\ 400\ V}$ (at $V_{line}$ = 3 × 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 × AC 400 V) Nominal throughput current $I_{N\ 500\ V}$ (at $V_{line}$ = 3 × 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%)[3] | 0075 | 0110 | 0150/0300[5] | 0220 | 0370/0450/ 0550[5]/0750[5] / 0900[5] | 0550/0750/0 900 | 1100/1320 |
| Increased power (125%)[3] | 0055 | 0075 | 0110/0220[5] | 0150 | 0300/0370/0 450 /0550[5]/0750[5] | 0550/0750 | 0900/1100/1 320 |
| Assignment to AC 230 V devices (MDX61B...-2_3) | | | | | | | |
| Voltage drop at $I_N$ ΔU | < 18.5% (19%) at AC 230 V with $f_{Amax}$ = 50 Hz (60 Hz) | | | | | | |
| Nominal throughput current $I_{N\ 230\ V}$ (at $V_{line}$ = 3 × AC 230 V) | AC 29 A | AC 42 A | AC 56.5 A | AC 82.6 A | AC 156 A | – | – |
| Nominal operation (100%)[3] | 0075 | 0110 | 0150/0300[5] | 0220 | 0300 | – | – |
| Increased power (125%)[3] | 0055 | 0075 | 0110/0220[5] | 0150 | 0220/0300 | – | – |

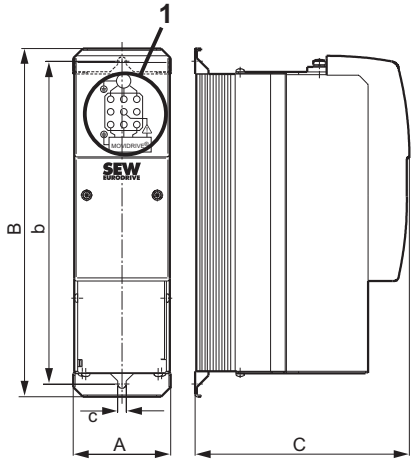
1) Approved to UL/cUL in combination with MOVIDRIVE® drive inverters. SEW-EURODRIVE will provide certification on request.
2) A reduction of 6% I N per 10 Hz applies above f A = 60 Hz for the nominal through current IN.
3) Observe the chapter on EMC-compliant installation according to EN 61800-3 in the SEW documentation
4) Only applies for operation without Uz connection. For operation with Uz 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.

27793230/EN – 08/2022

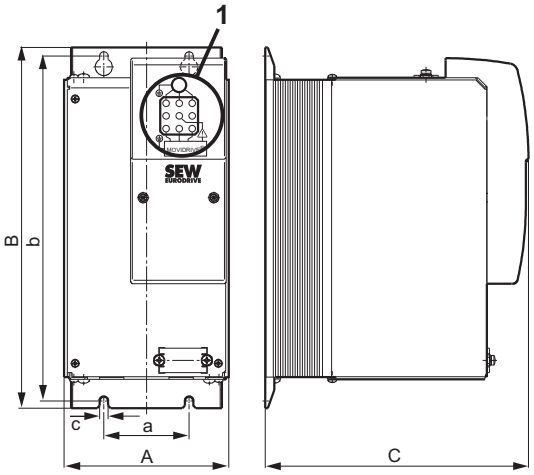
### 6.5.1 Dimension drawings of HF...-503 output filters

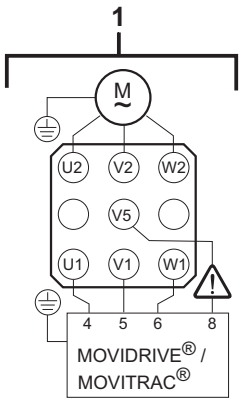
The following figures show the mechanical dimensions in mm (in).

HF008/015/022/030-503




HF040/055/075-503



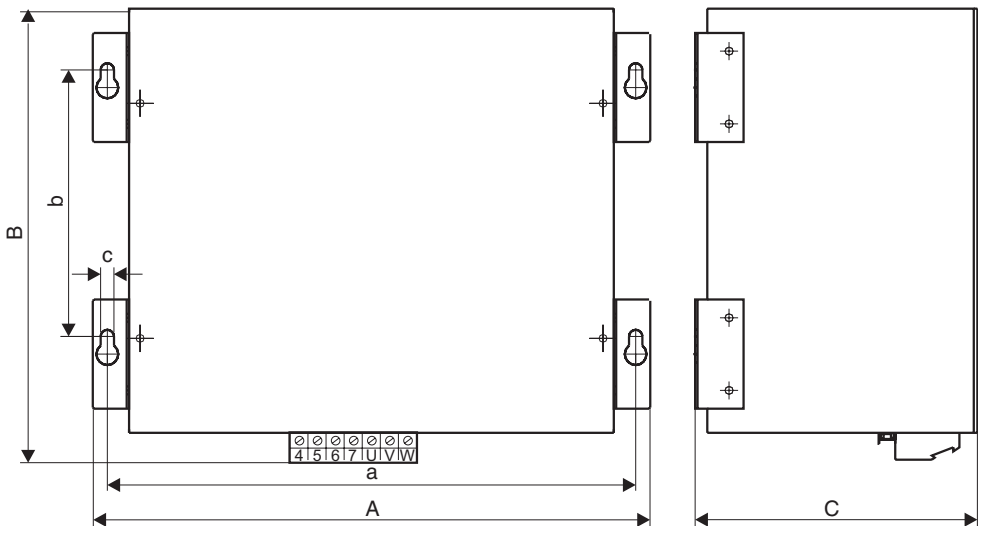

*9007200727565579*

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[1] mm | |
|---|---|---|---|---|---|---|---|---|
| | A | B | C | a | b | c | 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



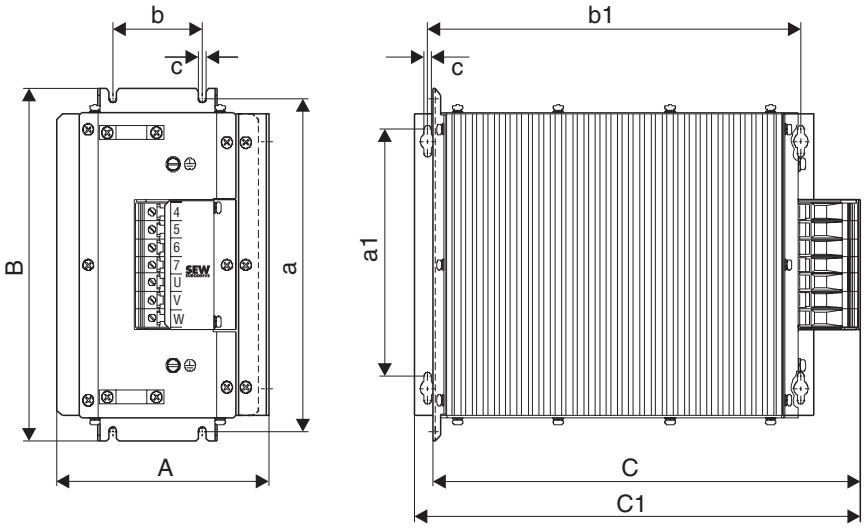

*1472827659*

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 | c | Top | Bottom |
| HF450-503 | 465 | 385 | 240 | 436 | 220 | 8.5 | 100 | 100 |

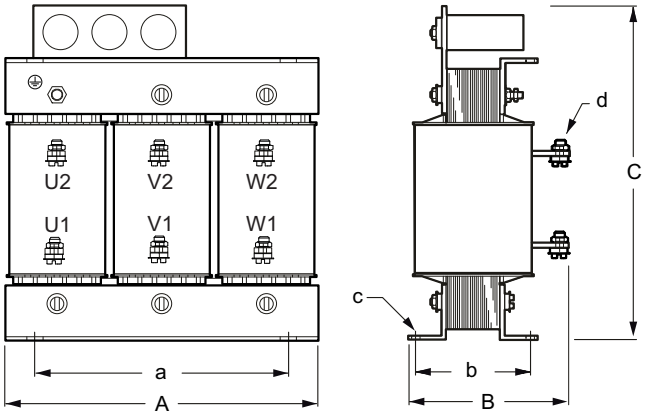
### 6.5.2 Dimension drawings of HF...-403 output filters

The following figures show the mechanical dimensions in mm (in).




1472830731

| Type | Main dimensions in mm | | | Mounting dimensions mm | | | | Hole dimension mm | Ventilation clearances mm | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Standard installation | | Horizontal mounting position | | | | | |
| | A | B | C/C1 | a | b | a1 | b1 | c | On the side | Top | Bottom |
| 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 | | | | | | |




2705456011

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 |

27793230/EN – 08/2022

# 7 Prefabricated cables

## 7.1 Overview

SEW-EURODRIVE offers cable sets and prefabricated cables for straightforward and error-free connection of various system components to MOVIDRIVE®. The cables are prefabricated in 1 m steps to the required length.

Cables from SEW-EURODRIVE can be distinguished as follows:

1. Cable sets for DC link connection
2. Motor cables and extension cables for connecting CM.. motors
3. Motor cables and extension cables for connecting CMP.. motors.
4. Connection to encoder interfaces: Encoder cable and extension cable in connector and terminal box design for motors

Depending on the cable installation, cables are available for fixed installation or cable carrier installation.

## 7.2 DC link connection

### 7.2.1 Description

SEW-EURODRIVE strongly recommends using the accessories listed in the table below. The cable sets, DC link couplings and DC link adapters provide the required dielectric strength. In addition, the cable sets are color-coded as reverse polarity and ground fault may damage the connected devices.

27793230/EN – 08/2022

### 7.2.2 Assignment

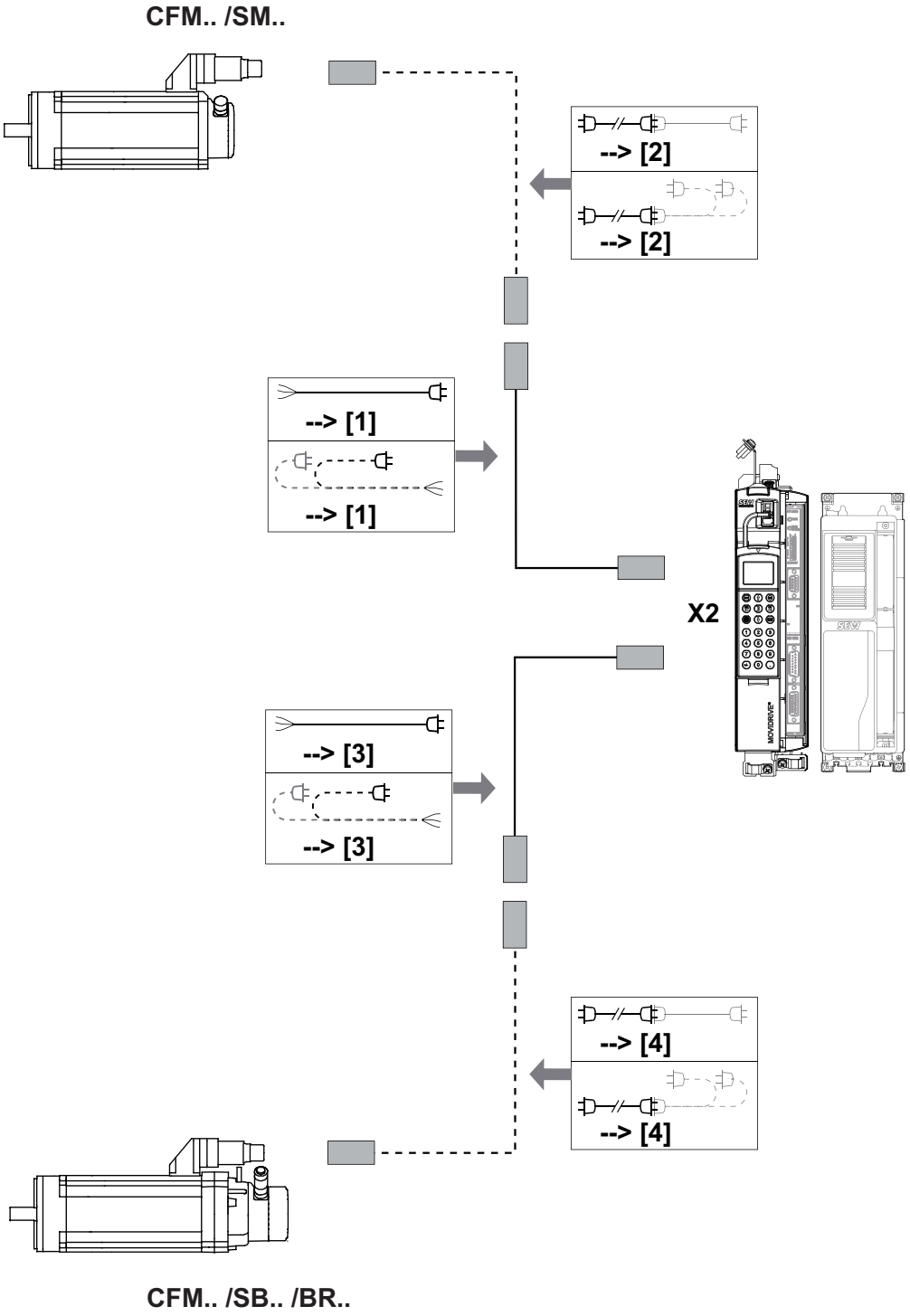
The following table shows the recommended accessories for the DC link connection. Only fixed installation.

| For the connection of MOVIDRIVE® MDX60B/61B/62B | Regenerative power supply units | |
|---|---|---|
| | MOVIDRIVE® MDR60A | MOVIDRIVE® MDR61B |
| 0015 – 0110 | DCP12A cable set<br>Part number<br>08145679 | DLZ31B DC link adapter<br>Part number<br>18236286 |
| 0110 – 0300 | DCP21A cable set<br>Part number<br>18131778 | |
| 0150 – 0370 | DCP13A cable set<br>Part number<br>08142505 | |
| 0450 – 0750 | DCP15A cable set<br>Part number<br>08142513 | |
| 0900 – 1320 | DCP16A cable set<br>Part number<br>08175934 | |
| 1600 – 2500 | | DLZ11B DC link coupling<br>"Part numbers" (→ 🗎 148) |

27793230/EN – 08/2022

## 7.3 Power cables for CFM.. motors

### 7.3.1 Overview




*20695097483*

[1] Motor cable ../SM.. (→ 🗎 180)

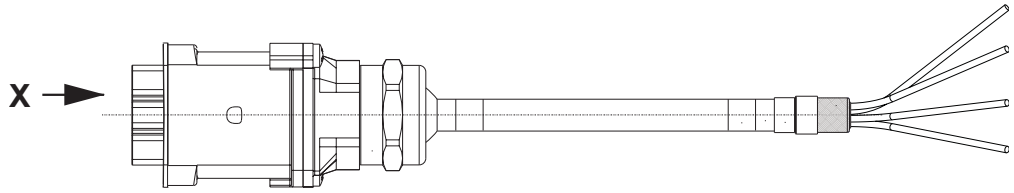
[2] Motor extension cable ../SM.. (→ 🗎 181)

[3] Brakemotor cable ../SB.. /BR (→ 🗎 182)

[4] Brakemotor extension cable ../SB.. /BR (→ 🗎 183)

### 7.3.2 Motor cables

**Illustration of motor cable**




*4836649099*

**Types of motor cables**

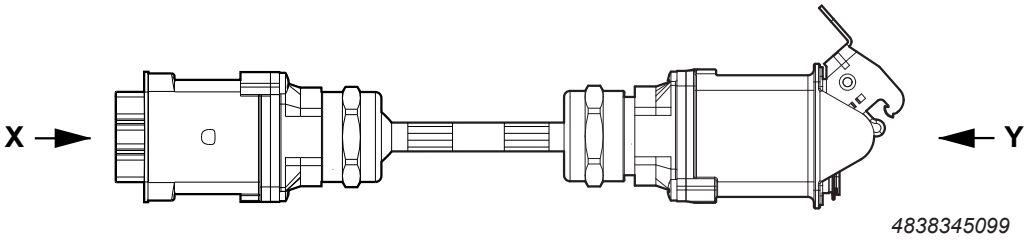
The cables are equipped with a connector for motor connection and conductor end sleeves for inverter connection.

| Plug connector | Number of cores and cable cross section | Part number | Installation type |
|---|---|---|---|
| SM51/SM61 | 4 × 1.5 mm² | 01991795 | Fixed installation |
| SM51/SM61 | 4 × 1.5 mm² | 13331140 | Cable carrier installation |
| SM52/SM62 | 4 × 2.5 mm² | 01991817 | Fixed installation |
| SM52/SM62 | 4 × 2.5 mm² | 13331159 | Cable carrier installation |
| SM54/SM64 | 4 × 4 mm² | 01991833 | Fixed installation |
| SM54/SM64 | 4 × 4 mm² | 01991841 | Cable carrier installation |
| SM56/SM66 | 4 × 6 mm² | 0199185X | Fixed installation |
| SM56/SM66 | 4 × 6 mm² | 01991868 | Cable carrier installation |
| SM59/SM69 | 4 × 10 mm² | 01991876 | Fixed installation |
| SM59/SM69 | 4 × 10 mm² | 01991884 | Cable carrier installation |

27793230/EN – 08/2022

### 7.3.3 Motor extension cables

**Illustration of motor extension cable**




**Types of motor extension cables**

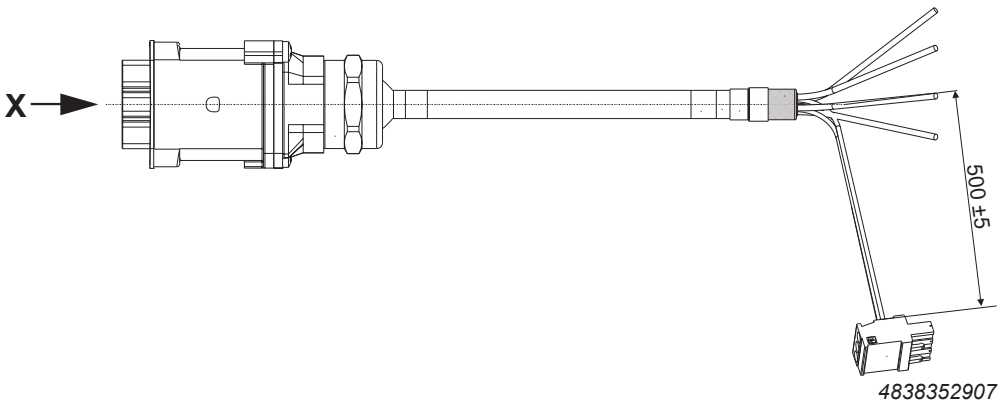
The cables are equipped with a connector and adapter for extending the CFM.. motor cable.

| Plug connector | Number of cores and cable cross section | Part number | Installation type |
|---|---|---|---|
| SM51/SM61 | 4 × 1.5 mm² | 01995499 | Fixed installation |
| SM51/SM61 | 4 × 1.5 mm² | 13331183 | Cable carrier installation |
| SM52/SM62 | 4 × 2.5 mm² | 01995510 | Fixed installation |
| SM52/SM62 | 4 × 2.5 mm² | 13331191 | Cable carrier installation |
| SM54/SM64 | 4 × 4 mm² | 01995537 | Fixed installation |
| SM54/SM64 | 4 × 4 mm² | 01995545 | Cable carrier installation |
| SM56/SM66 | 4 × 6 mm² | 01995553 | Fixed installation |
| SM56/SM66 | 4 × 6 mm² | 01995561 | Cable carrier installation |
| SM59/SM69 | 4 × 10 mm² | 0199557X | Fixed installation |
| SM59/SM69 | 4 × 10 mm² | 01995588 | Cable carrier installation |

27793230/EN – 08/2022

### 7.3.4 Brakemotor cables

**Illustration of brakemotor cable**



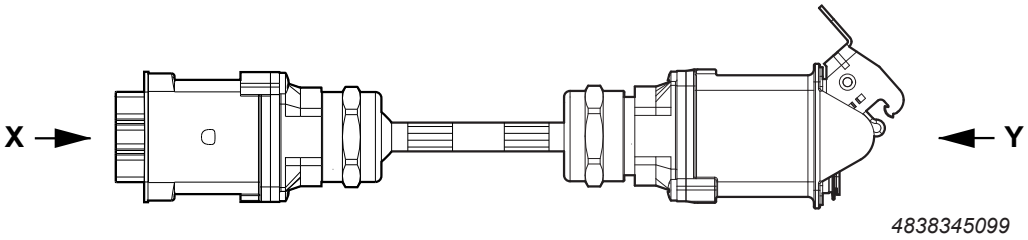

**Types of brakemotor cables**

| Plug connector | Number of cores and cable cross section | Part number | Installation type |
|---|---|---|---|
| SB51/SB61 | 4 × 1.5 $mm^2$ + 3 × 1.0 $mm^2$ | 01991892 | Fixed installation |
| SB51/SB61 | 4 × 1.5 $mm^2$ + 3 × 1.0 $mm^2$ | 13331167 | Cable carrier installation |
| SB52/SB62 | 4 × 2.5 $mm^2$ + 3 × 1.0 $mm^2$ | 01991914 | Fixed installation |
| SB52/SB62 | 4 × 2.5 $mm^2$ + 3 × 1.0 $mm^2$ | 13331175 | Cable carrier installation |
| SB54/SB64 | 4 × 4 $mm^2$ + 3 × 1.0 $mm^2$ | 01991930 | Fixed installation |
| SB54/SB64 | 4 × 4 $mm^2$ + 3 × 1.0 $mm^2$ | 01991949 | Cable carrier installation |
| SB56/SB66 | 4 × 6 $mm^2$ + 3 × 1.5 $mm^2$ | 01991957 | Fixed installation |
| SB56/SB66 | 4 × 6 $mm^2$ + 3 × 1.5 $mm^2$ | 01991965 | Cable carrier installation |
| SB59/SB69 | 4 × 10 $mm^2$ + 3 × 1.5 $mm^2$ | 01991973 | Fixed installation |
| SB59/SB69 | 4 × 10 $mm^2$ + 3 × 1.5 $mm^2$ | 01991981 | Cable carrier installation |

27793230/EN – 08/2022

### 7.3.5 Brakemotor extension cables

**Illustration of brakemotor extension cable**



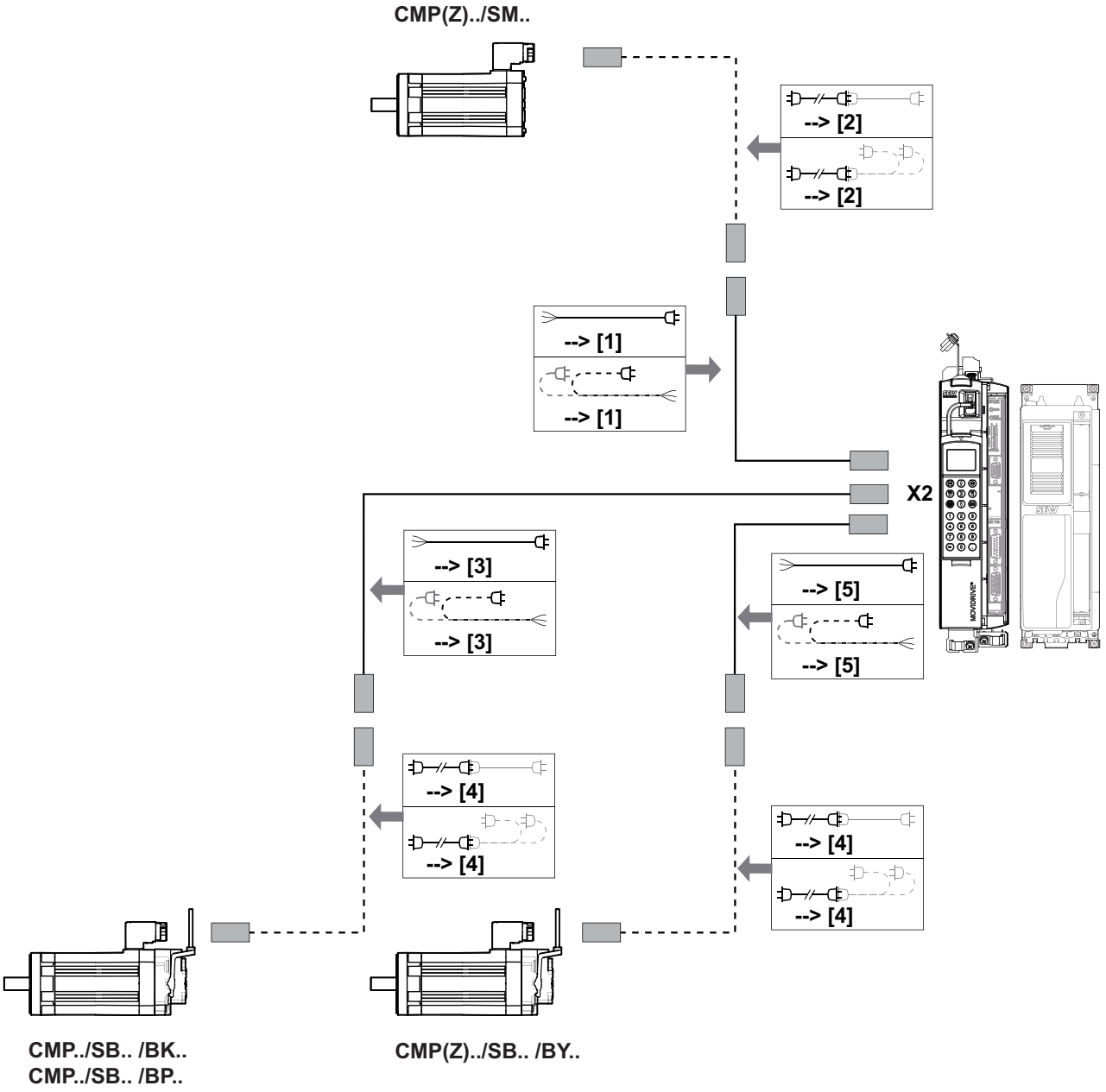

**Types of brakemotor extension cables**

| Plug connector | Number of cores and cable cross section | Part number | Installation type |
|---|---|---|---|
| SK51/SK61 | 4 × 1.5 $mm^2$ + 3 × 1.0 $mm^2$ | 0199199X | Fixed installation |
| SK51/SK61 | 4 × 1.5 $mm^2$ + 3 × 1.0 $mm^2$ | 13331205 | Cable carrier installation |
| SK52/SK62 | 4 × 2.5 $mm^2$ + 3 × 1.0 $mm^2$ | 01992015 | Fixed installation |
| SK52/SK62 | 4 × 2.5 $mm^2$ + 3 × 1.0 $mm^2$ | 13331213 | Cable carrier installation |
| SK54/SK64 | 4 × 4 $mm^2$ + 3 × 1.0 $mm^2$ | 01992031 | Fixed installation |
| SK54/SK64 | 4 × 4 $mm^2$ + 3 × 1.0 $mm^2$ | 0199204X | Cable carrier installation |
| SK56/SK66 | 4 × 6 $mm^2$ + 3 × 1.5 $mm^2$ | 01992058 | Fixed installation |
| SK56/SK66 | 4 × 6 $mm^2$ + 3 × 1.5 $mm^2$ | 01992066 | Cable carrier installation |
| SK59/SK69 | 4 × 10 $mm^2$ + 3 × 1.5 $mm^2$ | 01992074 | Fixed installation |
| SK59/SK69 | 4 × 10 $mm^2$ + 3 × 1.5 $mm^2$ | 01992082 | Cable carrier installation |

27793230/EN – 08/2022

## 7.4 Power cables for CMP.. motors

### 7.4.1 Overview




*20705866251*

[1] Motor cable ../SM.. (→ 🗎 180)

[2] Motor extension cable ../SM.. (→ 🗎 181)

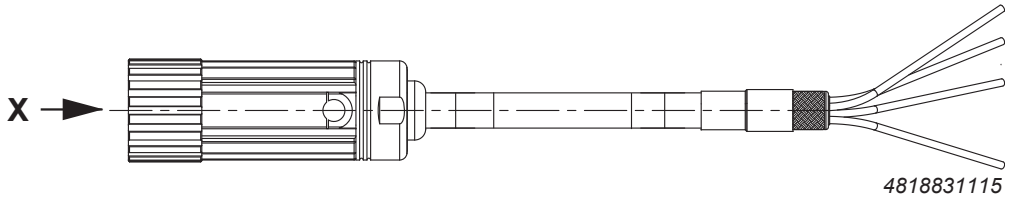
[3] Brakemotor cable ../SB.. /BR (→ 🗎 182)

[4] Brakemotor extension cable ../SB.. /BR (→ 🗎 183)

27793230/EN – 08/2022

### 7.4.2 Motor cables with connector on motor end

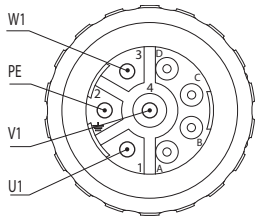
**Illustration of motor cable**

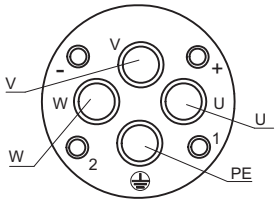



**Types of CMP.. motor cables**

| Plug connector | Number of cores and cable cross section | Part number | Installation type |
|---|---|---|---|
| SM11 | 4 × 1.5 mm² | 05904544 | Fixed installation |
| SM11 | 4 × 1.5 mm² | 05906245 | Cable carrier installation |
| SM12 | 4 × 2.5 mm² | 05904552 | Fixed installation |
| SM12 | 4 × 2.5 mm² | 05906253 | Cable carrier installation |
| SM14 | 4 × 4 mm² | 05904560 | Fixed installation |
| SM14 | 4 × 4 mm² | 05904803 | Cable carrier installation |
| SMB6 | 4 × 6 mm² | 13350269 | Fixed installation |
| SMB6 | 4 × 6 mm² | 13350293 | Cable carrier installation |
| SMB10 | 4 × 10 mm² | 13350277 | Fixed installation |
| SMB10 | 4 × 10 mm² | 13350307 | Cable carrier installation |
| SMB16 | 4 × 16 mm² | 13350285 | Fixed installation |
| SMB16 | 4 × 16 mm² | 13350315 | Cable carrier installation |
| SMC16 | 4 × 16 mm² | 18148476 | Fixed installation |
| SMC16 | 4 × 16 mm² | 18148484 | Cable carrier installation |
| SMC25 | 4 × 25 mm² | 18148581 | Cable carrier installation |
| SMC35 | 4 × 35 mm² | 18148697 | Cable carrier installation |

**Pin assignment of the CMP.. motor cable**

| Plug connector view X | Contact | Description | Core color | Core marking |
|---|---|---|---|---|
| SM1<br>  | 1 | V | Black (BK) | |
| | 2 | Protective earth | Green-yellow (GNYE) | |
| | 3 | W | Black (BK) | |
| | 4 | V | Black (BK) | |
| | | | | |

| Plug connector view X | Contact | Description | Core color | Core marking |
|---|---|---|---|---|
| SMB   | V | V | Black (BKWH) | V |
| | V | V | | V |
| | W | W | | W |
| | PE | Protective earth | Green-yellow (GNYE) | |
| | | | | |

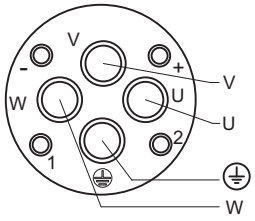
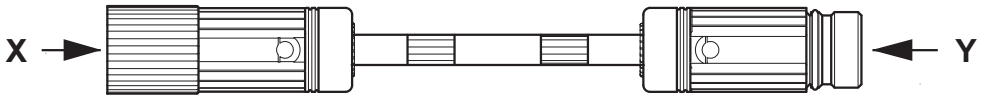
| Plug connector view X | Contact | Description | Core color | Core marking |
|---|---|---|---|---|
| SMC   | V | V | Black (BKWH) | V |
| | V | V | | V |
| | W | W | | W |
| | PE | Protective earth | Green-yellow (GNYE) | |
| | | | | |

**Illustration of motor extension cable**




*4818839179*

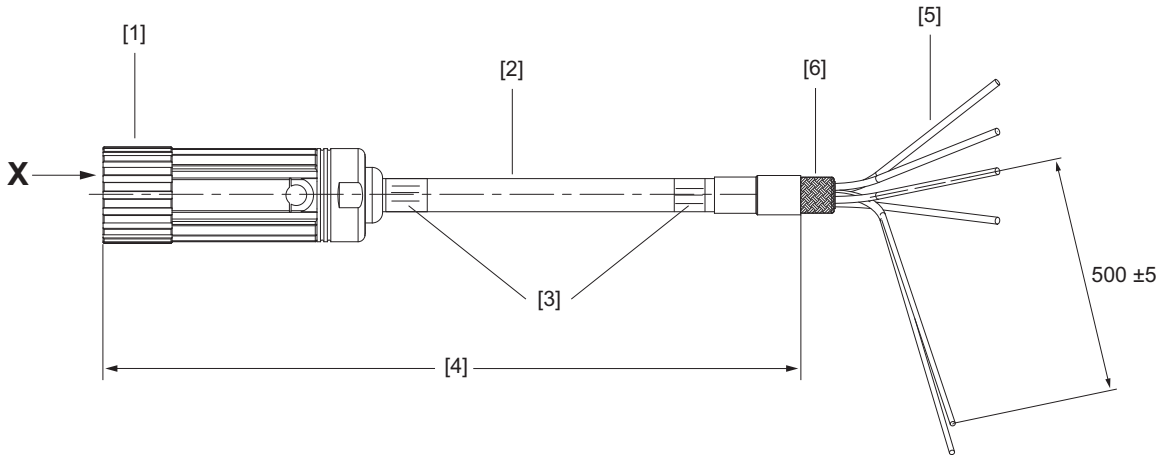
**Types of CMP.. motor extension cables**

| Plug connector | Number of cores and cable cross section | Part number | Installation type |
|---|---|---|---|
| SM11 | 4 × 1.5 mm² | 13332457 | Cable carrier installation |
| SM12 | 4 × 2.5 mm² | 13332465 | Cable carrier installation |
| SM14 | 4 × 4 mm² | 13332473 | Cable carrier installation |
| SMB6 | 4 × 6 mm² | 13350021 | Cable carrier installation |
| SMB10 | 4 × 10 mm² | 13350048 | Cable carrier installation |
| SMB16 | 4 × 16 mm² | 13350056 | Cable carrier installation |
| SMC16 | 4 × 16 mm² | 18156819 | Cable carrier installation |
| SMC25 | 4 x 25 mm² | 18156827 | Cable carrier installation |
| SMC35 | 4 x 35 mm² | 18156835 | Cable carrier installation |

27793230/EN – 08/2022

### 7.4.3 Brakemotor cables for BP/BK brake with connector at motor end

**Figure of CMP.. brakemotor cables**




*4818640779*

**Types of CMP.. brakemotor cables**

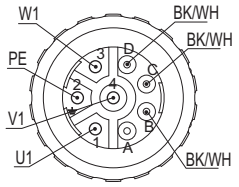
| Plug connector | Number of cores and cable cross section | Part number | Installation type |
|---|---|---|---|
| SB11 | 4 × 1.5 mm² + 3 × 1 mm² | 13354345 | Fixed installation |
| SB11 | 4 × 1.5 mm² + 3 × 1 mm² | 13354388 | Cable carrier installation |
| SB12 | 4 × 2.5 mm² + 3 × 1 mm² | 13354353 | Fixed installation |
| SB12 | 4 × 2.5 mm² + 3 × 1 mm² | 13354396 | Cable carrier installation |
| SB14 | 4 × 4 mm² + 3 × 1 mm² | 13354361 | Fixed installation |
| SB14 | 4 × 4 mm² + 3 × 1 mm² | 13421603 | Cable carrier installation |
| SBB6 | 4 × 6 mm² + 3 × 1.5 mm² | 13350196 | Fixed installation |
| SBB6 | 4 × 6 mm² + 3 × 1.5 mm² | 13350234 | Cable carrier installation |
| SBB10 | 4 × 10 mm² + 3 × 1.5 mm² | 13350218 | Fixed installation |
| SBB10 | 4 × 10 mm² + 3 × 1.5 mm² | 13350242 | Cable carrier installation |
| SBB16 | 4 × 16 mm² + 3 × 1.5 mm² | 13350226 | Fixed installation |
| SBB16 | 4 × 16 mm² + 3 × 1.5 mm² | 13350250 | Cable carrier installation |

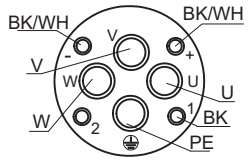
## INFORMATION

As for the power cables for brakemotors with BP/BK brake, only two signal cables are required, the third signal core is cut off during cable assembly.

27793230/EN – 08/2022

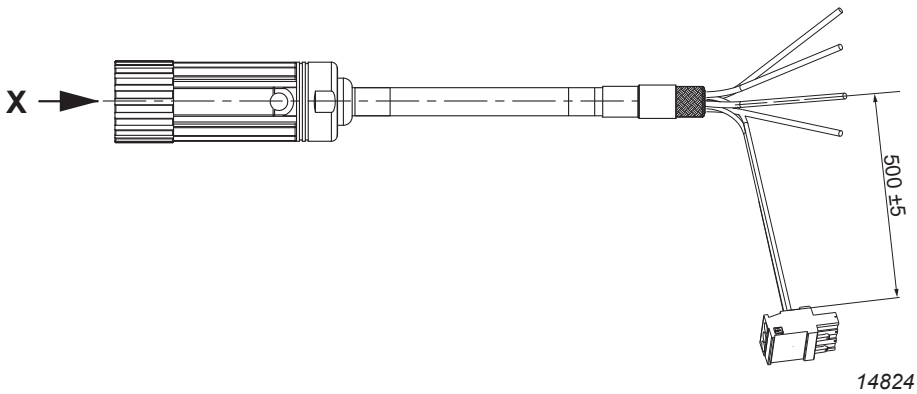
**Pin assignment of CMP.. brakemotor cables**

| Plug connector view X | Contact | Description | Core color | Core marking |
|---|---|---|---|---|
| SB1<br>  | 1 | V | Black (BKWH) | V |
| | 4 | V | | V |
| | 3 | W | | W |
| | 2 | Protective earth | Green-yellow (GNYE) | |
| | A | n. c. | – | |
| | B | n. c. | – | |
| | C | + | Black (BKWH) | 1 |
| | D | – | | 3 |

| Plug connector view X | Contact | Description | Core color | Core marking |
|---|---|---|---|---|
| SBB<br>  | V | V | Black (BKWH) | V |
| | V | V | | V |
| | W | W | | W |
| | PE | Protective earth | Green-yellow (GNYE) | |
| | – | – | Black (BKWH) | 3 |
| | + | + | | 1 |
| | 1 | n. c. | – | |
| | 2 | n. c. | – | |

### 7.4.4 Brakemotor cables for BY brake with connector at motor end

**Illustration of CMP.. brakemotor cable**




*14824163467*

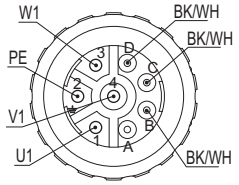
**Types of CMP.. brakemotor cables**

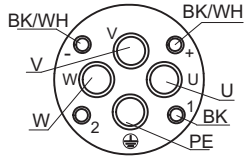
| Plug connector | Number of cores and cable cross section | Part number | Installation type |
|---|---|---|---|
| SB11 | 4 × 1.5 mm² + 3 × 1 mm² | 13354272 | Fixed installation |
| SB11 | 4 × 1.5 mm² + 3 × 1 mm² | 13354302 | Cable carrier installation |
| SB12 | 4 × 2.5 mm² + 3 × 1 mm² | 13354280 | Fixed installation |

27793230/EN – 08/2022

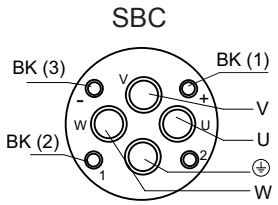
| Plug connector | Number of cores and cable cross section | Part number | Installation type |
|---|---|---|---|
| SB12 | 4 × 2.5 mm² + 3 × 1 mm² | 13354310 | Cable carrier installation |
| SB14 | 4 × 4 mm² + 3 × 1 mm² | 13354299 | Fixed installation |
| SB14 | 4 × 4 mm² + 3 × 1 mm² | 13354329 | Cable carrier installation |
| SBB6 | 4 × 6 mm² + 3 × 1.5 mm² | 13350129 | Fixed installation |
| SBB6 | 4 × 6 mm² + 3 × 1.5 mm² | 13350153 | Cable carrier installation |
| SBB10 | 4 × 10 mm² + 3 × 1.5 mm² | 13350137 | Fixed installation |
| SBB10 | 4 × 10 mm² + 3 × 1.5 mm² | 13350161 | Cable carrier installation |
| SBB16 | 4 × 16 mm² + 3 × 1.5 mm² | 13350145 | Fixed installation |
| SBB16 | 4 × 16 mm² + 3 × 1.5 mm² | 13350188 | Cable carrier installation |
| SBC16 | 4 × 16 mm² + 3 × 1.5 mm² | 18148514 | Fixed installation |
| SBC16 | 4 × 16 mm² + 3 × 1.5 mm² | 18148522 | Cable carrier installation |

**Pin assignment of CMP.. brakemotor cables**

| Plug connector view X | Contact | Description | Core color | Core marking |
|---|---|---|---|---|
| SB1<br>  | 1 | V | Black (BKWH) | V |
| | 4 | V | | V |
| | 3 | W | | W |
| | 2 | Protective earth | Green-yellow (GNYE) | |
| | A | n. c. | – | |
| | B | 2 | Black (BKWH) | 2 |
| | C | 1 | | 1 |
| | D | 3 | | 3 |

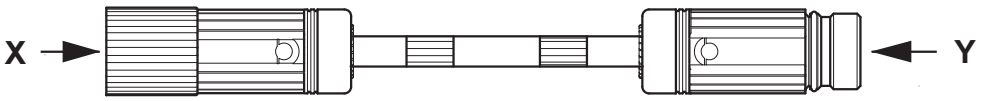
| Plug connector view X | Contact | Description | Core color | Core marking |
|---|---|---|---|---|
| SBB<br>  | V | V | Black (BKWH) | V |
| | V | V | | V |
| | W | W | | W |
| | PE | Protective earth | Green-yellow (GNYE) | |
| | – | 15 | Black (BKWH) | 15 |
| | + | 13 | | 13 |
| | 1 | 14 | | 14 |
| | 2 | n.c. | – | |

27793230/EN – 08/2022

| Plug connector view X | Contact | Description | Core color | Core marking |
|---|---|---|---|---|
|  | V | V | Black (BKWH) | V |
| | V | V | | V |
| | W | W | | W |
| | PE | Protective earth | Green-yellow (GNYE) | |
| | – | 15 | Black (BKWH) | 15 |
| | + | 13 | | 13 |
| | 1 | 14 | | 14 |
| | 2 | n.c. | – | |

### 7.4.5 Extension cables BP/BK and BY brakes

**Illustration of brakemotor extension cable**



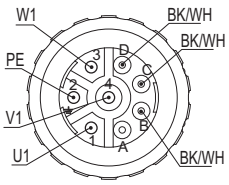
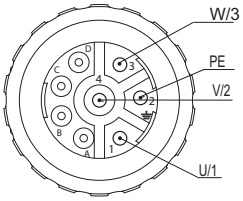
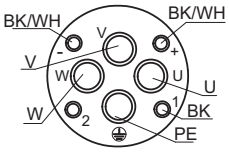
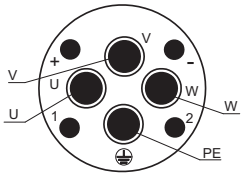

*4818839179*

**Types of CMP.. brakemotor extension cables**

| Plug connector | Number of cores and cable cross section | Part number | Installation type |
|---|---|---|---|
| SB11 | 4 × 1.5 $mm^2$ + 3 × 1 $mm^2$ | 13354221 | Cable carrier installation |
| SB12 | 4 × 2.5 $mm^2$ + 3 × 1 $mm^2$ | 13354248 | Cable carrier installation |
| SB14 | 4 × 4 $mm^2$ + 3 × 1 $mm^2$ | 13354337 | Cable carrier installation |
| SBB6 | 4 × 6 $mm^2$ + 3 × 1.5 $mm^2$ | 13350099 | Cable carrier installation |
| SBB10 | 4 × 10 $mm^2$ + 3 × 1.5 $mm^2$ | 13350102 | Cable carrier installation |
| SBB16 | 4 × 16 $mm^2$ + 3 × 1.5 $mm^2$ | 13350110 | Cable carrier installation |
| SBC16 | 4 × 16 $mm^2$ + 3 × 1.5 $mm^2$ | 18156843 | Cable carrier installation |

27793230/EN – 08/2022

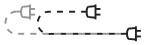
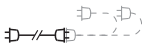
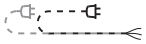
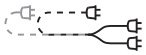
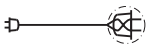
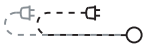
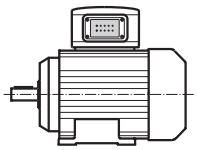
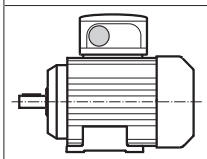
**Pin assignment of the CMP.. brakemotor extension cable**

| Plug connector view X | Contact | Cable core color | Assigned | Contact | Plug connector view Y |
|---|---|---|---|---|---|
| **BSTA 078**<br>SB1<br>  | 1 | (BKWH) Black with white lettering U, V, W | V | 1 | **BKUA 199**<br>  |
| | 4 | | V | 4 | |
| | 3 | | W | 3 | |
| | 2 | (GNYE) green/ yellow | PE | 2 | |
| | A | – | n. c. | A | |
| | B | (BKWH) Black with white lettering | 2. | B | |
| | C | | 1 | C | |
| | D | | 3 | D | |
| CSTA 264<br>SBB<br>  | | | | | **CKUA 268**<br>  |

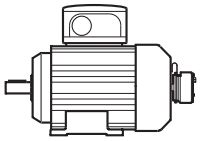
27793230/EN – 08/2022

## 7.5 Encoder cable selection: Meaning of the icons

The connection cables are assigned a part number and an icon. The icons have the following meaning:

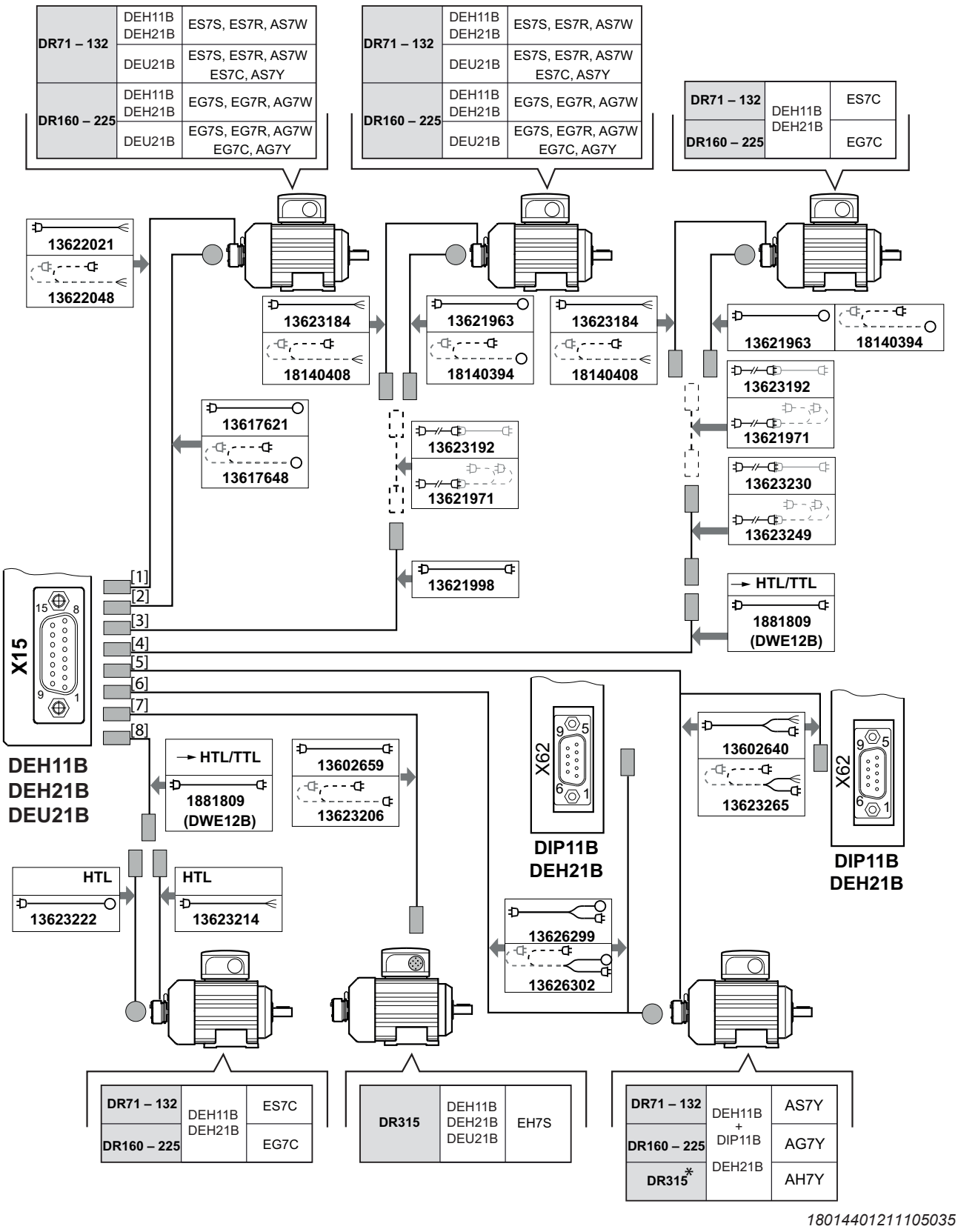
| Icon | Meaning |
|---|---|
|  | Connection cable connector → connector for fixed installation |
|  | Extension connection cable connector → connector for fixed installation |
|  | Connection cable (litz wire) connector → encoder connection cover for fixed installation |
|  | Connection cable connector → connector for cable carrier installation |
|  | Extension connection cable connector → connector for cable carrier installation |
|  | Connection cable connector → terminal box for fixed installation |
|  | Connection cable connector → terminal box for cable carrier installation |
|  | Connection cable connector → Y connector for fixed installation |
|  | Connection cable connector → Y connector for cable carrier installation |
|  | Connection cable connector → connector with crossed A/B track for reversing the direction of rotation (for fixed installation) |
|  | Connection cable connector → encoder connection cover for fixed installation |
|  | Connection cable connector → encoder connection cover for cable carrier installation |
|  | Encoder connection via plug connector |
|  | Encoder connection via encoder terminal strip |
|  | Encoder connection via encoder connection cover |
|  | Connection via plug connector on the motor side |
|  | Connection via terminal box on the motor side |

27793230/EN – 08/2022

| Icon | Meaning |
|---|---|
|  | Connection via encoder connection cover on the motor side |

27793230/EN – 08/2022

## 7.6 Encoder cable for DR.. motors on X15 DEH11B/DEH21B/DEU21B




*18014401211105035*

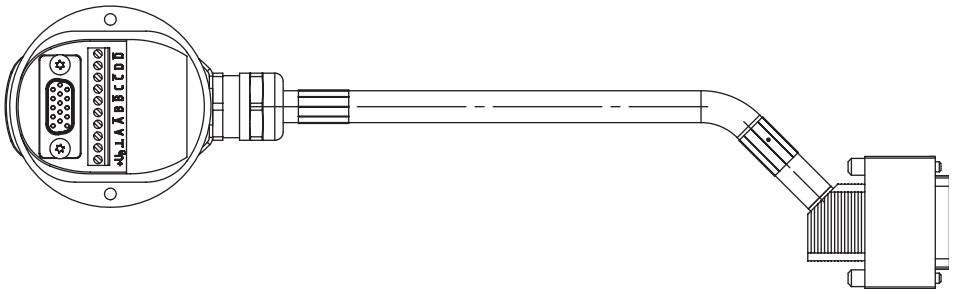
*)Only use encoder cables with litz wires 13602640 or 13623265.

27793230/EN – 08/2022

For the individual wiring diagrams, refer to chapter "Installation" in the "MOVIDRIVE® MDX60B/61B" operating instructions.

### 7.6.1 Required prefabricated cables

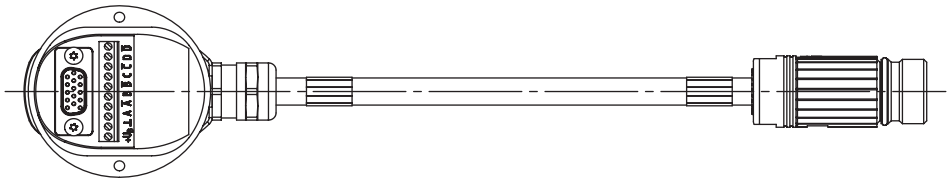
- Part number: 13617621 or 13617648
- Cable with D-sub 15 plug connector and encoder connection cover



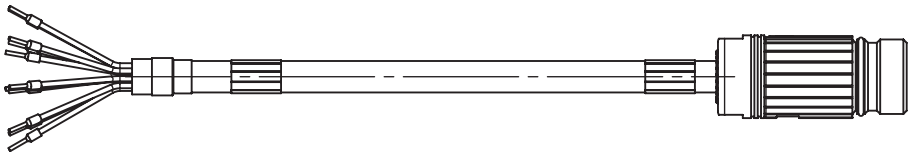
*2047431819*

- Part number 13622021 or 13622048
- Cable with D-sub 15 plug connector and conductor end sleeves:

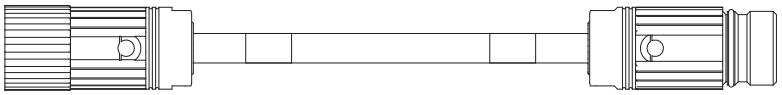
- Part number: 13621963
- Cable with encoder connection cover and M23 plug connector:



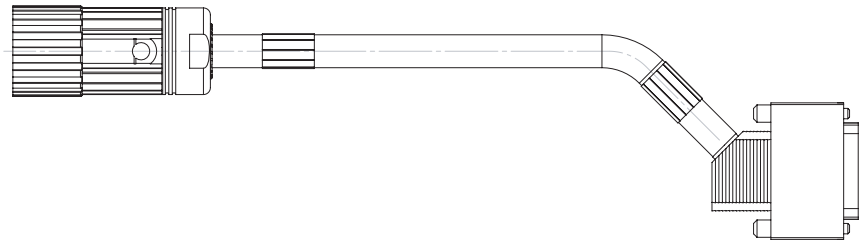
- Part number: 13623184
- Cable with conductor end sleeves and M23 plug connector:



- Part number: 13623192 or 13621971
- Optional: Extension cable with M23 plug connector on both sides:

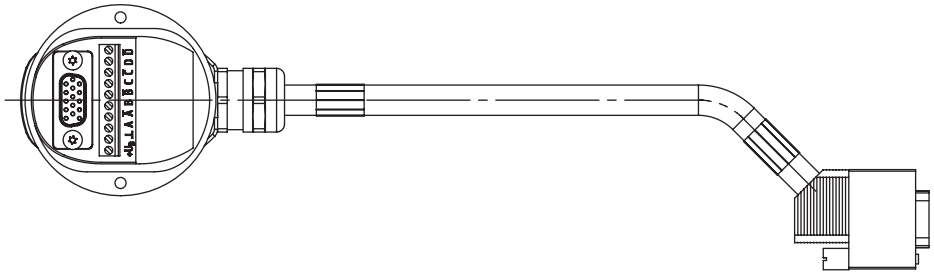


- Part number: 13621998
- Cable with M23 plug connector and D-sub 15 plug connector:



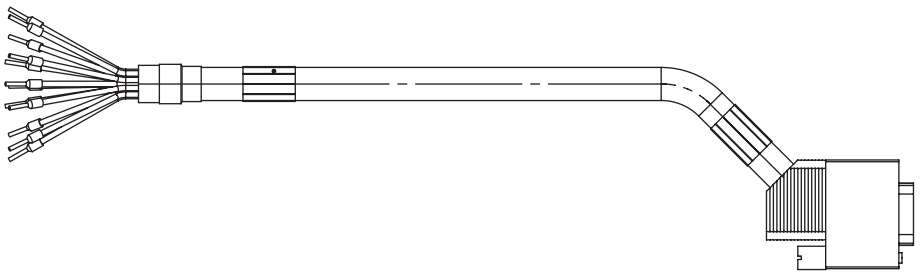
2047504139

- Part number: 13623222
- Cable with D-sub 9 plug connector and encoder connection cover:



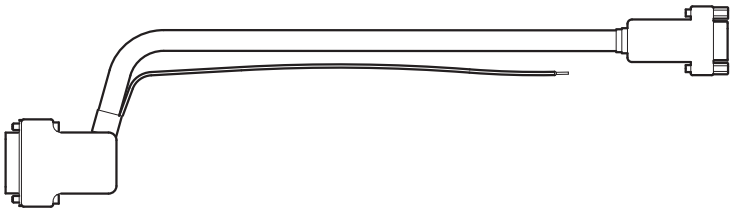
2047505803

- Part number: 13623214
- Cable with D-sub 9 plug connector and conductor end sleeves:



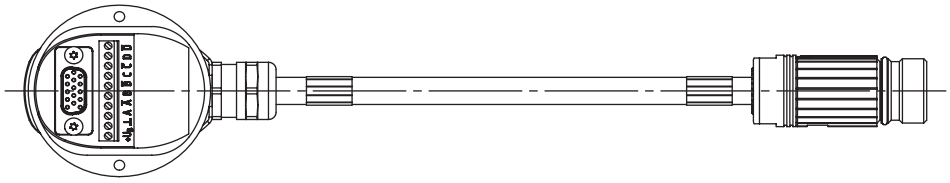
2047507467

- Part number 01881809
- DWE12B option, interface adapter HTL→ TTL (length: 1 m):

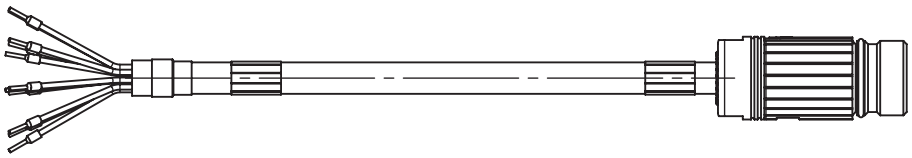


27793230/EN – 08/2022

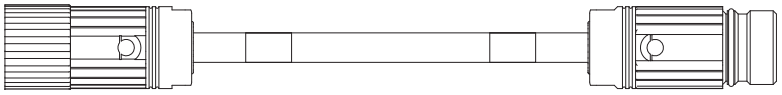
- Part number: 13621963
- Option 1: Cable with encoder connection cover and M23 plug connector:



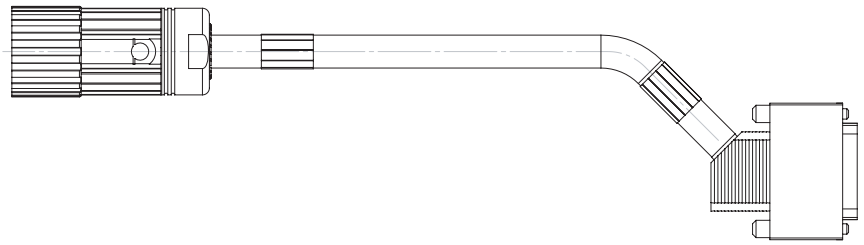
- Part number: 13623184
- Cable with M23 plug connector and conductor end sleeves:



- Part number: 13621971
- Extension cable with M23 plug connector on both sides:

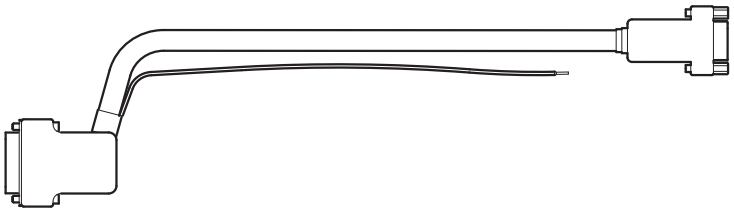


- Part number: 13623230 or 13623249
- Extension cable with M23 plug connector and D-sub 9 plug connector:

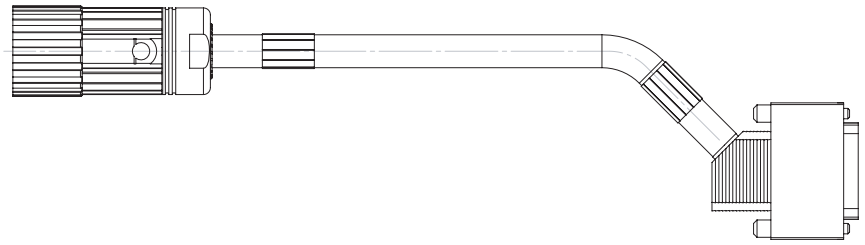


*2047504139*

- Part number: 01881809
- DWE12B option, interface adapter HTL→ TTL (length: 1 m):

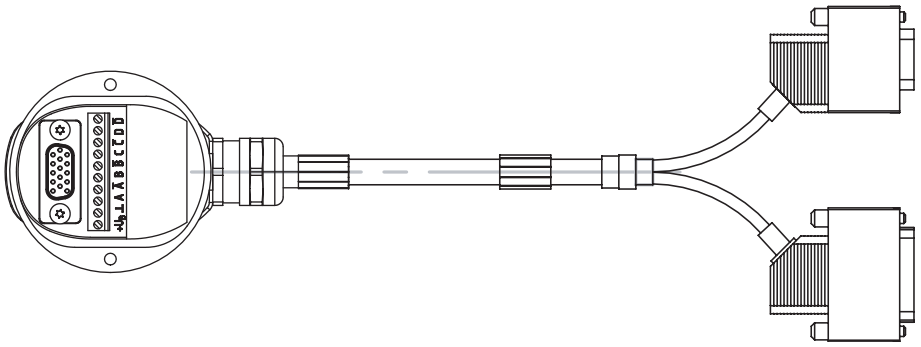


- Part number: 13602659 or 13623206
- Cable with M23 plug connector and D-sub 15 plug connector:



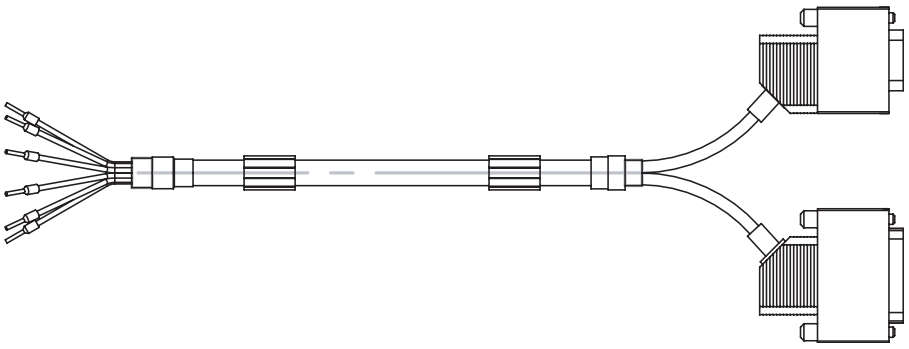
*2047504139*

- Part number: 13626299 or 13626302
- Option 1: Y-cable with D-sub 15 plug connector, D-sub 9 plug connector and encoder connection cover:



*2047512459*

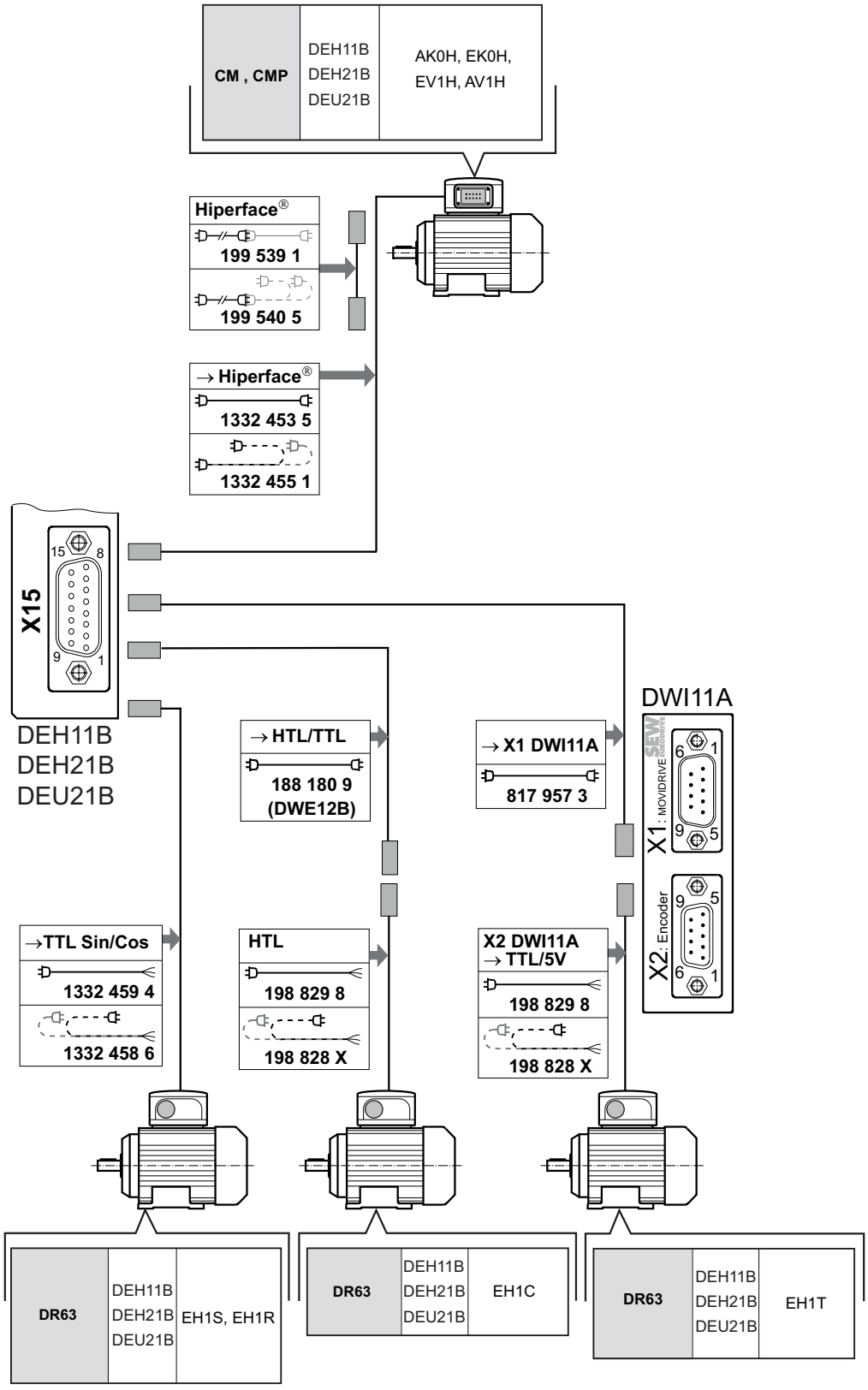
- Part number: 13602640 or 13623265
- Option 2: Y-cable with D-sub 15 plug connector, D-sub 9 plug connector and conductor end sleeves:



*2047514123*

27793230/EN – 08/2022

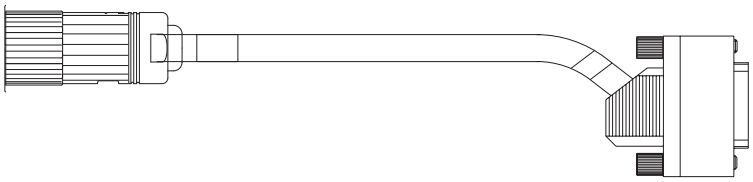
## 7.7 Encoder cable for CMP.., CM.., motors on X15 DEH11B/DEH21B and DEU21B



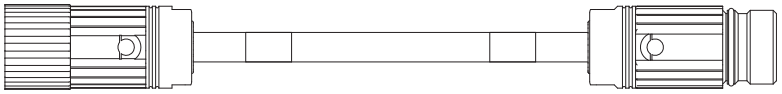

27793230/EN – 08/2022

For the individual wiring diagrams, refer to chapter "Installation" in the "MOVIDRIVE® MDX60B/61B" operating instructions. When combining SSI or HTL encoders with the DEU21B multi-encoder card, refer to the "MOVIDRIVE® DEU21B Multi-Encoder Card" manual.

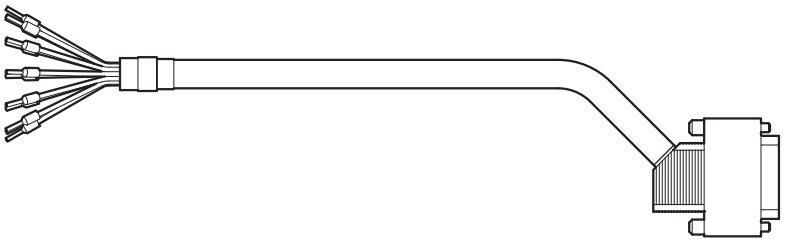
- Part number: 13324535 or 13324551
- Cable for encoder connection with plug connector on motor side.



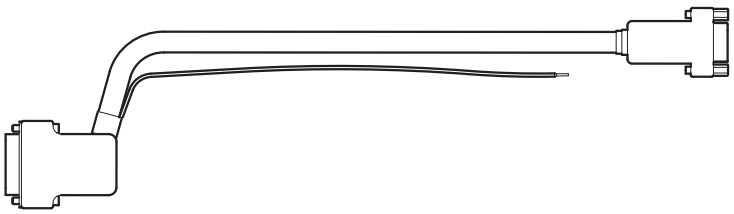
- Part number: 01995391 or 01995405
- Extension cable for encoder connection with plug connector on motor side.



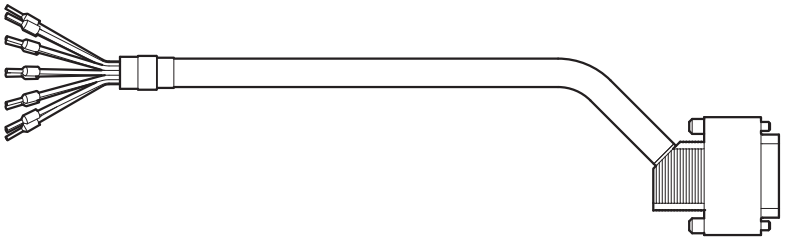
- Part number: 13324594 or 13324586
- Cable for encoder connection with terminal box connection on the motor side.



- Part number: 01881809
- Cable (option DWE12B, interface adapter HTL → TTL) to connect push-pull HTL encoders at X15 of the DEH11B/21B option (→ chapter "DWE11B/12B interface adapter option").

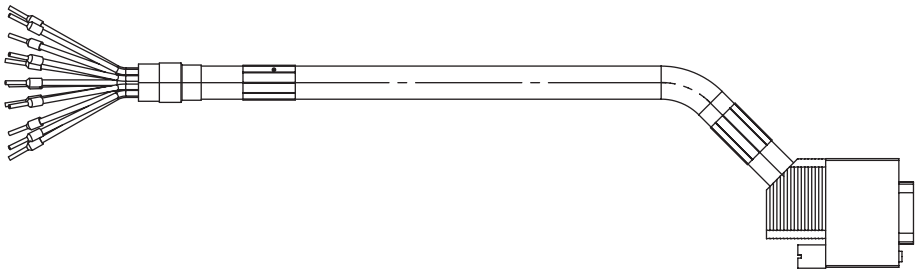


- Part number: 01988298 or 0198828X
- Cable for push-pull HTL encoder connection with terminal box connection on motor side.

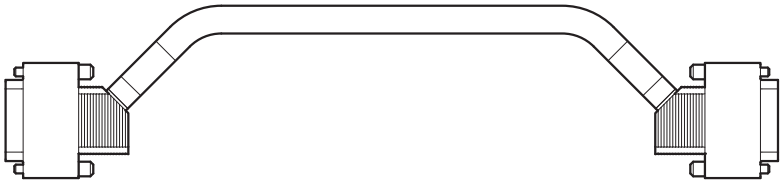


27793230/EN – 08/2022

- Part number: 01988298 or 0198828X
- Cable to connect an external DC 5 V TTL encoder with terminal box connection on the motor side to the DC 5 V encoder power supply DWI11A.

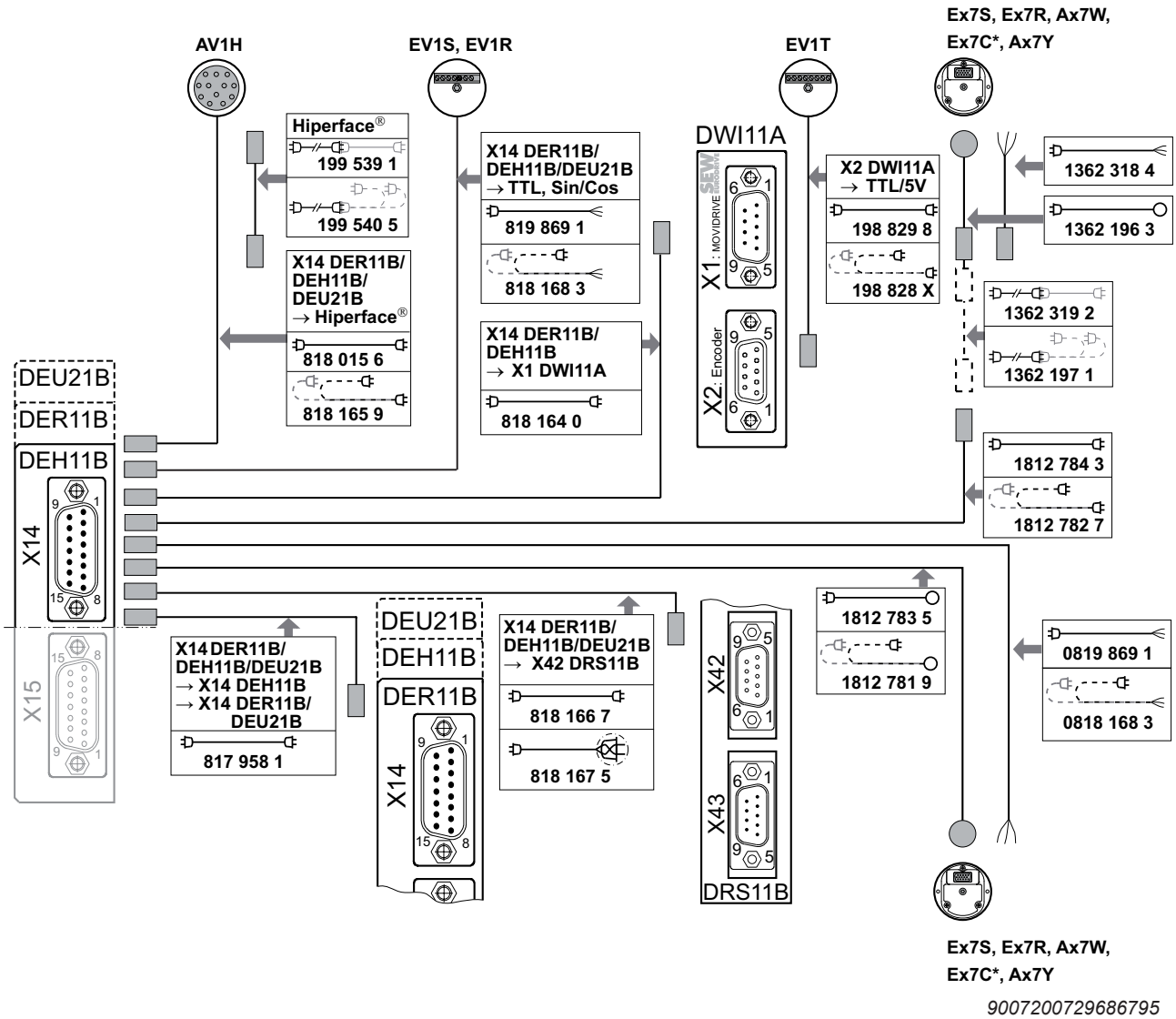


- Part number: 08179573
- Cable to connect the DC 5 V encoder power supply type DWI11A via plug connector.



27793230/EN – 08/2022

## 7.8 Encoder cable for distance encoders on X14, DEH11B/DER11B/DEU21B

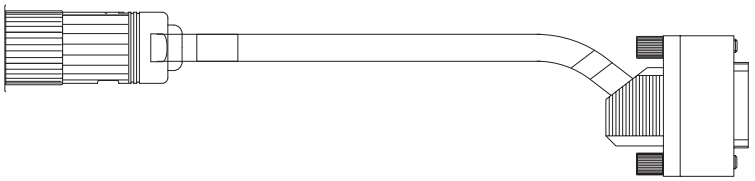



*9007200729686795*

## INFORMATION

* ES7C and EG7C may only be used in connection with the DEU21B multi-encoder card. For the individual wiring diagrams, refer to chapter "Installation" in the "MOVIDRIVE® MDX60B/61B" operating instructions.

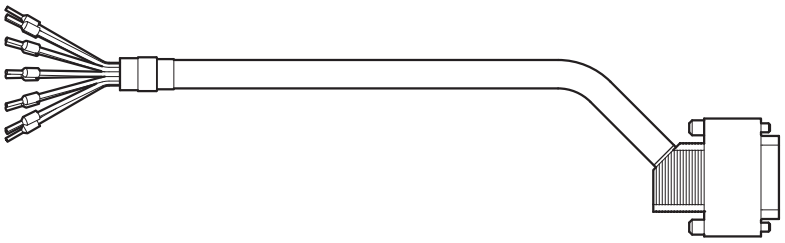
- Part number: 08180156 or 08181659
- Cable to connect external encoders via plug connectors.



- Part number: 01995391 or 01995405
- Extension cable to connect external encoders via plug connectors.

27793230/EN – 08/2022

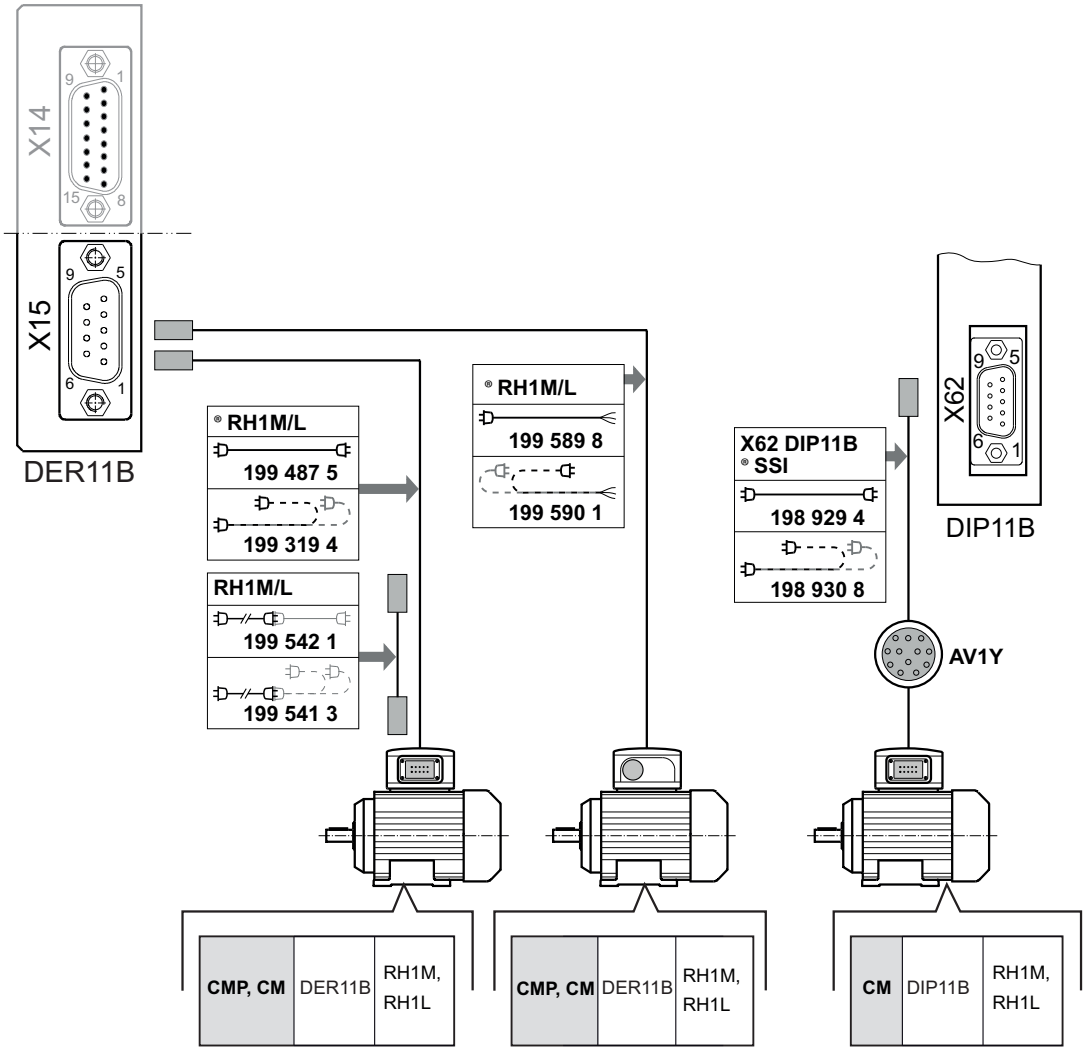
- Part number: 08198691 or 08181683
- Cable to connect external encoders via encoder terminal strip.



*1474233867*

27793230/EN – 08/2022

## 7.9 Encoder cable for resolvers on X15 DER11B



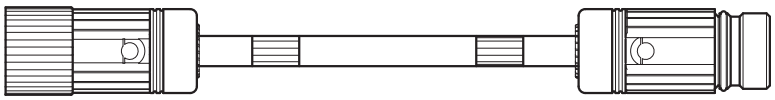

For the individual wiring diagrams, refer to chapter "Installation" in the "MOVIDRIVE® MDX60B/61B" operating instructions.

- Part number: 01994875 or 01993194
- Cable to connect resolvers RH1M / RH1L with plug connector connection on the motor side to CM.. or CMP.. motors.

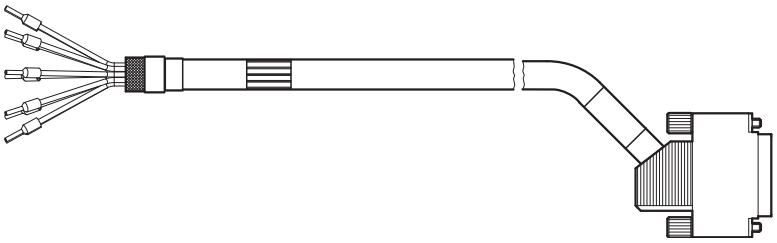


1475686283

- Part number: 01995421 or 01995413
- Extension cable to connect resolvers RH1M / RH1L with plug connector connection on the motor side to DS.., CM.., CMD.. or CMP.. motors.

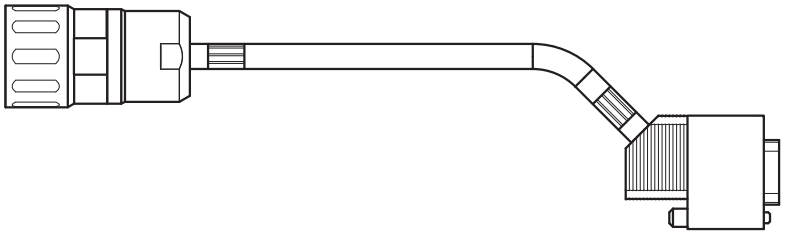


- Part numbers:
  - For CM.. motors: 01995898 or 01995901



*1475692811*

- Part number: 01989294 or 01989308
- CM.. motors with integrated resolver: Additional cable to connect the AV1Y absolute encoder with plug connector connection on the motor side to DIP11B X62.



# 8 Parameters

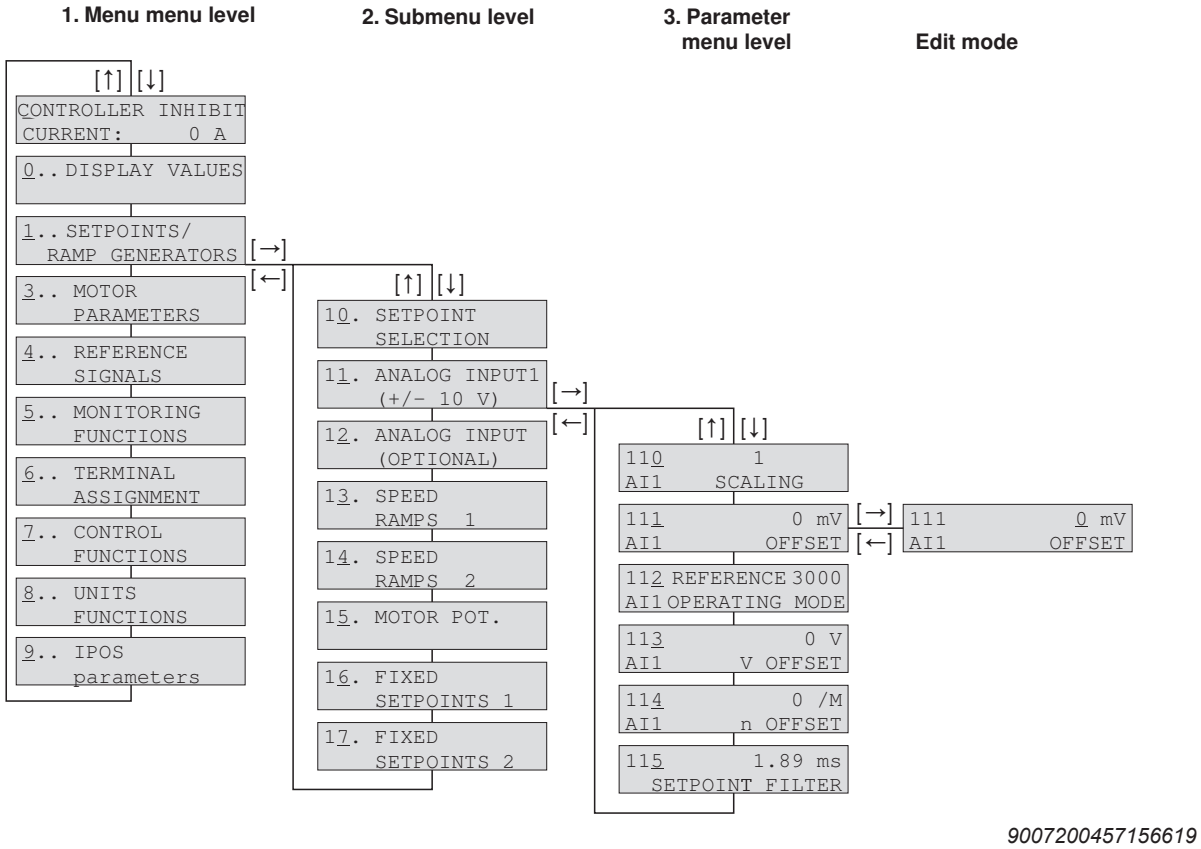
The parameter menu is usually only required for startup and when servicing is performed. For this reason, MOVIDRIVE® is designed as a basic device without keypad. If required, you can equip the MOVIDRIVE® with a PC connection or a keypad.

You can set the MOVIDRIVE® parameters in various ways:

- Using the optional DBG60B keypad.
- Using the MOVITOOLS® MotionStudio engineering software (includes SHELL, SCOPE and IPOS$^{PLUS®}$ programming).
- Using the serial interfaces.
- Using the fieldbus interfaces.
- Via IPOS$^{PLUS®}$.

You can download the latest version of the MOVITOOLS® MotionStudio engineering software from the SEW homepage (www.sew-eurodrive.com).

## 8.1 Structure of the DBG60B menu




*9007200457156619*

27793230/EN – 08/2022

## 8.2 Overview of parameters

**The following table lists all parameters together with their factory settings (indicated in bold). Numerical values are displayed with the complete setting range.**

| "Parameter group 0: Display values" (→ 🗎 218) | |
|---|---|
| "P00. Process values" (→ 🗎 218) | |
| "P000 Speed" (→ 🗎 218) | |
| "P001 User display" (→ 🗎 218) | |
| "P002 Frequency" (→ 🗎 218) | |
| "P003 Actual position" (→ 🗎 218) | |
| "P004 Output current" (→ 🗎 219) | |
| "P005 Active current" (→ 🗎 219) | |
| "P006/P007 Motor utilization 1/2" (→ 🗎 219) | |
| "P008 DC link voltage" (→ 🗎 219) | |
| "P009 Output current" (→ 🗎 219) | |
| "P01. Status displays" (→ 🗎 220) | |
| "P010 Inverter status" (→ 🗎 220) | |
| "P011 Operating state" (→ 🗎 220) | |
| "P012 Fault status" (→ 🗎 220) | |
| "P013 Current parameter set" (→ 🗎 220) | |
| "P014 Heat sink temperature" (→ 🗎 220) | |
| "P015 Power-applied hours" (→ 🗎 220) | |
| "P016 Enable hours" (→ 🗎 221) | |
| "P017 Work" (→ 🗎 221) | |
| "P018/P019 KTY utilization 1/2" (→ 🗎 221) | |
| "P02. Analog setpoints" (→ 🗎 221) | |
| "P020/P021 Analog input AI1/AI2" (→ 🗎 221) | |
| "P022 External current limiting" (→ 🗎 221) | |
| "P03. Digital inputs of basic device" (→ 🗎 221) | |
| "P030 – P037 Digital inputs DI00 – DI07" (→ 🗎 221) | |
| "P039 Digital inputs DI00 – DI07" (→ 🗎 221) | |
| "P04. Digital inputs option" (→ 🗎 221) | |
| "P040 – P047 Digital inputs DI10 – DI17" (→ 🗎 221) | |
| "P048 Digital inputs DI10 – DI17" (→ 🗎 221) | |
| "P05. Digital outputs basic device" (→ 🗎 222) | |
| "P050 – P055 Digital outputs DB00, DO01 – DO05" (→ 🗎 222) | |
| "P059 Digital outputs DB00, DO01 – DO05" (→ 🗎 222) | |
| "P06. Digital outputs option" (→ 🗎 222) | |

27793230/EN – 08/2022

| | |
|---|---|
| "P060 – P067 Digital outputs DO10 – DO17" (→ 🗎 222) | |
| "P068 Digital outputs DO10 – DO17" (→ 🗎 222) | |
| "P07. Device data" (→ 🗎 222) | |
| "P070 Device type" (→ 🗎 222) | |
| "P071 Nominal output current" (→ 🗎 222) | |
| "P072 Option/firmware encoder slot" (→ 🗎 222) | |
| "P073 Option/firmware fieldbus option slot" (→ 🗎 222) | |
| "P074 Option/firmware expansion slot" (→ 🗎 222) | |
| "P076 Firmware basic device" (→ 🗎 222) | |
| "P077 Firmware digital operator panel" (→ 🗎 222) | |
| "P078 Technology function" (→ 🗎 223) | |
| "P079 Device design" (→ 🗎 223) | |
| "P08. Fault memory" (→ 🗎 224) | |
| "P080 – P084 Faults t-0 – t-4" (→ 🗎 224) | |
| "P09. Bus diagnostics" (→ 🗎 224) | |
| "P090 PD configuration" (→ 🗎 224) | |
| "P091 Fieldbus type" (→ 🗎 224) | |
| "P092 Fieldbus baud rate" (→ 🗎 224) | |
| "P093 Fieldbus address" (→ 🗎 224) | |
| "P094 – P096 PO1 – PO3 setpoint" (→ 🗎 224) | |
| "P097 – P099 PI1 – PI3 actual value" (→ 🗎 225) | |

| "Parameter group 1: Setpoints/ramp generators" (→ 🗎 226) | |
|---|---|
| "P10. Setpoint selection" (→ 🗎 226) | |
| "P100 Setpoint source" (→ 🗎 226) | **Unipolar/fixed setpoint** |
| "P101 Control signal source" (→ 🗎 227) | **Terminals** |
| "P102 Frequency scaling" (→ 🗎 228) | 0.1 – **10** – 65 kHz |
| "P105 Error response to wire break AI1" (→ 🗎 228) | **No response** |
| "P11. Analog input AI1" (→ 🗎 229) | |
| "P110 AI1 scaling" (→ 🗎 229) | -10 – **1** – 10 |
| "P111 AI1 Offset" (→ 🗎 229) | -500 – **0** – 500 mV |
| "P112 AI1 operating mode" (→ 🗎 230) | **10V, reference potential maximum speed** |
| "P113 AI1 voltage offset" (→ 🗎 231) | -10 – **0** – 10 V |
| "P114 AI1 speed offset" (→ 🗎 232) | -6000 – **0** – 6000 $min^{-1}$ |
| "P115 Filter setpoint" (→ 🗎 233) | 0 – **5** – 100 ms, (0 = setpoint filter off) |

27793230/EN – 08/2022

| | |
|---|---|
| "P12. Analog inputs option" (→ 🗎 237) | |
| "P120 AI2 operating mode (optional)" (→ 🗎 237) | **No function** |
| "P13./P14. Speed ramps 1/2" (→ 🗎 237) | |
| "P130 – P133 / P140 – P143 Ramp t11 / t21 up/ down CW/CCW" (→ 🗎 237) | 0 – **2** – 2000 s |
| "P134/P144 Ramp t12/t22 UP = DOWN" (→ 🗎 237) | 0 – **10** – 2000 s |
| "P135/P145 S pattern t12/t22" (→ 🗎 238) | **0** – 3 |
| "P136/P146 Stop ramp t13/t23" (→ 🗎 238) | 0 – **2** – 20 s |
| "P137/P147 Emergency stop ramp t14/ t24" (→ 🗎 238) | 0 – **2** – 20 s |
| "P138 Ramp limit VFC" (→ 🗎 239) | **Yes** |
| "P139/P149 Ramp monitoring 1/2" (→ 🗎 239) | **Off** |
| "P15. Motor potentiometer" (→ 🗎 239) | |
| "P150/P151 Ramp t3 up / down" (→ 🗎 239) | 0.2 – **20** – 50 s |
| "P152 Save last setpoint" (→ 🗎 240) | **No** |
| "P16./P17. Fixed setpoints 1/2" (→ 🗎 241) | |

| "Parameter group 2: Controller parameters" (→ 🗎 242) | |
|---|---|
| "P20. Speed Control" (→ 🗎 242) | |
| "P200 P gain n controller" (→ 🗎 242) | 0.01 – **2** – 32 |
| "P201 Time constant n-controller" (→ 🗎 243) | 0 – **10** – 3000 ms |
| "P202 Gain acceleration precontrol" (→ 🗎 243) | **0** – 65 |
| "P203 Filter acceleration precontrol" (→ 🗎 243) | **0** – 100 ms |
| "P204 Actual speed value filter" (→ 🗎 243) | **0** – 32 ms |
| "P205 Load precontrol CFC" (→ 🗎 243) | -150 – **0** – +150% |
| "P206 Sampling cycle n-controller" (→ 🗎 243) | **1 ms** 0.5 ms |
| "P207 Load precontrol VFC" (→ 🗎 244) | -150 – **Off** – 150% |
| "P21. Hold controller" (→ 🗎 244) | |
| "P210 P-gain hold controller" (→ 🗎 244) | 0.1 – **0.5** – 32 |
| "P22. Synchronous operation control" (→ 🗎 244) | |
| "P220 P-gain DRS" (→ 🗎 244) | 1 – **10** – 200 |
| "P221 – P222 Master gear ratio factor / Slave gear ratio factor" (→ 🗎 245) | **1** – 3 999 999 999 |
| "P223 Mode selection" (→ 🗎 245) | **Mode 1** |
| "P224 Slave counter" (→ 🗎 247) | -99 999 999 – **10** – 99 999 999 |
| "P225/P226/P227 Offset 1/2/3" (→ 🗎 247) | -32767 – **10** – 32767 |
| "P228 Precontrol filter DRS" (→ 🗎 247) | **0** – 100 ms |
| "P23. Synchronous operation with distance encoder" (→ 🗎 247) | |

27793230/EN – 08/2022

| | |
|---|---|
| "P230 Distance encoder" (→ 🗎 247) | **Off** |
| "P231/P232 Factor slave encoder / Factor slave distance encoder" (→ 🗎 247) | **1** – 1000 |
| "P233 Distance encoder resolution" (→ 🗎 248) | **1024** |
| "P234 Master encoder resolution" (→ 🗎 248) | **1024** |
| "P24. Synchronous operation with catch up" (→ 🗎 248) | |
| "P240 Synchronous speed" (→ 🗎 248) | 0 – **1500** – 6000 $min^{-1}$ |
| "P241 Synchronization ramp" (→ 🗎 248) | 0 – **2** – 50 s |
| "P26. Process controller parameter" (→ 🗎 248) | |
| "P260 Operating mode" (→ 🗎 248) | **Controller off** |
| "P261 Cycle time" (→ 🗎 248) | **5** ms |
| "P262 Interruption" (→ 🗎 249) | **No response** |
| "P263 Factor KP" (→ 🗎 249) | 0 – **1** – 32.767 |
| "P264 Integral time TN" (→ 🗎 249) | **0** – 65535 ms |
| "P265 Derivative time TV" (→ 🗎 249) | **0** – 30 ms |
| "P266 Precontrol" (→ 🗎 249) | -32767 – **0** – 32767 |
| "P27. Process controller input values" (→ 🗎 250) | |
| "P270 Setpoint source" (→ 🗎 250) | **Parameter** |
| "P271 Setpoint" (→ 🗎 250) | -32767 – **0** – 32767 |
| "P272 IPOS setpoint address" (→ 🗎 250) | **0** – 1023 |
| "P273 Time constant" (→ 🗎 250) | **0** – 0.01 – 2000 s |
| "P274 Scaling setpoint" (→ 🗎 250) | -32,767 – **1** – 32,767 |
| "P275 Actual value source" (→ 🗎 250) | **Analog 1** |
| "P276 IPOS actual value address" (→ 🗎 250) | **0** – 1023 |
| "P277 Scaling actual value" (→ 🗎 250) | -32.767 – **1** – 32.767 |
| "P278 Offset actual value" (→ 🗎 251) | -32767 – **0** – 32767 |
| "P279 Time constant actual value" (→ 🗎 251) | **0** – 500 ms |
| "P28. Process controller limits" (→ 🗎 251) | |
| "P280 Minimum offset + actual value" (→ 🗎 251) | -32767 – **0** – 32767 |
| "P281 Maximum offset + actual value" (→ 🗎 251) | -32767 – **10000** – 32767 |
| "P282 PID controller minimum output" (→ 🗎 251) | -32767 – **-1000** – 32767 |
| "P283 PID controller maximum output" (→ 🗎 251) | -32767 – **10000** – 32767 |
| "P284 Process controller minimum output" (→ 🗎 251) | -32767 – **0** – 32767 |
| "P285 Process controller maximum output" (→ 🗎 251) | -32767 – **7500** – 32767 |

| | |
|---|---|
| "Parameter group 3: Motor parameters" (→ 🗎 252) | |
| "P30./P31. Limits 1 / 2" (→ 🗎 252) | |

27793230/EN – 08/2022

| | |
|---|---|
| "P300 / P310 Start/stop speed 1/2" (→ 🗎 252) | 0 – 150 $min^{-1}$ |
| "P301/P311 Minimum speed 1/2" (→ 🗎 252) | 0 – **15** – 6100 $min^{-1}$ |
| "P302/P312 Maximum speed 1/2" (→ 🗎 252) | 0 – **1500** – 6100 $min^{-1}$ |
| "P303/P313 Current limit 1/2" (→ 🗎 253) | 0 – 150% of the nominal motor current $I_N$ |
| "P304 Torque limit" (→ 🗎 253) | **0** – 150% (size 0: 0 – 200%) |
| "P32./P33. Motor compensation 1/2 (synchronous)" (→ 🗎 253) | |
| "P320/P330 Automatic adjustment 1/2" (→ 🗎 253) | **On** |
| "P321/P331 Boost 1/2" (→ 🗎 254) | **0** – 100% |
| "P322/P332 IxR adjustment 1/2" (→ 🗎 254) | 0 – 100% |
| "P323/P333 Premagnetization time 1/2" (→ 🗎 254) | 0 – 20 s |
| "P324/P334 Slip compensation 1/2" (→ 🗎 254) | 0 – 500 $min^{-1}$ |
| "P34. Motor protection" (→ 🗎 255) | |
| "P340/P342 Motor protection 1/2" (→ 🗎 255) | **Off** |
| "P341/P343 Type of cooling 1/2" (→ 🗎 257) | **Fan cooled** |
| "P344 Motor protection interval" (→ 🗎 257) | 0.1 – **4** – 20 s |
| "P345/P346 IN/UL monitoring" (→ 🗎 257) | 0.1 – 500 A |
| "P35. Direction of motor rotation" (→ 🗎 258) | |
| "P350/P351 Direction of rotation reversal 1/2" (→ 🗎 258) | **Off** |
| "P36. Startup" (→ 🗎 258) | |
| "P360 Startup" (→ 🗎 258) | **No** |

| "Parameter group 4: Reference signals" (→ 🗎 259) | |
|---|---|
| "P40. Speed reference message" (→ 🗎 259) | |
| "P400 Speed reference value" (→ 🗎 259) | 0 – **1500** – 6000 $min^{-1}$ |
| "P401 Hysteresis" (→ 🗎 259) | 0 – **100** – 500 $min^{-1}$ |
| "P402 Delay time" (→ 🗎 259) | 0 – **1** – 9 s |
| "P403 Signal = “1" when:" (→ 🗎 259) | **n < $n_{ref}$** / n > $n_{ref}$ |
| "P41. Speed window signal" (→ 🗎 260) | |
| "P410 Window center" (→ 🗎 260) | 0 – **1500** – 6000 $min^{-1}$ |
| "P411 Range width" (→ 🗎 260) | **0** – 6000 $min^{-1}$ |
| "P412 Deceleration time" (→ 🗎 260) | 0 – **1** – 9 s |
| "P413 Signal = "1" if:" (→ 🗎 260) | **Internal** |
| "P42. Speed setpoint/actual value comparison" (→ 🗎 261) | |
| "P420 Hysteresis" (→ 🗎 261) | 1 – **100** – 300 $min^{-1}$ |
| "P421 Deceleration time" (→ 🗎 261) | 0 – **1** – 9 s |
| "P422 Signal = "1" if:" (→ 🗎 261) | **n = $n_{setpoint}$** |

27793230/EN – 08/2022

| | |
|---|---|
| "P43. Current reference signal" (→ 🗎 262) | |
| "P430 Current reference value" (→ 🗎 262) | 0 – **100** – 150% $I_N$ |
| "P431 Hysteresis" (→ 🗎 262) | 0 – **5** – 30% $I_N$ |
| "P432 Deceleration time" (→ 🗎 262) | 0 – **1** – 9 s |
| "P433 Signal = "1" if:" (→ 🗎 262) | **I < $I_{ref}$** |
| "P44. Imax signal" (→ 🗎 262) | |
| "P440 Hysteresis" (→ 🗎 262) | **5** – 50% $I_N$ |
| "P441 Deceleration time" (→ 🗎 262) | 0 – **1** – 9 s |
| "P442 Signal = "1" if:" (→ 🗎 262) | **I < $I_{max}$** |

| "Parameter group 5: Monitoring functions" (→ 🗎 263) | |
|---|---|
| "P50. Speed monitoring" (→ 🗎 263) | |
| "P500/P502 Speed monitoring 1/2" (→ 🗎 263) | **Motoring/regenerative** |
| "P501/P503 Delay time 1/2" (→ 🗎 263) | 0 – **1** – 10 s |
| "P504 Encoder monitoring motor" (→ 🗎 263) | **Off** |
| "P505 Distance encoder monitoring" (→ 🗎 264) | **Off** |
| "P51. Synchronous operation monitoring" (→ 🗎 264) | |
| "P510 Positional tolerance slave" (→ 🗎 264) | 10 – **25** – 32 768 Inc. |
| "P511 Lag error prewarning" (→ 🗎 264) | **50** – 99 999 999 Inc. |
| "P512 lag error limit" (→ 🗎 264) | 100 – **4000** – 99 999 999 Inc. |
| "P513 Delay time error signal" (→ 🗎 264) | 0 – **1** – 99 s |
| "P514 Counter LED display" (→ 🗎 265) | 10 – **100** – 32 768 Inc. |
| "P515 Delay in-position signal" (→ 🗎 265) | 5 – **10** – 2000 ms |
| "P516 X41 Encoder monitoring" (→ 🗎 265) | **Off** |
| "P517 X41 Pulse count monitoring" (→ 🗎 265) | **Off** |
| "P518 X42 Encoder monitoring" (→ 🗎 266) | **Off** |
| "P519 X42 Pulse count monitoring" (→ 🗎 266) | **Off** |
| "P52. Power off monitoring" (→ 🗎 266) | |
| "P520 Power off response time" (→ 🗎 266) | **0** – 5 s |
| "P521 Power off response" (→ 🗎 266) | **Controller inhibit** |
| "P522 Phase failure monitoring" (→ 🗎 267) | **On** |
| "P53. Motor temperature protection" (→ 🗎 267) | |
| "P530 Sensor type 1" (→ 🗎 267) | **No sensor** |
| "P531 Sensor type 2" (→ 🗎 267) | **No sensor** |
| "P54. Gear unit/motor monitoring" (→ 🗎 268) | |
| "P540 Drive vibration response/warning" (→ 🗎 269) | **Display error** |
| "P541 Drive vibration response/fault" (→ 🗎 269) | **Rapid stop/warning** |
| "P542 Response oil aging / warning" (→ 🗎 269) | **Display error** |
| "P543 Response oil aging / fault" (→ 🗎 269) | **Display error** |

27793230/EN – 08/2022

| | |
|---|---|
| "P544 Oil aging/overtemperature" (→ 🗎 269) | **Display error** |
| "P545 Oil aging/ready signal" (→ 🗎 270) | **Display error** |
| "P549 Response to brake wear" (→ 🗎 270) | **Display error** |
| "P55. DCS safety module" (→ 🗎 270) | |
| "P550 DCS safety module status" (→ 🗎 270) | Display value |
| "P551 Digital inputs DCS DI1 – DI8" (→ 🗎 270) | Display value |
| "P552 Digital outputs DCS DO0_P – DO2_M" (→ 🗎 271) | Display value |
| "P553 Serial number DCS" (→ 🗎 271) | Display value |
| "P554 CRC DCS" (→ 🗎 271) | Display value |
| "P555 DCS error response" (→ 🗎 271) | **Immediate stop/Fault** |
| "P556 DCS alarm response" (→ 🗎 271) | **Rapid stop/warning** |
| "P557 DCS source actual position" (→ 🗎 271) | **Motor encoder (X15)** |
| "P56. Ex-e motor current limiting" (→ 🗎 272) | |
| "P560 Current limiting Ex-e motor" (→ 🗎 272) | **Off** |
| "P561 Frequency A" (→ 🗎 273) | 0 – **5** – 60 Hz |
| "P562 Current limit A" (→ 🗎 273) | 0 – **50** – 150% |
| "P563 Frequency B" (→ 🗎 273) | 0 – **10** – 104 Hz |
| "P564 Current limit B" (→ 🗎 273) | 0 – **80** – 200% |
| "P565 Frequency C" (→ 🗎 273) | 0 – **25** – 104 Hz |
| "P566 Current limit C" (→ 🗎 273) | 0 – **100** – 200% |

| "Parameter group 6: Terminal assignment" (→ 🗎 274) | |
|---|---|
| "P60. Digital inputs of basic device" (→ 🗎 274) | |
| "P600 – P606 Digital input DIØ1 – DIØ7" (→ 🗎 274) | |
| "P61. Digital inputs option" (→ 🗎 275) | |
| "P610 – P617 Digital inputs DI1Ø – DI17" (→ 🗎 275) | **No function** |
| "P62. Digital outputs basic device" (→ 🗎 276) | |
| "P620 – P624 Digital outputs DOØ1 – DOØ5" (→ 🗎 276) | |
| "P63. Digital outputs option" (→ 🗎 277) | |
| "P630 – P637 Digital outputs DO1Ø – DO17" (→ 🗎 277) | **No function** |
| "P64x Analog outputs optional" (→ 🗎 279) | |
| "P640/P643 Analog output AO1/AO2" (→ 🗎 279) | **Actual speed/output current** |
| "P641/P644 Scaling AO1/AO2" (→ 🗎 280) | -10 – 0 – **1** – 10 |
| "P642/P645 Operating mode AO1/AO2" (→ 🗎 280) | **-10 V.–.10 V** |

| "Parameter group 7: Control functions" (→ 🗎 282) | |
|---|---|
| "P70. Duty types" (→ 🗎 282) | |

| | |
|---|---|
| "P700/P701 Operating mode 1/2" (→ 🗎 282) | **VFC 1/2** |
| "P702 Motor category" (→ 🗎 283) | **Rotatory** |
| "P703 Dynamic response" (→ 🗎 283) | **Standard** |
| "P704 VFC-n with output filter" (→ 🗎 283) | **No** |
| "P705 Premagnetization time lower limit" (→ 🗎 283) | **No** |
| "P706 Flux model: Yrq = 0" (→ 🗎 283) | **Yes** |
| "P71. Standstill current" (→ 🗎 284) | |
| "P710/P711 Standstill current 1/2" (→ 🗎 284) | **0** – 50% $I_{Mot}$ |
| "P72. Setpoint stop function" (→ 🗎 285) | |
| "P720/P723 Stop by setpoint function 1/2" (→ 🗎 285) | **Off** |
| "P721/P724 Stop setpoint 1/2" (→ 🗎 285) | 0 – **30** – 500 $min^{-1}$ |
| "P722/P725 Start offset 1/2" (→ 🗎 286) | 0 – **30** – 500 $min^{-1}$ |
| "P73. Brake function" (→ 🗎 286) | |
| "P730/P733 Brake function 1/2" (→ 🗎 286) | **On** |
| "P731/P734 Brake release time 1/2" (→ 🗎 287) | 0 – 2 s |
| "P732/P735 Brake application time 1/2" (→ 🗎 287) | 0 – 2 s |
| "P74. Speed skip function" (→ 🗎 287) | |
| "P740/P742 Skip center 1/2" (→ 🗎 288) | 0 – **1500** – 6000 $min^{-1}$ |
| "P741/P743 Skip bandwidth 1/2" (→ 🗎 288) | **0** – 300 $min^{-1}$ |
| "P75. Master/slave function" (→ 🗎 288) | |
| "P750 Slave setpoint" (→ 🗎 293) | **Master/slave off** |
| "P751 Scaling of slave setpoint" (→ 🗎 294) | -10 – **1** – 10 |
| "P76. Manual operation" (→ 🗎 294) | |
| "P760 Interlocking run/stop keys" (→ 🗎 294) | **Off** |
| "P77. Energy-saving function" (→ 🗎 294) | |
| "P770 Energy-saving function" (→ 🗎 294) | **Off** |
| "P78. Ethernet configuration" (→ 🗎 294) | |
| "P780 IP address" (→ 🗎 294) | **192.168.10.4** |
| "P781 Subnet mask" (→ 🗎 294) | **255.255.255.0** |
| "P782 Standard gateway" (→ 🗎 294) | **000,000,000,000** |
| "P783 Baud rate" (→ 🗎 295) | |
| "P784 MAC address" (→ 🗎 295) | |
| "P785 Ethernet/IP configuration" (→ 🗎 295) | **DHCP** |

| | |
|---|---|
| "Parameter group 8: Device functions" (→ 🗎 296) | |
| "P80. Setup" (→ 🗎 296) | |
| "P800 User menu" (→ 🗎 296) | **On** (only in DBG60B) |
| "P801 Language" (→ 🗎 296) | Dependent on DBG60B design |

27793230/EN – 08/2022

| | |
|---|---|
| "P802 Factory setting" (→ 🗎 296) | **No** |
| "P803 Parameter lock" (→ 🗎 297) | **Off** |
| "P804 Reset statistic data" (→ 🗎 297) | **No action** |
| "P806 Copy DBG -> MDX" (→ 🗎 297) | **No** (only in DBG60B) |
| "P807 Copy MDX - DBG" (→ 🗎 298) | **No** (only in DBG60B) |
| "P81. Serial communication" (→ 🗎 298) | |
| "P810 RS485 Address" (→ 🗎 298) | **0** – 99 |
| "P811 RS485 group address" (→ 🗎 298) | **100** – 199 |
| "P812 RS485 timeout interval" (→ 🗎 298) | **0** – 650 s |
| "P819 Fieldbus timeout interval" (→ 🗎 299) | 0 – **0.5** – 650 s |
| "P82. Braking operation" (→ 🗎 299) | |
| "P820/P821 4-Quadrant operation 1/2" (→ 🗎 299) | **On** |
| "P83. Fault responses" (→ 🗎 300) | |
| "P830 Response to "External fault"" (→ 🗎 301) | **Emergency stop/malfunction** |
| "P831 'Fieldbus timeout' response" (→ 🗎 301) | **Rapid stop/warning** |
| "P832 Response to "Motor overload"" (→ 🗎 301) | **Emergency stop/malfunction** |
| "P833 'RS485 timeout' response" (→ 🗎 301) | **Rapid stop/warning** |
| "P834 Response to "Lag error"" (→ 🗎 302) | **Emergency stop/malfunction** |
| "P835 'TF signal' response" (→ 🗎 302) | **No response** |
| "P836 'Timeout SBus 1/2' response" (→ 🗎 302) | **Emergency stop/malfunction** |
| "P838 'SW limit switch' response" (→ 🗎 302) | **Emergency stop/malfunction** |
| "P839 Response to "Positioning interruption"" (→ 🗎 302) | **Emergency stop/Warning** |
| "P84. Reset behavior" (→ 🗎 302) | |
| "P840 Manual reset" (→ 🗎 302) | **No** |
| "P841 Auto reset" (→ 🗎 303) | **No** |
| "P842 Restart time" (→ 🗎 303) | 1 – **3** – 30 s |
| "P85. Scaling actual speed value" (→ 🗎 304) | |
| "P850 Scaling factor numerator" (→ 🗎 304) | **1** – 65535 |
| "P851 Scaling factor denominator" (→ 🗎 304) | **1** – 65535 |
| "P852 User unit" (→ 🗎 304) | **1/min** |
| "P86. Modulation" (→ 🗎 304) | |
| "P860/P861 PWM frequency 1/2 VFC" (→ 🗎 304) | **2.5 kHz (size 7) /4 kHz** |
| "P862/P863 PWM fix 1/2" (→ 🗎 305) | **Off** |
| "P864 PWM frequency CFC" (→ 🗎 305) | **2.5 kHz (size 7) /4 kHz** |

27793230/EN – 08/2022

| | |
|---|---|
| "P87. Process data description" (→ 🗎 306) | |
| "P870/P871/P872 Setpoint description PO1/PO2/ PO3" (→ 🗎 306) | |
| "P873/P874/P875 Actual value description PI1/PI2/ PI3" (→ 🗎 307) | |
| "P876 PO data enable" (→ 🗎 307) | **On** |
| "P88./P89. Serial communication SBus 1/2" (→ 🗎 308) | |
| "P880/P890 Protocol SBus 1/2" (→ 🗎 308) | **SBus MOVILINK®** |
| "P881/P891 Address SBus 1/2" (→ 🗎 308) | **0** – 63 |
| "P882/P892 SBus group address 1/2" (→ 🗎 308) | **0** – 63 |
| "P883/P893 SBus timeout delay 1/2" (→ 🗎 308) | **0** – 650 s |
| "P884/P894 SBus baud rate 1/2" (→ 🗎 308) | **500 kBd** |
| "P885/P895 Synchronization ID SBus 1/2" (→ 🗎 308) | **0** – 2047 |
| "P886/P896 CANopen address 1/2" (→ 🗎 309) | 1 – **127** |
| "P887 Synchronization ext. controller 1/2" (→ 🗎 309) | **Off** |
| "P888 Synchronization time" (→ 🗎 309) | 1 – **5** – 10 ms |
| "P889/P899 Parameter channel 2" (→ 🗎 309) | **Off** |

| "Parameter group 9: IPOS parameters" (→ 🗎 310) | |
|---|---|
| "P90. IPOS reference travel" (→ 🗎 310) | |
| "P900 Reference offset" (→ 🗎 311) | $-(2^{31} - 1)$ – **0** – $(2^{31} - 1)$ Inc. |
| "P901 Reference speed 1" (→ 🗎 311) | 0 – **200** – 6000 $min^{-1}$ |
| "P902 Reference speed 2" (→ 🗎 311) | 0 – **50** – 6000 $min^{-1}$ |
| "P903 Reference travel type" (→ 🗎 312) | **0** – 8 |
| "P904 Reference travel to zero pulse" (→ 🗎 313) | **Yes** |
| "P905 Hiperface Offset X15" (→ 🗎 313) | $-(2^{31} - 1)$ – **0** – $(2^{31} - 1)$ Inc. |
| "P906 Cam distance" (→ 🗎 313) | Display value |
| "P91. IPOS Travel parameters" (→ 🗎 314) | |
| "P910 Gain X controller" (→ 🗎 314) | 0.1 – **0.5** – 32 |
| "P911/P912 Positioning ramp 1/2" (→ 🗎 314) | 0.01 – **1** – 20 s |
| "P913/P914 Travel speed CW/CCW" (→ 🗎 314) | 0 – **1500** – 6000 $min^{-1}$ |
| "P915 Velocity precontrol" (→ 🗎 314) | -199.99 – 0 – **100** – 199.99% |
| "P916 Ramp type" (→ 🗎 315) | **Linear** |
| "P917 Ramp mode" (→ 🗎 318) | **Mode 1** |
| "P918 bus setpoint source" (→ 🗎 318) | 0 – **499** – 1023 |
| "P92. IPOS monitoring" (→ 🗎 318) | |
| "P920 / P921 SW limit switch CW / CCW" (→ 🗎 318) | $-(2^{31} - 1)$ – **0** – $(2^{31} - 1)$ Inc. |
| "P922 Position window" (→ 🗎 319) | 0 – **50** – 32767 Inc. |
| "P923 Lag error window" (→ 🗎 319) | 0 – **5000** – $(2^{31} - 1)$ Inc. |

27793230/EN – 08/2022

| | |
|---|---|
| "P924 Positioning interruption detection" (→ 🗎 319) | **Off** |
| "P93. Special IPOS functions" (→ 🗎 320) | |
| "P930 Override" (→ 🗎 320) | **Off** |
| "P931 IPOS CTRL word Task 1" (→ 🗎 320) | **Stop** (only with DBG60B) |
| "P932 IPOS CTRL word Task 2" (→ 🗎 320) | **Stop** (only with DBG60B) |
| "P933 Jerk time" (→ 🗎 320) | **0.005** – 2 s |
| "P938/P939 Speed task 1/task 2" (→ 🗎 320) | **0** – 9 additional assembler commands/ms |
| "P94. IPOS encoder" (→ 🗎 321) | |
| "P940 IPOS variables edit" (→ 🗎 321) | **Off** (Only DBG) |
| "P941 Actual position source" (→ 🗎 321) | **Motor encoder (X15)** |
| "P942/P943 Encoder factor numerator/denominator" (→ 🗎 321) | **1** – 32767 |
| "P944 Encoder scaling ext. Encoder" (→ 🗎 322) | **x1** |
| "P945 Distance encoder type (X14)" (→ 🗎 323) | **TTL** |
| "P946 Distance encoder counting direction (X14)" (→ 🗎 323) | **Standard** |
| "P947 Hiperface offset X14" (→ 🗎 324) | $-(2^{31} - 1)$ – **0** – $(2^{31} - 1)$ Inc. |
| "P948 Automatic encoder replacement detection" (→ 🗎 324) | **On** |
| "P95. Absolute encoder" (→ 🗎 325) | |
| "P950 Encoder type" (→ 🗎 325) | **No encoder** |
| "P951 Counting direction" (→ 🗎 325) | **Standard** |
| "P952 Clock frequency" (→ 🗎 325) | **1** – 200% |
| "P953 Position offset" (→ 🗎 325) | $-(2^{31} - 1)$ – **0** – $(2^{31} - 1)$ Inc. |
| "P954 Zero offset" (→ 🗎 326) | $-(2^{31} - 1)$ – **0** – $(2^{31} - 1)$ Inc. |
| "P955 Encoder scaling" (→ 🗎 326) | **x1** |
| "P96. IPOSplus® modulo function" (→ 🗎 327) | |
| "P960 Modulo function" (→ 🗎 327) | **Off** |
| "P961 Modulo numerator" (→ 🗎 327) | **1** – $(2^{31} - 1)$ |
| "P962 Modulo denominator" (→ 🗎 327) | **1** – $(2^{31} - 1)$ |
| "P963 Modulo encoder resolution" (→ 🗎 327) | 1 – **4096** – 65535 |
| "P97. IPOS synchronization" (→ 🗎 329) | |
| "P970 DPRAM synchronization" (→ 🗎 329) | **No** |
| "P971 Synchronization phase" (→ 🗎 329) | -2 – **0** – 2 ms |

27793230/EN – 08/2022

## 8.3 Explanation of the parameters

The parameters are explained below. The parameters are divided into 10 groups. The parameter names correspond to their representation in the parameter tree. The factory setting is indicated by **bold**.

### 8.3.1 Icons

The following icons explain the parameters:




These parameters are switch-selectable and available in parameter sets 1 and 2.



These parameters can only be changed with INHIBITED inverter status (= output stage at high resistance).




The startup function automatically changes this parameter.

### 8.3.2 Parameter group 0: Display values

This parameter group contains the following information:

- Process values and states of the basic device
- Process values and states of the installed options
- Fault memory
- Fieldbus parameters

**P00. Process values**

*P000 Speed*

Resolution with DBG60B: ± 1 $min^{-1}$; with MOVITOOLS® MotionStudio: ± 0.2 $min^{-1}$

The speed is determined by taking the setpoint speed and the set slip compensation in VFC or V/f mode without an encoder connection. The speed is established from the encoder or resolver signals and displayed when there is an encoder connection.

*P001 User display*

Determined by the following parameters:

- *P850 Scaling factor numerator* (→ 🗎 304)
- *P851 Scaling factor denominator* (→ 🗎 304)
- *P852 User unit* (→ 🗎 304)

*P002 Frequency*

Output frequency of the device (signed).

*P003 Actual position*

With encoder connection, position of the drive as a value in increments observing the signs in the range 0 – ± ($2^{31}$-1) increments. Without encoder connection, the value is zero.

27793230/EN – 08/2022

*P004 Output current*

Apparent current in the range 0 – 200% of the nominal device current $I_N$ (Size 0: 250%).

*P005 Active current*

Active current in the range 0 – 200% of the nominal device current $I_N$ (signed) (Size 0: 250%).

The display value is positive when torque is applied in the positive direction of rotation; negative when torque is applied in the negative direction of rotation.

*P006/P007 Motor utilization 1/2*

Current thermal motor utilization of the connected motor in the range 0 – 200%.

The motor utilization is calculated using the motor temperature emulation in the device. The synchronous motor with KTY and the asynchronous motor is turned off when 110% motor utilization is reached.

*P008 DC link voltage*

Voltage in V measured in the DC link circuit.

*P009 Output current*

Apparent current in AC A.

27793230/EN – 08/2022

### P01. Status displays

*P010 Inverter status*

The output stage can have the following states:

- Disabled
- Enabled

*P011 Operating state*

The following operating states are possible (7 segment display):

- 0: 24 V operation (inverter not ready for operation)
- 1: Controller inhibit
- 2: No enable
- 3: Standstill current
- 4: Enable (VFC)
- 5: Enab. (N-control)
- 6: Torque control
- 7: Position hold control
- 8: Factory setting
- 9: Limit switch
- A: Technology option
- c: Reference mode
- d: Flying start in progress
- E: Encoder calibration
- F: Fault
- H: Manual mode
- t: Waiting for data
- U: STO

*P012 Fault status*

Error number and error in text form.

*P013 Current parameter set*

Parameter set 1 or 2.

*P014 Heat sink temperature*

Heat sink temperature of the device in the range -40 – 125 °C.

*P015 Power-applied hours*

The total of hours in which the device was connected to the supply system or an external DC 24 V supply.

Storage cycle: 15 min

27793230/EN – 08/2022

*P016 Enable hours*

Total number of hours for which the device was in "enable".

Storage cycle: 15 min

*P017 Work*

Total of the active energy the motor has consumed.

Storage cycle: 15 min

*P018/P019 KTY utilization 1/2*

Display 0%: Motor is not in operation at max. ambient temperature.

Display 110%: Switch-off point of motor

**P02. Analog setpoints**

*P020/P021 Analog input AI1/AI2*

Voltage (-10 V – +10 V) at analog input AI1 (020) and at the optional analog input AI2 (021).

If *P112 AI1 Operating mode* = N-MAX, 0(4) – 20 mA and S11 = ON, then *P020* displays 0(1) – 5 V ≙ 0(4) – 20 mA.

*P022 External current limiting*

If *P120 AI2 operating mode (optional)* = 0 – 10 V I-limit, then *P022* is used to display the active external current limiting.

**P03. Digital inputs of basic device**

*P030 – P037 Digital inputs DI00 – DI07*

Current state of the input terminals DI00 – DI07 and the current function assignment.

Observe that digital input DI00 is always assigned with the controller inhibit.

Refer to *P60* for the menu selection. *Digital inputs of basic device* (→ 🗎 274)

*P039 Digital inputs DI00 – DI07*

Standard digital inputs DI00 – DI07.

**P04. Digital inputs option**

*P040 – P047 Digital inputs DI10 – DI17*

Current status of the digital input on an option card (e.g. DIO) with the current function assignment.

If the option is not installed, the display will show "–".

Refer to *P61* for the menu selection. *Digital inputs option* (→ 🗎 275).

*P048 Digital inputs DI10 – DI17*

Optional digital inputs DO10 – DO17

27793230/EN – 08/2022

### P05. Digital outputs basic device

*P050 – P055 Digital outputs DB00, DO01 – DO05*

Current status of the digital output in the basic device, and current function assignment.

The output DB00 is always programmed to the "/Brake" function.

Refer to *P62* for the menu selection. *Digital outputs basic device* (→ 🗎 276).

*P059 Digital outputs DB00, DO01 – DO05*

Digital outputs DB00 and DO01 – DO05

### P06. Digital outputs option

*P060 – P067 Digital outputs DO10 – DO17*

Current status of the digital output in the option (e.g. DIO), and current function assignment.

If the option is not installed, the display will show "–".

Refer to *P63* for the menu selection. *Digital outputs option* (→ 🗎 277).

*P068 Digital outputs DO10 – DO17*

Optional digital outputs DO10 – DO17

### P07. Device data

*P070 Device type*

Device designation, e.g. MDX60B0014-5A3.

*P071 Nominal output current*

Rms value of nominal output current in A.

*P072 Option/firmware encoder slot*

Installed encoder card and its program version.

*P073 Option/firmware fieldbus option slot*

Installed fieldbus interface and its program version.

*P074 Option/firmware expansion slot*

Installed option cards and their program version, in case the option has a program memory

*P076 Firmware basic device*

Part number and version of the program for the firmware used in the basic device.

*P077 Firmware digital operator panel*

Part number and version of the program for the firmware used in the operator panel. Only displayed in the digital operator panel.

27793230/EN – 08/2022

*P078 Technology function*

Setting in the technology function

- Standard: Operating settings for the drive inverter with the functions described in the system manual (positioning, speed control, etc.).
- Electronic cam: Setting for using the technology function "Electronic cam" to coordinate the operation of several drives. Requirements:
  - Motor with encoder feedback
  - Inverter in "Technology" design
- Int. synchronous operation: Setting for using the technology function "Electronic synchronous operation" to synchronize the operation of several drives with accurate positioning. Prerequisites are:
  - Motor with encoder feedback
  - Inverter in "Technology" design
- Auto ASR: Special solution for optimum load distribution of the drive power for running gear with multi-axis drive.
- SBUS / TP: A special solution for event controlled data transmission depending on the touchprobe result.
- Cross cutter: Special solution for synchronizing a slave that follows the master using a certain travel profile.

*P079 Device design*

Indication of the device design.

Technology: Application modules and technology functions can be used.

Standard: Application modules and technology functions cannot be used.

27793230/EN – 08/2022

### P08. Fault memory

*P080 – P084 Faults t-0 – t-4*

The device has 5 fault memories (t-0 to t4-). The faults ""are saved in chronological sequence. The last fault result is stored in the fault memory t-0. In the case of more than 5 faults, the oldest fault result is deleted from the fault memory t-4.

The following information is stored and displayed when an error occurs:

- Status ("0" or "1") of the digital inputs/outputs
- Operating state of the inverter
- Inverter status
- Heat sink temperature
- Speed
- Output current
- Active current
- Device utilization
- DC link voltage
- Operating hours
- Enable hours
- Parameter set
- Motor utilization 1 and 2

### P09. Bus diagnostics

*P090 PD configuration*

Set process data word configuration.

*P091 Fieldbus type*

Installed fieldbus type:

- PROFIBUS DP
- INTERBUS
- INTERBUS with FOC
- Ethernet
- DeviceNet™
- NO FIELDBUS

*P092 Fieldbus baud rate*

Active baud rate.

*P093 Fieldbus address*

Address of the inverter on the fieldbus.

*P094 – P096 PO1 – PO3 setpoint*

Currently transferred value of the process output data words (→ 🗎 306) in hexadecimal form.

27793230/EN – 08/2022

*P097 – P099 PI1 – PI3 actual value*

Currently transferred value of the process output data words (→ 🖹 307) in hexadecimal form.

27793230/EN – 08/2022

### 8.3.3 Parameter group 1: Setpoints/ramp generators

#### P10. Setpoint selection

*P100* (→ 🗎 226) and *P101* (→ 🗎 227) can also be used for selecting a communication interface as the setpoint or control signal source. However, the interfaces are not automatically deactivated with these parameters because the drive inverter must remain ready to receive via all interfaces at any time.

Fixed setpoint always have a higher priority than other setpoints.

If the drive inverter is in the sate "t = Waiting for data", check the timeout intervals of parameter *P812* (→ 🗎 298), *P819* (→ 🗎 299) and, if necessary, switch off timeout monitoring by entering 0 s or 650 s.

*P100 Setpoint source* 

This parameter is used for setting from where the inverter obtains its setpoint.

- Bipolar/fixed setpoint: The setpoint is provided by the analog inputs (AI1/AI2) or by *P16. Fixed setpoints 1* (→ 🗎 241), if selected via *P60. Digital inputs basic device* (→ 🗎 274) / *P61. Digital inputs option* (→ 🗎 275). The setpoints are processed according to their signs. A positive setpoint causes CW rotation; a negative setpoint produces CCW rotation.
- **Unipolar/fixed setpoint**: The setpoint is provided by the analog inputs or the fixed setpoints. Negative analog setpoints result in a setpoint of zero. The fixed setpoints are processed in accordance to their values. The direction of rotation is specified via *P60. Digital inputs basic device* (→ 🗎 274) / *P61. Digital inputs option* (→ 🗎 275).
- RS485/fixed setpoint: The setpoint is obtained from the RS485 interface.
- Fieldbus: The setpoint is obtained from the fieldbus interface.
- Motor potentiometer/fixed setpoint: The setpoint is generated by the internal motor potentiometer. For this purpose, one digital input must be programmed to *Motor potentiometer up*, and another digital input to *Motor potentiometer down*. The digital inputs must be activated accordingly. The direction of rotation is specified by the digital inputs CW/stop and CCW/stop. Refer to *P15. Motor potentiometer* (→ 🗎 239).
- Motor potentiometer + analog setpoint: The setpoint is defined by the total of the motor potentiometer and the setpoint selection at analog input AI1. The analog setpoint is processed as a signed setpoint. If the sum is negative, $n_{min}$ applies. The direction of rotation is specified via digital inputs. In addition, the settings of *P112 AI1 operating mode* apply (→ 🗎 230). Refer to *P15. Motor potentiometer* (→ 🗎 239).
- Fixed setpoint + AI01: The setpoint is defined by the total of the selected fixed setpoint and the setpoint selection at analog input AI1. The fixed setpoint is processed without sign (= according to its value) and the analog setpoint is processed as a signed setpoint. If the total is negative or if a fixed setpoint has not been selected, $n_{min}$ applies. The direction of rotation is specified via digital inputs. Refer to *P16. Fixed setpoints 1* (→ 🗎 241).
- Fixed setpoint * AI01: The value at analog input AI1 serves as evaluation factor (0 – 10 V ≙ 0 – 100%) for the selected fixed setpoint. The fixed setpoint is processed without sign (= according to the value). If the voltage at analog input AI1 is negative or if no fixed setpoint is selected $n_{min}$ applies. The direction of rotation is specified via digital inputs. Refer to *P16. Fixed setpoints 1* (→ 🗎 241).
- Master SBus 1: The setpoint is provided by the master in master/slave operation via system bus 1. Refer to *P75. Master/slave function* (→ 🗎 288).

27793230/EN – 08/2022

- Master RS485: The setpoint comes from the master in master/slave operation via the RS485 interface. Refer to *P75. Master/slave function* (→ 🗎 288).
- SBus 1/fixed setpoint: The setpoint is selected via the system bus 1. Refer to the IPOS$^{PLUS®}$ manual.
- Frequency setpoint input/fixed setpoint: Setting *P100 Setpoint source* to the function "Frequency input" causes the setpoint speed to be set via digital input DI04 in form of a frequency. For this purpose, digital input DI04 (→ 🗎 274) must be set to "No function" and DIP switch S14 must be set to "ON" position. The digital input works with PLC-compatible input signals that are specified as follows:
  - 0 – 7 V -> low level
  - 7 – 24 V -> high level
  - This means an HTL rotary encoder can for example be connected to the digital input to serve as a reference input variable encoder. The pulses from this encoder are then counted via digital input DI04 and a setpoint is calculated for the device. The pulse duty factor (pulse width of the high and low signal) should be about 1 : 1. The factor determines the rising edge and the falling edge of the input signal. Use *P102 Frequency scaling* (→ 🗎 228) to determine at which input frequency the system setpoint (torque or speed) reaches 100%. The reference of the system setpoint is set via" P112 AI1 Operation mode" (→ 🗎 230) (→ 🗎 230). The direction of rotation is specified by the digital inputs CW/stop and CCW/stop.

| Frequency scaling | Minimum response time (delay) | Frequency input resolution |
|---|---|---|
| 25 – 120 kHz | 20 ms | 50 Hz |
| 125 – 24.99 kHz | 40 ms | 25 Hz |
| 10 – 12.94 kHz | 60 ms | 16.7 Hz |
| 1 – 9.99 kHz | 500 ms | 2 Hz |

  - The number of pulses detected at digital input DI04 is mapped to the IPOS variable H508. The maximum input frequency is 65 kHz.

## INFORMATION

IPOS variable H508 is also used when *P916 Ramp type* (→ 🗎 315) is set to "Position interpolation 16 bit".

IPOS variable H508 only provides meaningful values when

- DIP switch S14 = "ON" or
- P916 Ramp type = "Position interpolation 16 bit"

- SBus 2/fixed setpoint: The setpoint is selected via the system bus 2. Refer to the IPOS$^{PLUS®}$ manual.
- IPOS: The actual value of variable H524 is used as setpoint.

*P101 Control signal source*

This parameter is used to set the source of the control commands for the inverter (controller inhibit, enable, CW, CCW, ...). Control via IPOS$^{PLUS®}$ is taken into account disregarding of *P101*.

- **Terminals**: Controlled via digital inputs.

27793230/EN – 08/2022

- RS485: Controlled via the RS485 interface and the digital inputs.
- Fieldbus: Controlled via the fieldbus and the digital inputs.
- SBus: Controlled via the system bus and the digital inputs.

*P102 Frequency scaling* 

Setting range: 0.1 – **10** – 65 kHz

Only effective, if *P100* (→ 🗎 226) is set to "Frequency input". Is set to determine at which input frequency the system setpoint (torque or speed) of 100% is reached.

*P105 Error response to wire break AI1*

Setting range: **No response**/Immediate stop/Fault/Rapid stop/Fault/Rapid stop/Warning

Only effective if *P112 AI1 Operating mode* (→ 🗎 230) is set to "4 – 20 mA, reference maximum speed". If analog input AI1 is used as current input 4 – 20 mA, the set response will be triggered in the event of a wire break (measured current < 2 mA). If a response is set, error message F113 will be issued.

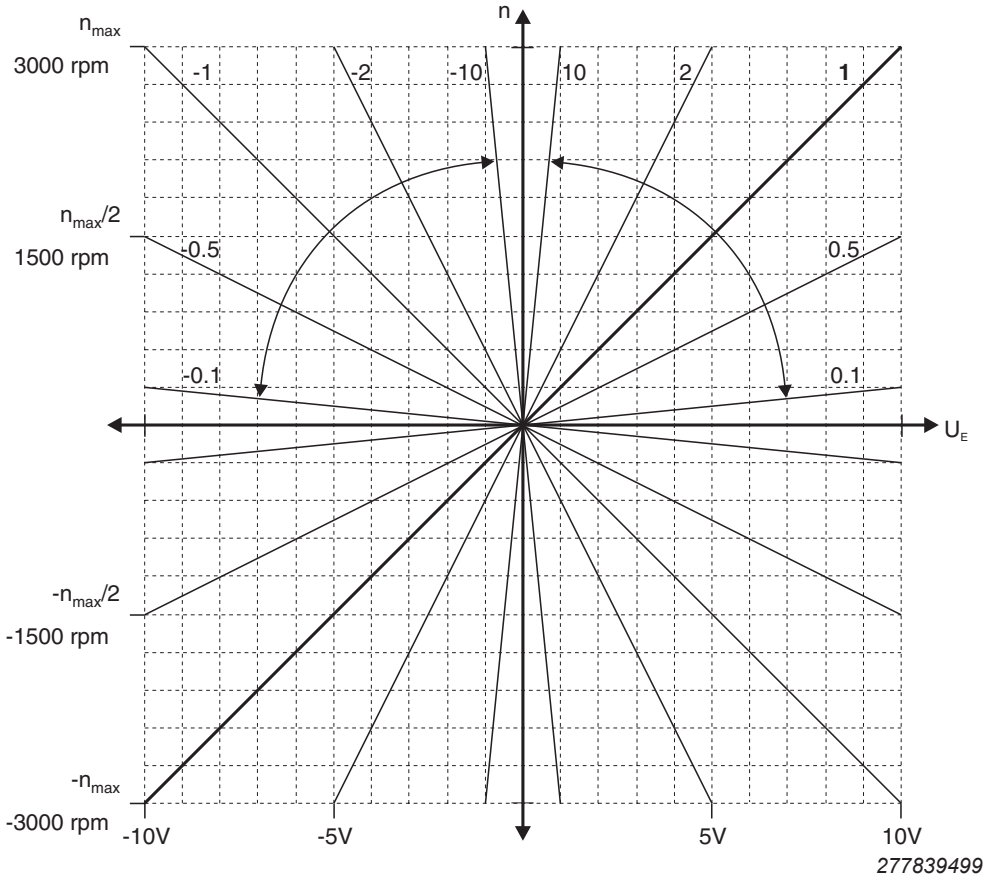
27793230/EN – 08/2022

### P11. Analog input AI1

*P110 AI1 scaling*

Setting range: -10 – 0 – **1** – 10

The slope of the setpoint characteristic curve is defined. Depending on *P112 AI1 operating mode* (→ 🗎 230), with AI1 scaling = 1 and an input voltage $V_I$ of ±10 V, the setpoint ±3000 $min^{-1}$ or $±n_{max}$ is set.

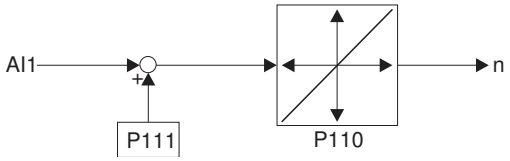



With *P100 Setpoint source* (→ 🗎 226) = *unipolar/fixed setpoint*, only the first quadrant can be used. Negative setpoint selections create the setpoint zero. If a current input is set in *P112 AI1 Operating mode* (→ 🗎 230), *P110 AI1 Scaling* is ineffective.

*P111 AI1 Offset*

Setting range: -500 – **0** – 500 mV

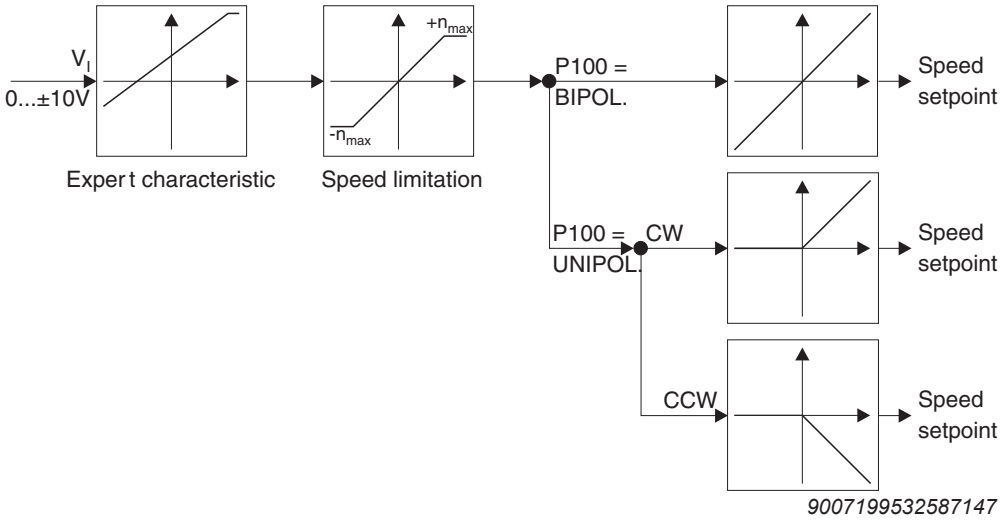
When the setpoint is selected by an external controller, it is possible to compensate for a voltage offset present at analog input AI1 when the setpoint selection is zero. Setting this parameter causes calibration of the coordinate basic origin. This setting takes effect in all AI1 operating modes.



*P112 AI1 operating mode*

The selection for the AI1 operating mode differentiates between various characteristic curves and voltage/current input.

- **10 V, reference potential maximum speed**: Voltage input with reference $n_{max}$ ( *P302/P312 Maximum speed 1/2* (→ 🗎 252)). The characteristic can be adapted using P110 AI1 scaling (→ 🗎 229). *P113 AI1 voltage offset* (→ 🗎 231) and *P114 AI1 speed offset* (→ 🗎 232)are ineffective.
- 10 V, reference 3000 1/min: Voltage input with reference 3000 $min^{-1}$. The characteristic can be adapted using *P110 AI1 scaling* (→ 🗎 229). *P113 AI1 voltage offset* (→ 🗎 231) and *P114 AI1 speed offset* (→ 🗎 232)are ineffective.
- Voltage offset, reference maximum speed: Voltage input with reference $n_{max}$. The characteristic can be adapted using *P113 AI1 voltage offset* (→ 🗎 231). *P110 AI1 scaling* (→ 🗎 229) and *P114 AI1 speed offset* (→ 🗎 232) are ineffective.
- Speed offset, reference maximum speed: Voltage input with reference $n_{max}$. The characteristic can be adapted using *P114 AI1 speed offset* (→ 🗎 232). *P110 AI1 Scaling* (→ 🗎 229) and *P113 AI1 Voltage offset* (→ 🗎 231) are ineffective.
- Expert characteristic: Free choice of reference between setpoint voltage and speed. The characteristic can be adapted using *P110 AI1 scaling* (→ 🗎 229) (reference 3000 $min^{-1}$), *P113 AI1 voltage offset* (→ 🗎 231) and *P114 AI1 speed offset* (→ 🗎 232). The following structural diagram shows how a speed setpoint is created from an expert characteristic curve.
- 0 – 20 mA, reference maximum speed: Current input 0 – 20 mA = 0 – $n_{max}$, no setting options (*P110 AI1 scaling* (→ 🗎 229) ineffective). Set the internal resistance (250 Ω) "S11 = ON".
- 4 – 20 mA, reference maximum speed: Current input 4 – 20 mA = 0 – $n_{max}$, no setting options (*P110 AI1 scaling* (→ 🗎 229) ineffective). Set the internal resistance (250 Ω) "S11 = ON". This setting means that analog input AI1 is monitored for wire break (see *P105* (→ 🗎 228)).



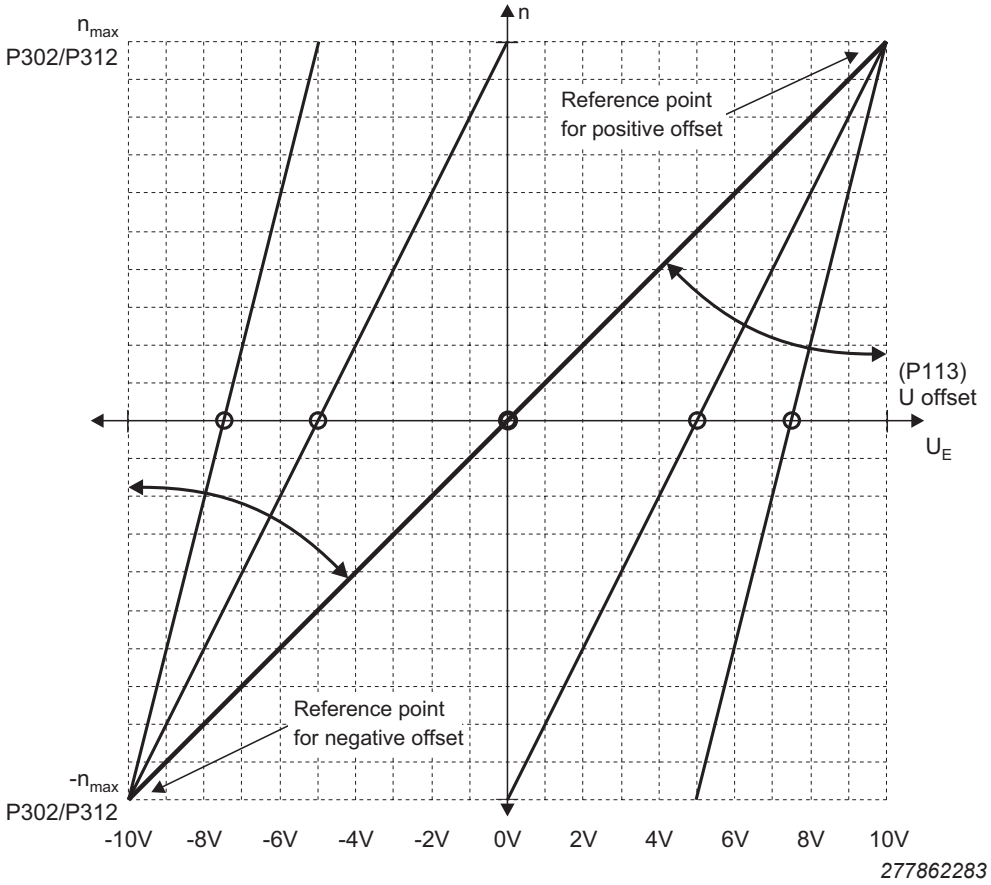

*9007199532587147*

27793230/EN – 08/2022

*P113 AI1 voltage offset*

Setting range: -10 – **0** – 10 V

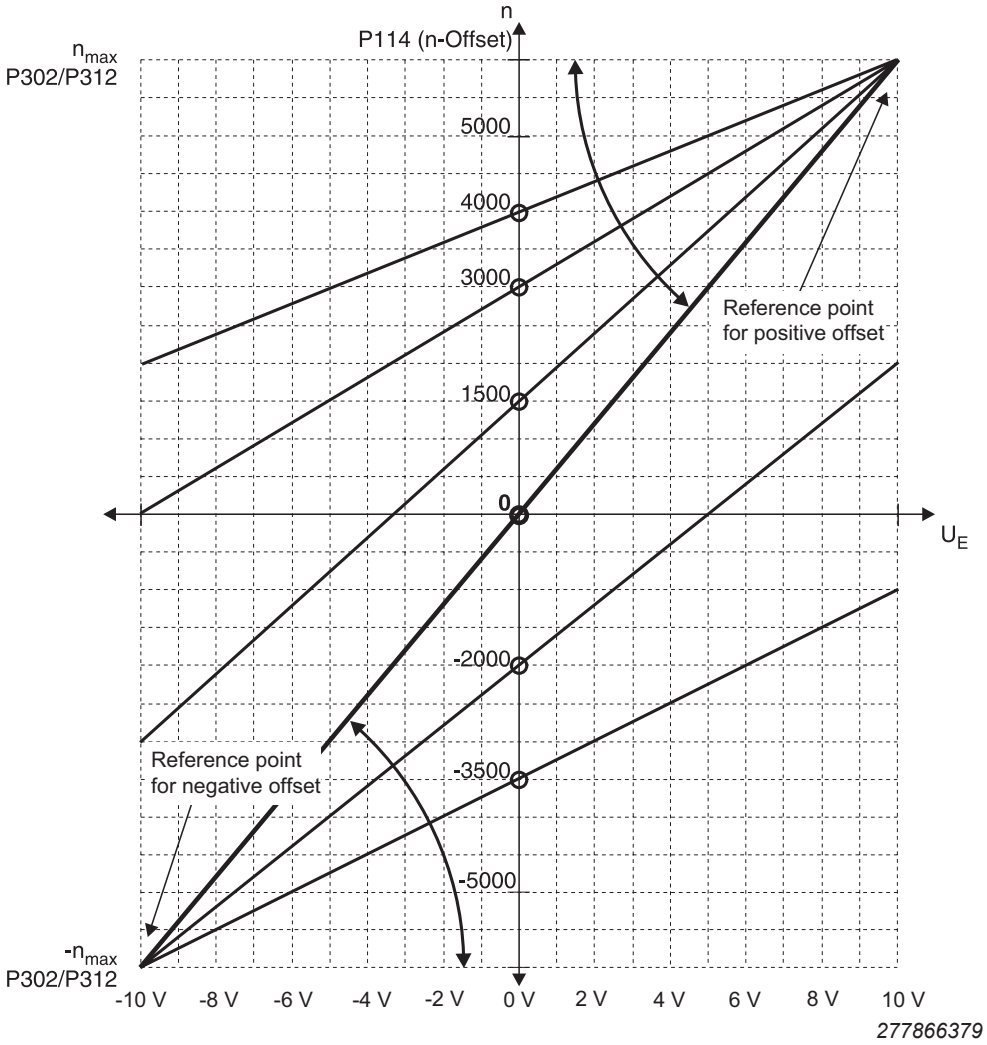
The zero crossing of the setpoint characteristic curve can be moved along the $U_E$ axis.



*P114 AI1 speed offset*

Setting range: -6000 – **0** – 6000 $min^{-1}$

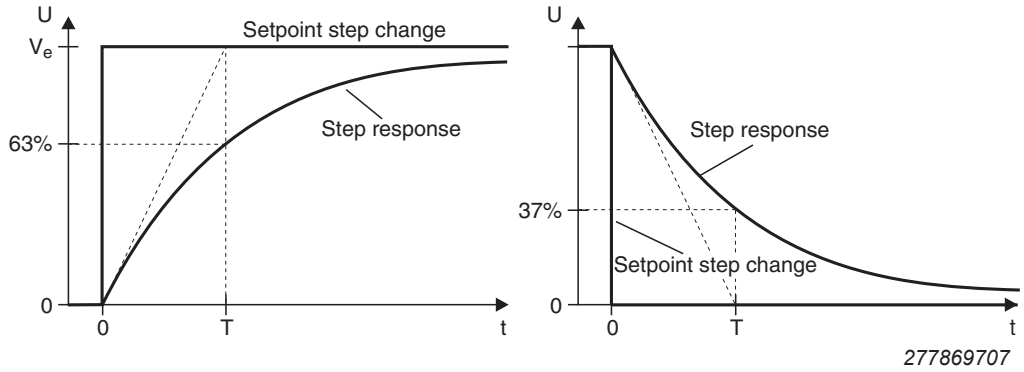
The zero crossing of the setpoint characteristic curve can be moved along the n-axis.



*P115 Filter setpoint*

Setting range: T = 0 – **5** – 100 ms (0 = setpoint filter off)

The speed ramp is filtered. The filter can be used for dampening stepped setpoint selections, e.g. from external controllers or interference pulses at the analog input. Also applies to torque control.




*Sample expert characteristics*

(*P112 AI1 Operating mode* (→ 🗎 230) = Expert characteristics)

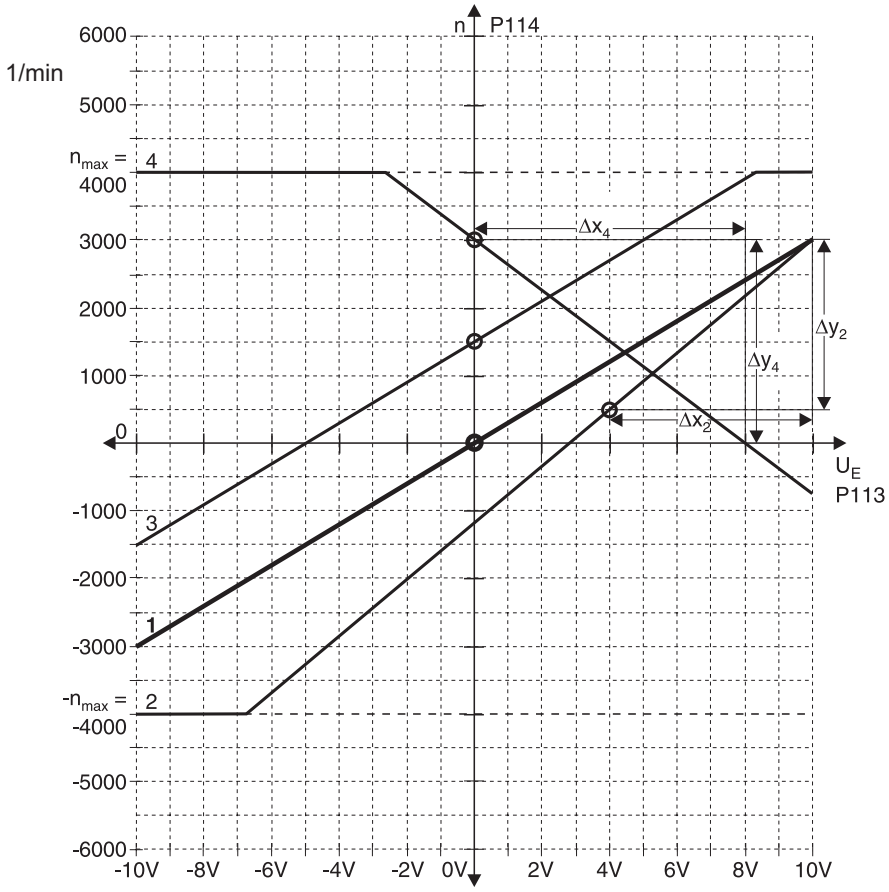
There is a free choice of reference between setpoint voltage and speed in the expert characteristic. Set parameter *P100 Setpoint source* (→ 🗎 226) = *Bipolar/fixed setpoint* to make full use of the possibilities of the expert characteristic.

One point in the characteristic curve (in the following figure indicated with a circle) will be determined with *P113 AI1 voltage offset* (→ 🗎 231) and *P114 AI1 speed offset* (→ 🗎 232); the slope will then be set with *P110 AI1 Scaling* (→ 🗎 229). Reference 3000 $min^{-1}$ always applies to scaling with the expert characteristic.

The speed range is restricted by *P302/P312 Maximum speed 1/2* (→ 🗎 252). In the following figure, *P302 Maximum speed 1* (→ 🗎 252) is set to 4000 $min^{-1}$. Setting the maximum speed does not change the slope.

27793230/EN – 08/2022

The voltage value of the x-axis must be converted to a speed value for calculating the slope triangle Δy/Δx = slope = setting value for *P110 AI1 scaling* (→ 🗎 229). The following applies: 10 V ≙ 3000 min$^{-1}$.




277873035

The following slope triangles are calculated for characteristic curves 2 and 4 in the previous figure. This determines the settings for *P110 AI1 scaling* (→ 🗎 229).

Characteristic 2: $\Delta y_2$ = 2500 min$^{-1}$, $\Delta x_2$ = 6 V ≙ 1800 min$^{-1}$, $\Delta y_2/\Delta x_2$ = 2500/1800 = 1.39

Characteristic 4: $\Delta y_4$ = -3000 min$^{-1}$, $\Delta x_4$ = 8 V ≙ 2400 min$^{-1}$, $\Delta y_4/\Delta x_4$ = -3000/2400 = -1.25

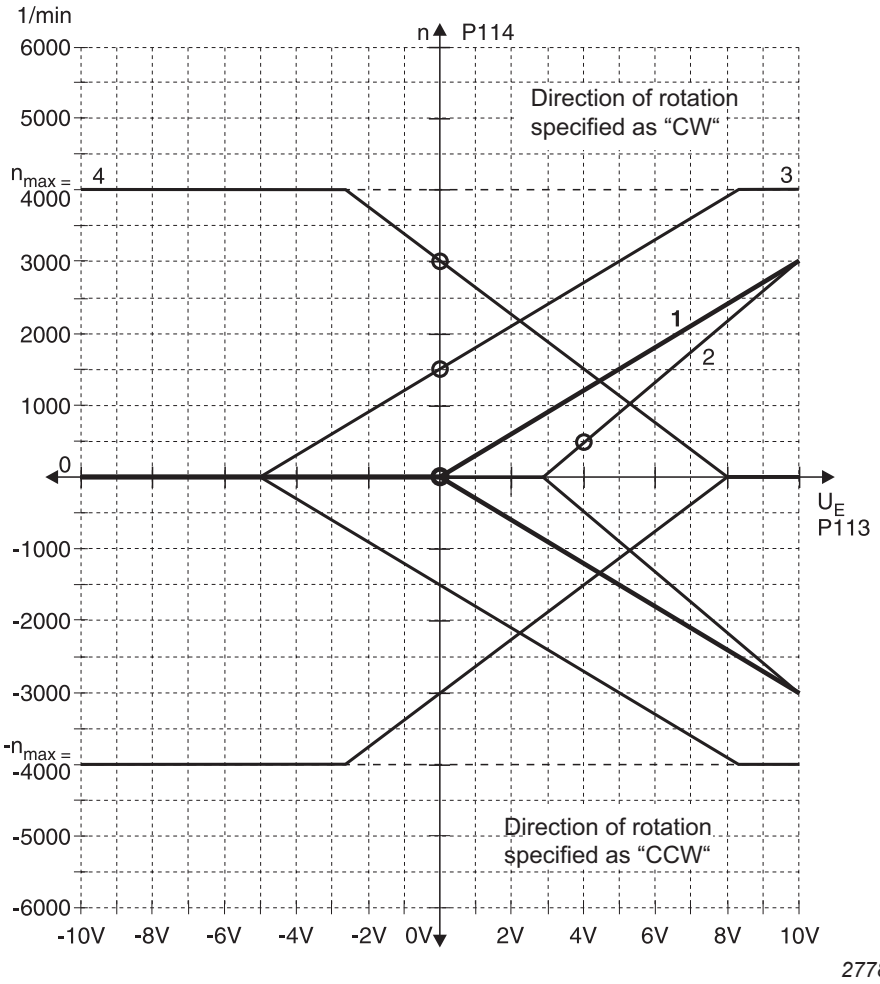
The shown expert characteristics are created as follows:

| Characteristic curve | P113 AI1 voltage offset (→ 🗎 231) V | P114 AI1 speed offset (→ 🗎 232) min$^{-1}$ | P110 AI1 scaling (→ 🗎 229) (slope) |
|---|---|---|---|
| 1 | 0 | 0 | 1 |
| 2 | 4 | 500 | 1.39 |
| 3 | 0 | 1500 | 1 |
| 4 | 0 | 3000 | -1.25 |

The expert characteristic can also be used with *P100 Setpoint source* (→ 🗎 226) = *unipolar/fixed setpoint*. The direction of rotation is then specified via digital inputs. The expert characteristic curve is reflected on the x-axis. The section below the x-axis results in a speed setpoint = 0. If the direction of rotation "CW" is specified, then move-

27793230/EN – 08/2022

ment is only possible at speeds in the range 0 – $n_{max}$, while the range 0 – $-n_{max}$ applies if the direction of rotation "CCW" is specified. The following figure shows the expert characteristic curve from the previous figure with the setting *P100 Setpoint source* (→ 🗎 226) = *Unipolar/fixed setpoint*.

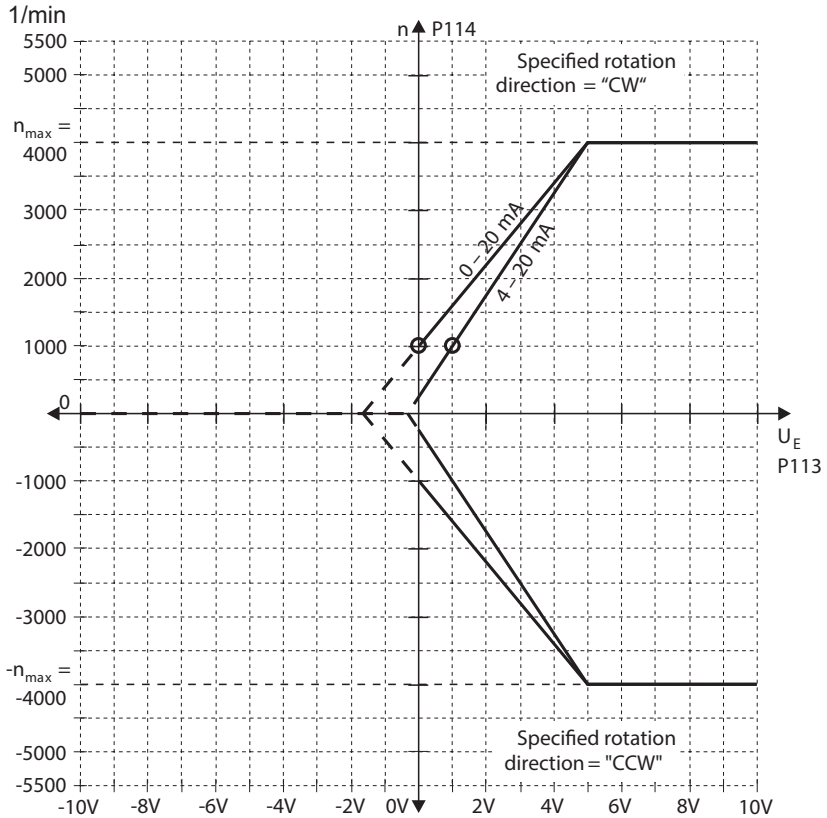



The shown expert characteristics are created as follows:

| Characteristic curve | P113 AI1 voltage offset (→ 🗎 231) V | P114 AI1 speed offset (→ 🗎 232) $min^{-1}$ | P110 AI1 scaling (→ 🗎 229) (slope) |
|---|---|---|---|
| 1 | 0 | 0 | 1 |
| 2 | 4 | 500 | 1.39 |
| 3 | 0 | 1500 | 1 |
| 4 | 0 | 3000 | -1.25 |

*Expert characteristic curve with current setpoints*

Voltage signals are required at the analog input AI11/AI12 for the expert characteristic to function. Switch S11 (changeover I-signal/U-signal) must be set to ON and the current signal routed to X11:2 AI11 if an impressed current of 0(4) – 20 mA is available as the setpoint. The internal resistance (250 Ω) converts the 0(4) – 20 mA setpoints into 0 (1) – 5 V voltage signals.




Set the expert characteristic as follows to achieve speeds of 1000 – 4000 $min^{-1}$, for example, with 0 (4) – 20 mA:

| | | | | |
|---|---|---|---|---|
| **for 0 – 20 mA:** | *P110* = 2 | *P113* = 0 V | *P114* = 1000 $min^{-1}$ | *P302* ($n_{max}$) = 4000 $min^{-1}$ |
| **for 4 – 20 mA:** | *P110* = 2.5 | *P113* = 1 V | *P114* = 1000 $min^{-1}$ | *P302* ($n_{max}$) = 4000 $min^{-1}$ |

Set *P100 Setpoint source* (→ 🗎 226) = *Unipolar/fixed setpoint*. The direction of rotation is then specified via digital inputs.

27793230/EN – 08/2022

### P12. Analog inputs option

*P120 AI2 operating mode (optional)*

Analog input AI2 is only available with the optional input/output card (DIO11B).

- **No function**: The setpoint on AI2 is not used.
- 0 – ±10 V + setpoint: The setpoint at AI2 is added to setpoint 1 (= AI1) observing the signs. ±10 V ≙ $\pm n_{max}$ (reference $n_{max}$).
- 0 – 10 V current limiting: The input serves as external current limiting. 0 – 10 V ≙ 0 – 100% of the internally set current limiting:
  - In V/f and VFC operating modes: *P303/P312 Current limit 1/2* (→ 🗎 253)
  - In CFC and SERVO operating modes: *P304 Torque limit* (→ 🗎 253)
- Actual value PID controller: Feedback of actual value for process controller (→ 🗎 250)

### P13./P14. Speed ramps 1/2

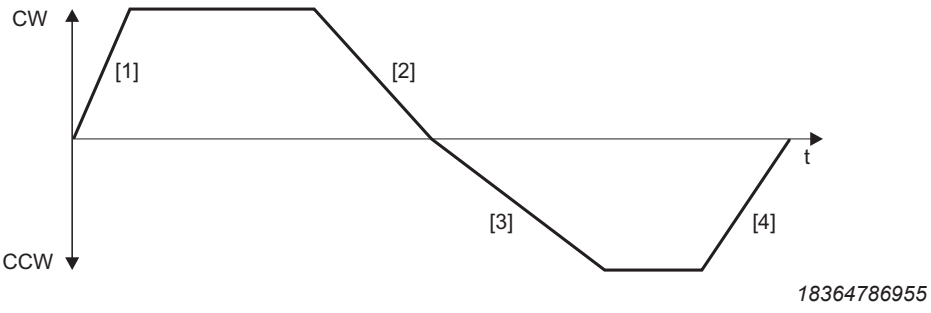
*P130 – P133 / P140 – P143 ramp t11 / t21 up/down CW/CCW* 1 2

Setting range: 0 – **2** – 2000 s

Specifically, the parameters are:

- *P130 Ramp t11 up CW* / *P140 Ramp t21 up CW*
- *P131 Ramp t11 down CW* / *P141 Ramp t21 down CW*
- *P132 Ramp t11 up CCW* / *P142 Ramp t21 up CCW*
- *P133 Ramp t11 down CCW* / *P143 Ramp t21 down CCW*

The ramp times refer to a setpoint step change of Δn = 3000 $min^{-1}$. The ramp takes effect when the speed setpoint is changed and the enable signal is revoked via the CW/CCW terminal.




[1] Ramp up CW
[2] Ramp down CW
[3] Ramp up CCW
[4] Ramp down CCW

*P134/P144 Ramp t12/t22 UP = DOWN* 1 2

Setting range: 0 – **10** – 2000 s

The following applies to this ramp: UP = DOWN and CW = CCW.

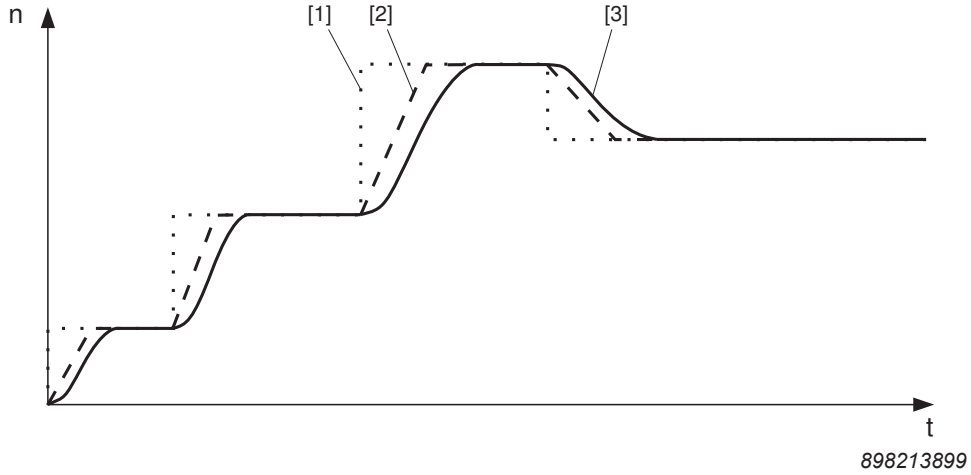
Ramps t12/t22 are activated via a digital input (→ 🗎 274), which is programmed with the function "Speed ramp switchover".

27793230/EN – 08/2022

*P135/P145 S pattern t12/t22* 1 2

Setting range: **0** – 3 (**0 = Off**, 1 = weak, 2 = medium, 3 = strong)

In order to achieve gentler drive acceleration, the 2nd ramp (t12/t22) can be rounded with 3 pattern grades.




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

A started S pattern is interrupted by the stop ramp t13/t23 and a changeover to ramp t11/t21. Revoking the setpoint or a stop via the input terminals causes the started S curve to be completed. This allows the drive to continue to accelerate despite the fact that the setpoint has been withdrawn.

*P136/P146 Stop ramp t13/t23* 1 2

Setting range: 0 – **2** – 20 s

Activated by withdrawing the "Enable" terminal or by an error (→ 🗎 300).

*P137/P147 Emergency stop ramp t14/t24* 1 2 AUTO

Setting range: 0 – **2** – 20 s

Activated by a fault (→ 🗎 300).

The function monitors whether the drive reaches zero speed within the set time. After the set time expires, the output stage is inhibited and the brake applied even if zero drive speed has not yet been reached.

27793230/EN – 08/2022

*P138 Ramp limit VFC* [1][2]

Setting range: **Yes**/No

The ramp limit restricts the smallest possible ramp time to 100 ms in the VFC and V/F operating modes (→ 🗎 282) (reference: Δn = 3000 $min^{-1}$). Settings shorter than 10 ms are ignored. In this case, the ramp time is 100 ms. The ramp limitation limits the maximum output current to the value set in *P303/P312* (→ 🗎 253). Active stall protection is implemented for the connected motor using the current limiting controller when ramp limit is activated.

## INFORMATION

There is no active stall protection for the connected motor when ramp limit is deactivated and ramp times of less than 100 ms are used. Parameters *P303/P313 Current limit 1/2* (→ 🗎 253) will be ineffective. If a maximum output current of 185% of the nominal output current is exceeded (applies to sizes 1 to 6; 225% apply to size 0) for more than 60 ms, the inverter will switch off indicating fault F01 Overcurrent and according to the "Immediate switch-off" fault response.

*P139/P149 Ramp monitoring 1/2* [1][2]

Setting range: On/**off**

If you set the deceleration ramps to a value that is much shorter than can be physically achieved in the system, the turning drive will be stopped once the monitoring time has expired. In addition to the error message, this also leads to increased brake wear.

Even if the ramp timeout clearly occurs due to an impossible specification ramp, the adjustment of the respective ramp must be increased.

The parameter is an additional monitoring function for speed monitoring, but only applies for the downward ramp. It can be used to monitor the deceleration ramp, stop ramp or emergency stop ramp if speed monitoring is not desired.

### P15. Motor potentiometer

The ramp times refer to a setpoint change of Δn = 3000 $min^{-1}$.

*P150/P151 Ramp t3 up/down* [1][2]

Setting range: 0.2 – **20** – 50 s

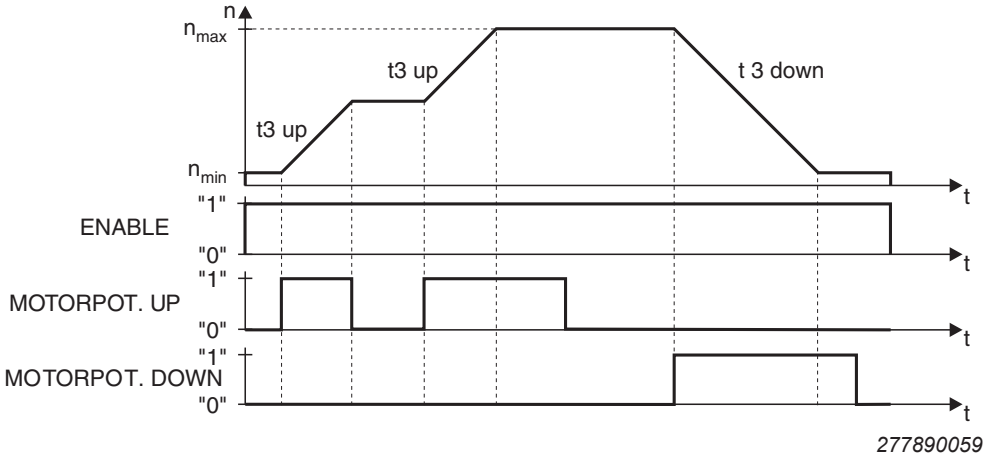
The ramp is active when the setpoint source (→ 🗎 226) is set to *Motor potentiometer/ fixed setpoint* or *Motor potentiometer + analog setpoint*, and if an input terminal (→ 🗎 274) programmed to *Motor potentiometer up* or *Motor potentiometer down* has a "1" signal.

27793230/EN – 08/2022

*P152 Save last setpoint* 1 2

Setting range: Yes/**No**

- Yes: If *motor potentiometer up* and *motor potentiometer down* = "0," the last applicable motor potentiometer setpoint is stored in the non-volatile memory 2 s afterwards. The last motor potentiometer setpoint takes effect again after power off and power on.
- **No**: The inverter starts with *P301/P311 Minimum speed 1/2* (→ 🗎 252) following power off/on or after withdrawal of the enable.




27793230/EN – 08/2022

### P16./P17. Fixed setpoints 1/2

Setting range: -6000 – +6000 min$^{-1}$

3 internal speed setpoints, so-called fixed setpoints, can be set separately for parameter sets 1 and 2. The internal setpoints are active when an input terminal programmed to n11/n21 or n12/n22 has a "1" signal.

In the setting range of 0 – +6000 min$^{-1}$, the parameters have the following factory settings:

| Parameter | Factory setting |
|---|---|
| *P160/P170 Internal setpoint n11/n21* | n11/n21 = 150 min$^{-1}$ |
| *P161/P171 Internal setpoint n12/n22* | n12/n22 = 750 min$^{-1}$ |
| *P162/P172 Internal setpoint n13/n23* | n13/n23 = 1500 min$^{-1}$ |

The following table shows the programming of the input terminals:

| Response | Input terminal | | | |
|---|---|---|---|---|
| | n11/n21 | n12/n22 | Enable/stop | Parameter set 1/2 |
| Stop with t13/t23 | – | – | "0" | – |
| Fixed setpoint not active | "0" | "0" | "1" | "0" |
| n11 effective | "1" | "0" | "1" | "0" |
| n12 effective | "0" | "1" | "1" | "0" |
| n13 effective | "1" | "1" | "1" | "0" |
| n21 effective | "1" | "0" | "1" | "1" |
| n22 effective | "0" | "1" | "1" | "1" |
| n23 effective | "1" | "1" | "1" | "1" |

The fixed setpoints of the currently inactive parameter set come into effect when this terminal is actuated ("1"-signal) if an input terminal is programmed to "Fixed setpoint switch-over".

The changeover to fixed setpoints is possible both in the inhibited and the released device state.

27793230/EN – 08/2022

### 8.3.4 Parameter group 2: Controller parameters

#### P20. Speed Control

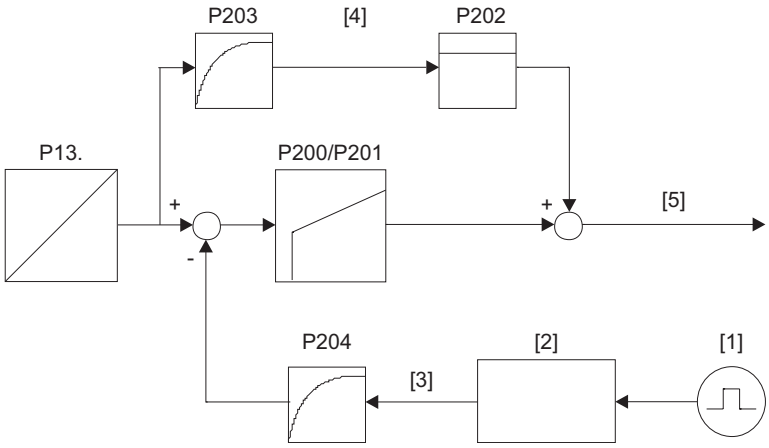
The speed control function is available only in parameter set 1.

The speed controller of MOVIDRIVE® B is a PI controller. The speed control works in the following operating modes:

- All operating modes with VFC-n control
- CFC operating modes: The speed controller is active in "CFC & Torque control" only when speed limitation is active.
- Servo operating modes: The speed controller is only active in "Servo & Torque control" when speed limitation is active.

The startup functions of the MOVITOOLS® MotionStudio engineering software support the adjustment of all relevant parameters for speed control. Direct changes to individual parameters should be made only by specialists.

The following figure shows the controller structure of the parameters for speed control:




18403733899

| | |
|---|---|
| [1] | Incremental encoder/resolver |
| [2] | Signal processor |
| [3] | Actual speed value |
| [4] | Acceleration precontrol |
| [5] | Torque setpoint |
| *P13.* | Parameters of speed ramp |
| *P200/P201* | PI-controller |
| *P203* | Filter acceleration precontrol |
| *P202* | Gain acceleration precontrol |
| *P204* | Filter actual speed value |

*P200 P gain n controller* AUTO

Setting range: 0.01 – **2** – 32

Gain factor of the P component of the speed controller

27793230/EN – 08/2022

*P201 Time constant n-controller* AUTO

Setting range: 0 – **10** – 3000 ms

Integration time constant of the speed controller

The I component reacts inversely proportionate to the time constant: A large numerical value results in a small I component. However, a zero value means "no I component".

*P202 Gain acceleration precontrol* AUTO

Setting range: **0** – 65

Gain factor of acceleration precontrol which improves the guide behavior of the speed controller.

*P203 Filter acceleration precontrol* AUTO

Setting range: **0** – 100 ms

Filter time constant of acceleration precontrol which improves the guide behavior of the speed controller. The differentiator is programmed and cannot be changed.

*P204 Actual speed value filter* AUTO

Setting range: **0** – 32 ms

Filter time constant of the actual speed value filter

*P205 Load precontrol CFC*

The parameter is only effective in "CFC and "Servo" operating modes.

Setting range: -150% – **0** – +150%

Determines the initial value of the torque setpoint upon enable. The parameter must be set if increased starting torque is required when the drive is enabled. For example, a parameter value greater than 0% makes it possible to prevent the unwanted sagging of hoists when the brake is released. This function should only be used in hoists without counterweight.

Recommended setting: Value of the active current (→ 🗎 219) at speed zero (n = 0)

*P206 Sampling cycle n-controller*

The parameter is only effective in "CFC and "Servo" operating modes.

Setting range: **1 ms**/0.5 ms

Setting the time to 0.5 ms improves speed control for dynamic drives with low moment of inertia.

27793230/EN – 08/2022

*P207 Load precontrol VFC*

The parameter is effective only in the operating modes with "VFC n-control".

Setting range: -150% – **Off** – 150%

Determines the initial value of slip control upon enable.

If the parameter value is greater than 0%, the slip control is pre-stressed and the motor develops more torque upon enable. This setting can, for example, prevent the unwanted sagging of hoists when the brake is released. This function should only be used in hoists without counterweight.

Parameter values greater than 150% switch off the function (no pre-stressing). In the "VFC & Hoist" operating mode, the preload 0.5 x $s_N$ is effective with a parameter value of greater than 150% ($s_N$ = nominal slip of the connected motor).

Recommended setting: Value of the active current (→ 🗎 219) at minimal speed

**P21. Hold controller**

The position hold control function is only available in parameter set 1.

Serves for drift-free standstill control of the drive. The position hold control can only be activated in operating modes with speed control (encoder feedback).

Position hold control is active when an input terminal (→ 🗎 274) programmed to /Position hold control has a "0" signal. The device then performs a stop using the "t11 up" or "t21 down" ramp. If the drive reaches speed zero, it is held in the position that is valid at this point.

The startup function of the speed controller in the MOVITOOLS® MotionStudio engineering software supports adjustment of the gain factor.

The 7-segment display of the device shows the status "A1.7" when position hold control is active.

*P210 P-gain hold controller* AUTO

Setting range: 0.1 – **0.5** – 32

Corresponds to the proportional gain of a position controller. The parameter is only effective when the "position hold control" function is activated.

**P22. Synchronous operation control**

Synchronous operation control only in parameter set 1 and with the DRS11B option.

Refer to the “MDX61B - Synchronous Operation Card DRS11B“ manual for a detailed description.

*P220 P-gain DRS*

Setting range: 1 – **10** – 200

Gain of the synchronous operation controller in the slave drive. This determines the control response of the slave drive depending on the angle differentials in relation to the master drive.

27793230/EN – 08/2022

*P221/P222 Master gear ratio factor / Slave gear ratio factor*

Setting range: **1** – 3 999 999 999

These settings are only required with the slave inverter. These parameters are used to set the position measurement ratio between master drive and slave drive. The ratio is entered as the quotient of master to slave drive to include non-integer ratios.

Note that position measurement of the master and slave drives can only occur using the motor encoders **if there is positive power transmission (without slip)**. Position measurement has to be via an **additional encoder (external encoder)** in all applications in which power transmission between motor shaft and machine is **non-positive** and thus slip is to be expected. Install the encoder on the moving machine component with a positive connection.

*P223 Mode selection*

Setting range: **Mode 1**/Mode 2/Mode 3/Mode 4/Mode 5/Mode 6/Mode 7/Mode 8

Mode selection determines how the slave drive responds to a free-running signal.

- **Mode 1**: Free-running unlimited, new reference point
  - Free-running is active when a "1" signal is set at X40:1.
  - The input terminals and setpoints of the slave drive are effective in free-running mode.
  - An angular offset generated in free-running mode is not processed when synchronization is started again.
- Mode 2: Free-running unlimited, offset is processed
  - Free-running is active when a "1" signal is set at X40:1.
  - The input terminals and setpoints of the slave drive are effective in free-running mode.
  - An angular offset generated during free-running mode is reduced to zero when synchronization is started again.
- Mode 3: Free-running unlimited, offset generated is processed + *P224* (→ 🗎 247)
  - Free-running is active when a "1" signal is set at X40:1.
  - The input terminals and setpoints of the slave drive are effective in free-running mode.
  - During resynchronization, in addition to the offset, the old synchronous position of the signed position offset in *P224* (→ 🗎 247) is also reduced to zero.
- Mode 4: Free-running limited by *P224 Slave counter* (→ 🗎 247), generated offset is processed
  - Free-running is activated via a "1" signal (> 100 ms) at X40:1.
  - The input terminals and setpoints of the slave drive are effective during free-running.
  - Free-running ends when the angle differential entered in *P224* (→ 🗎 247) has been reached. The angular offset is then reduced to zero.
- Mode 5: Free-running limited by *P224 Slave counter* (→ 🗎 247), new reference point
  - Free-running is activated via a "1" signal (> 100 ms) at X40:1.
  - The input terminals and setpoints of the slave drive are effective during free-running.

27793230/EN – 08/2022

  - Free-running ends when the angle differential entered in *P224* (→ 🗎 247) has been reached.
  - If another "1" signal is applied at X40:1 before free-running has ended, the value at which free-running is to end increases to the value entered in *P224* (→ 🗎 247).
  - The slave drive synchronizes with the new angle differential.
- Mode 6: Temporary angular offset, new reference point
  - Free-running is active when a "1" signal is set at X40:1.
  - The input terminals and setpoints of the slave drive are effective in free-running mode.
  - An angular offset generated in free-running mode is not processed when synchronization is started again.
  - A "1" signal at X40:2, X40:3 or X40:4 on DRS11B activates an angular misalignment. Each angular offset is stored in parameters *P225/P226/P227 Offset 1/2/3* (→ 🗎 247).
  - If a "0" signal is applied again at one of the input terminals X40:2, X40:3 or X40:4, the angular misalignment is eliminated again.
- Mode 7: Permanent angular offset (phase trimming), new reference point
  - Free-running is active when a "1" signal is set at X40:1.
  - The input terminals and setpoints of the slave drive are effective in free-running mode.
  - An angular offset generated in free-running mode is not processed when synchronization is started again.
  - A "1" signal at X40:2, X40:3 or X40:4 on DRS11B activates an angular misalignment. Each angular offset is stored in parameters *P225/P226/P227 Offset 1/2/3* (→ 🗎 247).
  - If a "0" signal is applied again at one of the input terminals X40:2, X40:3 or X40:4, the angular misalignment is maintained.
  - If the input signal lasts longer than 3 seconds, the value is corrected at 4 steps per second.
- Mode 8: Free-running unlimited, new reference point + *P224* (→ 🗎 247)
  - Free-running is active when a "1" signal is set at X40:1.
  - The input terminals and setpoints of the slave drive are effective in free-running mode.
  - If a "0" signal is applied at input terminal X40:1, the slave drive synchronizes with the current position of the master drive plus the position offset stored in *P224* (→ 🗎 247).

27793230/EN – 08/2022

*P224 Slave counter*

Setting range: -99 999 999 – **10** – 99 999 999 increments

The angular misalignment in relation to the master drive, which can be activated in mode 3, 4, 5 and 8, is referred to as the slave counter. In contrast to the offset, this angular misalignment can be set using the "Teach In" function. Depending on the mode, this value functions as a limit value for free running or specifies a permanent angular misalignment for the slave drive in relation to the master drive (= new reference point).

*P225/P226/P227 Offset 1/2/3*

Setting range: -32767 – **10** – 32767 increments (only effective in mode 6 or 7)

Three separately adjustable angle differentials to which the slave drive sets itself for the duration of the "1" signal at X40:2 / X40:3 / X40:4.

*P228 Precontrol filter DRS*

Setting range: **0** – 100 ms

Setpoint filter for precontrol of the DRS11B synchronous operation control. The master speed (determined on the DRS..) must be filtered for optimum acceleration precontrol of the slave drive. Filtering requires the filter time constant. Value 0 indicates an unfiltered master speed.

**P23. Synchronous operation with distance encoder**

Synchronous operation with distance encoder only in parameter set 1 and with the DRS11B option (not in size 0).

Refer to the “MDX61B - Synchronous Operation Card DRS11B“ manual for a detailed description.

Position measurement has to be performed via an external encoder (= distance encoder) in all applications in which power transmission between the motor shaft and the machine is non-positive, which means that slip is to be expected.

*P230 Distance encoder*

Setting range: **Off**/equal-ranking/chain

- **Off**: Synchronous operation control with the signals on X15: "Motor encoder". *P231/P232 Factor slave encoder / Factor slave distance encoder* (→ 🗎 247) are ineffective.
- Equal-ranked: Forwarding of X42 signals: "Master encoder" at X43: "Incremental encoder output". Evaluation of *P231/P232 Factor slave encoder / Factor slave distance encoder* (→ 🗎 247).
- Chain: Forwarding of X41 signals: "Input distance encoder" at X43: "Incremental encoder output". Evaluation of *P231/P232 Factor slave encoder / Factor slave distance encoder* (→ 🗎 247).

*P231/P232 Factor slave encoder / Factor slave distance encoder*

Setting range: **1** – 1000

In most cases there is a mechanical gear ratio between both encoders. This gear ratio must be set using these parameters.

27793230/EN – 08/2022

*P233 Distance encoder resolution*

Setting range: 128/256/512/**1024**/2048

Setting the resolution of the connected distance encoder.

*P234 Master encoder resolution*

Setting range: 128/256/512/**1024**/2048

Setting the resolution of the connected master encoder.

**P24. Synchronous operation with catch up**

Synchronous operation with catch up only in parameter set 1 and with the DRS11B option.

Refer to the “MDX61B - Synchronous Operation Card DRS11B“ manual for a detailed description.

When the slave drive is switched to synchronous operation, the current angular misalignment in relation to the master is reduced to zero, depending on the operation mode selected. For this catch up procedure to be performed in a controlled manner, it is possible to set parameters for both the synchronization speed and the synchronization ramp.

*P240 synchronous speed*

Setting range: 0 – **1500** – 6000 $min^{-1}$

This parameter determines the speed of the synchronization process.

*P241 Synchronization ramp*

Setting range: 0 – **2** – 50 s

Value of the acceleration ramp for synchronizing the slave with the master. A value of 0 means maximum possible acceleration.

**P26. Process controller parameter**

*P260 Operating mode*

Setting range: **Controller off**/control/step response

- **Controller off**: The PID controller is deactivated.
- Control: The PID controller is active and determines the required motor speed using the control deviation and its parameters.
- Step response: A step can be specified via the setpoint (→ 🗎 250). The filtered and scaled actual value can be included for purposes of evaluation.
- *P260* and the IPOS variable H543 are identical.

*P261 Cycle time*

Setting range: 1/**5**/10 ms

This parameter sets the cycle time of the PID controller.

27793230/EN – 08/2022

*P262 Interruption*

Setting range: **No response**/Move closer to setpoint

This parameter specifies how the PID controller responds to an interruption (controller inhibit).

- **No response:** The PID controller is not affected and continues to operate as usual.
- Move closer to setpoint: After an interruption, the setpoint is set to the actual value. The PID controller then moves closer to the set value again via the setpoint ramp.

*P263 Factor $K_P$*

Setting range: 0 – **1** – 32.767

Proportional factor of the proportional share of the PID controller with 3 decimal positions. The proportional factor takes the sign (+/-) of the parameter "Direction of rotation" into account. *P263* and the IPOS variable H541 are identical.

*P264 Integral time $T_N$*

Setting range: **0** – 65535 ms

This parameter is used to set the integral time (time constant) of the integrating part of the PID controller:

- $1 \text{ ms} \leq T_N \leq 65535 \text{ ms}$
- $T_N = 0 \rightarrow$ no I component

*P265 Derivative time $T_V$*

Setting range: **0** – 30 ms

This parameter is used to set the derivative time (time constant) of the differential part of the PID controller:

- $1 \text{ ms} \leq T_V \leq 30 \text{ ms}$
- $T_V = 0 \rightarrow$ no D component

*P266 Precontrol*

Setting range: -32767 – **0** – 32767

The precontrol value is added to the result of the PID controller. *P266* and the IPOS variable H545 are identical.

27793230/EN – 08/2022

### P27. Process controller input values

*P270 Setpoint source*

Setting range: **Parameters**/IPOS variable/Analog 1/Analog 2

This parameter is used to set the source from which the setpoint should be read.

*P271 Setpoint*

Setting range: -32767 – **0** – 32767

If *P270* (→ 🗎 250) is set to "Parameter", the value of the parameter *P271* is used as the setpoint. *P271* and the IPOS variable H546 are identical.

*P272 IPOS setpoint address*

Setting range: **0** – 1023

If *P270* (→ 🗎 250) is set to "IPOS variable", the address of the variable to be used is stored in *P271* (→ 🗎 250). *P272* and the IPOS variable H547 are identical.

*P273 Time constant*

Setting range: **0** – 0.01 – 2000 s

This parameter is used to set the ramp for the setpoint ramp generator (reference 15000 units).

- Time constant $T_{setpoint}$ = 0 → ramp is deactivated.

*P274 Scaling setpoint*

Setting range: -32,767 – **1** – 32,767

Factor for scaling the setpoint. *P274* and the IPOS variable H548 are identical.

*P275 Actual value source*

Setting range: **Analog 1**/analog 2/IPOS variable

This parameter is used to set the source from which the actual value should be read.

*P276 IPOS actual value address*

Setting range: **0** – 1023

If *P275* (→ 🗎 250) is set to "IPOS variable", the address of the variable to be used is stored in *P276*. *P276* and the IPOS variable H549 are identical.

*P277 Scaling actual value*

Setting range: -32,767 – **1** – 32,767

Scaling factor of the filtered actual value. *P277* and the IPOS variable H550 are identical.

27793230/EN – 08/2022

*P278 Offset actual value*

Setting range: -32767 – **0** – 32767

This parameter is used to set an integer, permanent offset of the actual value. *P278* and the IPOS variable H552 are identical.

*P279 Time constant actual value*

Setting range: **0** – 500 ms

This parameter is used to set the time constant of the actual value filter. When the parameter is set to "0", the filter is deactivated.

**P28. Process controller limits**

The output value of the process controller is stored in the IPOS variable H524. To use the output value of the process controller as setpoint for MOVIDRIVE® B, *P100 Setpoint source* (→ 🗎 226) must be set to "IPOS setpoint".

*P280 Minimum offset + actual value*

Setting range: -32767 – **0** – 32767

Minimum value for the offset. *P280* and the IPOS variable H553 are identical.

*P281 Maximum offset + actual value*

Setting range: -32767 – **10000** – 32767

Maximum value for offset. *P281* and the IPOS variable H554 are identical.

*P282 PID controller minimum output*

Setting range: -32767 – **-1000** – 32767

Minimum output value of the P, I and D components. *P282* and the IPOS variable H555 are identical. For PI and PID controllers, you have to enter a negative value for enabling downward integration.

*P283 PID controller maximum output*

Setting range: -32767 – **10000** – 32767

Maximum output value of the P, I and D components. *P283* and the IPOS variable H556 are identical.

*P284 Process controller minimum output*

Setting range: -32767 – **0** – 32767

Minimum output value of the process controller (PID controller + precontrol (→ 🗎 249)). *P284* and the IPOS variable H557 are identical.

*P285 Process controller maximum output*

Setting range: -32767 – **7500** – 32767

Maximum output value of the process controller (PID controller + precontrol (→ 🗎 249)). *P285* and the IPOS variable H558 are identical.

27793230/EN – 08/2022

### 8.3.5 Parameter group 3: Motor parameters

This parameter group is used to adjust the device to the motor. The parameters can be set separately for parameter set 1 and 2. Thus, 2 different motors can be operated alternately on the same device without requiring a new setting.

**P30./P31. Limits 1/2**

*P300 / P310 Start/stop speed 1/2* 1 2 AUTO

The parameter is only effective in "VFC and "V/f" operating modes. The parameter has no function in "CFC" and "Servo" operating modes.

Setting range: 0 – 150 $min^{-1}$

Defines the smallest speed request which the device sends to the motor when enabled. The transition to the setpoint speed (determined by the setpoint selection) is made using the active acceleration ramp.

At startup without encoder, 0.5 × the nominal slip of the connected motor is set. At startup with encoder, 15 $min^{-1}$ is set.

When a stop command is executed, this setting also determines the lowest speed at which the motor power is switched off or the post-magnetization triggered and, if applicable, the brake applied.

*P301/P311 Minimum speed 1/2* 1 2 AUTO

Setting range: 0 – **15** – 6100 $min^{-1}$

The value below which the speed may not fall, even if zero is selected as the setpoint. Even if the minimum speed is less than the start-stop speed ($n_{min} < n_{start/stop}$), the minimum speed is valid.

**Important:**

- With hoist function activated, the smallest speed is 15 $min^{-1}$, regardless of the set minimum speed value.
- To enable the drive to move clear of the limit switches even at low speeds, minimum speed is not active for the hardware limit switch with which the drive has come into contact.
- The minimum speed does not apply in the IPOS operating modes.

*P302/P312 Maximum speed 1/2* 1 2 AUTO

Setting range: 0 – **1500** – 6100 $min^{-1}$

Speed value which is not exceeded by a speed setpoint. If the minimum speed is greater than the maximum speed ($n_{min} > n_{max}$), the maximum speed is valid.

The maximum speed depends on the set operating mode " ".

27793230/EN – 08/2022

*P303/P313 Current limit 1/2* 1 2 AUTO

Setting range: 0 – 150% of the nominal motor current $I_N$

The factory setting for the current limitation is set to 150% $I_N$ of the matching motor.

The internal current limiting is based on the apparent current. In the operating modes "V/f" and "VFC" without speed control, the current limit is automatically reduced in field weakening mode above the frequency of 1.15 × $f_{base}$. This implements stall protection for the connected motor. The current limit effective in the field weakening range is calculated using the following formula:

$$\textit{Current limit} = (1{,}15 \times \frac{f_{base}}{f_{actual}}) \times \textit{setting value P303/P313}$$

18327565835

$f_{base}$ Base frequency
$f_{actual}$ Current rotational frequency

*P304 Torque limit* 1 2 AUTO

The parameter is only effective in "CFC and "Servo" operating modes.

Setting range: **0** – 150% (size 0: 0 – 200%)

Limits the maximum torque of the motor. The entry acts on the setpoint of the motor torque ($k_T$ × $I_N$(device)). In order to ensure secure triggering of the speed monitoring, the parameter value must always be less than or equal to the current limit (→ 🗎 253).

**P32./P33. Motor compensation 1/2 (asynchronous)**

*P320/P330 Automatic adjustment 1/2* 1 2

The parameter is only effective in "VFC and "V/f" operating modes. The function is only useful for single-motor operation.

Setting range: **On**/Off

When the parameter is activated, the device automatically adjusts the parameter *P322/P332 IxR adjustment 1/2* (→ 🗎 254) with every enable and saves the value. The device thereby determines a basic setting that is adequate for a great number of drive applications. The connected motor is calibrated in the last 20 ms of the premagnetization phase, except if:

- The parameter is deactivated.
- The operating modes "VFC & Group" or "VFC & flying start function" are set.
- The premagnetization time (→ 🗎 254) has been reduced by more than 30 ms in relation to the proposed value.
- In the operating mode "VFC n-control," the parameter *P730/P733 brake function 1/2* (→ 🗎 286) is deactivated.

In such cases, the set IxR value is used for calculating the winding resistance.

27793230/EN – 08/2022

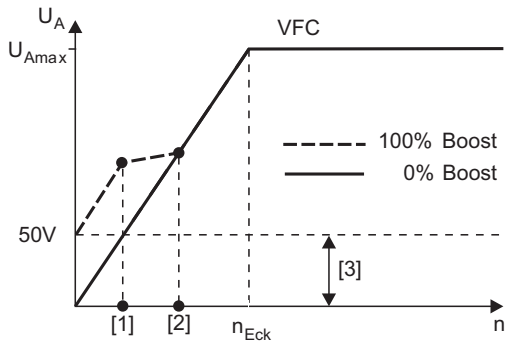
*P321/P331 Boost 1/2* 1 2

Setting range: **0** – 100%

In operating modes "V/f" and "VFC & Group": Manual adjustment of the parameters is required in order to increase the starting torque by raising the output voltage in the range below the base speed.

In operating mode "VFC ": Manual adjustment of the parameter is normally not required. In exceptional cases, manual setting may be necessary to increase the breakaway torque. In this case, set max. 10%.

The following figure shows the phase-zero phase-to-phase voltage (not the voltage difference between the outer conductors).




*36028797297140363*

[1] $n_{slip}$
[2] $2 \times n_{slip}$
[3] Boost setting range

*P322/P332 IxR adjustment 1/2* 1 2 AUTO

Setting range: 0 – 100%

The IxR value of the matching motor is set as the factory setting.

In operating mode "VFC", this parameter acts on the parameters of the calculated motor model which establish the torque. When the automatic motor adjustment " " is activated the device sets the parameter automatically. If set to 100%, the output voltage of the device is increased by 50 V when the nominal current of the motor flows.

Direct changes to this parameter should be made only by specialists.

*P323/P333 Premagnetization time 1/2* 1 2 AUTO

Setting range: 0 – 20 s

The premagnetization value of the matching motor is set as the factory setting.

Premagnetization serves to establish a high motor torque and starts when the device is enabled.

*P324/P334 Slip compensation 1/2* 1 2 AUTO

The parameter is only effective in "VFC," "VFC n-control" and "V/f" operating modes.

Setting range: 0 – 500 $min^{-1}$

The value of the matching motor is set as the factory setting.

27793230/EN – 08/2022

Increases the speed accuracy of the motor. If values are entered manually, the nominal slip of the connected motor must be entered. A setting range of ± 20% of the nominal slip is permitted if a value other than the nominal slip is entered to compensate for fluctuations between various motors.

#### P34. Motor protection

*P340/P342 Motor protection 1/2* 

Setting range: **Off**/On asynchronous motor/On servomotor

Depending on the motor connected (synchronous or asynchronous motor) this function can have the following effects.

**Off**: The function is not active.

On asynchronous motor: MOVIDRIVE® B takes over the thermal protection of the connected motor electronically. In most cases, the motor protection function is comparable to standard thermal protection (motor protection switch) but, in addition, it takes account of speed-dependent cooling by the integrated fan. The motor utilization is calculated on the basis of:

- Inverter output current
- Type of cooling
- Motor speed
- Time

The thermal motor model is based on the motor data entered in the MOVITOOLS® MotionStudio engineering software and the operating conditions specified for the motor.

## INFORMATION

If the motor also has to be protected against failure of the ventilation, blockage of air ducts, etc., it is also necessary to employ protection in the form of a TF positive temperature coefficient thermistor or TH bimetallic switch.

The following signal and display functions are available in conjunction with motor protection:

| Parameter | Signal and display function |
|---|---|
| *P006/P007 Motor utilization 1/2* (→ 🗎 219) | Motor utilization for parameter set 1/2 |
| *P832 Response to "Motor overload"* (→ 🗎 301) | Error response of the device when the motor utilization reaches the value 110%.<br>Factory setting: Emergency stop/Fault. |

The following parameters must be set:

| Parameter | Setting / Description |
|---|---|
| *P341/P343 Type of cooling 1/2* (→ 🗎 257) | Self-cooling or external cooling |
| Digital output programmed to the response: "/Motor utilization 1/2" | Prewarning if motor utilization exceeds a value of 100%. In this case, the programmed digital output is set to zero (0 V). |

27793230/EN – 08/2022

## INFORMATION

Deactivating the device (line and external DC 24 V supply) always sets the motor utilization to zero. After reactivation, already existing motor heating is not considered.

The motor protection function processes the utilization of the connected motors separately for both parameter sets. The motor protection function may **not** be used in the following cases:

- if only one motor is permanently connected to the device and the "parameter set changeover" function is only used for control technology purposes.
- in the case of group drives. In this case, not every individual motor can be reliably protected.

On servomotor:

- Motor **without** KTY temperature sensor:

  MOVIDRIVE® B calculates the motor utilization based on the nominal motor current. The aim is to determine after only a few cycles or during startup whether the drive will switch off due to an overload, with the error message "A1.F31" (TF/TH trip). In order to determine the capacity utilization at which the connected motor drives the machine cycle as precisely as possible, the duration of the machine cycle must be entered.

  This setting is only possible for parameter set 1.

The following signal and display functions are available in conjunction with motor protection:

| Parameter | Signal and display function |
|---|---|
| *P006 Motor utilization 1* | Display of the motor utilization for parameter set 1. Valid after about 10 to 20 cycles, or after about 2 s. Can be evaluated using IPOS$^{PLUS®}$ or by a PLC. |
| *P007 Motor utilization 2* | In setting *P340 = On servomotor* without function |
| *P832 Response to "Motor overload"* (→ 🗎 301) | In setting *P340 = On servomotor* without function |

The following parameters must be set:

| Parameter | Meaning |
|---|---|
| *P344 Motor protection interval* (→ 🗎 257) | Corresponds to the machine cycle of the application. Range: 0.1 s – 20 s |

## INFORMATION

Activating the function does not trigger monitoring or protection of the connected motor. The programming of a digital output to "/Motor utilization 1/2" is also ineffective.

The motor protection must be guaranteed via TF/TH.

- Motor from SEW-EURODRIVE **with** KTY temperature sensor:

  MOVIDRIVE® B calculates the motor utilization based on an internal motor model that uses the parameters *P006 Motor utilization 1* (→ 🗎 219) and *P018 KTY utilization 1* (→ 🗎 221) as reference parameters.

  When the motor-dependent shut-down limit is reached, the device is shut down with the response set in the parameter *P832 'Motor overload' response* (→ 🗎 301). In this case, the settings in Parameters *P341 Type of cooling 1* (→ 🗎 257) and *P344 Interval for motor protection* (→ 🗎 257) are not relevant.

27793230/EN – 08/2022

*P341/P343 Type of cooling 1/2* 1 2

Setting range: **Self-ventilation**/Forced air cooling

Knowledge of the cooling type of the motor is required for precise calculation of the thermal load of the motor (→ 🗎 255).

*P344 Motor protection interval* 1 2

Setting range: 0.1 – **4** – 20 s

This parameter is not effective for asynchronous motors.

Corresponds to the cycle time of the movement in the case of synchronous motors without KTY temperature sensor. The parameter is used as a reference parameter for calculating the parameter *P006/P007 motor utilization 1/2* (→ 🗎 219).

Always set the time for forward and backward movement.

*P345 / 346 $I_N/U_L$ monitoring 1/2* 1 2 AUTO

Setting range: 0.1 – 500 A

The function cannot be switched off.

The factory setting depends on the rated power of MOVIDRIVE® B and is set to the nominal current of the SEW-EURODRIVE motor with the same rating. In devices with resolver input, the factory setting of the parameter is the value zero.

At 150% nominal motor current $I_N$, the device switches off after 5 minutes. The error message "F84" (motor protection) is displayed.

At 500% nominal motor current $I_N$, the device switches off after 20 seconds. The error message "F84" (motor protection) is displayed.

27793230/EN – 08/2022

### P35. Direction of motor rotation

SEW-EURODRIVE specifies the direction of rotation as seen onto the A-side of the motor. Clockwise (positive) is defined as rotation to the right and counterclockwise as rotation to the left. This definition is implemented when the motor is connected according to the description from SEW EURODRIVE.

*P350/P351 Direction of rotation reversal 1/2* 1 2 AUTO

Setting range: On/**Off**/terminal (only in parameter set 1)

| Direction of rotation reversal | Positive setpoint (positive direction of travel) | Negative setpoint (negative direction of travel) |
|---|---|---|
| Off | Motor turns clockwise | Motor turns counterclockwise |
| On | Motor turns counterclockwise | Motor turns clockwise |

- On: The definition from SEW-EURODRIVE is reversed for the motor rotation direction. The assignment of limit switches is maintained: When the motor turns in CLOCKWISE direction, the drive will be properly stopped once it hits the right limit switch.

  After changing the parameter, note the correct connection of the limit switch and the definition of the reference point and the travel positions.

## INFORMATION

If the parameter is changed, the system loses its reference point for the position without withdrawal of the reference bit. The result may be undesirable movements of the axis.

Referencing is also mandatory after the parameter change (including after activation of the binary terminal).

- **Off**: The motor rotation direction corresponds to the definition from SEW-EURODRIVE.
- Terminal: A terminal parameterized to "Direction of rotation reversal" will activate the function.

### P36. Startup

**Startup** (only available in the DBG60B keypad).

*P360 Startup*

Setting range: Yes / **No**

- Yes: Begins the startup function with the DBG60B keypad.

## INFORMATION

With *P360*, MOVIDRIVE® B can only be started up in VFC operating modes. Startup in CFC and SERVO operating modes must be performed using MOVITOOLS® MotionStudio.

- **No**: The startup function is not begun.

27793230/EN – 08/2022

### 8.3.6 Parameter group 4: Reference signals

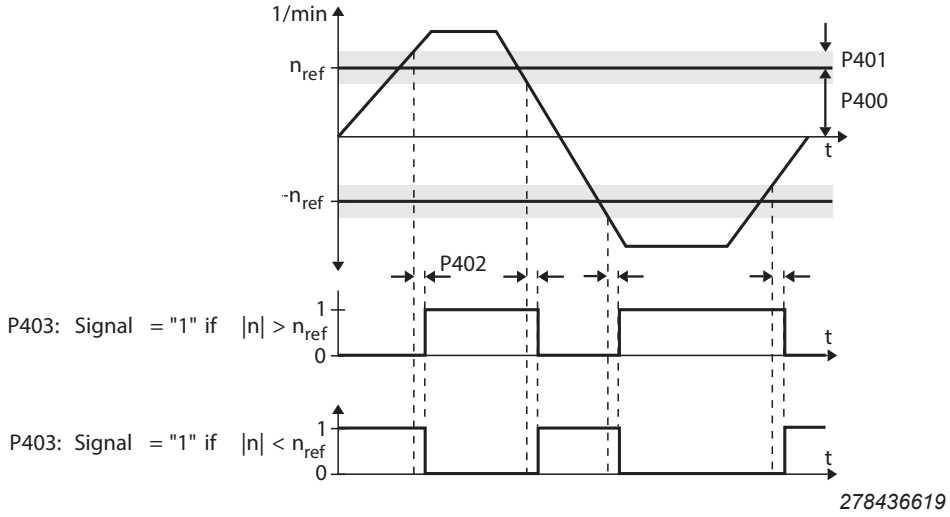
The following reference values are used for detecting and reporting certain operating states. All signals in parameter group 4 can be output via digital outputs (*P62. Digital outputs basic device* (→ 🗎 276) / *P63. Digital outputs option* (→ 🗎 277)).

## INFORMATION

The signals are only valid if the inverter has signaled "ready" after switch-on and there is no error display.

**P40. Speed reference message**

Signal if the speed is less than or greater than the set reference speed.




*P400 Speed reference value*

Setting range: 0 – **1500** – 6000 $min^{-1}$

*P401 Hysteresis*

Setting range: 0 – **100** – 500 $min^{-1}$

*P402 Delay time*

Setting range: 0 – **1** – 9 s

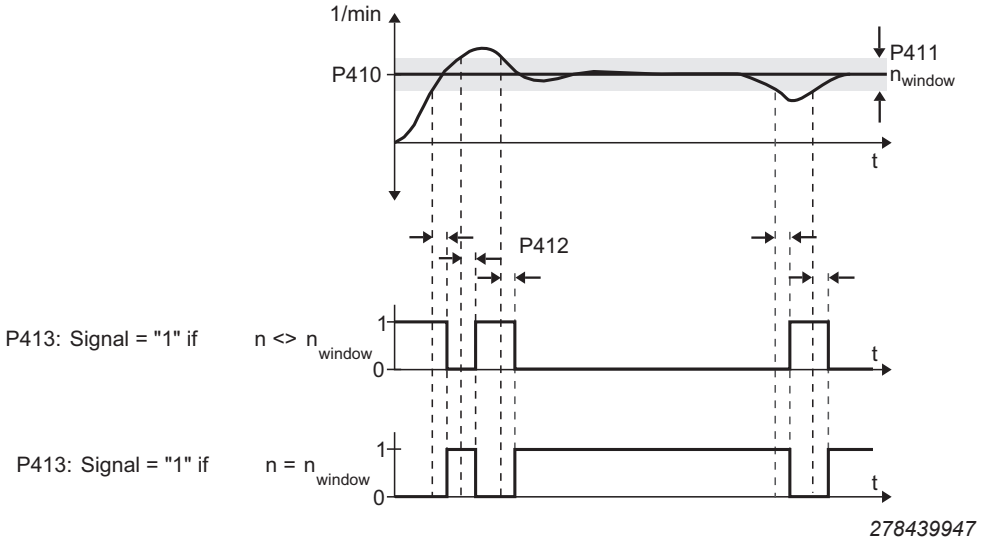
*P403 Signal = "1" when:*

**n < n** $_{ref}$ / n > $n_{ref}$

27793230/EN – 08/2022

### P41. Speed window signal

Signals whether the speed is within or outside the set window range.




*P410 Window center*

Setting range: 0 – **1500** – 6000 $min^{-1}$

*P411 Range width*

Setting range: **0** – 6000 $min^{-1}$

*P412 Deceleration time*

Setting range: 0 – **1** – 9 s

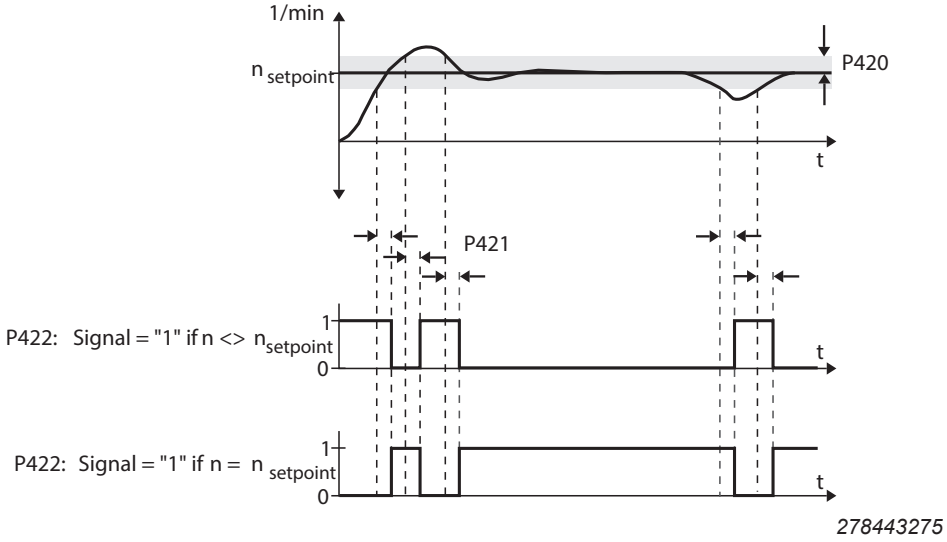
*P413 Signal = "1" if:*

Setting range: **Inside**/outside

27793230/EN – 08/2022

### P42. Speed setpoint / actual value comparison

Signal if the speed is equal to or not equal to the setpoint speed.




*P420 Hysteresis*

Setting range: 1 – **100** – 300 $min^{-1}$

*P421 Deceleration time*

Setting range: 0 – **1** – 9 s

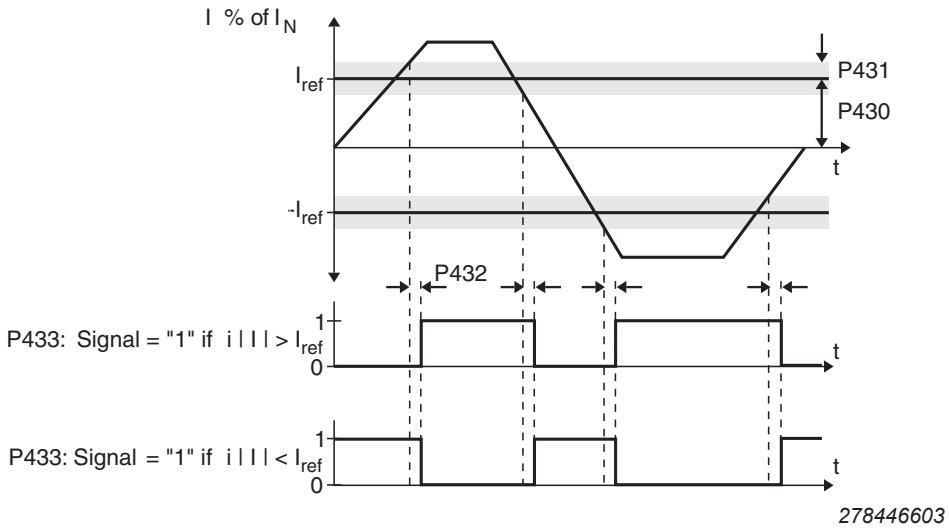
*P422 Signal = "1" if:*

Setting range: **n = $n_{setpoint}$** / n <> $n_{setpoint}$

27793230/EN – 08/2022

### P43. Current reference signal

Signal if the output current is greater than or less than the reference value.




*P430 Current reference value*

Setting range: 0 – **100** – 150% $I_N$ (size 0: 200% $I_N$)

*P431 Hysteresis*

Setting range: 0 – **5** – 30% $I_N$

*P432 Deceleration time*

Setting range: 0 – **1** – 9 s

*P433 Signal = "1" if:*

**I < I** $_{ref}$ / I > $I_{ref}$

### P44. $I_{max}$ signal

Signal if the inverter has reached the current limiting.

*P440 Hysteresis*

Setting range: **5** – 50% $I_N$

*P441 Deceleration time*

Setting range: 0 – **1** – 9 s

*P442 Signal = "1" if:*

**I < I** $_{max}$ / I = $I_{max}$

27793230/EN – 08/2022

### 8.3.7 Parameter group 5: Monitoring functions

The following monitoring functions have been implemented to monitor what happens to drive-specific parameters in the specific application and to be able to react in case of impermissible deviations. Some of the monitoring functions are available separately in both parameter sets. The response to the triggering of the monitoring functions can be set using *P83. Error responses* (→ 🗎 300).

#### P50. Speed monitoring

*P500/P502 Speed monitoring 1/2* 1 2

Setting range: Off/motor/regenerative/**motor/regenerative**

The speed setpoint can only be achieved if there is sufficient torque available to meet the load requirements. If the internal current limit (→ 🗎 253) reaches the external current limit, MOVIDRIVE® assumes that the torque has reached its maximum and the desired speed cannot be attained. If this state persists for the duration of the deceleration time (→ 🗎 263), the speed monitoring trips.

In the case of a hoist, activate the speed monitoring and set the deceleration time to as small a value as possible. Speed monitoring is not that important for safety since an incorrect movement of the hoist does not necessarily mean operation in the current limiting.

*P501/P503 Delay time 1/2* 1 2

Setting range: 0 – **1** – 10 s

The set current internal limit can be reached briefly during acceleration, deceleration, or load peaks. Corresponding setting of the deceleration time can prevent unintentional, sensitive activation of the speed monitoring. The speed monitoring should only trip when the current limit is reached permanently for the duration of the set deceleration time (→ 🗎 263).

*P504 Encoder monitoring motor*

Setting range: On/**Off**

- On: A wire break between the device and motor encoder will be detected directly when using sin/cos encoders and TTL encoders. An error is displayed in case of a defective connection. The error message is also generated in the inhibited state of the device. With the DEU card, F57 is issued for TTL encoders, and F58 for sin/cos encoders. With DEH×1B F14 is issues independently of the encoder type.
- **Off**: A wire break between the device and motor encoder is not detected directly. If the speed monitoring is not deactivated, the error message "F08" (speed monitoring) is displayed in the case of a defective connection. The error message is only generated in the enabled state of the device.

## INFORMATION

Encoder monitoring is not a safety function. If you use a HIPERFACE® encoder, encoder monitoring is always active (including for the track) regardless of the parameter setting.

27793230/EN – 08/2022

*P505 Distance encoder monitoring*

Setting range: On/**Off**

- On: A wire break between the device and distance encoder will be detected directly when using sin/cos encoders and TTL encoders. In the case of a defective connection, the error message "F14" (encoder fault) is displayed. The error message is also generated in the inhibited state of the device.
- **Off**: A wire break between the device and distance encoder is not detected directly. If the speed monitoring is not deactivated, the error message "F08" (speed monitoring) is displayed in the case of a defective connection. The error message is only generated in the enabled state of the device.

**P51. Synchronous operation monitoring**

**Synchronous operation monitoring** only in parameter set 1 and when the DRS11B option is used.

Refer to the “MDX61B - Synchronous Operation Card DRS11B“ manual for a detailed description.

*P510 Positional tolerance slave*

Setting range: 10 – **25** – 32 768 inc.

Various conditions must be met to allow for precise positioning of the slave drive. The brake of the slave drive is applied if all of the following conditions are met:

- Brake function of the slave drive is activated.
- Master drive at a standstill.
- Master drive is de-energized (inverter status = inhibited).
- Slave drive is at standstill and is located within the positioning window.

*P511 Lag error prewarning*

Setting range: **50** – 99 999 999 inc.

A prewarning is issued regardless of the operating mode of the slave drive if the angular offset exceeds the set value.

*P512 lag error limit*

Setting range: **4000** – 99 999 999 inc.

Error message F42 "Lag error" is issued if the angular misalignment exceeds the value set here. The error message is issued regardless of whether the slave drive is operating in free running or synchronous operation.

*P513 Delay time lag error signal*

Setting range: 0 – **1** – 99 s

It is possible to suppress the "Prewarning lag error" and "Lag error limit" signals from being output as an error message or onto a digital output for an adjustable skip time when switching over from free running to synchronous operation.

27793230/EN – 08/2022

*P514 Counter LED display*

Setting range: 10 – **100** – 32 768 inc.

The LED V1 (green) lights up if the angular misalignment exceeds the value set here. This permits an immediate visual display of the maximum differential between the master and slave drives during operation. This is helpful during startup.

*P515 Delay time position signal*

Setting range: 5 – **10** – 2000 ms

The "Synchronous operation slave in position" digital output signal is not issued unless the master and slave drive are located within the *P510 Positioning tol. slave* (→ 🗎 264) for the time set here.

*P516 X41 Encoder monitoring*

Setting range: **Off**/On

- **Off**: Wire break between the frequency inverter and a TTL encoder connected at X41 is not recognized directly. In case of a defective connection, fault F42 "Lag error" will be issued in enabled state unless it has been deactivated.
- On: Wire break between the frequency inverter and a TTL encoder connected at X41 is recognized directly. The fault message F48 "Hardware DRS" will be issued in case of a fault. This error will also be generated in inhibited state.

## INFORMATION

Encoder monitoring is not a safety function.

*P517 X41 Pulse count monitoring*

Setting range: **Off**/On

The number of pulses of the encoder connected at X41 is checked using the resolution set in P233 (→ 🗎 248) through evaluation of the C track. If increments are lost, the fault message F48 "Hardware DRS" is generated.

- **Off**: Pulse counter monitoring is not active.
- On: Pulse counter monitoring is active.

27793230/EN – 08/2022

*P518 X42 Encoder monitoring*

Setting range: **Off**/On

- **Off**: Wire break between the frequency inverter and a TTL encoder connected at X42 is not recognized directly. In case of a defective connection, fault F42 "Lag error" will be issued in enabled state unless it has been deactivated.
- On: Wire break between the frequency inverter and a TTL encoder connected at X42 is recognized directly. The fault message F48 "Hardware DRS" will be issued in case of a fault. This error will also be generated in inhibited state.

## INFORMATION

Encoder monitoring is not a safety function.

*P519 X42 Pulse count monitoring*

Setting range: **Off**/On

The number of pulses of the encoder connected at X42 is checked using the resolution set in *P233* (→ 🗎 248) through evaluation of the C track. If increments are lost, the fault message F48 "Hardware DRS" is generated.

- **Off**: Pulse counter monitoring is not active.
- On: Pulse counter monitoring is active.

**P52. Power off monitoring**

The setting of *P520 Power off response time* (→ 🗎 266) / *P521 Power off response* (→ 🗎 266) is important when programming a digital input to “Power on recognition” and using MOVIDRIVE® regenerative power supply (refer to the regenerative power supply unit and DC link connection system manual).

*P520 Power off response time*

Setting range: **0** – 5 s

Time that the power off must be present for the parameterized power off response to be triggered.

*P521 Power off response*

Setting range: **Controller inhibit**/emergency stop

If a digital input is programmed to "Power on recognition" and as soon as it receives a "0" signal, the response set here is triggered. The 7-segment display of MOVIDRIVE® B indicates "0" (device status 24 V operation).

27793230/EN – 08/2022

*P522 Phase failure monitoring*

Setting range: Off/**On**

**On**: Phase failure is monitored

Off: No phase failure monitoring

With MOVIDRIVE® the line input phases are monitored for failure as follows:

For size 7, the line input phases are directly measured.

Since the line input phases cannot be monitored directly for sizes 1 – 6, monitoring has to be done indirectly via the DC link ripple. If one phase fails, the ripple increases drastically.

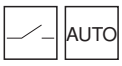
The DC link voltage is monitored at a time interval Δt = 1 ms for dropping below a minimum voltage level that depends on the rated supply voltage of the device.

A phase failure is recognized by the following nominal guide value:

- In a 50 Hz supply system: The voltage level has been underrun approx. $t_{max}$ = 3.0 s.
- In a 60 Hz supply system: The voltage level has been underrun approx. $t_{max}$ = 2.5 s.

If a line phase failure is detected, the output stage is immediately inhibited and the brake is applied. The error message "F06" (phase failure) is displayed and the error response "Immediate switch-off with interlocking" is carried out. The error can only be reset by a device reset.

**P53. Motor temperature protection**

*P530 Sensor type 1* 


Setting range: **No sensor** / TF/TH / KTY / TF/TH DEU / KTY DEU / PK / PK DEU

(KTY and PK only for SEW-EURODRIVE synchronous motors)

(PK stands for the PT1000 temperature sensor)

Selection of the sensor used for motor protection in parameter set 1. When the multi-encoder card DEU is used, select "TF/TH DEU" or "KTY DEU" or "PK DEU".

- Setting "TF/TH": Set the response using *P835 Response 'TF-Message'* (→ 🗎 302).
- Setting "KTY" or "PK": Can only be selected for synchronous motors from SEW-EURODRIVE. Activate the motor model with the setting "One servomotor" of the parameter *P340 motor protection 1* (→ 🗎 255). Set the response using parameter *P832 Response 'Motor overload'* (→ 🗎 301).

*P531 Sensor type 2* 


Setting range: **No sensor**/TF-TH

Selection of the sensor used for motor protection in parameter set 2.

## INFORMATION

If you select the setting "KTY" or "PK" (for SEW-EURODRIVE synchronous motors only), you have to repeat startup, else fault F84 will be triggered.

27793230/EN – 08/2022

### P54. Gear unit/motor monitoring

These parameters are used to set the response to be triggered in the event of a motor or gear unit problem. The digital inputs must be programmed with the corresponding function. The error responses are also be triggered in the "controller inhibit" device status.

The following table shows possible error responses:

| Response | Description |
|---|---|
| No response | An error is not displayed, nor is an error response performed. The signaled error is ignored. |
| Display error | Display of error on the 7-segment display of the device and in the MOVITOOLS® MotionStudio engineering software.<br>The device performs no other error responses.<br>The device can be reset by a device reset (terminal, fieldbus, auto reset). |
| Immediate stop/malfunction | Immediate switch-off of the device with error message.<br>The output stage is inhibited and the brake is applied.<br>The ready signal is revoked.<br>A restart is only possible after a fault reset has been performed during which the device is reinitialized. |
| Emergency stop/malfunction | The drive is braked with the emergency stop ramp t14/t24 " ".<br>Once the stop speed is reached, the output stage is inhibited and the brake is applied.<br>The error is signaled immediately.<br>The ready signal is revoked.<br>A restart is only possible after a fault reset has been performed during which the device is reinitialized. |
| Rapid stop/malfunction | The drive is braked with the stop ramp t13/t23 " ".<br>Once the stop speed is reached, the output stage is inhibited and the brake is applied.<br>The error is signaled immediately.<br>The ready signal is revoked.<br>A restart is only possible after a fault reset has been performed during which the device is reinitialized. |
| Immediate stop/Warning | Immediate switch-off of the device with error message.<br>The output stage is inhibited and the brake is applied.<br>The ready signal is not revoked.<br>The drive restarts without device re-initialization if the error is rectified by an internal procedure or by an error reset. |

27793230/EN – 08/2022

| Response | Description |
|---|---|
| Emergency stop/Warning | The drive is braked with the emergency stop ramp t14/t24 " ".<br>Once the stop speed is reached, the output stage is inhibited and the brake applied.<br>The error is signaled immediately.<br>The ready signal is not revoked.<br>The drive restarts without device re-initialization if the error is rectified by an internal procedure or by an error reset. |
| Rapid stop/Warning | The drive is braked with the stop ramp t13/t23 " ".<br>Once the stop speed is reached, the output stage is inhibited and the brake applied.<br>The error is signaled immediately.<br>The ready signal is not revoked.<br>The drive restarts without device re-initialization if the error is rectified by an internal procedure or by an error reset. |

*P540 Drive vibration response/warning*

Factory setting: **Display fault**

If the drive vibration sensor signals a warning, the device carries out the set response.

*P541 Drive vibration response/fault*

Factory setting: **Rapid stop/warning**

If the drive vibration sensor signals an error, the device carries out the set response.

*P542 Response oil aging/warning*

Factory setting: **Display fault**

If the oil aging sensor signals a warning, the device carries out the set response.

*P543 Response oil aging/fault*

Factory setting: **Display fault**

If the oil aging sensor signals a fault, the device carries out the set response.

*P544 Oil aging/overtemperature*

Factory setting: **Display fault**

If the oil aging sensor signals an overtemperature, the device performs the set response.

27793230/EN – 08/2022

*P545 Oil aging/ready signal*

Factory setting: **Display fault**

If the oil aging sensor withdraws the ready signal, the device carries out the set response.

*P549 Response to brake wear*

Factory setting: **Display fault**

If the brake wear sensor trips, the device carries out the set response.

**P55. DCS safety module**

Parameter group *P55.* The *DCS safety module* includes display and setting values that are specific to the option DCS21B/22B/31B/32B. For more detailed information, refer to the "MOVIDRIVE® MDX 61B Safety Module DCS21B/22B/31B/32B Option" manual.

*P550 DCS safety module status*

Display value that cannot be changed.

Parameter *P550* shows the current status of the option DCS21B/22B/31B/32B.

- RUN: Normal operation.
- STOP: Operation of option DCS21B/22B/31B/32B was stopped via programming interface.
- ALARM: Option DCS21B/22B/31B/32B has issued an alarm.
- ERROR: Option DCS21B/22B/31B/32B has issued a fault.

  You have the following options to read the corresponding fault or alarm message from the fault memory of the DCS21B/22B/31B/32B option:

  – Using the X87 service interface of the MOVISAFE® Config DCS/Assist DCS parameter setting software
  – Using the DBG60B keypad (if *P555 Fault response DCS / P556 Alarm response DCS* (→ 🗎 271) is not set to "No response")
  – Fault memory MOVIDRIVE® B (if *P555 Fault response DCS / P556 Alarm response DCS* (→ 🗎 271) is not set to "No response")

*P551 Digital inputs DCS DI1 – DI8*

Display value that cannot be changed.

Parameter *P551* shows the present status of the digital inputs of option DCS21B/22B/31B/32B in the order DI1 – DI8.

27793230/EN – 08/2022

*P552 Digital outputs DCS DO0_P – DO2_M*

Display value that cannot be changed.

Parameter *P552* shows the present status of the digital outputs of option DCS21B/22B/31B/32B in the following order:

- DO0_P
- DO0_M
- DO1_P
- DO1_M
- DO2_P
- DO2_M

*P553 Serial number DCS*

Display value that cannot be changed.

Parameter *P553* shows the serial number of option DCS21B/22B/31B/32B. The displayed serial number must be identical with the serial number on the nameplate of the DCS21B/31B option, which is attached to MOVIDRIVE® MDX61B. You have to enter the serial number in the validation report.

*P554 CRC DCS*

Display value that cannot be changed.

The parameter *P554* shows the CRC (cyclic redundancy check) of the program stored on the DCS21B/22B/31B/32B option. You have to enter the CRC in the validation report.

*P555 Fault response DCS / P556 Alarm response DCS*

Setting range *P555*: No response / **Display fault** / Rapid stop/Fault / Emergency stop/Fault / Rapid stop/Fault / Immediate stop/Warning / Emergency stop/Warning / Rapid stop/Warning

Setting range *P556*: No response / **Display fault** / Rapid stop/Fault / Emergency stop/Fault / Rapid stop/Fault / Immediate stop/Warning / Emergency stop/Warning / Rapid stop/Warning

If option DCS21B/22B/31B/32B signals a fault (*P555*) or an alarm (*P556*), the inverter performs the set response. As the safety-related switching off is performed by the DCS21B/22B/31B/32B option or a higher-level safety controller, SEW-EURODRIVE recommends to set *P555* and *P556* to "Display fault".

*P557 DCS actual position source*

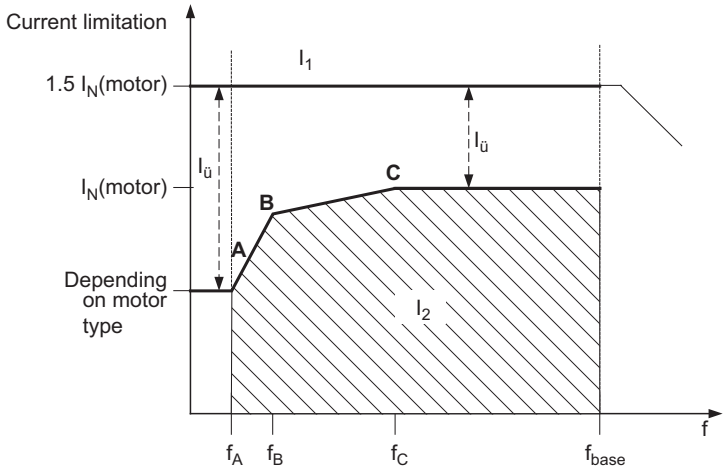
Setting range: **Motor encoder (X15)**/Ext. Encoder (X14)/Absolute encoder (X62)

If the option "Inverter encoder" is set as encoder 1 in the MOVISAFE® Config DCS/Assist DCS parameter setting software, the setting in *P557* determines which encoder signal is evaluated by the DCS21B/22B/31B/32B option.

27793230/EN – 08/2022

### P56. Ex-e motor current limiting

Display and setting values that are specific to the "Current limiting in the Ex-e motor on the inverter" function.




18379642507

| | |
|---|---|
| $I_N$ | Nominal motor current in A |
| $I_1$ | Maximum permitted current in A |
| $I_2$ | Permitted continuous current range in A |
| $I_O$ | Overload current in A |
| $f_{base}$ | Base frequency in Hz |
| A, B, C | Limiting points |

- Frequencies below $f_A$ are only permitted to a limited extent.
- Frequencies higher than the rated motor frequency are not permitted.
- Frequency A < frequency B < frequency C < rated motor frequency
- Current limit A < current limit B < current limit C

Refer to the "Explosion-Protected AC Motors" operating instructions for more information.

## INFORMATION

For third-party EX motors, you have to perform all settings manually.

*P560 Current limitation Ex-e motor* AUTO

Setting range: On/**Off**

- On: Current limiting for Ex-e motors is active. The current limiting is already activated during startup for the Ex-e operation selected and approved motors. The current limit (→ 🗎 253) can no longer be changed when the protection function is active.
- **Off**: Current limiting for Ex-e motors is not active.

27793230/EN – 08/2022

*P561 Frequency A* AUTO

Setting range: 0 – **5** – 60 Hz

Value for minimum operating frequency $f_A$. The device is operated independently of the current amount for 60 s at the operating frequency $f_A$. After this time elapses, the device switches off and displays the error message "F110" (Ex e protection) .

*P562 Current limit A* AUTO

Setting range: 0 – **50** – 150%

Current limitation that is permitted with operating frequency $f_A$. There is a linear gradient between current limits A and B.

*P563 Frequency B* AUTO

Setting range: 0 – **10** – 104 Hz

Value for operating frequency $f_B$.

*P564 Current limit B* AUTO

Setting range: 0 – **80** – 200%

Current limitation that is permitted with operating frequency $f_B$. There is a linear gradient between current limits B and C.

*P565 Frequency C* AUTO

Setting range: 0 – **25** – 104 Hz

Value for operating frequency $f_C$.

*P566 Current limit C* AUTO

Setting range: 0 – **100** – 200%

Current limit that is permitted between operating frequency $f_C$ and rated motor frequency. The rated motor frequency is 50 Hz for star connection and 87 Hz for delta connection. After startup with an Ex-e motor, the current limit C is approximately equal to the rated motor current $I_N$.

27793230/EN – 08/2022

### 8.3.8 Parameter group 6: Terminal assignment

**P60. Digital inputs of basic device**

Digital input DIØØ, with fixed assignment "/Controller inhibit".

If this terminal is revoked, the output stage is immediately inhibited and the brake is applied.

*P600 – P606 Digital input DIØ1 – DIØ7* 

The digital inputs of the basic device can be set to the same functions as the digital inputs of the option (→ 🗎 275).

27793230/EN – 08/2022

### P61. Digital inputs option

*P610 – P617 Digital inputs DI1Ø – DI17* 

The digital inputs can be programmed to the following functions:

| Function | Effect in case of | | Effective in Inverter status | | Factory set to | See also |
|---|---|---|---|---|---|---|
| | "0" signal | "1" signal | Inhibited | Enabled | | |
| No function | – | – | – | – | DIØ6<br>DIØ7 | |
| Enable / stop | Stop on t13/t23 | Enabled | No | Yes | DIØ3 | *P13x* / *P14x* |
| CW / stop | Stop at t11/t21 or t12/t22 | Enable CW | No | Yes | DIØ1 | |
| CCW/stop | Stop at t11/t21 or t12/t22 | Enable CCW | No | Yes | DIØ2 | |
| n11 / n21 n13 / n23 | External setpoints only | n11 / n21 n13 / n23 | No | Yes | DIØ4 | *P16x* / *P17x* |
| n12 / n22 | External setpoints only | n12 / n22 | No | Yes | DIØ5 | |
| Fixed setpoint changeover | Fixed setpoints of the active parameter set selected | Fixed setpoints of the active parameter set selected | Yes | Yes | | |
| Parameter set changeover[1)] | Parameter set 1 | Parameter set 2 | Yes | No | | |
| Speed ramp switchover | 1. Ramp (t11/t21) active | 2. Ramp (t12/t22) active | Yes | Yes | | *P13x* / *P14x* |
| Motor potentiometer up | – | Increase setpoint | No | Yes | | *P15x* |
| Motor potentiometer down | – | Decrease setpoint | No | Yes | | |
| /External error | External fault | – | No | Yes | | |
| Fault reset | Reset on positive edge ("0" to "1") | | Yes | Yes | | |
| /Position hold control | Hold control active | – | No | Yes | | *P210* |
| /Limit switch right | Right limit switch reached | Not reached | No | Yes | | |
| /Limit switch left | Left limit switch reached | Not reached | No | Yes | | |
| IPOS input | Function depends on IPOS function | | | | | IPOS[PLUS®] manual |
| Reference cam | Not activated | Activated | No | Yes | | |
| Start reference travel | – | Start referencing for IPOS | No | Yes | | |
| Slave free running | Master/slave operation | Slave free running | Yes | Yes | | |
| Setpoint acceptance active | Do not accept | Accept setpoint | No | Yes | | |
| Mains On detection | see *P521* (→ 🗎 266) | Ext. POWER ON signal | Yes | Yes | | *P52x* |
| Synchronous operation set zero point | "1" to "0": sets new zero point | Delete angular offset | Yes | Yes | | Synchronous operation manual |
| Synchronous operation slave start | No enable | Enabled | No | Yes | | |
| Synchronous operation teach-in | – | Adopt angular offset in *P224* (→ 🗎 247) | Yes | Yes | | |
| Synchronous operation master stopped | Master drive turns | Master drive at a standstill | Yes | Yes | | |
| /Vibration warning | Vibration sensor signals warning | Vibration sensor does not signal warning | Yes | Yes | | |
| /Vibration fault | Vibration sensor reports fault | Vibration sensor does not report fault | Yes | Yes | | |
| /Oil aging warning | Oil aging sensor signals warning | Oil aging sensor does not signal warning | Yes | Yes | | |
| /Oil aging fault | Oil aging sensor signals fault | Oil aging sensor does not signal fault | Yes | Yes | | |
| /Oil aging overtemperature | Oil aging sensor signals overtemperature | Oil aging sensor does not signal overtemperature | Yes | Yes | | |
| Oil aging/ready | Oil aging sensor is not ready for operation | Oil aging sensor is ready for operation | Yes | Yes | | |
| Brake wear signal | Brake is worn | Brake is OK | Yes | Yes | | |

27793230/EN – 08/2022

| Function | Effect in case of | | Effective in Inverter status | | Factory set to | See also |
|---|---|---|---|---|---|---|
| | "0" signal | "1" signal | Inhibited | Enabled | | |
| Direction of rotation reversal | Off | On | Yes | No | | *P350/351* |

1) With operating modes with encoder feedback, observe the following: The parameter set must not be changed more often than every two seconds.

### P62. Digital outputs basic device

Use digital output DBØØ for controlling the brake. This digital output has the fixed assignment of the "/Brake" function. The "Brake released" and "Brake applied" signals are intended to be passed on to a higher-level controller.

## INFORMATION

The binary signals are only valid if the inverter has signaled "ready" after it has been switched on and if no error message has been issued. Binary signals have "0" status while MOVIDRIVE® is being initialized.

Several terminals can be assigned the same function.

*P620 – P624 Digital outputs DOØ1 – DOØ5*

The digital outputs of the basic device can be set to the same functions as the digital outputs of the option (→ 🗎 277).

27793230/EN – 08/2022

### P63. Digital outputs option

*P630 – P637 Digital outputs DO1Ø – DO17* 

The following functions can be assigned to the digital outputs:

| Function | Digital output has | | Factory set to | See also |
|---|---|---|---|---|
| | "0" signal | "1" signal | | |
| No function | Always "0" signal | – | | |
| /Failure | Collective fault signal | – | DOØ2 | |
| Ready for operation | Not ready | Ready | DOØ1 | |
| Output stage ON | Device inhibited | Device enabled and motor energized | | |
| Rotating field on | No rotating field | Rotating field | | |
| Brake released[1)] | Brake applied | Brake released | | |
| Brake applied [1)] | Brake released | Brake applied | | |
| Motor standstill | Motor running | Motor at standstill | | |
| Parameter set | Parameter set 1 active | Parameter set 2 active | | |
| Speed reference signal *P403* (→ 🗎 259) = $n < n_{ref}$ ($n > n_{ref}$) | $n > n_{ref}$ ($n < n_{ref}$) | $n < n_{ref}$ ($n > n_{ref}$) | | *P40x* |
| Speed window signal *P413* (→ 🗎 260) = Inside (outside) | Speed is outside (within) speed window | Speed is within (outside) speed window | | *P41x* |
| Comparison message setpoint/actual value *P422* (→ 🗎 261) = $n = n_{setpoint}$ ($n <> n_{setpoint}$) | $n <> n_{setpoint}$ ($n = n_{setpoint}$) | $n = n_{setpoint}$ ($n <> n_{setpoint}$) | | *P42x* |
| Current reference message *P433* (→ 🗎 262) = $I < I_{ref}$ ($I > I_{ref}$) | $I > I_{ref}$ ($I < I_{ref}$) | I < Iref ($I > I_{ref}$) | | *P43x* |
| Imax signal *P442* (→ 🗎 262) = $I = I_{max}$ ($I < I_{max}$) | $I < I_{max}$ ($I = I_{max}$) | $I = I_{max}$ ($I < I_{max}$) | | *P44x* |
| /Warning motor utilization 1 | 100% prewarning of motor protection in parameter set 1 | – | | *P34x* |
| /Warning motor utilization 2 | 100% prewarning of motor protection in parameter set 2 | – | | |
| /Synchronous operation prewarning | Value for lag error prewarning (→ 🗎 264) exceeded | – | | Synchronous operation manual |
| /Synchronous operation lag error | Lag error limit (→ 🗎 264) exceeded | – | | |
| Synchronous operation slave in position | Position not reached | Position reached | | |
| IPOS in position | Position not reached | Position reached | | IPOS[PLUS®] manual |
| IPOS referenced | No referencing | Referencing finished | | |
| IPOS output | Depends on IPOS program | | DOØ3<br>DOØ4<br>DOØ5 | |
| /IPOS fault | IPOS program fault message | – | | |
| Ex-e current limit active | Not active | Active | - | *P56x* |
| LSM commutation finished | Not commutated | Commutated | - | - |
| S-pattern profile is generated | S pattern is not calculated | S pattern is calculated | - | *P135/145* |
| STO safety function | Not active | Active | - | - |

1) Use digital output DBØØ to control the brake. This digital output has the fixed assignment of the "/Brake" function. The "Brake released" and "Brake applied" signals are intended to be passed on to a higher-level controller.

27793230/EN – 08/2022

## INFORMATION

The binary signals are only valid if the inverter has signaled "ready" after switch-on. Binary signals have "0" status while MOVIDRIVE® is being initialized.

Several terminals can be assigned the same function.

27793230/EN – 08/2022

### P64. Analog outputs optional

*P640/P643 Analog output AO1/AO2* 

Depending on *P642/P645 Operating mode AO1/AO2* (→ 🗎 280), the signal range is -10 – 0 – 10 V (AOV1/AOV2) and 0 (4) – 20 mA (AOC1/AOC2).

The following functions can be assigned to the analog outputs:

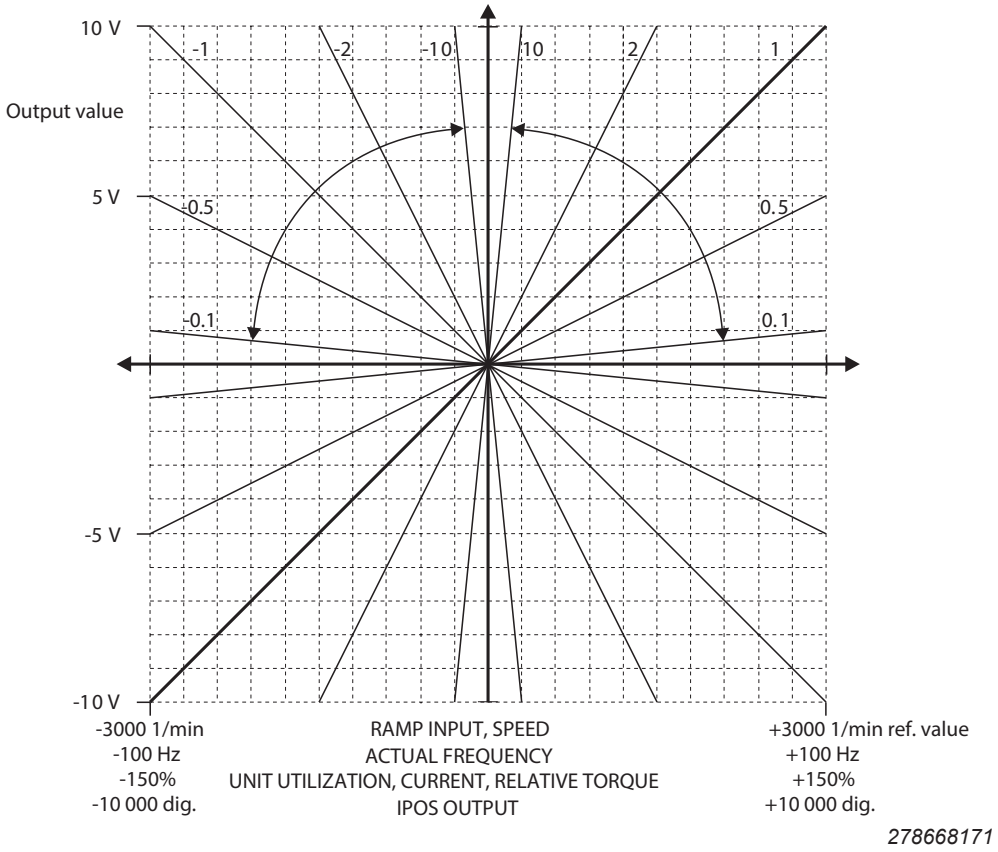
| Function | Scaling (when *P641/P644 Scaling AO1/AO2* (→ 🗎 280) = 1) | | Explanation | Factory setting |
|---|---|---|---|---|
| | Reference value | Output value | | |
| No function | always 0 V or 0 mA | | – | |
| Ramp generator input | ±3000 min$^{-1}$ | ±10 V / 20 mA | Setpoint speed at the input of the internal ramp generator | |
| Setpoint speed | ±3000 min$^{-1}$ | ±10 V / 20 mA | Valid setpoint speed (output ramp generator or manipulated value of the higher-level controller) | |
| Actual speed | ±3000 min$^{-1}$ | ±10 V / 20 mA | Actual speed | AO1 |
| Actual frequency | ±100 Hz | ±10 V / 20 mA | Rotating field frequency | |
| Output current | 150% $I_N$) (Size 0: 200% $I_N$) | 10 V or 20 mA | Apparent current | AO2 |
| Active current | ±150% $I_N$ (Size 0: ±200% $I_N$) | ±10 V / 20 mA | Active current, positive when torque is in positive sense of rotation; negative when torque is in negative sense of rotation. | |
| Relative torque | ±150% $I_N$ (Size 0: ±200% $I_N$ | ±10 V / 20 mA | Active current that forms the torque; the value "0" is always output in VFC operating modes. | |
| Device utilization | 150 % (Size 0: 200%) | 10 V or 20 mA | Current device utilization | |
| IPOS output 1 | ±10000 digits | ±10 V / 20 mA | Internal IPOS values (see IPOS$^{PLUS®}$ manual) | |
| IPOS output 2 | ±10000 digits | ±10 V / 20 mA | Internal IPOS values (see IPOS$^{PLUS®}$ manual) | |

27793230/EN – 08/2022

*P641/P644 Scaling AO1/AO2*

Setting range: -10 – 0 – **1** – 10

The slope of the characteristic for the analog outputs is defined. The value for device utilization, current and relative torque is 200% for each in size 0.

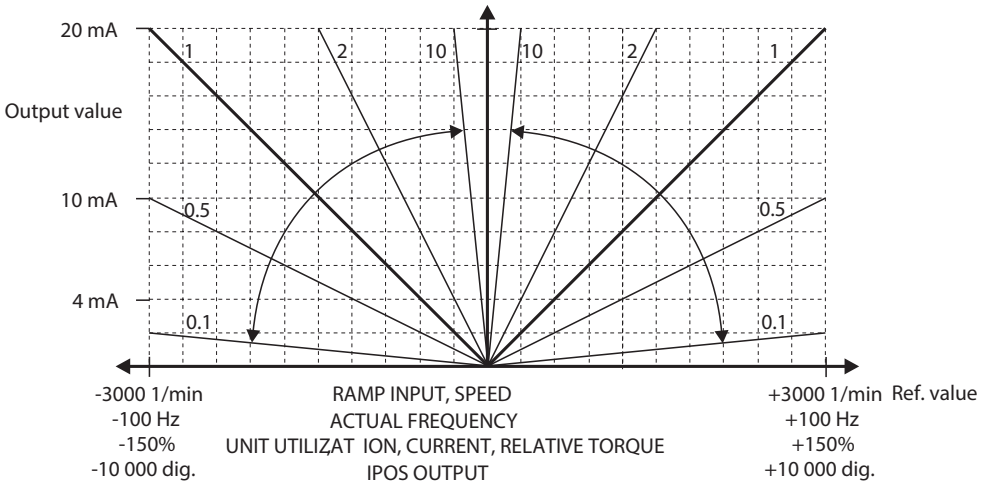



*P642/P645 Operating mode AO1/AO2*

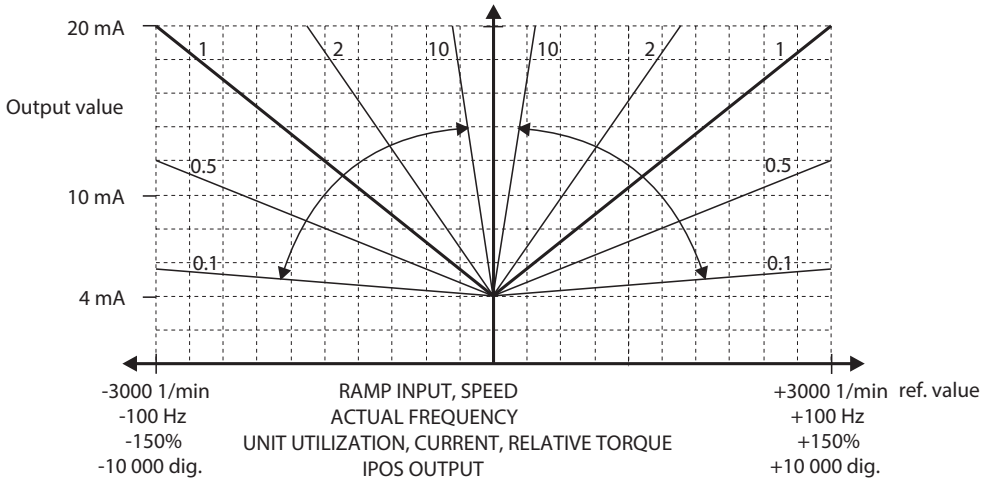
Here you can set the operating mode of the analog output. The following operating modes are available:

- No function: The value zero is always output.
- **-10 V – 10 V**: Output of the reference value with the correct signs as voltage values on AOV1/AOV2; the current outputs AOC1/AOC2 are not valid.
- 0 – 20 mA: Output of the value of the reference value as current value 0 – 20 mA on AOC1/AOC2, the voltage output AOV1/AOV2 is not valid. *P641/P644 Scaling AO1/AO2* (→ 🗎 280) is evaluated on the basis of the value.
- 4 – 20 mA: Output of the value of the reference value as current value 4 – 20 mA on AOC1/AOC2, the voltage output AOV1/AOV2 is not valid. The slope of the characteristics is flatter than in 0 – 20 mA operating mode. The characteristic has an offset of 4 mA and the value of *P641/P644 Scaling AO1/AO2* (→ 🗎 280) refers to the value range of 16 mA. The value for device utilization, current and relative torque is 200% for each in size 0.

27793230/EN – 08/2022




*278671499*




*278674827*

27793230/EN – 08/2022

### 8.3.9 Parameter group 7: Control functions

The the fundamental control properties of the device are programmed with this parameter group. These functions are carried out automatically upon activation of the device and influence its behavior in certain operating modes.

## INFORMATION

When using incremental encoders (resolver, push-pull TTL, RS422, sin/cos, HIPERFACE® single-turn), changing the parameter set invalidates the IPOS variables *H510 Actual position* and *H511 Actual position*. A position is only retained after switching over the parameter sets if an absolute encoder (SSI, HIPERFACE® Multi-Turn) is used.

#### P70. Operating modes

*P700/P701 Operating mode 1/2* 


This parameter is used to set the basic operating mode of the inverter for parameter sets 1 and 2. This includes in particular the definition of the motor system, encoder feedback and corresponding control functions. When MOVIDRIVE® inverters are delivered, their parameters are set to the specific motor which matches the power of the motor.

All operating modes can be set for parameter set 1. Only operating modes without encoder feedback can be set for parameter set 2 (see group 1). Without new startup, the operating mode may only be changed within a group.

| Group | Parameter set 1/2<br>P700 Operating mode 1<br>P701 Operating mode 2 | Device type and option | Motor |
|---|---|---|---|
| 1 | VFC 1/2 (factory setting)<br>VFC 1/2 & group<br>VFC 1/2 & hoist<br>VFC 1/2 & DC braking<br>VFC 1/2 & flying start function<br>V/f characteristic curve<br>V/f & DC braking | MDX,<br>no option required | Asynchronous motor without incremental encoder |
| 2 | VFC n-control<br>VFC n-control & group<br>VFC n-control & hoist | MDX + DEH11B | Asynchronous motor with incremental encoder or HIPERFACE® encoder |
| | VFC n-control & synchronous operation | MDX + DRS11B + DEH11B | |
| | VFC n-control & IPOS | MDX + DEH11B | |
| 3 | CFC<br>CFC & torque control<br>CFC & IPOS | MDX + DEH11B | DR.. with incremental encoder or HIPERFACE® encoder or DRL (incremental encoder installed as standard) |
| | CFC & synchronous operation | MDX + DRS11B + DEH11B | |
| 4 | Servo<br>Servo & torque control<br>Servo & IPOS | MDX with option DER11B or DEH11B | CM/CMP<br>With Hiperface® encoder or resolver |
| | Servo & synchronous operation | MDX + DRS11B + DEH11B/ DER11B | |

You will find detailed information about the individual operating modes in the "Operating modes" chapter.

27793230/EN – 08/2022

*P702 Motor category* AUTO

Setting range: **Rotatory**/linear

Automatically set during startup. Displays the connected motor type.

Parameter set 2 is not available when operating a linear motor.

*P703 Dynamic response*

Setting range: **Standard**/increased

This parameter only applies to *P700* (→ 282) = "VFC n-control & ..." or "VFC & hoist".

For *P700* = "VFC-n-control & ...":

- Increased: The controller can be set dynamically (speed controller)
- **Standard**: Standard control

Activating this parameter may require reducing the stiffness under certain conditions.

For *P700* = "VFC & hoist":

- Increased: The internal filters are initialized by the nominal motor data.
- **Standard**: The internal filters are initialized by 0.

*P704 VFC-n with output filter* AUTO

Setting range: Yes/**no**

- Yes: An output filter is used in operating mode VFC n-control

  To suppress current oscillations , the premagnetization strategy is adjusted.
- **No**: No output filter connected

*P705 Premagnetization time lower limit*

Setting range: Yes/**no**

- Yes: The premagnetization time is limited device internally to the lowest possible value. Ensures that the motor always starts up with nominal magnetization. Setting the parameter *P323/P333* below this value will be ignored.
- **No**: The premagnetization time can be shortened as desired. The motor may eventually start up unmagnetized.

*P706 Flux model: Yrq = 0*

Setting range: **Yes**/no

- **Yes**: With low speeds the flux model is supported by additional observers. This enhances the control for low speeds.
- No: A standard flux model is applied.

Only valid with VFC operating modes without encoder feedback.

27793230/EN – 08/2022

### P71. Standstill current

*P710/P711 Standstill current 1/2* [1][2]

Setting range: **0** – 50% of the nominal motor current $I_N$

Imprints an adjustable current (in % of the nominal motor current $I_N$) into the motor during motor standstill and closed brake. The standstill current can be switched off by "/controller inhibit = 0".

The standstill current fulfills the following functions:

- Prevents the risk of condensation at the motor and freezing of the brake when the ambient temperature is low.

  Set the amount of current in such a way that the motor does not overheat. SEW-EURODRIVE recommends a current level at which the motor housing is warm to the touch.
- Enables rapid start of the motor without complying with the premagnetization time.

  SEW-EURODRIVE recommends setting the standstill current to 45 – 50% of the nominal motor current $I_N$ in hoists.

The standstill current function is deactivated at a value of 0% of the nominal motor current $I_N$. The standstill current is monitored for current limit in any case (→ 🗎 253).

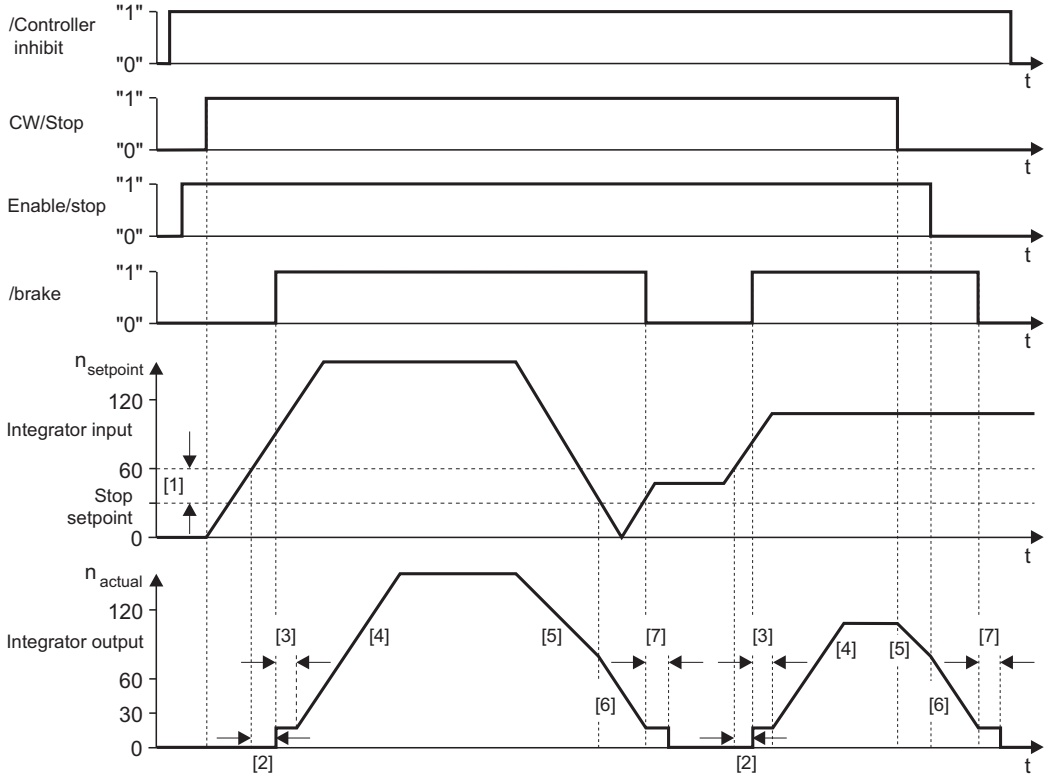
- At least the magnetizing current is always imprinted in the operating mode "CFC," which is required according to the motor model.
- No current is imprinted in the operating mode "Servo".
- The nominal magnetizing current is always imprinted in the operating modes "VFC & Hoist" and "VFC-n-control & Hoist" and activated standstill current.
- In the other operating modes, a rapid start will take place only if the set standstill current is greater than or equal to the rated magnetizing current.

If, in the standstill current phase, the set premagnetization time of the standstill current is constant and greater than or equal to the rated magnetizing current of the motor in time intervals of the set premagnetization time, the motor resistance is calibrated. If an enable is issued again during the measurement interval, the resistance value is not calculated. In this case, the existing resistance value continues to be used.

27793230/EN – 08/2022

### P72. Stop by setpoint function

With activated stop by setpoint function, the device automatically generates an enable in dependence on the main setpoint. All required functions such as premagnetization, brake control, etc. are enabled. An additional enable via terminals must still occur in any case, however.




18382962827

[1] Start offset
[2] Premagnetization time
[3] Brake release time
[4] t11 up CW
[5] t11 down CW
[6] t13 Stop ramp
[7] Brake application time

*P720/P723 Stop by setpoint function 1/2* 1 2

Setting range: On/**off**

*P721/P724 Stop setpoint 1/2* 1 2

Setting range: 0 – **30** – 500 $min^{-1}$

In the "VFC & hoist" operating mode, the minimum stop setpoint is internally limited to 16 $min^{-1}$.

27793230/EN – 08/2022

*P722/P725 Start offset 1/2* 1 2

Setting range: 0 – **30** – 500 min$^{-1}$

- If the start setpoint (stop setpoint + start offset) is greater than the maximum speed, no enable occurs.
- If the stop setpoint is greater than the minimum speed, the minimum speed can never be run.

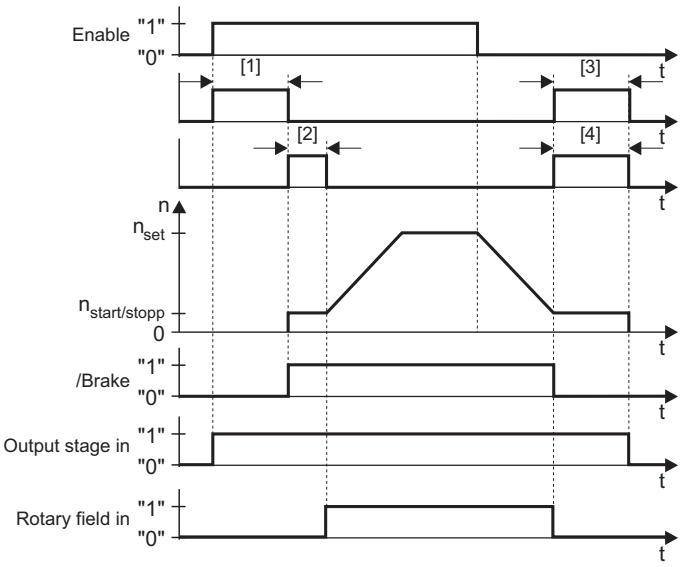
### P73. Brake function

MOVIDRIVE® B is capable of controlling a brake installed on the motor. The brake function takes effect on the digital output DB00, which is permanently assigned the function "/Brake" (24 V = brake released).

In a drive with encoder feedback (speed control), it is possible to select between electrical holding of the load and mechanical application of the brake in halt condition.

## INFORMATION

- With controller inhibit active (controller inhibit = "0") the brake is **always** applied.
- When the drive safety function "STO" is activated at X17:4 = DC 0 V the brake is **always** applied.




*18402473227*

[1] Premagnetization time
[2] Brake release time
[3] Post-magnetization time
[4] Brake application time

*P730/P733 Brake function 1/2* 1 2 AUTO

Setting range: **On**/Off

**On**: The brake is applied when the enable command is withdrawn (Enabled = “0”).

27793230/EN – 08/2022

Off: The brake remains released when the enable command is withdrawn. For operating modes with encoder feedback (VFC n-control&..., CFC, SERVO) the drive is held in position electrically, drives without encoder feedback are no longer energized and thus do not generate torque.

## INFORMATION

Drives without encoder feedback may drift away when the brake function is deactivated.

With hoists in controlled operation (VFC&Hoist) the brake function is always active regardless of the parameter settings.

*P731/P734 Brake release time 1/2* 1 2 AUTO

Setting range: 0 – 2 s

The brake release time of the matching motor is set as the factory setting.

Specifies how long the motor will remain at a standstill after expiration of the premagnetization time and how much time the brake has to release.

*P732/P735 Brake application time 1/2* 1 2 AUTO

Setting range: 0 – 2 s

The brake application time of the matching motor is set as the factory setting.

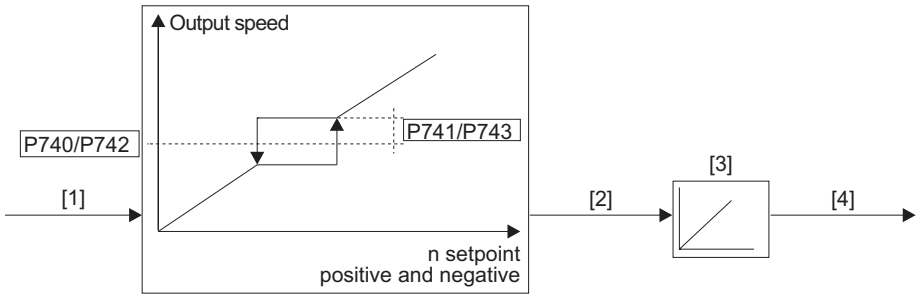
Specifies the time required for the mechanical brake to apply. This parameter prevents a sagging of the drive.

### P74. Speed skip function

With these parameters, the motor speed can be prevented from persisting within a certain speed window. This function is particularly useful for machines with strong mechanical resonance because the skip function helps suppress vibrations and noise.

The parameters automatically have effect on positive and negative setpoints when activated. In the factory setting, the function is deactivated (*P741/P743 Skip bandwidth 1/2* = 0).

The following figure shows the mechanism of the parameters:




18409535883

[1] n setpoint
[2] n setpoint on the integrator input
[3] Ramps t11/t12
[4] n setpoint on the integrator output

*P740/P742 Skip center 1/2* 1 2

Setting range: 0 – **1500** – 6000 min$^{-1}$

*P741/P743 Skip bandwidth 1/2* 1 2

Setting range: **0** – 300 min$^{-1}$

**P75. Master/slave function**

The master-slave function allows for implementing automatic functions such as speed synchronism, shared load, and torque control (slave). The RS485 interface (ST11/ ST12) or the system bus interface (SC11/SC12) can be used as the communication link. *P100 Setpoint source* (→ 🗎 226) = Master SBus or *P100 Setpoint source* (→ 🗎 226) = Master RS485 must be set at the slave. The process output data PO1 – PO3 (*P870/P871/P872 Setpoint description 1/2/3* (→ 🗎 306)) are automatically set by the firmware. A programmable terminal function "Slave free run." *P60. Digital inputs basic device* (→ 🗎 274) / *P61. Digital inputs option* (→ 🗎 275), allows for separating the slave from the master setpoint and switch to local control mode, with exception of the operating mode torque control.

## INFORMATION

The process data *P87.* (→ 🗎 306) of the slave are automatically assignment:

PO1 = Control word 1[1)]

PO2 = Speed or current in M-control

PO3 = IPOS PO data

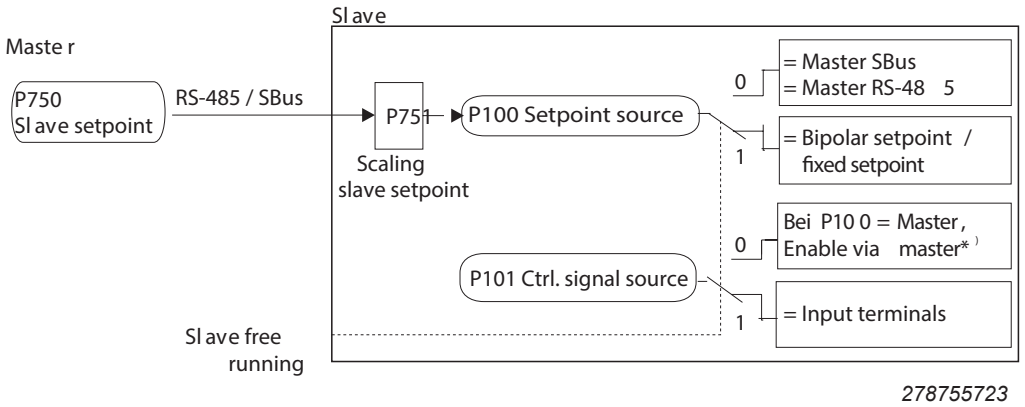
PI1 = Status word 1

PI2 = Speed

PI3 = IPOS PI data

PI3 and PO3 are not used and are available in IPOS$^{PLUS®}$ as required.

The function "Slave free run." resets the PO and PI data to the value previously set.




278755723

## INFORMATION

*P811 RS485 group address* (→ 🗎 298) or *P882 SBus group address* (→ 🗎 308) must be set to the same value in master and slave. For master/slave operation via RS485 interface, set *P811 RS485 Group address* (→ 🗎 298) to a value greater than 100. For operation via system bus (e.g. master/slave operation), the bus terminating resistors at the start and end of the system bus must be activated (S12 = ON).

1) DIØØ "/Controller inhibit" and the programmed digital inputs Enable, CW, and CCW must also receive a "1" signal.

*Connection check*

- System bus (SBus): *P883 SBus timeout interval* (→ 🗎 308) is effective when there is a communication link via the SBus. If *P883 SBus timeout interval* (→ 🗎 308) = 0, data transmission via SBus will not be monitored.
- RS485 interface: A connection check is always in effect if the communication link takes place via the RS485 interface. *P812 RS485 timeout delay* (→ 🗎 298) does not have any function. The slave inverters must receive a valid RS485 telegram within the fixed time interval of t = 500 ms. If the time is exceeded, the slave drives will stop at the emergency stop ramp and fault message F43 "RS485 timeout" will be issued.
- In case of communication via SBus 2, parameter *P893 Timeout interval SBus* (→ 🗎 308) should be set to ≥ 10 ms (recommendation: 100 ms).

## INFORMATION

The error is automatically reset and the drives are enabled when the slave inverters once again receive a valid telegram.

The connection check is effective at both RS485 interfaces. If you have connected a PC using XT and the UWS21B or USB11A option, every telegram from the PC will reset the error.

27793230/EN – 08/2022

*Overview of functions of master/slave operation*

| Function | Master | | Slave | |
|---|---|---|---|---|
| | ***P750 Slave setpoint*** (→ 🗎 293) | ***P700 Operating mode 1*** (→ 🗎 282) | ***P100 Setpoint source*** (→ 🗎 226) | ***P700 Operating mode 1*** (→ 🗎 282) |
| Speed synchronism:<br>• Master controlled<br>• Slave controlled | Speed RS485 + SBus<br>Speed RS485<br>Speed SBus | VFC<br>VFC & Group<br>VFC & Hoist<br>V/f characteristic curve<br>V/f & DC braking | Master SBus 1<br>Master RS485 | VFC<br>VFC & Group<br>VFC & Hoist<br>V/f characteristic curve<br>V/f & DC braking |
| Speed synchronism:<br>• Master speed controlled<br>• Slave controlled | Speed RS485 + SBus<br>Speed RS485<br>Speed SBus | VFC n-control<br>VFC n-control & ...<br>CFC<br>CFC/Servo & IPOS<br>CFC/Servo & Synchronous operation | Master SBus 1<br>Master RS485 | VFC<br>VFC & Group<br>VFC & Hoist |
| Speed synchronism:<br>• Master speed controlled<br>• Slave controlled<br>• Drives do not have a rigid mechanical connection. | Speed RS485 + SBus<br>Speed RS485<br>Speed SBus | VFC n-control<br>VFC n-control & ...<br>CFC/Servo<br>CFC/Servo & IPOS<br>CFC/Servo & Synchronous operation | Master SBus 1<br>Master RS485 | VFC n-control<br>VFC n-control & group<br>VFC n-control & hoist<br>CFC<br>Servo |
| Speed synchronism:<br>• Master controlled<br>• Slave controlled<br>• Drives do not have a rigid mechanical connection. | Speed RS485 + SBus<br>Speed RS485<br>Speed SBus | VFC<br>VFC & Group<br>VFC & Hoist | Master SBus 1<br>Master RS485 | VFC n-control<br>VFC n-control & group<br>VFC n-control & hoist<br>CFC<br>Servo |
| Load distribution:<br>• Master controlled<br>• Slave controlled | Load distribution RS485 + SBus<br>Load distribution RS485<br>Load distribution SBus | VFC<br>VFC & Group<br>VFC & Hoist | Master SBus 1<br>Master RS485 | VFC<br>VFC & Group<br>VFC & Hoist |
| Load distribution:<br>• Master speed controlled<br>• Slave controlled | Load distribution RS485 + SBus<br>Load distribution RS485<br>Load distribution SBus | VFC n-control<br>VFC n-control & ...<br>CFC/Servo<br>CFC/Servo & IPOS<br>CFC/Servo & Synchronous operation | Master SBus 1<br>Master RS485 | VFC<br>VFC & Group<br>VFC & Hoist<br>VFC & flying start function |
| Load distribution:<br>• Master speed controlled<br>• Slave controlled | Not possible | | | |
| Load distribution:<br>• Master controlled<br>• Slave controlled | Not possible | | | |
| Torque control of the slave:<br>• Master speed controlled<br>• Slave torque controlled | Torque RS485 + SBus<br>Torque RS485<br>Torque SBus | CFC/Servo<br>CFC/Servo & IPOS<br>CFC/Servo & Synchronous operation | Master SBus 1<br>Master RS485 | CFC/Servo & Torque control |

27793230/EN – 08/2022

*Speed synchronism*

**Speed synchronism (speed RS485/speed SBus/speed RS485 + SBus):**

The actual speed of the master is transferred to the slave. Set the torque ratio for the slave inverter using *P751 Scaling slave setpoint* (→ 🗎 294). Leave *P324/P334 Slip compensation 1/2* (→ 🗎 254) of the slave at the value as the startup setting. Example:

| Parameters | Setting on the master | Setting on the slave |
|---|---|---|
| *P100 Setpoint source* (→ 🗎 226) | Such as unipolar/fixed setpoint | Master SBus |
| *P101 setpoint source* (→ 🗎 227) | Such as terminals | Not in effect |
| *P700 Operating mode 1* (→ 🗎 282) | VFC n-control | VFC 1 |
| *P750 Slave setpoint* (→ 🗎 293) | Speed (SBus) | Master/slave off |
| *P751 Scaling of slave setpoint* (→ 🗎 294) | Not in effect | 1 (then 1 : 1) |
| *P810 RS485 Address* (→ 🗎 298) | Set different values | |
| *P811 RS485 group address* (→ 🗎 298) | Not in effect | |
| *P881 Address SBus 1* (→ 🗎 308) | Set different values | |
| *P882/P892 SBus Group address* (→ 🗎 308) | Set the same value (0 – 63) | |
| *P884/P894 SBus baud rate* (→ 🗎 308) | Set the same value (125, 250, 500, or 1000 kBaud) | |

27793230/EN – 08/2022

*Load distribution*

**Load distribution (load distribution RS485/load distribution SBus/load distribution RS485 + SBus):**

This function allows for 2 inverters to control the same load. The rotating field frequency of the master is transferred to the slave. It is assumed in this case that the shafts of the motors corresponding to the master and the slave are rigidly connected together. You are recommended to use the same motors with the same gear ratios, otherwise different delays may result during starting/stopping due to the premagnetization time and the brake release/application time. *P751 Scaling slave setpoint* (→ 🗎 294) must be set to the value "1".

## INFORMATION

*P324/P334 Slip compensation 1/2* (→ 🗎 254) of the slave must be set to 0.

Better behavior can be accomplished by setting the slave as follows:

- *P138 Ramp limit VFC* (→ 🗎 239): Off
- *P115 Filter setpoint* (→ 🗎 233): 0 s
- Ramps *P130* / *P131* / *P132* / *P133*: 0 s
- *P301/P311 Minimum speed 1/2* (→ 🗎 252): 0 $min^{-1}$

Example:

| Parameters | Setting on the master | Setting on the slave |
|---|---|---|
| *P100 Setpoint source* (→ 🗎 226) | Such as bipolar/fixed setpoint | Master RS485 |
| *P101 Control signal source* (→ 🗎 227) | Such as terminals | Not in effect |
| *P324 Slip compensation 1* (→ 🗎 254) | Do not change | 0 |
| *P700 Operating mode 1* (→ 🗎 282) | VFC 1 | VFC 1 |
| *P750 Slave setpoint* (→ 🗎 293) | Load distribution (RS485) | Master/slave off |
| *P751 Scaling slave setpoint* (→ 🗎 294) | Not in effect | 1 (then 1 : 1) |
| *P810 RS485 Address* (→ 🗎 298) | Set different values | |
| *P811 RS485 group address* (→ 🗎 298) | Set the same value (101 – 199) | |
| *P881 Address SBus 1* (→ 🗎 308) | Set different values | |
| *P882/P892 SBus Group address* (→ 🗎 308) | Not in effect | |
| *P884/P894 SBus baud rate* (→ 🗎 308) | Not in effect | |

27793230/EN – 08/2022

*Torque control*

**Torque control of the slave (torque RS485/torque SBus/torque Rs485 + SBus):**

The slave inverter receives the torque setpoint of the master directly (the manipulated value of the speed controller). This also enables high quality load distribution to be achieved, for example. This setting should be preferred over load sharing if the drive configuration permits it. Set the torque ratio using *P751 Scaling slave setpoint* (→ 🗎 294). Example:

| Parameters | Setting on the master | Setting on the slave |
|---|---|---|
| *P100 Setpoint source* (→ 🗎 226) | Such as unipolar/fixed setpoint | Master RS485 |
| *P101 Control signal source* (→ 🗎 227) | Such as terminals | Not in effect |
| *P700 Operating mode 1* (→ 🗎 282) | CFC | CFC + torque control |
| *P750 Slave setpoint* (→ 🗎 293) | Torque RS485 | Master/slave off |
| *P751 Scaling slave setpoint* (→ 🗎 294) | Not in effect | 1 (then 1 : 1) |
| *P810 RS485 Address* (→ 🗎 298) | Set different values | |
| *P811 RS485 group address* (→ 🗎 298) | Set the same value (101 – 199) | |
| *P881 Address SBus 1* (→ 🗎 308) | Set different values | |
| *P882/P892 SBus Group address* (→ 🗎 308) | Not in effect | |
| *P884/P894* SBus baud rate (→ 🗎 308) | Not in effect | |

*P750 Slave setpoint*

The master is used to determine the setpoint transmitted to the slave. The "master/slave off" setting must be retained on the slave.

- **Master/slave off**
- Speed RS485
- Speed SBus1
- Speed 485 + SBus1
- Torque RS485
- Torque SBus1
- Torque 485 + SBus1
- Load distribution RS485
- Load distribution SBus1
- Load distribution 485 + SBus1

27793230/EN – 08/2022

*P751 Scaling of slave setpoint*

Setting range: -10 – **1** – 10

When this setting is made in the slave, the setpoint transferred from the master is multiplied by this factor.

### P76. Manual operation

*P760 Lock run/stop keys*

Setting range: On/**off**

**Off**: Run/stop keys of the DBG60B keypad are active and can be used for starting and stopping the motor.

On: Run/stop keys of the DBG60B keypad are locked and therefore without function.

### P77. Energy-saving function

Energy can be saved in the operation of pumps, fans, conveyor belts etc. In this procedure, the magnetization of the asynchronous motor is controlled depending on the load by adapting the voltage-frequency ratio; the motor is under-magnetized.

*P770 Energy-saving function*

Setting range: On/**off**

The parameter is only effective in "VFC," "VFC & Group," "VFC & flying start function" and "V/f characteristic curve" operating modes.

During no-load operation, the power consumption of the inverter can be reduced by up to 70%. Note the following limitations:

- The energy-saving function only offers advantages in the part-load range.
- No large step changes in load should occur during operation.

### P78. Ethernet configuration

The parameter group P78. includes display and setting values that are specific to the DFE33B option card.

*P780 IP address*

Setting range: 000.000.000.000 – **192.168.10.4** – 223.255.255.255

Use *P780* to set the IP address for linking MOVIDRIVE® B via Ethernet. The IP address consists of 4 bytes in decimal form separated by dots. If the value is set via the DIP switch of the DHCP (Dynamic Host Configuration Protocol) option, the value specified by the DHCP server will be displayed.

*P781 Subnet mask*

Setting range: 000.000.000.000 – **255.255.255.0** – 255.255.255.255

Factory setting at delivery is a class C network.

The subnet mask divides the network into subnets. The set bits determine which part of the IP address represents the address of the (sub)net. If the DHCP option is activated via the DIP switch, the value specified by the DHCP server will be displayed.

*P782 Standard gateway*

Setting range: **000.000.000.000** – 255.255.255.255

27793230/EN – 08/2022

The standard gateway is addressed if the desired communication partner is not within the actual network. The standard gateway will have to be part of the actual network. If the DHCP option is activated via the DIP switch, the value specified by the DHCP server will be displayed.

*P783 Baud rate*

Display value, cannot be altered. Shows the current baud rate of the Ethernet connection. During the initialization phase of the DFE32/33, the value "0" is displayed for approximately 35 s.

*P784 MAC address*

Display value, cannot be altered. Displays the MAC address, i.e. the unique layer-2 Ethernet address of the interface.

*P785 EtherNet/IP™ Startup Configuration*

Setting range: **DHCP**/Saved IP parameters

Only available with EtherNet/IP™ option.

- **DHCP**: The DFE13B option is assigned its IP parameters (P780 (→ 🗎 294) – *P782* (→ 🗎 294)) by a DHCP server when the supply voltage is switched on.
- Saved IP parameters: The option is started with the saved IP parameters when the supply voltage is switched on.

27793230/EN – 08/2022

### 8.3.10 Parameter group 8: Device functions

**P80. Setup**

*P800 User menu*

User menu only for DBG60B keypad.

Setting range: On/**off**

*P800* enables the DBG60B keypad to be switched between the individual user menu and the detailed parameter menu. A slash following the parameter number indicates that the user menu is activated. The parameters in the factory set user menu are indicated by a "\" in the parameter list. The previously selected menu is active after the MOVIDRIVE® B device has been switched off and on again.

*P801 Language*

Language selection only for DBG60B keypad.

Use *P801* to set different languages in the DBG60B keypad. The language setting is not changed by the factory setting of MOVIDRIVE® MDX60B/61B.

*P802 Factory setting*

Setting range: **No**/standard/delivery state

Reestablishes the factory setting for the parameter saved in EEPROM.

## INFORMATION

Before you reset the parameter, save the set parameter values using the MOVITOOLS® MotionStudio engineering software. After the reset, you must readjust the parameter values and terminal assignments in accordance with the requirements.

- "Standard" setting: nearly all parameter values are overwritten. The following data is **not** reset:
  - *P20. Speed control* .(→ 🗎 242)
  - *P210 P-gain hold controller* (→ 🗎 244)
  - *P26. Process controller parameter* (→ 🗎 248)
  - *P27. Process controller input values* (→ 🗎 250)
  - *P28. Process controller limits* (→ 🗎 251)
  - *P30./P31. Limits 1 / 2* (→ 🗎 252)
  - *P32./P33. Motor compensation 1/2 (asynchronous)* (→ 🗎 253)
  - *P345/346 IN/UL monitoring 1/2* (→ 🗎 257)
  - *P557 DCS actual position source* (→ 🗎 271)
  - *P70. Operating modes* (→ 🗎 282)
  - *P73. Brake function* (→ 🗎 286)
  - *P78. Ethernet configuration* (→ 🗎 294)
  - *P810 RS485 Address* (→ 🗎 298)
  - *P811 RS485 group address* (→ 🗎 298)
  - *P88. Serial communication SBus 1* (→ 🗎 308) (except *P883 Timeout interval SBus 1* (→ 🗎 308), *P885 Synchronization ID SBus 1* (→ 🗎 308), *P884 Baud rate SBus 1* (→ 🗎 308), *P888 Synchronization time* (→ 🗎 309))

27793230/EN – 08/2022

  - *P89. Serial communication SBus 2* (→ 🗎 308) (except *P883 Timeout interval SBus 2* (→ 🗎 308), *P885 Synchronization ID SBus 2* (→ 🗎 308))
  - *P905 HIPERFACE offset X15* (→ 🗎 313)
  - *P910 Gain X controller* (→ 🗎 314)
  - *P938 Speed task 1* (→ 🗎 320)/*P939 Speed task 2* (→ 🗎 320)
  - *P94. IPOS encoder* (→ 🗎 321) (except *P944 Encoder scaling ext. Encoder* (→ 🗎 322))
  - *P95. Absolute encoder* (→ 🗎 325) (except *P955 Encoder scaling* (→ 🗎 326))
  - Fault memory
  - Statistical data
  - PROFINET device name
- Setting "Delivery state": All parameter values are overwritten.

The 7-segment display of the device shows the status "8" during the reset. The parameter automatically returns to the "No" setting.

*P803 Parameter lock*

Setting range: On/**off**

- On: The device can **not** be started. Any adjustment to the parameters is prevented. The following parameters are excluded from the inhibit:
  - *P780 IP address* (→ 🗎 294)
  - *P781 Subnet mask* (→ 🗎 294)
  - *P782 Standard gateway* (→ 🗎 294)
  - *P785 EtherNet/IP™ Startup configuration* (→ 🗎 295)
  - *P803 Parameter lock*
  - *P819 Fieldbus timeout interval* (→ 🗎 299)
  - *P840 Manual reset* (→ 🗎 302)
  - *P876 PO data enable* (→ 🗎 307)
  - *P931 IPOS control word task 1* (→ 🗎 320)

  A parameter lock is useful, for example, after an optimized setting of MOVIDRIVE® B.
- **Off**: Parameter adjustments are possible.

*P804 Reset statistic data*

Setting range: **No**/fault memory/kWh counter/operating hours

Resets the statistical data, error memory, kilowatt-hour meter, and operating hours counter stored in EEPROM.

This data is not reset when selecting the "Standard" of the parameter *P802 Factory setting* (→ 🗎 296).

*P806 Copy DBG → MDX*

Setting range: Yes/**no**

The parameter data in the DBG60B are transmitted to MOVIDRIVE®.

27793230/EN – 08/2022

*P807 Copy MDX → DBG*

Setting range: Yes/**no**

The parameter data set in MOVIDRIVE® are transmitted to the DBG60B keypad.

**P81. Serial communication**

*P810 RS485 Address*

Setting range: **0** – 99

*P810* sets the address by means of which communication can take place with MOVIDRIVE® B via the serial interfaces. A maximum of 32 stations can be interconnected.

## INFORMATION

On delivery, the MOVIDRIVE® B address is always set to 0. You are recommended not to use the 0 address in order to avoid collisions during data transmission when several inverters are involved in serial communication.

*P811 RS485 group address*

Setting range: **100** – 199

*P811* allows for grouping several MOVIDRIVE® B devices for communication via the serial interface. All MOVIDRIVE® B devices with the same RS485 group address can thus be addressed using a multicast telegram via this address. The data received via the group address is not acknowledged by MOVIDRIVE® B. For example, the RS485 group address makes it possible to send setpoint selections to a group of MOVIDRIVE® B inverters simultaneously. Group address 100 means that no group is assigned to the inverter.

*P812 RS485 timeout interval*

Setting range: **0** – 650 s

*P812* sets the monitoring time for data transmission via the serial interface. MOVIDRIVE® B performs the error response set in *P833 'RS485 timeout' response* (→ 🗎 301) if there is no cyclical process data exchange via the serial interface for the period set in *P812*. Serial data transmission is not monitored when *P812* is set to 0. Monitoring is activated with the first cyclical data exchange.

27793230/EN – 08/2022

*P819 Fieldbus timeout interval*

Setting range: 0 – **0.5** – 650 s

*P819* sets the monitoring time for data transmission via the implemented fieldbus (DFx). MOVIDRIVE® B performs the fault response set in *P831 'Fieldbus timeout' response* (→ 🗎 301) if there is no data traffic via the fieldbus for the period set in *P819*. When *P819* is set to the value 0 or 650, data transmission via fieldbus is not monitored. The timeout time is specified automatically by the DP master with PROFIBUS-DP and DeviceNet. Changing this parameter does not have any effect and is overwritten whenever the PROFIBUS-DP is started up again.

### P82. Braking operation

*P820/P821 4-Quadrant operation 1/2*

Setting range: **On**/Off

The parameter is only effective in operating modes without encoder feedback (VFC and V/f). 4-quadrant operation is assumed in all other operating modes.

- If a braking resistor is connected to the device, the following 4-quadrant operating modes are possible:
  - CCW / CW
  - Motor/regenerative
- Parameter must be set to "OFF" if there is no braking resistor connected to device, which means regenerative operation is not possible.

  In these operating modes, the device attempts to extend the deceleration ramp so the generated power is not too great and the DC link voltage remains below the switch-off threshold.

  Despite the fact that the deceleration ramps are automatically extended by device, it is possible that the regenerated power during braking may be too great, leading to device switching itself off and issuing error message "F07 "(DC link overvoltage). In this case you have to extend the deceleration ramps manually.

27793230/EN – 08/2022

### P83. Fault responses

With these parameters, you set the response for occurring errors and faults.

The following table shows possible error responses:

| Response | Description |
|---|---|
| No response | An error is not displayed, nor is an error response performed. The signaled error is ignored. |
| Display error | Display of error on the 7-segment display of the device and in the MOVITOOLS® MotionStudio engineering software.<br>The device performs no other error responses.<br>The device can be reset by a device reset (terminal, fieldbus, auto reset). |
| Immediate stop/malfunction | Immediate switch-off of the device with error message.<br>The output stage is inhibited and the brake is applied.<br>The ready signal is revoked.<br>A restart is only possible after a fault reset has been performed during which the device is reinitialized. |
| Emergency stop/malfunction | The drive is braked with the emergency stop ramp t14/t24 " ".<br>Once the stop speed is reached, the output stage is inhibited and the brake is applied.<br>The error is signaled immediately.<br>The ready signal is revoked.<br>A restart is only possible after a fault reset has been performed during which the device is reinitialized. |
| Rapid stop/malfunction | The drive is braked with the stop ramp t13/t23 " ".<br>Once the stop speed is reached, the output stage is inhibited and the brake is applied.<br>The error is signaled immediately.<br>The ready signal is revoked.<br>A restart is only possible after a fault reset has been performed during which the device is reinitialized. |
| Immediate stop/Warning | Immediate switch-off of the device with error message.<br>The output stage is inhibited and the brake is applied.<br>The ready signal is not revoked.<br>The drive restarts without device re-initialization if the error is rectified by an internal procedure or by an error reset. |

27793230/EN – 08/2022

| Response | Description |
|---|---|
| Emergency stop/Warning | The drive is braked with the emergency stop ramp t14/t24 " ".<br>Once the stop speed is reached, the output stage is inhibited and the brake applied.<br>The error is signaled immediately.<br>The ready signal is not revoked.<br>The drive restarts without device re-initialization if the error is rectified by an internal procedure or by an error reset. |
| Rapid stop/Warning | The drive is braked with the stop ramp t13/t23 " ".<br>Once the stop speed is reached, the output stage is inhibited and the brake applied.<br>The error is signaled immediately.<br>The ready signal is not revoked.<br>The drive restarts without device re-initialization if the error is rectified by an internal procedure or by an error reset. |

*P830 Response to "External fault"*

Factory setting: **Emergency stop/malfunction**

Triggered only in the inverter status "Enabled" via an input terminal programmed to "/ External fault".

*P831 'Fieldbus timeout' response*

Factory setting: **Rapid stop/warning**

The error is only triggered in the ENABLED inverter status. *P831* programs the fault response which is triggered by fieldbus timeout monitoring. The response time of the monitoring process can be set with *P819 Fieldbus timeout interval* (→ 🗎 299) (see "Fieldbus device profile" manual for a more detailed description).

*P832 Response to "Motor overload"*

Factory setting: **Emergency stop/malfunction**

Triggered in case of a motor overload. Make one of the following settings to monitor the motor overload:

- In parameter *P340 Motor protection 1* (→ 🗎 255), the setting "One asynchronous motor"
- In parameter *P340 Motor protection 1* (→ 🗎 255), the setting "One servomotor" and in parameter *P530 Sensor type 1* (→ 🗎 267) the setting "KTY"

*P833 'RS485 timeout' response*

Factory setting: **Rapid stop/warning**

*P833* is used to program the fault response that is triggered by the RS485 timeout monitoring. The response time of the monitoring process can be set using *P812 RS485 timeout interval* (→ 🗎 298).

27793230/EN – 08/2022

*P834 Response to "Lag error"*

The response is only possible with DRS11B or IPOS$^{PLUS®}$.

Factory setting: **Emergency stop/malfunction**

*P834* is used to program the fault response that is triggered by lag error monitoring of the "synchronous operation card DRS11B" option and of positioning mode with IPOS$^{PLUS®}$. Different settings are available in *P51. Synchronous operation monitoring* (→ 🗎 264).

*P835 'TF signal' response* AUTO

Factory setting: **No response**

Triggered via the temperature sensor monitoring of the temperature sensor TF or TH in the motor winding, as applicable.

*P836 'Timeout SBus 1/2' response*

Factory setting: **Emergency stop/malfunction**

*P836/P837* are used to program the fault response that is triggered by the system bus timeout monitoring. The response time of the monitoring process can be set with *P883/P893 Timeout interval SBus 1/2* (→ 🗎 308).

**Important:** If the DCS21B/22B/31B/32B option is plugged in, *P837* is automatically set to "Emergency stop/Warning" after each restart.

*P838 'SW limit switch' response*

Factory setting: **Emergency stop/malfunction**

This response is triggered if a target position outside the software limit switch is specified in the referenced drive. The software limit switches are set using parameters *P920/P921 SW limit switch CW/CCW* (→ 🗎 318).

*P839 Response to "Positioning interruption"*

Factory setting: **Emergency stop/warning**

If the parameter *P924 'Position interruption' detection* (→ 🗎 319) is activated, this response is triggered upon interrupting a positioning process.

**P84. Reset behavior**

*P840 Manual reset*

Setting range: Yes/**no**

- Yes: Resets the fault in MOVIDRIVE® B. As soon as the reset is carried out, the parameter automatically resets to the setting "**No**". Activating the manual reset does not have any effect if there is no error present. In case of a fault, you can press the [← / Del] key on the DBG60B to access *P840* directly.
- **No**: No reset is performed.

27793230/EN – 08/2022

*P841 Auto reset*

Setting range: Yes/**no**



**⚠ DANGER**

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

Fatal or severe injuries and damage to property.

- Do not use the auto-reset function with drives where an automatic restart could represent a danger to people or devices.
- Perform a manual reset.

- Yes: Automatically performs a device reset in case of error after an adjustable wait period. The wait period is adjusted via the parameter *P842 Restart time* (→ 🗎 303).

  A maximum of 5 auto resets are possible during an auto reset phase. If 5 errors occur that are reset by an auto-reset, no more auto-resets are possible until one of the following situations occurs:

  – a manual reset is performed using the input terminal,

  – A manual reset is performed via the serial interface (with the MOVITOOLS® MotionStudio engineering software or via the PLC)

  – There is a transition to 24 V backup mode, or the device is switched off completely

  Five auto resets are then possible again.
- **No**: No auto reset is performed.

*P842 Restart time*

Setting range: 1 – **3** – 30 s

Wait time that should occur between the moment an error occurs and the execution of an auto reset.

27793230/EN – 08/2022

### P85. Scaling actual speed value

Specifies a user-specific display parameter. The display parameter is shown in the parameter *P001 User display* (→ 🗎 218).

#### Example

A scaling factor of 1/60 is required to display the actual speed value in $s^{-1}$. The following settings must be specified for the display parameter:

| Parameters | Setting |
|---|---|
| *P850 Scaling factor numerator* | 1 |
| *P851 Scaling factor denominator* | 60 |
| *P852 User unit* | $s^{-1}$ |

With these settings, an actual speed value of 1500 $min^{-1}$ in the parameter *P001 User display* is shown as 25 $s^{-1}$.

*P850 Scaling factor numerator*

Setting range: **1** – 65535

*P851 Scaling factor denominator*

Setting range: **1** – 65535

*P852 User unit*

Factory setting: **1/min** (can only be set via MotionStudio)

The user unit can comprise a maximum of 8 ASCII characters. The user unit is shown in the parameter *P001 User display* (→ 🗎 218).

### P86. Modulation

*P860/P861 PWM frequency 1/2 VFC* 1 2

The parameter is only effective in "VFC & ..." and "V/f ..." operating modes.

Setting range for sizes 0 – 5: **4**/8/12/16 kHz

Setting range for size 6: **4**/8 kHz

Setting range for size 7: **2.5**/4 kHz

Sets the clock frequency on the device output for parameter set 1/2. The set clock frequency can be permanently fixed with the parameter *P862/P863 PWM fix 1/2* (→ 🗎 305).

If the clock frequency is not permanently fixed to the set value, the device automatically switches back to lower clock frequencies when the device utilization reaches a specific level. The modulation frequency reduces switching losses in the output stage and, consequently, device utilization.

27793230/EN – 08/2022

*P862/P863 PWM fix 1/2* 

Setting range: On/**off**

- On: Fixes the clock frequency set in parameter *P860/P861 PWM-frequency 1/2* (→ 🗎 304) for parameter set 1/2. This prevents an automatic reduction of the clock frequency (e.g. when using output filters).
- **Off**: The device automatically reduces the set output frequency (down to minimum 4 kHz) when there is a high level of thermal load on the output stage. This is to avoid a switch-off of the device with the error message "Device utilization".

*P864 PWM frequency CFC*

The parameter is effective only in "CFC & ..." and "Servo & ..." operating modes.

Setting range for sizes 0 – 5: **4**/8/16 kHz

Setting range for size 6: **4**/8 kHz

Setting range for size 7: **2.5**/4 kHz

Sets the clock frequency on the device output for parameter set 1. The cycle frequency is set to a fixed value and is not automatically reduced with high device utilization.

27793230/EN – 08/2022

### P87. Process data description

*P870/P871/P872 Setpoint description PO1/PO2/PO3*

Defines the content of the process output data words PO1/PO2/PO3. MOVIDRIVE® B can only allocate the corresponding setpoint according to this specification.

Specifically, the parameters are:

| Parameters | Factory setting |
|---|---|
| *P870 Setpoint description PO1* | Control word 1 |
| *P871 Setpoint description PO2* | Setpoint speed |
| *P872 Setpoint description PO3* | Ramp |

The process output data words can be allocated as follows:

| Assignment | Description |
|---|---|
| No function | The content of the process output word is ignored. |
| Setpoint speed | Setpoint speed in $min^{-1}$ |
| Setpoint current | Current setpoint input with torque control |
| Setpoint position low | Setpoint position low word |
| Setpoint position high | Setpoint position high word |
| Max. speed | Maximum system speed " " |
| Max. current | Current limiting in % of $I_N$ of the device " " |
| Slip speed | Slip compensation " " |
| Ramp | Ramp time for setpoint selection |
| Control word 1 | Control signals for start/stop, etc. |
| Control word 2 | Control signals for start/stop, etc. |
| Setpoint speed [%] | Speed setpoint input in % of $n_{max}$ |
| IPOS PO data | Response of a 16-bit encoded value for an IPOS$^{PLUS®}$ application module |

For more detailed information, refer to the "Fieldbus Device Profile with List of Parameters" manual.

27793230/EN – 08/2022

*P873/P874/P875 Actual value description PI1/PI2/PI3*

Defines the content of the process input data words PI1/PI2/PI3. MOVIDRIVE® B can only allocate the corresponding actual values according to this specification.

Specifically, the parameters are:

| Parameters | Factory setting |
|---|---|
| *P873 Actual value description PI1* | Status word 1 |
| *P874 Actual value description PI2* | Actual speed |
| *P875 Actual value description PI3* | Output current |

The process input data words can be allocated as follows:

| Assignment | Description |
|---|---|
| No function | The content of the process input data word is $0000_{hex}$ |
| Actual speed | Current speed actual value of the drive in $min^{-1}$ |
| Output current | Present output current of the system in % of $I_N$ |
| Active current | Present active current of the system in % of the nominal device current $I_N$<br>• Positive algebraic sign corresponds to a positive torque.<br>• Negative algebraic sign corresponds to a negative torque. |
| Actual position low [1)] | Current actual position low word |
| Actual position high[1)] | Current actual position high word |
| Status word 1 | Status information of the device |
| Status word 2 | Status information of the device |
| Actual speed [%] | Present actual speed value in % of the maximum speed $n_{max}$ |
| IPOS PE data | Response of a 16-bit encoded value for an IPOS$^{PLUS®}$ application module |
| Status word 3 | Status information of the device |

1) The actual position is read in from the parameter P941 Source actual position. Both the low word and the high word must be set.

For more detailed information, refer to the "Fieldbus Device Profile with List of Parameters" manual.

*P876 PO data enable*

Setting range: **Yes**/no

- **Yes**: The process output data that was last sent from the PLC becomes effective.
- No: The last valid process output data remain in effect.

## INFORMATION

If the process data assignment is changed, the parameter is automatically set to "No". This only occurs if *P100* or *P101* is set to "Fieldbus". In case a bus card is plugged in, the parameter is immediately set to "Yes" in the RAM after booting, even if the value "No" is set in EEPROM. But the EEPROM value will be adopted after a fault reset.

### P88./P89. Serial communication SBus 1/2

*P880/P890 Protocol SBus 1/2*

Setting range: **SBus MOVILINK®**/CANopen/Protocol DCS

*P881/P891 Address SBus 1/2*

Setting range: **0** – 63

Use *P881/P891* to set the system bus address of MOVIDRIVE® B. The MOVIDRIVE® B device can communicate with other MOVIDRIVE® B devices using the system bus (SC11/SC12) by means of the address set here.

*P882/P892 SBus group address 1/2*

Setting range: **0** – 63

*P882/P892* is used to set the system bus group address for multicast telegrams of MOVIDRIVE® B.

*P883/P893 SBus timeout delay 1/2*

Setting range: **0** – 650 s

*P883/P893* is used to set the monitoring time for data transmission via system bus. If there is no data traffic via the system bus during the time period set in *P883/P893*, MOVIDRIVE® will execute the error response set in *P836/P837 'Timeout SBus 1/2' response* (→ 🗎 302). Data transmission via the system bus is not monitored when *P883/P893* are set to the value 0.

*P884/P894 SBus baud rate 1/2*

Setting range: 125/250/**500**/1000 kBaud

*P884/P894* is used to set the transmission speed of the system bus. The total of the baud rates specified in *P884/P894* must not exceed 1125 kBaud.

*P885/P895 Synchronization ID SBus 1/2*

Setting range: **0** – 2047

The drives can be synchronized for transmitting process data and parameter data via the optional CAN bus. For this purpose, the master controller must send a synchronization message to the connected inverter at certain intervals. In this way, the inverters synchronize themselves to the master controller. *P885/P895* is used for setting the identifier (address) of the synchronization message in the inverter for the optional CAN bus. Make sure there is no overlap between the identifiers for the process data or parameter data telegrams.

## INFORMATION

The inverters may either be synchronized by SBus 1 or SBus 2 or by DPRAM (*P970* (→ 🗎 329)). The inverters must **not** be synchronized **from several interfaces at the same time**.

27793230/EN – 08/2022

*P886/P896 CANopen address 1/2*

Setting range: 1 – **127**

*P886*/*P896* is used to set the serial communication with the SBus.

*P887 Synchronization ext. controller*

Setting range: On/**off**

If a MOVIDRIVE® B receives cyclical setpoints from a higher-level controller via SBus 1 or SBus 2 (e.g. position setpoint or master axis position) it is necessary that the MOVIDRIVE® B processor works synchronously with the control processor so that the internal time dial for the position controller is an integer divisor of the synchronization time (the cycle time for the new setpoints from the control).

This setting prevents information from being processed twice and ensures that setpoint jumps do not occur due to beat effects or long-term drift.

The synchronization of MOVIDRIVE® B and control takes place via *P885/P895 Synchronization ID SBus 1/2* (→ 🗎 308), the time dial is set using *P887*.

You will have to set *P916 Ramp type* (→ 🗎 315) to "Bus ramp" for cyclical presetting of the position setpoint.

On: the internal time dial for position control will have to be set to exactly 1 ms.

**Off**: The internal time dial for position control is set to the standard SEW time base (ca. 1 ms).

If several MOVIDRIVE® B devices are synchronized via SBus without control, *P887* has to be set to OFF in all inverters.

Information: For technical reasons, the setting *P887* = On is available for field-oriented operating modes with CFC or SERVO only. VFC operating modes always work with the standard SEW time base.

*P888 Synchronization time*

Setting range: 1 – **5** – 10 ms

Cycle time for new setpoints of a higher-level controller.

See also *P885/P895 Synchronization ID SBus 1/2* (→ 🗎 308) / *P887 Synchronization ext. Controller 1/2* (→ 🗎 309).

*P889/P899 Parameter channel 2*

Setting range: On/**off**

On: The second parameter channel is active

**Off**: The second parameter channel remains inactive

27793230/EN – 08/2022

### 8.3.11 Parameter group 9: IPOS parameters

These parameters can only be used in connection with IPOS$^{PLUS®}$ application modules.



**⚠ DANGER**

Risk of crushing if the motor starts up unintentionally.

Fatal or severe injuries and damage to property.

- Ensure that the motor cannot start unintentionally.
- Note that modifying these parameters without knowledge of the IPOS$^{PLUS®}$ application module which may be active can cause unexpected movements and place unwanted loads on the mechanical drive train. It is essential that you are familiar with the "Positioning and process control with IPOS$^{PLUS®}$" manual to make the setting for these parameters.

#### P90. IPOS reference travel

Reference travel is used to establish a machine zero to which all absolute positioning commands refer.

The parameter *P903 Reference travel type* (→ 🗎 312) specifies various reference travel strategies which define the corresponding travel modes. For example, if a reference travel is carried out with a reference cam, the machine zero is calculated as follows:

*Machine zero = reference position + reference offset*

The reference position is determined in the reference travel and the reference offset in the parameter *P900 Reference offset* (→ 🗎 311).

The speeds of the travel movements required on the basis of the reference travel type are set using *P901 Reference speed 1* (→ 🗎 311) and *P902 Reference speed 2* (→ 🗎 311).

27793230/EN – 08/2022

*P900 reference offset*

Setting range: -($2^{31}$-1) – **0** – ($2^{31}$-1)

Zero position correction for calculating the machine zero

All absolute positioning commands refer to the machine zero.

The machine zero is calculated as follows:

*Machine zero = reference position + reference offset*

The reference position is determined in the reference travel.

The reference offset always refers to the encoder. This encoder can be a motor encoder, an external encoder or a DIP encoder. Select the encoder in the parameter *P941 Source actual position* (→ 🗎 321).

The actual positions are displayed in the following IPOS$^{PLUS®}$ variables:

- The DIP encoder in the IPOS$^{PLUS®}$ variable *H509 Actual position.*
- The external encoder in the IPOS$^{PLUS®}$ variable *H510 Actual position*.
- The motor encoder in the IPOS$^{PLUS®}$ variable *H511 Actual position*.

The reference offset becomes active after reference travel has been completed successfully.

## INFORMATION

In the case of a reference travel with HIPERFACE® encoder, the value of the parameter *P905 HIPERFACE® offset (motor)* is recalculated and overwritten as follows:

HIPERFACE® offset = encoder value - reference offset

*P901 Reference speed 1*

Setting range: 0 – **200** – 6000 min$^{-1}$

Specifies the travel speed for the first part of the reference travel until reaching the reference cam.

Stop ramp t13 " " is always used to change the speed. The search directions during reference travel are determined by the respective reference travel type.

*P902 Reference speed 2*

Setting range: 0 – **50** – 6000 min$^{-1}$

Specifies the travel speed for the second part of the reference travel from leaving the reference cam until reaching the first zero pulse.

Stop ramp t13 " " is always used to change the speed. The search directions during reference travel are determined by the respective reference travel type.

27793230/EN – 08/2022

*P903 Reference travel type*

Setting range: **0** – 8

Reference travel strategy with which the machine zero of a system is specified. This defines a travel mode for searching for a reference cam, for example.

This parameter also specifies the search direction for the reference cam in the individual referencing phases.

Use parameter *P904 Referencing to zero pulse* (→ 🗎 313) to determine if the reference travel takes place to the edge change of the reference cam or the next zero pulse of the encoder.

An operationally ready and enabled drive is prerequisite for carrying out the reference travel. The reference travel type 8 is an exception.

The following reference travel types are possible:

- Type 0: Left zero pulse
  - First search direction: CCW
  - Reference point: CCW zero pulse from current position
  - Machine zero: Reference position + reference offset
- Type 1: Left end of the reference cam
  - First search direction: CCW
  - Reference point: First zero pulse or falling edge to the left of the reference cam
  - Machine zero: Reference position + reference offset
- Type 2: Right end of the reference cam
  - First search direction: CW
  - Reference point: First zero pulse or falling edge to the right of the reference cam
  - Machine zero: Reference position + reference offset
- Type 3: Limit switch right
  - First search direction: CW
  - Reference point: First zero pulse or falling edge to the left of the right limit switch
  - Machine zero: Reference position + reference offset
  - Reference travel should take place to zero pulse.
- Type 4: Limit switch left
  - First search direction: CCW
  - Reference point: First zero pulse or falling edge to the right of the left limit switch
  - Machine zero: Reference position + reference offset
  - Reference travel should take place to zero pulse.
- Type 5: No reference travel
  - Reference point: Current position (referencing with drive enable)
  - Machine zero: Reference offset
- Type 6: Reference cam flush with right limit switch
  - First search direction: CW
  - Reference point: First zero pulse or falling edge to the left of the reference cam

27793230/EN – 08/2022

  - Machine zero: Reference position + reference offset
  - Reference cam and limit switches must be flush.
- Type 7: Reference cam flush with left limit switch
  - First search direction: CCW
  - Reference point: First zero pulse or falling edge to the right of the reference cam
  - Machine zero: Reference position + reference offset
  - Reference cam and limit switches must be flush.
- Type 8: Resetting of encoder position without enable
  - Reference point: Current position (referencing with drive enable)
  - Machine zero: Reference offset
  - Reference travel can take place when the drive is not ready for operation.

*P904 Reference travel to zero pulse*

Setting range: **Yes**/No

- **Yes**: The drive is referenced to the zero pulse of the selected IPOS$^{PLUS®}$ encoder.
- No: Reference travel takes place to the falling edge of the reference cam.

*P905 Hiperface offset X15*

Setting range: -($2^{31}$ - 1) – **0** – ($2^{31}$ - 1)

Specifies the zero point of the encoder display.

Use this parameter to define the machine zero without reference travel. It adds or subtracts the offset from the encoder value. The IPOS$^{PLUS®}$ variable *H511 Actual position* of the motor encoder is calculated directly after input of values as follows:

*H511* = Encoder value - HIPERFACE® offset

A HIPERFACE® multi-turn encoder must be referenced once, a HIPERFACE® single-turn encoder must always be referenced.

## INFORMATION

In the case of a reference travel with HIPERFACE® encoder, the value of the parameter *P905 HIPERFACE® offset (motor)* is recalculated and overwritten as follows:

HIPERFACE® offset = encoder value - reference offset

*P906 Cam distance*

Contains the number of increments from leaving the reference cam to the zero pulse of the motor encoder. The parameter is displayed following successfully completed reference travel.

Ideally, the cam distance is half the encoder resolution after 4x evaluation. In order to approach the ideal case, you may have to adjust the cam.

27793230/EN – 08/2022

### P91. IPOS Travel parameters

*P910 Gain X controller*

Setting range: 0.1 – **0.5** – 32

Setting value for the P controller of the position control loop in the IPOS$^{PLUS®}$ application module

In the basic setting, the value of the parameter *P210 P-gain hold controller* (→ 🗎 244) is accepted.

*P911/P912 Positioning ramp 1/2*

Setting range: 0.01 – **1** – 20 s

Value set for the ramp used depending on *P916* (→ 🗎 315) during the positioning operation.

- The positioning ramp 1 is always used in the case of a sinusoidal or square ramp for acceleration and brake deceleration.
- With a linear ramp (P916 = "Linear" or "Jerk limited"), the braking deceleration is set depending on the ramp mode *P917* (→ 🗎 318).
  - If the ramp mode "Mode 1" is set, braking deceleration for travel to target position (spot braking) only takes place with positioning ramp 2. Positioning ramp 1 is used for all other positioning operations.
  - If the ramp mode "Mode 2" is set, positioning ramp 2 is always used during travel for brake deceleration when changing the travel speed. Positioning ramp 1 is used for acceleration.

*P913/P914 Travel speed CW/CCW*

Setting range: 0 – **1500** – 6000 min$^{-1}$

Speed used for positioning. It is limited by the maximum speed of the motor.

## INFORMATION

In order to prevent a lag error, always set the maximum speed about 10% greater than the travel speed.

*P915 Velocity precontrol*

Setting range: -199.99 – 0 – **100** – 199.99%

Parameter is only in effect with the "linear" and "jerk limited" ramp types. The function has no effect for the ramp types "Sine" and "Squared".

Setting range: -199.99 – 0 – **100** – 199.99%

- Setting "**100%**": The drive runs optimally with regard to time using the linear velocity profile.
- If a value less than 100% is specified, a larger gap between position setpoint and actual position occurs (lag distance) during a positioning operation. This results in a "soft" run-in to the target position for the acceleration procedure.

27793230/EN – 08/2022

*P916 Ramp type* 

Specifies the type of positioning ramp. This influences the speed or acceleration characteristics during positioning.

## INFORMATION

The following ramp types are not supported when *P702 Motor category* (→ 🗎 283) is set to "linear":

- Velocity interpolation
- Position interpolation 12 bit
- Position interpolation 16 bit

The following ramp types are possible:

| Ramp type | Positioning performance |
|---|---|
| **Linear** | Optimum time, however block-shaped acceleration characteristic |
| Square | Softer acceleration, but higher torque demand than Ramp type "linear" |
| Sine | Very soft acceleration profile, but required torque higher than with "Squared" acceleration profile |
| Bus ramp | Setting for operation of the device with a PLC.<br>The PLC generates a cyclical position setpoint that is written directly to the position controller. The ramp generator is deactivated. The position specifications sent cyclically by the PLC are interpolated linearly. For configuration, one process output data word must be set to "position high" and another one to "position low". |
| Jerk-limited | Based on the principle of the linear ramp, the torque and, therefore, the acceleration is trapezoidal.<br>During acceleration, the torque is increased over time in linear form to the maximum value. In the same way, the torque is reduced again over time in linear form to zero. Consequently, the system experiences almost no vibration.<br>If a jerk time is set, the positioning time extends relative to the linear ramp by the set jerk time. The acceleration and torque do not increase in comparison with the linear ramp. |
| Cam | Activating the technology function "Electronic cam". |
| I-synchronous operation | Activating the technology function "Electronic synchronous operation". |
| Cross Cutter | Activating the technology function "Cross cutter". |

27793230/EN – 08/2022

| Ramp type | Positioning performance |
|---|---|
| Velocity interpolation | The speed values sent cyclically by the external controller are interpolated linearly.<br>• Speed specification via process data:<br>– Set *P888 Synchronization time SBus* " " (→ 309) to 5 ms or 10 ms<br>– Set *P100 Setpoint source* (→ 226) to "SBus" or "Fieldbus"<br>– You have to set a process output data word to "Speed".<br>• Speed specification via SBus/SCOM object:<br>– Set *P888 Synchronization time SBus* (→ 309) to 1 – 10 ms<br>– Set the *P100 Setpoint source* (→ 226) to "Bipolar/ fixed setpoint"<br>– You must not set a process output data word to "Speed"<br>– Create a SCOM receive object (using the SCOM receive command → IPOS$^{PLUS®}$ manual) with the target variable *SetPosBus* (H499) |
| Position interpolation 12 bit | The position specifications sent cyclically by the external controller are interpolated. Position resolution: 1 revolution corresponds to 4096 increments (12 bit).<br>• Position specification using process data:<br>– Set *P888 Synchronization time SBus* to 5 ms or 10 ms<br>– Set *P100 Setpoint source* to "SBus" or "Fieldbus"<br>– Set one process output data word to "position HIGH" and another one to "position LOW".<br>• Position specification via SBus/SCOM object:<br>– Set *P888 Synchronization time SBus* to 1 – 10 ms<br>– Set *P100 Setpoint source* to "Bipolar/fixed setpoint"<br>– Do not set a process output data word to "position HIGH" or "position LOW".<br>– Create a SCOM receive object (using the SCOM receive command → IPOS$^{PLUS®}$ manual) with the target variable *SetPosBus* (H599) |

27793230/EN – 08/2022

| Ramp type | Positioning performance |
|---|---|
| Position interpolation 16 bit | The position specifications sent cyclically by the external controller are interpolated. Position resolution: 1 revolution corresponds to 65536 increments (16 bit).<br>• Position specification using process data<br>– Set *P888 Synchronization time SBus* to 5 ms or 10 ms<br>– Set *P100 Setpoint source* to "SBus" or "Fieldbus"<br>– Set one process output data word to "position HIGH" and another one to "position LOW".<br>**Notice**: Position resolution via PI data assignment is 4096 increments per revolution (= 12 bit)<br>IPOS$^{PLUS®}$ variable H508 provides the motor position, extended to 16 bits.<br>The IPOS$^{PLUS®}$ variable *ActPos_Mot* (H511) has a position resolution of 4096 increments per revolution (= 12 bit)<br>• Position specification via SBus/SCOM object:<br>– Set *P888 Synchronization time SBus* to 1 – 10 ms<br>– Set *P100 Setpoint source* to "BIPOL./FIXED SETPT".<br>– Do not set a process output data word to "position HIGH" or "position LOW".<br>– Create a SCOM receive object (using the SCOM receive command → IPOS$^{PLUS®}$ manual) with the target variable *SetPosBus* (H499)<br>**Notice**: Position resolution via PI data assignment is 4096 increments per revolution (= 12 bit)<br>The position resolution of 4096 increments per revolution (= 12 bit) expanded to 16 bit is available on IPOS$^{PLUS®}$ variable H508<br>The IPOS$^{PLUS®}$ variable *ActPos_Mot* (H511) has a position resolution of 4096 increments per revolution (= 12 bit) |

## INFORMATION

Note the following for the "Position interpolation 16 Bit" ramp type:

- IPOS variable H508 is also used when S14 is set to ON. IPOS variable H508 only provides meaningful values when
  - DIP switch S14 = "On" **or**
  - *P916 Ramp type* = "Position interpolation 16 bit"

27793230/EN – 08/2022

*P917 Ramp mode*

Setting range: **Mode 1**/Mode 2/Mode 3

Determines use of the positioning ramp 2 (→ 🗎 314).

- **Mode 1**: Braking deceleration for travel to target position (spot braking) takes place only with positioning ramp 2. Positioning ramp 1 is used for all other positioning operations.

  If 12 bit or 16 bit position interpolation is active, it runs in mode 1 without dead time compensation.
- Mode 2: If the travel speed changes during travel, the positioning ramp 2 is always used for brake deceleration. Positioning ramp 1 is used for acceleration.

  If 12 bit or 16 bit position interpolation is active, it runs in mode 2 without dead time compensation.
- Mode 3: This bus position interpolator is based on the bus setpoint.

*P918 bus setpoint source*

Setting range: 0 – **499** – 1023

Sets the source for the setpoint in the IPOS$^{PLUS®}$ application module when operating with EtherCAT®.

**P92. IPOS monitoring**

*P920/P921 SW limit switch CW/CCW*

The software limit switches are only monitored in IPOS$^{PLUS®}$ Operating modes.

Setting range: -($2^{31}$-1) – **0** – ($2^{31}$-1)

Specifies the limits of the target range in the software in which the travel commands are still accepted. However, the drive can move past the target specified due to the mass moment of inertia of the machine or if the parameter settings are set incorrectly in the controller. Software limit switches cannot prevent this from happening.

If *P941 Source actual position* (→ 🗎 321) is set to "motor encoder" or "external encoder", then the software limit switches do not take effect until after performance of a reference travel.

If the target position *H492* of the current travel command is outside of the active software limit switch, the travel command is not executed. The drive responds accordingly to the error response set in the parameter *P838 Response 'SW limit switch'* (→ 🗎 302). If the error responses "../warning" or ".../error" are set, then error message "F78" (IPOS SW limit switch) is displayed:

- Setting ".../error": After an error reset, the drive is no longer referenced with the incremental encoder. The software limit switches have no effect. They are only activated again after the drive has been referenced. A drive with absolute encoder, by contrast, remains referenced even after a fault reset.
- Setting ".../Warning": The drive remains referenced after an error reset.

For deactivation, both limit switches must be set to "0" (e.g. for continuous travel).

27793230/EN – 08/2022

*P922 Position window*

Setting range: 0 – **50** – 32767 inc.

Defines a distance range (position window) around the target position of a travel or stop command. The "Axis in position = Yes" condition applies if a drive is inside the position window around the current target position (*H492*). The "Axis in position" information is used as a final condition for waiting positioning commands.

*P923 Lag error window*

Setting range: 0 – **5000** – 2 inc.

Defines a permitted difference between the setpoint and actual position value. The lag error response that is set in the parameter *P834 Response to 'lag error'* (→ 🗎 302) is triggered upon exceeding.

The setting "0" deactivates the lag error monitoring.

*P924 Positioning interruption detection*

Setting range: On/**off**

Adjusts whether an interruption of the positioning process (withdrawal of enable) is monitored. The error response is set in the parameter *P839 Response to 'Positioning interruption'* (→ 🗎 319).

Target monitoring is in effect for the ramp types linear, sine, squared ,and jerk limited.

27793230/EN – 08/2022

### P93. Special IPOS functions

*P930 Override*

Setting range: On/**off**

Enables the change to the travel speed of the positioning processes programmed in the IPOS$^{PLUS®}$ application module. The change occurs in the range from 0 – 150% of the respectively programmed velocity. This requires an analog input, with 0 – 150% corresponding to 0 – 10 V at the analog input. The maximum speed value is limited by the maximum speed of motor (→ 🗎 252).

*P931 IPOS CTRL word Task 1*

Setting range: **Stop**/start/hold

IPOS CTRL.W Task 1 in the DBG60B keypad only, not in MOVITOOLS® MotionStudio.

Stop: Task 1 of the IPOS$^{PLUS®}$ program is stopped.

Start: Task 1 of the IPOS$^{PLUS®}$ program is started.

Stop: Tasks 1, 2 and 3 of the IPOS$^{PLUS®}$ program are stopped.

*P932 IPOS CTRL word Task 2*

Display range: Start/**Stop**

IPOS CTRL.W Task 2 in the DBG60B keypad only, not in MOVITOOLS® MotionStudio.

Display parameter, cannot be set using DBG60B.

Start = Task 2 of the IPOS$^{PLUS®}$ program is currently being processed.

**Stop** = Task 2 of the IPOS$^{PLUS®}$ program is stopped.

*P933 Jerk time*

Setting range: **0.005** – 2 s

Duration of the torque build-up

If the jerk time is less than or equal to the positioning ramp 1 and 2 (→ 🗎 314), the positioning time extends relative to the linear ramp by the set jerk time. Otherwise, the torque build-up continues to be trapezoidal and the set jerk time does not correspond to the duration of the torque build-up.

*P938/P939 Speed task 1/task 2*

Setting range: **0** – 9 additional assembler commands/ms

Increases the speed by up to 9 additional assembler commands per millisecond. The resources for the speed increase are divided between task 1 and task 2: Task 1 and task 2 may be assigned together with 9 additional assembler commands per millisecond.

The default setting for task1 is "1" and "2" for task 2. For example, a possible speed increase is:

Task 1 + 2 additional assembler commands/ms = 3 assembler commands/ms

Task 2 + 7 additional assembler commands/ms = 9 assembler commands/ms

27793230/EN – 08/2022

*P939 Speed for task 2*

Setting range: **0** – 9 additional assembler commands/ms

The standard setting for task 2 is 2 assembler commands/ms. The speed can be increased by up to 9 additional assembler commands/ms with *P939*. *P939* and "P938" (→ 🗎 320) share the resources for the speed increase; that is, task 1 and task 2 **together** can be assigned a total of 9 additional assembler commands/ms. Example:

Task 1 **+ 2 additional assembler commands/ms** = 3 assembler commands/ms

Task 2 **+ 7 additional assembler commands/ms** = 9 assembler commands/ms

**P94. IPOS encoder**

*P940 IPOS variables edit*

Setting range: On/**off**

IPOS$^{PLUS®}$ variables can only be edited with DBG60B keypad, not in MOVITOOLS® MotionStudio.

The IPOS$^{PLUS®}$ variables can be altered when *P940* = "ON".

*P941 Actual position source*

Setting range: **Motor encoder (X15)**/ external encoder (X14)/ absolute encoder (X62)

Defines the encoder to which the IPOS$^{PLUS®}$ application module positions.

*P942/P943 Encoder factor numerator/denominator*

Setting range: **1** – 32767

This parameter must remain set to 1 when the multi-encoder card DEU21B is used.

**First** set *P944 Encoder scaling ext. encoder (X14)*" " (→ 🗎 322) or *P955 Encoder scaling* (→ 🗎 326) (when using option DIP11B or DEH21B). Then continue with the settings for *P942*/*P943*.

In the event of positioning to an external encoder (X14) or an absolute encoder (X62), then these two parameters are used for adapting the resolution to the motor encoder (X15).

Proceed as follows:

- Write down the values of variables H509 absolute position (H510 with external encoder) and H511 Current motor position.
- Move the drive by about 30 000 increments (H511).
- Calculate the difference between the values you wrote down and the new values of the variables:
  - H509 new – H509 old = H509 difference
  - H511 new – H511 old = H511 difference
- The values must not differ by more than 32 767 ($2^{15}$ - 1). If the values are greater, divide both differentials by the same number to obtain correspondingly smaller values. Alternatively, repeat the procedure with a shorter travel distance.
- Enter the result H511 difference in *P942* Encoder factor numerator and H509 in P943 Encoder factor denominator.

27793230/EN – 08/2022

*P944 Encoder scaling ext. Encoder (X14)*

Setting range: **x1**/x2/x4/x8/x16/x32/x64

This parameter does not apply to the DEU21B multi-encoder card.

Parameter *P944* is only effective on the encoder connected to X14.

**Before** setting *P944*, make sure that *P942* and *P943* are set to "1".

The significance of the travel resolution of the motor encoder and external encoder is adapted. The parameter is set so the travel information ratio between the motor encoder and the external encoder is as close to "1" as possible. First set the parameter to "x1". To do this, note the values in variables H510 and H511.

- Move the drive by about 1000 increments (H511).
- Calculate the difference between the values you wrote down and the current values:
  - H510 new – H510 old = H510 difference
  - H511 new – H511 old = H511 difference
- Calculate the quotient from H511 difference divided by H509 difference. Set the parameter P944 Encoder scaling ext. encoder to the value that is closest to the calculated quotient.

**Notice**: Encoder scaling directly affects the parameters *P900 Reference offset* (→ 🗎 311), *P942/P943 Encoder factor numerator/denominator* (→ 🗎 321) as well as the parameter group *P92. IIPOS monitoring* (→ 🗎 318). All positions of the IPOS$^{PLUS®}$ program have to be adjusted when using the external encoder. The setting of all listed parameters has to be adjusted every time the encoder scaling is changed.

The number of pulses detected at X14 is multiplied by *P944* and then mapped to H510. The external encoder must always provide fewer pulses than the motor encoder. If this is not possible, contact SEW-EURODRIVE.

27793230/EN – 08/2022

*P945 Distance encoder type (X14)*

Setting range: **TTL**/Sin/Cos/HIPERFACE®/RS485

This parameter does not apply to the DEU21B multi-encoder card.

Enter the used encoder type here. Possible encoder types are:

- **TTL**: Encoder with digital, rectangular output signal (TTL level 0 V, 5 V, with negated tracks, encoder with signal level according to RS422)
- Sin/cos: Encoder with analog, sinusodial output signal (1 $V_{SS}$)
- HIPERFACE®/RS485: Encoder with designation AV1H, AS1H, ES1H, EV1H
- SSI: Encoder with SSI protocol

| SEW encoder type | Startup parameters encoder type/PPR count |
|---|---|
| ES1S/ES2S/EV1S/EH1S | SINE ENCODER/1024 |
| AV1Y | SINE ENCODER/512 |
| ES1R/ES2R/EV1R/EH1R | INCREM. ENCODER TTL/1024 |
| ES1T[1)]/ES2T[1)]/EV1T[1)]/EH1T[1)] | INCREM. ENCODER TTL/1024 |
| AV1H/AS1H/ES1H/EV1H | HIPERFACE® |
| AS7W/AG7W | RS485 |
| AV7Y/AG7Y/AH7Y | SINE ENCODER/2048 |

1) Only via DWI11A

*P946 Distance encoder counting direction (X14)*

Setting range: **Normal**/inverted

This parameter does not apply to the DEU21B multi-encoder card.

Defines the counting direction of the distance encoder. The setting must be made so the counting direction of the motor encoder (X15) and the distance encoder (X14) match.

27793230/EN – 08/2022

*P947 HIPERFACE® offset X14*

Setting range: -($2^{31}$-1) – **0** – ($2^{31}$-1)

This parameter is used to specify the zero point of the motor encoder display.

Use this parameter to define the machine zero without reference travel. It adds or subtracts the offset from the encoder value.

- *P905 HIPERFACE® offset (X15)* (→ 🗎 313) has an effect on the actual position of the motor encoder H511.

H511 = Encoder value – *P905* (→ 🗎 313)

- *P947 Hiperface ® offset X14* has an effect on the actual position of the external encoder H510.

H510 = Encoder value – P947

The actual position is determined directly after the values have been entered. Performing a reference travel is not required.

Information:

When reference travel of a drive system takes place with a HIPERFACE® encoder, the HIPERFACE® offsets (*P905* (→ 🗎 313) or *P947*) are recalculated and overwritten due to the reference travel depending on the set actual position source.

The following applies:

- *P905* (→ 🗎 313) = Encoder value - *P900* (→ 🗎 311)
- *P947* = Encoder value - *P900* (→ 🗎 311)

*P948 Automatic encoder replacement detection*

The parameter is only effective with HIPERFACE® encoders.

Setting range: **On**/Off

This parameter is only effective with HIPERFACE® multi-turn encoders.

- **On:** The replaced HIPERFACE® encoder is detected. Reference travel is required before the "IPOS referenced" bit is set.
- Off: The HIPERFACE® encoder is always referenced. The "IPOS referenced" bit is set.

## INFORMATION

If the parameter is switched off and on again, the "IPOS referenced" bit is set to "0" once you have restarted the device. Reference travel is necessary to reset the "IPOS referenced" bit to "1".

27793230/EN – 08/2022

### P95. Absolute encoder

The DIP parameters are described in detail in the "MOVIDRIVE® MDX61B Absolute Encoder Card DIP11B/DEH21B" manual. The DIP11B option cannot be used with MOVIDRIVE® MDX61B size 0.

These parameters apply only to encoders that are connected to X62 (DIP11B or DEH21B).

*P950 Encoder type*

The absolute encoder connected to the DEH21B/DIP11B option (X62) is selected. At present, encoders can be selected from the following list:

- VISOLUX: EDM
- TR: CE58, CE65, CE100MSSI, ZE65M, LA41KSSI, LA66KSSI
- TR: LE100 SSI, LE200
- HEIDENHAIN: AV1Y / ROQ424
- SICK/STEGMANN: ATM60, DME 3000, DME 4000, DME 5000
- SICK/STEGMANN: AG100MSSI, AG626, Pomux KH53
- STAHL: WCS2, WCS3
- IVO: GM401, GXMMW
- LEUZE: BPS37, OMS1, OMS2, AMS200
- KÜBLER: 9081
- MTS: Temposonics RP, RH, RF, RD3
- HÜBNER: AH7Y / HMG161-S24 H2048
- HÜBNER: AS7Y, AG7Y
- ELGO: LIMAX2-00-030-0125-SSG1-D9M3
- BALLUF: BTL5-S112-M1500-P-S32
- Pepperl & Fuchs: AVM58X1212, WCS2A, WCS3A, EDM, VDM100

*P951 Counting direction*

Setting range: **Normal**/inverted

Defines the counting direction of the absolute encoder. The setting must be made so the counting direction of the motor encoder (X15) and the absolute encoder (X62) match.

*P952 Clock frequency*

Setting range: **1** – 200%

Defines the clock frequency at which absolute encoder information is transmitted from the encoder to the inverter. A clock frequency of 100% corresponds to the nominal frequency of the encoder in relation to a 100 m cable length.

*P953 Position offset*

Setting range: $-(2^{31}-1)$ – **0** – $(2^{31}-1)$

The position offset *P953* only needs to be set on rotary encoders; it should be set to 0 for other encoders.

Information: The position value will be recalculated and overwritten automatically after successful completion of the reference travel.

27793230/EN – 08/2022

*P954 Zero offset*

Setting range: -($2^{31}$ - 1) – **0** – ($2^{31}$ - 1)

Zero offset is used for assigning the value you want to a specific position. The range of values can adopt positive or negative position values. The maximum valid parameter must not be exceeded. The limit is determined by the range of values of the numerator ($2^{31}$) and the range of values of the absolute encoder. Move the drive to a known position. Read the value of variable H509 ACT.POS.ABS and enter the following value in parameter *P954 Zero offset*: *P954* = Variable H509 – required value.

The required value is the display value you wish to have for the current position.

*P955 Encoder scaling*

Setting range: **x1**/x2/x4/x8/x16/x32/x64

**Before** setting *P955*, make sure that *P942* and *P943* are set to "1".

The significance of the travel resolution of the motor encoder and absolute encoder is adapted. The parameter is set so the travel information ratio between the motor encoder and the absolute encoder is as close to "1" as possible. First set the parameter to "x1". To do this, note the values in variables H509 and H511.

- Move the drive by about 1000 increments (H511).
- Calculate the difference between the values you wrote down and the current values:
  - H509 new – H509 old = H509 difference
  - H511 new – H511 old = H511 difference
- Calculate the quotient from H511 difference divided by H509 difference. Set parameter *P955 Encoder scaling* to the value that is closest to the calculated quotient.

**Notice**: Encoder scaling directly influences parameters *P900 Reference offset* (→ 🗎 311), *P942/P943 Encoder factor numerator/denominator* (→ 🗎 321), *P954 Zero offset* (→ 🗎 326) and the parameter group *P92.. IPOS monitoring* (→ 🗎 318). All positions of the IPOS$^{PLUS®}$ program have to be adjusted when using the external encoder. The setting of all listed parameters has to be adjusted every time the encoder scaling is changed.

27793230/EN – 08/2022

### P96. IPOS$^{PLUS®}$ modulo function

These parameters serve for continuous positioning, such as in the case of rotary tables or chain conveyors. For further information, refer to the manual "MOVIDRIVE® MDX60B / 61B application "Modulo positioning"" and in the "IPOS$^{PLUS®}$" manual.

Note that the following prerequisite must be met:

$$\textit{Maximum target position} < \frac{2^{31}}{P963 \times P961}$$

*19032235915*

*P960 Modulo function*

Setting range: **Off**/short/CW/CCW

- **Off**: The modulo function is deactivated.
- In short: The "short travel" modulo function is active. The drive moves from the actual position to the target position taking the shortest possible route. Both directions of rotation are possible.
- Clockwise: The "CW" modulo function is active. The drives moves from its actual position to the target position with a CW direction of rotation, even if this means moving a longer distance. The "CCW" direction of rotation is not possible.
- Counterclockwise: The "CCW" modulo function is active. The drives moves from its actual position to the target position with a "CCW" direction of rotation, even if this means moving a longer distance. The "CW" direction of rotation is not possible.

*P961 Modulo numerator*

Setting range: **1** – ($2^{31}$ - 1)

Simulation of the gear unit

The modulo numerator is calculated with the tooth numbers of gear unit and additional transmission as follows:

*Modulo numerator = Numerator gear unit i × numerator additional transmission i*

*P962 Modulo denominator*

Setting range: **1** – ($2^{31}$ - 1)

Simulation of the gear unit

The modulo denominator is calculated with the tooth numbers of gear unit and additional transmission as follows:

*Modulo denominator = Denominator gear unit i × denominator additional transmission i*

*P963 Modulo encoder resolution*

Setting range: 1 – **4096** – 65535

Resolution of the selected IPOS$^{PLUS®}$ encoder system in increments.

The IPOS$^{PLUS®}$ encoder resolution for positioning to the motor encoder is set to 4096 increments (prerequisite is an encoder resolution of 512 to 2048).

27793230/EN – 08/2022

## INFORMATION

If F14 occurs, the axis must be referenced again independent of the used encoder when the modulo function is used.

27793230/EN – 08/2022

### P97. IPOS synchronization

*P970 DPRAM synchronization*

Setting range: Yes/**no**

MOVIDRIVE® B allows for synchronized operation with option cards (e.g. DHP11B, DFE24B).

Yes: Synchronized operation with option card is activated.

**Please note:** The inverters may either be synchronized by SBus1, SBus2 or by DPRAM. The inverters must **not** be synchronized **from several interfaces at the same time**. SEW-EURODRIVE recommends to set *P885* / *P895* to an identifier that is not used in the entire CAN network. You need parameters *P888* and *P916* to implement synchronization with interpolating setpoint processing.

**No**: Synchronized operation with the option card is not activated.

*P971 Synchronization phase*

Setting range: -2 – **0** – 2 ms

Time interval between clock signal and data transfer

27793230/EN – 08/2022

## 8.4 Operating modes

### INFORMATION

- For operating modes with encoder feedback, parameters must not be changed in cycles faster than 2 seconds. This makes sure that the encoders can be initialized.
- The maximum output frequency in the VFC operating modes without encoder feedback is 150 Hz.
- The maximum output frequency in the V/f operating mode and all operating modes with encoder feedback is 599 Hz.
- If the maximum output frequency is exceeded, error 08 "Speed monitoring" is displayed.

### 8.4.1 VFC and V/f characteristic curves

Default setting for asynchronous motors without encoder feedback. Suitable for general applications, such as conveyor belts, horizontal drives, and hoists with counterweight. A flux-oriented motor model is used (not for V/f characteristic operating mode). This model is optimally adapted to the motor after the startup function in MOVITOOLS® MotionStudio or in the DBG60B keypad has been carried out. It is necessary to enter the motor type (SEW motor) or the nameplate data (third-party motor) as part of the startup function. The following parameters are preset (parameter set 1/2):

| **Settings after the startup function** | |
|---|---|
| "P303 / P313" (→ 🗎 253) | $I_{max}$ (inverter) = 150% $I_{N\_Mot}$ |
| "P302 / P312" (→ 🗎 252) | Depends on number of poles and rated motor frequency<br>e.g. 2-pole / 50 Hz -> 3000 $min^{-1}$<br>e.g. 4-pole / 60 Hz -> 1800 $min^{-1}$ |
| "P301 / P311" (→ 🗎 252) | 15 $min^{-1}$ |
| "P130 – P133 / P140 – P143" (→ 🗎 237) | 2 s |
| "P136 / P146" (→ 🗎 238) | 2 s |
| "P137 / P147" (→ 🗎 238) | 2 s |
| "P500 / P502" (→ 🗎 263) | Motor/generator mode |
| "P501 / P503" (→ 🗎 263) | 1 s |
| "P100" (→ 🗎 226) | Unipolar / fixed setpoint |
| "P101" (→ 🗎 227) | Terminals |
| "P730 / P733" (→ 🗎 286) | ON |
| "P731 / P734" (→ 🗎 287) | For SEW motors: Setting in accordance with motor data.<br>**For third-party motors: Set the correct value manually!** |
| "P732 / P73" (→ 🗎 287) | |

27793230/EN – 08/2022

| Settings after the startup function | |
|---|---|
| "P300 / P310" (→ 🗎 252) | 15 $min^{-1}$ |
| "P820 / P821" (→ 🗎 299) | ON |
| "P324 / PP334" (→ 🗎 254) | Setting in accordance with specified motor data |
| "P321 / P331" (→ 🗎 254) | 0 |
| "P322 / P332" (→ 🗎 254) | Setting in accordance with specified motor data |
| "P320 / P330" (→ 🗎 253) | ON |
| "P323 / P333" (→ 🗎 254) | Setting in accordance with specified motor data |

## INFORMATION

- SEW-EURODRIVE recommends using the "P320/P330 Automatic adjustment 1/2" (→ 🗎 253) parameter activated in the factory setting. This means the parameter "P322/P332 IxR compensation 1/2" (→ 🗎 254) is set automatically during the premagnetization time through the calibration of the motor.
- SEW-EURODRIVE recommends not changing the parameter "P321/P331 Boost 1/2" (→ 🗎 254) from its factory setting (=0).

27793230/EN – 08/2022

### 8.4.2 VFC & Group

Select this mode if a group of asynchronous motors is to be operated on one inverter. All motors of the group must have the same nominal voltage and nominal frequency. The brake is controlled according to "P730/P733 Brake function 1/2" (→ 🗎 286). Set the data for the largest motor in the group during startup. Once startup is finished, adapt "P303/P313 Current limit 1/2" (→ 🗎 253) to the total current of all connected motors. We recommend a basic setting of "P321/P331 Boost 1/2" (→ 🗎 254) to the same value as "P322/P332 IxR compensation 1/2" (→ 🗎 254).

| **Settings after the startup function** | |
|---|---|
| "P303 / P313 Current limit 1/2 " (→ 🗎 253) | $I_{max}$ (inverter) = 150% $\Sigma I_{N\_Mot}$ |
| "P302 / P312 Maximum speed 1 / 2 " (→ 🗎 252) | Depends on number of poles and rated motor frequency<br>e.g. 2-pole / 50 Hz -> 3000 $min^{-1}$<br>e.g. 4-pole / 60 Hz -> 1800 $min^{-1}$ |
| "P301/311 Minimum speed 1/2 " (→ 🗎 252) | 15 $min^{-1}$ |
| "P130 – P133/P140 – P143 Ramp t11/ t21" (→ 🗎 237) | 2 s |
| "P136/P146 Stop ramp t13 / t23 " (→ 🗎 238) | 2 s |
| "P137/P147 Emergency ramp t14/t24 " (→ 🗎 238) | 2 s |
| "P500 / P502 speed monitoring 1 / 2" (→ 🗎 263) | Motor/generator mode |
| "P501 / P503 deceleration time 1 / 2" (→ 🗎 263) | 1 s |
| "P100 Setpoint source" (→ 🗎 226) | Unipolar / fixed setpoint |
| "P101 Control signal source" (→ 🗎 227) | Terminals |
| "P730 / P733 Brake function 1/2" (→ 🗎 286) | ON |
| "P731/P734 Brake release time 1/2" (→ 🗎 287) | For SEW motors: Setting in accordance with motor data.<br>**For third-party motors: Set the correct value manually!** |
| "P732/P735 Brake application time 1/2 " (→ 🗎 287) | |
| "P300 / P310 Start/stop speed 1/2" (→ 🗎 252) | Setting in accordance with specified motor data |
| "P820/P821 4-quadrant operation 1 / 2 " (→ 🗎 299) | ON |

## INFORMATION

- Do not use this operating mode for lifting applications!
- The premagnetization current is adapted to the largest motor in the group during startup.
- If motors are removed from the group by switching them off, it may be necessary to reduce the current limit to a current that matches the actual combination of motors.
- Slip compensation is not effective. Motor speeds are therefore dependent on the load.

27793230/EN – 08/2022

### 8.4.3 VFC & hoist / VFC n-control & hoist

VFC-n-control & Hoist in parameter set 1 only. Disabling 4-quadrant operation ("P820" (→ 🗎 299)) is ignored.

In VFC&Hoist operating mode, the start/stop speed (P300 / P310) is set to the slip speed of the motor; in the VFC n-control & hoist operating mode it is set to 15 $min^{-1}$.

The minimum rotational speed ("P301/P311" (→ 🗎 252)) in operating mode VFC & hoist is internally limited to 15 $min^{-1}$.

The hoist function automatically provides all functions necessary for operating an unbalanced hoist. In particular, monitoring functions are activated for safety reasons. The following functions may prevent the drive from starting:

- Monitoring the output current during the premagnetization phase.
- Avoid sagging when the brake is released by load precontrol.

| Faulty constellations | Triggered fault |
|---|---|
| 2 or 3-phase motor phase failure | F82 = Output open |
| Premagnetization time too short or incorrect motor/inverter combination. | F81 = Start condition fault |
| Motor phase failure due to active rotational speed monitoring (factory setting) "P500/P502 Speed monitoring 1/2" (→ 🗎 263), "P501/P503 Delay time 1/2" (→ 🗎 263) | F08 = n-monitoring fault |

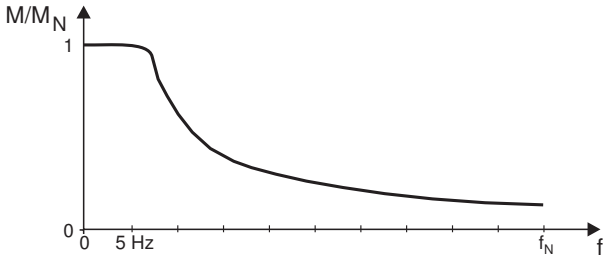
## INFORMATION

- A single-phase motor phase failure cannot always be detected reliably.
- SEW-EURODRIVE strongly recommends activating speed monitoring (factory setting).
- Correct performance of the hoist function requires the motor brake to be controlled via the inverter.
- In VFC mode without encoder feedback, the control must be designed in such a way that the direction of rotation of the drive can only be changed when it is at a standstill. Only enable the opposing direction of rotation after the brake is applied (DB00 = 0). This restriction does not apply to the other operating modes.

27793230/EN – 08/2022

### 8.4.4 VFC & DC braking and V/f & DC braking

The DC braking function allows an asynchronous motor to be braked using a current injection. The motor can be braked without a braking resistor using the inverter.




285043851

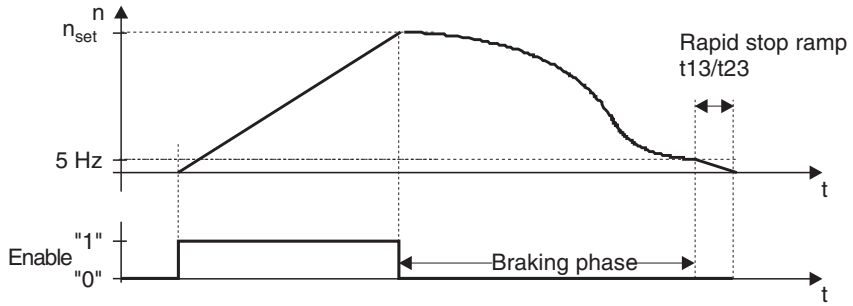
A constant current with a rotating field frequency of 5 Hz is supplied during the braking process. The braking torque = 0 at standstill. At a low speed, the braking torque is high, at higher speeds, the braking torque decreases. The braking time and consequently the duration of the braking current depends on the load connected to the motor. DC braking is stopped once the rotating field frequency of the motor reaches 5 Hz and the motor is stopped using the rapid stop ramp. The current injection is performed with the nominal motor current according to the startup function. In general, the inverter limits the current to max. 125% $I_N$. For controlling the brake, see the brake function.

## ⚠ CAUTION



No guided stop.

Can cause damage to the system.




285047179

## INFORMATION

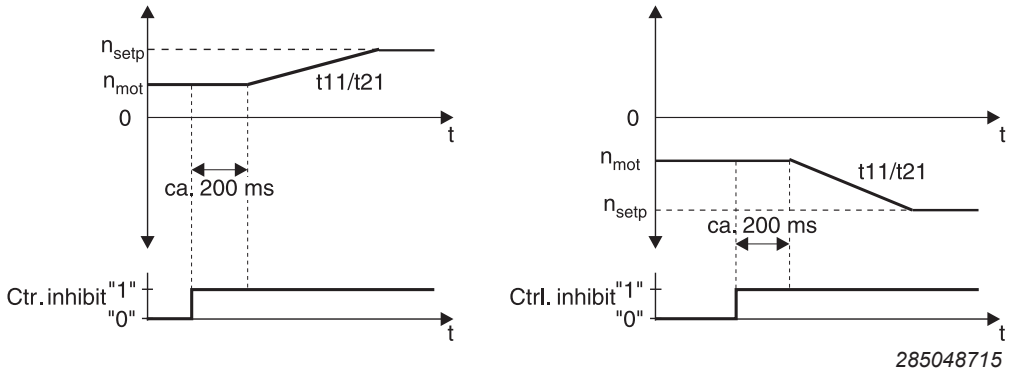


- The **braking procedure is not interrupted** if the digital input "Enable" receives a "1" signal again during the braking phase. DC braking is completed before the drive is accelerated again.
- The drive stops with ramp t11/t21 or t12/t22 if a digital input is programmed to the function "CW/Stop (CCW/Stop)" in "VFC & DC braking" operating mode and "CW/Stop (CCW/Stop)" receives a "0" signal. The stop is continued and **no DC braking initiated** if then digital input "Enable" is switched from "1" to "0" during the ramp time. To start **DC braking**, you must **first switch "Enable" from "1" to "0"**. This must happen at least 10 ms before switching "CW/Stop (CCW/Stop)" from "1" to "0".

27793230/EN – 08/2022

### 8.4.5 VFC & flying start function

The flying start function lets you synchronize the inverter to a motor that is already in operation. This function is used in particular with drives that are not braked actively, run on for a long time or are turned by a flowing medium, e.g. pumps and fans. The maximum flying start time is approx. 200 ms.




If the inverter fails to detect a "flying start point", it assumes that the motor is at a standstill and commences the integrator start from n = 0. Consequently, the motor decelerates to n = 0 followed by a run up to $n_{setpoint}$. This behavior may arise in particular with very low-impedance motors in the speed range below n = 300 $min^{-1}$ (4-pole motor).

**⚠ DANGER**



Risk of crushing if the motor starts up unintentionally in lifting applications.

Severe or fatal injuries.

- **Do not use the flying start function in lifting applications!**
- Ensure that the motor cannot start unintentionally.

## INFORMATION



- The flying start function does not function if there is an output filter connected to the inverter.
- Due to exact motor data, the proper function of the flying start function has only been tested with SEW-EURODRIVE motors.

27793230/EN – 08/2022

### 8.4.6 VFC n-control

VFC n-control in parameter set 1 only.

Based on VFC operating mode, the VFC n-control operating mode allows for speed controlled operation with an encoder installed on the motor shaft. The following encoders can be used:

- HIPERFACE® encoder
- TTL encoders with negated tracks, encoders with signal level to RS422
- High-resolution incremental encoder with sinusoidal tracks 1 $V_{SS}$
- HTL encoder with DWE12B option

SEW-EURODRIVE recommends the use of encoders with 1024 increments/revolution as standard. Speed control results in the following characteristics:

- Increased static control accuracy and higher dynamic response.
- Position hold control: By programming a digital input to "/Position hold control" ("P60x Digital inputs of basic device" (→ 🗎 274) / "P61x Digital inputs on option" (→ 🗎 275)) a position-controlled standstill of the motor can be accomplished under load. Set position hold control with "P210 P-gain position hold control" (→ 🗎 244).
- Synchronous operation is possible with DRS11B.

The startup function of MOVITOOLS® MotionStudio not only supports motor startup (VFC) but also the additional controller setting of the speed controller. The following parameters relevant for n-control are set:

| **Settings after the startup function** | |
|---|---|
| "P303 Current limit 1" (→ 🗎 253) | $I_{max}$ (inverter) = 150% $I_{motor}$ |
| "P302 Maximum speed 1" (→ 🗎 252) | Depending on number of poles and rated motor frequency<br>e.g. 2-pole / 50 Hz -> 3000 $min^{-1}$<br>e.g. 4-pole / 60 Hz -> 1800 $min^{-1}$ |
| "P301 Minimum speed 1" (→ 🗎 252) | 0 $min^{-1}$ |
| "P500 Speed monitoring 1" (→ 🗎 263) | Motor/generator mode |
| "P501 / P503 deceleration time 1 / 2" (→ 🗎 263) | 0.1 s |
| "P100 Setpoint source" (→ 🗎 226) | Unipolar / fixed setpoint |
| "P101 Control signal source" (→ 🗎 227) | Terminals |
| "P730 Brake function 1" (→ 🗎 286) | ON |
| "P731 Brake release time 1" (→ 🗎 287) | For SEW motors: Setting in accordance with motor data.<br>**For third-party motors: Set the correct value manually!** |
| "P732 Brake application time 1" (→ 🗎 287) | |
| "P323 Premagnetization time 1" (→ 🗎 254) | Setting in accordance with specified motor data |

27793230/EN – 08/2022

| Settings after the startup function of the speed controller | |
|---|---|
| "P200 P gain n controller" (→ 🗎 242) | Setting in accordance with specified data |
| "P201 Time constant n-controller" (→ 🗎 243) | |
| "P202 Gain acceleration precontrol" (→ 🗎 243) | |
| "P204 Actual speed value filter" (→ 🗎 243) | |
| "P115 Filter setpoint" (→ 🗎 233) | |
| "P203 Filter acceleration precontrol" (→ 🗎 243) | |
| "P210 P-gain position hold controller" (→ 🗎 244) | Position controller gain for the position hold control function |
| "P910 Gain X controller" (→ 🗎 314) | Position controller gain for IPOS$^{PLUS®}$<br>(positioning mode) |
| "P130 – P133 Ramp t11" (→ 🗎 237) | Setting in accordance with specified data |
| "P136 Stop ramp t13" (→ 🗎 238) | |
| "P137 Emergency stop ramp t14" (→ 🗎 238) | |

Setting of "P820 4-quadrant operation 1" (→ 🗎 299) is ignored; 4-Q operation is always active.

27793230/EN – 08/2022

### 8.4.7 VFC n-control & group

VFC-n-control & group in parameter set 1 only.

Select this mode if a group of asynchronous motors is to be operated on one inverter. All motors of the group must have the same nominal voltage, nominal frequency and nominal power. One motor of the group must be operated with speed control and be equipped with an incremental encoder that is connected to X15. The other motors of the group follow the speed controlled motor depending on the slip. The following encoders can be used as incremental encoder:

- HIPERFACE® encoder
- TTL encoders with negated tracks, encoders with signal level to RS422
- High-resolution incremental encoder with sinusoidal tracks 1 $V_{SS}$
- HTL encoder with DWE12B option

SEW-EURODRIVE recommends the use of encoders with 1024 increments/revolution as standard.

The startup function of MOVITOOLS® MotionStudio not only supports motor startup (VFC) but also the additional controller setting of the speed controller. The following parameters relevant for n-control are set:

| **Settings after the startup function** | |
|---|---|
| "P303 Current limit 1" (→ 🗎 253) | $I_{max}$ (inverter) = 150% $\Sigma I_{N\_Mot}$ |
| "P302 Maximum speed 1" (→ 🗎 252) | Depends on number of poles and rated motor frequency<br>e.g. 2-pole / 50 Hz -> 3000 $min^{-1}$<br>e.g. 4-pole / 60 Hz -> 1800 $min^{-1}$ |
| "P301 Minimum speed 1" (→ 🗎 252) | 0 $min^{-1}$ |
| "P500 Speed monitoring 1" (→ 🗎 263) | Motor/generator mode |
| "P501 Delay time 1" (→ 🗎 263) | 0.1 s |
| "P100 Setpoint source" (→ 🗎 226) | Unipolar / fixed setpoint |
| "P101 Control signal source" (→ 🗎 227) | Terminals |
| "P730 Brake function 1" (→ 🗎 286) | ON |
| "P731 Brake release time 1" (→ 🗎 287) | For SEW motors: Setting in accordance with motor data.<br>**For third-party motors: Set the correct value manually!** |
| "P732 Brake application time 1" (→ 🗎 287) | |
| "P323 Premagnetization time 1" (→ 🗎 254) | Setting in accordance with specified motor data |

| **Settings after the startup function of the speed controller** | |
|---|---|
| "P200 P gain n controller" (→ 🗎 242) | Setting in accordance with specified data |
| "P201 Time constant n-controller" (→ 🗎 243) | |
| "P202 Gain acceleration precontrol" (→ 🗎 243) | |
| "P204 Actual speed value filter" (→ 🗎 243) | |
| "P115 Filter setpoint" (→ 🗎 233) | |
| "P203 Filter acceleration precontrol" (→ 🗎 243) | |

27793230/EN – 08/2022

| Settings after the startup function of the speed controller | |
|---|---|
| "P210 P-gain position hold controller" (→ 🗎 244) | Position controller gain for the position hold control function |
| "P910 Gain X controller" (→ 🗎 314) | Position controller gain for IPOS$^{PLUS®}$ (positioning mode) |
| "P130 – P133 Ramp t11" (→ 🗎 237) | Setting in accordance with specified data |
| "P136 Stop ramp t13" (→ 🗎 238) | |
| "P137 Emergency stop ramp t14" (→ 🗎 238) | |

Setting of "P820 4-quadrant operation 1" (→ 🗎 299) is ignored; 4-Q operation is always active.

### 8.4.8 VFC n-control & synchronous operation

VFC-n-control & synchronous operation in parameter set 1 only.

Set on the slave drives if a group of asynchronous motors should be operated at a synchronous angle in relation to one another or with an adjustable proportional ratio. Refer to the "MDX61B - Synchronous Operation Card DRS11B" manual for a detailed description of synchronous operation. This manual is available from SEW-EURODRIVE.

### 8.4.9 VFC n-control & IPOS

VFC-n-control & IPOS in parameter set 1 only.

Must be set if IPOS$^{PLUS®}$ positioning commands are to be processed. Refer to the "IPOS$^{PLUS®}$ Positioning and Sequence Control System" manual for detailed descriptions of IPOS$^{PLUS®}$. This manual can be obtained from SEW-EURODRIVE.

27793230/EN – 08/2022

### 8.4.10 CFC

CFC in parameter set 1 only.

The CFC operating mode allows for operating an asynchronous motor with real servo characteristics, which means high dynamic response, excellent concentric running characteristics and controlled operation even at standstill. It is achieved because the CFC procedure enables direct control over the magnetic flux in the motor and, therefore, over the torque. Speed feedback via encoder is mandatory for this operating mode. The following encoders can be used:

- HIPERFACE® encoder
- TTL encoders with negated tracks, encoders with signal level to RS422
- High-resolution incremental encoder with sinusoidal tracks 1 $V_{SS}$
- HTL encoder with DWE12B option

SEW-EURODRIVE recommends high-resolution incremental encoders with a PPR count of 1024. Optimum control characteristics are achieved with these encoders.

"P324 Slip compensation 1" (→ 🗎 254), "P321 Boost 1" (→ 🗎 254) and "P322 IxR compensation" (→ 🗎 254) are ineffective.

The MOVITOOLS® MotionStudio startup function requires the motor type to be entered (SEW-EURODRIVE motor). No startup can be performed with the DBG60B keypad in CFC mode. The following parameters are preset (parameter set 1):

| **Settings after the startup function** | |
|---|---|
| "P303 Current limit 1" (→ 🗎 253) | $I_{max}$ (inverter) = 150% $I_{motor}$ |
| "P302 Maximum speed 1" (→ 🗎 252) | Depends on number of poles and rated motor frequency<br>e.g. 2-pole / 50 Hz -> 3000 $min^{-1}$<br>e.g. 4-pole / 60 Hz -> 1800 $min^{-1}$ |
| "P301 Minimum speed 1" (→ 🗎 252) | 0 $min^{-1}$ |
| "P500 Speed monitoring 1" (→ 🗎 263) | Motor/generator mode |
| "P501 Delay time 1" (→ 🗎 263) | 0.1 s |
| "P100 Setpoint source" (→ 🗎 226) | Unipolar / fixed setpoint |
| "P101 Control signal source" (→ 🗎 227) | Terminals |
| "P730 Brake function 1" (→ 🗎 286) | ON |
| "P731 Brake release time 1" (→ 🗎 287) | Setting in accordance with specified motor data |
| "P732 Brake application time 1" (→ 🗎 287) | |
| "P323 Premagnetization time 1" (→ 🗎 254) | Setting in accordance with specified motor data |

27793230/EN – 08/2022

CFC always requires to startup the speed controller.

| Settings after the startup function of the speed controller | |
|---|---|
| "P200 P gain n controller" (→ 🗎 242) | Setting in accordance with specified data |
| "P201 Time constant n-controller" (→ 🗎 243) | |
| "P202 Gain acceleration precontrol" (→ 🗎 243) | |
| "P204 Actual speed value filter" (→ 🗎 243) | |
| "P115 Filter setpoint" (→ 🗎 233) | |
| "P203 Filter acceleration precontrol" (→ 🗎 243) | |
| "P210 P-gain position hold controller" (→ 🗎 244) | Position controller gain for the position hold control function |
| "P910 Gain X controller" (→ 🗎 314) | Position controller gain for IPOS$^{PLUS®}$<br>(positioning mode) |
| "P130 – P133 Ramp t11" (→ 🗎 237) | Setting in accordance with specified data |
| "P136 Stop ramp t13" (→ 🗎 238) | |
| "P137 Emergency stop ramp t14" (→ 🗎 238) | |

Setting of "P820 4-quadrant operation 1" (→ 🗎 299) is ignored; 4-Q operation is always active.

27793230/EN – 08/2022

### 8.4.11 CFC & torque control

CFC & torque control in parameter set 1 only.

This operating mode enables the asynchronous motor to be controlled directly with torque control. The setpoint is standardized on the torque as follows:

3000 $min^{-1}$ ≙ 150% output current x torque constant.

In "P16x Fixed setpoints 1" (→ 🗎 241), the torques have to be entered directly in % $I_N$. The set processing "P11x Analog input AI1" (→ 🗎 229) also applies to the torque control if the setpoint selection is made by way of an analog input.

The torque constant (motor-specific parameter) is defined by: $k_T = M_N / I_{q\_n}$

## INFORMATION

- If "P500 Speed monitoring 1" (→ 🗎 263) is active, the drive is monitored according to the "P500" (→ 🗎 263) parameter description.
- If "P500 Speed monitoring 1" (→ 🗎 263) = OFF, the drive responds as follows if its speed exceeds or drops below "P302 Maximum speed 1" (→ 🗎 252):
  - Motor operation: The available motor torque is reduced to zero with a linear function above $n_{max}$ and below $-n_{max}$. There is no active speed control.
  - Regenerative operation: No response; the master drive must prevent the drive losing position.
- M-control is also in effect in the range $-n_{min} \leq n \leq n_{min}$.
- The current is always limited to "P303 Current limit 1" (→ 🗎 253).
- At a stop ramp, the drive inverter switches to speed control and the drive is decelerated along the relevant stop ramp.

| Settings after the startup function | |
|---|---|
| "P303 Current limit 1" (→ 🗎 253) | $I_{max}$ (inverter) = 150% $I_{motor}$ |
| "P302 Maximum speed 1" (→ 🗎 252) | Depends on number of poles and rated motor frequency<br>e.g. 2-pole / 50 Hz -> 3000 $min^{-1}$<br>e.g. 4-pole / 60 Hz -> 1800 $min^{-1}$ |
| "P301 Minimum speed 1" (→ 🗎 252) | 0 $min^{-1}$ |
| "P500 Speed monitoring 1" (→ 🗎 263) | Motor/generator mode |
| "P501 Delay time 1" (→ 🗎 263) | 0.1 s |
| "P100 Setpoint source" (→ 🗎 226) | Unipolar / fixed setpoint |
| "P101 Control signal source" (→ 🗎 227) | Terminals |
| "P730 Brake function 1" (→ 🗎 286) | ON |
| "P731 Brake release time 1" (→ 🗎 287) | Setting in accordance with specified motor data. |
| "P732 Brake application time 1" (→ 🗎 287) | |
| "P323 Premagnetization time 1" (→ 🗎 254) | Setting in accordance with specified motor data |

27793230/EN – 08/2022

| Settings after the startup function of the torque controller | |
|---|---|
| "P200 P gain n controller" (→ 🗎 242) | Setting in accordance with specified data |
| "P201 Time constant n-controller" (→ 🗎 243) | |
| "P202 Gain acceleration precontrol" (→ 🗎 243) | |
| "P204 Actual speed value filter" (→ 🗎 243) | |
| "P115 Filter setpoint" (→ 🗎 233) | |
| "P203 Filter acceleration precontrol" (→ 🗎 243) | |
| "P210 P-gain position hold controller" (→ 🗎 244) | Position controller gain for the position hold control function |
| "P910 Gain X controller" (→ 🗎 314) | Position controller gain for IPOS$^{PLUS®}$<br>(positioning mode) |
| "P130 – P133 Ramp t11" (→ 🗎 237) | Setting in accordance with specified data |
| "P136 Stop ramp t13" (→ 🗎 238) | |
| "P137 Emergency stop ramp t14" (→ 🗎 238) | |

Setting of "P820 4-quadrant operation 1" (→ 🗎 299) is ignored; 4-Q operation is always active.

### 8.4.12 CFC & IPOS

CFC & IPOS in parameter set 1 only.

Must be set if IPOS$^{PLUS®}$ positioning commands are to be processed. Refer to the "IPOS$^{PLUS®}$ Positioning and Sequence Control System" manual for detailed descriptions of IPOS$^{PLUS®}$. This manual can be obtained from SEW-EURODRIVE.

### 8.4.13 CFC & synchronous operation

CFC & synchronous operation in parameter set 1 only.

Set on the slave drives if a group of asynchronous motors should be operated at a synchronous angle in relation to one another or with an adjustable proportional ratio. Refer to the "MDX61B - Synchronous Operation Card DRS11B" manual for a detailed description of synchronous operation. This manual is available from SEW-EURODRIVE.

27793230/EN – 08/2022

### 8.4.14 SERVO

SERVO in parameter set 1 only.

The SERVO operating mode allows for operating a permanent-field synchronous motor (servomotor). The motor must be equipped with a resolver or a HIPERFACE® encoder.

The MOVITOOLS® MotionStudio startup function requires the motor type to be entered (SEW-EURODRIVE motor). Startup cannot be performed with the DBG60B keypad in SERVO mode. The following parameters are preset (parameter set 1):

| Settings after the startup function | |
|---|---|
| "P303 Current limit 1" (→ 🗎 253) | $I_{max}$ (inverter) = maximum motor standstill current |
| Torque limit | The value of the motor torque can be limited. The maximum value is determined by the motor type. Do not alter "P303 Current limit 1" (→ 🗎 253). |
| "P302 Maximum speed 1" (→ 🗎 252) | Nominal motor speed (2000 $min^{-1}$, 3000 $min^{-1}$, 4500 $min^{-1}$) |
| "P301 Minimum speed 1" (→ 🗎 252) | 0 $min^{-1}$ |
| "P500 Speed monitoring 1" (→ 🗎 263) | Motor/generator mode |
| "P501 Delay time 1" (→ 🗎 263) | 0.1 s |
| "P100 Setpoint source" (→ 🗎 226) | Unipolar / fixed setpoint |
| "P101 Control signal source" (→ 🗎 227) | Terminals |
| "P730 Brake function 1" (→ 🗎 286) | ON |
| "P731 Brake release time 1" (→ 🗎 287) | Setting in accordance with specified motor data |
| "P732 Brake application time 1" (→ 🗎 287) | |

SERVO always requires to startup the speed controller.

| Settings after the startup function of the speed controller | |
|---|---|
| "P200 P gain n controller" (→ 🗎 242) | Setting in accordance with specified data |
| "P201 Time constant n-controller" (→ 🗎 243) | |
| "P202 Gain acceleration precontrol" (→ 🗎 243) | |
| "P204 Actual speed value filter" (→ 🗎 243) | |
| "P115 Filter setpoint" (→ 🗎 233) | |
| "P203 Filter acceleration precontrol" (→ 🗎 243) | |
| "P210 P-gain position hold controller" (→ 🗎 244) | Position controller gain for the position hold control function |
| "P910 Gain X controller" (→ 🗎 314) | Position controller gain for IPOS$^{PLUS®}$ (positioning mode) |

27793230/EN – 08/2022

| Settings after the startup function of the speed controller | |
|---|---|
| "P130 – P133 Ramp t11" (→ 🗎 237) | Setting in accordance with specified data |
| "P136 Stop ramp t13" (→ 🗎 238) | |
| "P137 Emergency stop ramp t14" (→ 🗎 238) | |

Setting of "P820 4-quadrant operation 1" (→ 🗎 299) is ignored; 4-Q operation is always active.

### 8.4.15 SERVO & torque control

SERVO & torque control in parameter set 1 only.

This operating mode enables the servomotor to be controlled directly with torque control. The setpoint is standardized on the following torque:

3000 $min^{-1}$ ≙ 150% output current x torque constant.

As fixed setpoints, the torque values must be entered directly in the unit % $I_N$ ("P16x Fixed setpoints 1" (→ 🗎 241)). The set processing ("P11x Analog input AI1" (→ 🗎 229)) also applies to the torque control if the setpoint selection is made by way of an analog input.

The torque constant (motor-specific parameter) is defined by: $k_e = M_0 / I_0$

## INFORMATION

- If "P500 Speed monitoring 1" (→ 🗎 263) is active, the drive is monitored according to the "P500" (→ 🗎 263) parameter description.
- If "P500 Speed monitoring 1" (→ 🗎 263) = Off, the drive responds as follows if its speed exceeds or drops below "P302 Maximum speed 1" (→ 🗎 252):
  - Motor operation: The available motor torque is reduced to zero with a linear function above $n_{max}$ and below $-n_{max}$. There is no active speed control.
  - Regenerative operation: No response; the master drive must prevent the drive losing position.
- M-control is also in effect in the range $-n_{min} \leq n \leq n_{min}$.
- The current is always limited to "P303 Current limit 1" (→ 🗎 253).
- At a stop ramp, the drive inverter switches to speed control and the drive is decelerated along the relevant stop ramp.

### 8.4.16 SERVO & IPOS

SERVO & IPOS in parameter set 1 only.

Must be set if IPOS$^{PLUS®}$ positioning commands are to be processed. Refer to the "IPOS$^{PLUS®}$ Positioning and Sequence Control System" manual for detailed descriptions of IPOS$^{PLUS®}$. This manual can be obtained from SEW-EURODRIVE.

27793230/EN – 08/2022

### 8.4.17 SERVO & synchronous operation

SERVO & synchronous operation in parameter set 1 only.

Set on the slave drives if a group of servomotors should be operated at a synchronous angle in relation to one another or with an adjustable proportional ratio. Refer to the "MDX61B - Synchronous Operation Card DRS11B" manual for a detailed description of synchronous operation. This manual is available from SEW-EURODRIVE.

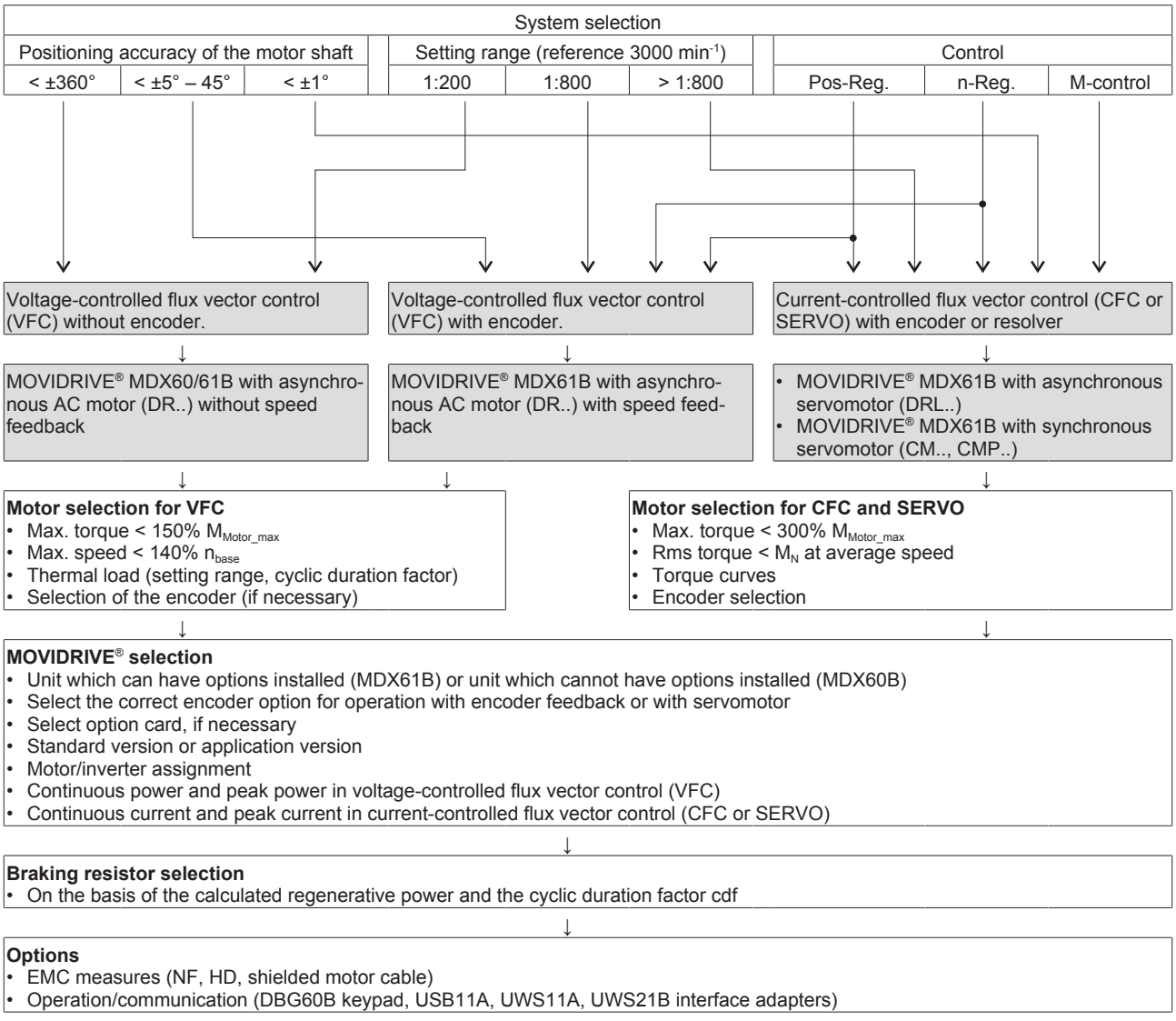
27793230/EN – 08/2022

# 9 Project planning

## 9.1 Schematic procedure

### 9.1.1 Drive properties

The required drive properties are the main factors determining the selection of the inverter. The following figure provides assistance.



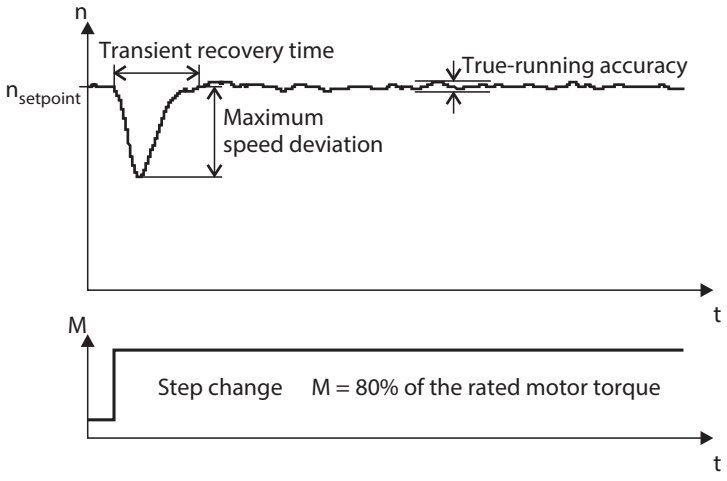

| | | | |
|---|---|---|---|
| Pos-Reg. | = Positioning control | VFC | = Voltage controlled flux vector control |
| n-Reg. | = Speed control | | (Voltage Mode Flux Control) |
| M-control | = Torque control | CFC | = current-controlled flux vector control for asynchronous servomotors |
| $M_N$ | = Nominal motor torque | | (Current Mode Flux Control) |
| $n_{base}$ | = Rated speed (base speed) of the motor | SERVO | = current-controlled flux vector control for synchronous servomotors |

27793230/EN – 08/2022

## 9.2 Control characteristics

### 9.2.1 Characteristic values

MOVIDRIVE® drive inverters achieve excellent control characteristics thanks to their optimally adapted control algorithms. The following characteristic features apply to operation with 4-pole motors and synchronous servomotors from SEW-EURODRIVE.




*3471858955*

The following values apply to MOVIDRIVE® inverters in combination with motors of the same power:

| **MOVIDRIVE® type** | **Continuous setting range** $n_{max}$ = 3000 min$^{-1}$ | **Stationary control accuracy**[1] **based on** $n_{max}$ = 3000 min$^{-1}$ |
|---|---|---|
| MDX60/61B, VFC without encoder | 1:200 | 0.30% |
| MDX61B, VFC with TTL encoder (1024 inc.) | 1:800 | 0.01% |
| MDX61B, CFC with TTL encoder (1024 inc.) | 1:3000 | 0.01% |
| MDX61B, CFC with sin/cos encoder | 1:5000 | 0.01% |
| MDX61B, SERVO with resolver | > 1:3000 | 0.01% |
| MDX61B, CFC/SERVO with HIPERFACE® encoder | 1:5000 | 0.01% |

1) = Deviation from speed mean value to setpoint speed

The defined control characteristics are maintained in the specified setting range.

27793230/EN – 08/2022

### 9.2.2 Control characteristics

**⚠ DANGER**

Motor overheat due to repeated resets over a short time.

Damage to property.

- Do not perform repeated resets if the motor is already overheated.
- Only acknowledge the fault after the cause has been found and eliminated.

**INFORMATION**

Due to the higher output frequency, the following motors must be operated with a PWM frequency of at least 8 kHz (P864):

- CMP 40 – 63 for speed class 6000 $min^{-1}$
- CMP 71 – 100 for speed classes 4500 $min^{-1}$ and 6000 $min^{-1}$

**INFORMATION**

The following project planning guidelines apply to the operation of CMP71-100 motors:

- The motor load must not exceed a maximum of 4 times the nominal motor current $I_0$.
- The current of MOVIDRIVE® B must be limited to the following values:
  - For size 0 to 166% $I_N$
  - For size 1 – 6 to 125% $I_N$
- The following motor selection tables and the startup adhere to these project planning guidelines.

The following table shows the differences in control characteristics between VFC without encoder, VFC with encoder, and CFC (always with encoder) operating modes.

**Specification**

- Setpoint speed $n_{setpoint}$ = 1000 $min^{-1}$
- Step change in load DM = 80% of nominal motor torque
- Torsion-free load with mass moment of inertia $J_L/J_M$ = 1.8

| MOVIDRIVE® MDX60/61B | Transient recovery time in relation to the value of VFC without encoder | Max. speed deviation at DM = 80%, Refers to n = 3000 $min^{-1}$ | True-running accuracy at M = const., refers to n = 3000 $min^{-1}$ |
|---|---|---|---|
| VFC without encoder | 100% | 1.8% | ≤ 0.20% |
| VFC with TTL encoder (1024 inc.) | 90% | 1.5% | ≤ 0.17% |
| CFC with TTL encoder (1024 inc.) | 35% | 1.0% | ≤ 0.07% |
| CFC with sin/cos encoder | 25% | 0.7% | ≤ 0.03% |

27793230/EN – 08/2022

## 9.3 Description of the applications

### 9.3.1 Description of the applications

**Selecting the inverter**

The large number of different drive applications can be divided into 5 categories. The 5 categories are listed below together with the recommended SEW-EURODRIVE inverter. The assignment is based on the required setting range and the resulting control process.



1. Drives with a base load and a speed dependent load, such as conveyor drives.
   - Low requirements on the setting range (motor without encoder)
     - MOVIDRIVE® MDX60/61B without option in VFC operating mode
   - High requirements on the setting range
     - MOVIDRIVE® MDX61B with in the VFC n-control operating mode
2. Dynamic load, e.g. horizontal drives; brief high torque demand for acceleration followed by low load.
   - Low requirements on the setting range (motor without encoder)
     - MOVIDRIVE® MDX60/61B without option in VFC operating mode
   - High requirements on the setting range
     - MOVIDRIVE® MDX61B with in the VFC n-control operating mode
   - High dynamic properties required (asynchronous or synchronous servomotor)
     - Asynchronous or synchronous servomotor with encoder feedback: MOVIDRIVE® MDX61B in CFC or SERVO operating mode
3. Stationary load, e.g. hoists; mainly steady high stationary load with overload peaks.
   - Low requirements on the setting range (motor without encoder)
     - MOVIDRIVE® MDX60/61B in VFC operating mode
   - High requirements on the setting range (motor with encoder)
     - Motor with encoder: MOVIDRIVE® MDX61B in VFC-n-control, CFC or SERVO operating mode
4. Load falling in inverse proportion to speed, e.g. winding or coil drives.
   - Torque control (asynchronous or synchronous servomotor)
     - Asynchronous or synchronous servomotor with encoder: MOVIDRIVE® MDX61B in operating modes CFC & torque control or SERVO & torque control
5. Variable torque load, e.g. fans and pumps.
   - Low load at low speeds and no load peaks, 125% utilization ($I_D$ = 125% $I_N$)
     - Asynchronous servomotor without encoder: MOVIDRIVE® MDX60/61B in VFC or V/f operating mode.

**Project planning for hoists**

In practice, hoists are dimensioned by taking account of special thermal and safety-relevant criteria.

27793230/EN – 08/2022

*Thermal considerations*

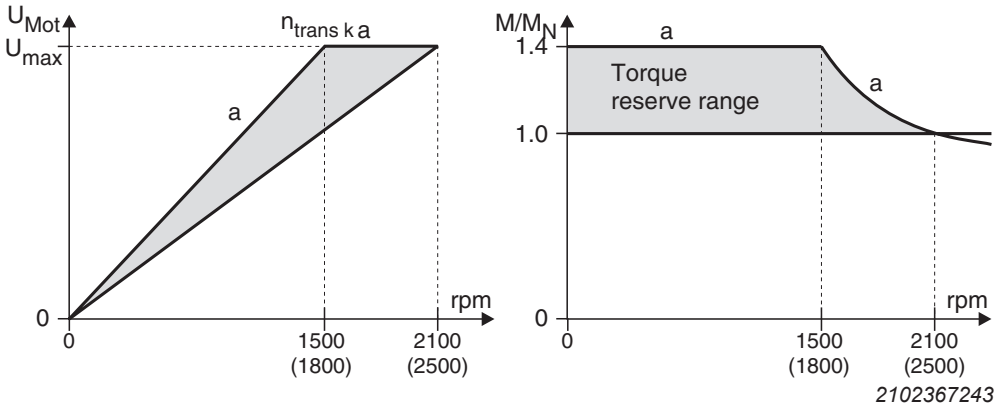
In contrast to trolleys, horizontal drives require approx. 70 – 90% of the nominal motor torque assuming constant speed upwards or downwards and the standard configuration.

*Starting torque*

The highest operating torque is required for acceleration with maximum load in the upwards hoisting direction.

*VFC & hoist*

The 4-pole gearmotor should always be designed for a maximum speed of 2100 $min^{-1}$ (70 Hz) with a base speed of 1500 $min^{-1}$ (50 Hz) and 2500 $min^{-1}$ (83 Hz) at a base speed of 1800 $min^{-1}$ (60 Hz). This means the input speed of the gear unit is approx. 1.4 times higher. Consequently, it is also necessary to choose a gear unit ratio which is higher by a factor of 1.4. This measure means that no torque is lost on the output shaft in the field weakening range (50 – 70 Hz or 60 – 83 Hz), because the higher gear ratio compensates for the inversely proportionate fall in torque in relation to speed (frequency). Furthermore, the start-up torque is 1.4 times greater in the range from 0 – 1500 $min^{-1}$ (0 – 50 Hz) or 0 – 1800 $min^{-1}$ (0 – 60 Hz). Further advantages are that the setting range is greater and the self-cooling of the motor more powerful.




a = Recommended voltage/speed characteristic curve and resultant torque profile

The motor power for hoists is selected according to the load type.

- S1 (100% cdf): Motor power 1 level higher than the selected inverter power, e.g. for lengthy upwards travel or continuous vertical conveyors.
- S3 (40% cdf): Motor power in accordance with the selected inverter power.

The hoist function must be activated on the inverter regardless of the above guidelines. See also "Examples for motor selection" (→ 🗎 358).

*Encoder monitoring*

MOVIDRIVE® has encoder monitoring for RS422, TTL, sin/cos and HIPERFACE® encoders.

## INFORMATION

For speed controlled hoist drives, SEW-EURODRIVE recommends using RS422, TTL, sin/cos, or HIPERFACE® encoders, and activating encoder monitoring.

*Controller*

The control for the hoist without encoder feedback must be designed so that the direction of rotation of the drive can only be changed when it is at a standstill (DB00 = 0).

**Variable torque load (pumps, fans)**

Thermal overload of the motor at low speeds can be ruled out in these applications. Maximum load occurs at the maximum speed; overload peaks do not occur. This is why the dimensions of MOVIDRIVE® and the motor can be selected so that the continuous motor current is less than or equal to the continuous output current (VFC operating mode, 125% of the nominal output current at $f_{PWM}$ = 4 kHz) of MOVIDRIVE®. This means MOVIDRIVE® can operate a motor with the power of the next higher motor type. See also "Examples for motor selection" (→ 🗎 358).

27793230/EN – 08/2022

## 9.4 Basic recommendations for motor selection

- Only use motors with at least thermal class 155 (F).
- Use TF thermistors or TH winding thermostats. TH should be preferred for group drives on one inverter. The series connection of the TH contacts (normally closed) is not subject to limitation when both monitoring functions are used.
- For group drives, we recommend that the motors should not differ from one another by more than 3 motor types.
- Use 4-pole motors if possible. This particularly applies to gearmotors which are operated with a high oil filling level as a result of their vertical mounting position.
- Generally speaking, the motor can be operated at its listed power without external cooling if the operating conditions differ from S1 operation, e.g. positioning drive with 1:20 setting range in S3 operation.
- Do not select a motor that is too big, particularly for delta connection. Otherwise, the inverter may trigger a short circuit fault.
- A MOVIDRIVE® MDX61B with DEH11B, DEH21B, DEU21B HIPERFACE® encoder card option or with DER11B resolver card option is required for speed control. In this case, the motor must be equipped with an encoder (HIPERFACE®, sin/cos, or TTL) or resolver.

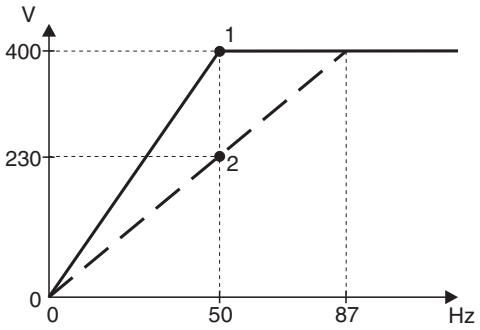
27793230/EN – 08/2022

## 9.5 Motor selection for asynchronous AC motors (VFC)

### 9.5.1 Voltage/frequency characteristic

The asynchronous motor follows a load-dependent voltage/frequency characteristic in VFC operating mode. The continuous calculation of the motor model enables the full motor torque to be utilized right down to the lowest speeds. This characteristic curve is set by entering the nominal motor voltage and the nominal motor frequency in the startup function. The setting determines the speed-dependent torque and power characteristics of the asynchronous motor.

The following figure shows an example of the voltage/frequency characteristic curves of an asynchronous AC motor 230/400 V, 50 Hz.




*9007200730463627*

1 Star connection; 400 V, 50 Hz

2 Delta connection: 230 V, 50 Hz

The inverter output voltage $V_O$ is limited by the connected supply voltage. The "nominal supply voltage" input value in the startup function limits the rms value of the maximum output voltage. This restriction is used whenever the connected motor has a lower rated voltage than the power supply of the inverter. Enter the maximum permitted motor voltage. Furthermore, make sure that the "nominal supply voltage" input value is less than or equal to the supply voltage of the inverter.

27793230/EN – 08/2022

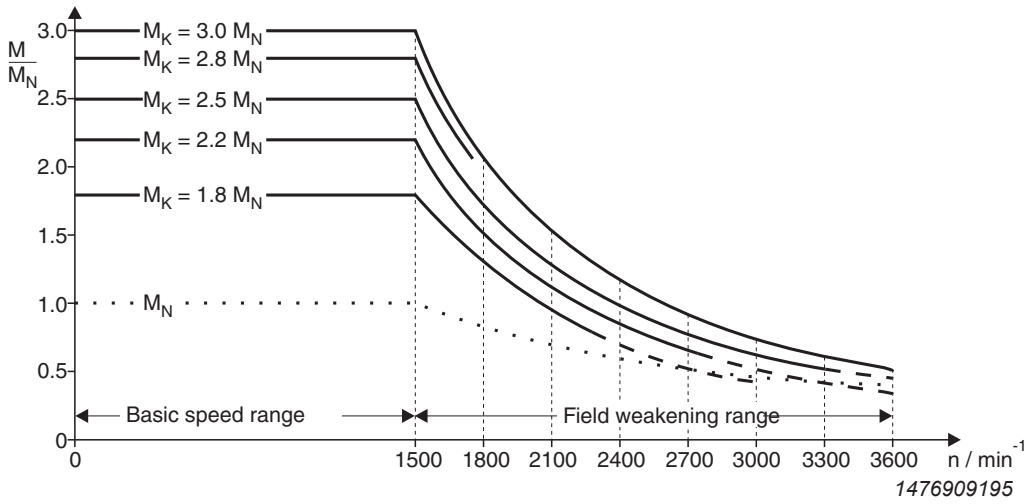
### 9.5.2 Speed/torque characteristics

The field weakening range starts when the set maximum output voltage of the inverter is reached. Consequently, the speed range of the motor is divided into two ranges:

- Basic speed range → constant torque with increasing power
- Field weakening range → constant power with an inversely proportionate decrease in torque.

When determining the maximum rotational speed in the field weakening range, note that the nominal torque $M_N$ (in relation to the nominal rotational speed, e.g. $n_N$ = 1500 $min^{-1}$) falls in inverse proportion and the breakdown torque $M_K$ is reduced in an inverse quadratic relationship. The $M_K/M_N$ ratio is a motor-specific parameter. The MOVIDRIVE® stall protection limits the speed when the maximum possible torque is reached.

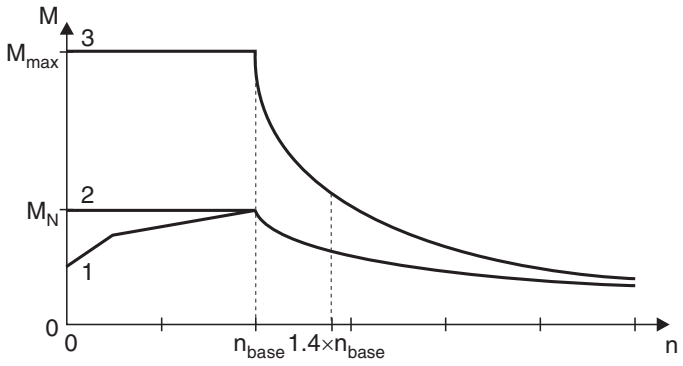
The following figure shows an example of different motor characteristic curves in the basic speed range and in the field weakening range.




With gearmotors, the maximum motor speed is dependent on the size and mounting position of the gear unit. The speed should not exceed 3000 $min^{-1}$ due to the resulting noise and oil churning losses.

#### Typical speed-torque characteristics

$M_N$ is determined by the motor. $M_{max}$ and $n_{base}$ depend on the motor/inverter combination. Refer to the motor selection tables for the CFC mode for the values of $n_{base}$, $M_N$ and $M_{max}$.




*1476913547*

[1] With self-cooling

[2] With external cooling

[3] Maximum torque

### 9.5.3 Dynamic applications ($P_{inverter} > P_{motor}$)

Observe the following notes for dynamic applications in which the inverter power is significantly greater than the motor power:

- The startup function sets the current limit of the inverter (P303/P313) to 150% of the nominal motor current. The value of the current limit is based on the nominal inverter current. As a result, 150% of the nominal motor current is less than 150% of the nominal inverter current (value of P303/P313). For dynamic applications, this parameter must be set manually to a higher value.
- The startup function sets the slip compensation parameter (P324/P334) to the nominal slip of the motor. In the case of VFC-n control, the internal slip limiting function allows the slip to reach max. 150% of this setting. Consequently, the motor develops maximally 150% of the nominal motor torque. For higher torque ratings, the slip compensation parameter (P324) must be increased accordingly.

## INFORMATION

**Set parameter P324 "Slip compensation" to max. 130% of the rated slip of the motor for stable operation.**

27793230/EN – 08/2022

### Combinations with $P_{inverter} > 4 \times P_{motor}$

For inverter/motor combinations in which the inverter power is greater than four times the motor power, special measures must be taken during project planning and startup. The reason for this is the large difference between the rated inverter current and the rated motor current.

Therefore, note the following measures:

- Perform project planning for connecting the motor in a delta connection. This increases the motor current by a factor of √**3** and lowers the unfavorable ratio.
- If this measure does not suffice, start up the motor in VFC & group or V/f operating mode. In these operating modes, the inverter simulates a supply system with constant voltage and frequency with a constant V/f ratio.

27793230/EN – 08/2022

### 9.5.4 Examples for motor selection delta/star AC 230/400 V

**Trolley drive**

- $P_{travel}$ = 1.3 kW
- $P_{max}$ = 13 kW
- $n_{min}$ = 270 $min^{-1}$, setting range 1:10
- $n_{max}$ = 2610 $min^{-1}$

In inverter mode with adapted power (P = $P_{n)}$, the motor can output 150% of its listed power during the acceleration phase. The following applies:

$P_{mot}$ = $P_{max}$: 1.5 = 13 kW: 1.5 = 8.67 kW

A DRS132M4 motor with delta connection ($P_n$ = 9.2 kW) is selected.

According to the selection table, a MOVIDRIVE® MDX61B0110 (P = $P_n$) should be selected.

**Hoist drive**

High constant load with short-term overload (acceleration):

- $P_{max}$ = 26 kW
- $P_{duration}$ = 20 kW
- Setting range 1:15, low speed only for positioning
- Brake applied when the drive is at a standstill
- Load type S3 (40% cdf)

The inverter can yield 150% of its nominal current during acceleration. Consequently, a MOVIDRIVE® MDX61B0220 is selected.

In view of the duty type (S3, 40% cdf), the selection table allocates motor type DRS180L4 ($P_n$ = 22 kW) in star connection.

For more information, see → Sec. Project planning for hoists

**Fan/pump**

Variable torque load with the following power values:

- $P_{max}$ = 4.8 kW
- $n_{max}$ = 1400 $min^{-1}$, continuous duty with $n_{max}$

The motor can be operated at its listed power (P = $P_n$) even without external cooling due to the quadratically falling torque. Therefore, the motor type DRS132S4 in star connection ($P_n$ = 5.5 kW) is sufficient.

According to the selection table, a MOVIDRIVE® MDX61B0055 (P = $P_n$) should be selected. However, as there is a variable torque load without overload, the inverter can be operated with increased output power. Consequently, a MOVIDRIVE® MDX61B0040 is sufficient.

27793230/EN – 08/2022

## 9.6 Motor selection for asynchronous AC and servomotors (CFC)

### INFORMATION

The torque limit *P304* is set automatically by the startup function of the MOVITOOLS® MotionStudio engineering software. Do not increase this automatically set value!

SEW-EURODRIVE recommends always using the latest version of MOVITOOLS® MotionStudio for startup. The latest MOVITOOLS® MotionStudio version can be downloaded from our homepage (www.sew-eurodrive.de).

### 9.6.1 Motor characteristics

In operating mode CFC the drive is characterized by controlling the torque directly and quickly. This means they achieve a highly dynamic overload capacity (up to 3 × $M_N$) and a very high speed and control range (up to 1:5000). Stable speed and positioning accuracy meet the high requirements of servo technology. Achieve this behavior via a field-oriented control. The current components for magnetization ($I_d$) and torque generation ($I_q$) are controlled separately. A prerequisite of the CFC operating modes is that there must always be an encoder on the motor.

The inverter needs to know exact data about the connected motor to calculate the motor model. This data is made available by the MOVITOOLS® MotionStudio engineering software with the startup function. The CFC operating modes are only possible with the SEW motors listed in the following chapters. They cannot be used with other SEW motors or third-party motor. The necessary motor data for the CFC operating modes are stored on the operator panel for the 2-, 4-, and 6-pole SEW motors.

### 9.6.2 Magnetizing current

Dynamic drives that have to accelerate without a delay are also energized at standstill without load. The magnetizing current $I_d$ flows at standstill. The inverter must be able to supply this current constantly in applications in which the output stage is permanently enabled, for example in CFC & torque control mode. In particular in the case of large motors with a slip frequency ≤ 2 Hz, you must refer to the diagrams in chapter "Load capacity of the devices at low output frequencies" to check whether the inverter can supply the current. Also check whether the thermal characteristics of the motor are suitable (external cooling fan) for this. For the magnetizing current $I_d$, refer to the motor tables.

27793230/EN – 08/2022

### 9.6.3 CFC mode with speed control

There is no need to differentiate between the load types quadratic, dynamic and static when performing project planning for the CFC operating mode. Project planning for an asynchronous motor in CFC mode is carried out in accordance with the following requirements:

First Effective torque requirement at average application speed.

$M_{rms} < M_{N\_Mot}$

The operating point must lie below the characteristic curve for the continuous torque. No external cooling is required if this operating point lies below the characteristic curve for self-cooling.

Second Maximum torque needed across the speed curve.

$M_{max} < M_{dyn\_Mot}$

This operating point must lie below the characteristic curve for the maximum torque of the motor/MOVIDRIVE® combination.

3. Maximum speed

Do not configure the maximum speed of the motor higher than 1.4 times the base speed. The maximum torque available will then still be approx. 110% of the continuous nominal torque of the motor. Observe the maximum input speed of the gear unit.

$n_{max} < 1.4 \times n_{base}$

### 9.6.4 Cooling the motor

Self-cooling of asynchronous motors is based on the integrated fan, which means self-cooling depends on the speed. The integrated fan does not provide cooling for the motor at low speeds and standstill. External cooling may be necessary in case of a high static load or a high effective torque.

27793230/EN – 08/2022

### 9.6.5 CFC mode with torque control

This operating mode permits direct torque control of the asynchronous motor in the basic speed range ($n \leq n_{base}$). The setpoint sources of the speed-controlled CFC mode can also be used for torque control. All speed setpoint sources (except for bus setpoints) are interpreted as current setpoint sources. Assign "Current" to a process data word for fieldbus control. The settings for evaluating the analog input (→ P11_, parameter description) also remain in effect. The fixed setpoints (P16_, P17_) can be entered either in the device ($min^{-1}$) or ($\%I_{N\_inverter}$) (→ MOVITOOLS® MotionStudio).

**The following relationship exists between the units:**

3000 $min^{-1}$ ≙ 150% nominal inverter current

The torque on the output shaft of the motor can be calculated for the basic speed range ($n \leq n_{base}$) using the following formulae:

**Specification of a setpoint for the motor torque in $\%I_{N\_inverter}$:**

$$M = k_T \times I_{N\_inverter} \times setpoint$$

*1477199499*

**Specification of a setpoint for the motor torque in $min^{-1}$:**

$$M = k_T \times 1.5 \times I_{N\_inverter} \times \frac{setpoint}{3000\ 1/min}$$

*1477203211*

$I_{N\_inverter}$ = Nominal output current of the inverter

$c_T$ = Torque constant = $M_n$ / $I_{q\_n}$

$M_n$ and $I_{q\_n}$ are motor-specific values. For the values of the torque constants $k_T$ and the motor-specific parameters $M_n$ and $I_{q\_n}$, refer to the motor tables.

In addition to the torque-generating current $I_q$, the inverter must also provide the magnetizing current $I_d$. The actual inverter output current $I_{tot}$ can be calculated using the following formulae:

**Specification of a setpoint for the motor torque in $\%I_{N\_inverter}$:**

$$I_{total} = \sqrt{\left(setpoint \times I_{N\_inverter}\right)^2 + I_{d\_N}^2}$$

*1477206667*

**Specification of a setpoint for the motor torque in $min^{-1}$:**

$$I_{total} = \sqrt{\left(setpoint \times 1.5 \times I_{N\ \ inverter} \times \frac{1}{3000\ 1/min}\right)^2 + I_{d\ \ N}^2}$$

*1477274379*

$I_{q\_n}$ = Nominal value of the torque-generating current according to the motor table

$I_{d\_n}$ = Nominal value of the magnetizing current, according to the motor table

27793230/EN – 08/2022

### 9.6.6 DRL.. motor table

**Asynchronous DRL.. servomotors**

**4-pole DRL.. servomotors for 400 V, 50 Hz**

| $n_N$ | Motor type | $M_N$ | $I_N$ | $I_{q\_n}$ | $I_{d\_n}$ | $c_T$ | $M_{pk}$ D1 | $M_{pk}$ D2 | m | $J_{mot}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Nm | A | A | A | Nm/A | Nm | Nm | kg | $10^{-4}$ kgm² |
| 1200 | DRL71S4 | 2.7 | 1.18 | 1.02 | 0.62 | 2.66 | 5 | 8.5 | 8.6 | 4.9 |
| | DRL71M4 | 4 | 1.6 | 1.36 | 0.80 | 2.93 | 7 | 14 | 10 | 7.1 |
| | DRL80S4 | 6.5 | 2.15 | 1.95 | 0.88 | 3.33 | 10 | 25 | 11.5 | 14.9 |
| | DRL80M4 | 9.5 | 2.9 | 2.64 | 1.10 | 3.60 | 14 | 30 | 15.2 | 21.5 |
| | DRL90L4 | 15 | 4.8 | 4.14 | 2.21 | 3.63 | 25 | 46 | 22.5 | 43.5 |
| | DRL100L4 | 26 | 8.5 | 8.05 | 2.68 | 3.23 | 40 | 85 | 30 | 68 |
| | DRL132S4 | 42 | 12.6 | 11.9 | 4.07 | 3.52 | 80 | 150 | 45.5 | 190 |
| | DRL132MC4 | 56 | 17.6 | 15.4 | 7.50 | 3.63 | 130 | 200 | 65 | 340 |
| | DRL160M4 | 85 | 25.5 | 24.2 | 8.05 | 3.51 | 165 | 280 | 93 | 450 |
| | DRL160MC4 | 90 | 28 | 25.1 | 10.9 | 3.58 | 185 | 320 | 95 | 590 |
| | DRL180S4 | 120 | 34.5 | 33.2 | 10.8 | 3.62 | 210 | 380 | 122 | 900 |
| | DRL180M4 | 135 | 38 | 36.1 | 11.3 | 3.74 | 250 | 430 | 143 | 1110 |
| | DRL180L4 | 165 | 47 | 44.9 | 14.8 | 3.67 | 320 | 520 | 154 | 1300 |
| | DRL180LC4 | 175 | 52 | 46.8 | 17.1 | 3.74 | 420 | 600 | 163 | 1680 |
| | DRL200L4 | 200 | 58.5 | 56.0 | 17.8 | 3.57 | 475 | 680 | 260 | 2360 |
| | DRL225S4 | 250 | 72 | 68.1 | 23.4 | 3.67 | 520 | 770 | 295 | 2930 |
| | DRL225MC4 | 290 | 89 | 78.6 | 29.2 | 3.69 | 770 | 1100 | 330 | 4330 |
| 1700 | DRL71S4 | 2.7 | 1.63 | 1.40 | 0.86 | 1.92 | 5 | 8.5 | 8.6 | 4.9 |
| | DRL71M4 | 4 | 2.2 | 1.90 | 1.11 | 2.11 | 7 | 14 | 10 | 7.1 |
| | DRL80S4 | 6.5 | 2.96 | 2.71 | 1.22 | 2.40 | 10 | 25 | 11.5 | 14.9 |
| | DRL80M4 | 9.5 | 4 | 3.65 | 1.52 | 2.60 | 14 | 30 | 15.2 | 21.5 |
| | DRL90L4 | 15 | 6.6 | 5.67 | 3.02 | 2.65 | 25 | 46 | 22.5 | 43.5 |
| | DRL100L4 | 26 | 11.4 | 11.00 | 3.66 | 2.36 | 40 | 85 | 30 | 68 |
| | DRL132S4 | 42 | 17.8 | 16.9 | 5.75 | 2.49 | 80 | 150 | 45.5 | 190 |
| | DRL132MC4 | 56 | 24.9 | 21.9 | 10.6 | 2.56 | 130 | 200 | 65 | 340 |
| | DRL160M4 | 85 | 35 | 33.5 | 11.1 | 2.54 | 165 | 280 | 93 | 450 |
| | DRL160MC4 | 90 | 36 | 32.3 | 14.0 | 2.78 | 185 | 320 | 95 | 590 |
| | DRL180S4 | 120 | 47.5 | 45.6 | 14.8 | 2.63 | 210 | 380 | 122 | 900 |
| | DRL180M4 | 135 | 52 | 50.1 | 15.7 | 2.70 | 250 | 430 | 143 | 1110 |
| | DRL180L4 | 165 | 63 | 61.3 | 20.2 | 2.69 | 320 | 520 | 154 | 1300 |
| | DRL180LC4 | 175 | 72 | 65.7 | 24.1 | 2.66 | 420 | 600 | 163 | 1680 |
| | DRL200L4 | 200 | 80.6 | 78.4 | 25.0 | 2.55 | 475 | 680 | 260 | 2360 |
| | DRL225S4 | 245 | 97 | 92 | 32.2 | 2.66 | 520 | 770 | 295 | 2930 |
| | DRL225MC4 | 280 | 130 | 114 | 43.9 | 2.45 | 770 | 1100 | 330 | 4330 |

27793230/EN – 08/2022

| $n_N$ | Motor type | $M_N$ | $I_N$ | $I_{q\_n}$ | $I_{d\_n}$ | $c_T$ | $M_{pk}$ D1 | $M_{pk}$ D2 | m | $J_{mot}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Nm | A | A | A | Nm/A | Nm | Nm | kg | $10^{-4}$ kgm² |
| 2100 | DRL71S4 | 2.6 | 2 | 1.70 | 1.08 | 1.53 | 5 | 8.5 | 8.6 | 4.9 |
| | DRL71M4 | 3.8 | 2.7 | 2.25 | 1.39 | 1.69 | 7 | 14 | 10 | 7.1 |
| | DRL80S4 | 6.2 | 3.59 | 3.22 | 1.52 | 1.92 | 10 | 25 | 11.5 | 14.9 |
| | DRL80M4 | 9.5 | 5 | 4.60 | 1.91 | 2.07 | 14 | 30 | 15.2 | 21.5 |
| | DRL90L4 | 15 | 8.4 | 7.21 | 3.84 | 2.08 | 25 | 46 | 22.5 | 43.5 |
| | DRL100L4 | 25 | 14 | 13.4 | 4.63 | 1.87 | 40 | 85 | 30 | 68 |
| | DRL132S4 | 41 | 21.4 | 20.3 | 7.07 | 2.02 | 80 | 150 | 45.5 | 190 |
| | DRL132MC4 | 52 | 28.8 | 25.0 | 13.0 | 2.08 | 130 | 200 | 65 | 340 |
| | DRL160M4 | 85 | 44 | 42.1 | 14.0 | 2.02 | 165 | 280 | 93 | 450 |
| | DRL160MC4 | 88 | 48 | 42.8 | 18.9 | 2.06 | 185 | 320 | 95 | 590 |
| | DRL180S4 | 110 | 55.3 | 52.7 | 18.7 | 2.09 | 210 | 380 | 122 | 900 |
| | DRL180M4 | 130 | 64 | 60.4 | 19.6 | 2.15 | 250 | 430 | 143 | 1110 |
| | DRL180L4 | 160 | 78 | 75.8 | 25.8 | 2.11 | 320 | 520 | 154 | 1300 |
| | DRL180LC4 | 170 | 87 | 79.1 | 29.8 | 2.15 | 420 | 600 | 163 | 1680 |
| | DRL200L4 | 195 | 99 | 94.6 | 30.9 | 2.06 | 475 | 680 | 260 | 2360 |
| | DRL225S4 | 235 | 119 | 111 | 40.6 | 2.11 | 520 | 770 | 295 | 2930 |
| | DRL225MC4 | 265 | 142 | 125 | 50.8 | 2.12 | 770 | 1100 | 330 | 4330 |
| 3000 | DRL71S4 | 2.5 | 2.68 | 2.26 | 1.49 | 1.11 | 5 | 8.5 | 8.6 | 4.9 |
| | DRL71M4 | 3.6 | 3.55 | 2.96 | 1.93 | 1.21 | 7 | 14 | 10 | 7.1 |
| | DRL80S4 | 6 | 4.82 | 4.32 | 2.10 | 1.39 | 10 | 25 | 11.5 | 14.9 |
| | DRL80M4 | 8.8 | 6.5 | 5.86 | 2.63 | 1.50 | 14 | 30 | 15.2 | 21.5 |
| | DRL90L4 | 14 | 11 | 9.19 | 5.25 | 1.52 | 25 | 46 | 22.5 | 43.5 |
| | DRL100L4 | 21 | 16.6 | 15.4 | 6.35 | 1.36 | 40 | 85 | 30 | 68 |
| | DRL132S4 | 35 | 25.5 | 24.4 | 10.0 | 1.43 | 80 | 150 | 45.5 | 190 |
| | DRL132MC4 | 42 | 34.8 | 28.4 | 18.4 | 1.48 | 130 | 200 | 65 | 340 |
| | DRL160M4 | 79 | 57 | 53.9 | 19.3 | 1.47 | 165 | 280 | 93 | 450 |
| | DRL160MC4 | 83 | 59 | 51.8 | 24.3 | 1.60 | 185 | 320 | 95 | 590 |
| | DRL180S4 | 100 | 70.1 | 65.9 | 25.7 | 1.52 | 210 | 380 | 122 | 900 |
| | DRL180M4 | 105 | 73 | 67.6 | 27.2 | 1.55 | 250 | 430 | 143 | 1110 |
| | DRL180L4 | 130 | 90 | 83.8 | 35.0 | 1.55 | 320 | 520 | 154 | 1300 |
| | DRL180LC4 | 140 | 105 | 91 | 41.8 | 1.53 | 420 | 600 | 163 | 1680 |
| | DRL200L4 | 165 | 118 | 112 | 43.3 | 1.47 | 475 | 680 | 260 | 2360 |
| | DRL225S4 | 195 | 139 | 127 | 56.0 | 1.53 | 520 | 770 | 295 | 2930 |
| | DRL225MC4 | 220 | 188 | 156 | 76 | 1.41 | 770 | 1100 | 330 | 4330 |

27793230/EN – 08/2022

### 4-pole DRL.. servomotors/brakemotors for 400 V, 50 Hz

| $n_N$ | Motor type | $M_N$ | $I_N$ | BE.. | $M_B$ D1 | $M_B$ D2 | $m_B$ | $J_{Mot\_BE}$ |
|---|---|---|---|---|---|---|---|---|
| | | Nm | A | | Nm | Nm | kg[1)] | $10^{-4}$ kgm$^2$ |
| 1200 | DRL71S4 | 2.7 | 1.18 | BE05 | 5 | 5 | 11 | 6.2 |
| | DRL71M4 | 4 | 1.6 | BE1 | 7 | 10 | 12.6 | 8.4 |
| | DRL80S4 | 6.5 | 2.15 | BE2 | 10 | 20 | 15.2 | 19.4 |
| | DRL80M4 | 9.5 | 2.9 | BE2 | 14 | 20 | 18.9 | 26 |
| | DRL90L4 | 15 | 4.8 | BE5 | 20 | 40 | 28.5 | 49.5 |
| | DRL100L4 | 26 | 8.5 | BE5 | 40 | 55 | 36 | 74 |
| | DRL132S4 | 42 | 12.6 | BE11 | 80 | 110 | 60 | 200 |
| | DRL132MC4 | 56 | 17.6 | BE11 | 110 | 110 | 79 | 355 |
| | DRL160M4 | 85 | 25.5 | BE20 | 150 | 200 | 120 | 500 |
| | DRL160MC4 | 90 | 28 | BE20 | 150 | 200 | 122 | 640 |
| | DRL180S4 | 120 | 34.5 | BE30 | 200 | 300 | 162 | 1030 |
| | DRL180M4 | 135 | 38 | BE30 | 200 | 300 | 183 | 1250 |
| | DRL180L4 | 165 | 47 | BE30 | 300 | 300 | 194 | 1440 |
| | DRL180LC4 | 175 | 52 | BE32 | 400 | 400 | 210 | 1910 |
| | DRL200L4 | 200 | 58.5 | BE32 | 400 | 600 | 315 | 2590 |
| | DRL225S4 | 250 | 72 | BE32 | 500 | 500 | 350 | 3160 |
| | DRL225MC4 | 290 | 89 | BE32 | 600 | 600 | 385 | 4560 |
| 1700 | DRL71S4 | 2.7 | 1.63 | BE05 | 5 | 5 | 11 | 6.2 |
| | DRL71M4 | 4 | 2.2 | BE1 | 7 | 10 | 12.6 | 8.4 |
| | DRL80S4 | 6.5 | 2.96 | BE2 | 10 | 20 | 15.2 | 19.4 |
| | DRL80M4 | 9.5 | 4 | BE2 | 14 | 20 | 18.9 | 26 |
| | DRL90L4 | 15 | 6.6 | BE5 | 20 | 40 | 28.5 | 49.5 |
| | DRL100L4 | 26 | 11.4 | BE5 | 40 | 55 | 36 | 74 |
| | DRL132S4 | 42 | 17.8 | BE11 | 80 | 110 | 60 | 200 |
| | DRL132MC4 | 56 | 24.9 | BE11 | 110 | 110 | 79 | 355 |
| | DRL160M4 | 85 | 35 | BE20 | 150 | 200 | 120 | 500 |
| | DRL160MC4 | 90 | 36 | BE20 | 150 | 200 | 122 | 640 |
| | DRL180S4 | 120 | 47.5 | BE30 | 200 | 300 | 162 | 1030 |
| | DRL180M4 | 135 | 52 | BE30 | 200 | 300 | 183 | 1250 |
| | DRL180L4 | 165 | 63 | BE30 | 300 | 300 | 194 | 1440 |
| | DRL180LC4 | 175 | 72 | BE32 | 400 | 400 | 210 | 1910 |
| | DRL200L4 | 200 | 80.6 | BE32 | 400 | 600 | 315 | 2590 |
| | DRL225S4 | 245 | 97 | BE32 | 500 | 500 | 350 | 3160 |
| | DRL225MC4 | 280 | 130 | BE32 | 600 | 600 | 385 | 4560 |
| 2100 | DRL71S4 | 2.6 | 2 | BE05 | 5 | 5 | 11 | 6.2 |
| | DRL71M4 | 3.8 | 2.7 | BE1 | 7 | 10 | 12.6 | 8.4 |
| | DRL80S4 | 6.2 | 3.59 | BE2 | 10 | 20 | 15.2 | 19.4 |
| | DRL80M4 | 9.5 | 5 | BE2 | 14 | 20 | 18.9 | 26 |
| | DRL90L4 | 15 | 8.4 | BE5 | 20 | 40 | 28.5 | 49.5 |
| | DRL100L4 | 25 | 14 | BE5 | 40 | 55 | 36 | 74 |
| | DRL132S4 | 41 | 21.4 | BE11 | 80 | 110 | 60 | 200 |
| | DRL132MC4 | 52 | 28.8 | BE11 | 110 | 110 | 79 | 355 |
| | DRL160M4 | 85 | 44 | BE20 | 150 | 200 | 120 | 500 |
| | DRL160MC4 | 88 | 48 | BE20 | 150 | 200 | 122 | 640 |
| | DRL180S4 | 110 | 55.3 | BE30 | 200 | 300 | 162 | 1030 |
| | DRL180M4 | 130 | 64 | BE30 | 200 | 300 | 183 | 1250 |
| | DRL180L4 | 160 | 78 | BE30 | 300 | 300 | 194 | 1440 |
| | DRL180LC4 | 170 | 87 | BE32 | 400 | 400 | 210 | 1910 |
| | DRL200L4 | 195 | 99 | BE32 | 400 | 600 | 315 | 2590 |
| | DRL225S4 | 235 | 119 | BE32 | 500 | 500 | 350 | 3160 |
| | DRL225MC4 | 265 | 142 | BE32 | 600 | 600 | 385 | 4560 |

27793230/EN – 08/2022

| $n_N$ | Motor type | $M_N$ | $I_N$ | BE.. | $M_B$ D1 | $M_B$ D2 | $m_B$ | $J_{Mot\_BE}$ |
|---|---|---|---|---|---|---|---|---|
| | | Nm | A | | Nm | Nm | kg[1)] | $10^{-4}$ kgm$^2$ |
| 3000 | DRL71S4 | 2.5 | 2.68 | BE05 | 5 | 5 | 11 | 6.2 |
| | DRL71M4 | 3.6 | 3.55 | BE1 | 7 | 10 | 12.6 | 8.4 |
| | DRL80S4 | 6 | 4.82 | BE2 | 10 | 20 | 15.2 | 19.4 |
| | DRL80M4 | 8.8 | 6.5 | BE2 | 14 | 20 | 18.9 | 26 |
| | DRL90L4 | 14 | 11 | BE5 | 20 | 40 | 28.5 | 49.5 |
| | DRL100L4 | 21 | 16.6 | BE5 | 40 | 55 | 36 | 74 |
| | DRL132S4 | 35 | 25.5 | BE11 | 80 | 110 | 60 | 200 |
| | DRL132MC4 | 42 | 34.8 | BE11 | 110 | 110 | 79 | 355 |
| | DRL160M4 | 79 | 57 | BE20 | 150 | 200 | 120 | 500 |
| | DRL160MC4 | 83 | 59 | BE20 | 150 | 200 | 122 | 640 |
| | DRL180S4 | 100 | 70.1 | BE30 | 200 | 300 | 162 | 1030 |
| | DRL180M4 | 105 | 73 | BE30 | 200 | 300 | 183 | 1250 |
| | DRL180L4 | 130 | 90 | BE30 | 300 | 300 | 194 | 1440 |
| | DRL180LC4 | 140 | 105 | BE32 | 400 | 400 | 210 | 1910 |
| | DRL200L4 | 165 | 118 | BE32 | 400 | 600 | 315 | 2590 |
| | DRL225S4 | 195 | 139 | BE32 | 500 | 500 | 350 | 3160 |
| | DRL225MC4 | 220 | 188 | BE32 | 600 | 600 | 385 | 4560 |

1) Applies for foot-mounted motor with brake (DRL...BE../FI..)

27793230/EN – 08/2022

### 9.6.7 DRL.. asynchronous servomotors

SEW-EURODRIVE offers DRL.. series asynchronous servomotors especially for operation with MOVIDRIVE® in CFC operating modes. These motors have the following characteristics:

**High power yield**

The optimum winding of DRL.. motors permits a high power yield.

**Division into speed classes**

DRL.. motors are available in four speed classes. This assures an optimum utilization of torques and speeds.

**With sin/cos encoder as standard**

As standard, DRL.. motors are equipped with a high-resolution sin/cos encoder (ES7S, EG7S).

27793230/EN – 08/2022

### TF or TH motor protection as standard

The winding temperature of the 3 motor phases is monitored using thermistors (TF). The thermistor can be connected to the TF/TH input of MOVIDRIVE®. The temperature is then monitored by MOVIDRIVE®, no additional monitoring unit is required.

Bimetallic switches (TH) can also be used instead of thermistors. The bimetallic switches are also connected to the TF/TH input.

### Thermal class 155 (F) as standard

DRL.. motors are built using material of thermal class 155 (F) as standard.

### Dynamics packages 1 and 2

DRL.. motors are available in 2 dynamics packages. The motors differ in their overload capacity related to the nominal motor torque.

- Dynamics package 1: 190% – 220% nominal motor torque
- Dynamics package 2: 300% – 350% nominal motor torque

DRN.., DRS.., DRE. motors or DRL.. motors can be used in CFC mode. SEW-EURODRIVE recommends using DRL.. motors to achieve optimum benefit from the advantages of CFC mode.

| | Advantage | Disadvantage |
|---|---|---|
| CFC mode with DRN.., DRS.., DRE.. motor selection | Standard motor version | Slower base speed than the DRL.. motor. |
| | | The power yield of the motor is less than the rated motor power. |
| | | In terms of the power yield, the mass inertia is greater than that of the DRL.. motors. |
| | | The maximum torque is limited for some of the inverter/motor combinations due to mechanical rigidity. |
| CFC mode with DRL.. motor<br>Motor Selection | Higher base speed<br>As DRN.., DRS.., DRE..motor. | No IEC standard motor |
| | Usually with a power yield one motor type higher. | |
| | Based on the power yield of a lower mass moment of inertia. | Higher current demand due to higher power yield; therefore a larger inverter has to be assigned. |
| | Motor is designed for dynamic operation. | |

27793230/EN – 08/2022

### 9.6.8 Combination overview for DRL.. motors with MOVIDRIVE® B (line voltage 400 V)

**Nominal speed $n_N$ = 1200 $min^{-1}$, dynamics package 1**

*Assignment of MOVIDRIVE® MDX61B0005-5A3 – MDX61B0110-503 (sizes 0 – 2):*

| Motor | | MOVIDRIVE® MDX61B...-5_3 (AC 400/500 V devices) in CFC operating modes (P700) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0005 | 0008 | 0011 | 0014 | 0015 | 0022 | 0030 | 0040 | 0055 | 0075 | 0110 |
| DRL71S4 | $M_{max}$ Nm | 5 | | | | | | | | | | |
| | $n_{base}$ $min^{-1}$ | 942 | | | | | | | | | | |
| DRL71M4 | $M_{max}$ Nm | 7 | | | | 7 | | | | | | |
| | $n_{base}$ $min^{-1}$ | 991 | | | | 1034 | | | | | | |
| DRL80S4 | $M_{max}$ Nm | 10 | | | | 10 | | | | | | |
| | $n_{base}$ $min^{-1}$ | 963 | | | | 977 | | | | | | |
| DRL80M4 | $M_{max}$ Nm | 13.3 | 14 | 14 | | 14 | | | | | | |
| | $n_{base}$ $min^{-1}$ | 991 | 1020 | 1055 | | 1055 | | | | | | |
| DRL100L4 | $M_{max}$ Nm | | | | | | 24.8 | 32.3 | 40 | | | |
| | $n_{base}$ $min^{-1}$ | | | | | | 1238 | 1188 | 1181 | | | |
| DRL90L4 | $M_{max}$ Nm | | | | 25 | 19.3 | 25 | 25 | | | | |
| | $n_{base}$ $min^{-1}$ | | | | 1062 | 1097 | 1083 | 1195 | | | | |
| DRL132S4 | $M_{max}$ Nm | | | | | | | | 47.1 | 63.2 | 80 | 80 |
| | $n_{base}$ $min^{-1}$ | | | | | | | | 1090 | 1031 | 973 | 1066 |
| DRL132MC4 | $M_{max}$ Nm | | | | | | | | | | 78.5 | 121 |
| | $n_{base}$ $min^{-1}$ | | | | | | | | | | 1125 | 1049 |
| DRL160M4 | $M_{max}$ Nm | | | | | | | | | | 79.4 | 123 |
| | $n_{base}$ $min^{-1}$ | | | | | | | | | | 1150 | 1092 |
| DRL160MC4 | $M_{max}$ Nm | | | | | | | | | | | 118 |
| | $n_{base}$ $min^{-1}$ | | | | | | | | | | | 1150 |

*Assignment of MOVIDRIVE® MDX61B0150-503 – MDX61B1320-503 (sizes 3 – 6):*

| Motor | | MOVIDRIVE® MDX61B...-5_3 (AC 400/500 V devices) in CFC operating modes (P700) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0150 | 0220 | 0300 | 0370 | 0450 | 0550 | 0750 | 0900 | 1100 | 1320 |
| DRL132MC4 | $M_{max}$ Nm | 130 | | | | | | | | | |
| | $n_{base}$ $min^{-1}$ | 1166 | | | | | | | | | |
| DRL160M4 | $M_{max}$ Nm | 165 | 165 | | | | | | | | |
| | $n_{base}$ $min^{-1}$ | 1018 | 1144 | | | | | | | | |
| DRL160MC4 | $M_{max}$ Nm | 162 | 185 | | | | | | | | |
| | $n_{base}$ $min^{-1}$ | 1097 | 1208 | | | | | | | | |
| DRL180S4 | $M_{max}$ Nm | 171 | 210 | | | | | | | | |
| | $n_{base}$ $min^{-1}$ | 1092 | 1134 | | | | | | | | |
| DRL180M4 | $M_{max}$ Nm | 172 | 250 | 250 | | | | | | | |
| | $n_{base}$ $min^{-1}$ | 1155 | 1076 | 1213 | | | | | | | |
| DRL180L4 | $M_{max}$ Nm | 170 | 251 | 320 | 320 | | | | | | |
| | $n_{base}$ $min^{-1}$ | 1171 | 1107 | 1076 | 1181 | | | | | | |
| DRL180LC4 | $M_{max}$ Nm | | 241 | 318 | 390 | 420 | | | | | |
| | $n_{base}$ $min^{-1}$ | | 1139 | 1086 | 1039 | 1076 | | | | | |
| DRL200L4 | $M_{max}$ Nm | | 239 | 317 | 388 | 475 | | | | | |
| | $n_{base}$ $min^{-1}$ | | 1161 | 1120 | 1083 | 1038 | | | | | |
| DRL225S4 | $M_{max}$ Nm | | | 318 | 391 | 480 | 520 | | | | |
| | $n_{base}$ $min^{-1}$ | | | 1161 | 1132 | 1095 | 1136 | | | | |
| DRL225MC4 | $M_{max}$ Nm | | | | 368 | 455 | 540 | 673 | 770 | | |
| | $n_{base}$ $min^{-1}$ | | | | 1177 | 1153 | 1124 | 1083 | 1116 | | |

27793230/EN – 08/2022

### Nominal speed $n_N$ = 1200 min$^{-1}$, dynamics package 2

*Assignment of MOVIDRIVE® MDX61B0005-5A3 – MDX61B0110-503 (sizes 0 – 2):*

| Motor | | MOVIDRIVE® MDX61B...-5_3 (AC 400/500 V devices) in CFC operating modes (P700) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0005 | 0008 | 0011 | 0014 | 0015 | 0022 | 0030 | 0040 | 0055 | 0075 | 0110 |
| DRL71S4 | $M_{max}$ Nm | 8.5 | | | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 548 | | | | | | | | | | |
| DRL71M4 | $M_{max}$ Nm | 11.4 | 13.8 | 14.0 | 14.0 | 14 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 647 | 506 | 506 | 520 | 506 | | | | | | |
| DRL80S4 | $M_{max}$ Nm | 13 | 15.7 | 20.4 | 25 | 19.8 | 25 | | | | | |
| | $n_{base}$ min$^{-1}$ | 773 | 647 | 429 | 225 | 457 | 225 | | | | | |
| DRL80M4 | $M_{max}$ Nm | | 16.2 | 21.1 | 27.4 | 20.4 | 28.3 | 30.0 | | | | |
| | $n_{base}$ min$^{-1}$ | | 907 | 759 | 577 | 780 | 555 | 506 | | | | |
| DRL100L4 | $M_{max}$ Nm | | | | | | | 32.3 | 44.5 | 59 | 75.8 | 85 |
| | $n_{base}$ min$^{-1}$ | | | | | | | 1188 | 1083 | 963 | 823 | 752 |
| DRL90L4 | $M_{max}$ Nm | | | | 26.6 | 19.3 | 27.5 | 35.5 | 46 | | | |
| | $n_{base}$ min$^{-1}$ | | | | 1005 | 1097 | 998 | 900 | 773 | | | |
| DRL132S4 | $M_{max}$ Nm | | | | | | | | 47.1 | 63.2 | 81.6 | 124 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | 1090 | 1031 | 961 | 803 |
| DRL132MC4 | $M_{max}$ Nm | | | | | | | | | | 78.5 | 121 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | 1125 | 1049 |
| DRL160M4 | $M_{max}$ Nm | | | | | | | | | | | 123 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | | 1092 |
| DRL160MC4 | $M_{max}$ Nm | | | | | | | | | | | 118 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | | 1150 |

*Assignment of MOVIDRIVE® MDX61B0150-503 – MDX61B1320-503 (sizes 3 – 6):*

| Motor | | MOVIDRIVE® MDX61B...-5_3 (AC 400/500 V devices) in CFC operating modes (P700) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0150 | 0220 | 0300 | 0370 | 0450 | 0550 | 0750 | 0900 | 1100 | 1320 |
| DRL132S4 | $M_{max}$ Nm | 150 | | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 709 | | | | | | | | | |
| DRL132MC4 | $M_{max}$ Nm | 163 | 200 | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 973 | 955 | | | | | | | | |
| DRL160M4 | $M_{max}$ Nm | 166 | 241 | 280 | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1018 | 902 | 854 | | | | | | | |
| DRL160MC4 | $M_{max}$ Nm | 162 | 236 | 310 | 320 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1097 | 1007 | 918 | 912 | | | | | | |
| DRL180S4 | $M_{max}$ Nm | 171 | 249 | 326 | 380 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1092 | 997 | 902 | 833 | | | | | | |
| DRL180M4 | $M_{max}$ Nm | 172 | 251 | 329 | 402 | 430 | | | | | |
| | $n_{base}$ min$^{-1}$ | 1155 | 1076 | 1002 | 928 | 918 | | | | | |
| DRL180L4 | $M_{max}$ Nm | | 251 | 331 | 404 | 495 | 520 | | | | |
| | $n_{base}$ min$^{-1}$ | | 1107 | 1049 | 991 | 923 | 912 | | | | |
| DRL180LC4 | $M_{max}$ Nm | | 241 | 318 | 390 | 477 | 564 | 600 | | | |
| | $n_{base}$ min$^{-1}$ | | 1139 | 1086 | 1039 | 981 | 923 | 907 | | | |
| DRL200L4 | $M_{max}$ Nm | | 239 | 317 | 388 | 475 | 562 | 680 | | | |
| | $n_{base}$ min$^{-1}$ | | 1161 | 1120 | 1083 | 1038 | 988 | 931 | | | |
| DRL225S4 | $M_{max}$ Nm | | | 318 | 391 | 480 | 569 | 708 | 770 | | |
| | $n_{base}$ min$^{-1}$ | | | 1161 | 1132 | 1095 | 1062 | 1005 | 1025 | | |
| DRL225MC4 | $M_{max}$ Nm | | | | 368 | 455 | 540 | 673 | 884 | 1042 | 1100 |
| | $n_{base}$ min$^{-1}$ | | | | 1177 | 1153 | 1124 | 1083 | 1017 | 968 | 964 |

27793230/EN – 08/2022

### Nominal speed $n_N$ = 1700 $min^{-1}$, dynamics package 1

*Assignment of MOVIDRIVE® MDX61B0005-5A3 – MDX61B0110-503 (sizes 0 – 2):*

| Motor | | MOVIDRIVE® MDX61B...-5_3 (AC 400/500 V devices) in CFC operating modes (P700) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0005 | 0008 | 0011 | 0014 | 0015 | 0022 | 0030 | 0040 | 0055 | 0075 | 0110 |
| DRL71S4 | $M_{max}$ Nm | 5 | | | | 5 | | | | | | |
| | $n_{base}$ $min^{-1}$ | 1512 | | | | 1582 | | | | | | |
| DRL71M4 | $M_{max}$ Nm | 7 | | | | 7 | | | | | | |
| | $n_{base}$ $min^{-1}$ | 1498 | | | | 1617 | | | | | | |
| DRL80S4 | $M_{max}$ Nm | | 10 | 10 | | 10 | | | | | | |
| | $n_{base}$ $min^{-1}$ | | 1505 | 1603 | | 1603 | | | | | | |
| DRL80M4 | $M_{max}$ Nm | | | 14 | 14 | 14 | 14 | | | | | |
| | $n_{base}$ $min^{-1}$ | | | 1519 | 1680 | 1491 | 1695 | | | | | |
| DRL100L4 | $M_{max}$ Nm | | | | | | | | 32 | 40 | 40 | |
| | $n_{base}$ $min^{-1}$ | | | | | | | | 1702 | 1688 | 1920 | |
| DRL90L4 | $M_{max}$ Nm | | | | | | 19.4 | 25 | 25 | | | |
| | $n_{base}$ $min^{-1}$ | | | | | | 1575 | 1505 | 1793 | | | |
| DRL132S4 | $M_{max}$ Nm | | | | | | | | | 43.5 | 56.9 | 80 |
| | $n_{base}$ $min^{-1}$ | | | | | | | | | 1605 | 1547 | 1500 |
| DRL132MC4 | $M_{max}$ Nm | | | | | | | | | | | 83.5 |
| | $n_{base}$ $min^{-1}$ | | | | | | | | | | | 1623 |
| DRL160M4 | $M_{max}$ Nm | | | | | | | | | | | 86.8 |
| | $n_{base}$ $min^{-1}$ | | | | | | | | | | | 1619 |

*Assignment of MOVIDRIVE® MDX61B0150-503 – MDX61B1320-503 (sizes 3 – 6):*

| Motor | | MOVIDRIVE® MDX61B...-5_3 (AC 400/500 V devices) in CFC operating modes (P700) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0150 | 0220 | 0300 | 0370 | 0450 | 0550 | 0750 | 0900 | 1100 | 1320 |
| DRL132MC4 | $M_{max}$ Nm | 114 | 130 | | | | | | | | |
| | $n_{base}$ $min^{-1}$ | 1559 | 1752 | | | | | | | | |
| DRL160M4 | $M_{max}$ Nm | 118 | 165 | | | | | | | | |
| | $n_{base}$ $min^{-1}$ | 1556 | 1498 | | | | | | | | |
| DRL160MC4 | $M_{max}$ Nm | 123 | 182 | 185 | | | | | | | |
| | $n_{base}$ $min^{-1}$ | 1492 | 1408 | 1598 | | | | | | | |
| DRL180S4 | $M_{max}$ Nm | 121 | 178 | 210 | | | | | | | |
| | $n_{base}$ $min^{-1}$ | 1619 | 1535 | 1582 | | | | | | | |
| DRL180M4 | $M_{max}$ Nm | | 178 | 235 | 250 | 250 | | | | | |
| | $n_{base}$ $min^{-1}$ | | 1624 | 1556 | 1661 | 1788 | | | | | |
| DRL180L4 | $M_{max}$ Nm | | 180 | 239 | 294 | 320 | 320 | | | | |
| | $n_{base}$ $min^{-1}$ | | 1608 | 1561 | 1508 | 1582 | 1698 | | | | |
| DRL180LC4 | $M_{max}$ Nm | | 166 | 223 | 274 | 337 | 400 | 420 | | | |
| | $n_{base}$ $min^{-1}$ | | 1677 | 1640 | 1598 | 1545 | 1492 | 1577 | | | |
| DRL200L4 | $M_{max}$ Nm | | | | 273 | 336 | 398 | 475 | | | |
| | $n_{base}$ $min^{-1}$ | | | | 1628 | 1587 | 1542 | 1513 | | | |
| DRL225S4 | $M_{max}$ Nm | | | | 277 | 343 | 409 | 510 | 520 | | |
| | $n_{base}$ $min^{-1}$ | | | | 1637 | 1608 | 1575 | 1526 | 1727 | | |
| DRL225MC4 | $M_{max}$ Nm | | | | | | 351 | 441 | 583 | 689 | 770 |
| | $n_{base}$ $min^{-1}$ | | | | | | 1801 | 1764 | 1702 | 1657 | 1706 |

27793230/EN – 08/2022

### Nominal speed $n_N$ = 1700 $min^{-1}$, dynamics package 2

*Assignment of MOVIDRIVE® MDX61B0005-5A3 – MDX61B0110-503 (sizes 0 – 2):*

| Motor | | MOVIDRIVE® MDX61B...-5_3 (AC 400/500 V devices) in CFC operating modes (P700) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0005 | 0008 | 0011 | 0014 | 0015 | 0022 | 0030 | 0040 | 0055 | 0075 | 0110 |
| DRL71S4 | $M_{max}$ Nm | 7.56 | 8.5 | | | 8.5 | | | | | | |
| | $n_{base}$ $min^{-1}$ | 1104 | 1005 | | | 1027 | | | | | | |
| DRL71M4 | $M_{max}$ Nm | 8.06 | 9.79 | 12.8 | 14 | 12.3 | 14 | | | | | |
| | $n_{base}$ $min^{-1}$ | 1343 | 1223 | 1034 | 977 | 1062 | 977 | | | | | |
| DRL80S4 | $M_{max}$ Nm | | 11.1 | 14.6 | 19 | 14.1 | 19.6 | 25 | | | | |
| | $n_{base}$ $min^{-1}$ | | 1378 | 1202 | 977 | 1223 | 949 | 682 | | | | |
| DRL80M4 | $M_{max}$ Nm | | | 15.1 | 19.7 | 14.6 | 20.3 | 26 | 30 | | | |
| | $n_{base}$ $min^{-1}$ | | | 1434 | 1287 | 1448 | 1266 | 1083 | 963 | | | |
| DRL100L4 | $M_{max}$ Nm | | | | | | | | 32 | 42.8 | 55.2 | 83.3 |
| | $n_{base}$ $min^{-1}$ | | | | | | | | 1702 | 1603 | 1491 | 1238 |
| DRL90L4 | $M_{max}$ Nm | | | | | | 19.4 | 25.4 | 35.2 | 46 | | |
| | $n_{base}$ $min^{-1}$ | | | | | | 1575 | 1491 | 1364 | 1223 | | |
| DRL132S4 | $M_{max}$ Nm | | | | | | | | | | 56.9 | 86.8 |
| | $n_{base}$ $min^{-1}$ | | | | | | | | | | 1547 | 1412 |
| DRL132MC4 | $M_{max}$ Nm | | | | | | | | | | | 83.5 |
| | $n_{base}$ $min^{-1}$ | | | | | | | | | | | 1623 |

*Assignment of MOVIDRIVE® MDX61B0150-503 – MDX61B1600-503 (sizes 3 - 7):*

| Motor | | MOVIDRIVE® MDX61B...-5_3 (AC 400/500 V devices) in CFC operating modes (P700) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0150 | 0220 | 0300 | 0370 | 0450 | 0550 | 0750 | 0900 | 1100 | 1320 | 1600 | 2000 |
| DRL100L4 | $M_{max}$ Nm | 85 | | | | | | | | | | | |
| | $n_{base}$ $min^{-1}$ | 1238 | | | | | | | | | | | |
| DRL132S4 | $M_{max}$ Nm | 116 | 150 | | | | | | | | | | |
| | $n_{base}$ $min^{-1}$ | 1277 | 1137 | | | | | | | | | | |
| DRL132MC4 | $M_{max}$ Nm | 114 | 166 | 200 | | | | | | | | | |
| | $n_{base}$ $min^{-1}$ | 1559 | 1453 | 1424 | | | | | | | | | |
| DRL160M4 | $M_{max}$ Nm | 118 | 173 | 226 | 276 | 280 | | | | | | | |
| | $n_{base}$ $min^{-1}$ | 1556 | 1455 | 1350 | 1260 | 1281 | | | | | | | |
| DRL160MC4 | $M_{max}$ Nm | 123 | 182 | 240 | 293 | 320 | | | | | | | |
| | $n_{base}$ $min^{-1}$ | 1492 | 1408 | 1324 | 1245 | 1234 | | | | | | | |
| DRL180S4 | $M_{max}$ Nm | | 178 | 235 | 287 | 351 | 380 | | | | | | |
| | $n_{base}$ $min^{-1}$ | | 1535 | 1450 | 1371 | 1276 | 1234 | | | | | | |
| DRL180M4 | $M_{max}$ Nm | | 178 | 235 | 288 | 352 | 416 | 430 | | | | | |
| | $n_{base}$ $min^{-1}$ | | 1624 | 1556 | 1498 | 1419 | 1339 | 1350 | | | | | |
| DRL180L4 | $M_{max}$ Nm | | | 239 | 294 | 360 | 426 | 520 | | | | | |
| | $n_{base}$ $min^{-1}$ | | | 1561 | 1508 | 1450 | 1387 | 1297 | | | | | |
| DRL180LC4 | $M_{max}$ Nm | | | 223 | 274 | 337 | 400 | 497 | 600 | | | | |
| | $n_{base}$ $min^{-1}$ | | | 1640 | 1598 | 1545 | 1492 | 1408 | 1324 | | | | |
| DRL200L4 | $M_{max}$ Nm | | | | 273 | 336 | 398 | 495 | 650 | 680 | | | |
| | $n_{base}$ $min^{-1}$ | | | | 1628 | 1587 | 1542 | 1481 | 1374 | 1366 | | | |
| DRL225S4 | $M_{max}$ Nm | | | | 277 | 343 | 409 | 510 | 670 | 770 | 770 | | |
| | $n_{base}$ $min^{-1}$ | | | | 1637 | 1608 | 1575 | 1526 | 1448 | 1403 | 1468 | | |
| DRL225MC4 | $M_{max}$ Nm | | | | | | 351 | 441 | 583 | 689 | 864 | 1039 | 1100 |
| | $n_{base}$ $min^{-1}$ | | | | | | 1801 | 1764 | 1702 | 1657 | 1579 | 1505 | 1522 |

27793230/EN – 08/2022

### Nominal speed $n_N$ = 2100 $min^{-1}$, dynamics package 1

*Assignment of MOVIDRIVE® MDX61B0005-5A3 – MDX61B0110-503 (sizes 0 – 2):*

| Motor | | MOVIDRIVE® MDX61B...-5_3 (AC 400/500 V devices) in CFC operating modes (P700) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0005 | 0008 | 0011 | 0014 | 0015 | 0022 | 0030 | 0040 | 0055 | 0075 | 0110 |
| DRL71S4 | $M_{max}$ Nm | 5 | 5 | | | 5 | 5 | | | | | |
| | $n_{base}$ $min^{-1}$ | 1969 | 2081 | | | 2130 | 2215 | | | | | |
| DRL71M4 | $M_{max}$ Nm | | 7 | 7 | | 7 | 7 | | | | | |
| | $n_{base}$ $min^{-1}$ | | 1948 | 2102 | | 2095 | 2215 | | | | | |
| DRL80S4 | $M_{max}$ Nm | | | 10 | 10 | 10 | 10 | | | | | |
| | $n_{base}$ $min^{-1}$ | | | 2039 | 2180 | 2004 | 2187 | | | | | |
| DRL80M4 | $M_{max}$ Nm | | | | 14 | 11.3 | 14 | 14 | | | | |
| | $n_{base}$ $min^{-1}$ | | | | 2039 | 2025 | 2081 | 2299 | | | | |
| DRL100L4 | $M_{max}$ Nm | | | | | | | | 24.8 | 33.4 | 40 | 40 |
| | $n_{base}$ $min^{-1}$ | | | | | | | | 2285 | 2201 | 2229 | 2651 |
| DRL90L4 | $M_{max}$ Nm | | | | | | | 19.4 | 25 | 25 | | |
| | $n_{base}$ $min^{-1}$ | | | | | | | 2046 | 2074 | 2426 | | |
| DRL132S4 | $M_{max}$ Nm | | | | | | | | | | 45.5 | 70 |
| | $n_{base}$ $min^{-1}$ | | | | | | | | | | 1992 | 1869 |

*Assignment of MOVIDRIVE® MDX61B0150-503 – MDX61B1600-503 (sizes 3 - 7):*

| Motor | | MOVIDRIVE® MDX61B...-5_3 (AC 400/500 V devices) in CFC operating modes (P700) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0150 | 0220 | 0300 | 0370 | 0450 | 0550 | 0750 | 0900 | 1100 | 1320 | 1600 | 2000 |
| DRL132S4 | $M_{max}$ Nm | 80 | | | | | | | | | | | |
| | $n_{base}$ $min^{-1}$ | 1969 | | | | | | | | | | | |
| DRL132MC4 | $M_{max}$ Nm | 91.5 | 130 | 130 | | | | | | | | | |
| | $n_{base}$ $min^{-1}$ | 1992 | 1928 | 2250 | | | | | | | | | |
| DRL160M4 | $M_{max}$ Nm | | 136 | 165 | | | | | | | | | |
| | $n_{base}$ $min^{-1}$ | | 1946 | 1956 | | | | | | | | | |
| DRL160MC4 | $M_{max}$ Nm | | 132 | 175 | 185 | | | | | | | | |
| | $n_{base}$ $min^{-1}$ | | 2025 | 1946 | 2104 | | | | | | | | |
| DRL180S4 | $M_{max}$ Nm | | 139 | 185 | 210 | | | | | | | | |
| | $n_{base}$ $min^{-1}$ | | 2030 | 1956 | 1983 | | | | | | | | |
| DRL180M4 | $M_{max}$ Nm | | 140 | 186 | 228 | 250 | 250 | | | | | | |
| | $n_{base}$ $min^{-1}$ | | 2104 | 2046 | 1988 | 2078 | 2241 | | | | | | |
| DRL180L4 | $M_{max}$ Nm | | | 185 | 228 | 281 | 320 | 320 | | | | | |
| | $n_{base}$ $min^{-1}$ | | | 2062 | 2020 | 1967 | 1956 | 2188 | | | | | |
| DRL180LC4 | $M_{max}$ Nm | | | | 218 | 270 | 320 | 399 | 420 | | | | |
| | $n_{base}$ $min^{-1}$ | | | | 2051 | 1999 | 1951 | 1872 | 2004 | | | | |
| DRL200L4 | $M_{max}$ Nm | | | | 217 | 268 | 319 | 398 | 475 | 475 | 475 | | |
| | $n_{base}$ $min^{-1}$ | | | | 2071 | 2034 | 1993 | 1932 | 1952 | 2047 | 2125 | | |
| DRL225S4 | $M_{max}$ Nm | | | | | 267 | 320 | 401 | 520 | 520 | 520 | 520 | |
| | $n_{base}$ $min^{-1}$ | | | | | 2084 | 2055 | 2010 | 1936 | 2137 | 2268 | 2305 | |
| DRL225MC4 | $M_{max}$ Nm | | | | | | | 378 | 501 | 593 | 746 | 770 | 770 |
| | $n_{base}$ $min^{-1}$ | | | | | | | 2075 | 2018 | 1973 | 1899 | 2018 | 2108 |

27793230/EN – 08/2022

### Nominal speed $n_N$ = 2100 min$^{-1}$, dynamics package 2

*Assignment of MOVIDRIVE® MDX61B0005-5A3 – MDX61B0110-503 (sizes 0 – 2):*

| Motor | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0005 | 0008 | 0011 | 0014 | 0015 | 0022 | 0030 | 0040 | 0055 | 0075 | 0110 |
| DRL71S4 | $M_{max}$ Nm | 5.91 | 7.18 | 8.5 | | 8.5 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1723 | 1589 | 1462 | | 1455 | | | | | | |
| DRL71M4 | $M_{max}$ Nm | | 7.69 | 10.1 | 13.2 | 9.78 | 13.6 | 14 | | | | |
| | $n_{base}$ min$^{-1}$ | | 1807 | 1638 | 1427 | 1659 | 1399 | 1406 | | | | |
| DRL80S4 | $M_{max}$ Nm | | | 11.5 | 15 | 11.1 | 15.5 | 19.9 | 25 | | | |
| | $n_{base}$ min$^{-1}$ | | | 1814 | 1617 | 1842 | 1596 | 1357 | 1090 | | | |
| DRL80M4 | $M_{max}$ Nm | | | | 15.4 | 11.3 | 16 | 20.5 | 28.1 | 30 | | |
| | $n_{base}$ min$^{-1}$ | | | | 1884 | 2025 | 1870 | 1716 | 1455 | 1399 | | |
| DRL100L4 | $M_{max}$ Nm | | | | | | | | | 33.4 | 43.3 | 65.6 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | 2201 | 2102 | 1884 |
| DRL90L4 | $M_{max}$ Nm | | | | | | | 19.4 | 27.3 | 36.5 | 46 | 46 |
| | $n_{base}$ min$^{-1}$ | | | | | | | 2046 | 1934 | 1800 | 1673 | 1800 |
| DRL132S4 | $M_{max}$ Nm | | | | | | | | | | | 70 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | | 1869 |
| DRL132MC4 | $M_{max}$ Nm | | | | | | | | | | | 66.4 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | | 2051 |

*Assignment of MOVIDRIVE® MDX61B0150-503 – MDX61B2000-503 (sizes 3 – 7):*

| Motor | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0150 | 0220 | 0300 | 0370 | 0450 | 0550 | 0750 | 0900 | 1100 | 1320 | 1600 | 2000 |
| DRL100L4 | $M_{max}$ Nm | 85 | | | | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1695 | | | | | | | | | | | |
| DRL132S4 | $M_{max}$ Nm | 94.2 | 136 | 150 | | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1746 | 1535 | 1482 | | | | | | | | | |
| DRL132MC4 | $M_{max}$ Nm | 91.5 | 134 | 176 | 200 | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1992 | 1893 | 1793 | 1793 | | | | | | | | |
| DRL160M4 | $M_{max}$ Nm | | 136 | 179 | 219 | 268 | 280 | | | | | | |
| | $n_{base}$ min$^{-1}$ | | 1946 | 1851 | 1761 | 1661 | 1651 | | | | | | |
| DRL160MC4 | $M_{max}$ Nm | | 132 | 175 | 215 | 264 | 312 | 320 | | | | | |
| | $n_{base}$ min$^{-1}$ | | 2025 | 1946 | 1877 | 1788 | 1698 | 1724 | | | | | |
| DRL180S4 | $M_{max}$ Nm | | 139 | 185 | 227 | 278 | 329 | 380 | | | | | |
| | $n_{base}$ min$^{-1}$ | | 2030 | 1956 | 1883 | 1788 | 1698 | 1603 | | | | | |
| DRL180M4 | $M_{max}$ Nm | | | 186 | 228 | 280 | 331 | 411 | 430 | | | | |
| | $n_{base}$ min$^{-1}$ | | | 2046 | 1988 | 1914 | 1840 | 1730 | 1756 | | | | |
| DRL180L4 | $M_{max}$ Nm | | | 185 | 228 | 281 | 333 | 414 | 520 | | | | |
| | $n_{base}$ min$^{-1}$ | | | 2062 | 2020 | 1967 | 1909 | 1819 | 1714 | | | | |
| DRL180LC4 | $M_{max}$ Nm | | | | 218 | 270 | 320 | 399 | 525 | 600 | | | |
| | $n_{base}$ min$^{-1}$ | | | | 2051 | 1999 | 1951 | 1872 | 1746 | 1661 | | | |
| DRL200L4 | $M_{max}$ Nm | | | | 217 | 268 | 319 | 398 | 523 | 617 | 680 | | |
| | $n_{base}$ min$^{-1}$ | | | | 2071 | 2034 | 1993 | 1932 | 1833 | 1760 | 1747 | | |
| DRL225S4 | $M_{max}$ Nm | | | | | 267 | 320 | 401 | 529 | 625 | 770 | 770 | |
| | $n_{base}$ min$^{-1}$ | | | | | 2084 | 2055 | 2010 | 1932 | 1879 | 1784 | 1866 | |
| DRL225MC4 | $M_{max}$ Nm | | | | | | | 378 | 501 | 593 | 746 | 897 | 1100 |
| | $n_{base}$ min$^{-1}$ | | | | | | | 2075 | 2018 | 1973 | 1899 | 1825 | 1735 |

27793230/EN – 08/2022

### Nominal speed $n_N$ = 3000 min$^{-1}$, dynamics package 1

*Assignment of MOVIDRIVE® MDX61B0005-5A3 – MDX61B0110-503 (sizes 0 – 2):*

| Motor | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0005 | 0008 | 0011 | 0014 | 0015 | 0022 | 0030 | 0040 | 0055 | 0075 | 0110 |
| DRL71S4 | $M_{max}$ Nm | | 5 | 5 | 5 | 5 | 5 | | | | | |
| | $n_{base}$ min$^{-1}$ | | 2665 | 3073 | 3213 | 3023 | 3227 | | | | | |
| DRL71M4 | $M_{max}$ Nm | | | 7 | 7 | 6.87 | 7 | 7 | | | | |
| | $n_{base}$ min$^{-1}$ | | | 2707 | 3101 | 2728 | 3136 | 3291 | | | | |
| DRL80S4 | $M_{max}$ Nm | | | | 10 | 7.76 | 10 | 10 | | | | |
| | $n_{base}$ min$^{-1}$ | | | | 2876 | 2925 | 2932 | 3291 | | | | |
| DRL80M4 | $M_{max}$ Nm | | | | | | 11.3 | 14 | 14 | 14 | | |
| | $n_{base}$ min$^{-1}$ | | | | | | 2897 | 2848 | 3389 | 3516 | | |
| DRL100L4 | $M_{max}$ Nm | | | | | | | | | 23.6 | 31 | 40 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | 3206 | 3129 | 3361 |
| DRL90L4 | $M_{max}$ Nm | | | | | | | | 19.2 | 25 | 25 | 25 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | 2869 | 2834 | 3368 | 3755 |
| DRL132S4 | $M_{max}$ Nm | | | | | | | | | | | 48.6 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | | 2836 |

*Assignment of MOVIDRIVE® MDX61B0150-503 – MDX61B2500-503 (sizes 3 – 7):*

| Motor | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0150 | 0220 | 0300 | 0370 | 0450 | 0550 | 0750 | 0900 | 1100 | 1320 | 1600 | 2000 | 2500 |
| DRL100L4 | $M_{max}$ Nm | 40 | 40 | | | | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 3860 | 4050 | | | | | | | | | | | |
| DRL132S4 | $M_{max}$ Nm | 66 | 80 | 80 | | | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 2730 | 2895 | 3070 | | | | | | | | | | |
| DRL132MC4 | $M_{max}$ Nm | 62.2 | 93.3 | 124 | 130 | 130 | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 2936 | 2848 | 2760 | 3006 | 3328 | | | | | | | | |
| DRL160M4 | $M_{max}$ Nm | | 97.1 | 129 | 158 | 165 | 165 | | | | | | | |
| | $n_{base}$ min$^{-1}$ | | 2832 | 2742 | 2663 | 2863 | 3027 | | | | | | | |
| DRL160MC4 | $M_{max}$ Nm | | 99.2 | 134 | 165 | 185 | 185 | | | | | | | |
| | $n_{base}$ min$^{-1}$ | | 2684 | 2616 | 2547 | 2642 | 2874 | | | | | | | |
| DRL180S4 | $M_{max}$ Nm | | | 131 | 162 | 200 | 210 | 210 | | | | | | |
| | $n_{base}$ min$^{-1}$ | | | 2848 | 2784 | 2700 | 2848 | 3111 | | | | | | |
| DRL180M4 | $M_{max}$ Nm | | | 131 | 162 | 200 | 237 | 250 | 250 | | | | | |
| | $n_{base}$ min$^{-1}$ | | | 2953 | 2906 | 2842 | 2779 | 3006 | 3243 | | | | | |
| DRL180L4 | $M_{max}$ Nm | | | | 163 | 203 | 242 | 302 | 320 | 320 | | | | |
| | $n_{base}$ min$^{-1}$ | | | | 2858 | 2811 | 2763 | 2684 | 2979 | 3106 | | | | |
| DRL180LC4 | $M_{max}$ Nm | | | | | 187 | 224 | 281 | 372 | 420 | 420 | | | |
| | $n_{base}$ min$^{-1}$ | | | | | 2932 | 2890 | 2821 | 2700 | 2668 | 2890 | | | |
| DRL200L4 | $M_{max}$ Nm | | | | | | 223 | 280 | 370 | 437 | 475 | 475 | | |
| | $n_{base}$ min$^{-1}$ | | | | | | 2916 | 2863 | 2773 | 2703 | 2830 | 2961 | | |
| DRL225S4 | $M_{max}$ Nm | | | | | | | 285 | 380 | 450 | 520 | 520 | 520 | |
| | $n_{base}$ min$^{-1}$ | | | | | | | 2871 | 2805 | 2752 | 2805 | 3084 | 3203 | |
| DRL225MC4 | $M_{max}$ Nm | | | | | | | | 325 | 387 | 490 | 592 | 754 | 770 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | 3171 | 3134 | 3064 | 2998 | 2888 | 3117 |

27793230/EN – 08/2022

### Nominal speed $n_N$ = 3000 min$^{-1}$, dynamics package 2

*Assignment of MOVIDRIVE® MDX61B0005-5A3 – MDX61B0110-503 (sizes 0 – 2):*

| Motor | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0005 | 0008 | 0011 | 0014 | 0015 | 0022 | 0030 | 0040 | 0055 | 0075 | 0110 |
| DRL71S4 | $M_{max}$ Nm | | 5.09 | 6.71 | 8.5 | 6.48 | 8.5 | 8.5 | | | | |
| | $n_{base}$ min$^{-1}$ | | 2658 | 2461 | 2250 | 2489 | 2278 | 2370 | | | | |
| DRL71M4 | $M_{max}$ Nm | | | 7.12 | 9.39 | 6.87 | 9.7 | 12.5 | 14 | | | |
| | $n_{base}$ min$^{-1}$ | | | 2700 | 2517 | 2728 | 2489 | 2278 | 2229 | | | |
| DRL80S4 | $M_{max}$ Nm | | | | 10.7 | 7.76 | 11 | 14.2 | 19.5 | 25 | | |
| | $n_{base}$ min$^{-1}$ | | | | 2749 | 2925 | 2721 | 2524 | 2194 | 1849 | | |
| DRL80M4 | $M_{max}$ Nm | | | | | | 11.3 | 14.7 | 20.2 | 26.8 | 30 | |
| | $n_{base}$ min$^{-1}$ | | | | | | 2897 | 2770 | 2552 | 2299 | 2194 | |
| DRL100L4 | $M_{max}$ Nm | | | | | | | | | | 31 | 47.5 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | 3129 | 2946 |
| DRL90L4 | $M_{max}$ Nm | | | | | | | | 19.2 | 26.1 | 34 | 46 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | 2869 | 2756 | 2630 | 2552 |
| DRL132S4 | $M_{max}$ Nm | | | | | | | | | | | 48.6 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | | 2836 |

*Assignment of MOVIDRIVE® MDX61B0150-503 – MDX61B2500-503 (sizes 3 – 7):*

| Motor | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0150 | 0220 | 0300 | 0370 | 0450 | 0550 | 0750 | 0900 | 1100 | 1320 | 1600 | 2000 | 2500 |
| DRL100L4 | $M_{max}$ Nm | 63.8 | 85 | | | | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 2763 | 2566 | | | | | | | | | | | |
| DRL132S4 | $M_{max}$ Nm | 66 | 96 | 126 | 150 | | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 2730 | 2543 | 2355 | 2197 | | | | | | | | | |
| DRL132MC4 | $M_{max}$ Nm | | 93.3 | 124 | 152 | 186 | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | | 2848 | 2760 | 2678 | 2578 | | | | | | | | |
| DRL160M4 | $M_{max}$ Nm | | 97.1 | 129 | 158 | 194 | 229 | 280 | 280 | | | | | |
| | $n_{base}$ min$^{-1}$ | | 2832 | 2742 | 2663 | 2563 | 2468 | 2326 | 2421 | | | | | |
| DRL160MC4 | $M_{max}$ Nm | | 99.2 | 134 | 165 | 204 | 242 | 301 | 320 | | | | | |
| | $n_{base}$ min$^{-1}$ | | 2684 | 2616 | 2547 | 2463 | 2378 | 2246 | 2278 | | | | | |
| DRL180S4 | $M_{max}$ Nm | | | 131 | 162 | 200 | 237 | 295 | 380 | 380 | | | | |
| | $n_{base}$ min$^{-1}$ | | | 2848 | 2784 | 2700 | 2616 | 2484 | 2278 | 2310 | | | | |
| DRL180M4 | $M_{max}$ Nm | | | 131 | 162 | 200 | 237 | 296 | 388 | 430 | | | | |
| | $n_{base}$ min$^{-1}$ | | | 2953 | 2906 | 2842 | 2779 | 2674 | 2505 | 2452 | | | | |
| DRL180L4 | $M_{max}$ Nm | | | | 163 | 203 | 242 | 302 | 398 | 469 | 520 | | | |
| | $n_{base}$ min$^{-1}$ | | | | 2858 | 2811 | 2763 | 2684 | 2552 | 2452 | 2421 | | | |
| DRL180LC4 | $M_{max}$ Nm | | | | | 187 | 224 | 281 | 372 | 439 | 551 | 600 | | |
| | $n_{base}$ min$^{-1}$ | | | | | 2932 | 2890 | 2821 | 2700 | 2610 | 2463 | 2410 | | |
| DRL200L4 | $M_{max}$ Nm | | | | | | 223 | 280 | 370 | 437 | 549 | 660 | | |
| | $n_{base}$ min$^{-1}$ | | | | | | 2916 | 2863 | 2773 | 2703 | 2588 | 2473 | | |
| DRL225S4 | $M_{max}$ Nm | | | | | | | 285 | 380 | 450 | 566 | 681 | 770 | |
| | $n_{base}$ min$^{-1}$ | | | | | | | 2871 | 2805 | 2752 | 2666 | 2576 | 2596 | |
| DRL225MC4 | $M_{max}$ Nm | | | | | | | | 325 | 387 | 490 | 592 | 754 | 936 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | 3171 | 3134 | 3064 | 2998 | 2888 | 2760 |

27793230/EN – 08/2022

### 9.6.9 DRN.. motor table (50 Hz) (Characteristic values for delta/star AC 230/400 V / 50 Hz)

| Motor | $P_m$ | $M_N$ | Mass moment of inertia $J_M$ | | Star ⅄ (AC 400 V) | | | | Delta △ (AC 230 V) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Without brake | with brake | $I_n$ | $I_{q\_n}$ [1] | $I_{d\_n}$ [1] | $c_T$ [1] | $I_n$ | $I_{q\_n}$ [1] | $I_{d\_n}$ [1] | $c_T$ |
| | kW | Nm | $10^{-4}$ kgm² | | A | A | A | Nm/A | A | A | A | Nm/A |
| DRN80M4 | 0.75 | 4.95 | 24.7 | 26.2 | 1.74 | 1.38 | 1.06 | 3.60 | 3.03 | 2.40 | 1.84 | 2.07 |
| DRN90S4 | 1.1 | 7.2 | 54 | 58.7 | 2.55 | 2.10 | 1.44 | 3.44 | 4.43 | 3.65 | 2.51 | 1.98 |
| DRN90L4 | 1.5 | 9.8 | 67.2 | 71.9 | 3.40 | 2.80 | 1.94 | 3.50 | 5.92 | 4.87 | 3.37 | 2.01 |
| DRN100LS4 | 2.2 | 14.5 | 81.4 | 87.4 | 4.94 | 4.25 | 2.53 | 3.41 | 8.60 | 7.39 | 4.39 | 1.96 |
| DRN100L4 | 3 | 19.7 | 112 | 118 | 6.35 | 5.28 | 3.54 | 3.73 | 11.0 | 9.18 | 6.16 | 2.14 |
| DRN112M4 | 4 | 26 | 178 | 183 | 8.14 | 7.31 | 3.58 | 3.57 | 14.2 | 12.7 | 6.23 | 2.05 |
| DRN132S4 | 5.5 | 36 | 241 | 251 | 10.7 | 9.87 | 4.07 | 3.64 | 18.6 | 17.2 | 7.09 | 2.09 |
| DRN132M4 | 7.5 | 49 | 381 | 403 | 15.3 | 13.7 | 6.70 | 3.55 | 26.6 | 23.9 | 11.7 | 2.04 |
| DRN132L4 | 9.2 | 60 | 439 | 490 | 18.7 | 16.3 | 9.29 | 3.67 | 32.6 | 28.3 | 16.2 | 2.11 |
| DRN160M4 | 11 | 71 | 817 | 877 | 21.1 | 19.2 | 8.86 | 3.72 | 36.7 | 33.3 | 15.4 | 2.14 |
| DRN160L4 | 15 | 97 | 1040 | 1100 | 28.9 | 25.7 | 13.1 | 3.78 | 50.2 | 44.7 | 22.8 | 2.17 |
| DRN180M4 | 18.5 | 120 | 1630 | 1770 | 33.5 | 31.4 | 11.7 | 3.80 | 58.3 | 54.7 | 20.3 | 2.19 |
| DRN180L4 | 22 | 142 | 1950 | 2090 | 38.7 | 37.1 | 11.1 | 3.84 | 67.3 | 64.5 | 19.3 | 2.21 |
| DRN200L4 | 30 | 194 | 2660 | 2890 | 55.8 | 52.7 | 18.5 | 3.68 | 97.1 | 91.6 | 32.2 | 2.11 |
| DRN225S4 | 37 | 240 | 4350 | 4580 | 64.0 | 61.9 | 16.5 | 3.85 | 111 | 108 | 28.8 | 2.22 |
| DRN225M4 | 45 | 290 | 4350 | 4580 | 80.9 | 75.7 | 28.6 | 3.83 | 141 | 132 | 49.8 | 2.20 |
| DRN250M4 | 55 | 355 | 7360 | 7960 | 106 | 92.3 | 51.4 | 3.84 | 184 | 161 | 89.4 | 2.21 |
| DRN280S4 | 75 | 485 | 8940 | 9530 | 143 | 121 | 75.8 | 3.99 | 249 | 211 | 132 | 2.29 |
| DRN280M4 | 90 | 580 | 12000 | 12600 | 161 | 153 | 49.9 | 3.80 | 280 | 266 | 86.9 | 2.21 |
| DRN315S4 | 110 | 710 | 23400 | 24400 | 189 | 181 | 56.3 | 3.90 | 330 | 315 | 98.0 | 2.24 |
| DRN315M4 | 132 | 850 | 24800 | 25800 | 228 | 218 | 67.6 | 3.89 | 397 | 379 | 118 | 2.24 |
| DRN315L4 | 160 | 1030 | 28600 | 29600 | 273 | 262 | 76.6 | 3.93 | 474 | 455 | 133 | 2.26 |
| DRN315H4 | 200 | 1280 | 35200 | 36200 | 357 | 336 | 120 | 3.82 | 621 | 585 | 209 | 2.19 |

1) Applies in the basic speed range up to n base.

27793230/EN – 08/2022

### 9.6.10 DRN.. motor selection with delta/star connection type (line AC 400 V / 50 Hz)

**AC 230/400 V / 50 Hz motors in star connection or AC 400/690 V / 50 Hz motors in delta connection**

*Assignment of MOVIDRIVE® MDX61B0005-5A3 – MDX61B0110-503 (sizes 0 – 2):*

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AC 400 / 50Hz | | 0005 | 0008 | 0011 | 0014 | 0015 | 0022 | 0030 | 0040 | 0055 | 0075 | 0110 |
| DRN80M4 750 W | $M_{max}$ Nm | 13.9 | 16.8 | 16.9 | | 16.9 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 921 | 837 | 851 | | 851 | | | | | | |
| DRN90S4 1.1 kW | $M_{max}$ Nm | | 15.8 | 20.7 | 23.8 | 20 | 23.8 | | | | | |
| | $n_{base}$ min$^{-1}$ | | 1041 | 956 | 949 | 963 | 956 | | | | | |
| DRN90L4 1.5 kW | $M_{max}$ Nm | | | 20.6 | 27.2 | 19.9 | 28.1 | 32.4 | | | | |
| | $n_{base}$ min$^{-1}$ | | | 1062 | 991 | 1076 | 984 | 991 | | | | |
| DRN100LS4 2.2 kW | $M_{max}$ Nm | | | | 25.9 | 18.5 | 26.8 | 34.7 | 47.8 | | | |
| | $n_{base}$ min$^{-1}$ | | | | 1085 | 1146 | 1072 | 1005 | 896 | | | |
| DRN100L4 3.0 kW | $M_{max}$ Nm | | | | | | 27.8 | 36.9 | 51.5 | 68.7 | 72.8 | |
| | $n_{base}$ min$^{-1}$ | | | | | | 1146 | 1097 | 1024 | 938 | 969 | |
| DRN112M4 4.0 kW | $M_{max}$ Nm | | | | | | | 35.2 | 49.3 | 65.7 | 84.7 | |
| | $n_{base}$ min$^{-1}$ | | | | | | | 1154 | 1102 | 1037 | 961 | |
| DRN132S4 5.5 kW | $M_{max}$ Nm | | | | | | | | 49.7 | 66.7 | 86.1 | 126 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | 1148 | 1096 | 1043 | 932 |
| DRN132M4 7.5 kW | $M_{max}$ Nm | | | | | | | | | 62.1 | 81.8 | 126 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | 1155 | 1113 | 1023 |
| DRN132L4 9.2 kW | $M_{max}$ Nm | | | | | | | | | | 81.2 | 128 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | 1150 | 1081 |
| DRN160M4 11.0 kW | $M_{max}$ Nm | **Notice:** The data is based on a supply voltage of AC 400 V. | | | | | | | | | | 130 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | | 1118 |
| DRN160L4 15.0 kW | $M_{max}$ Nm | | | | | | | | | | | 127 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | | 1171 |

27793230/EN – 08/2022

*Assignment of MOVIDRIVE® MDX61B0150-503 – MDX61B0750-503 (sizes 3 – 5):*

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| AC 400 / 50Hz | | 0150 | 0220 | 0300 | 0370 | 0450 | 0550 | 0750 |
| DRN132M4 7.5 kW | $M_{max}$ Nm | 161 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 970 | | | | | | |
| DRN132L4 9.2 kW | $M_{max}$ Nm | 173 | 221 | | **Notice:** The data is based on a supply voltage of AC 400 V. | | | |
| | $n_{base}$ min$^{-1}$ | 1018 | 997 | | | | | |
| DRN160M4 11.0 kW | $M_{max}$ Nm | 176 | 214 | | | | | |
| | $n_{base}$ min$^{-1}$ | 1060 | 1065 | | | | | |
| DRN160L4 15.0 kW | $M_{max}$ Nm | 174 | 256 | 330 | | | | |
| | $n_{base}$ min$^{-1}$ | 1134 | 1060 | 997 | | | | |
| DRN180M4 18.5 kW | $M_{max}$ Nm | 177 | 259 | 339 | 414 | 430 | | |
| | $n_{base}$ min$^{-1}$ | 1168 | 1105 | 1047 | 990 | 1019 | | |
| DRN180L4 22.0 kW | $M_{max}$ Nm | 179 | 261 | 343 | 418 | 504 | | |
| | $n_{base}$ min$^{-1}$ | 1177 | 1124 | 1067 | 1014 | 956 | | |
| DRN200L4 30.0 kW | $M_{max}$ Nm | | 244 | 324 | 397 | 486 | 575 | 639 |
| | $n_{base}$ min$^{-1}$ | | 1169 | 1132 | 1095 | 1050 | 1005 | 997 |
| DRN225S4 37.0 kW | $M_{max}$ Nm | | | 341 | 417 | 511 | 604 | 718 |
| | $n_{base}$ min$^{-1}$ | | | 1170 | 1141 | 1101 | 1057 | 1014 |
| DRN225M4 45.0 kW | $M_{max}$ Nm | | | | 405 | 500 | 593 | 739 |
| | $n_{base}$ min$^{-1}$ | | | | 1166 | 1144 | 1119 | 1079 |
| DRN250M4 55.0 kW | $M_{max}$ Nm | | | | | 473 | 572 | 722 |
| | $n_{base}$ min$^{-1}$ | | | | | 1182 | 1167 | 1143 |
| DRN280S4 75.0 kW | $M_{max}$ Nm | | | | | | | 716 |
| | $n_{base}$ min$^{-1}$ | | | | | | | 1170 |
| DRN280M4 90.0 kW | $M_{max}$ Nm | | | | | | | 716 |
| | $n_{base}$ min$^{-1}$ | | | | | | | 1194 |

*Assignment of MOVIDRIVE® MDX61B0900-503 – MDX61B2500-503 (sizes 6 – 7):*

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | |
|---|---|---|---|---|---|---|---|
| AC 400 / 50Hz | | 0900 | 1100 | 1320 | 1600 | 2000 | 2500 |
| DRN225M4 45.0 kW | $M_{max}$ Nm | 870 | 870 | | | | |
| | $n_{base}$ 1/min | 1093 | 1144 | | | | |
| DRN250M4 55.0 kW | $M_{max}$ Nm | 959 | 1135 | 1400 | | | |
| | $n_{base}$ 1/min | 1100 | 1066 | 1021 | | | |
| DRN280S4 75.0 kW | $M_{max}$ Nm | 970 | 1157 | 1464 | 1768 | 1790 | |
| | $n_{base}$ 1/min | 1143 | 1118 | 1082 | 1042 | 1140 | |
| DRN280M4 90.0 kW | $M_{max}$ Nm | 950 | 1124 | 1412 | 1699 | 2090 | |
| | $n_{base}$ 1/min | 1161 | 1133 | 1085 | 1039 | 975 | |
| DRN315S4 110.0 kW | $M_{max}$ Nm | 970 | 1150 | 1447 | 1600 | | |
| | $n_{base}$ 1/min | 1187 | 1166 | 1128 | 1157 | | |
| DRN315M4 132.0 kW | $M_{max}$ Nm | 956 | 1137 | 1435 | 1600 | | |
| | $n_{base}$ 1/min | 1213 | 1198 | 1169 | 1210 | | |
| DRN315L4 160.0 kW | $M_{max}$ Nm | | | 1442 | 1742 | 2219 | 2400 |
| | $n_{base}$ 1/min | | | 1189 | 1166 | 1122 | 1184 |
| DRN315H4 200.0 kW | $M_{max}$ Nm | **Notice:** The data is based on a supply voltage of AC 400 V. | | | 1654 | 2126 | 2400 |
| | $n_{base}$ 1/min | | | | 1201 | 1181 | 1257 |

27793230/EN – 08/2022

### AC 230/400 V / 50 Hz motors in delta connection

*Assignment of MOVIDRIVE® MDX61B0005-5A3 – MDX61B0110-503 (sizes 0 – 2):*

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AC 230 V / 50Hz | | 0005 | 0008 | 0011 | 0014 | 0015 | 0022 | 0030 | 0040 | 0055 | 0075 | 0110 |
| DRN80M4 750 W | $M_{max}$ Nm | | | 12.2 | 16.1 | 11.8 | 16.6 | 16.9 | | | | |
| | $n_{base}$ min$^{-1}$ | | | 1891 | 1765 | 1912 | 1744 | 1898 | | | | |
| DRN90S4 1.1 kW | $M_{max}$ Nm | | | | 15 | 10.8 | 15.5 | 20.2 | 23.8 | | | |
| | $n_{base}$ min$^{-1}$ | | | | 1976 | 2060 | 1969 | 1877 | 1962 | | | |
| DRN90L4 1.5 kW | $M_{max}$ Nm | | | | | | 15.2 | 20 | 27.9 | 32.4 | | |
| | $n_{base}$ min$^{-1}$ | | | | | | 2060 | 1997 | 1905 | 2011 | | |
| DRN100LS4 2.2 kW | $M_{max}$ Nm | | | | | | | 18.7 | 26.6 | 35.7 | 46.2 | |
| | $n_{base}$ min$^{-1}$ | | | | | | | 2084 | 1999 | 1913 | 1810 | |
| DRN100L4 3.0 kW | $M_{max}$ Nm | | | | | | | | 27.6 | 38 | 49.7 | 72.8 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | 2072 | 2011 | 1938 | 1822 |
| DRN112M4 4.0 kW | $M_{max}$ Nm | | | | | | | | | 36.3 | 47.6 | 72.8 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | 2074 | 2021 | 1898 |
| DRN132S4 5.5 kW | $M_{max}$ Nm | | | | | | | | | | 48 | 73.9 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | 2080 | 1980 |
| DRN132M4 7.5 kW | $M_{max}$ Nm | | | | | | | | | | | 69.5 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | | 2041 |

*Assignment of MOVIDRIVE® MDX61B0150-503 – MDX61B0750-503 (sizes 3 – 5):*

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| AC 230 V / 50Hz | | 0150 | 0220 | 0300 | 0370 | 0450 | 0550 | 0750 |
| DRN112M4 4.0 kW | $M_{max}$ Nm | 93.9 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1822 | | | | | | |
| DRN132S4 5.5 kW | $M_{max}$ Nm | 99.4 | 126 | | | | | |
| | $n_{base}$ min$^{-1}$ | 1887 | 1893 | | | | | |
| DRN132M4 7.5 kW | $M_{max}$ Nm | 95 | 139 | 161 | | | | |
| | $n_{base}$ min$^{-1}$ | 1972 | 1851 | 1883 | | | | |
| DRN132L4 9.2 kW | $M_{max}$ Nm | 95.4 | 142 | 187 | 221 | | | |
| | $n_{base}$ min$^{-1}$ | 2020 | 1925 | 1840 | 1798 | | | |
| DRN160M4 11.0 kW | $M_{max}$ Nm | 97.3 | 144 | 190 | 214 | | | |
| | $n_{base}$ min$^{-1}$ | 2062 | 1978 | 1888 | 1904 | | | |
| DRN160L4 15.0 kW | $M_{max}$ Nm | | 142 | 189 | 233 | 286 | 330 | |
| | $n_{base}$ min$^{-1}$ | | 2057 | 2004 | 1951 | 1883 | 1830 | |
| DRN180M4 18.5 kW | $M_{max}$ Nm | | 144 | 192 | 235 | 289 | 342 | 424 |
| | $n_{base}$ min$^{-1}$ | | 2104 | 2056 | 2013 | 1956 | 1898 | 1807 |
| DRN180L4 22.0 kW | $M_{max}$ Nm | | | 194 | 238 | 291 | 1898 | 428 |
| | $n_{base}$ min$^{-1}$ | | | 2076 | 2032 | 1980 | 1927 | 1845 |
| DRN200L4 30.0 kW | $M_{max}$ Nm | | | | 221 | 274 | 326 | 406 |
| | $n_{base}$ min$^{-1}$ | | | | 2088 | 2051 | 2014 | 1952 |
| DRN225S4 37.0 kW | $M_{max}$ Nm | | | | | 289 | 343 | 427 |
| | $n_{base}$ min$^{-1}$ | | | | | 2100 | 2071 | 2016 |
| DRN225M4 45.0 kW | $M_{max}$ Nm | | | | | | | 415 |
| | $n_{base}$ min$^{-1}$ | | | | | | | 2056 |

27793230/EN – 08/2022

*Assignment of MOVIDRIVE® MDX61B0900-503 – MDX61B2500-503 (sizes 6 – 7):*

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | |
|---|---|---|---|---|---|---|---|
| AC 230 V / 50Hz | | 0900 | 1100 | 1320 | 1600 | 2000 | 2500 |
| DRN180M4 18.5 kW | $M_{max}$ Nm | 430 | | | | | |
| | $n_{base}$ min$^{-1}$ | 1927 | | | | | |
| DRN180L4 22.0 kW | $M_{max}$ Nm | 504 | | | | | |
| | $n_{base}$ min$^{-1}$ | 1826 | | | | | |
| DRN200L4 30.0 kW | $M_{max}$ Nm | 535 | 630 | 639 | | | |
| | $n_{base}$ min$^{-1}$ | 1854 | 1776 | 1833 | | | |
| DRN225S4 37.0 kW | $M_{max}$ Nm | 562 | 662 | 718 | | | |
| | $n_{base}$ min$^{-1}$ | 1925 | 1853 | 1856 | | | |
| DRN225M4 45.0 kW | $M_{max}$ Nm | 551 | 652 | 819 | 870 | 870 | |
| | $n_{base}$ min$^{-1}$ | 2002 | 1962 | 1893 | 1976 | 2078 | |
| DRN250M4 55.0 kW | $M_{max}$ Nm | 527 | 632 | 804 | 974 | 1243 | |
| | $n_{base}$ min$^{-1}$ | 2069 | 2044 | 1999 | 1956 | 1883 | |
| DRN280S4 75.0 kW | $M_{max}$ Nm | | | 805 | 986 | 1271 | 1587 |
| | $n_{base}$ min$^{-1}$ | | | 2044 | 2014 | 1965 | 1904 |
| DRN280M4 90.0 kW | $M_{max}$ Nm | | | 797 | 964 | 1230 | 1528 |
| | $n_{base}$ min$^{-1}$ | | | 2087 | 2051 | 1987 | 1910 |
| DRN315S4 110.0 kW | $M_{max}$ Nm | | | 812 | 985 | 1260 | 1566 |
| | $n_{base}$ min$^{-1}$ | | | 2109 | 2080 | 2027 | 1966 |
| DRN315M4 132.0 kW | $M_{max}$ Nm | | | | 972 | 1248 | 1555 |
| | $n_{base}$ min$^{-1}$ | | | | 2127 | 2086 | 2039 |
| DRN315L4 160.0 kW | $M_{max}$ Nm | | | | | 1252 | 1564 |
| | $n_{base}$ min$^{-1}$ | | | | | 2115 | 2077 |
| DRN315H4 200.0 kW | $M_{max}$ Nm | | | | | | 1477 |
| | $n_{base}$ min$^{-1}$ | | | | | | 2115 |

27793230/EN – 08/2022

### 9.6.11 DRN.. motor selection with delta connection type (line AC 230 V / 50 Hz)

**AC 230/400 V / 50 Hz motors in delta connection**

| Motor voltage | | MOVIDRIVE® MDX61B...-2_3 (AC 230 V devices) in CFC operating modes (P700) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| AC 230 V / 50 Hz | | 0015 | 0022 | 0037 | 0055 | 0075 | 0110 | 0150 | 0220 | 0300 |
| DRN80M4 750 W | $M_{max}$ Nm | 16.9 | | | **Notice:** The data is based on a supply voltage of AC 230 V. | | | | | |
| | $n_{base}$ min$^{-1}$ | 851 | | | | | | | | |
| DRN90S4 1.1 kW | $M_{max}$ Nm | 21.1 | 23.8 | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 949 | 921 | | | | | | | |
| DRN90L4 1.5 kW | $M_{max}$ Nm | 21 | 25.1 | 32.4 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1062 | 1020 | 1055 | | | | | | |
| DRN100LS4 2.2 kW | $M_{max}$ Nm | 19.7 | 23.8 | 41.7 | 47.8 | | | | | |
| | $n_{base}$ min$^{-1}$ | 1133 | 1103 | 951 | 957 | | | | | |
| DRN100L4 3.0 kW | $M_{max}$ Nm | | 24.3 | 44.7 | 69.5 | | | | | |
| | $n_{base}$ min$^{-1}$ | | 1164 | 1060 | 932 | | | | | |
| DRN112M4 4.0 kW | $M_{max}$ Nm | | | 42.8 | 66.5 | 88.4 | | | | |
| | $n_{base}$ min$^{-1}$ | | | 1125 | 1031 | 949 | | | | |
| DRN132S4 5.5 kW | $M_{max}$ Nm | | | 43.1 | 67.5 | 89.9 | 126 | | | |
| | $n_{base}$ min$^{-1}$ | | | 1166 | 1096 | 1031 | 938 | | | |
| DRN132M4 7.5 kW | $M_{max}$ Nm | | | | 63 | 85.5 | 126 | 161 | | |
| | $n_{base}$ min$^{-1}$ | | | | 1155 | 1107 | 1023 | 954 | | |
| DRN132L4 9.2 kW | $M_{max}$ Nm | | | | | 85.3 | 129 | 168 | 221 | |
| | $n_{base}$ min$^{-1}$ | | | | | 1144 | 1081 | 1023 | 997 | |
| DRN160M4 11.0 kW | $M_{max}$ Nm | | | | | 87 | 131 | 170 | 214 | |
| | $n_{base}$ min$^{-1}$ | | | | | 1171 | 1118 | 1065 | 1065 | |
| DRN160L4 15.0 kW | $M_{max}$ Nm | | | | | | 128 | 169 | 256 | 306 |
| | $n_{base}$ min$^{-1}$ | | | | | | 1171 | 1139 | 1060 | 1018 |
| DRN180M4 18.5 kW | $M_{max}$ Nm | | | | | | | 171 | 259 | 308 |
| | $n_{base}$ min$^{-1}$ | | | | | | | 1172 | 1105 | 1071 |
| DRN180L4 22.0 kW | $M_{max}$ Nm | | | | | | | 174 | 261 | 312 |
| | $n_{base}$ min$^{-1}$ | | | | | | | 1182 | 1124 | 1091 |
| DRN200L4 30.0 kW | $M_{max}$ Nm | **Notice:** The data is based on a supply voltage of AC 230 V. | | | | | | | 244 | 293 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | 1169 | 1148 |
| DRN225S4 37.0 kW | $M_{max}$ Nm | | | | | | | | | 309 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | 1184 |

27793230/EN – 08/2022

### 9.6.12 DRN.. motor table (60 Hz) (Characteristic values for double-star/star AC 230/460 V / 60 Hz)

| Motor | $P_m$ | $M_N$ | Mass moment of inertia $J_M$ | | Star ⅄ (AC 460 V) | | | | Double-star ⅄⅄ (AC 230 V) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Without brake | with brake | $I_n$ | $I_{q\_n}$ [1] | $I_{d\_n}$ [1] | $c_T$ [1] | $I_n$ | $I_{q\_n}$ [1] | $I_{d\_n}$ [1] | $c_T$ [1] |
| | kW | Nm | $10^{-4}$ kgm² | | A | A | A | Nm/A | A | A | A | Nm/A |
| DRN80M4 | 0.75 | 4.1 | 24.7 | 26.2 | 1.63 | 1.28 | 1.00 | 3.19 | 3.26 | 2.57 | 2.01 | 1.59 |
| DRN90S4 | 1.1 | 6 | 54 | 58.7 | 2.31 | 1.86 | 1.36 | 3.20 | 4.62 | 3.72 | 2.73 | 1.60 |
| DRN90L4 | 1.5 | 8.1 | 67.2 | 71.9 | 3.01 | 2.39 | 1.83 | 3.39 | 6.02 | 4.79 | 3.66 | 1.69 |
| DRN100L4 | 2.2 | 11.9 | 112 | 118 | 4.17 | 3.46 | 2.32 | 3.44 | 8.34 | 6.93 | 4.64 | 1.72 |
| DRN100L4 | 3 | 16.2 | 112 | 118 | 5.55 | 4.42 | 3.37 | 3.68 | 11.1 | 8.83 | 6.74 | 1.84 |
| DRN100L4 | 3.7 | 20 | 112 | 118 | 7.19 | 5.86 | 4.17 | 3.43 | 14.4 | 11.7 | 8.35 | 1.72 |
| DRN112M4 | 4 | 21.5 | 178 | 183 | 7.10 | 6.27 | 3.34 | 3.45 | 14.2 | 12.5 | 6.68 | 1.72 |
| DRN132S4 | 5.5 | 29.5 | 241 | 251 | 9.34 | 8.44 | 4.01 | 3.52 | 18.7 | 16.9 | 8.01 | 1.76 |
| DRN132M4 | 7.5 | 40.5 | 381 | 403 | 13.4 | 11.8 | 6.17 | 3.41 | 26.7 | 23.7 | 12.3 | 1.70 |
| DRN132L4 | 9.2 | 49.5 | 439 | 461 | 16.5 | 14.3 | 8.33 | 3.46 | 33.1 | 28.6 | 16.7 | 1.73 |
| DRN160M4 | 11 | 59 | 817 | 877 | 18.6 | 16.7 | 8.26 | 3.54 | 37.3 | 33.4 | 16.5 | 1.77 |
| DRN160L4 | 15 | 81 | 1040 | 1100 | 25.0 | 22.0 | 11.9 | 3.66 | 50.1 | 44.0 | 23.8 | 1.83 |
| DRN180M4 | 18.5 | 99 | 1630 | 1690 | 29.4 | 27.3 | 10.7 | 3.63 | 58.8 | 54.7 | 21.5 | 1.81 |
| DRN180L4 | 22 | 118 | 1950 | 2090 | 33.9 | 32.4 | 10.2 | 3.64 | 67.9 | 64.7 | 20.5 | 1.82 |
| DRN200L4 | 30 | 161 | 2660 | 2890 | 48.8 | 45.6 | 17.4 | 3.52 | 97.6 | 91.2 | 34.8 | 1.76 |
| DRN225S4 | 37 | 198 | 4350 | 4580 | 55.8 | 53.5 | 15.9 | 3.70 | 112 | 107 | 31.8 | 1.85 |
| DRN225M4 | 45 | 240 | 4350 | 4580 | 69.8 | 64.9 | 25.9 | 3.71 | 140 | 130 | 51.8 | 1.86 |
| DRN250ME4 | 55 | 295 | 8940 | 9280 | 86.3 | 80.2 | 31.7 | 3.67 | 173 | 160 | 63.4 | 1.83 |
| DRN280S4 | 75 | 400 | 8940 | 9530 | 125 | 105 | 67.9 | 3.83 | 250 | 210 | 136 | 1.91 |
| DRN280M4 | 90 | 480 | 12000 | 12600 | 141 | 132 | 48.1 | 3.65 | 281 | 264 | 96.1 | 1.82 |
| DRN315S4 | 110 | 590 | 23400 | 24400 | 165 | 157 | 52.6 | 3.74 | 331 | 314 | 105 | 1.87 |
| DRN315ME4 | 132 | 700 | 28300 | 29400 | 200 | 186 | 72.5 | 3.78 | 400 | 373 | 145 | 1.89 |
| DRN315L4 | 160 | 850 | 28600 | 29600 | 237 | 226 | 71.9 | 3.78 | 474 | 452 | 144 | 1.89 |
| DRN315H4 | 185 | 990 | 35200 | 36200 | 291 | 271 | 107 | 3.64 | 582 | 541 | 214 | 1.82 |
| DRN315H4 | 200 | 1070 | 35200 | 36200 | 311 | 292 | 107 | 3.65 | 622 | 584 | 213 | 1.83 |

1) Applies in the basic speed range up to n base.

27793230/EN – 08/2022

### 9.6.13 DRN.. motor selection with double-star/star connection type (line AC 460 V / 60 Hz)

**AC 230/460 V / 60 Hz motors in star connection or AC 460 V / 60 Hz motors in delta connection**

*Assignment of MOVIDRIVE® MDX61B0005-5A3 – MDX61B0110-503 (sizes 0 – 2):*

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AC 460 V / 60 Hz | | 0005 | 0008 | 0011 | 0014 | 0015 | 0022 | 0030 | 0040 | 0055 | 0075 | 0110 |
| DRN80M4 750 W | $M_{max}$ Nm | 12.3 | 15 | 17.2 | | 17.2 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1146 | 1055 | 984 | | 984 | | | | | | |
| DRN90S4 1.1 kW | $M_{max}$ Nm | 12 | 14.7 | 19.4 | 23.8 | 18.7 | 23.8 | | | | | |
| | $n_{base}$ min$^{-1}$ | 1315 | 1266 | 1181 | 1125 | 1195 | 1139 | | | | | |
| DRN90L4 1.5 kW | $M_{max}$ Nm | | | 20.1 | 26.4 | 19.4 | 27.2 | 32.4 | | | | |
| | $n_{base}$ min$^{-1}$ | | | 1294 | 1223 | 1301 | 1209 | 1202 | | | | |
| DRN100L4 2.2 kW | $M_{max}$ Nm | | | | 26.3 | 19 | 27.2 | 35.2 | 48.3 | | | |
| | $n_{base}$ min$^{-1}$ | | | | 1316 | 1377 | 1310 | 1249 | 1140 | | | |
| DRN100L4 3.0 kW | $M_{max}$ Nm | | | | | | 27.7 | 36.6 | 50.9 | 67.9 | | |
| | $n_{base}$ min$^{-1}$ | | | | | | 1371 | 1322 | 1243 | 1152 | | |
| DRN100L4 3.7 kW | $M_{max}$ Nm | | | | | | 24.4 | 33.1 | 46.7 | 62.7 | 81.1 | |
| | $n_{base}$ min$^{-1}$ | | | | | | 1414 | 1371 | 1310 | 1231 | 1146 | |
| DRN112M4 4.0 kW | $M_{max}$ Nm | | | | | | 26 | 34.3 | 47.7 | 63.6 | 81.9 | |
| | $n_{base}$ min$^{-1}$ | | | | | | 1418 | 1383 | 1324 | 1254 | 1172 | |
| DRN132S4 5.5 kW | $M_{max}$ Nm | | | | | | | 34.2 | 48.1 | 64.5 | 83.3 | 126 |
| | $n_{base}$ min$^{-1}$ | | | | | | | 1436 | 1389 | 1342 | 1283 | 1154 |
| DRN132M4 7.5 kW | $M_{max}$ Nm | | | | | | | | | 60.3 | 79 | 121 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | 1387 | 1339 | 1239 |
| DRN132L4 9.2 kW | $M_{max}$ Nm | **Notice:** The data is based on a supply voltage of AC 460 V. | | | | | | | | | 78 | 121 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | 1382 | 1303 |
| DRN160M4 11.0 kW | $M_{max}$ Nm | | | | | | | | | | 79.7 | 124 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | 1413 | 1345 |
| DRN160L4 15.0 kW | $M_{max}$ Nm | | | | | | | | | | | 124 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | | 1413 |
| DRN180M4 18.5 kW | $M_{max}$ Nm | | | | | | | | | | | 125 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | | 1441 |

27793230/EN – 08/2022

*Assignment of MOVIDRIVE® MDX61B0150-503 – MDX61B0750-503 (sizes 3 – 5):*

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **AC 460 V / 60 Hz** | | **0150** | **0220** | **0300** | **0370** | **0450** | **0550** | **0750** |
| DRN132M4 7.5 kW | $M_{max}$ Nm | 149 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1202 | | | | | | |
| DRN132L4 9.2 kW | $M_{max}$ Nm | 164 | 213 | | **Notice:** The data is based on a supply voltage of AC 460 V. | | | |
| | $n_{base}$ min$^{-1}$ | 1223 | 1160 | | | | | |
| DRN160M4 11.0 kW | $M_{max}$ Nm | 167 | 183 | | | | | |
| | $n_{base}$ min$^{-1}$ | 1276 | 1387 | | | | | |
| DRN160L4 15.0 kW | $M_{max}$ Nm | 170 | 249 | 306 | | | | |
| | $n_{base}$ min$^{-1}$ | 1371 | 1292 | 1260 | | | | |
| DRN180M4 18.5 kW | $M_{max}$ Nm | 170 | 247 | 324 | 395 | 407 | | |
| | $n_{base}$ min$^{-1}$ | 1403 | 1336 | 1264 | 1196 | 1230 | | |
| DRN180L4 22.0 kW | $M_{max}$ Nm | 171 | 249 | 326 | 397 | 485 | 490 | |
| | $n_{base}$ min$^{-1}$ | 1417 | 1355 | 1292 | 1235 | 1158 | 1172 | |
| DRN200L4 30.0 kW | $M_{max}$ Nm | | 235 | 311 | 381 | 466 | 552 | 562 |
| | $n_{base}$ min$^{-1}$ | | 1411 | 1370 | 1333 | 1284 | 1230 | 1292 |
| DRN225S4 37.0 kW | $M_{max}$ Nm | | 249 | 328 | 401 | 491 | 580 | 679 |
| | $n_{base}$ min$^{-1}$ | | 1435 | 1395 | 1359 | 1308 | 1257 | 1213 |
| DRN225M4 45.0 kW | $M_{max}$ Nm | | | 320 | 395 | 486 | 577 | 717 |
| | $n_{base}$ min$^{-1}$ | | | 1428 | 1406 | 1373 | 1341 | 1282 |
| DRN250ME4 55.0 kW | $M_{max}$ Nm | | | | 384 | 476 | 566 | 706 |
| | $n_{base}$ min$^{-1}$ | | | | 1444 | 1420 | 1392 | 1353 |
| DRN280S4 75.0 kW | $M_{max}$ Nm | | | | | | 544 | 700 |
| | $n_{base}$ min$^{-1}$ | | | | | | 1426 | 1408 |
| DRN280M4 90.0 kW | $M_{max}$ Nm | | | | | | 547 | 689 |
| | $n_{base}$ min$^{-1}$ | | | | | | 1453 | 1429 |
| DRN315S4 110.0 kW | $M_{max}$ Nm | | | | | | | 703 |
| | $n_{base}$ min$^{-1}$ | | | | | | | 1436 |

27793230/EN – 08/2022

*Assignment of MOVIDRIVE® MDX61B0900-503 – MDX61B2500-503 (sizes 6 – 7):*

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | |
|---|---|---|---|---|---|---|---|
| **AC 460 V / 60 Hz** | | **0900** | **1100** | **1320** | **1600** | **2000** | **2500** |
| DRN225M4 45.0 kW | $M_{max}$ Nm | 867 | 867 | | | | |
| | $n_{base}$ 1/min | 1257 | 1279 | | | | |
| DRN250ME4 55.0 kW | $M_{max}$ Nm | 928 | 1094 | | | | |
| | $n_{base}$ 1/min | 1283 | 1231 | | | | |
| DRN280S4 75.0 kW | $M_{max}$ Nm | 941 | 1119 | 1412 | 1703 | | |
| | $n_{base}$ 1/min | 1377 | 1353 | 1313 | 1274 | | |
| DRN280M4 90.0 kW | $M_{max}$ Nm | 913 | 1080 | 1356 | 1631 | | |
| | $n_{base}$ 1/min | 1386 | 1356 | 1301 | 1243 | | |
| DRN315S4 110.0 kW | $M_{max}$ Nm | 934 | 1105 | 1389 | 1600 | | |
| | $n_{base}$ 1/min | 1406 | 1383 | 1339 | 1327 | | |
| DRN315ME4 132.0 kW | $M_{max}$ Nm | 923 | 1099 | 1389 | 1600 | | |
| | $n_{base}$ 1/min | 1456 | 1441 | 1415 | 1433 | | |
| DRN315L4 150.0 kW | $M_{max}$ Nm | 926 | 1102 | 1393 | 1682 | 2141 | 2400 |
| | $n_{base}$ 1/min | 1456 | 1441 | 1415 | 1386 | 1333 | 1368 |
| DRN315L4 160.0 kW | $M_{max}$ Nm | | 1101 | 1391 | 1679 | 2137 | 2400 |
| | $n_{base}$ 1/min | | 1444 | 1418 | 1386 | 1336 | 1368 |
| DRN315H4 185.0 kW | $M_{max}$ Nm | **Notice:** | | 1310 | 1593 | 2040 | 2400 |
| | $n_{base}$ 1/min | The data is based on a supply voltage of AC 460 V. | | 1462 | 1447 | 1424 | 1450 |
| DRN315H4 200.0 kW | $M_{max}$ Nm | | | 1313 | 1597 | 2045 | 2400 |
| | $n_{base}$ 1/min | | | 1465 | 1450 | 1424 | 1456 |
| DRN315H4 225.0 kW | $M_{max}$ Nm | | | | 1600 | 2049 | 2400 |
| | $n_{base}$ 1/min | | | | 1453 | 1427 | 1462 |

27793230/EN – 08/2022

### AC 230/460 V / 60 Hz motors in delta connection

*Assignment of MOVIDRIVE® MDX61B0005-5A3 – MDX61B0110-503 (sizes 0 – 2):*

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AC 230 V / 60 Hz | | 0005 | 0008 | 0011 | 0014 | 0015 | 0022 | 0030 | 0040 | 0055 | 0075 | 0110 |
| DRN80M4 750 W | $M_{max}$ Nm | | | 9.34 | 12.3 | 9 | 12.7 | 16.4 | | | | |
| | $n_{base}$ min$^{-1}$ | | | 2749 | 2623 | 2763 | 2602 | 2440 | | | | |
| DRN90S4 1.1 kW | $M_{max}$ Nm | | | | 12 | 8.56 | 12.5 | 16.2 | 22.4 | | | |
| | $n_{base}$ min$^{-1}$ | | | | 2812 | 2890 | 2805 | 2721 | 2588 | | | |
| DRN90L4 1.5 kW | $M_{max}$ Nm | | | | | | 12.5 | 16.7 | 23.3 | 31.1 | | |
| | $n_{base}$ min$^{-1}$ | | | | | | 2890 | 2827 | 2735 | 2637 | | |
| DRN100L4 2.2 kW | $M_{max}$ Nm | | | | | | | 16.2 | 23.1 | 31.2 | 40.4 | |
| | $n_{base}$ min$^{-1}$ | | | | | | | 2901 | 2828 | 2742 | 2645 | |
| DRN100L4 3.0 kW | $M_{max}$ Nm | | | | | | | | 23.1 | 32.2 | 42.4 | 65.1 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | 2882 | 2821 | 2748 | 2596 |
| DRN100L4 3.7 kW | $M_{max}$ Nm | | | | | | | | | 28.8 | 38.6 | 60.1 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | 2888 | 2828 | 2700 |
| DRN112M4 4.0 kW | $M_{max}$ Nm | | | | | | | | | 30.2 | 39.7 | 61 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | 2889 | 2830 | 2701 |
| DRN132S4 5.5 kW | $M_{max}$ Nm | | | | | | | | | | 39.8 | 61.8 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | 2906 | 2812 |
| DRN132M4 7.5 kW | $M_{max}$ Nm | | | | | | | | | | | 57.6 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | | 2858 |

27793230/EN – 08/2022

*Assignment of MOVIDRIVE® MDX61B0150-503 – MDX61B0750-503 (sizes 3 – 5):*

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| AC 230 V / 60 Hz | | 0150 | 0220 | 0300 | 0370 | 0450 | 0550 | 0750 |
| DRN100L4 3.7 kW | $M_{max}$ Nm | 81.1 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 2578 | | | | | | |
| DRN112M4 4.0 kW | $M_{max}$ Nm | 81.9 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 2578 | | | | | | |
| DRN132S4 5.5 kW | $M_{max}$ Nm | 83.3 | 121 | | | | | |
| | $n_{base}$ min$^{-1}$ | 2719 | 2561 | | | | | |
| DRN132M4 7.5 kW | $M_{max}$ Nm | 79 | 116 | 149 | | | | |
| | $n_{base}$ min$^{-1}$ | 2779 | 2642 | 2500 | | | | |
| DRN132L4 9.2 kW | $M_{max}$ Nm | 78 | 116 | 153 | 187 | 213 | | |
| | $n_{base}$ min$^{-1}$ | 2832 | 2721 | 2610 | 2510 | 2484 | | |
| DRN160M4 11.0 kW | $M_{max}$ Nm | 79.7 | 118 | 156 | 183 | | | |
| | $n_{base}$ min$^{-1}$ | 2879 | 2790 | 2695 | 2658 | | | |
| DRN160L4 15.0 kW | $M_{max}$ Nm | | 119 | 159 | 196 | 240 | 285 | 306 |
| | $n_{base}$ min$^{-1}$ | | 2890 | 2832 | 2774 | 2700 | 2626 | 2753 |
| DRN180M4 18.5 kW | $M_{max}$ Nm | | 119 | 159 | 195 | 239 | 283 | 352 |
| | $n_{base}$ min$^{-1}$ | | 2940 | 2888 | 2835 | 2768 | 2700 | 2599 |
| DRN180L4 22.0 kW | $M_{max}$ Nm | | | 160 | 196 | 240 | 285 | 353 |
| | $n_{base}$ min$^{-1}$ | | | 2902 | 2859 | 2801 | 2743 | 2647 |
| DRN200L4 30.0 kW | $M_{max}$ Nm | | | | 183 | 227 | 271 | 338 |
| | $n_{base}$ min$^{-1}$ | | | | 2920 | 2879 | 2842 | 2781 |
| DRN225S4 37.0 kW | $M_{max}$ Nm | | | | | 240 | 286 | 356 |
| | $n_{base}$ min$^{-1}$ | | | | | 2914 | 2874 | 2812 |
| DRN225M4 45.0 kW | $M_{max}$ Nm | | | | | | 276 | 349 |
| | $n_{base}$ min$^{-1}$ | | | | | | 2914 | 2877 |

27793230/EN – 08/2022

*Assignment of MOVIDRIVE® MDX61B0900-503 – MDX61B2500-503 (sizes 6 – 7):*

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | |
|---|---|---|---|---|---|---|---|
| AC 230 V / 60 Hz | | 0900 | 1100 | 1320 | 1600 | 2000 | 2500 |
| DRN180M4 18.5 kW | $M_{max}$ Nm | 407 | | | | | |
| | $n_{base}$ min$^{-1}$ | 2614 | | | | | |
| DRN180L4 22.0 kW | $M_{max}$ Nm | 463 | 490 | | | | |
| | $n_{base}$ min$^{-1}$ | 2489 | 2513 | | | | |
| DRN200L4 30.0 kW | $M_{max}$ Nm | 445 | 525 | 562 | | | |
| | $n_{base}$ min$^{-1}$ | 2678 | 2596 | 2691 | | | |
| DRN225S4 37.0 kW | $M_{max}$ Nm | 468 | 552 | 679 | | | |
| | $n_{base}$ min$^{-1}$ | 2706 | 2619 | 2474 | | | |
| DRN225M4 45.0 kW | $M_{max}$ Nm | 463 | 548 | 689 | 830 | 867 | |
| | $n_{base}$ min$^{-1}$ | 2808 | 2754 | 2659 | 2558 | 2634 | |
| DRN250ME4 55.0 kW | $M_{max}$ Nm | 453 | 538 | 678 | 817 | 1039 | |
| | $n_{base}$ min$^{-1}$ | 2600 | 2600 | 2600 | 2600 | 2575 | |
| DRN280S4 75.0 kW | $M_{max}$ Nm | | | 668 | 820 | 1060 | 1324 |
| | $n_{base}$ min$^{-1}$ | | | 2600 | 2600 | 2600 | 2600 |
| DRN280M4 90.0 kW | $M_{max}$ Nm | | | 660 | 801 | 1024 | 1273 |
| | $n_{base}$ min$^{-1}$ | | | 2600 | 2600 | 2600 | 2600 |
| DRN315S4 110.0 kW | $M_{max}$ Nm | | | 673 | 818 | 1048 | 1304 |
| | $n_{base}$ min$^{-1}$ | | | 2500 | 2500 | 2500 | 2500 |
| DRN315ME4 132.0 kW | $M_{max}$ Nm | | | | 804 | 1041 | 1302 |
| | $n_{base}$ min$^{-1}$ | | | | 2500 | 2500 | 2500 |
| DRN315L4 150.0 kW | $M_{max}$ Nm | | | | | 1043 | 1306 |
| | $n_{base}$ min$^{-1}$ | | | | | 2500 | 2500 |
| DRN315L4 160.0 kW | $M_{max}$ Nm | | | | | 1042 | 1304 |
| | $n_{base}$ min$^{-1}$ | | | | | 2500 | 2500 |
| DRN315H4 185.0 kW | $M_{max}$ Nm | | | | | | 1223 |
| | $n_{base}$ min$^{-1}$ | | | | | | 2500 |
| DRN315H4 200.0 kW | $M_{max}$ Nm | | | | | | 1227 |
| | $n_{base}$ min$^{-1}$ | | | | | | 2500 |

27793230/EN – 08/2022

### 9.6.14 DRN.. motor selection with double-star connection type (line AC 230 V / 60 Hz)

**AC 230/460 V / 60 Hz motors in delta connection**

| Motor voltage | | MOVIDRIVE® MDX61B...-2_3 (AC 230 V devices) in CFC operating modes (P700) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **AC 230 V / 60 Hz** | | **0015** | **0022** | **0037** | **0055** | **0075** | **0110** | **0150** | **0220** | **0300** |
| DRN80M4 750 W | $M_{max}$ Nm | 17.1 | | | **Notice:** The data is based on a supply voltage of AC 230 V. | | | | | |
| | $n_{base}$ min$^{-1}$ | 977 | | | | | | | | |
| DRN90S4 1.1 kW | $M_{max}$ Nm | 17 | 20.2 | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1223 | 1167 | | | | | | | |
| DRN90L4 1.5 kW | $M_{max}$ Nm | 17.5 | 20.9 | 32.4 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1322 | 1287 | 1223 | | | | | | |
| DRN100L4 2.2 kW | $M_{max}$ Nm | 17 | 20.7 | 36.5 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1395 | 1365 | 1237 | | | | | | |
| DRN100L4 3.0 kW | $M_{max}$ Nm | | | 38 | 59.4 | 71.5 | | | | |
| | $n_{base}$ min$^{-1}$ | | | 1316 | 1200 | 1182 | | | | |
| DRN100L4 3.7 kW | $M_{max}$ Nm | | | 34.4 | 54.8 | 73.2 | | | | |
| | $n_{base}$ min$^{-1}$ | | | 1365 | 1268 | 1182 | | | | |
| DRN112M4 4.0 kW | $M_{max}$ Nm | | | 35.7 | 55.7 | 74.1 | | | | |
| | $n_{base}$ min$^{-1}$ | | | 1377 | 1289 | 1207 | | | | |
| DRN132S4 5.5 kW | $M_{max}$ Nm | | | 35.6 | 56.3 | 75.3 | 110 | 128 | | |
| | $n_{base}$ min$^{-1}$ | | | 1430 | 1365 | 1307 | 1201 | 1189 | | |
| DRN132M4 7.5 kW | $M_{max}$ Nm | | | | 52.1 | 71.1 | 105 | 136 | | |
| | $n_{base}$ min$^{-1}$ | | | | 1408 | 1361 | 1276 | 1197 | | |
| DRN132L4 9.2 kW | $M_{max}$ Nm | | | | | 69.6 | 105 | 137 | 206 | |
| | $n_{base}$ min$^{-1}$ | | | | | 1397 | 1329 | 1271 | 1144 | |
| DRN160M4 11.0 kW | $M_{max}$ Nm | | | | | 71.2 | 108 | 140 | 183 | |
| | $n_{base}$ min$^{-1}$ | | | | | 1424 | 1371 | 1318 | 1334 | |
| DRN160L4 15.0 kW | $M_{max}$ Nm | | | | | | 107 | 142 | 215 | 257 |
| | $n_{base}$ min$^{-1}$ | | | | | | 1429 | 1397 | 1324 | 1281 |
| DRN180M4 18.5 kW | $M_{max}$ Nm | | | | | | | 142 | 214 | 255 |
| | $n_{base}$ min$^{-1}$ | | | | | | | 1427 | 1365 | 1326 |
| DRN180L4 22.0 kW | $M_{max}$ Nm | **Notice:** The data is based on a supply voltage of AC 230 V. | | | | | | 143 | 215 | 257 |
| | $n_{base}$ min$^{-1}$ | | | | | | | 1437 | 1384 | 1350 |
| DRN200L4 30.0 kW | $M_{max}$ Nm | | | | | | | | 202 | 243 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | 1431 | 1407 |
| DRN225S4 37.0 kW | $M_{max}$ Nm | | | | | | | | | 257 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | 1431 |

27793230/EN – 08/2022

### 9.6.15 Motor table DRE.. series AC motors (characteristic values with delta/star connection AC 230/400 V / 50 Hz)

| Motor | $P_m$ | $M_N$ | Mass moment of inertia $J_M$ | | Star ⅄ (AC 400 V) | | | | Delta △ (AC 230 V) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Without brake | with brake | $I_n$ | $I_{q\_n}$ [1] | $I_{d\_n}$ [1] | $c_T$ [1] | $I_n$ | $I_{q\_n}$ [1] | $I_{d\_n}$ [1] | $c_T$ [1] |
| | kW | Nm | $10^{-4}$ kgm² | | A | A | A | Nm/A | A | A | A | Nm/A |
| DRE80M4 | 0.75 | 5 | 21.5 | 23 | 1.68 | 1.37 | 0.98 | 3.66 | 2.91 | 2.37 | 1.69 | 2.11 |
| DRE90M4 | 1.1 | 7.4 | 35.5 | 40 | 2.45 | 2.15 | 1.18 | 3.45 | 4.24 | 3.72 | 2.04 | 1.99 |
| DRE90L4 | 1.5 | 10 | 43.5 | 48.5 | 3.35 | 2.64 | 2.06 | 3.78 | 5.80 | 4.58 | 3.56 | 2.18 |
| DRE100M4 | 2.2 | 14.7 | 56 | 62 | 4.6 | 4.16 | 1.96 | 3.53 | 8.0 | 7.21 | 3.40 | 2.04 |
| DRE100LC4 | 3 | 19.7 | 90 | 96 | 6.2 | 5.52 | 2.81 | 3.57 | 10.7 | 9.57 | 4.87 | 2.06 |
| DRE112M4 | 3 | 19.7 | 146 | 151 | 6 | 5.51 | 2.38 | 3.58 | 10.4 | 9.54 | 4.12 | 2.07 |
| DRE132S4 | 4 | 26 | 190 | 195 | 8 | 7.35 | 3.17 | 3.54 | 13.9 | 12.7 | 5.5 | 2.04 |
| DRE132M4 | 5.5 | 36 | 255 | 265 | 10.5 | 9.91 | 3.48 | 3.63 | 18.2 | 17.2 | 6.0 | 2.10 |
| DRE132MC4 | 7.5 | 48.5 | 340 | 355 | 14.8 | 13.4 | 6.31 | 3.62 | 25.6 | 23.2 | 10.9 | 2.09 |
| DRE160S4 | 7.5 | 49 | 370 | 390 | 14.7 | 13.3 | 6.29 | 3.68 | 25.5 | 23.0 | 10.9 | 2.13 |
| DRE160M4 | 9.2 | 60 | 450 | 500 | 18.3 | 16.2 | 8.41 | 3.70 | 31.7 | 28.1 | 14.6 | 2.13 |
| DRE160MC4 | 11 | 71 | 590 | 640 | 21.5 | 20.1 | 8.10 | 3.53 | 37 | 34.9 | 14.0 | 2.04 |
| DRE180S4 | 11 | 71 | 895 | 955 | 21 | 18.7 | 9.26 | 3.79 | 36 | 32.5 | 16.0 | 2.19 |
| DRE180M4 | 15 | 97 | 1110 | 1170 | 28 | 25.9 | 10.4 | 3.75 | 48 | 44.8 | 18.1 | 2.17 |
| DRE180L4 | 18.5 | 120 | 1300 | 1440 | 34 | 31.2 | 14.1 | 3.85 | 59 | 54.0 | 24.4 | 2.22 |
| DRE180LC4 | 22 | 142 | 1680 | 1815 | 42 | 36.3 | 20.8 | 3.91 | 73 | 62.8 | 36.0 | 2.26 |
| DRE200L4 | 30 | 194 | 2360 | 2500 | 57 | 53.6 | 19.4 | 3.62 | 99 | 92.8 | 33.6 | 2.09 |
| DRE225S4 | 37 | 240 | 2930 | 3160 | 70 | 65.1 | 25.7 | 3.69 | 121 | 113 | 44.5 | 2.13 |
| DRE225M4 | 45 | 290 | 3430 | 3660 | 84 | 78.3 | 30.5 | 3.70 | 145 | 136 | 52.9 | 2.14 |
| DRE315K4 | 110 | 708 | 18400 | 19500 | 196 | 183 | 69.6 | 3.86 | 340 | 317 | 121 | 2.23 |
| DRE315S4 | 132 | 850 | 22500 | 23600 | 230 | 208 | 95.6 | 4.08 | 425 | 360 | 166 | 2.36 |
| DRE315M4 | 160 | 1030 | 27900 | 29000 | 275 | 260 | 88.8 | 3.96 | 480 | 451 | 154 | 2.28 |
| DRE315L4 | 200 | 1289 | 31900 | 33000 | 345 | 328 | 106 | 3.93 | – | – | – | – |

1) Applies in the basic speed range up to n base.

27793230/EN – 08/2022

### 9.6.16 DRE.. motor selection with delta/star connection type (line AC 400 V / 50 Hz)

**AC 230/400 V / 50 Hz motors in star connection or AC 400/690 V / 50 Hz motors in delta connection**

*Assignment of MOVIDRIVE® MDX61B0005-5A3 – MDX61B0110-503 (sizes 0 – 2):*

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AC 400 / 50Hz | | 0005 | 0008 | 0011 | 0014 | 0015 | 0022 | 0030 | 0040 | 0055 | 0075 | 0110 |
| DRE80S4 370 W | $M_{max}$ Nm | 7.14 | | | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 879 | | | | | | | | | | |
| DRE80M4 550 W | $M_{max}$ Nm | 12.4 | | | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 851 | | | | | | | | | | |
| DRE80M4 750 W | $M_{max}$ Nm | 13.7 | 15.5 | | | 15.5 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 872 | 816 | | | 823 | | | | | | |
| DRE90M4 1.1 kW | $M_{max}$ Nm | 13.3 | 16.2 | 21.2 | | 20.5 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1027 | 956 | 851 | | 865 | | | | | | |
| DRE90L4 1.5 kW | $M_{max}$ Nm | | | 21 | 27.6 | 20.3 | 28.5 | 34.1 | | | | |
| | $n_{base}$ min$^{-1}$ | | | 1020 | 928 | 1027 | 914 | 844 | | | | |
| DRE100M4 2.2 kW | $M_{max}$ Nm | | | | 27.5 | 20 | 28.4 | 36.7 | 48.7 | | | |
| | $n_{base}$ min$^{-1}$ | | | | 1027 | 1111 | 1012 | 928 | 795 | | | |
| DRE112M4 2.2 kW | $M_{max}$ Nm | | | | 27.8 | 20.3 | 28.7 | 36.9 | 50.5 | 51.6 | | |
| | $n_{base}$ min$^{-1}$ | | | | 1061 | 1119 | 1055 | 990 | 885 | 902 | | |
| DRE100LC4 3.0 kW | $M_{max}$ Nm | | | | | | 27.6 | 36.0 | 49.6 | 65.0 | | |
| | $n_{base}$ min$^{-1}$ | | | | | | 1139 | 1083 | 998 | 907 | | |
| DRE112M4 3.0 kW | $M_{max}$ Nm | | | | | | 27.9 | 36.1 | 49.5 | | | |
| | $n_{base}$ min$^{-1}$ | | | | | | 1084 | 1025 | 932 | | | |
| DRE132S4 4.0 kW | $M_{max}$ Nm | | | | | | | 35.5 | 49.2 | 65.3 | 83.7 | |
| | $n_{base}$ min$^{-1}$ | | | | | | | 1125 | 1072 | 1002 | 926 | |
| DRE132M4 5.5 kW | $M_{max}$ Nm | | | | | | | | 49.7 | 66.2 | 85.2 | 112 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | 1137 | 1072 | 996 | 914 |
| DRE132MC4 7.5 kW | $M_{max}$ Nm | | | | | | | | | 62.6 | 81.9 | 125 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | 1143 | 1102 | 1014 |
| DRE160S4 7.5 kW | $M_{max}$ Nm | | | | | | | | | 63.8 | 82.8 | 122 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | 1139 | 1092 | 1002 |
| DRE160M4 9.2 kW | $M_{max}$ Nm | | | | | | | | | | 81.3 | 125 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | 1139 | 1065 |
| DRE160MC4 11.0 kW | $M_{max}$ Nm | **Notice:** The data is based on a supply voltage of AC 400 V. | | | | | | | | | | 125 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | | 1107 |
| DRE180S4 11.0 kW | $M_{max}$ Nm | | | | | | | | | | 83.2 | 129 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | 1187 | 1123 |
| DRE180M4 15.0 kW | $M_{max}$ Nm | | | | | | | | | | | 130 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | | 1171 |

27793230/EN – 08/2022

*Assignment of MOVIDRIVE® MDX61B0150-503 – MDX61B0750-503 (sizes 3 – 5):*

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| AC 400 / 50Hz | | 0150 | 0220 | 0300 | 0370 | 0450 | 0550 | 0750 |
| DRE132MC4 7.5 kW | $M_{max}$ Nm | 156 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 973 | | | | | | |
| DRE160S4 7.5 kW | $M_{max}$ Nm | 122 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1071 | | | | | | |
| DRE160M4 9.2 kW | $M_{max}$ Nm | 169 | 179 | | | | | |
| | $n_{base}$ min$^{-1}$ | 991 | 1060 | | | | | |
| DRE160MC4 11.0 kW | $M_{max}$ Nm | 168 | 199 | | **Notice:** The data is based on a supply voltage of AC 400 V. | | | |
| | $n_{base}$ min$^{-1}$ | 1049 | 1086 | | | | | |
| DRE180S4 11.0 kW | $M_{max}$ Nm | 174 | 207 | | | | | |
| | $n_{base}$ min$^{-1}$ | 1055 | 1065 | | | | | |
| DRE180M4 15.0 kW | $M_{max}$ Nm | 176 | 255 | | | | | |
| | $n_{base}$ min$^{-1}$ | 1123 | 1039 | | | | | |
| DRE180L4 18.5 kW | $M_{max}$ Nm | 174 | 254 | 334 | 361 | | | |
| | $n_{base}$ min$^{-1}$ | 1155 | 1086 | 1018 | 1034 | | | |
| DRE180LC4 22.0 kW | $M_{max}$ Nm | 166 | 244 | 320 | 391 | 397 | | |
| | $n_{base}$ min$^{-1}$ | 1181 | 1123 | 1060 | 1007 | 1044 | | |
| DRE200L4 30.0 kW | $M_{max}$ Nm | | 239 | 317 | 388 | 475 | 505 | 505 |
| | $n_{base}$ min$^{-1}$ | | 1157 | 1120 | 1079 | 1034 | 1062 | 1099 |
| DRE225S4 37.0 kW | $M_{max}$ Nm | | | 315 | 388 | 477 | 565 | 702 |
| | $n_{base}$ min$^{-1}$ | | | 1161 | 1132 | 1095 | 1062 | 1005 |
| DRE225M4 45.0 kW | $M_{max}$ Nm | | | | 391 | 484 | 576 | 718 |
| | $n_{base}$ min$^{-1}$ | | | | 1161 | 1136 | 1103 | 1058 |
| DRE250M4 55.0 kW | $M_{max}$ Nm | | | | | 476 | 572 | 719 |
| | $n_{base}$ min$^{-1}$ | | | | | 1170 | 1149 | 1118 |
| DRE280S4 75.0 kW | $M_{max}$ Nm | | | | | | 562 | 709 |
| | $n_{base}$ min$^{-1}$ | | | | | | 1191 | 1170 |

27793230/EN – 08/2022

*Assignment of MOVIDRIVE® MDX61B0900-503 – MDX61B2500-503 (sizes 6 – 7):*

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | |
|---|---|---|---|---|---|---|---|
| AC 400 / 50Hz | | 0900 | 1100 | 1320 | 1600 | 2000 | 2500 |
| DRE225M4 45.0 kW | $M_{max}$ Nm | 843 | | | | | |
| | $n_{base}$ min$^{-1}$ | 1062 | | | | | |
| DRE250M4 55.0 kW | $M_{max}$ Nm | 952 | 1125 | 1200 | | | |
| | $n_{base}$ min$^{-1}$ | 1060 | 1018 | 1051 | | | |
| DRE280S4 75.0 kW | $M_{max}$ Nm | 942 | 1115 | 1200 | 1200 | | |
| | $n_{base}$ min$^{-1}$ | 1136 | 1109 | 1194 | 1280 | | |
| DRE280M4 90.0 kW | $M_{max}$ Nm | 945 | 1129 | 1200 | 1200 | 1200 | |
| | $n_{base}$ min$^{-1}$ | 1155 | 1133 | 1277 | 1411 | 1472 | |
| DRE315K4 110.0 kW | $M_{max}$ Nm | 936 | 1107 | 1392 | 1600 | 1600 | |
| | $n_{base}$ min$^{-1}$ | 1160 | 1140 | 1102 | 1093 | 1184 | |
| DRE315S4 132.0 kW | $M_{max}$ Nm | 955 | 1136 | 1433 | 1600 | 1600 | |
| | $n_{base}$ min$^{-1}$ | 1189 | 1175 | 1148 | 1192 | 1362 | |
| DRE315M4 160.0 kW | $M_{max}$ Nm | | 1128 | 1423 | 1715 | 2181 | 2400 |
| | $n_{base}$ min$^{-1}$ | | 1198 | 1169 | 1143 | 1096 | 1128 |
| DRE315L4 200.0 kW | $M_{max}$ Nm | **Notice:** The data is based on a line voltage of AC 400 V. | | 1432 | 1731 | 2205 | 2400 |
| | $n_{base}$ min$^{-1}$ | | | 1204 | 1181 | 1137 | 1195 |

27793230/EN – 08/2022

### AC 230/400 V / 50Hz motors in delta connection

*Assignment of MOVIDRIVE® MDX61B0008-5A3 – MDX61B0110-503 (sizes 0 – 2):*

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AC 230 V / 50Hz | | 0005 | 0008 | 0011 | 0014 | 0015 | 0022 | 0030 | 0040 | 0055 | 0075 | 0110 |
| DRE80S4 250 W | $M_{max}$ Nm | 5.14 | | | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1934 | | | | | | | | | | |
| DRE80S4 370 W | $M_{max}$ Nm | 7.14 | 7.14 | 7.14 | | 7.14 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1849 | 1976 | 2011 | | 2011 | | | | | | |
| DRE80M4 550 W | $M_{max}$ Nm | 8.00 | 9.76 | 12.4 | 12.4 | 12.4 | 12.4 | | | | | |
| | $n_{base}$ min$^{-1}$ | 1941 | 1863 | 1758 | 1934 | 1744 | 1941 | | | | | |
| DRE80M4 750 W | $M_{max}$ Nm | | 9.16 | 12.1 | 15.5 | 11.7 | 15.5 | 15.5 | | | | |
| | $n_{base}$ min$^{-1}$ | | 1976 | 1863 | 1737 | 1877 | 1765 | 1884 | | | | |
| DRE90M4 1.1 kW | $M_{max}$ Nm | | | | 15.5 | 11.3 | 16 | 20.7 | | | | |
| | $n_{base}$ min$^{-1}$ | | | | 1898 | 2011 | 1884 | 1765 | | | | |
| DRE90L4 1.5 kW | $M_{max}$ Nm | | | | | | 15.6 | 20.4 | 28.3 | 34.1 | | |
| | $n_{base}$ min$^{-1}$ | | | | | | 2039 | 1955 | 1821 | 1793 | | |
| DRE100M4 2.2 kW | $M_{max}$ Nm | | | | | | | 20.2 | 28.2 | 37.7 | 48.6 | |
| | $n_{base}$ min$^{-1}$ | | | | | | | 2053 | 1948 | 1828 | 1688 | |
| DRE112M4 2.2 kW | $M_{max}$ Nm | | | | | | | 20.5 | 28.5 | 38 | 48.9 | |
| | $n_{base}$ min$^{-1}$ | | | | | | | 2016 | 1928 | 1828 | 1717 | |
| DRE100LC4 3.0 kW | $M_{max}$ Nm | | | | | | | | 27.4 | 37 | 48 | 65.0 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | 2081 | 2004 | 1927 | 1905 |
| DRE112M4 3.0 kW | $M_{max}$ Nm | | | | | | | | 27.7 | 37.1 | 47.9 | 59.1 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | 1975 | 1881 | 1781 | 1734 |
| DRE132S4 4.0 kW | $M_{max}$ Nm | **Notice:** The data is based on a supply voltage of AC 400 V. | | | | | | | | 36.5 | 47.5 | 72.3 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | 2021 | 1963 | 1828 |
| DRE132M4 5.5 kW | $M_{max}$ Nm | | | | | | | | | | 48.1 | 73.2 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | 2068 | 1934 |
| DRE132MC4 7.5 kW | $M_{max}$ Nm | | | | | | | | | | | 69.8 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | | 2021 |
| DRE160S4 7.5 kW | $M_{max}$ Nm | | | | | | | | | | | 70.9 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | | 2020 |

27793230/EN – 08/2022

*Assignment of MOVIDRIVE® MDX61B0150-503 – MDX61B0750-503 (sizes 3 – 5):*

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| AC 230 V / 50Hz | | 0150 | 0220 | 0300 | 0370 | 0450 | 0550 | 0750 |
| DRE132S4 4.0 kW | $M_{max}$ Nm | 83.7 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1863 | | | | | | |
| DRE132M4 5.5 kW | $M_{max}$ Nm | 98.2 | 112 | | | | | |
| | $n_{base}$ min$^{-1}$ | 1805 | 1816 | | | | | |
| DRE132MC4 7.5 kW | $M_{max}$ Nm | 94.9 | 138 | 156 | **Notice:** The data is based on a supply voltage of AC 400 V. | | | |
| | $n_{base}$ min$^{-1}$ | 1951 | 1828 | 1887 | | | | |
| DRE160S4 7.5 kW | $M_{max}$ Nm | 95.7 | 122 | 122 | | | | |
| | $n_{base}$ min$^{-1}$ | 1935 | 1946 | 2062 | | | | |
| DRE160M4 9.2 kW | $M_{max}$ Nm | 94.6 | 139 | 179 | 179 | 179 | | |
| | $n_{base}$ min$^{-1}$ | 2009 | 1904 | 1809 | 1983 | 2025 | | |
| DRE160MC4 11.0 kW | $M_{max}$ Nm | 93.5 | 138 | 182 | 199 | 199 | | |
| | $n_{base}$ min$^{-1}$ | 2036 | 1951 | 1867 | 1925 | 2004 | | |
| DRE180S4 11.0 kW | $M_{max}$ Nm | 97.1 | 143 | 188 | 207 | 207 | | |
| | $n_{base}$ min$^{-1}$ | 2083 | 1993 | 1893 | 1935 | 2030 | | |
| DRE180M4 15.0 kW | $M_{max}$ Nm | | 144 | 190 | 232 | 284 | | |
| | $n_{base}$ min$^{-1}$ | | 2062 | 1993 | 1930 | 1851 | | |
| DRE180L4 18.5 kW | $M_{max}$ Nm | | 141 | 188 | 231 | 284 | 336 | 361 |
| | $n_{base}$ min$^{-1}$ | | 2104 | 2046 | 1999 | 1930 | 1867 | 1935 |
| DRE180LC4 22.0 kW | $M_{max}$ Nm | | | 180 | 222 | 272 | 322 | 397 |
| | $n_{base}$ min$^{-1}$ | | | 2078 | 2030 | 1972 | 1914 | 1819 |
| DRE200L4 30.0 kW | $M_{max}$ Nm | | | | 217 | 268 | 319 | 397 |
| | $n_{base}$ min$^{-1}$ | | | | 2067 | 2030 | 1993 | 1932 |
| DRE225S4 37.0 kW | $M_{max}$ Nm | **Notice:** The data is based on a supply voltage of AC 400 V. | | | | | 317 | 398 |
| | $n_{base}$ min$^{-1}$ | | | | | | 2051 | 2006 |
| DRE225M4 45.0 kW | $M_{max}$ Nm | | | | | | | 402 |
| | $n_{base}$ min$^{-1}$ | | | | | | | 2051 |

27793230/EN – 08/2022

*Assignment of MOVIDRIVE® MDX61B0900-503 – MDX61B2500-503 (sizes 6 – 7):*

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | |
|---|---|---|---|---|---|---|---|
| AC 230 V / 50Hz | | 0900 | 1100 | 1320 | 1600 | 2000 | 2500 |
| DRE180L4 18.5 kW | $M_{max}$ Nm | 361 | | | | | |
| | $n_{base}$ min$^{-1}$ | 1999 | | | | | |
| DRE180LC4 22.0 kW | $M_{max}$ Nm | 397 | | | | | |
| | $n_{base}$ min$^{-1}$ | 1956 | | | | | |
| DRE200L4 30.0 kW | $M_{max}$ Nm | 505 | 505 | 505 | | | |
| | $n_{base}$ min$^{-1}$ | 1858 | 1977 | 2051 | | | |
| DRE225S4 37.0 kW | $M_{max}$ Nm | 525 | 620 | 718 | | | |
| | $n_{base}$ min$^{-1}$ | 1932 | 1874 | 1866 | | | |
| DRE225M4 45.0 kW | $M_{max}$ Nm | 534 | 633 | 796 | | | |
| | $n_{base}$ min$^{-1}$ | 1989 | 1940 | 1862 | | | |
| DRE250M4 55.0 kW | $M_{max}$ Nm | 529 | 631 | 800 | 966 | 1200 | 1200 |
| | $n_{base}$ min$^{-1}$ | 2051 | 2017 | 1959 | 1898 | 1807 | 1916 |
| DRE280S4 75.0 kW | $M_{max}$ Nm | | 621 | 790 | 956 | 1200 | 1200 |
| | $n_{base}$ min$^{-1}$ | | 2081 | 2048 | 2011 | 1950 | 2218 |
| DRE280M4 90.0 kW | $M_{max}$ Nm | | | 780 | 960 | 1200 | 1200 |
| | $n_{base}$ min$^{-1}$ | | | 2066 | 2038 | 2023 | 2377 |
| DRE315K4 110.0 kW | $M_{max}$ Nm | | | 784 | 950 | 1213 | 1507 |
| | $n_{base}$ min$^{-1}$ | | | 2071 | 2039 | 1986 | 1922 |
| DRE315S4 132.0 kW | $M_{max}$ Nm | | | | 970 | 1246 | 1553 |
| | $n_{base}$ min$^{-1}$ | | | | 2083 | 2048 | 2007 |
| DRE315M4 160.0 kW | $M_{max}$ Nm | **Notice:** The data is based on a supply voltage of AC 400 V. | | | | 1238 | 1542 |
| | $n_{base}$ min$^{-1}$ | | | | | 2086 | 2042 |
| DRE315L4 200.0 kW | $M_{max}$ Nm | | | | | | 1554 |
| | $n_{base}$ min$^{-1}$ | | | | | | 2098 |

27793230/EN – 08/2022

### 9.6.17 DRE.. motor selection in delta connection type (line AC 230 V / 50 Hz)

**AC 230/400 V / 50 Hz motors in delta connection**

| Motor voltage | | MOVIDRIVE® MDX61B...-2_3 (AC 230 V devices) in CFC operating modes (P700) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| AC 230 V / 50 Hz | | 0015 | 0022 | 0037 | 0055 | 0075 | 0110 | 0150 | 0220 | 0300 |
| DRE80M4 750 W | $M_{max}$ Nm | 15.5 | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 823 | | | | | | | | |
| DRE90M4 1.1 kW | $M_{max}$ Nm | 21.6 | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 844 | | | | | | | | |
| DRE90L4 1.5 kW | $M_{max}$ Nm | 21.4 | 25.5 | 34.1 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1012 | 956 | 858 | | | | | | |
| DRE100M4 2.2 kW | $M_{max}$ Nm | 21.2 | 25.4 | 43.9 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1097 | 1048 | 844 | | | | | | |
| DRE112M4 2.2 kW | $M_{max}$ Nm | 21.4 | 25.6 | 44.2 | 51.6 | | | | | |
| | $n_{base}$ min$^{-1}$ | 1113 | 1078 | 932 | 902 | | | | | |
| DRE100LC4 3.0 kW | $M_{max}$ Nm | | 24.4 | 43.3 | 65 | | | | | |
| | $n_{base}$ min$^{-1}$ | | 1160 | 1041 | 914 | | | | | |
| DRE112M4 3.0 kW | $M_{max}$ Nm | | 24.9 | 43.2 | 59.1 | | | | | |
| | $n_{base}$ min$^{-1}$ | | 1107 | 973 | 879 | | | | | |
| DRE132S4 4.0 kW | $M_{max}$ Nm | | | 42.8 | 66.1 | 83.7 | | | | |
| | $n_{base}$ min$^{-1}$ | | | 1096 | 996 | 938 | | | | |
| DRE132M4 5.5 kW | $M_{max}$ Nm | | | 43.3 | 67 | 88.8 | 112 | | | |
| | $n_{base}$ min$^{-1}$ | | | 1160 | 1066 | 984 | 914 | | | |
| DRE132MC4 7.5 kW | $M_{max}$ Nm | | | | 63.4 | 85.6 | 126 | 156 | | |
| | $n_{base}$ min$^{-1}$ | | | | 1143 | 1096 | 1008 | 961 | | |
| DRE160S4 7.5 kW | $M_{max}$ Nm | | | | 64.7 | 86.5 | 122 | 122 | | |
| | $n_{base}$ min$^{-1}$ | | | | 1139 | 1081 | 1002 | 1065 | | |
| DRE160M4 9.2 kW | $M_{max}$ Nm | | | | | 85 | 126 | 163 | 179 | |
| | $n_{base}$ min$^{-1}$ | | | | | 1134 | 1065 | 1002 | 1060 | |
| DRE160MC4 11.0 kW | $M_{max}$ Nm | | | | | 83.8 | 126 | 163 | 199 | |
| | $n_{base}$ min$^{-1}$ | | | | | 1160 | 1107 | 1055 | 1086 | |
| DRE180S4 11.0 kW | $M_{max}$ Nm | | | | | 87.2 | 130 | 169 | 207 | |
| | $n_{base}$ min$^{-1}$ | | | | | 1181 | 1123 | 1065 | 1065 | |
| DRE180M4 15.0 kW | $M_{max}$ Nm | | | | | | 130 | 170 | 255 | |
| | $n_{base}$ min$^{-1}$ | | | | | | 1171 | 1129 | 1039 | |
| DRE180L4 18.5 kW | $M_{max}$ Nm | **Notice:** The data is based on a supply voltage of AC 230 V. | | | | | | 168 | 254 | 303 |
| | $n_{base}$ min$^{-1}$ | | | | | | | 1160 | 1086 | 1044 |
| DRE180LC4 22.0 kW | $M_{max}$ Nm | | | | | | | 161 | 244 | 291 |
| | $n_{base}$ min$^{-1}$ | | | | | | | 1187 | 1123 | 1086 |
| DRE200L4 30.0 kW | $M_{max}$ Nm | | | | | | | | 239 | 287 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | 1157 | 1132 |
| DRE225S4 37.0 kW | $M_{max}$ Nm | | | | | | | | | 285 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | 1169 |

27793230/EN – 08/2022

### 9.6.18 Motor table DRE.. series AC motors (characteristic values with delta/star connection AC 230/460 V / 60 Hz)

| Motor | $P_m$ | $M_N$ | Mass moment of inertia $J_M$ | | Star ⅄ (AC 460 V) | | | | Double-star ⅄ (AC 230 V) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Without brake | with brake | $I_n$ | $I_{q\_n}$ [1] | $I_{d\_n}$ [1] | $c_T$ [1] | $I_n$ | $I_{q\_n}$ [1] | $I_{d\_n}$ [1] | $c_T$ [1] |
| | kW | Nm | $10^{-4}$ kgm² | | A | A | A | Nm/A | A | A | A | Nm/A |
| DRE80M4 | 0.75 | 4.1 | 21.5 | 23 | 1.44 | 1.15 | 0.86 | 3.56 | 2.88 | 2.31 | 1.73 | 1.78 |
| DRE90M4 | 1.1 | 6 | 35.5 | 40 | 2.30 | 1.83 | 1.39 | 3.27 | 4.60 | 3.67 | 2.77 | 1.63 |
| DRE90L4 | 1.5 | 8.2 | 43.5 | 48.5 | 2.80 | 2.14 | 1.80 | 3.83 | 5.60 | 4.28 | 3.61 | 1.91 |
| DRE100L4 | 2.2 | 12.1 | 68 | 74 | 4.00 | 3.39 | 2.12 | 3.57 | 8.0 | 6.8 | 4.25 | 1.78 |
| DRE100LC4 | 3 | 16.3 | 89.8 | 95.8 | 5.40 | 5.14 | 2.58 | 3.17 | 10.8 | 10.3 | 5.16 | 1.59 |
| DRE100LC4 | 3.7 | 20 | 89.8 | 95.8 | 6.40 | 5.85 | 2.60 | 3.42 | 12.8 | 11.7 | 5.20 | 1.71 |
| DRE112M4 | 3.7 | 20 | 146 | 151 | 6.30 | 5.96 | 2.04 | 3.35 | 12.6 | 11.9 | 4.07 | 1.68 |
| DRE132S4 | 4 | 21.6 | 190 | 195 | 7.90 | 6.36 | 2.79 | 3.39 | 15.8 | 12.7 | 5.59 | 1.70 |
| DRE132M4 | 5.5 | 30 | 255 | 265 | 9.00 | 8.57 | 2.74 | 3.50 | 18.0 | 17.1 | 5.49 | 1.75 |
| DRE132MC4 | 7.5 | 40.5 | 340 | 355 | 12.9 | 11.5 | 5.93 | 3.54 | 25.8 | 22.9 | 11.9 | 1.77 |
| DRE160S4 | 7.5 | 40.5 | 370 | 390 | 12.7 | 11.4 | 5.66 | 3.56 | 25.4 | 22.7 | 11.3 | 1.78 |
| DRE160M4 | 9.2 | 49.5 | 450 | 500 | 15.4 | 14.0 | 6.52 | 3.55 | 30.8 | 27.9 | 13.0 | 1.77 |
| DRE160MC4 | 11 | 59 | 590 | 640 | 18.3 | 16.8 | 7.28 | 3.51 | 36.6 | 33.6 | 14.6 | 1.76 |
| DRE180S4 | 11 | 59 | 900 | 960 | 17.9 | 16.3 | 7.36 | 3.62 | 35.8 | 32.6 | 14.7 | 1.81 |
| DRE180M4 | 15 | 81 | 1110 | 1170 | 24.0 | 22.1 | 8.86 | 3.67 | 48.0 | 44.2 | 17.7 | 1.83 |
| DRE180L4 | 18.5 | 100 | 1300 | 1440 | 30.0 | 27.0 | 12.7 | 3.71 | 60.0 | 54.0 | 25.3 | 1.85 |
| DRE180LC4 | 22 | 118 | 1790 | 1930 | 35.5 | 33.2 | 12.6 | 3.56 | 71.0 | 66.4 | 25.2 | 1.78 |
| DRE200L4 | 30 | 161 | 2360 | 2500 | 49.5 | 45.4 | 19.0 | 3.54 | 99.0 | 90.9 | 38.0 | 1.77 |
| DRE225S4 | 37 | 199 | 2930 | 3160 | 59.0 | 57.2 | 15.1 | 3.48 | 118 | 114 | 30.3 | 1.74 |
| DRE225M4 | 45 | 240 | 3430 | 3660 | 71.0 | 66.5 | 24.4 | 3.61 | 142 | 133 | 48.7 | 1.80 |
| DRE315K4 | 110 | 590 | 18400 | 19500 | 169 | 157 | 63.2 | 3.76 | 338 | 314 | 126 | 1.88 |
| DRE315S4 | 132 | 707 | 22500 | 23600 | 205 | 202 | 43.4 | 3.49 | 410 | 405 | 87 | 1.75 |
| DRE315S4 | 150 | 900 | 22500 | 23600 | 225 | 218 | 61.2 | 4.14 | 450 | 435 | 122 | 2.07 |
| DRE315M4 | 160 | 856 | 27900 | 29000 | 240 | 232 | 60.7 | 3.69 | 480 | 464 | 121 | 1.84 |
| DRE315M4 | 185 | 990 | 27900 | 29000 | 275 | 264 | 81.0 | 3.75 | 550 | 528 | 162 | 1.87 |
| DRE315L4 | 200 | 1070 | 31900 | 33000 | 295 | 287 | 74 | 3.73 | – | – | – | – |
| DRE315L4 | 225 | 1205 | 31900 | 33000 | 335 | 325 | 73 | 3.71 | – | – | – | – |

1) Applies in the basic speed range up to n base.

27793230/EN – 08/2022

### 9.6.19 DRE.. motor selection in double-star/star connection type (line AC 460 V / 60 Hz)

**AC 230/460 V / 60 Hz motors in star connection**

*Assignment of MOVIDRIVE® MDX61B0005-5A3 – MDX61B0110-503 (sizes 0 – 2):*

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AC 460 V / 60 Hz | | 0005 | 0008 | 0011 | 0014 | 0015 | 0022 | 0030 | 0040 | 0055 | 0075 | 0110 |
| DRE80M4 550 W | $M_{max}$ Nm | 11.7 | | | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1012 | | | | | | | | | | |
| DRE80M4 750 W | $M_{max}$ Nm | 13.2 | 14.4 | | | 14.4 | **Notice:** The data is based on a line voltage of AC 460 V. | | | | | |
| | $n_{base}$ min$^{-1}$ | 1034 | 991 | | | 991 | | | | | | |
| DRE80S4 750 W | $M_{max}$ Nm | 11.3 | 11.3 | | | 11.3 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1020 | 1020 | | | 1034 | | | | | | |
| DRE80M4 1.1 kW | $M_{max}$ Nm | 13 | 15.8 | 19.4 | | 19.4 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1188 | 1104 | 998 | | 998 | | | | | | |
| DRE90M4 1.1 kW | $M_{max}$ Nm | 12.5 | 15.2 | 20 | 22.9 | 19.3 | 22.9 | | | | | |
| | $n_{base}$ min$^{-1}$ | 1273 | 1209 | 1097 | 1062 | 1111 | 1062 | | | | | |
| DRE90L4 1.5 kW | $M_{max}$ Nm | | 15.5 | 20.4 | 26.6 | 19.7 | 27.5 | | | | | |
| | $n_{base}$ min$^{-1}$ | | 1294 | 1209 | 1097 | 1223 | 1083 | | | | | |
| DRE90M4 1.5 kW | $M_{max}$ Nm | | 15.4 | 20.1 | 25.1 | 19.5 | 25.1 | 25.1 | | | | |
| | $n_{base}$ min$^{-1}$ | | 1230 | 1118 | 1005 | 1132 | 1012 | 1034 | | | | |
| DRE100L4 2.2 kW | $M_{max}$ Nm | | | 20.3 | 26.6 | 19.6 | 27.5 | 35.4 | | | | |
| | $n_{base}$ min$^{-1}$ | | | 1329 | 1252 | 1336 | 1245 | 1153 | | | | |
| DRE90L4 2.2 kW | $M_{max}$ Nm | | | | 26.4 | 19.4 | 27.3 | 35 | | | | |
| | $n_{base}$ min$^{-1}$ | | | | 1195 | 1301 | 1181 | 1069 | | | | |
| DRE100LC4 3 kW | $M_{max}$ Nm | | | | | | 27 | 35 | 48.3 | 64 | | |
| | $n_{base}$ min$^{-1}$ | | | | | | 1357 | 1301 | 1209 | 1104 | | |
| DRE100M4 3 kW | $M_{max}$ Nm | | | | | | 26.2 | 34 | 46.8 | | | |
| | $n_{base}$ min$^{-1}$ | | | | | | 1308 | 1223 | 1090 | | | |
| DRE112M4 3 kW | $M_{max}$ Nm | | | | | | 27.5 | 35.5 | 48.6 | 56.6 | | |
| | $n_{base}$ min$^{-1}$ | | | | | | 1301 | 1230 | 1125 | 1084 | | |
| DRE100L4 3.7 kW | $M_{max}$ Nm | | | | | | 27.1 | 36 | 50.2 | 67 | 74.2 | |
| | $n_{base}$ min$^{-1}$ | | | | | | 1364 | 1308 | 1223 | 1118 | 1125 | |
| DRE100LC4 3.7 kW | $M_{max}$ Nm | | | | | | 26.9 | 35 | 48.1 | 62.6 | 62.6 | |
| | $n_{base}$ min$^{-1}$ | | | | | | 1371 | 1315 | 1223 | 1132 | 1216 | |
| DRE112M4 3.7 kW | $M_{max}$ Nm | | | | | | 27.9 | 36.2 | 49.9 | 56.5 | 56.5 | |
| | $n_{base}$ min$^{-1}$ | | | | | | 1324 | 1266 | 1172 | 1172 | 1219 | |
| DRE132S4 3.7 kW | $M_{max}$ Nm | | | | | | 28 | 36.2 | 49.6 | 65.6 | 76.1 | |
| | $n_{base}$ min$^{-1}$ | | | | | | 1389 | 1342 | 1266 | 1172 | 1143 | |
| DRE132S4 4 kW | $M_{max}$ Nm | | | | | | 26.4 | 34.5 | 47.6 | 63.1 | 81.1 | |
| | $n_{base}$ min$^{-1}$ | | | | | | 1395 | 1354 | 1289 | 1213 | 1125 | |
| DRE112M4 4.5 kW | $M_{max}$ Nm | | | | | | | 31.7 | 43.8 | 58.1 | 64.2 | 64.2 |
| | $n_{base}$ min$^{-1}$ | | | | | | | 1295 | 1207 | 1102 | 1084 | 1119 |
| DRE132M4 5.5 kW | $M_{max}$ Nm | **Notice:** The data is based on a line voltage of AC 460 V. | | | | | | 35.1 | 48.7 | 64.7 | 83.3 | 89.8 |
| | $n_{base}$ min$^{-1}$ | | | | | | | 1418 | 1354 | 1283 | 1201 | 1248 |
| DRE132S4 5.5 kW | $M_{max}$ Nm | | | | | | | | 46.9 | 62.7 | 80.9 | 93 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | 1330 | 1266 | 1189 | 1225 |
| DRE132M4 7.5 kW | $M_{max}$ Nm | | | | | | | | 46.2 | 62.5 | 81.2 | 123 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | 1389 | 1336 | 1277 | 1154 |
| DRE132MC4 7.5 kW | $M_{max}$ Nm | | | | | | | | 46.2 | 62.6 | 81.5 | 124 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | 1400 | 1365 | 1324 | 1225 |
| DRE160S4 7.5 kW | $M_{max}$ Nm | | | | | | | | 46 | 61.9 | 80.2 | 117 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | 1403 | 1355 | 1303 | 1208 |
| DRE132MC4 9.2 kW | $M_{max}$ Nm | | | | | | | | | 60.9 | 80.1 | 123 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | 1389 | 1348 | 1260 |

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AC 460 V / 60 Hz | | 0005 | 0008 | 0011 | 0014 | 0015 | 0022 | 0030 | 0040 | 0055 | 0075 | 0110 |
| DRE160M4 9.2 kW | $M_{max}$ Nm | | | | | | | | | 61.7 | 80.4 | 122 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | 1397 | 1350 | 1250 |
| DRE160S4 9.2 kW | $M_{max}$ Nm | | | | | | | | | 60.9 | 79.3 | 121 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | 1387 | 1339 | 1229 |
| DRE160M4 11 kW | $M_{max}$ Nm | | | | | | | | | | 79.1 | 121 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | 1376 | 1292 |
| DRE160MC4 11 kW | $M_{max}$ Nm | | | | | | | | | | 79.5 | 122 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | 1387 | 1313 |
| DRE180S4 11 kW | $M_{max}$ Nm | | | | | | | | | | 81.9 | 126 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | 1397 | 1313 |
| DRE160MC4 15 kW | $M_{max}$ Nm | | | | | | | | | | | 117 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | | 1366 |
| DRE180M4 15 kW | $M_{max}$ Nm | | | | | | | | | | | 126 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | | 1387 |
| DRE180S4 15 kW | $M_{max}$ Nm | | | | | | | | | | | 123 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | | 1376 |
| DRE180L4 18.5 kW | $M_{max}$ Nm | | | | | | | | | | | 123 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | | 1434 |
| DRE180M4 18.5 kW | $M_{max}$ Nm | | | | | | | | | | | 123 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | | 1419 |

27793230/EN – 08/2022

*Assignment of MOVIDRIVE® MDX61B0150-503 – MDX61B0750-503 (sizes 3 – 5):*

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| AC 460 V / 60 Hz | | 0150 | 0220 | 0300 | 0370 | 0450 | 0550 | 0750 |
| DRE132M4 7.5 kW | $M_{max}$ Nm | 139 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1154 | | | | | | |
| DRE132MC4 7.5 kW | $M_{max}$ Nm | 149 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1225 | | | | | | |
| DRE160S4 7.5 kW | $M_{max}$ Nm | 117 | | | **Notice:** The data is based on a line voltage of AC 460 V. | | | |
| | $n_{base}$ min$^{-1}$ | 1287 | | | | | | |
| DRE132MC4 9.2 kW | $M_{max}$ Nm | 165 | 169 | | | | | |
| | $n_{base}$ min$^{-1}$ | 1178 | 1289 | | | | | |
| DRE160M4 9.2 kW | $M_{max}$ Nm | 149 | 149 | | | | | |
| | $n_{base}$ min$^{-1}$ | 1229 | 1313 | | | | | |
| DRE160S4 9.2 kW | $M_{max}$ Nm | 130 | 130 | | | | | |
| | $n_{base}$ min$^{-1}$ | 1287 | 1350 | | | | | |
| DRE160M4 11 kW | $M_{max}$ Nm | 163 | 173 | | | | | |
| | $n_{base}$ min$^{-1}$ | 1208 | 1276 | | | | | |
| DRE160MC4 11 kW | $M_{max}$ Nm | 164 | 177 | | | | | |
| | $n_{base}$ min$^{-1}$ | 1239 | 1303 | | | | | |
| DRE180S4 11 kW | $M_{max}$ Nm | 169 | 178 | | | | | |
| | $n_{base}$ min$^{-1}$ | 1229 | 1313 | | | | | |
| DRE160MC4 15 kW | $M_{max}$ Nm | 159 | 226 | 226 | 226 | | | |
| | $n_{base}$ min$^{-1}$ | 1308 | 1213 | 1308 | 1324 | | | |
| DRE180M4 15 kW | $M_{max}$ Nm | 170 | 242 | | | | | |
| | $n_{base}$ min$^{-1}$ | 1324 | 1223 | | | | | |
| DRE180S4 15 kW | $M_{max}$ Nm | 166 | 219 | | | | | |
| | $n_{base}$ min$^{-1}$ | 1308 | 1260 | | | | | |
| DRE180L4 18.5 kW | $M_{max}$ Nm | 168 | 245 | 321 | 338 | 338 | | |
| | $n_{base}$ min$^{-1}$ | 1392 | 1313 | 1229 | 1271 | 1287 | | |
| DRE180M4 18.5 kW | $M_{max}$ Nm | 167 | 244 | 309 | 309 | | | |
| | $n_{base}$ min$^{-1}$ | 1366 | 1281 | 1218 | 1276 | | | |
| DRE180L4 22 kW | $M_{max}$ Nm | 168 | 245 | 321 | 344 | 344 | | |
| | $n_{base}$ min$^{-1}$ | 1397 | 1318 | 1234 | 1260 | 1287 | | |
| DRE180LC4 22 kW | $M_{max}$ Nm | 165 | 242 | 317 | 342 | 342 | | |
| | $n_{base}$ min$^{-1}$ | 1397 | 1329 | 1260 | 1303 | 1334 | | |
| DRE180LC4 30 kW | $M_{max}$ Nm | | 234 | 309 | 377 | 387 | | |
| | $n_{base}$ min$^{-1}$ | | 1366 | 1308 | 1250 | 1329 | | |
| DRE200L4 30 kW | $M_{max}$ Nm | | 232 | 307 | 375 | 459 | 467 | 467 |
| | $n_{base}$ min$^{-1}$ | | 1386 | 1341 | 1296 | 1243 | 1312 | 1345 |
| DRE225S4 37 kW | $M_{max}$ Nm | | 236 | 315 | 387 | 475 | 537 | 537 |
| | $n_{base}$ min$^{-1}$ | | 1411 | 1374 | 1341 | 1300 | 1300 | 1431 |
| DRE225M4 45 kW | $M_{max}$ Nm | | | 311 | 382 | 468 | 554 | 676 |
| | $n_{base}$ min$^{-1}$ | | | 1411 | 1374 | 1329 | 1284 | 1218 |
| DRE250M4 55 kW | $M_{max}$ Nm | | | | 366 | 459 | 549 | 689 |
| | $n_{base}$ min$^{-1}$ | | | | 1426 | 1402 | 1377 | 1338 |
| DRE280S4 75 kW | $M_{max}$ Nm | | | | | 468 | 558 | 697 |
| | $n_{base}$ min$^{-1}$ | | | | | 1435 | 1414 | 1380 |
| DRE280M4 90 kW | $M_{max}$ Nm | | | | | | | 683 |
| | $n_{base}$ min$^{-1}$ | | | | | | | 1414 |
| DRE315K4 110 kW | $M_{max}$ Nm | **Notice:** The data is based on a line voltage of AC 460 V. | | | | | | 686 |
| | $n_{base}$ min$^{-1}$ | | | | | | | 1424 |

*Assignment of MOVIDRIVE® MDX61B0150-503 – MDX61B0750-503 (sizes 6 – 7):*

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | |
|---|---|---|---|---|---|---|---|
| AC 460 V / 60 Hz | | 0900 | 1100 | 1320 | 1600 | 2000 | 2500 |
| DRE225S4 37 kW | $M_{max}$ Nm | 537 | | | | | |
| | $n_{base}$ min$^{-1}$ | 1464 | | | | | |
| DRE250M4 55 kW | $M_{max}$ Nm | 910 | 1074 | 1200 | | | |
| | $n_{base}$ min$^{-1}$ | 1271 | 1222 | 1219 | | | |
| DRE280S4 75 kW | $M_{max}$ Nm | 918 | 1083 | 1200 | | | |
| | $n_{base}$ min$^{-1}$ | 1328 | 1289 | 1322 | | | |
| DRE280M4 90 kW | $M_{max}$ Nm | 905 | 1070 | 1200 | 1200 | | |
| | $n_{base}$ min$^{-1}$ | 1371 | 1338 | 1386 | 1472 | | |
| DRE315K4 110 kW | $M_{max}$ Nm | 909 | 1075 | 1350 | 1600 | 1600 | 1600 |
| | $n_{base}$ min$^{-1}$ | 1389 | 1362 | 1315 | 1271 | 1380 | 1400 |
| DRE315S4 132 kW | $M_{max}$ Nm | 877 | 1036 | 1300 | 1563 | 1600 | 1600 |
| | $n_{base}$ min$^{-1}$ | 1418 | 1392 | 1348 | 1304 | 1383 | 1433 |
| DRE315S4 150 kW | $M_{max}$ Nm | 913 | 1083 | 1364 | 1600 | 1600 | 1600 |
| | $n_{base}$ min$^{-1}$ | 1436 | 1418 | 1386 | 1374 | 1570 | 1638 |
| DRE315M4 160 kW | $M_{max}$ Nm | | 1083 | 1364 | 1644 | 2089 | 2400 |
| | $n_{base}$ min$^{-1}$ | | 1433 | 1397 | 1365 | 1307 | 1301 |
| DRE315M4 185 kW | $M_{max}$ Nm | | 1080 | 1360 | 1639 | 2083 | 2400 |
| | $n_{base}$ min$^{-1}$ | | 1436 | 1403 | 1368 | 1310 | 1304 |
| DRE315L4 200 kW | $M_{max}$ Nm | | | 1372 | 1657 | 2110 | 2400 |
| | $n_{base}$ min$^{-1}$ | | | 1438 | 1409 | 1356 | 1374 |
| DRE315L4 225 kW | $M_{max}$ Nm | | | 1365 | 1648 | 2098 | 2400 |
| | $n_{base}$ min$^{-1}$ | | | 1444 | 1415 | 1365 | 1377 |

27793230/EN – 08/2022

## AC 230/460 V / 60 Hz motors in double-star connection

*Assignment of MOVIDRIVE® MDX61B0005-5A3 – MDX61B0110-503 (sizes 0 – 2):*

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AC 230 V / 60 Hz | | 0005 | 0008 | 0011 | 0014 | 0015 | 0022 | 0030 | 0040 | 0055 | 0075 | 0110 |
| DRE80S4 250 W | $M_{max}$ Nm | 5.18 | 5.18 | | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 2665 | 2707 | | | | | | | | | |
| DRE80S4 370 W | $M_{max}$ Nm | 6.69 | 7.47 | 7.47 | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 2545 | 2566 | 2791 | | | | | | | | |
| DRE80M4 550 W | $M_{max}$ Nm | 6.35 | 7.76 | 10.2 | 11.7 | 9.83 | 11.7 | | | | | |
| | $n_{base}$ min$^{-1}$ | 2763 | 2679 | 2524 | 2559 | 2545 | 2588 | | | | | |
| DRE80M4 750 W | $M_{max}$ Nm | | 7.63 | 10.1 | 13.2 | 9.72 | 13.6 | 14.4 | | | | |
| | $n_{base}$ min$^{-1}$ | | 2784 | 2658 | 2496 | 2679 | 2475 | 2602 | | | | |
| DRE80S4 750 W | $M_{max}$ Nm | | 7.5 | 9.9 | 11.3 | 9.56 | 11.3 | 11.3 | | | | |
| | $n_{base}$ min$^{-1}$ | | 2749 | 2588 | 2630 | 2609 | 2665 | 2756 | | | | |
| DRE80M4 1.1 kW | $M_{max}$ Nm | | | | 13 | 9.46 | 13.5 | 17.4 | 19.4 | | | |
| | $n_{base}$ min$^{-1}$ | | | | 2707 | 2841 | 2693 | 2538 | 2658 | | | |
| DRE90M4 1.1 kW | $M_{max}$ Nm | | | | 12.5 | 8.91 | 12.9 | 16.8 | 22.9 | | | |
| | $n_{base}$ min$^{-1}$ | | | | 2770 | 2869 | 2756 | 2644 | 2461 | | | |
| DRE90L4 1.5 kW | $M_{max}$ Nm | | | | | | 13 | 17.1 | 23.6 | 30.5 | 30.5 | |
| | $n_{base}$ min$^{-1}$ | | | | | | 2848 | 2756 | 2609 | 2461 | 2665 | |
| DRE90M4 1.5 kW | $M_{max}$ Nm | | | | | | 13 | 16.9 | 23.3 | 25.1 | 25.1 | |
| | $n_{base}$ min$^{-1}$ | | | | | | 2805 | 2686 | 2503 | 2644 | 2742 | |
| DRE100L4 2.2 kW | $M_{max}$ Nm | | | | | | | 16.8 | 23.6 | 31.5 | 40.6 | |
| | $n_{base}$ min$^{-1}$ | | | | | | | 2876 | 2777 | 2665 | 2538 | |
| DRE90L4 2.2 kW | $M_{max}$ Nm | | | | | | | 16.7 | 23.4 | 31.2 | 35.6 | |
| | $n_{base}$ min$^{-1}$ | | | | | | | 2869 | 2742 | 2595 | 2637 | |
| DRE100LC4 3 kW | $M_{max}$ Nm | | | | | | | | 22.8 | 31 | 40.4 | 61.4 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | 2890 | 2812 | 2728 | 2545 |
| DRE100M4 3 kW | $M_{max}$ Nm | **Notice:** The data is based on a line voltage of AC 460 V. | | | | | | | 22.3 | 30.1 | 39.2 | 59.5 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | 2869 | 2763 | 2644 | 2377 |
| DRE112M4 3 kW | $M_{max}$ Nm | | | | | | | | 23.5 | 31.5 | 40.7 | 56.6 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | 2771 | 2666 | 2549 | 2408 |
| DRE100L4 3.7 kW | $M_{max}$ Nm | | | | | | | | | 31.6 | 41.7 | 64.2 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | 2827 | 2749 | 2580 |
| DRE100LC4 3.7 kW | $M_{max}$ Nm | | | | | | | | | 31 | 40.2 | 61.2 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | 2848 | 2763 | 2573 |
| DRE112M4 3.7 kW | $M_{max}$ Nm | | | | | | | | 23.6 | 32 | 41.7 | 56.5 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | 2801 | 2713 | 2613 | 2566 |
| DRE132S4 3.7 kW | $M_{max}$ Nm | | | | | | | | 23.9 | 32.1 | 41.6 | 62.9 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | 2900 | 2830 | 2754 | 2572 |
| DRE132S4 4 kW | $M_{max}$ Nm | | | | | | | | | 30.5 | 39.7 | 60.5 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | 2836 | 2766 | 2619 |
| DRE112M4 4.5 kW | $M_{max}$ Nm | | | | | | | | | 28 | 36.6 | 55.8 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | 2766 | 2666 | 2455 |
| DRE132M4 5.5 kW | $M_{max}$ Nm | | | | | | | | | | 40.6 | 62.1 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | 2877 | 2730 |
| DRE132S4 5.5 kW | $M_{max}$ Nm | | | | | | | | | | 38.9 | 60.1 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | 2818 | 2695 |
| DRE132M4 7.5 kW | $M_{max}$ Nm | | | | | | | | | | | 59.8 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | | 2789 |
| DRE132MC4 7.5 kW | $M_{max}$ Nm | | | | | | | | | | | 59.9 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | | 2818 |
| DRE160S4 7.5 kW | $M_{max}$ Nm | | | | | | | | | | | 59.3 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | | 2811 |

27793230/EN – 08/2022

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AC 230 V / 60 Hz | | 0005 | 0008 | 0011 | 0014 | 0015 | 0022 | 0030 | 0040 | 0055 | 0075 | 0110 |
| DRE160M4 9.2 kW | $M_{max}$ Nm | | | | | | | | | | | 59 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | | 2874 |
| DRE160S4 9.2 kW | $M_{max}$ Nm | | | | | | | | | | | 58.3 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | | 2869 |

*Assignment of MOVIDRIVE® MDX61B0150-503 – MDX61B0750-503 (sizes 3 – 5):*

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| AC 230 V / 60 Hz | | 0150 | 0220 | 0300 | 0370 | 0450 | 0550 | 0750 |
| DRE100M4 3 kW | $M_{max}$ Nm | 60.1 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 2524 | | | | | | |
| DRE100L4 3.7 kW | $M_{max}$ Nm | 74.2 | | | **Notice:** The data is based on a line voltage of AC 460 V. | | | |
| | $n_{base}$ min$^{-1}$ | 2707 | | | | | | |
| DRE100LC4 3.7 kW | $M_{max}$ Nm | 62.6 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 2911 | | | | | | |
| DRE112M4 3.7 kW | $M_{max}$ Nm | 56.5 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 2701 | | | | | | |
| DRE132S4 3.7 kW | $M_{max}$ Nm | 76.1 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 2531 | | | | | | |
| DRE132S4 4 kW | $M_{max}$ Nm | 81.1 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 2467 | | | | | | |
| DRE112M4 4.5 kW | $M_{max}$ Nm | 64.2 | 64.2 | | | | | |
| | $n_{base}$ min$^{-1}$ | 2432 | 2566 | | | | | |
| DRE132M4 5.5 kW | $M_{max}$ Nm | 83.3 | 89.8 | | | | | |
| | $n_{base}$ min$^{-1}$ | 2590 | 2771 | | | | | |
| DRE132S4 5.5 kW | $M_{max}$ Nm | 80.9 | 93 | | | | | |
| | $n_{base}$ min$^{-1}$ | 2572 | 2713 | | | | | |
| DRE132M4 7.5 kW | $M_{max}$ Nm | 81.2 | 118 | 139 | 139 | | | |
| | $n_{base}$ min$^{-1}$ | 2695 | 2525 | 2525 | 2602 | | | |
| DRE132MC4 7.5 kW | $M_{max}$ Nm | 81.5 | 119 | 149 | 149 | | | |
| | $n_{base}$ min$^{-1}$ | 2748 | 2625 | 2555 | 2783 | | | |
| DRE160S4 7.5 kW | $M_{max}$ Nm | 80.2 | 116 | 117 | 117 | | | |
| | $n_{base}$ min$^{-1}$ | 2716 | 2552 | 2758 | 2858 | | | |
| DRE132MC4 9.2 kW | $M_{max}$ Nm | 80.1 | 118 | 155 | 169 | 169 | | |
| | $n_{base}$ min$^{-1}$ | 2783 | 2678 | 2566 | 2660 | 2848 | | |
| DRE160M4 9.2 kW | $M_{max}$ Nm | 80.4 | 117 | 149 | 149 | 149 | | |
| | $n_{base}$ min$^{-1}$ | 2790 | 2653 | 2542 | 2758 | 2827 | | |
| DRE160S4 9.2 kW | $M_{max}$ Nm | 79.3 | 115 | 130 | 130 | 130 | | |
| | $n_{base}$ min$^{-1}$ | 2784 | 2631 | 2737 | 2853 | 2906 | | |
| DRE160M4 11 kW | $M_{max}$ Nm | 79.1 | 116 | 152 | 173 | 173 | 173 | |
| | $n_{base}$ min$^{-1}$ | 2832 | 2716 | 2600 | 2600 | 2747 | 2837 | |
| DRE160MC4 11 kW | $M_{max}$ Nm | 79.5 | 117 | 153 | 177 | 177 | 177 | |
| | $n_{base}$ min$^{-1}$ | 2832 | 2721 | 2616 | 2584 | 2769 | 2805 | |
| DRE180S4 11 kW | $M_{max}$ Nm | 81.9 | 120 | 158 | 178 | 178 | 178 | |
| | $n_{base}$ min$^{-1}$ | 2858 | 2747 | 2631 | 2647 | 2800 | 2827 | |
| DRE160MC4 15 kW | $M_{max}$ Nm | | 111 | 148 | 182 | 223 | 226 | 226 |
| | $n_{base}$ min$^{-1}$ | | 2805 | 2721 | 2642 | 2537 | 2695 | 2769 |
| DRE180M4 15 kW | $M_{max}$ Nm | | 121 | 159 | 194 | 238 | 242 | 242 |
| | $n_{base}$ min$^{-1}$ | | 2863 | 2774 | 2689 | 2589 | 2726 | 2821 |
| DRE180S4 15 kW | $M_{max}$ Nm | | 118 | 156 | 191 | 219 | 219 | 219 |
| | $n_{base}$ min$^{-1}$ | | 2858 | 2758 | 2663 | 2637 | 2790 | 2827 |
| DRE180L4 18.5 kW | $M_{max}$ Nm | | 117 | 157 | 193 | 237 | 280 | 338 |
| | $n_{base}$ min$^{-1}$ | | 2937 | 2879 | 2821 | 2747 | 2668 | 2573 |

27793230/EN – 08/2022

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| AC 230 V / 60 Hz | | 0150 | 0220 | 0300 | 0370 | 0450 | 0550 | 0750 |
| DRE180M4 18.5 kW | $M_{max}$ Nm | | 117 | 156 | 192 | 236 | 279 | 309 |
| | $n_{base}$ min$^{-1}$ | | 2900 | 2837 | 2774 | 2695 | 2610 | 2668 |
| DRE180L4 22 kW | $M_{max}$ Nm | | | 157 | 193 | 236 | 280 | 344 |
| | $n_{base}$ min$^{-1}$ | | | 2895 | 2837 | 2763 | 2684 | 2563 |
| DRE180LC4 22 kW | $M_{max}$ Nm | | | 154 | 190 | 233 | 277 | 342 |
| | $n_{base}$ min$^{-1}$ | | | 2869 | 2816 | 2753 | 2684 | 2573 |
| DRE180LC4 30 kW | $M_{max}$ Nm | | | | 183 | 226 | 269 | 335 |
| | $n_{base}$ min$^{-1}$ | | | | 2869 | 2811 | 2753 | 2663 |
| DRE200L4 30 kW | $M_{max}$ Nm | | | | 181 | 224 | 267 | 333 |
| | $n_{base}$ min$^{-1}$ | | | | 2879 | 2838 | 2793 | 2723 |
| DRE225S4 37 kW | $M_{max}$ Nm | **Notice:** The data is based on a line voltage of AC 460 V. | | | | 227 | 273 | 343 |
| | $n_{base}$ min$^{-1}$ | | | | | 2863 | 2830 | 2781 |
| DRE225M4 45 kW | $M_{max}$ Nm | | | | | | 270 | 339 |
| | $n_{base}$ min$^{-1}$ | | | | | | 2900 | 2842 |

*Assignment of MOVIDRIVE® MDX61B0150-503 – MDX61B0750-503 (sizes 6 – 7):*

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | |
|---|---|---|---|---|---|---|---|
| AC 230 V / 60 Hz | | 0900 | 1100 | 1320 | 1600 | 2000 | 2500 |
| DRE180L4 18.5 kW | $M_{max}$ Nm | 338 | | | | | |
| | $n_{base}$ min$^{-1}$ | 2774 | | | | | |
| DRE180M4 18.5 kW | $M_{max}$ Nm | 309 | | | **Notice:** The data is based on a line voltage of AC 460 V. | | |
| | $n_{base}$ min$^{-1}$ | 2784 | | | | | |
| DRE180L4 22 kW | $M_{max}$ Nm | 344 | 344 | | | | |
| | $n_{base}$ min$^{-1}$ | 2742 | 2769 | | | | |
| DRE180LC4 22 kW | $M_{max}$ Nm | 342 | 342 | | | | |
| | $n_{base}$ min$^{-1}$ | 2821 | 2853 | | | | |
| DRE180LC4 30 kW | $M_{max}$ Nm | 387 | 387 | 387 | 387 | | |
| | $n_{base}$ min$^{-1}$ | 2732 | 2821 | 2858 | 2943 | | |
| DRE200L4 30 kW | $M_{max}$ Nm | 438 | 467 | 467 | 467 | | |
| | $n_{base}$ min$^{-1}$ | 2609 | 2670 | 2793 | 2883 | | |
| DRE225S4 37 kW | $M_{max}$ Nm | 453 | 535 | 537 | 537 | | |
| | $n_{base}$ min$^{-1}$ | 2695 | 2629 | 2916 | 3011 | | |
| DRE225M4 45 kW | $M_{max}$ Nm | 447 | 527 | 661 | 676 | 676 | |
| | $n_{base}$ min$^{-1}$ | 2748 | 2674 | 2547 | 2629 | 2670 | |
| DRE250M4 55 kW | $M_{max}$ Nm | 436 | 521 | 661 | 800 | 1019 | 1200 |
| | $n_{base}$ min$^{-1}$ | 2600 | 2600 | 2600 | 2600 | 2562 | 2477 |
| DRE280S4 75 kW | $M_{max}$ Nm | | 529 | 669 | 807 | 1028 | 1200 |
| | $n_{base}$ min$^{-1}$ | | 2600 | 2600 | 2600 | 2600 | 2600 |
| DRE280M4 90 kW | $M_{max}$ Nm | | | 654 | 794 | 1014 | 1200 |
| | $n_{base}$ min$^{-1}$ | | | 2600 | 2600 | 2600 | 2600 |
| DRE315K4 110 kW | $M_{max}$ Nm | | | 657 | 797 | 1019 | 1267 |
| | $n_{base}$ min$^{-1}$ | | | 2500 | 2500 | 2500 | 2500 |
| DRE315S4 132 kW | $M_{max}$ Nm | | | | 770 | 983 | 1220 |
| | $n_{base}$ min$^{-1}$ | | | | 2500 | 2500 | 2500 |
| DRE315S4 150 kW | $M_{max}$ Nm | | | | | 1025 | 1279 |
| | $n_{base}$ min$^{-1}$ | | | | | 2500 | 2500 |
| DRE315M4 160 kW | $M_{max}$ Nm | | | | | 1026 | 1280 |
| | $n_{base}$ min$^{-1}$ | | | | | 2500 | 2500 |
| DRE315M4 185 kW | $M_{max}$ Nm | | | | | | 1276 |
| | $n_{base}$ min$^{-1}$ | | | | | | 2500 |
| DRE315L4 200 kW | $M_{max}$ Nm | | | | | | 1286 |
| | $n_{base}$ min$^{-1}$ | | | | | | 2500 |

27793230/EN – 08/2022

### 9.6.20 DRE.. motor selection in double-star connection type (line AC 230 V / 60 Hz)

**AC 230/460 V / 60 Hz motors in double-star connection**

| Motor voltage | | MOVIDRIVE® MDX61B...-2_3 (AC 230 V devices) in CFC operating modes (P700) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| AC 230 V / 60 Hz | | 0015 | 0022 | 0037 | 0055 | 0075 | 0110 | 0150 | 0220 | 0300 |
| DRE80M4 750 W | $M_{max}$ Nm | 14.4 | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 998 | | | | | | | | |
| DRE80S4 750 W | $M_{max}$ Nm | 11.3 | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1027 | | | | | | | | |
| DRE80M4 1.1 kW | $M_{max}$ Nm | 18.2 | | | **Notice:** The data is based on a line voltage of AC 230 V. | | | | | |
| | $n_{base}$ min$^{-1}$ | 1034 | | | | | | | | |
| DRE90M4 1.1 kW | $M_{max}$ Nm | 17.5 | 20.8 | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1153 | 1076 | | | | | | | |
| DRE90L4 1.5 kW | $M_{max}$ Nm | 17.8 | 21.2 | 30.5 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1252 | 1195 | 1062 | | | | | | |
| DRE90M4 1.5 kW | $M_{max}$ Nm | 17.7 | 21 | 25.1 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1174 | 1097 | 1034 | | | | | | |
| DRE100L4 2.2 kW | $M_{max}$ Nm | 17.7 | 21.2 | 36.7 | 49.6 | | | | | |
| | $n_{base}$ min$^{-1}$ | 1357 | 1315 | 1139 | 1012 | | | | | |
| DRE90L4 2.2 kW | $M_{max}$ Nm | 17.5 | 21 | 35.6 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1329 | 1280 | 1062 | | | | | | |
| DRE100LC4 3 kW | $M_{max}$ Nm | | 20.3 | 36.4 | 56.1 | 65.1 | | | | |
| | $n_{base}$ min$^{-1}$ | | 1406 | 1294 | 1153 | 1153 | | | | |
| DRE100M4 3 kW | $M_{max}$ Nm | | 19.8 | 35.3 | 54.4 | | | | | |
| | $n_{base}$ min$^{-1}$ | | 19.8 | 1209 | 1012 | | | | | |
| DRE112M4 3 kW | $M_{max}$ Nm | | | 36.8 | 56.4 | | | | | |
| | $n_{base}$ min$^{-1}$ | | | 1219 | 1061 | | | | | |
| DRE100L4 3.7 kW | $M_{max}$ Nm | | | 37.4 | 58.6 | 74.2 | | | | |
| | $n_{base}$ min$^{-1}$ | | | 1301 | 1167 | 1090 | | | | |
| DRE100LC4 3.7 kW | $M_{max}$ Nm | | | 36.3 | 56 | 62.6 | | | | |
| | $n_{base}$ min$^{-1}$ | | | 1308 | 1167 | 1195 | | | | |
| DRE112M4 3.7 kW | $M_{max}$ Nm | | | 37.6 | 56.5 | 56.5 | | | | |
| | $n_{base}$ min$^{-1}$ | | | 1254 | 1131 | 1207 | | | | |
| DRE132S4 3.7 kW | $M_{max}$ Nm | | | 37.5 | 57.6 | 76.1 | | | | |
| | $n_{base}$ min$^{-1}$ | | | 1336 | 1219 | 1113 | | | | |
| DRE132S4 4 kW | $M_{max}$ Nm | | | 35.8 | 55.4 | 73.4 | | | | |
| | $n_{base}$ min$^{-1}$ | | | 1348 | 1254 | 1166 | | | | |
| DRE112M4 4.5 kW | $M_{max}$ Nm | | | 32.9 | 51 | 64.2 | | | | |
| | $n_{base}$ min$^{-1}$ | | | 1289 | 1154 | 1066 | | | | |
| DRE132M4 5.5 kW | $M_{max}$ Nm | | | 36.5 | 56.7 | 75.4 | 89.8 | | | |
| | $n_{base}$ min$^{-1}$ | | | 1412 | 1318 | 1236 | 1236 | | | |
| DRE132S4 5.5 kW | $M_{max}$ Nm | | | 34.9 | 54.9 | 73.1 | 93 | 93 | | |
| | $n_{base}$ min$^{-1}$ | | | 1383 | 1301 | 1225 | 1195 | 1236 | | |
| DRE132M4 7.5 kW | $M_{max}$ Nm | | | | 54.4 | 73.2 | 108 | 139 | | |
| | $n_{base}$ min$^{-1}$ | | | | 1359 | 1307 | 1201 | 1107 | | |
| DRE132MC4 7.5 kW | $M_{max}$ Nm | | | | 54.5 | 73.4 | 108 | 140 | | |
| | $n_{base}$ min$^{-1}$ | | | | 1383 | 1342 | 1266 | 1195 | | |
| DRE160S4 7.5 kW | $M_{max}$ Nm | | | | 54 | 72.4 | 106 | 117 | | |
| | $n_{base}$ min$^{-1}$ | | | | 1376 | 1324 | 1223 | 1260 | | |
| DRE132MC4 9.2 kW | $M_{max}$ Nm | | | | | 71.9 | 107 | 139 | 169 | |
| | $n_{base}$ min$^{-1}$ | | | | | 1365 | 1295 | 1230 | 1271 | |
| DRE160M4 9.2 kW | $M_{max}$ Nm | | | | | 72.4 | 107 | 138 | 149 | |
| | $n_{base}$ min$^{-1}$ | | | | | 1371 | 1287 | 1213 | 1276 | |
| DRE160S4 9.2 kW | $M_{max}$ Nm | | | | | 71.4 | 105 | 130 | 130 | |
| | $n_{base}$ min$^{-1}$ | | | | | 1361 | 1271 | 1223 | 1329 | |

27793230/EN – 08/2022

| Motor voltage | | MOVIDRIVE® MDX61B...-2_3 (AC 230 V devices) in CFC operating modes (P700) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| AC 230 V / 60 Hz | | 0015 | 0022 | 0037 | 0055 | 0075 | 0110 | 0150 | 0220 | 0300 |
| DRE160M4 11 kW | $M_{max}$ Nm | | | | | 71 | 106 | 137 | 173 | |
| | $n_{base}$ min$^{-1}$ | | | | | 1397 | 1324 | 1260 | 1260 | |
| DRE160MC4 11 kW | $M_{max}$ Nm | | | | | 71.4 | 106 | 138 | 177 | 177 |
| | $n_{base}$ min$^{-1}$ | | | | | 1403 | 1345 | 1287 | 1287 | 1308 |
| DRE180S4 11 kW | $M_{max}$ Nm | | | | | 73.6 | 109 | 142 | 178 | 178 |
| | $n_{base}$ min$^{-1}$ | | | | | 1413 | 1345 | 1281 | 1287 | 1313 |
| DRE160MC4 15 kW | $M_{max}$ Nm | | | | | | 101 | 132 | 200 | 226 |
| | $n_{base}$ min$^{-1}$ | | | | | | 1387 | 1345 | 1245 | 1234 |
| DRE180M4 15 kW | $M_{max}$ Nm | | | | | | 109 | 143 | 213 | 242 |
| | $n_{base}$ min$^{-1}$ | | | | | | 1408 | 1366 | 1260 | 1239 |
| DRE180S4 15 kW | $M_{max}$ Nm | | | | | | 107 | 140 | 209 | 219 |
| | $n_{base}$ min$^{-1}$ | | | | | | 1403 | 1350 | 1234 | 1271 |
| DRE180L4 18.5 kW | $M_{max}$ Nm | **Notice:** The data is based on a line voltage of AC 230 V. | | | | | | 140 | 212 | 253 |
| | $n_{base}$ min$^{-1}$ | | | | | | | 1419 | 1345 | 1303 |
| DRE180M4 18.5 kW | $M_{max}$ Nm | | | | | | | 140 | 211 | 252 |
| | $n_{base}$ min$^{-1}$ | | | | | | | 1397 | 1318 | 1271 |
| DRE180L4 22 kW | $M_{max}$ Nm | | | | | | | 140 | 212 | 253 |
| | $n_{base}$ min$^{-1}$ | | | | | | | 1429 | 1355 | 1308 |
| DRE180LC4 22 kW | $M_{max}$ Nm | | | | | | | 137 | 209 | 250 |
| | $n_{base}$ min$^{-1}$ | | | | | | | 1424 | 1361 | 1324 |
| DRE180LC4 30 kW | $M_{max}$ Nm | | | | | | | | 202 | 242 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | 1392 | 1361 |
| DRE200L4 30 kW | $M_{max}$ Nm | | | | | | | | 200 | 240 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | 1407 | 1382 |
| DRE225S4 37 kW | $M_{max}$ Nm | | | | | | | | | 244 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | 1407 |

27793230/EN – 08/2022

### 9.6.21 Motor table DRS.. series AC motors (characteristic value with delta/star connection AC 230/400 V / 50 Hz)

| Motor | $P_m$ | $M_N$ | Mass moment of inertia $J_M$ | | Star ⅄ (AC 400 V) | | | | Delta △ (AC 230 V) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Without brake | with brake | $I_n$ | $I_{q\_n}$ [1] | $I_{d\_n}$ [1] | $c_T$ [1] | $I_n$ | $I_{q\_n}$ [1] | $I_{d\_n}$ [1] | $c_T$ |
| | kW | Nm | $10^{-4}$ kgm² | | A | A | A | Nm/A | A | A | A | Nm/A |
| DRS71S4 | 0.37 | 2.55 | 4.9 | 6.2 | 1.14 | 0.91 | 0.68 | 2.79 | 1.97 | 1.58 | 1.18 | 1.61 |
| DRS71M4 | 0.55 | 3.8 | 7.1 | 8.4 | 1.55 | 1.23 | 0.95 | 3.10 | 2.68 | 2.12 | 1.64 | 1.79 |
| DRS80S4 | 0.75 | 5.1 | 14.9 | 16.4 | 1.8 | 1.54 | 0.93 | 3.31 | 3.1 | 2.67 | 1.61 | 1.91 |
| DRS80M4 | 1.1 | 7.4 | 21.5 | 26 | 2.4 | 2.09 | 1.19 | 3.55 | 4.2 | 3.6 | 2.1 | 2.05 |
| DRS90M4 | 1.5 | 10.3 | 35.5 | 40 | 3.3 | 3.00 | 1.39 | 3.44 | 5.7 | 5.2 | 2.4 | 1.99 |
| DRS90L4 | 2.2 | 15 | 43.5 | 49.5 | 4.85 | 4.11 | 2.57 | 3.65 | 8.4 | 7.1 | 4.4 | 2.10 |
| DRS100M4 | 3 | 20.5 | 56 | 62 | 6.4 | 5.91 | 2.45 | 3.47 | 11.1 | 10.2 | 4.2 | 2.00 |
| DRS100LC4 | 4 | 26.5 | 90 | 96 | 8.4 | 7.55 | 3.67 | 3.51 | 14.5 | 13.1 | 6.4 | 2.03 |
| DRS112M4 | 4 | 26.5 | 146 | 151 | 8.1 | 7.71 | 2.49 | 3.44 | 14.0 | 13.4 | 4.3 | 1.98 |
| DRS132S4 | 5.5 | 36.5 | 190 | 200 | 11.1 | 10.3 | 4.18 | 3.55 | 19.2 | 17.8 | 7.2 | 2.05 |
| DRS132M4 | 7.5 | 49.5 | 255 | 265 | 14.4 | 13.6 | 4.64 | 3.63 | 24.9 | 23.6 | 8.0 | 2.10 |
| DRS132MC4 | 9.2 | 60 | 340 | 355 | 18.6 | 16.6 | 8.29 | 3.60 | 32.2 | 28.8 | 14.4 | 2.08 |
| DRS160S4 | 9.2 | 60 | 370 | 420 | 18.9 | 16.8 | 8.75 | 3.58 | 32.7 | 29.1 | 15.2 | 2.07 |
| DRS160M4 | 11 | 72 | 450 | 500 | 22 | 20.1 | 8.94 | 3.58 | 38.1 | 34.8 | 15.5 | 2.07 |
| DRS160MC4 | 15 | 94 | 590 | 640 | 30 | 27.8 | 11.8 | 3.38 | 52.0 | 48.1 | 20.5 | 1.95 |
| DRS180S4 | 15 | 98 | 900 | 960 | 29 | 26.4 | 11.7 | 3.71 | 50.2 | 45.7 | 20.3 | 2.14 |
| DRS180M4 | 18.5 | 121 | 1110 | 1250 | 34.5 | 32.0 | 12.7 | 3.78 | 59.8 | 55.4 | 21.9 | 2.18 |
| DRS180L4 | 22 | 143 | 1300 | 1440 | 41.5 | 37.5 | 17.3 | 3.81 | 71.9 | 64.9 | 29.9 | 2.20 |
| DRS180LC4 | 30 | 195 | 1680 | 1910 | 57 | 52.6 | 21.2 | 3.71 | 98.7 | 91.1 | 36.7 | 2.14 |
| DRS200L4 | 30 | 194 | 2360 | 2590 | 57 | 53.2 | 20.6 | 3.64 | 98.7 | 92.2 | 35.7 | 2.10 |
| DRS225S4 | 37 | 240 | 2930 | 3160 | 70 | 64.8 | 25.2 | 3.70 | 121 | 112 | 43.7 | 2.14 |
| DRS225M4 | 45 | 290 | 3430 | 3660 | 84 | 76.2 | 35.1 | 3.80 | 145 | 132 | 60.8 | 2.20 |
| DRS225MC4 | 55 | 355 | 4330 | 4560 | 105 | 97.6 | 38.7 | 3.64 | 182 | 169 | 67.1 | 2.10 |
| DRS315K4 | 110 | 710 | 18400 | 19500 | 200 | 185 | 75.9 | 3.84 | 345 | 321 | 131 | 2.22 |
| DRS315S4 | 132 | 850 | 22500 | 23600 | 245 [2] | 212 | 94.7 | 4.01 | 425 | 367 | 164 | 2.32 |
| DRS315M4 | 160 | 1030 | 27900 | 29000 | 280 | 262 | 97.4 | 3.92 | 485 | 455 | 169 | 2.27 |
| DRS315L4 | 200 | 1290 | 31900 | 33000 | 350 | 330 | 117 | 3.91 | – | – | – | – |

1) Applies in the basic speed range up to n base.

2) Current ratings for 230/400 V winding. Due to the number of turns, the current of the 400/690 V winding is 235 A.

27793230/EN – 08/2022

### 9.6.22 DRS.. motor selection with delta/star connection type (line AC 400 V / 50 Hz)

**AC 230/400 V / 50 Hz motors in star connection or AC 400/690 V / 50 Hz motors in delta connection**

*Assignment of MOVIDRIVE® MDX61B0005-5A3 – MDX61B0110-503 (sizes 0 – 2):*

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AC 400 / 50Hz | | 0005 | 0008 | 0011 | 0014 | 0015 | 0022 | 0030 | 0040 | 0055 | 0075 | 0110 |
| DRS71M4 370 W | $M_{max}$ Nm | 5.63 | | | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 844 | | | | | | | | | | |
| DRS71S4 370 W | $M_{max}$ Nm | 5.38 | | | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 865 | | | | | | | | | | |
| DRS80S4 370 W | $M_{max}$ Nm | 6.22 | | | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 830 | | | | | | | | | | |
| DRS71M4 550 W | $M_{max}$ Nm | 8.50 | | | | 8.50 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 844 | | | | 872 | | | | | | |
| DRS80M4 550 W | $M_{max}$ Nm | 9.54 | | | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 907 | | | | | | | | | | |
| DRS80M4 750 W | $M_{max}$ Nm | 11.7 | | | | 11.7 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 865 | | | | 879 | | | | | | |
| DRS80S4 750 W | $M_{max}$ Nm | 11.3 | 11.3 | | | 11.3 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 872 | 872 | | | 872 | | | | | | |
| DRS80M4 1.1 kW | $M_{max}$ Nm | 13.4 | 16.2 | | | 17.1 | 17.1 | | | | | |
| | $n_{base}$ min$^{-1}$ | 977 | 893 | | | 893 | 907 | | | | | |
| DRS90M4 1.5 kW | $M_{max}$ Nm | | | 20.7 | 25.7 | 20 | 25.7 | 25.7 | | | | |
| | $n_{base}$ min$^{-1}$ | | | 935 | 844 | 949 | 851 | 865 | | | | |
| DRS90L4 2.2 kW | $M_{max}$ Nm | | | | 26.6 | 19.3 | 27.5 | 35.5 | 37.5 | | | |
| | $n_{base}$ min$^{-1}$ | | | | 1005 | 1097 | 998 | 900 | 907 | | | |
| DRS100LC4 2.6 kW | $M_{max}$ Nm | | | | | | 27.4 | 35.4 | 48.6 | 56.7 | | |
| | $n_{base}$ min$^{-1}$ | | | | | | 1118 | 1062 | 963 | 935 | | |
| DRS100M4 3.0 kW | $M_{max}$ Nm | | | | | | 27.4 | 35.6 | 49.1 | | | |
| | $n_{base}$ min$^{-1}$ | | | | | | 1083 | 1005 | 879 | | | |
| DRS100LC4 4.0 kW | $M_{max}$ Nm | | | | | | | 32.2 | 45.2 | 60.5 | 78.1 | |
| | $n_{base}$ min$^{-1}$ | | | | | | | 1146 | 1076 | 998 | 907 | |
| DRS112M4 4.0 kW | $M_{max}$ Nm | | | | | | | 35.7 | 49.6 | 66.1 | | |
| | $n_{base}$ min$^{-1}$ | | | | | | | 1055 | 979 | 885 | | |
| DRS132S4 5.5 kW | $M_{max}$ Nm | **Notice:** | | | | | | | 47.1 | 63.3 | 81.8 | 102 |
| | $n_{base}$ min$^{-1}$ | The data is based on a line voltage of AC 400 V. | | | | | | | 1084 | 1025 | 955 | 908 |
| DRS132M4 7.5 kW | $M_{max}$ Nm | | | | | | | | | 64.2 | 83 | 126 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | 1113 | 1055 | 920 |
| DRS132MC4 9.2 kW | $M_{max}$ Nm | | | | | | | | | | 78.5 | 121 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | 1125 | 1049 |
| DRS160S4 9.2 kW | $M_{max}$ Nm | | | | | | | | | | 78.9 | 122 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | 1134 | 1049 |
| DRS160M4 11.0 kW | $M_{max}$ Nm | | | | | | | | | | | 123 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | | 1086 |
| DRS160MC4 15.0 kW | $M_{max}$ Nm | | | | | | | | | | | 118 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | | 1150 |
| DRS180S4 15.0 kW | $M_{max}$ Nm | | | | | | | | | | | 126 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | | 1144 |

*Assignment of MOVIDRIVE® MDX61B0150-503 – MDX61B0750-503 (sizes 3 – 5):*

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| AC 400 / 50Hz | | 0150 | 0220 | 0300 | 0370 | 0450 | 0550 | 0750 |
| DRS132MC4 9.2 kW | $M_{max}$ Nm | 163 | 174 | | | | | |
| | $n_{base}$ min$^{-1}$ | 973 | 1049 | | | | | |
| DRS160S4 9.2 kW | $M_{max}$ Nm | 156 | 156 | | **Notice:** The data is based on a line voltage of AC 400 V. | | | |
| | $n_{base}$ min$^{-1}$ | 997 | 1076 | | | | | |
| DRS160M4 11.0 kW | $M_{max}$ Nm | 166 | 201 | | | | | |
| | $n_{base}$ min$^{-1}$ | 1018 | 1012 | | | | | |
| DRS160MC4 15.0 kW | $M_{max}$ Nm | 162 | 234 | 234 | | | | |
| | $n_{base}$ min$^{-1}$ | 1097 | 1012 | 1102 | | | | |
| DRS180S4 15.0 kW | $M_{max}$ Nm | 171 | 249 | | | | | |
| | $n_{base}$ min$^{-1}$ | 1092 | 997 | | | | | |
| DRS180M4 18.5 kW | $M_{max}$ Nm | 172 | 251 | 326 | 326 | | | |
| | $n_{base}$ min$^{-1}$ | 1150 | 1076 | 1002 | 1055 | | | |
| DRS180L4 22.0 kW | $M_{max}$ Nm | 170 | 251 | 331 | 402 | 402 | | |
| | $n_{base}$ min$^{-1}$ | 1176 | 1118 | 1055 | 1002 | 1065 | | |
| DRS180LC4 30.0 kW | $M_{max}$ Nm | | 241 | 318 | 390 | 429 | 429 | 429 |
| | $n_{base}$ min$^{-1}$ | | 1139 | 1086 | 1039 | 1060 | 1086 | 1097 |
| DRS200L4 30.0 kW | $M_{max}$ Nm | | 240 | 317 | 388 | 476 | 505 | 505 |
| | $n_{base}$ min$^{-1}$ | | 1157 | 1120 | 1079 | 1034 | 1062 | 1099 |
| DRS225S4 37.0 kW | $M_{max}$ Nm | | | 318 | 391 | 481 | 570 | 708 |
| | $n_{base}$ min$^{-1}$ | | | 1157 | 1132 | 1095 | 1058 | 1005 |
| DRS225M4 45.0 kW | $M_{max}$ Nm | | | | 391 | 484 | 575 | 717 |
| | $n_{base}$ min$^{-1}$ | | | | 1161 | 1136 | 1103 | 1058 |
| DRS225MC4 55.0 kW | $M_{max}$ Nm | | | | | 455 | 540 | 673 |
| | $n_{base}$ min$^{-1}$ | | | | | 1153 | 1124 | 1083 |
| DRS250M4 55.0 kW | $M_{max}$ Nm | | | | | 469 | 564 | 709 |
| | $n_{base}$ min$^{-1}$ | | | | | 1173 | 1152 | 1118 |
| DRS280S4 75.0 kW | $M_{max}$ Nm | | | | | | 554 | 699 |
| | $n_{base}$ min$^{-1}$ | | | | | | 1191 | 1170 |

*Assignment of MOVIDRIVE® MDX61B0900-503 – MDX61B2500-503 (sizes 6 – 7):*

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | |
|---|---|---|---|---|---|---|---|
| AC 400 / 50Hz | | 0900 | 1100 | 1320 | 1600 | 2000 | 2500 |
| DRS225M4 45.0 kW | $M_{max}$ Nm | 842 | | | | | |
| | $n_{base}$ 1/min | 1062 | | | | | |
| DRS225MC4 55.0 kW | $M_{max}$ Nm | 852 | 852 | 852 | | | |
| | $n_{base}$ 1/min | 1038 | 1083 | 1124 | | | |
| DRS250M4 55.0 kW | $M_{max}$ Nm | 938 | 1108 | 1200 | | | |
| | $n_{base}$ 1/min | 1063 | 1021 | 1045 | | | |
| DRS280S4 75.0 kW | $M_{max}$ Nm | 929 | 1099 | 1200 | 1200 | | |
| | $n_{base}$ 1/min | 1136 | 1109 | 1182 | 1271 | | |
| DRS280M4 90.0 kW | $M_{max}$ Nm | 945 | 1129 | 1200 | 1200 | 1200 | |
| | $n_{base}$ 1/min | 1155 | 1133 | 1277 | 1411 | 1472 | |
| DRS315K4 110.0 kW | $M_{max}$ Nm | 916 | 1084 | 1362 | 1600 | 1600 | |
| | $n_{base}$ 1/min | 1166 | 1143 | 1104 | 1078 | 1175 | |
| DRS315S4 132.0 kW | $M_{max}$ Nm | 941 | 1119 | 1412 | 1600 | 1600 | 1600 |
| | $n_{base}$ 1/min | 1192 | 1178 | 1151 | 1178 | 1351 | 1403 |
| DRS315M4 160.0 kW | $M_{max}$ Nm | | | 1425 | 1719 | 2185 | 2400 |
| | $n_{base}$ 1/min | | | 1169 | 1143 | 1096 | 1131 |
| DRS315L4 200.0 kW | $M_{max}$ Nm | **Notice:** The data is based on a line voltage of AC 400 V. | | | 1675 | 2134 | 2400 |
| | $n_{base}$ 1/min | | | | 1184 | 1143 | 1172 |

27793230/EN – 08/2022

### AC 230/400 V / 50 Hz motors in delta connection

*Assignment of MOVIDRIVE® MDX61B0005-5A3 – MDX61B0110-503 (sizes 0 – 2):*

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AC 230 V / 50Hz | | 0005 | 0008 | 0011 | 0014 | 0015 | 0022 | 0030 | 0040 | 0055 | 0075 | 0110 |
| DR63M4 180 W | $M_{max}$ Nm | 2.34 | | | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 2184 | | | | | | | | | | |
| DRS71S4 180 W | $M_{max}$ Nm | 2.81 | | | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 2088 | | | | | | | | | | |
| DR63L4 250 W | $M_{max}$ Nm | 3.31 | | | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 2100 | | | | | | | | | | |
| DRS71S4 250 W | $M_{max}$ Nm | 3.95 | 3.95 | 3.95 | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1983 | 2025 | 2088 | | | | | | | | |
| DRS71M4 370 W | $M_{max}$ Nm | 5.63 | 5.63 | 5.63 | | 5.63 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1765 | 1821 | 1884 | | 1877 | | | | | | |
| DRS71S4 370 W | $M_{max}$ Nm | 5.38 | 5.38 | 5.38 | 5.38 | 5.38 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1849 | 1962 | 2032 | 2081 | 2025 | | | | | | |
| DRS80S4 370 W | $M_{max}$ Nm | 6.22 | | | | 6.22 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1821 | | | | 1912 | | | | | | |
| DRS71M4 550 W | $M_{max}$ Nm | | 7.76 | 8.50 | 8.50 | 8.5 | 8.5 | | | | | |
| | $n_{base}$ min$^{-1}$ | | 1793 | 1856 | 1941 | 1835 | 1948 | | | | | |
| DRS80M4 550 W | $M_{max}$ Nm | 7.88 | 9.54 | 9.54 | 9.54 | 9.54 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1884 | 1793 | 1997 | 2039 | 1976 | | | | | | |
| DRS80M4 750 W | $M_{max}$ Nm | | 9.16 | 11.7 | 11.7 | 11.6 | 11.7 | | | | | |
| | $n_{base}$ min$^{-1}$ | | 1920 | 1800 | 1976 | 1800 | 1976 | | | | | |
| DRS80S4 750 W | $M_{max}$ Nm | | | 11.3 | 11.3 | 11.2 | 11.3 | | | | | |
| | $n_{base}$ min$^{-1}$ | | | 1821 | 2004 | 1814 | 2018 | | | | | |
| DRS80M4 1.1 kW | $M_{max}$ Nm | | | | 15.5 | 11.3 | 16 | 17.1 | | | | |
| | $n_{base}$ min$^{-1}$ | | | | 1863 | 2004 | 1849 | 1969 | | | | |
| DRS90M4 1.5 kW | $M_{max}$ Nm | | | | | | 15.5 | 20.1 | 25.7 | 25.7 | | |
| | $n_{base}$ min$^{-1}$ | | | | | | 1990 | 1884 | 1807 | 1941 | | |
| DRS90L4 2.2 kW | $M_{max}$ Nm | | | | | | | 19.4 | 27.3 | 36.5 | 37.5 | 37.5 |
| | $n_{base}$ min$^{-1}$ | | | | | | | 2039 | 1927 | 1793 | 1955 | 2053 |
| DRS100LC4 2.6 kW | $M_{max}$ Nm | | | | | | | | 27.2 | 36.4 | 47 | 56.7 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | 2067 | 1983 | 1884 | 1983 |
| DRS100M4 3.0 kW | $M_{max}$ Nm | | | | | | | | 27.2 | 36.6 | 47.5 | 57.3 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | 2032 | 1927 | 1807 | 1814 |
| DRS100LC4 4.0 kW | $M_{max}$ Nm | | | | | | | | | 33.2 | 43.7 | 67.1 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | 2088 | 2018 | 1877 |
| DRS112M4 4.0 kW | $M_{max}$ Nm | | | | | | | | | 36.7 | 48 | 66.5 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | 1916 | 1834 | 1758 |
| DRS132S4 5.5 kW | $M_{max}$ Nm | | | | | | | | | | 45.5 | 70.2 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | 1980 | 1857 |
| DRS132M4 7.5 kW | $M_{max}$ Nm | | | | | | | | | | | 71.2 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | | 1992 |

27793230/EN – 08/2022

*Assignment of MOVIDRIVE® MDX61B0150-503 – MDX61B0750-503 (sizes 3 – 5):*

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| AC 230 V / 50Hz | | 0150 | 0220 | 0300 | 0370 | 0450 | 0550 | 0750 |
| DRS100LC4 4.0 kW | $M_{max}$ Nm | 82.2 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1870 | | | | | | |
| DRS112M4 4.0 kW | $M_{max}$ Nm | 66.5 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1852 | | | | | | |
| DRS132S4 5.5 kW | $M_{max}$ Nm | 94.5 | 102 | | | | | |
| | $n_{base}$ min$^{-1}$ | 1740 | 1828 | | | | | |
| DRS132M4 7.5 kW | $M_{max}$ Nm | 95.8 | 134 | | | | | |
| | $n_{base}$ min$^{-1}$ | 1887 | 1746 | | | | | |
| DRS132MC4 9.2 kW | $M_{max}$ Nm | 91.5 | 134 | 174 | 174 | 174 | | |
| | $n_{base}$ min$^{-1}$ | 1992 | 1893 | 1799 | 1980 | 2033 | | |
| DRS160S4 9.2 kW | $M_{max}$ Nm | 91.9 | 135 | 156 | 156 | | | |
| | $n_{base}$ min$^{-1}$ | 1999 | 1883 | 1925 | 2020 | | | |
| DRS160M4 11.0 kW | $M_{max}$ Nm | 92.7 | 136 | 180 | 201 | 201 | | |
| | $n_{base}$ min$^{-1}$ | 2036 | 1941 | 1846 | 1862 | 1962 | | |
| DRS160MC4 15.0 kW | $M_{max}$ Nm | | 132 | 175 | 215 | 234 | | |
| | $n_{base}$ min$^{-1}$ | | 2025 | 1946 | 1877 | 1941 | | |
| DRS180S4 15.0 kW | $M_{max}$ Nm | | 140 | 185 | 227 | 255 | | |
| | $n_{base}$ min$^{-1}$ | | 2025 | 1951 | 1877 | 1893 | | |
| DRS180M4 18.5 kW | $M_{max}$ Nm | | 140 | 186 | 229 | 280 | 326 | 326 |
| | $n_{base}$ min$^{-1}$ | | 2099 | 2041 | 1983 | 1909 | 1846 | 1999 |
| DRS180L4 22.0 kW | $M_{max}$ Nm | | | 185 | 228 | 281 | 333 | 402 |
| | $n_{base}$ min$^{-1}$ | | | 2078 | 2036 | 1983 | 1925 | 1862 |
| DRS180LC4 30.0 kW | $M_{max}$ Nm | | | | 218 | 270 | 320 | 399 |
| | $n_{base}$ min$^{-1}$ | | | | 2051 | 2004 | 1951 | 1872 |
| DRS200L4 30.0 kW | $M_{max}$ Nm | | | | 217 | 268 | 319 | 398 |
| | $n_{base}$ min$^{-1}$ | | | | 2067 | 2030 | 1993 | 1932 |
| DRS225S4 37.0 kW | $M_{max}$ Nm | | | | | | 320 | 401 |
| | $n_{base}$ min$^{-1}$ | | | | | | 2051 | 2006 |
| DRS225M4 45.0 kW | $M_{max}$ Nm | | | | | | | 401 |
| | $n_{base}$ min$^{-1}$ | | | | | | | 2051 |

27793230/EN – 08/2022

*Assignment of MOVIDRIVE® MDX61B0900-503 – MDX61B2500-503 (sizes 6 – 7):*

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | |
|---|---|---|---|---|---|---|---|
| AC 230 V / 50Hz | | 0900 | 1100 | 1320 | 1600 | 2000 | 2500 |
| DRS180M4 18.5 kW | $M_{max}$ Nm | 326 | | | | | |
| | $n_{base}$ min$^{-1}$ | 2036 | | | | | |
| DRS180L4 22.0 kW | $M_{max}$ Nm | 402 | | | | | |
| | $n_{base}$ min$^{-1}$ | 1999 | | | | | |
| DRS180LC4 30.0 kW | $M_{max}$ Nm | 429 | 429 | | | | |
| | $n_{base}$ min$^{-1}$ | 1978 | 2030 | | | | |
| DRS200L4 30.0 kW | $M_{max}$ Nm | 505 | 505 | 505 | | | |
| | $n_{base}$ min$^{-1}$ | 1862 | 1977 | 2051 | | | |
| DRS225S4 37.0 kW | $M_{max}$ Nm | 529 | 625 | 719 | | | |
| | $n_{base}$ min$^{-1}$ | 1932 | 1874 | 1874 | | | |
| DRS225M4 45.0 kW | $M_{max}$ Nm | 534 | 632 | 795 | | | |
| | $n_{base}$ min$^{-1}$ | 1989 | 1940 | 1862 | | | |
| DRS225MC4 55.0 kW | $M_{max}$ Nm | 501 | 593 | 746 | 852 | 852 | 852 |
| | $n_{base}$ min$^{-1}$ | 2018 | 1973 | 1899 | 1879 | 2006 | 2043 |
| DRS250M4 55.0 kW | $M_{max}$ Nm | 521 | 622 | 788 | 952 | 1200 | 1200 |
| | $n_{base}$ min$^{-1}$ | 2054 | 2020 | 1962 | 1901 | 1801 | 1907 |
| DRS280S4 75.0 kW | $M_{max}$ Nm | | 612 | 779 | 943 | 1200 | 1200 |
| | $n_{base}$ min$^{-1}$ | | 2084 | 2051 | 2014 | 1953 | 2197 |
| DRS280M4 90.0 kW | $M_{max}$ Nm | | | 780 | 960 | 1200 | 1200 |
| | $n_{base}$ min$^{-1}$ | | | 2066 | 2038 | 2023 | 2377 |
| DRS315K4 110.0 kW | $M_{max}$ Nm | | | | 930 | 1187 | 1475 |
| | $n_{base}$ min$^{-1}$ | | | | 2045 | 1992 | 1928 |
| DRS315S4 132.0 kW | $M_{max}$ Nm | | | | 956 | 1227 | 1530 |
| | $n_{base}$ min$^{-1}$ | | | | 2089 | 2054 | 2013 |
| DRS315M4 160.0 kW | $M_{max}$ Nm | | | | | 1240 | 1544 |
| | $n_{base}$ min$^{-1}$ | | | | | 2086 | 2042 |
| DRS315L4 200.0 kW | $M_{max}$ Nm | | | | | | 1503 |
| | $n_{base}$ min$^{-1}$ | | | | | | 2106 |

27793230/EN – 08/2022

### 9.6.23 DRS.. motor selection in delta connection type (line AC 230 V / 50 Hz)

**AC 230/400 V / 50 Hz motors in delta connection**

| Motor voltage | | MOVIDRIVE® MDX61B...-2_3 (AC 230 V devices) in CFC operating modes (P700) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **AC 230 V / 50 Hz** | | **0015** | **0022** | **0037** | **0055** | **0075** | **0110** | **0150** | **0220** | **0300** |
| DRS71M4 550 W | $M_{max}$ Nm | 8.5 | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 872 | | | | | | | | |
| DRS80M4 750 W | $M_{max}$ Nm | 11.7 | | | **Notice:** The data is based on a line voltage of AC 230 V. | | | | | |
| | $n_{base}$ min$^{-1}$ | 879 | | | | | | | | |
| DRS80S4 750 W | $M_{max}$ Nm | 11.3 | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 879 | | | | | | | | |
| DRS80M4 1.1 kW | $M_{max}$ Nm | 17.1 | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 893 | | | | | | | | |
| DRS90M4 1.5 kW | $M_{max}$ Nm | 21 | 24.9 | 25.7 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 928 | 858 | 872 | | | | | | |
| DRS90L4 2.2 kW | $M_{max}$ Nm | 20.4 | 24.5 | 37.5 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1083 | 1034 | 900 | | | | | | |
| DRS100LC4 2.6 kW | $M_{max}$ Nm | 20.3 | 24.4 | 42.5 | 56.7 | | | | | |
| | $n_{base}$ min$^{-1}$ | 1174 | 1146 | 1005 | 942 | | | | | |
| DRS100M4 3.0 kW | $M_{max}$ Nm | | 24.3 | 42.8 | 57.3 | | | | | |
| | $n_{base}$ min$^{-1}$ | | 1111 | 935 | 809 | | | | | |
| DRS100LC4 4.0 kW | $M_{max}$ Nm | | | 39.2 | 61.3 | 81.5 | | | | |
| | $n_{base}$ min$^{-1}$ | | | 1111 | 998 | 893 | | | | |
| DRS112M4 4.0 kW | $M_{max}$ Nm | | | 43.2 | 66.5 | | | | | |
| | $n_{base}$ min$^{-1}$ | | | 1014 | 885 | | | | | |
| DRS132S4 5.5 kW | $M_{max}$ Nm | | | | 64.1 | 85.4 | 102 | | | |
| | $n_{base}$ min$^{-1}$ | | | | 1020 | 938 | 908 | | | |
| DRS132M4 7.5 kW | $M_{max}$ Nm | | | | 65 | 86.6 | 126 | | | |
| | $n_{base}$ min$^{-1}$ | | | | 1107 | 1043 | 920 | | | |
| DRS132MC4 9.2 kW | $M_{max}$ Nm | | | | | 82.2 | 122 | 158 | 174 | |
| | $n_{base}$ min$^{-1}$ | | | | | 1119 | 1049 | 984 | 1049 | |
| DRS160S4 9.2 kW | $M_{max}$ Nm | | | | | 82.6 | 122 | 156 | 156 | |
| | $n_{base}$ min$^{-1}$ | | | | | 1129 | 1044 | 981 | 1076 | |
| DRS160M4 11.0 kW | $M_{max}$ Nm | | | | | 83.1 | 124 | 161 | 201 | |
| | $n_{base}$ min$^{-1}$ | | | | | 1150 | 1086 | 1023 | 1012 | |
| DRS160MC4 15.0 kW | $M_{max}$ Nm | | | | | | 119 | 157 | 234 | 234 |
| | $n_{base}$ min$^{-1}$ | | | | | | 1150 | 1107 | 1012 | 1086 |
| DRS180S4 15.0 kW | $M_{max}$ Nm | | | | | | 126 | 166 | 249 | 255 |
| | $n_{base}$ min$^{-1}$ | | | | | | 1144 | 1097 | 997 | 1044 |
| DRS180M4 18.5 kW | $M_{max}$ Nm | | | | | | | 167 | 251 | 300 |
| | $n_{base}$ min$^{-1}$ | | | | | | | 1155 | 1076 | 1028 |
| DRS180L4 22.0 kW | $M_{max}$ Nm | | | | | | | 165 | 251 | 301 |
| | $n_{base}$ min$^{-1}$ | | | | | | | 1181 | 1118 | 1081 |
| DRS180LC4 30.0 kW | $M_{max}$ Nm | | | | | | | | 241 | 289 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | 1139 | 1107 |
| DRS200L4 30.0 kW | $M_{max}$ Nm | **Notice:** The data is based on a line voltage of AC 230 V. | | | | | | | 240 | 287 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | 1157 | 1132 |
| DRS225S4 37.0 kW | $M_{max}$ Nm | | | | | | | | | 287 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | 1169 |

27793230/EN – 08/2022

### 9.6.24 Motor table DRS.. series AC motors (characteristic value with double-star/star connection AC 230/460 V / 60 Hz)

| Motor | $P_m$ | $M_N$ | Mass moment of inertia $J_M$ | | Star ⅄ (AC 460 V) | | | | Double-star ⅄ (AC 230 V) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Without brake | with brake | $I_n$ | $I_{q\_n}$ [1] | $I_{d\_n}$ [1] | $c_T$ [1] | $I_n$ | $I_{q\_n}$ [1] | $I_{d\_n}$ [1] | $c_T$ [1] |
| | kW | Nm | $10^{-4}$ kgm² | | A | A | A | Nm/A | A | A | A | Nm/A |
| DRS71S4 | 0.37 | 2.1 | 4.9 | 6.2 | 0.92 | 0.72 | 0.58 | 2.93 | 1.84 | 1.43 | 1.16 | 1.47 |
| DRS71M4 | 0.55 | 3.1 | 7.1 | 8.4 | 1.25 | 1.00 | 0.75 | 3.09 | 2.50 | 2.00 | 1.49 | 1.55 |
| DRS80S4 | 0.75 | 4.2 | 14.9 | 16.4 | 1.66 | 1.23 | 1.12 | 3.43 | 3.32 | 2.45 | 2.24 | 1.71 |
| DRS80M4 | 1.1 | 6.1 | 21.5 | 26 | 2.14 | 1.75 | 1.23 | 3.48 | 4.28 | 3.50 | 2.46 | 1.74 |
| DRS90M4 | 1.5 | 8.4 | 35.5 | 40 | 2.87 | 2.52 | 1.38 | 3.34 | 5.74 | 5.03 | 2.76 | 1.67 |
| DRS90L4 | 2.2 | 12.2 | 43.5 | 49.5 | 4.1 | 3.33 | 2.37 | 3.66 | 8.20 | 6.66 | 4.75 | 1.83 |
| DRS100M4 | 3 | 16.7 | 56 | 62 | 5.5 | 4.92 | 2.45 | 3.39 | 11.0 | 9.85 | 4.90 | 1.70 |
| DRS100M4 | 3.7 | 21 | 56 | 62 | 6.65 | 6.19 | 2.42 | 3.39 | 13.3 | 12.4 | 4.84 | 1.70 |
| DRS100L4 | 4 | 22.5 | 68.3 | 74.3 | 7.3 | 6.25 | 3.78 | 3.60 | 14.6 | 12.5 | 7.56 | 1.80 |
| DRS112M4 | 4 | 22 | 146 | 151 | 6.8 | 6.41 | 2.26 | 3.43 | 13.6 | 12.8 | 4.52 | 1.71 |
| DRS132S4 | 5.5 | 30 | 190 | 200 | 9.4 | 8.8 | 3.36 | 3.42 | 18.8 | 17.6 | 6.72 | 1.71 |
| DRS132M4 | 7.5 | 41 | 255 | 265 | 12.4 | 11.7 | 4.01 | 3.50 | 24.8 | 23.5 | 8.02 | 1.75 |
| DRS132MC4 | 9.2 | 50 | 342 | 355 | 16 | 14.7 | 6.33 | 3.40 | 32.0 | 29.4 | 12.7 | 1.70 |
| DRS160S4 | 9.2 | 50 | 370 | 420 | 15.9 | 14.2 | 7.2 | 3.53 | 31.8 | 28.4 | 14.4 | 1.76 |
| DRS160M4 | 11 | 60 | 450 | 500 | 18.8 | 17.5 | 6.99 | 3.44 | 37.6 | 34.9 | 14.0 | 1.72 |
| DRS160MC4 | 15 | 81 | 590 | 640 | 26.5 | 24.7 | 9.57 | 3.28 | 53.0 | 49.4 | 19.1 | 1.64 |
| DRS180S4 | 15 | 81 | 895 | 955 | 25.5 | 23.6 | 9.68 | 3.43 | 51.0 | 47.2 | 19.4 | 1.72 |
| DRS180M4 | 18.5 | 100 | 1110 | 1250 | 30.5 | 27.0 | 14.1 | 3.70 | 61.0 | 54.1 | 28.2 | 1.85 |
| DRS180L4 | 22 | 119 | 1300 | 1440 | 35.9 | 32.1 | 16.0 | 3.70 | 71.8 | 64.2 | 32.0 | 1.85 |
| DRS180LC4 | 30 | 161 | 1680 | 1910 | 48.5 | 45.5 | 16.9 | 3.54 | 97.0 | 90.9 | 33.8 | 1.77 |
| DRS200L4 | 30 | 161 | 2360 | 2590 | 51 | 47.9 | 17.6 | 3.36 | 102 | 95.8 | 35.1 | 1.68 |
| DRS225S4 | 37 | 198 | 2930 | 3160 | 61 | 56.6 | 22.6 | 3.50 | 122 | 113 | 45.3 | 1.75 |
| DRS225M4 | 45 | 240 | 3430 | 3660 | 72 | 68.7 | 21.7 | 3.50 | 144 | 137 | 43.4 | 1.75 |
| DRS225MC4 | 55 | 295 | 4330 | 4560 | 87.9 | 84.5 | 24.2 | 3.49 | 176 | 169 | 48.4 | 1.75 |
| DRS315K4 | 110 | 589 | 18400 | 19500 | 172 | 165 | 47.4 | 3.56 | – | – | – | – |
| DRS315S4 | 132 | 707 | 22500 | 23600 | 205 | 202 | 43.4 | 3.49 | – | – | – | – |
| DRS315S4 | 150 | 802 | 22500 | 23600 | 230 | 222 | 60.7 | 3.62 | – | – | – | – |
| DRS315M4 | 160 | 856 | 27900 | 29000 | 245 | 237 | 60.3 | 3.60 | – | – | – | – |
| DRS315M4 | 185 | 991 | 27900 | 29000 | 280 | 274 | 59.9 | 3.62 | – | – | – | – |
| DRS315L4 | 200 | 1072 | 31900 | 33000 | 304 | 295 | 73.4 | 3.63 | – | – | – | – |
| DRS315L4 | 225 | 1205 | 31900 | 33000 | 335 | 328 | 72.8 | 3.67 | – | – | – | – |

1) Applies in the basic speed range up to n base.

27793230/EN – 08/2022

### 9.6.25 DRS.. motor selection with double-star/star connection type (line AC 460 V / 60 Hz)

**AC 230/460 V / 60 Hz motors in star connection**

*Assignment of MOVIDRIVE® MDX61B0005-5A3 – MDX61B0110-503 (sizes 0 – 2):*

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AC 460 / 60 Hz | | 0005 | 0008 | 0011 | 0014 | 0015 | 0022 | 0030 | 0040 | 0055 | 0075 | 0110 |
| DRS71M4 370 W | $M_{max}$ Nm | 5.02 | | | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1139 | | | | | | | | | | |
| DRS71S4 370 W | $M_{max}$ Nm | 5.20 | | | | **Notice:** The data is based on a line voltage of AC 460 V. | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1048 | | | | | | | | | | |
| DRS80S4 370 W | $M_{max}$ Nm | 5.14 | | | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1097 | | | | | | | | | | |
| DRS71M4 400 W | $M_{max}$ Nm | 5.24 | | | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1097 | | | | | | | | | | |
| DRS71M4 550 W | $M_{max}$ Nm | 7.46 | 7.46 | | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1118 | 1139 | | | | | | | | | |
| DRS80S4 550 W | $M_{max}$ Nm | 9.41 | | | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 970 | | | | | | | | | | |
| DRS90M4 550 W | $M_{max}$ Nm | 10.9 | | | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1020 | | | | | | | | | | |
| DRS80S4 750 W | $M_{max}$ Nm | 12.5 | 12.8 | | | 12.8 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1012 | 1027 | | | 1041 | | | | | | |
| DRS80M4 1.1 kW | $M_{max}$ Nm | 13.1 | 15.9 | 18.9 | 18.9 | 18.9 | 18.9 | | | | | |
| | $n_{base}$ min$^{-1}$ | 1188 | 1104 | 1027 | 1034 | 1020 | 1041 | | | | | |
| DRS90M4 1.5 kW | $M_{max}$ Nm | | 15.4 | 20.1 | 25.1 | 19.5 | 25.1 | 25.1 | | | | |
| | $n_{base}$ min$^{-1}$ | | 1230 | 1118 | 1005 | 1132 | 1012 | 1034 | | | | |
| DRS90L4 2.2 kW | $M_{max}$ Nm | | | | 26.3 | 19.3 | 27.2 | 34.9 | 35.5 | | | |
| | $n_{base}$ min$^{-1}$ | | | | 1195 | 1301 | 1181 | 1069 | 1111 | | | |
| DRS100M4 3kW | $M_{max}$ Nm | | | | | | 27 | 34.9 | 47.9 | | | |
| | $n_{base}$ min$^{-1}$ | | | | | | 1294 | 1209 | 1069 | | | |
| DRS100LC4 3.7 kW | $M_{max}$ Nm | | | | | | 26.8 | 35.2 | 48.9 | 65.1 | 74.5 | |
| | $n_{base}$ min$^{-1}$ | | | | | | 1399 | 1350 | 1266 | 1174 | 1174 | |
| DRS100M4 3.7kW | $M_{max}$ Nm | | | | | | 26.3 | 34.2 | 47.2 | 62.7 | | |
| | $n_{base}$ min$^{-1}$ | | | | | | 1336 | 1252 | 1125 | 977 | | |
| DRS112M4 3.7 kW | $M_{max}$ Nm | | | | | | 27.8 | 36.1 | 49.7 | 60.4 | 60.4 | |
| | $n_{base}$ min$^{-1}$ | | | | | | 1324 | 1266 | 1172 | 1125 | 1166 | |
| DRS100L4 4 kW | $M_{max}$ Nm | | | | | | | 33.3 | 46.1 | 61.3 | | |
| | $n_{base}$ min$^{-1}$ | | | | | | | 1329 | 1230 | 1111 | | |
| DRS100LC4 4 kW | $M_{max}$ Nm | | | | | | 26.7 | 35.2 | 48.8 | 64.9 | 74.2 | |
| | $n_{base}$ min$^{-1}$ | | | | | | 1406 | 1357 | 1273 | 1181 | 1181 | |
| DRS112M4 4 kW | $M_{max}$ Nm | | | | | | 27.1 | 35.1 | 48.4 | 54.7 | 54.7 | |
| | $n_{base}$ min$^{-1}$ | | | | | | 1342 | 1277 | 1184 | 1189 | 1225 | |
| DRS132S4 5.5 kW | $M_{max}$ Nm | | | | | | | | 46.3 | 61.9 | 79.8 | 89.8 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | 1312 | 1242 | 1160 | 1189 |
| DRS132M4 7.5 kW | $M_{max}$ Nm | | | | | | | | | 62.4 | 81.1 | 123 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | 1330 | 1277 | 1148 |
| DRS132MC4 9.2 kW | $M_{max}$ Nm | | | | | | | | | 61.1 | 80.3 | 123 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | 1389 | 1348 | 1260 |
| DRS160S4 9.2 kW | $M_{max}$ Nm | | | | | | | | | 60.7 | 79 | 120 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | 1387 | 1339 | 1229 |
| DRS160M4 11 kW | $M_{max}$ Nm | | | | | | | | | | 79.3 | 122 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | 1376 | 1292 |
| DRS160MC4 15 kW | $M_{max}$ Nm | | | | | | | | | | | 117 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | | 1366 |

27793230/EN – 08/2022

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AC 460 / 60 Hz | | 0005 | 0008 | 0011 | 0014 | 0015 | 0022 | 0030 | 0040 | 0055 | 0075 | 0110 |
| DRS180S4 15 kW | $M_{max}$ Nm | **Notice:** The data is based on a line voltage of AC 460 V. | | | | | | | | | | 124 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | | 1376 |
| DRS180M4 18.5 kW | $M_{max}$ Nm | | | | | | | | | | | 123 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | | 1419 |

*Assignment of MOVIDRIVE® MDX61B0150-503 – MDX61B0750-503 (sizes 3 – 5):*

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| AC 460 V / 60 Hz | | 0150 | 0220 | 0300 | 0370 | 0450 | 0550 | 0750 |
| DRS132M4 7.5 kW | $M_{max}$ Nm | 131 | | **Notice:** The data is based on a line voltage of AC 460 V. | | | | |
| | $n_{base}$ min$^{-1}$ | 1195 | | | | | | |
| DRS132MC4 9.2 kW | $M_{max}$ Nm | 166 | 169 | | | | | |
| | $n_{base}$ min$^{-1}$ | 1178 | 1289 | | | | | |
| DRS160S4 9.2 kW | $M_{max}$ Nm | 129 | 129 | | | | | |
| | $n_{base}$ min$^{-1}$ | 1287 | 1350 | | | | | |
| DRS160M4 11 kW | $M_{max}$ Nm | 163 | 173 | | | | | |
| | $n_{base}$ min$^{-1}$ | 1208 | 1281 | | | | | |
| DRS160MC4 15 kW | $M_{max}$ Nm | 159 | 227 | 227 | | | | |
| | $n_{base}$ min$^{-1}$ | 1308 | 1213 | 1308 | | | | |
| DRS180S4 15 kW | $M_{max}$ Nm | 167 | 220 | | | | | |
| | $n_{base}$ min$^{-1}$ | 1308 | 1255 | | | | | |
| DRS180M4 18.5 kW | $M_{max}$ Nm | 167 | 243 | 309 | 309 | 309 | | |
| | $n_{base}$ min$^{-1}$ | 1366 | 1281 | 1218 | 1271 | 1308 | | |
| DRS180L4 22 kW | $M_{max}$ Nm | 166 | 244 | 321 | 392 | 392 | | |
| | $n_{base}$ min$^{-1}$ | 1403 | 1334 | 1266 | 1197 | 1266 | | |
| DRS180LC4 30 kW | $M_{max}$ Nm | | 235 | 310 | 378 | 388 | 388 | 388 |
| | $n_{base}$ min$^{-1}$ | | 1366 | 1308 | 1250 | 1329 | 1350 | 1371 |
| DRS200L4 30 kW | $M_{max}$ Nm | | 233 | 308 | 376 | 461 | 468 | 468 |
| | $n_{base}$ min$^{-1}$ | | 1386 | 1341 | 1296 | 1243 | 1312 | 1345 |
| DRS225S4 37 kW | $M_{max}$ Nm | | 237 | 316 | 388 | 476 | 536 | 536 |
| | $n_{base}$ min$^{-1}$ | | 1411 | 1374 | 1341 | 1300 | 1304 | 1436 |
| DRS225M4 45 kW | $M_{max}$ Nm | | | 312 | 383 | 470 | 556 | 678 |
| | $n_{base}$ min$^{-1}$ | | | 1411 | 1374 | 1329 | 1284 | 1218 |
| DRS225MC4 55 kW | $M_{max}$ Nm | | | | 374 | 461 | 547 | 681 |
| | $n_{base}$ min$^{-1}$ | | | | 1403 | 1370 | 1337 | 1288 |
| DRS250M4 55 kW | $M_{max}$ Nm | | | | 364 | 456 | 546 | 685 |
| | $n_{base}$ min$^{-1}$ | | | | 1426 | 1402 | 1377 | 1338 |
| DRS280S4 75 kW | $M_{max}$ Nm | | | | | 461 | 549 | 687 |
| | $n_{base}$ min$^{-1}$ | | | | | 1435 | 1417 | 1383 |
| DRS280M4 90 kW | $M_{max}$ Nm | | | | | | | 679 |
| | $n_{base}$ min$^{-1}$ | | | | | | | 1417 |
| DRS315K4 110 kW | $M_{max}$ Nm | | | | | | | 674 |
| | $n_{base}$ min$^{-1}$ | | | | | | | 1430 |

27793230/EN – 08/2022

*Assignment of MOVIDRIVE® MDX61B0900-503 – MDX61B2500-503 (sizes 6 – 7):*

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | |
|---|---|---|---|---|---|---|---|
| AC 460 V / 60 Hz | | 0900 | 1100 | 1320 | 1600 | 2000 | 2500 |
| DRS225MC4 55 kW | $M_{max}$ Nm | 708 | 708 | 708 | **Notice:** The data is based on a line voltage of AC 460 V. | | |
| | $n_{base}$ min$^{-1}$ | 1403 | 1423 | 1477 | | | |
| DRS250M4 55 kW | $M_{max}$ Nm | 904 | 1068 | 1200 | | | |
| | $n_{base}$ min$^{-1}$ | 1271 | 1222 | 1216 | | | |
| DRS280S4 75 kW | $M_{max}$ Nm | 904 | 1067 | 1200 | | | |
| | $n_{base}$ min$^{-1}$ | 1331 | 1289 | 1310 | | | |
| DRS280M4 90 kW | $M_{max}$ Nm | 900 | 1064 | 1200 | 1200 | | |
| | $n_{base}$ min$^{-1}$ | 1371 | 1338 | 1383 | 1469 | | |
| DRS315K4 110 kW | $M_{max}$ Nm | 892 | 1055 | 1325 | 1594 | 1600 | |
| | $n_{base}$ min$^{-1}$ | 1395 | 1368 | 1321 | 1274 | 1374 | |
| DRS315S4 132 kW | $M_{max}$ Nm | 877 | 1036 | 1300 | 1563 | 1600 | 1600 |
| | $n_{base}$ min$^{-1}$ | 1418 | 1392 | 1348 | 1304 | 1383 | 1433 |
| DRS315S4 150 kW | $M_{max}$ Nm | 895 | 1062 | 1338 | 1600 | 1600 | |
| | $n_{base}$ min$^{-1}$ | 1441 | 1421 | 1389 | 1356 | 1553 | |
| DRS315M4 160 kW | $M_{max}$ Nm | | 1059 | 1334 | 1607 | 2043 | 2400 |
| | $n_{base}$ min$^{-1}$ | | 1438 | 1403 | 1371 | 1312 | 1286 |
| DRS315M4 185 kW | $M_{max}$ Nm | | | 1339 | 1614 | 2051 | 2400 |
| | $n_{base}$ min$^{-1}$ | | | 1409 | 1374 | 1315 | 1292 |
| DRS315L4 200 kW | $M_{max}$ Nm | | | 1337 | 1614 | 2055 | 2400 |
| | $n_{base}$ min$^{-1}$ | | | 1444 | 1415 | 1362 | 1354 |
| DRS315L4 225 kW | $M_{max}$ Nm | | | 1351 | 1631 | 2077 | 2400 |
| | $n_{base}$ min$^{-1}$ | | | 1453 | 1421 | 1368 | 1368 |

27793230/EN – 08/2022

## AC 230/460 V / 60 Hz motors in double-star connection

*Assignment of MOVIDRIVE® MDX61B0005-5A3 – MDX61B0110-503 (sizes 0 – 2):*

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AC 230 V / 60 Hz | | 0005 | 0008 | 0011 | 0014 | 0015 | 0022 | 0030 | 0040 | 0055 | 0075 | 0110 |
| DR63M4 180 W | $M_{max}$ Nm | 2.34 | | | **Notice:** The data is based on a line voltage of AC 460 V. | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 2677 | | | | | | | | | | |
| DRS71S4 200 W | $M_{max}$ Nm | 3.22 | 3.22 | | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 2714 | 2798 | | | | | | | | | |
| DR63L4 250 W | $M_{max}$ Nm | 3.31 | 3.31 | 3.31 | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 2770 | 2770 | 2770 | | | | | | | | |
| DRS71M4 370 W | $M_{max}$ Nm | 5.02 | | | | 5.02 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 2552 | | | | 2791 | | | | | | |
| DRS71S4 370 W | $M_{max}$ Nm | 5.14 | 5.20 | 5.2 | 5.2 | 5.2 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 2482 | 2651 | 2777 | 2890 | 2770 | | | | | | |
| DRS80S4 370 W | $M_{max}$ Nm | 5.14 | | | | 5.14 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 2665 | | | | 2876 | | | | | | |
| DRS71M4 400 W | $M_{max}$ Nm | 5.24 | 5.24 | 5.24 | 5.24 | 5.24 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 2475 | 2588 | 2728 | 2862 | 2714 | | | | | | |
| DRS71M4 550 W | $M_{max}$ Nm | | 6.67 | 7.46 | 7.46 | 7.46 | 7.46 | 7.46 | | | | |
| | $n_{base}$ min$^{-1}$ | | 2566 | 2672 | 2834 | 2630 | 2848 | 2981 | | | | |
| DRS80S4 550 W | $M_{max}$ Nm | 5.55 | 6.79 | 8.91 | 9.41 | 8.61 | 9.41 | | | | | |
| | $n_{base}$ min$^{-1}$ | 2777 | 2672 | 2489 | 2623 | 2510 | 2637 | | | | | |
| DRS90M4 550 W | $M_{max}$ Nm | 6.15 | 7.48 | 9.78 | 10.9 | 9.45 | 10.9 | | | | | |
| | $n_{base}$ min$^{-1}$ | 2700 | 2609 | 2461 | 2531 | 2482 | 2545 | | | | | |
| DRS80S4 750 W | $M_{max}$ Nm | | | 9.46 | 12.5 | 9.11 | 12.8 | 12.8 | | | | |
| | $n_{base}$ min$^{-1}$ | | | 2665 | 2496 | 2686 | 2468 | 2763 | | | | |
| DRS80M4 1.1 kW | $M_{max}$ Nm | | | | 13.1 | 9.49 | 13.5 | 17.4 | 18.9 | | | |
| | $n_{base}$ min$^{-1}$ | | | | 2707 | 2841 | 2693 | 2538 | 2714 | | | |
| DRS90M4 1.5 kW | $M_{max}$ Nm | | | | | | 13 | 16.9 | 23.3 | 25.1 | 25.1 | |
| | $n_{base}$ min$^{-1}$ | | | | | | 2805 | 2686 | 2503 | 2644 | 2742 | |
| DRS90L4 2.2 kW | $M_{max}$ Nm | | | | | | | 16.7 | 23.3 | 31.1 | 35.5 | |
| | $n_{base}$ min$^{-1}$ | | | | | | | 2869 | 2742 | 2595 | 2637 | |
| DRS100M4 3 kW | $M_{max}$ Nm | | | | | | | | 23 | 31 | 40.1 | 55 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | 2869 | 2756 | 2623 | 2503 |
| DRS100LC4 3.7 kW | $M_{max}$ Nm | | | | | | | | | 31 | 40.7 | 62.4 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | 2876 | 2805 | 2644 |
| DRS100M4 3.7 kW | $M_{max}$ Nm | | | | | | | | | 30.3 | 39.5 | 60.1 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | 2812 | 2693 | 2440 |
| DRS112M4 3.7 kW | $M_{max}$ Nm | | | | | | | | | 31.9 | 41.6 | 60.4 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | 2713 | 2607 | 2438 |
| DRS100L4 4 kW | $M_{max}$ Nm | | | | | | | | | 29.4 | 38.5 | 58.8 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | 2897 | 2812 | 2616 |
| DRS100LC4 4 kW | $M_{max}$ Nm | | | | | | | | | 31 | 40.7 | 62.3 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | 2890 | 2812 | 2658 |
| DRS112M4 4 kW | $M_{max}$ Nm | | | | | | | | | 31.1 | 40.5 | 54.7 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | 2742 | 2637 | 2590 |
| DRS132S4 5.5 kW | $M_{max}$ Nm | | | | | | | | | | 38.4 | 59.3 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | 2789 | 2654 |
| DRS132M4 7.5 kW | $M_{max}$ Nm | | | | | | | | | | | 59.8 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | | 2783 |
| DRS160S4 9.2 kW | $M_{max}$ Nm | | | | | | | | | | | 58.1 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | | | 2869 |

*Assignment of MOVIDRIVE® MDX61B0150-503 – MDX61B0750-503 (sizes 3 – 5):*

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| AC 230 V / 60 Hz | | 0150 | 0220 | 0300 | 0370 | 0450 | 0550 | 0750 |
| DRS100LC4 3.7 kW | $M_{max}$ Nm | 74.5 | | | **Notice:** The data is based on a line voltage of AC 460 V. | | | |
| | $n_{base}$ min$^{-1}$ | 2721 | | | | | | |
| DRS100M4 3.7 kW | $M_{max}$ Nm | 64.6 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 2538 | | | | | | |
| DRS112M4 3.7 kW | $M_{max}$ Nm | 60.4 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 2596 | | | | | | |
| DRS100L4 4 kW | $M_{max}$ Nm | 78 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 2419 | | | | | | |
| DRS100LC4 4 kW | $M_{max}$ Nm | 74.2 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 2735 | | | | | | |
| DRS112M4 4 kW | $M_{max}$ Nm | 54.7 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 2719 | | | | | | |
| DRS132S4 5.5 kW | $M_{max}$ Nm | 79.8 | 89.8 | | | | | |
| | $n_{base}$ min$^{-1}$ | 2525 | 2678 | | | | | |
| DRS132M4 7.5 kW | $M_{max}$ Nm | 81.1 | 118 | 131 | | | | |
| | $n_{base}$ min$^{-1}$ | 2684 | 2520 | 2625 | | | | |
| DRS132MC4 9.2 kW | $M_{max}$ Nm | 80.3 | 118 | 155 | 169 | 169 | | |
| | $n_{base}$ min$^{-1}$ | 2783 | 2678 | 2566 | 2666 | 2854 | | |
| DRS160S4 9.2 kW | $M_{max}$ Nm | 79 | 115 | 129 | 129 | 129 | | |
| | $n_{base}$ min$^{-1}$ | 2784 | 2637 | 2747 | 2858 | 2916 | | |
| DRS160M4 11 kW | $M_{max}$ Nm | 79.3 | 116 | 153 | 173 | 173 | | |
| | $n_{base}$ min$^{-1}$ | 2832 | 2716 | 2600 | 2605 | 2747 | | |
| DRS160MC4 15 kW | $M_{max}$ Nm | | 112 | 149 | 182 | 224 | 227 | |
| | $n_{base}$ min$^{-1}$ | | 2805 | 2721 | 2642 | 2537 | 2689 | |
| DRS180S4 15 kW | $M_{max}$ Nm | | 118 | 156 | 191 | 220 | 220 | |
| | $n_{base}$ min$^{-1}$ | | 2858 | 2758 | 2663 | 2631 | 2784 | |
| DRS180M4 18.5 kW | $M_{max}$ Nm | | 117 | 156 | 192 | 235 | 278 | 309 |
| | $n_{base}$ min$^{-1}$ | | 2900 | 2837 | 2774 | 2695 | 2610 | 2663 |
| DRS180L4 22 kW | $M_{max}$ Nm | | | 155 | 191 | 236 | 280 | 349 |
| | $n_{base}$ min$^{-1}$ | | | 2879 | 2832 | 2774 | 2711 | 2610 |
| DRS180LC4 30 kW | $M_{max}$ Nm | | | | 183 | 227 | 270 | 336 |
| | $n_{base}$ min$^{-1}$ | | | | 2869 | 2811 | 2753 | 2663 |
| DRS200L4 30 kW | $M_{max}$ Nm | | | | 182 | 225 | 268 | 334 |
| | $n_{base}$ min$^{-1}$ | | | | 2879 | 2838 | 2793 | 2723 |
| DRS225S4 37 kW | $M_{max}$ Nm | | | | | 228 | 274 | 344 |
| | $n_{base}$ min$^{-1}$ | | | | | 2863 | 2830 | 2781 |
| DRS225M4 45 kW | $M_{max}$ Nm | **Notice:** The data is based on a line voltage of AC 460 V. | | | | | 271 | 340 |
| | $n_{base}$ min$^{-1}$ | | | | | | 2900 | 2842 |
| DRS225MC4 55 kW | $M_{max}$ Nm | | | | | | | 331 |
| | $n_{base}$ min$^{-1}$ | | | | | | | 2871 |

27793230/EN – 08/2022

*Assignment of MOVIDRIVE® MDX61B0900-503 – MDX61B2500-503 (sizes 6 – 7):*

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC -400/500 V devices) in CFC operating modes (P700) | | | | | |
|---|---|---|---|---|---|---|---|
| AC 230 V / 60 Hz | | 0900 | 1100 | 1320 | 1600 | 2000 | 2500 |
| DRS180M4 18.5 kW | $M_{max}$ Nm | 309 | | | | | |
| | $n_{base}$ min$^{-1}$ | 2784 | | | | | |
| DRS180L4 22 kW | $M_{max}$ Nm | 392 | | | **Notice:** The data is based on a line voltage of AC 460 V. | | |
| | $n_{base}$ min$^{-1}$ | 2695 | | | | | |
| DRS180LC4 30 kW | $M_{max}$ Nm | 388 | 388 | 388 | | | |
| | $n_{base}$ min$^{-1}$ | 2732 | 2821 | 2858 | | | |
| DRS200L4 30 kW | $M_{max}$ Nm | 440 | 468 | 468 | | | |
| | $n_{base}$ min$^{-1}$ | 2609 | 2674 | 2793 | | | |
| DRS225S4 37 kW | $M_{max}$ Nm | 454 | 536 | 536 | 536 | | |
| | $n_{base}$ min$^{-1}$ | 2695 | 2629 | 2929 | 3015 | | |
| DRS225M4 45 kW | $M_{max}$ Nm | 448 | 529 | 663 | 678 | | |
| | $n_{base}$ min$^{-1}$ | 2748 | 2674 | 2547 | 2629 | | |
| DRS225MC4 55 kW | $M_{max}$ Nm | 440 | 521 | 655 | 708 | 708 | 708 |
| | $n_{base}$ min$^{-1}$ | 2801 | 2752 | 2666 | 2756 | 2965 | 3027 |
| DRS250M4 55 kW | $M_{max}$ Nm | 433 | 518 | 657 | 795 | 1014 | 1200 |
| | $n_{base}$ min$^{-1}$ | 2600 | 2600 | 2600 | 2600 | 2565 | 2468 |
| DRS280S4 75 kW | $M_{max}$ Nm | | 521 | 659 | 796 | 1013 | 1200 |
| | $n_{base}$ min$^{-1}$ | | 2600 | 2600 | 2600 | 2600 | 2600 |
| DRS280M4 90 kW | $M_{max}$ Nm | | | 651 | 789 | 1009 | 1200 |
| | $n_{base}$ min$^{-1}$ | | | 2600 | 2600 | 2600 | 2600 |
| DRS315K4 110 kW | $M_{max}$ Nm | | | | 783 | 1000 | 1243 |
| | $n_{base}$ min$^{-1}$ | | | | 2500 | 2500 | 2500 |
| DRS315S4 132 kW | $M_{max}$ Nm | | | | 770 | 982 | 1220 |
| | $n_{base}$ min$^{-1}$ | | | | 2500 | 2500 | 2500 |
| DRS315S4 150 kW | $M_{max}$ Nm | | | | | 1006 | 1255 |
| | $n_{base}$ min$^{-1}$ | | | | | 2500 | 2500 |
| DRS315M4 160 kW | $M_{max}$ Nm | | | | | 1003 | 1252 |
| | $n_{base}$ min$^{-1}$ | | | | | 2500 | 2500 |
| DRS315M4 185 kW | $M_{max}$ Nm | | | | | | 1256 |
| | $n_{base}$ min$^{-1}$ | | | | | | 2500 |
| DRS315L4 200 kW | $M_{max}$ Nm | | | | | | 1253 |
| | $n_{base}$ min$^{-1}$ | | | | | | 2500 |

27793230/EN – 08/2022

### 9.6.26 DRS.. motor selection in double-star connection (line AC 230 V / 60 Hz)

**AC 230/460 V / 60 Hz motors in double-star connection**

*Assignment of MOVIDRIVE® MDX61B0015-2A3 – MDX61B0300-203 (sizes 1 – 4):*

| Motor voltage | | MOVIDRIVE® MDX61B...-5_3 (AC 230 V devices) in CFC operating modes (P700) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| AC 230 V / 60 Hz | | 0015 | 0022 | 0037 | 0055 | 0075 | 0110 | 0150 | 0220 | 0300 |
| DRS80S4 750 W | $M_{max}$ Nm | 12.8 | | | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1034 | | | | | | | | |
| DRS80M4 1.1 kW | $M_{max}$ Nm | 18.2 | 18.9 | | | | **Notice:** The data is based on a line voltage of AC 230 V. | | | |
| | $n_{base}$ min$^{-1}$ | 1034 | 1027 | | | | | | | |
| DRS90M4 1.5 kW | $M_{max}$ Nm | 17.7 | 21 | 25.1 | | | | | | |
| | $n_{base}$ min$^{-1}$ | 1174 | 1097 | 1034 | | | | | | |
| DRS90L4 2.2 kW | $M_{max}$ Nm | 17.5 | 20.9 | 35.5 | 35.5 | | | | | |
| | $n_{base}$ min$^{-1}$ | 1329 | 1280 | 1062 | 1118 | | | | | |
| DRS100M4 3 kW | $M_{max}$ Nm | | 20.5 | 36.2 | 55 | | | | | |
| | $n_{base}$ min$^{-1}$ | | 1364 | 1195 | 991 | | | | | |
| DRS100LC4 3.7 kW | $M_{max}$ Nm | | | 36.6 | 57 | 74.5 | | | | |
| | $n_{base}$ min$^{-1}$ | | | 1343 | 1223 | 1125 | | | | |
| DRS100M4 3.7 kW | $M_{max}$ Nm | | | 35.6 | 55 | | | | | |
| | $n_{base}$ min$^{-1}$ | | | 1245 | 1055 | | | | | |
| DRS112M4 3.7 kW | $M_{max}$ Nm | | | 37.5 | 57.8 | 60.4 | | | | |
| | $n_{base}$ min$^{-1}$ | | | 1254 | 1113 | 1154 | | | | |
| DRS100L4 4 kW | $M_{max}$ Nm | | | 34.6 | 53.7 | 71.3 | | | | |
| | $n_{base}$ min$^{-1}$ | | | 1322 | 1167 | 1034 | | | | |
| DRS100LC4 4 kW | $M_{max}$ Nm | | | 36.5 | 56.9 | 74.2 | | | | |
| | $n_{base}$ min$^{-1}$ | | | 1343 | 1223 | 1132 | | | | |
| DRS112M4 4 kW | $M_{max}$ Nm | | | 36.5 | 54.7 | 54.7 | | | | |
| | $n_{base}$ min$^{-1}$ | | | 1266 | 1143 | 1213 | | | | |
| DRS132S4 5.5 kW | $M_{max}$ Nm | | | | 54.1 | 72.1 | 89.8 | 89.8 | | |
| | $n_{base}$ min$^{-1}$ | | | | 1277 | 1195 | 1172 | 1195 | | |
| DRS132M4 7.5 kW | $M_{max}$ Nm | | | | 54.3 | 73.1 | 107 | 131 | | |
| | $n_{base}$ min$^{-1}$ | | | | 1359 | 1301 | 1195 | 1148 | | |
| DRS132MC4 9.2 kW | $M_{max}$ Nm | | | | | 72.1 | 107 | 139 | 169 | |
| | $n_{base}$ min$^{-1}$ | | | | | 1365 | 1295 | 1230 | 1277 | |
| DRS160S4 9.2 kW | $M_{max}$ Nm | | | | | 71.2 | 105 | 129 | 129 | |
| | $n_{base}$ min$^{-1}$ | | | | | 1361 | 1271 | 1229 | 1334 | |
| DRS160M4 11 kW | $M_{max}$ Nm | | | | | 71.2 | 106 | 137 | 173 | 173 |
| | $n_{base}$ min$^{-1}$ | | | | | 1397 | 1324 | 1260 | 1260 | 1287 |
| DRS160MC4 15 kW | $M_{max}$ Nm | | | | | | 101 | 133 | 200 | 227 |
| | $n_{base}$ min$^{-1}$ | | | | | | 1387 | 1345 | 1245 | 1234 |
| DRS180S4 15 kW | $M_{max}$ Nm | | | | | | 107 | 140 | 210 | 220 |
| | $n_{base}$ min$^{-1}$ | | | | | | 1403 | 1350 | 1234 | 1271 |
| DRS180M4 18.5 kW | $M_{max}$ Nm | **Notice:** The data is based on a line voltage of AC 230 V. | | | | | | 139 | 211 | 251 |
| | $n_{base}$ min$^{-1}$ | | | | | | | 1397 | 1318 | 1271 |
| DRS180L4 22 kW | $M_{max}$ Nm | | | | | | | 138 | 211 | 253 |
| | $n_{base}$ min$^{-1}$ | | | | | | | 1424 | 1361 | 1324 |
| DRS180LC4 30 kW | $M_{max}$ Nm | | | | | | | | 202 | 243 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | 1392 | 1361 |
| DRS200L4 30 kW | $M_{max}$ Nm | | | | | | | | 201 | 241 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | 1407 | 1382 |
| DRS225S4 37 kW | $M_{max}$ Nm | | | | | | | | | 245 |
| | $n_{base}$ min$^{-1}$ | | | | | | | | | 1407 |

27793230/EN – 08/2022

## 9.7 Motor selection for synchronous servomotors (SERVO)

### INFORMATION

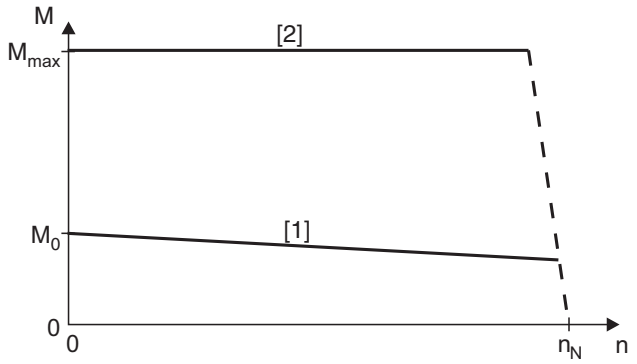
The torque limit *P304* is set automatically by the startup function of the MOVITOOLS® MotionStudio engineering software. Do not increase this automatically set value!

We recommend always using the latest version of MOVITOOLS® MotionStudio for startup. The latest MOVITOOLS® MotionStudio version can be downloaded from our homepage (www.sew-eurodrive.de).

### 9.7.1 Motor characteristics

The requirements to a servo drive include speed dynamics, stable speed and positioning accuracy. CM../CMP.. motors with MOVIDRIVE® meet these requirements.

Technically speaking, these are synchronous motors with permanent magnets on the rotor and a mounted resolver. The required characteristics, namely a constant torque over a wide speed range (up to $min^{-1}$), a high speed and control range and a high overload capacity, are achieved using control with MOVIDRIVE®. The mass moment of inertia of the servomotor is lower than that of the asynchronous motor. This means it is ideally suited to applications requiring dynamic speeds. The following figures shows the speed-torque characteristic curve of CM../CMP.. servomotors.




*1477399307*

[1] continuous torque

[2] Maximum torque

$M_0$ und $M_{max}$ are determined by the motor. The attainable $M_{max}$ can also be less, depending on the inverter.

Refer to the motor selection tables (CM../CMP..) the values for $M_0$.

Refer to the motor selection tables (CM../CMP..) for the values for $M_{max}$.

27793230/EN – 08/2022

### 9.7.2 Basic recommendations

For SEW-EURODRIVE motors, the motor data required for the SERVO operating modes is stored in MOVIDRIVE®.

Speed is the correcting variable in the SERVO operating modes with speed control. Torque is the correcting variable in the SERVO operating modes with torque control.

**SERVO operation with speed control**

There is no need to differentiate between the load types quadratic, dynamic and static when performing project planning for the SERVO operating mode. Project planning for a synchronous motor is carried out in accordance with the following requirements:

1. Effective torque requirement at average application speed.

$M_{eff} < M_0$

The point must lie below the characteristic curve for the continuous torque (figure 37, curve 1). The continuous torque of the CM.. series can be increased by 40% by forced air cooling if this operating point lies above the characteristic curve for self-cooling.

2. Maximum torque needed across the speed curve.

$M_{max} < M_{dyn\_mot}$

This operating point must lie below the characteristic curve for the maximum torque of the motor/MOVIDRIVE® combination (figure 37, curve 2).

3. Maximum speed

The maximum speed must not be configured higher than the nominal speed of the motor. Planetary gear units should be used for speeds greater than 3000 $min^{-1}$ as a result of the high input speed.

$n_{max} \leq n_N$

**SERVO operation with torque control**

This operating mode enables the servomotor to be controlled directly with torque control. The setpoint sources of the speed-controlled SERVO mode can also be used for torque control. All speed setpoint sources (except for bus setpoints) are interpreted as current setpoint sources. Assign "Current" to a process data word for fieldbus control. The settings for evaluating the analog input (→ P11_, parameter description) also remain in effect. The fixed setpoints (P16_, P17_) can be entered either in the unit [$min^{-1}$] or [$\%I_{N\_inverter}$] (→ MOVITOOLS® MotionStudio).

**The following relationship exists between the devices:**

3000 $min^{-1}$ ≙ 150% nominal inverter current

The torque at the output shaft of the servomotor can be calculated using the following formula:

$$M = \frac{M_0}{I_0} \times \frac{150\% \times I_{N\_inverter} \times n_{setpoint}}{3000\ 1/min}$$

*1477428491*

$M_0$ Continuous standstill torque according to motor tables

$I_0$ Continuous standstill current according to motor tables

27793230/EN – 08/2022

### 9.7.3 Motor table CM..

**Characteristic values at $U_{max}$ = AC 230 V / AC 400 V**

| | | Without forced cooling fan | | | With forced cooling fan VR | | | | | Mass moment of inertia $J_M$ | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $n_N$ | Motor | $M_0$ | $I_0$ [1] | $I_0$ [2] | $M_{0\_VR}$ | $I_{0\_VR}$ [1] | $I_{0\_VR}$ [2] | $I_{max}$ [1] | $I_{max}$ [2] | Without brake | With brake |
| min$^{-1}$ | | Nm | A | A | Nm | A | A | A | A | $10^{-4}$ kgm$^2$ | |
| 2000 | CM71S | 5.0 | 2.2 | 3.95 | 7.3 | 3.2 | 5.7 | 8.8 | 15.8 | 4.85 | 6.89 |
| | CM71M | 6.5 | 3.0 | 5.3 | 9.4 | 4.2 | 7.7 | 12.0 | 21.0 | 6.27 | 8.31 |
| | CM71L | 9.5 | 4.2 | 7.4 | 13.8 | 6.1 | 10.7 | 16.8 | 29.5 | 9.1 | 11.1 |
| | CM90S | 11.0 | 4.9 | 8.7 | 16.0 | 7.1 | 12.6 | 19.6 | 35.0 | 14.3 | 19.8 |
| | CM90M | 14.5 | 6.9 | 12.1 | 21.0 | 10.0 | 17.5 | 28.0 | 48.5 | 18.6 | 24.1 |
| | CM90L | 21.0 | 9.9 | 17.1 | 30.5 | 14.4 | 25.0 | 40.0 | 68.0 | 27.1 | 32.6 |
| | CM112S | 23.5 | 10.0 | 18.0 | 34.0 | 14.5 | 26.0 | 40.0 | 72 | 67.4 | 87.5 |
| | CM112M | 31.0 | 13.5 | 24.5 | 45.0 | 19.6 | 35.5 | 54.0 | 98 | 87.4 | 108 |
| | CM112L | 45.0 | 20.0 | 35.5 | 65.0 | 29.0 | 51.0 | 80.0 | 142 | 128 | 148 |
| | CM112H | 68.0 | 30.5 | 52.0 | 95.0 | 42.5 | 73.0 | 122 | 208 | 189 | 209 |
| 3000 | CM71S | 5.0 | 3.3 | 5.9 | 7.3 | 4.8 | 8.6 | 13.2 | 23.5 | 4.85 | 6.89 |
| | CM71M | 6.5 | 4.3 | 7.6 | 9.4 | 6.2 | 11.0 | 17.2 | 30.5 | 6.27 | 8.31 |
| | CM71L | 9.5 | 6.2 | 11.1 | 13.8 | 9.0 | 16.1 | 25.0 | 44.5 | 9.1 | 11.1 |
| | CM90S | 11.0 | 7.3 | 12.7 | 16.0 | 10.6 | 18.4 | 30.0 | 51 | 14.3 | 19.8 |
| | CM90M | 14.5 | 10.1 | 17.4 | 21.0 | 14.6 | 25.0 | 40.0 | 70 | 18.6 | 24.1 |
| | CM90L | 21.0 | 14.4 | 25.5 | 30.5 | 21.0 | 37.0 | 58.0 | 102 | 27.1 | 32.6 |
| | CM112S | 23.5 | 15.0 | 27.0 | 34.0 | 22.0 | 39.0 | 60.0 | 108 | 67.4 | 87.5 |
| | CM112M | 31.0 | 20.5 | 35.0 | 45.0 | 30.0 | 51.0 | 82.0 | 140 | 87.4 | 108 |
| | CM112L | 45.0 | 30.0 | 48.0 | 65.0 | 44.0 | 70.0 | 120 | 192 | 128 | 148 |
| | CM112H | 68.0 | 43.0 | 73.0 | 95.0 | 60.0 | 102 | 172 | 292 | 189 | 209 |
| 4500 | CM71S | 5.0 | 4.9 | 8.5 | 7.3 | 7.2 | 12.3 | 20.0 | 34 | 4.85 | 6.89 |
| | CM71M | 6.5 | 6.6 | 11.3 | 9.4 | 9.6 | 16.4 | 26.0 | 45 | 6.27 | 8.31 |
| | CM71L | 9.5 | 9.6 | 17.1 | 13.8 | 14.0 | 25.0 | 38.0 | 68 | 9.1 | 11.1 |
| | CM90S | 11.0 | 11.1 | 18.9 | 16.0 | 16.2 | 27.5 | 44.0 | 76 | 14.3 | 19.8 |
| | CM90M | 14.5 | 14.7 | 26.0 | 21.0 | 21.5 | 37.5 | 59.0 | 104 | 18.6 | 24.1 |
| | CM90L | 21.0 | 21.6 | 39.0 | 30.5 | 31.5 | 57 | 86.0 | 156 | 27.1 | 32.6 |
| | CM112S | 23.5 | 22.5 | 38.5 | 34.0 | 32.5 | 56 | 90.0 | 154 | 67.4 | 87.5 |
| | CM112M | 31.0 | 30.0 | 54.0 | 45.0 | 44.0 | 78 | 120 | 216 | 87.4 | 108 |
| | CM112L | 45.0 | 46.0 | 78.0 | 65.0 | 67.0 | 113 | 184 | 312 | 128 | 148 |
| | CM112H | 68.0 | 66.0 | – | 95.0 | 92.0 | – | 264 | – | 189 | 209 |
| 6000 | CM71S | 5.0 | 6.5 | 11.6 | 7.3 | 7.2 | 16.8 | 26.0 | 46.5 | 4.85 | 6.89 |
| | CM71M | 6.5 | 8.6 | 14.1 | 9.4 | 9.6 | 20.5 | 34.0 | 56 | 6.27 | 8.31 |
| | CM71L | 9.5 | 12.5 | 21.5 | 13.8 | 14.0 | 31.0 | 50.0 | 86 | 9.1 | 11.1 |
| | CM90S | 11.0 | 14.5 | 23.5 | 16.0 | 16.2 | 34.0 | 58.0 | 94 | 14.3 | 19.8 |
| | CM90M | 14.5 | 19.8 | 37.0 | 21.0 | 21.5 | 54 | 79.0 | 148 | 18.6 | 24.1 |
| | CM90L | 21.0 | 29.5 | 51.0 | 30.5 | 31.5 | 74 | 118.0 | 204 | 27.1 | 32.6 |

1) For DS../CM.. synchronous servomotors with AC 400 V system voltage

2) with AC 230 V system voltage

## INFORMATION

Additional project planning notes and information on the DS../CM.. synchronous servomotors can be found in the "Servo Gearmotors" catalog, which can be ordered from SEW-EURODRIVE.

27793230/EN – 08/2022

### 9.7.4 CM.. motor selection (line AC 400 V / 50 Hz)

**1. Nominal speed $n_N$= 2000 min$^{-1}$:**

| Motor | | MOVIDRIVE® MDX61B...-5_3 (AC 400/500 V devices) in the SERVO operating modes (P700) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0005 | 0008 | 0011 | 0014 | 0015 | 0022 | 0030 | 0040 | 0055 | 0075 | 0110 | 0150 | 0220 | 0300 | 0370 | 0450 |
| CM71S | $M_{max}$ Nm | 8.97 | 10.6 | 13.1 | 15.7 | 12.8 | 16 | 16.5 | | | | | | | | | |
| CM71M | $M_{max}$ Nm | 8.88 | 10.6 | 13.4 | 16.6 | 13 | 17 | 20.2 | 21.5 | | | | | | | | |
| CM71L | $M_{max}$ Nm | | 10.8 | 13.9 | 17.7 | 13.5 | 18.2 | 22.5 | 28.4 | 31.4 | | | | | | | |
| CM90S | $M_{max}$ Nm | | | 13.9 | 17.9 | 13.5 | 18.5 | 23.3 | 30.8 | 38.3 | 39.6 | | | | | | |
| CM90M | $M_{max}$ Nm | | | | 17 | 12.7 | 17.5 | 22.2 | 29.8 | 38.4 | 47.3 | 52.2 | | | | | |
| CM90L | $M_{max}$ Nm | | | | | | 17.6 | 22.4 | 30.3 | 39.5 | 49.9 | 70.6 | 75.6 | | | | |
| CM112S | $M_{max}$ Nm | | | | | | 19.3 | 24.6 | 33.4 | 43.6 | 54.8 | 76.2 | 82.3 | | | | |
| CM112M | $M_{max}$ Nm | | | | | | | 24.1 | 32.8 | 43.2 | 54.9 | 79.6 | 100 | 108 | | | |
| CM112L | $M_{max}$ Nm | | | | | | | | | 42 | 53.8 | 80.2 | 105 | 141 | 158 | | |
| CM112H | $M_{max}$ Nm | | | | | | | | | | 53.3 | 80.3 | 107 | 151 | 190 | 220 | 238 |

**2. Nominal speed $n_N$= 3000 min$^{-1}$:**

| Motor | | MOVIDRIVE® MDX61B...-5_3 (AC 400/500 V devices) in the SERVO operating modes (P700) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 0005 | 0008 | 0011 | 0014 | 0015 | 0022 | 0030 | 0040 | 0055 |
| CM71S | $M_{max}$ Nm | 6.07 | 7.26 | 9.25 | 11.6 | 8.97 | 11.9 | 14.3 | 16.5 | |
| CM71M | $M_{max}$ Nm | | 7.46 | 9.58 | 12.2 | 9.28 | 12.5 | 15.5 | 19.5 | 21.5 |
| CM71L | $M_{max}$ Nm | | | 9.49 | 12.2 | 9.19 | 12.6 | 15.9 | 21 | 26.2 |
| CM90S | $M_{max}$ Nm | | | | 12.1 | 9.07 | 12.5 | 15.8 | 21.3 | 27.5 |
| CM90M | $M_{max}$ Nm | | | | | | 12 | 15.2 | 20.6 | 26.9 |
| CM90L | $M_{max}$ Nm | | | | | | | | 20.9 | 27.4 |
| CM112S | $M_{max}$ Nm | | | | | | | | 22.2 | 29.3 |
| CM112M | $M_{max}$ Nm | | | | | | | | | 28.4 |

| Motor | | MOVIDRIVE® MDX61B...-5_3 (AC 400/500 V devices) in the SERVO operating modes (P700) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 0075 | 0110 | 0150 | 0220 | 0300 | 0370 | 0450 | 0550 | 0750 |
| CM71L | $M_{max}$ Nm | 30.8 | 31.4 | | | | | | | |
| CM90S | $M_{max}$ Nm | 34.1 | 39.6 | | | | | | | |
| CM90M | $M_{max}$ Nm | 34 | 48.2 | 52.2 | | | | | | |
| CM90L | $M_{max}$ Nm | 34.9 | 51.3 | 65.9 | 75.6 | | | | | |
| CM112S | $M_{max}$ Nm | 37.4 | 54.8 | 69.8 | 82.3 | | | | | |
| CM112M | $M_{max}$ Nm | 36.4 | 54.3 | 71 | 96 | 108 | | | | |
| CM112L | $M_{max}$ Nm | 35.7 | 53.8 | 71.5 | 101 | 127 | 147 | 158 | | |
| CM112H | $M_{max}$ Nm | | 56.8 | 75.9 | 109 | 140 | 167 | 198 | 224 | 238 |

27793230/EN – 08/2022

### 3. Nominal speed $n_N$= 4500 min$^{-1}$:

| Motor | | MOVIDRIVE® MDX61B...-5_3 (AC 400/500 V devices) in the SERVO operating modes (P700) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 0005 | 0008 | 0011 | 0014 | 0015 | 0022 | 0030 | 0040 |
| CM71S | $M_{max}$ Nm | | | 6.34 | 8.11 | 6.13 | 8.35 | 10.4 | 13.4 |
| CM71M | $M_{max}$ Nm | | | | 8.09 | 6.08 | 8.34 | 10.5 | 13.9 |
| CM71L | $M_{max}$ Nm | | | | | | 8.15 | 10.4 | 14 |
| CM90S | $M_{max}$ Nm | | | | | | | 10.4 | 14.1 |
| CM90M | $M_{max}$ Nm | | | | | | | | 14.2 |

| Motor | | MOVIDRIVE® MDX61B...-5_3 (AC 400/500 V devices) in the SERVO operating modes (P700) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0055 | 0075 | 0110 | 0150 | 0220 | 0300 | 0370 | 0450 | 0550 | 0750 | 0900 | 1100 |
| CM71S | $M_{max}$ Nm | 16.2 | 16.5 | | | | | | | | | | |
| CM71M | $M_{max}$ Nm | 17.5 | 20.7 | 21.5 | | | | | | | | | |
| CM71L | $M_{max}$ Nm | 18.1 | 22.5 | 30.3 | 31.4 | | | | | | | | |
| CM90S | $M_{max}$ Nm | 18.5 | 23.5 | 33.7 | 39.6 | | | | | | | | |
| CM90M | $M_{max}$ Nm | 18.6 | 23.8 | 35 | 45 | 52.2 | | | | | | | |
| CM90L | $M_{max}$ Nm | 18.3 | 23.4 | 34.9 | 46 | 63.7 | 75.6 | | | | | | |
| CM112S | $M_{max}$ Nm | 19.5 | 25 | 37.4 | 49.2 | 67.5 | 82.3 | 82.3 | | | | | |
| CM112M | $M_{max}$ Nm | | 24.8 | 37.3 | 49.6 | 69.6 | 87.8 | 102 | 108.0 | | | | |
| CM112L | $M_{max}$ Nm | | | 34.9 | 46.8 | 67.2 | 86.8 | 104 | 123 | 141 | 158 | | |
| CM112H | $M_{max}$ Nm | | | | | 71.1 | 92.7 | 112 | 136 | 158 | 190 | 232 | 238 |

### 4. Nominal speed $n_N$= 6000 min$^{-1}$:

| Motor | | MOVIDRIVE® MDX61B...-5_3 (AC 400/500 V devices) in the SERVO operating modes (P700) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0005 | 0008 | 0011 | 0014 | 0015 | 0022 | 0030 | 0040 | 0055 | 0075 | 0110 | 0150 | 0220 | 0300 | 0370 | 0450 |
| CM71S | $M_{max}$ Nm | | | | 6.17 | 4.63 | 6.36 | 8.03 | 10.6 | 13.3 | 15.8 | 16.5 | | | | | |
| CM71M | $M_{max}$ Nm | | | | | | 6.41 | 8.15 | 10.9 | 14.1 | 17.2 | 21.5 | | | | | |
| CM71L | $M_{max}$ Nm | | | | | | | 7.97 | 10.8 | 14.1 | 17.9 | 25.2 | 30.7 | 31.4 | | | |
| CM90S | $M_{max}$ Nm | | | | | | | | 10.8 | 14.2 | 18.2 | 26.7 | 34.3 | 39.6 | | | |
| CM90M | $M_{max}$ Nm | | | | | | | | | 13.9 | 17.7 | 26.4 | 34.6 | 47.4 | 52.2 | | |
| CM90L | $M_{max}$ Nm | | | | | | | | | | 17.2 | 25.7 | 34.1 | 48.3 | 61.3 | 71.7 | 75.6 |

27793230/EN – 08/2022

### 9.7.5 CM.. motor selection (line AC 230 V)

**Nominal speed $n_N$= 2000 min$^{-1}$:**

| Motor | | MOVIDRIVE® MDX61B...-2_3 (AC 230 V devices) in the SERVO operating modes (P700) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 0015 | 0022 | 0037 | 0055 | 0075 | 0110 | 0150 | 0220 | 0300 |
| CM71S | $M_{max}$ Nm | 12.9 | 14.6 | 16.5 | | | | | | |
| CM71M | $M_{max}$ Nm | 13.4 | 15.4 | 21.5 | | | | | | |
| CM71L | $M_{max}$ Nm | 14 | 16.3 | 25.6 | 31.4 | | | | | |
| CM90S | $M_{max}$ Nm | 13.9 | 16.3 | 26.9 | 38.1 | 39.6 | | | | |
| CM90M | $M_{max}$ Nm | 13.2 | 15.6 | 26.1 | 38.5 | 48.5 | 52.2 | | | |
| CM90L | $M_{max}$ Nm | | 15.9 | 26.8 | 40.3 | 52.2 | 71.3 | 75.6 | | |
| CM112S | $M_{max}$ Nm | | | 28.3 | 42.7 | 55.1 | 74.7 | 82.3 | | |
| CM112M | $M_{max}$ Nm | | | 27.5 | 41.9 | 54.9 | 77.1 | 94.8 | 108 | |
| CM112L | $M_{max}$ Nm | | | | 41.6 | 54.9 | 79.1 | 100 | 139 | 158 |
| CM112H | $M_{max}$ Nm | | | | | 56.7 | 82.4 | 106 | 153 | 178 |

**Nominal speed $n_N$= 3000 min$^{-1}$:**

| Motor | | MOVIDRIVE® MDX61B...-2_3 (AC 230 V devices) in the SERVO operating modes (P700) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 0015 | 0022 | 0037 | 0055 | 0075 | 0110 | 0150 | 0220 | 0300 |
| CM71S | $M_{max}$ Nm | 9.15 | 10.6 | 15.8 | 16.5 | | | | | |
| CM71M | $M_{max}$ Nm | 9.58 | 11.2 | 17.6 | 21.5 | | | | | |
| CM71L | $M_{max}$ Nm | 9.36 | 11.0 | 18.2 | 25.8 | 31 | 31.4 | | | |
| CM90S | $M_{max}$ Nm | 9.51 | 11.2 | 18.8 | 27.8 | 35.3 | 39.6 | | | |
| CM90M | $M_{max}$ Nm | | | 18.3 | 27.5 | 35.6 | 48.8 | 52.2 | | |
| CM90L | $M_{max}$ Nm | | | 18 | 27.2 | 35.7 | 50.8 | 63.4 | 75.6 | |
| CM112S | $M_{max}$ Nm | | | 18.8 | 28.7 | 37.7 | 53.4 | 66.3 | 82.3 | |
| CM112M | $M_{max}$ Nm | | | | 29.3 | 38.6 | 55.6 | 70.3 | 97.4 | 108 |
| CM112L | $M_{max}$ Nm | | | | | 40.5 | 58.8 | 75.4 | 109 | 126 |
| CM112H | $M_{max}$ Nm | | | | | | 58.5 | 75.5 | 111 | 131 |

**Nominal speed $n_N$= 4500 min$^{-1}$:**

| Motor | | MOVIDRIVE® MDX61B...-2_3 (AC 230 V devices) in the SERVO operating modes (P700) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 0015 | 0022 | 0037 | 0055 | 0075 | 0110 | 0150 | 0220 | 0300 |
| CM71S | $M_{max}$ Nm | 6.45 | 7.56 | 12.1 | 16.3 | 16.5 | | | | |
| CM71M | $M_{max}$ Nm | 6.48 | 7.63 | 12.6 | 17.8 | 21.4 | 21.5 | | | |
| CM71L | $M_{max}$ Nm | | 7.15 | 12.1 | 17.9 | 22.8 | 29.9 | 31.4 | | |
| CM90S | $M_{max}$ Nm | | | 12.7 | 19.1 | 24.9 | 34.5 | 39.6 | | |
| CM90M | $M_{max}$ Nm | | | 12.2 | 18.6 | 24.3 | 34.6 | 43.2 | 52.2 | |
| CM90L | $M_{max}$ Nm | | | | 17.8 | 23.5 | 33.9 | 43.2 | 61.7 | 70.8 |
| CM112S | $M_{max}$ Nm | | | | 20 | 26.5 | 38.2 | 48.6 | 68.3 | 77.7 |
| CM112M | $M_{max}$ Nm | | | | | 24.9 | 36.3 | 46.6 | 67.7 | 78.9 |

**Nominal speed $n_N$= 6000 min$^{-1}$:**

| Motor | | MOVIDRIVE® MDX61B...-2_3 (AC 230 V devices) in the SERVO operating modes (P700) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 0015 | 0022 | 0037 | 0055 | 0075 | 0110 | 0150 | 0220 | 0300 |
| CM71S | $M_{max}$ Nm | 4.74 | 5.58 | 9.23 | 13.2 | 16 | 16.5 | | | |
| CM71M | $M_{max}$ Nm | 5.19 | 6.12 | 10.2 | 14.9 | 18.6 | 21.5 | | | |
| CM71L | $M_{max}$ Nm | | | 9.6 | 14.5 | 18.7 | 25.6 | 30.3 | 31.4 | |
| CM90S | $M_{max}$ Nm | | | 10.2 | 15.5 | 20.2 | 28.6 | 35.4 | 39.6 | |
| CM90M | $M_{max}$ Nm | | | | 13.1 | 17.2 | 24.8 | 31.5 | 44.7 | 51 |
| CM90L | $M_{max}$ Nm | | | | | 18 | 26 | 33.3 | 48.6 | 56.8 |

27793230/EN – 08/2022

### 9.7.6 CMP.. motor table

**Key to the technical data**

| | |
|---|---|
| $n_N$ | Rated speed |
| $M_0$ | Standstill torque (thermal continuous torque at low speeds) |
| $I_0$ | Standstill current |
| $M_{pk}$ | Dynamic limit torque |
| $I_{max}$ | Maximum permitted motor current |
| $M_{0VR}$ | Standstill torque with forced cooling fan |
| $I_{0VR}$ | Standstill current with forced cooling fan |
| $J_{mot}$ | Mass moment of inertia of the motor |
| $J_{bmot}$ | Mass moment of inertia of the brakemotor |
| $M_{1m,100°C}$ | Maximum dynamic braking torque in case of emergency off |
| $M_{1max}$ | Minimal averaged dynamic braking torque in case of emergency off at 100 °C |
| $M_{2,\ 20\ °C}$ | Nominal torque for slipping brake disk (relative speed between brake disk and friction surface: 1 m/s) at 20 °C |
| $M_{4,100\ °C}$ | Minimum holding torque at 100 °C |
| $W_{max1}$ | Maximum permitted braking work per braking operation |
| $W_{max2}$ | Maximum permitted braking work per braking operation with optional braking torque |
| $L_1$ | Inductance between connection phase and star point |
| $R_1$ | Resistance between connection phase and star point |
| $V_{p0}$ cold | Internal voltage at 1000 $min^{-1}$ |
| $m_{mot}$ | Mass of the motor |
| $m_{bmot}$ | Mass of the brakemotor |

**CMP40 – CMP112, 400 V**

Information on motors

| $n_N$ $min^{-1}$ | Motor | $M_0$ Nm | $I_0$ A | $M_{pk}$ Nm | $I_{max}$ A | $M_{0VR}$ Nm | $I_{0VR}$ A | m kg | $J_{mot}$ $10^{-4}kgm^2$ | $L_1$ mH | $R_1$ Ω | $V_{p0}$ cold V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2000 | CMP71S | 6.4 | 3.4 | 19.2 | 17 | 8.7 | 4.6 | 7 | 3.13 | 33.5 | 3.48 | 128 |
| | CMP71M | 9.4 | 5 | 30.8 | 26 | 13.7 | 7.3 | 8.4 | 4.17 | 21.6 | 1.87 | 127 |
| | CMP71L | 13.1 | 6.3 | 46.9 | 39 | 21 | 10.1 | 11.4 | 6.27 | 16.2 | 1.2 | 142 |
| | CMP80S | 13.4 | 6.9 | 42.1 | 33 | 18.5 | 9.5 | 12.8 | 9 | 15.3 | 1.1 | 133 |
| | CMP80M | 18.7 | 9.3 | 62.6 | 48 | 27 | 13.4 | 16.5 | 12.1 | 10.5 | 0.689 | 136 |
| | CMP80L | 27.5 | 12.5 | 107 | 72 | 44 | 20 | 21.4 | 18.3 | 7.58 | 0.438 | 149 |
| | CMP100S | 25.5 | 13.3 | 68.3 | 49 | 36 | 18.8 | 19.8 | 20.3 | 8.51 | 0.439 | 130 |
| | CMP100M | 31 | 14.7 | 108 | 69 | 47 | 22.3 | 24.8 | 27.2 | 6.63 | 0.302 | 141 |
| | CMP100L | 47 | 21.8 | 178.8 | 113 | 70 | 32.5 | 34.6 | 40.9 | 4.17 | 0.169 | 145 |
| | CMP112S | 30 | 14.3 | 88 | 51 | 43 | 21 | 38.4 | 74 | 8.63 | 0.38 | 143 |
| | CMP112M | 45 | 21 | 136 | 74 | 68 | 32 | 46.2 | 103 | 5.82 | 0.212 | 147 |
| | CMP112L | 69 | 33 | 225 | 124 | 109 | 52 | 62.6 | 163 | 3.33 | 0.105 | 145 |
| | CMP112H | 83 | 38 | 270 | 148 | 123 | 57 | 70.4 | 193 | 2.85 | 0.0846 | 149 |
| | CMP112E | 95 | 44.5 | 320 | 175 | 150 | 71 | 78.2 | 222 | 2.34 | 0.066 | 146 |

27793230/EN – 08/2022

| $n_N$ min$^{-1}$ | Motor | $M_0$ Nm | $I_0$ A | $M_{pk}$ Nm | $I_{max}$ A | $M_{0VR}$ Nm | $I_{0VR}$ A | m kg | $J_{mot}$ $10^{-4}$kgm$^2$ | $L_1$ mH | $R_1$ Ω | $V_{p0}$ cold V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3000 | CMP40S | 0.5 | 1.2 | 1.9 | 6.1 | — | — | 1.3 | 0.1 | 23 | 11.9 | 27.5 |
| | CMP40M | 0.8 | 0.95 | 3.8 | 6 | — | — | 1.6 | 0.15 | 45.9 | 19.9 | 56.3 |
| | CMP50S | 1.3 | 0.96 | 5.2 | 5.1 | 1.7 | 1.25 | 2.3 | 0.42 | 71.2 | 22.5 | 86.3 |
| | CMP50M | 2.4 | 1.68 | 10.3 | 9.6 | 3.5 | 2.45 | 3.3 | 0.67 | 38.3 | 9.96 | 90.3 |
| | CMP50L | 3.3 | 2.2 | 15.4 | 13.6 | 4.8 | 3.2 | 4.1 | 0.92 | 30.4 | 7.42 | 98.2 |
| | CMP63S | 2.9 | 2.15 | 11.1 | 12.9 | 4 | 3 | 4 | 1.15 | 36.4 | 6.8 | 90.1 |
| | CMP63M | 5.3 | 3.6 | 21.4 | 21.6 | 7.5 | 5.1 | 5.7 | 1.92 | 21.8 | 3.56 | 100 |
| | CMP63L | 7.1 | 4.95 | 30.4 | 29.7 | 10.3 | 7.2 | 7.5 | 2.69 | 14.2 | 2.07 | 99.9 |
| | CMP71S | 6.4 | 4.9 | 19.2 | 25 | 8.7 | 6.7 | 7 | 3.13 | 15.7 | 1.48 | 87.5 |
| | CMP71M | 9.4 | 7.5 | 30.8 | 39 | 13.7 | 10.9 | 8.4 | 4.17 | 9.72 | 0.809 | 85.3 |
| | CMP71L | 13.1 | 9.4 | 46.9 | 58 | 21 | 15.1 | 11.4 | 6.27 | 7.34 | 0.559 | 95.7 |
| | CMP80S | 13.4 | 10 | 42.1 | 47 | 18.5 | 13.8 | 12.8 | 9 | 7.2 | 0.544 | 91.1 |
| | CMP80M | 18.7 | 13.4 | 62.6 | 69 | 27 | 19.3 | 16.5 | 12.1 | 5.03 | 0.344 | 94.3 |
| | CMP80L | 27.5 | 18.7 | 107 | 107 | 44 | 30 | 21.4 | 18.3 | 3.37 | 0.21 | 99.2 |
| | CMP100S | 25.5 | 19.6 | 68.3 | 73 | 36 | 27.5 | 19.8 | 20.3 | 3.91 | 0.214 | 88 |
| | CMP100M | 31 | 21.8 | 108 | 102 | 47 | 33 | 24.8 | 27.2 | 3.04 | 0.142 | 95.5 |
| | CMP100L | 47 | 32.3 | 178.8 | 167 | 70 | 48 | 34.6 | 40.9 | 1.9 | 0.0809 | 98 |
| | CMP112S | 30 | 21 | 88 | 74 | 43 | 30.5 | 38.4 | 74 | 4.04 | 0.177 | 97.5 |
| | CMP112M | 45 | 32 | 136 | 113 | 68 | 49 | 46.2 | 103 | 2.49 | 0.0896 | 96.1 |
| | CMP112L | 69 | 49 | 225 | 183 | 109 | 77 | 62.6 | 163 | 1.53 | 0.048 | 98 |
| | CMP112H | 83 | 57 | 270 | 220 | 123 | 84 | 70.4 | 193 | 1.29 | 0.0388 | 100 |
| | CMP112E | 95 | 65 | 320 | 255 | 150 | 104 | 78.2 | 222 | 1.09 | 0.031 | 99.8 |
| 4500 | CMP40S | 0.5 | 1.2 | 1.9 | 6.1 | — | — | 1.3 | 0.1 | 23 | 11.9 | 27.5 |
| | CMP40M | 0.8 | 0.95 | 3.8 | 6 | — | — | 1.6 | 0.15 | 45.9 | 19.9 | 56.3 |
| | CMP50S | 1.3 | 1.32 | 5.2 | 7 | 1.7 | 1.7 | 2.3 | 0.42 | 37.2 | 11.6 | 62.4 |
| | CMP50M | 2.4 | 2.3 | 10.3 | 13.1 | 3.5 | 3.35 | 3.3 | 0.67 | 20.7 | 5.29 | 66.3 |
| | CMP50L | 3.3 | 3.15 | 15.4 | 19.5 | 4.8 | 4.6 | 4.1 | 0.92 | 14.6 | 3.57 | 68 |
| | CMP63S | 2.9 | 3.05 | 11.1 | 18.3 | 4 | 4.2 | 4 | 1.15 | 18.3 | 3.35 | 63.9 |
| | CMP63M | 5.3 | 5.4 | 21.4 | 32.4 | 7.5 | 7.6 | 5.7 | 1.92 | 9.79 | 1.48 | 67 |
| | CMP63L | 7.1 | 6.9 | 30.4 | 41.4 | 10.3 | 10 | 7.5 | 2.69 | 7.21 | 1.07 | 71.1 |
| | CMP71S | 6.4 | 7.3 | 19.2 | 38 | 8.7 | 9.9 | 7 | 3.13 | 7.07 | 0.719 | 58.7 |
| | CMP71M | 9.4 | 10.9 | 30.8 | 57 | 13.7 | 15.9 | 8.4 | 4.17 | 4.54 | 0.384 | 58.3 |
| | CMP71L | 13.1 | 14.1 | 46.9 | 87 | 21 | 22.5 | 11.4 | 6.27 | 3.26 | 0.241 | 63.8 |
| | CMP80S | 13.4 | 15.3 | 42.1 | 73 | 18.5 | 21 | 12.8 | 9 | 3.06 | 0.221 | 59.4 |
| | CMP80M | 18.7 | 20.1 | 62.6 | 103 | 27 | 29 | 16.5 | 12.1 | 2.24 | 0.148 | 62.9 |
| | CMP80L | 27.5 | 27.8 | 107 | 159 | 44 | 44.5 | 21.4 | 18.3 | 1.54 | 0.0855 | 67 |
| | CMP100S | 25.5 | 30 | 68.3 | 111 | 36 | 42.5 | 19.8 | 20.3 | 1.68 | 0.0857 | 57.7 |
| | CMP100M | 31 | 33.1 | 108 | 154 | 47 | 50 | 24.8 | 27.2 | 1.32 | 0.065 | 62.9 |
| | CMP100L | 47 | 48.4 | 178.8 | 251 | 70 | 72 | 34.6 | 40.9 | 0.844 | 0.038 | 65.3 |
| | CMP112S | 30 | 31.5 | 88 | 112 | 43 | 45.5 | 38.4 | 74 | 1.78 | 0.0801 | 64.7 |
| | CMP112M | 45 | 47 | 136 | 168 | 68 | 72 | 46.2 | 103 | 1.14 | 0.0412 | 65 |
| | CMP112L | 69 | 73 | 225 | 275 | 107 | 114 | 62.6 | 163 | 0.68 | 0.0213 | 65.3 |
| | CMP112H | 83 | 86 | 270 | 335 | 123 | 128 | 70.4 | 193 | 0.557 | 0.0165 | 65.9 |
| | CMP112E | 95 | 98 | 320 | 385 | 150 | 156 | 78.2 | 222 | 0.484 | 0.0134 | 66.5 |

27793230/EN – 08/2022

| $n_N$ min$^{-1}$ | Motor | $M_0$ Nm | $I_0$ A | $M_{pk}$ Nm | $I_{max}$ A | $M_{0VR}$ Nm | $I_{0VR}$ A | m kg | $J_{mot}$ $10^{-4}$kgm$^2$ | $L_1$ mH | $R_1$ Ω | $V_{p0}$ cold V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6000 | CMP40S | 0.5 | 1.2 | 1.9 | 6.1 | — | — | 1.3 | 0.1 | 23 | 11.9 | 27.5 |
| | CMP40M | 0.8 | 1.1 | 3.8 | 6.9 | — | — | 1.6 | 0.15 | 34 | 15 | 48.5 |
| | CMP50S | 1.3 | 1.7 | 5.2 | 9 | 1.7 | 2.2 | 2.3 | 0.42 | 22.5 | 7.11 | 48.5 |
| | CMP50M | 2.4 | 3 | 10.3 | 17.1 | 3.5 | 4.4 | 3.3 | 0.67 | 12 | 3.21 | 50.5 |
| | CMP50L | 3.3 | 4.2 | 15.4 | 26 | 4.8 | 6.1 | 4.1 | 0.92 | 8.2 | 1.91 | 51 |
| | CMP63S | 2.9 | 3.9 | 11.1 | 23.4 | 4 | 5.4 | 4 | 1.15 | 11.2 | 2.1 | 50 |
| | CMP63M | 5.3 | 6.9 | 21.4 | 41.4 | 7.5 | 9.8 | 5.7 | 1.92 | 5.9 | 0.92 | 52 |
| | CMP63L | 7.1 | 9.3 | 30.4 | 55.8 | 10.3 | 13.5 | 7.5 | 2.69 | 4 | 0.62 | 53 |
| | CMP71S | 6.4 | 9.6 | 19.2 | 50 | 8.7 | 13.1 | 7 | 3.13 | 4.13 | 0.395 | 44.9 |
| | CMP71M | 9.4 | 14.7 | 30.8 | 76 | 13.7 | 21.5 | 8.4 | 4.17 | 2.53 | 0.206 | 43.5 |
| | CMP71L | 13.1 | 18.8 | 46.9 | 115 | 21 | 30 | 11.4 | 6.27 | 1.84 | 0.145 | 47.9 |
| | CMP80S | 13.4 | 20 | 42.1 | 95 | 18.5 | 27.5 | 12.8 | 9 | 1.8 | 0.136 | 45.6 |
| | CMP80M | 18.7 | 26.4 | 62.6 | 135 | 27 | 38 | 16.5 | 12.1 | 1.3 | 0.0873 | 47.9 |
| | CMP80L | 27.5 | 37.6 | 107 | 215 | 44 | 60 | 21.4 | 18.3 | 0.843 | 0.0507 | 49.6 |

### CMP40 – CMP100, 230 V

Information on motors

| $n_N$ min$^{-1}$ | Motor | $M_0$ Nm | $I_0$ A | $M_{pk}$ Nm | $I_{max}$ A | $M_{0VR}$ Nm | $I_{0VR}$ A | m kg | $J_{mot}$ $10^{-4}$kgm$^2$ | $L_1$ mH | $R_1$ Ω | $V_{p0}$ cold V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3000 | CMP40S | 0.5 | 1.2 | 1.9 | 6.1 | — | — | 1.3 | 0.1 | 23 | 11.9 | 27.5 |
| | CMP40M | 0.8 | 1.5 | 3.8 | 9 | — | — | 1.6 | 0.15 | 18.4 | 7.85 | 35.7 |
| | CMP50S | 1.3 | 1.64 | 5.2 | 9.8 | — | — | 2.3 | 0.42 | 24.3 | 7.39 | 50.4 |
| | CMP50M | 2.4 | 2.84 | 10.3 | 17.05 | — | — | 3.3 | 0.67 | 13.5 | 3.41 | 53.7 |
| | CMP50L | 3.3 | 3.84 | 15.4 | 23.1 | — | — | 4.1 | 0.92 | 9.79 | 2.34 | 55.7 |
| | CMP63S | 2.9 | 3.61 | 11.1 | 21.65 | — | — | 4 | 1.15 | 13 | 2.56 | 54 |
| | CMP63M | 5.3 | 6.35 | 21.4 | 38.1 | — | — | 5.7 | 1.92 | 7.09 | 1.12 | 57 |
| | CMP63L | 7.1 | 8.76 | 30.4 | 52.59 | — | — | 7.5 | 2.69 | 4.47 | 0.655 | 56 |
| | CMP71S | 6.4 | 8.7 | 19.2 | 44 | 8.7 | 11.8 | 7 | 3.13 | 5.03 | 0.483 | 49.5 |
| | CMP71M | 9.4 | 13.1 | 30.8 | 68 | 13.7 | 19.1 | 8.4 | 4.17 | 3.17 | 0.26 | 48.7 |
| | CMP71L | 13.1 | 16.8 | 46.9 | 103 | 21 | 27 | 11.4 | 6.27 | 2.31 | 0.163 | 53.7 |
| | CMP80S | 13.4 | 17.7 | 42.1 | 83 | 18.5 | 24.5 | 12.8 | 9 | 2.3 | 0.166 | 51.5 |
| | CMP80M | 18.7 | 23.5 | 62.6 | 121 | 27 | 34 | 16.5 | 12.1 | 1.64 | 0.113 | 53.9 |
| | CMP80L | 27.5 | 32.5 | 107 | 186 | 44 | 52 | 21.4 | 18.3 | 1.11 | 0.0728 | 57 |
| | CMP100S | 25.5 | 34.2 | 68.3 | 127 | — | — | 19.8 | 20.3 | 1.29 | 0.0664 | 50.5 |
| | CMP100M | 31 | 40 | 108 | 187 | — | — | 24.8 | 27.2 | 0.904 | 0.0445 | 52.1 |
| | CMP100L | 47 | 58.1 | 178.8 | 300 | — | — | 34.6 | 40.9 | 0.586 | 0.025 | 54.4 |
| 4500 | CMP40S | 0.5 | 1.2 | 1.9 | 6.1 | — | — | 1.3 | 0.1 | 23 | 11.9 | 27.5 |
| | CMP40M | 0.8 | 1.5 | 3.8 | 9 | — | — | 1.6 | 0.15 | 18.4 | 7.85 | 35.7 |
| | CMP50S | 1.3 | 2.29 | 5.2 | 13.75 | — | — | 2.3 | 0.42 | 12.3 | 3.73 | 35.9 |
| | CMP50M | 2.4 | 4.025 | 10.3 | 24.2 | — | — | 3.3 | 0.67 | 6.75 | 1.68 | 37.9 |
| | CMP50L | 3.3 | 5.53 | 15.4 | 33.2 | — | — | 4.1 | 0.92 | 4.73 | 1.14 | 38.7 |
| | CMP63S | 2.9 | 5.25 | 11.1 | 31.5 | — | — | 4 | 1.15 | 6.18 | 1.09 | 37.1 |
| | CMP63M | 5.3 | 9.78 | 21.4 | 58.7 | — | — | 5.7 | 1.92 | 2.99 | 0.462 | 37 |
| | CMP63L | 7.1 | 12.01 | 30.4 | 72.07 | — | — | 7.5 | 2.69 | 2.38 | 0.339 | 40.9 |
| | CMP71S | 6.4 | 12.8 | 19.2 | 67 | 8.7 | 17.4 | 7 | 3.13 | 2.29 | 0.226 | 33.4 |
| | CMP71M | 9.4 | 19.2 | 30.8 | 101 | 13.7 | 28 | 8.4 | 4.17 | 1.46 | 0.127 | 33.1 |
| | CMP71L | 13.1 | 25.6 | 46.9 | 158 | — | — | 11.4 | 6.27 | 1.05 | 0.0762 | 36.3 |
| | CMP80S | 13.4 | 27 | 42.1 | 129 | 18.5 | 37 | 12.8 | 9 | 0.983 | 0.0698 | 33.7 |
| | CMP80M | 18.7 | 35 | 62.6 | 180 | 27 | 51 | 16.5 | 12.1 | 0.73 | 0.051 | 35.9 |
| | CMP80L | 27.5 | 49.9 | 107 | 285 | — | — | 21.4 | 18.3 | 0.474 | 0.0305 | 37.2 |
| | CMP100S | 25.5 | 54.5 | 68.3 | 200 | — | — | 19.8 | 20.3 | 0.509 | 0.0268 | 31.7 |
| | CMP100M | 31 | 60 | 108 | 279 | — | — | 24.8 | 27.2 | 0.402 | 0.0179 | 34.7 |

| $n_N$ min$^{-1}$ | Motor | $M_0$ Nm | $I_0$ A | $M_{pk}$ Nm | $I_{max}$ A | $M_{0VR}$ Nm | $I_{0VR}$ A | m kg | $J_{mot}$ $10^{-4}$kgm$^2$ | $L_1$ mH | $R_1$ Ω | $V_{p0}$ cold V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6000 | CMP40S | 0.5 | 1.36 | 1.9 | 6.8 | — | — | 1.3 | 0.1 | 17.9 | 9.19 | 24.3 |
| | CMP40M | 0.8 | 1.91 | 3.8 | 11.5 | — | — | 1.6 | 0.15 | 11.2 | 4.83 | 27.8 |
| | CMP50S | 1.3 | 3.07 | 5.2 | 18.45 | — | — | 2.3 | 0.42 | 6.85 | 2 | 26.8 |
| | CMP50M | 2.4 | 5.25 | 10.3 | 31.5 | — | — | 3.3 | 0.67 | 3.97 | 1.03 | 29 |
| | CMP50L | 3.3 | 7.6 | 15.4 | 45.4 | — | — | 4.1 | 0.92 | 2.53 | 0.596 | 28.3 |
| | CMP63S | 2.9 | 6.78 | 11.1 | 40.7 | — | — | 4 | 1.15 | 3.69 | 0.668 | 28.7 |
| | CMP63M | 5.3 | 12.06 | 21.4 | 72.36 | 7.5 | 17.04 | 5.7 | 1.92 | 1.96 | 0.296 | 30 |
| | CMP71S | 6.4 | 17 | 19.2 | 89 | 8.7 | 23 | 7 | 3.13 | 1.32 | 0.124 | 25.3 |
| | CMP71M | 9.4 | 26.3 | 30.8 | 136 | — | — | 8.4 | 4.17 | 0.793 | 0.0663 | 24.4 |
| | CMP80S | 13.4 | 35.5 | 42.1 | 168 | 18.5 | 48.5 | 12.8 | 9 | 0.575 | 0.0416 | 25.7 |
| | CMP80M | 18.7 | 46.9 | 62.6 | 240 | — | — | 16.5 | 12.1 | 0.411 | 0.0282 | 26.9 |
| | CMP80L | 27.5 | 68 | 107 | 389 | — | — | 21.4 | 18.3 | 0.255 | 0.0155 | 27.3 |

27793230/EN – 08/2022

### 9.7.7 CMP.. motor selection (line AC 400 V)

**Nominal speed $n_N$= 2000 min$^{-1}$**

*Assignment of MOVIDRIVE® MDX61B0005-5_3 – MDX61B0110-5_3 (sizes 0 – 2):*

| Motor | | MOVIDRIVE® MDX61B...-5_3 (AC 400 V devices) in the SERVO operating modes (P700) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0005 | 0008 | 0011 | 0014 | 0015 | 0022 | 0030 | 0040 | 0055 | 0075 | 0110 |
| CMP71S | $M_{max}$ Nm | 6.47 | 7.64 | 9.58 | 11.8 | 9.34 | 12.1 | 14.4 | 17.1 | 18 | | |
| CMP71M | $M_{max}$ Nm | | | 9.63 | 12.3 | 9.37 | 12.7 | 15.7 | 20.1 | 24.2 | 27.4 | |
| CMP71L | $M_{max}$ Nm | | | | 13.6 | 10.2 | 14.1 | 17.8 | 23.7 | 30 | 36.1 | 41.1 |
| CMP80S | $M_{max}$ Nm | | | | 12.7 | 9.48 | 13.2 | 16.9 | 22.7 | 28.7 | 34 | 39.3 |
| CMP80M | $M_{max}$ Nm | | | | | | 13.9 | 17.7 | 23.8 | 30.8 | 38.2 | 51.1 |
| CMP100S | $M_{max}$ Nm | | | | | | | 17 | 23 | 30 | 37.6 | 52.2 |
| CMP80L | $M_{max}$ Nm | | | | | | | 19.1 | 25.9 | 33.7 | 42.6 | 61.3 |
| CMP100M | $M_{max}$ Nm | | | | | | | | 25 | 32.9 | 42 | 61.4 |
| CMP100L | $M_{max}$ Nm | | | | | | | | | 34 | 43.5 | 64.8 |

*Assignment of MOVIDRIVE® MDX61B0150-5_3 - MDX61B1320-5_3 (sizes 3 – 6):*

| Motor | | MOVIDRIVE® MDX61B...-5_3 (AC 400 V devices) in the SERVO operating modes (P700) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0150 | 0220 | 0300 | 0370 | 0450 | 0550 | 0750 | 0900 | 1100 | 1320 |
| CMP80M | $M_{max}$ Nm | 57 | | | | | | | | | |
| CMP100S | $M_{max}$ Nm | 62.2 | 68.3 | | | | | | | | |
| CMP80L | $M_{max}$ Nm | 77 | 89.4 | | | | | | | | |
| CMP100M | $M_{max}$ Nm | 78 | 98.8 | 100 | | | | | | | |
| CMP100L | $M_{max}$ Nm | 85.1 | 117 | 142 | 156 | | | | | | |

**Nominal speed $n_N$= 3000 min$^{-1}$**

*Assignment of MOVIDRIVE® MDX61B0005-5_3 - MDX61B0110-5_3 (sizes 0 – 2):*

| Motor | | MOVIDRIVE® MDX61B...-5_3 (AC 400 V devices) in the SERVO operating modes (P700) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0005 | 0008 | 0011 | 0014 | 0015 | 0022 | 0030 | 0040 | 0055 | 0075 | 0110 |
| CMP40S | $M_{max}$ Nm | 1.46 | 1.65 | 1.90 | | | | | | | | |
| CMP40M | $M_{max}$ Nm | 2.96 | 3.35 | 3.8 | | | | | | | | |
| CMP50S | $M_{max}$ Nm | 4.47 | 5.01 | 5.2 | | | | | | | | |
| CMP50M | $M_{max}$ Nm | 5.44 | 6.35 | 7.78 | 9.29 | | | | | | | |
| CMP63S | $M_{max}$ Nm | 5.15 | 5.97 | 7.25 | 8.62 | | | | | | | |
| CMP50L | $M_{max}$ Nm | 5.86 | 6.93 | 8.68 | 10.7 | 8.44 | 11 | 13.1 | 14 | | | |
| CMP63M | $M_{max}$ Nm | 6.08 | 7.18 | 8.99 | 11.1 | | | | | | | |
| CMP63L | $M_{max}$ Nm | | | 8.93 | 11.3 | | | | | | | |
| CMP71S | $M_{max}$ Nm | | | 6.92 | 8.7 | 6.74 | 8.97 | 11 | 13.9 | 16.4 | 18 | |
| CMP71M | $M_{max}$ Nm | | | | 8.33 | 6.32 | 8.62 | 10.9 | 14.4 | 18.2 | 21.9 | 27.4 |
| CMP71L | $M_{max}$ Nm | | | | | | 9.44 | 12 | 16.2 | 21.1 | 26.4 | 36.2 |
| CMP80S | $M_{max}$ Nm | | | | | | 8.98 | 11.5 | 15.8 | 20.7 | 25.9 | 34.7 |
| CMP80M | $M_{max}$ Nm | | | | | | | 12.3 | 16.7 | 21.8 | 27.6 | 39.5 |
| CMP100S | $M_{max}$ Nm | | | | | | | | | 20.5 | 26.2 | 38.2 |
| CMP80L | $M_{max}$ Nm | | | | | | | | 17.4 | 22.8 | 29 | 42.8 |
| CMP100M | $M_{max}$ Nm | | | | | | | | | 22.2 | 28.4 | 42.5 |
| CMP100L | $M_{max}$ Nm | | | | | | | | | | | 44 |

*Assignment of MOVIDRIVE® MDX61B0150-5_3 - MDX61B1320-5_3 (sizes 3 – 6):*

| Motor | | MOVIDRIVE® MDX61B...-5_3 (AC 400 V devices) in the SERVO operating modes (P700) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0150 | 0220 | 0300 | 0370 | 0450 | 0550 | 0750 | 0900 | 1100 | 1320 |
| CMP71L | $M_{max}$ Nm | 41.1 | | | | | | | | | |
| CMP80S | $M_{max}$ Nm | 39.3 | | | | | | | | | |
| CMP80M | $M_{max}$ Nm | 48.8 | 57 | | | | | | | | |
| CMP100S | $M_{max}$ Nm | 48.5 | 61.4 | 68.3 | | | | | | | |
| CMP80L | $M_{max}$ Nm | 55.5 | 74.8 | 89.4 | | | | | | | |
| CMP100M | $M_{max}$ Nm | 55.8 | 76.1 | 91.8 | 100 | | | | | | |
| CMP100L | $M_{max}$ Nm | 58.5 | 82.7 | 105 | 123 | 142 | 156 | | | | |

**Nominal speed $n_N$= 4500 min$^{-1}$**

*Assignment of MOVIDRIVE® MDX61B0005-5_3 – MDX61B0110-5_3 (sizes 0 – 2):*

| Motor | | MOVIDRIVE® MDX61B...-5_3 (AC 400 V devices) in the SERVO operating modes (P700) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0005 | 0008 | 0011 | 0014 | 0015 | 0022 | 0030 | 0040 | 0055 | 0075 | 0110 |
| CMP40S | $M_{max}$ Nm | 1.46 | 1.65 | 1.9 | | 1.89 | | | | | | |
| CMP40M | $M_{max}$ Nm | 2.96 | 3.35 | 3.8 | | 3.8 | | | | | | |
| CMP50S | $M_{max}$ Nm | 3.54 | 4.07 | 4.83 | 5.2 | 4.73 | 5.2 | | | | | |
| CMP50M | $M_{max}$ Nm | 4.11 | 4.85 | 6.05 | 7.43 | 5.88 | 7.61 | 9.04 | 10.3 | | | |
| CMP63S | $M_{max}$ Nm | 3.82 | 4.48 | 5.54 | 6.76 | 5.4 | 6.92 | 8.19 | 9.85 | 11.1 | | |
| CMP50L | $M_{max}$ Nm | 4.18 | 4.97 | 6.31 | 7.93 | 6.12 | 8.15 | 10 | 12.6 | 15.1 | | |
| CMP63M | $M_{max}$ Nm | | | 6.27 | 7.88 | 6.08 | 8.1 | 9.97 | 12.8 | 15.7 | 18.4 | 21.4 |
| CMP63L | $M_{max}$ Nm | | | | 8.31 | 6.33 | 8.55 | 10.7 | 14 | 17.7 | 21.5 | 28.2 |
| CMP71S[1)] | $M_{max}$ Nm | | | | 6.06 | 4.63 | 6.26 | 7.8 | 10.2 | 12.7 | 15 | 18 |
| CMP71M[1)] | $M_{max}$ Nm | | | | | | 5.98 | 7.58 | 10.2 | 13.1 | 16.3 | 22.4 |
| CMP71L[1)] | $M_{max}$ Nm | | | | | | | | 10.9 | 14.3 | 18.2 | 26.4 |
| CMP80S[1)] | $M_{max}$ Nm | | | | | | | | 10.2 | 13.5 | 17.4 | 25.5 |
| CMP80M[1)] | $M_{max}$ Nm | | | | | | | | | 14.6 | 18.7 | 27.6 |
| CMP100S[1)] | $M_{max}$ Nm | | | | | | | | | | 17.2 | 25.7 |
| CMP80L[1)] | $M_{max}$ Nm | | | | | | | | | | 19.7 | 29.3 |
| CMP100M[1)] | $M_{max}$ Nm | | | | | | | | | | | 28.1 |

1) Due to the high output frequency, the motors must be operated with a PWM frequency of at least 8 kHz (P864).

*Assignment of MOVIDRIVE® MDX61B0150-5_3 - MDX61B1320-5_3 (sizes 3 – 6):*

| Motor | | MOVIDRIVE® MDX61B...-5_3 (AC 400 V devices) in the SERVO operating modes (P700) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0150 | 0220 | 0300 | 0370 | 0450 | 0550 | 0750 | 0900 | 1100 | 1320 |
| CMP63L | $M_{max}$ Nm | 30.4 | | | | | | | | | |
| CMP71S[1)] | $M_{max}$ Nm | | | | | | | | | | |
| CMP71M[1)] | $M_{max}$ Nm | 26.4 | 27.4 | | | | | | | | |
| CMP71L[1)] | $M_{max}$ Nm | 33.3 | 41.1 | | | | | | | | |
| CMP80S[1)] | $M_{max}$ Nm | 31.8 | 38.4 | 39.3 | | | | | | | |
| CMP80M[1)] | $M_{max}$ Nm | 35.8 | 47.4 | 55.3 | 57 | | | | | | |
| CMP100S[1)] | $M_{max}$ Nm | 33.7 | 46.2 | 56 | 62.5 | 68.3 | | | | | |
| CMP80L[1)] | $M_{max}$ Nm | 38.6 | 53.9 | 67.5 | 78.5 | 89.4 | | | | | |
| CMP100M[1)] | $M_{max}$ Nm | 37.4 | 53 | 67.2 | 78.8 | 90.4 | 99.5 | 100 | | | |
| CMP100L[1)] | $M_{max}$ Nm | 39.2 | 56.2 | 72.6 | 87.2 | 104 | 119 | 140 | 156 | | |

1) Due to the high output frequency, the motors must be operated with a PWM frequency of at least 8 kHz (P864).

27793230/EN – 08/2022

### Nominal speed $n_N$= 6000 min$^{-1}$

*Assignment of MOVIDRIVE® MDX61B0005-5_3 – MDX61B0110-5_3 (sizes 0 – 2):*

| Motor[1] | | MOVIDRIVE® MDX61B...-5_3 (AC 400 V devices) in the SERVO operating modes (P700) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0005 | 0008 | 0011 | 0014 | 0015 | 0022 | 0030 | 0040 | 0055 | 0075 | 0110 |
| CMP40S | $M_{max}$ Nm | 1.46 | 1.65 | 1.9 | | 1.73 | 1.9 | | | | | |
| CMP40M | $M_{max}$ Nm | 2.64 | 3.04 | 3.58 | 3.8 | 3.19 | 3.8 | | | | | |
| CMP50S | $M_{max}$ Nm | 2.88 | 3.35 | 4.08 | 4.83 | 3.55 | 4.48 | 5.2 | 5.2 | | | |
| CMP50M | $M_{max}$ Nm | 3.22 | 3.81 | 4.8 | 5.99 | 4.07 | 5.41 | 6.63 | 8.37 | 10 | 10.3 | |
| CMP63S | $M_{max}$ Nm | 3.07 | 3.61 | 4.52 | 5.58 | 3.85 | 5.06 | 6.14 | 7.7 | 9.19 | 10.5 | 11.1 |
| CMP50L | $M_{max}$ Nm | | 3.78 | 4.82 | 6.12 | 4.05 | 5.47 | 6.84 | 8.95 | 11.2 | 13.4 | 15.4 |
| CMP63M | $M_{max}$ Nm | | | | 6.32 | 4.21 | 5.66 | 7.06 | 9.23 | 11.6 | 14.1 | 18.5 |
| CMP63L | $M_{max}$ Nm | | | | | | 5.58 | 7.03 | 9.36 | 12 | 14.9 | 20.8 |
| CMP71S | $M_{max}$ Nm | | | | | | 4.83 | 6.07 | 8.03 | 10.2 | 12.4 | 16.2 |
| CMP71M | $M_{max}$ Nm | | | | | | | | 7.62 | 9.94 | 12.5 | 17.9 |
| CMP71L | $M_{max}$ Nm | | | | | | | | 8.14 | 10.7 | 13.7 | 20.3 |
| CMP80S | $M_{max}$ Nm | | | | | | | | | 10.3 | 13.3 | 19.9 |
| CMP80M | $M_{max}$ Nm | | | | | | | | | | 14.3 | 21.3 |
| CMP80L | $M_{max}$ Nm | | | | | | | | | | | 21.8 |

1) At a nominal speed of nN= 6000 1/min, the motors must be operated with a minimum PWM frequency (P864) of 8 kHz due to the high output frequency.

*Assignment of MOVIDRIVE® MDX61B0150-5_3 - MDX61B1320-5_3 (sizes 3 – 6):*

| Motor[1] | | MOVIDRIVE® MDX61B...-5_3 (AC 400 V devices) in the SERVO operating modes (P700) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0150 | 0220 | 0300 | 0370 | 0450 | 0550 | 0750 | 0900 | 1100 | 1320 |
| CMP63M | $M_{max}$ Nm | 21.4 | 21.4 | | | | | | | | |
| CMP63L | $M_{max}$ Nm | 25.5 | 30.4 | 30.4 | | | | | | | |
| CMP71S | $M_{max}$ Nm | 18.0 | | | | | | | | | |
| CMP71M | $M_{max}$ Nm | 22.2 | 27.2 | 27.4 | | | | | | | |
| CMP71L | $M_{max}$ Nm | 26.4 | 35.2 | 41.1 | 41.1 | | | | | | |
| CMP80S | $M_{max}$ Nm | 25.9 | 33.8 | 38.4 | 39.3 | | | | | | |
| CMP80M | $M_{max}$ Nm | 28 | 38.6 | 47.2 | 53.2 | 57.0 | | | | | |
| CMP80L | $M_{max}$ Nm | 28.9 | 40.9 | 52.2 | 61.9 | 72.6 | 81.9 | 89.4 | | | |

1) At a nominal speed of nN= 6000 1/min, the motors must be operated with a minimum PWM frequency (P864) of 8 kHz due to the high output frequency.

27793230/EN – 08/2022

### 9.7.8 CMP.. motor selection (line AC 230 V)

**Nominal speed $n_N$= 3000 min$^{-1}$**

| Motor | | | MOVIDRIVE® MDX61B...-2_3 (AC 230 V devices) in the SERVO operating modes (P700) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0015 | 0022 | 0037 | 0055 | 0075 | 0110 | 0150 | 0220 | 0300 |
| CMP40S | $M_{max}$ | Nm | 1.9 | | | | | | | | |
| CMP40M | $M_{max}$ | Nm | 3.8 | | | | | | | | |
| CMP50S | $M_{max}$ | Nm | 5.2 | | | | | | | | |
| CMP50M | $M_{max}$ | Nm | 8.03 | 9.01 | 10.3 | | | | | | |
| CMP63S | $M_{max}$ | Nm | 7.51 | 8.4 | 11.1 | | | | | | |
| CMP50L | $M_{max}$ | Nm | 8.77 | 10.1 | 14.6 | 15.4 | | | | | |
| CMP63M | $M_{max}$ | Nm | 9 | 10.3 | 15.5 | 20 | 21.4 | | | | |
| CMP63L | $M_{max}$ | Nm | 8.91 | 10.4 | 16.4 | 22.8 | 27.4 | 30.4 | | | |
| CMP71S | $M_{max}$ | Nm | 6.91 | 8.02 | 12.4 | 16.3 | 18 | | | | |
| CMP71M | $M_{max}$ | Nm | 6.59 | 7.74 | 12.7 | 18.3 | 22.4 | 27.4 | | | |
| CMP71L | $M_{max}$ | Nm | | 8.25 | 13.9 | 20.8 | 26.7 | 35.7 | 41.1 | | |
| CMP80S | $M_{max}$ | Nm | | | 13.6 | 20.6 | 26.4 | 34.4 | 38.6 | 39.3 | |
| CMP80M | $M_{max}$ | Nm | | | 14.5 | 21.9 | 28.5 | 39.4 | 47.5 | 57 | |
| CMP100S | $M_{max}$ | Nm | | | | 20.7 | 27.2 | 38.3 | 47.3 | 61.3 | 66.4 |
| CMP80L | $M_{max}$ | Nm | | | | 23.1 | 30.2 | 43 | 54.1 | 74.8 | 84.5 |
| CMP100M | $M_{max}$ | Nm | | | | 21.2 | 28.1 | 40.6 | 51.6 | 72.9 | 83.2 |

**Nominal speed $n_N$= 4500 min$^{-1}$**

| Motor | | | MOVIDRIVE® MDX61B...-2_3 (AC 230 V devices) in the SERVO operating modes (P700) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0015 | 0022 | 0037 | 0055 | 0075 | 0110 | 0150 | 0220 | 0300 |
| CMP50L | $M_{max}$ | Nm | 6.34 | 7.36 | 11.4 | 14 | | | | | |
| CMP71S[1)] | $M_{max}$ | Nm | 4.81 | 5.62 | 9.04 | 12.7 | 15.3 | 18 | | | |
| CMP71M[1)] | $M_{max}$ | Nm | | | 8.87 | 13.1 | 16.7 | 22.3 | 25.8 | 27.4 | |
| CMP80S[1)] | $M_{max}$ | Nm | | | 8.75 | 13.5 | 17.9 | 25.3 | 30.9 | 38.2 | |
| CMP80M[1)] | $M_{max}$ | Nm | | | | 14.8 | 19.4 | 27.8 | 34.8 | 47.4 | 52.6 |
| CMP100S[1)] | $M_{max}$ | Nm | | | | | 17.1 | 24.8 | 31.5 | 44.6 | 51 |

1) Due to the high output frequency, the motors must be operated with a PWM frequency of at least 8 kHz (P864).

**Nominal speed $n_N$= 6000 min$^{-1}$**

| Motor[1)] | | | MOVIDRIVE® MDX61B...-2_3 (AC 230 V devices) in the SERVO operating modes (P700) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0015 | 0022 | 0037 | 0055 | 0075 | 0110 | 0150 | 0220 | 0300 |
| CMP40S | $M_{max}$ | Nm | 1.9 | | | | | | | | |
| CMP40M | $M_{max}$ | Nm | 3.3 | 3.65 | | | | | | | |
| CMP50S | $M_{max}$ | Nm | 3.58 | 4.05 | 5.2 | | | | | | |
| CMP50M | $M_{max}$ | Nm | 4.23 | 4.90 | 7.57 | 10 | 10.3 | | | | |
| CMP63S | $M_{max}$ | Nm | 4.02 | 4.63 | 7.02 | 9.26 | 10.7 | 11.1 | | | |
| CMP50L | $M_{max}$ | Nm | 4.08 | 4.77 | 7.72 | 11.0 | 13.4 | 15.4 | | | |
| CMP63M | $M_{max}$ | Nm | 4.38 | 5.11 | 8.21 | 11.7 | 14.5 | 18.5 | 21.1 | 21.4 | |
| CMP71S | $M_{max}$ | Nm | | 4.29 | 7.02 | 10.1 | 12.6 | 16.1 | 18 | | |
| CMP80S | $M_{max}$ | Nm | | | | 10.2 | 13.5 | 19.6 | 24.8 | 33.4 | 36.6 |

1) At a nominal speed of nN= 6000 1/min, the motors must be operated with a minimum PWM frequency (P864) of 8 kHz due to the high output frequency.

27793230/EN – 08/2022

## 9.8 SL2 synchronous linear motors

### INFORMATION

For detailed information on SL2 synchronous linear motors, refer to the operating instructions and the catalog "SL2 Synchronous Linear Motors". The documents are available for download from the homepage of SEW-EURODRIVE.

## 9.9 Overload capacity of the inverter

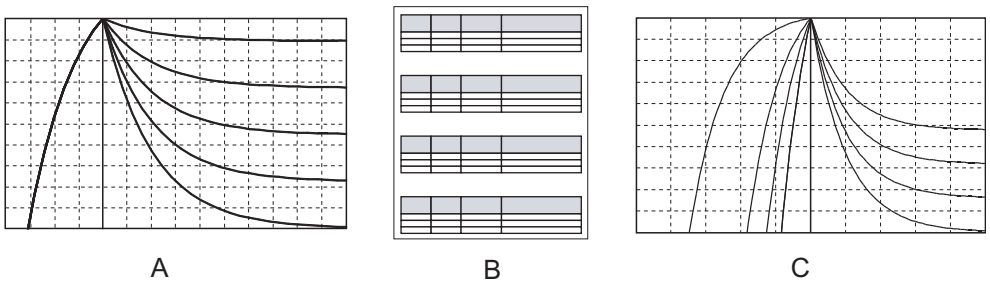
MOVIDRIVE® drive inverters calculate the load on the inverter output stage permanently (device utilization). Consequently, they enable the maximum possible power to be produced in each operating status. The heat sink constant T of the inverter is used as the time unit. The heat sink time constant T is different for every size (see section "Heat sink time constant")

### 9.9.1 Determining the overload capacity

The project planning software SEW-Workbench supports the inverter dimensioning with the function "detailed calculation" in the electronics selection for MOVIDRIVE® B. Use this function for correct dimensioning, especially for applications with output frequencies $f_O$ < 2 Hz.

Three steps are required to determine the overload capacity:

1. Determine the continuous output current $I_{out}$ depending on the output frequency (especially < 2 Hz) and the PWM frequency.
2. Characterize the duration of the overload:
   - Minutes: $t_{overload} \geq 0.25$ T (e.g. fans)
   - Seconds: $t_{overload} \geq 0.25$ T (e.g. roller conveyors)
   - Fraction of a second: $t_{overload} \leq 1$ s (e.g. dynamic servo applications)
3. Determine the overload capacity in the characterized time range (→ following figure):
   - Minutes: "Overload diagrams (A)" (→ 🗎 444)
   - Seconds: "Tables and formulas (B)" (→ 🗎 466)
   - Fraction of a second: "Overload diagrams (C)" (→ 🗎 469)



A B C

*2930850315*

27793230/EN – 08/2022

**Heat sink time constant T**

| Heat sink time constant T for inverter size | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 0S | 0M | 1 | 2 | 2S | 3 | 4 | 5 | 6 | 7 |
| 9.3 min = 560 s | 6 min = 360 s | 3.5 min = 210 s | 5 min = 300 s | 4 min = 240 s | 4 min = 240 s | 9 min = 540 s | 5 min = 300 s | 4.5 min = 270 s | 1.2 min = 72 s |

### 9.9.2 Load cycle

The required load cycle is the basis for determining the overload capacity of the inverter. The following conditions must be fulfilled for periodic repetition of a load cycle:

- At the end of the overload time $t_1$, the value is just below the critical heat sink temperature.
- During the following low-load time $t_2$, the heat sink temperature drops to such a degree that another overload is possible for the duration $t_1$.

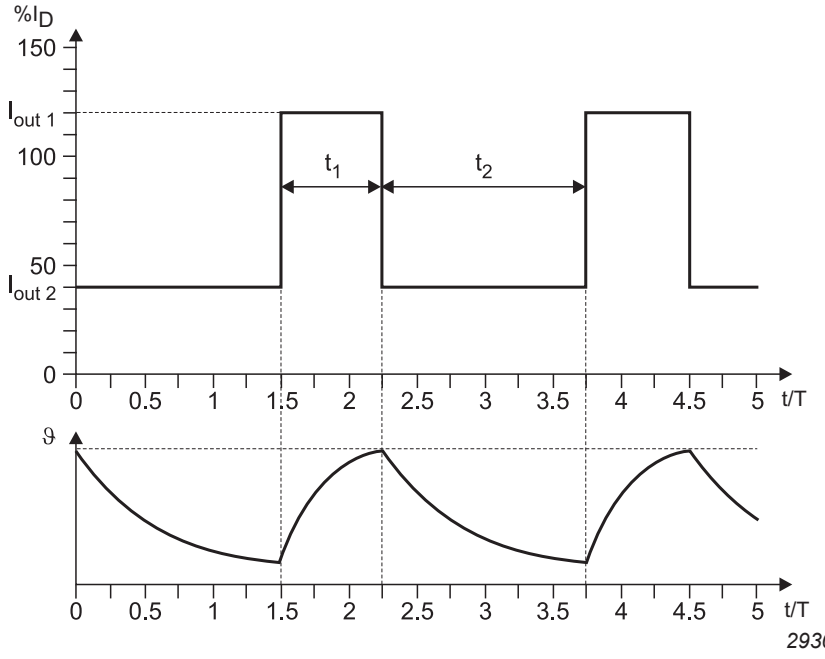
The following figure gives an example of such a load cycle. The temperature profiles of the heat sink for the overload time $t_1$ and the low-load time $t_2$ are shown under the load cycle. If you arrange the temperature profiles as shown in the following figure, you can check whether the overload limit is being exceeded.

**Example**

Sample load cycle:

- Overload current $I_{out\ 1}$ = 120% $I_D$
- Low-load current $I_{out\ 2}$ = 40% $I_D$
- Overload time $t_1$ = 0.75 × T
- Low-load time $t_2$ = 1.5 × T

The following figure gives an example of a load cycle.




27793230/EN – 08/2022

### 9.9.3 Continuous output current

The thermal model of MOVIDRIVE® is monitored. The maximum continuous output current $I_D$ is dependent on the PWM cycle frequency, the ambient temperature $\vartheta_{amb}$ and the output frequency $f_A$.

The project planning software SEW-Workbench supports the inverter dimensioning with the function "detailed calculation" in the electronics selection for MOVIDRIVE® B. Use this function for correct dimensioning, especially for applications with output frequencies $f_O$ < 2 Hz.

It is particularly important to consider output frequencies $f_{Output}$ < 2 Hz for:

- Electrically stopping hoists
- Torque control at low speeds or at a standstill

## INFORMATION

The output frequency of the inverter when used with asynchronous motors is based on the speed, number of pole pairs, and slip. With synchronous motors the output frequency of the inverter is based only on speed and number of pole pairs.

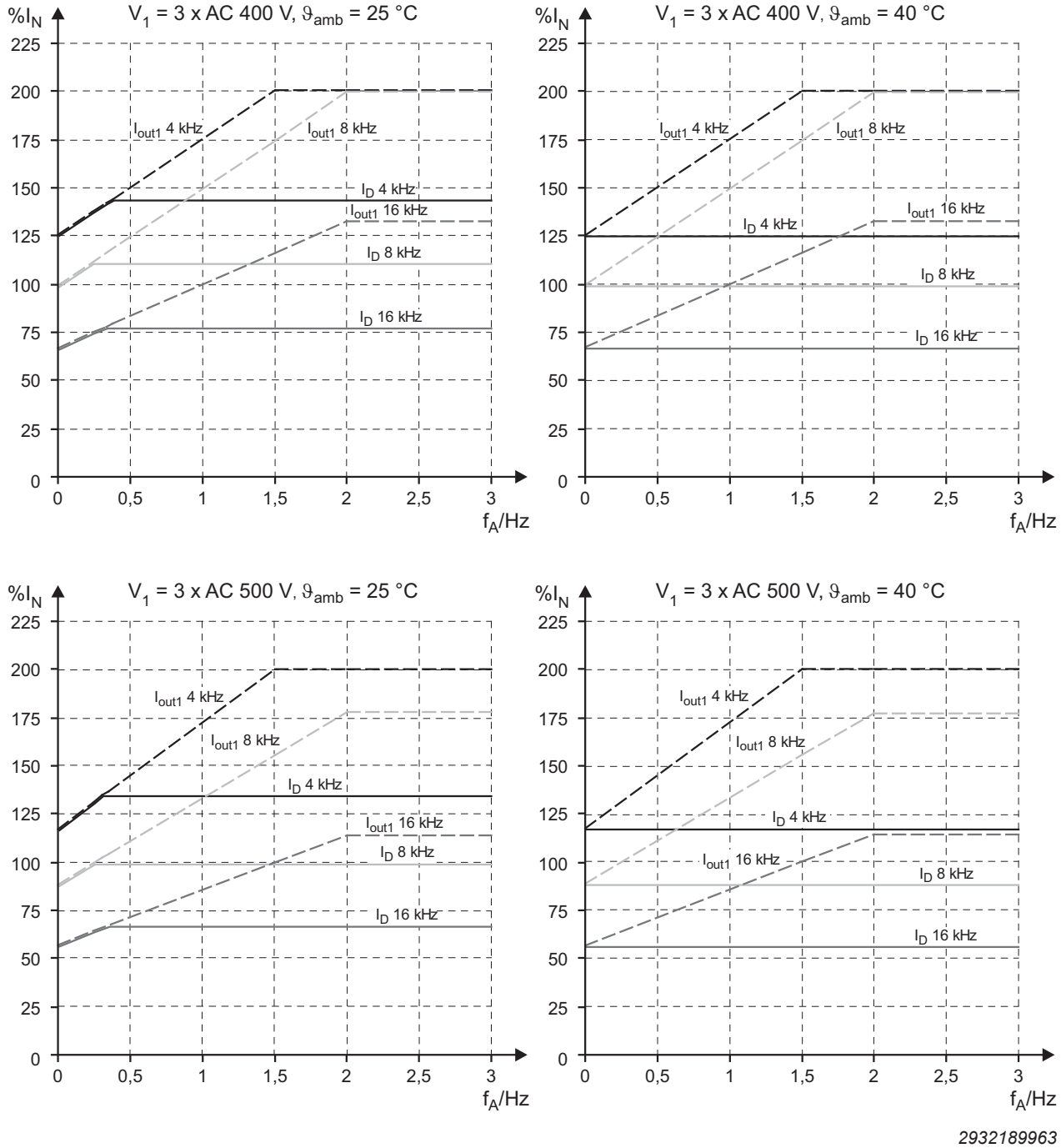
## NOTICE

With low rotational field frequencies (< 2 Hz) the output stage of the inverter is subject to disproportionate load. This must be taken into account during configuration.

- Select the lowest possible PWM frequency in *P860/P861* or *P864*
- Set parameter *P862/P863 PWM fixed* to Off (Not effective for operating modes CFC and SERVO)

27793230/EN – 08/2022

**MDX60B / 61B, size 0: Guaranteed continuous output currents $I_D$ depending on the output frequency $f_A$**




*2932189963*

$\vartheta_{amb}$ = Ambient temperature

$V_1$ = Line voltage

$f_O$ = Output frequency of the inverter

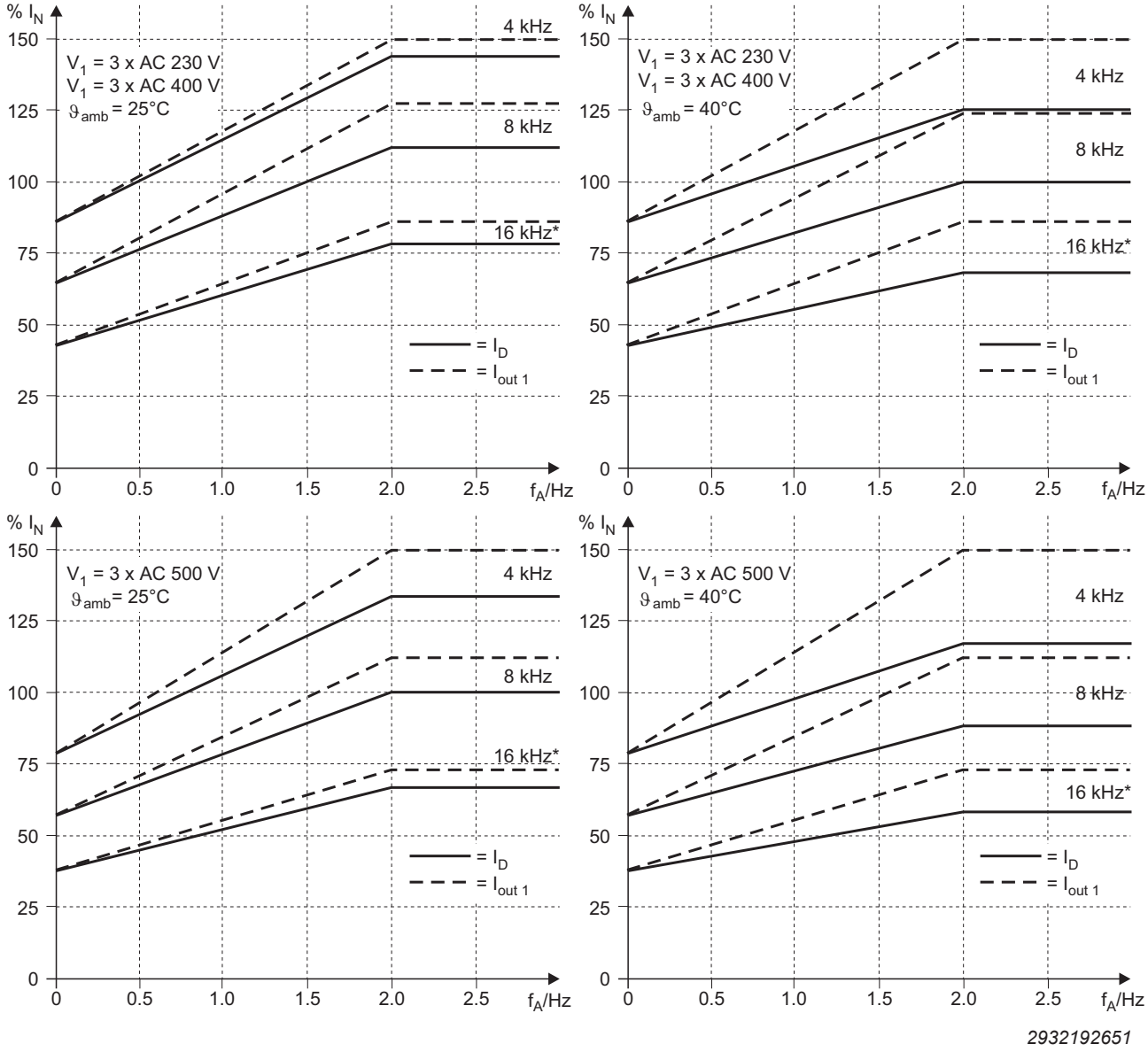
$I_D$ = Continuous output current of the inverter

$I_{out\,1}$ = Temporary overload current of the inverter

$I_N$ = Nominal output current of the inverter according to the technical data

27793230/EN – 08/2022

**MDX61B, sizes 1 – 6: Guaranteed continuous output currents $I_D$ depending on the output frequency $f_A$**

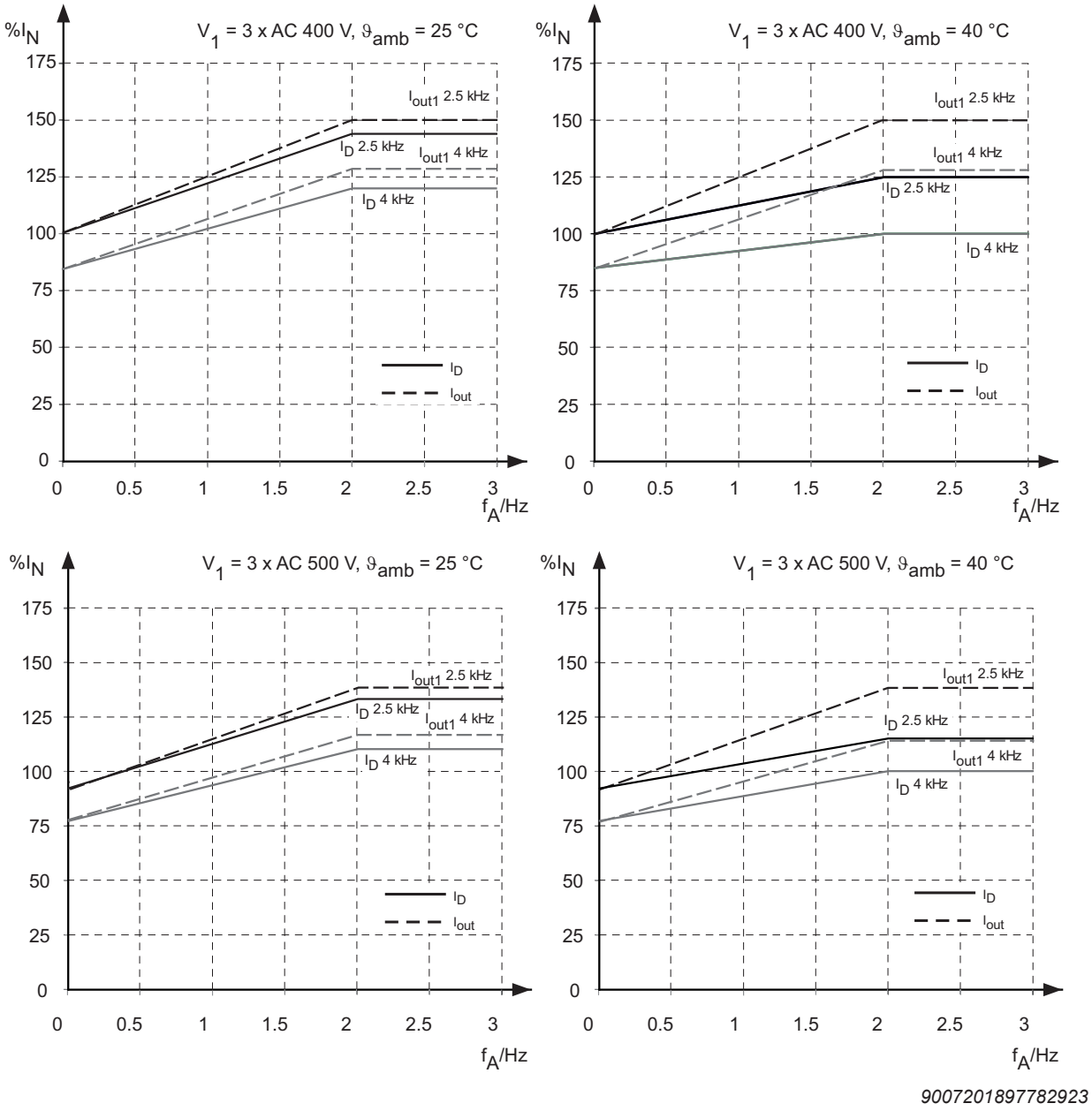



2932192651

| | | | |
|---|---|---|---|
| $\vartheta_{amb}$ | = Ambient temperature | $I_D$ | = Continuous output current of the inverter |
| $V_1$ | = Line voltage | $I_{out\ 1}$ | = Temporary overload current of the inverter |
| $f_O$ | = Output frequency of the inverter | $I_N$ | = Nominal output current of the inverter according to the technical data |
| $f_{PWM}$ | = PWM frequency (P860, P861) | | |

27793230/EN – 08/2022

**MDX61B size 7: Guaranteed continuous output currents $I_D$ depending on the output frequency $f_A$**




*9007201897782923*

$\vartheta_{amb}$ = Ambient temperature

$V_1$ = Line voltage

$f_O$ = Output frequency of the inverter

$I_D$ = Continuous output current of the inverter

$I_{out\ 1}$ = Temporary overload current of the inverter

$I_N$ = Nominal output current of the inverter according to the technical data

27793230/EN – 08/2022

### Device utilization

If "P860/P861 PWM frequency 1/2" > 4 kHz is set in the VFC and F/f modes and "P862/P863 PWM fix 1/2" is set to off, the inverter automatically reduces the PWM frequency in the event of a device overload. In the CFC and SERVO operating modes, the PWM frequency remains at the same setting and the inverter does not reduce the PWM frequency in the event of a device overload. If the inverter is subjected to a higher than permitted load, it issues the fault message "F44 Device utilization" and switches off immediately. The behavior must be taken into account during configuration.

### Temperature-controlled fan

The fans of the power section heat sink are subject to temperature-control. The fan is not switched on until above a heat sink temperature of $\vartheta$ = 45 °C.

27793230/EN – 08/2022

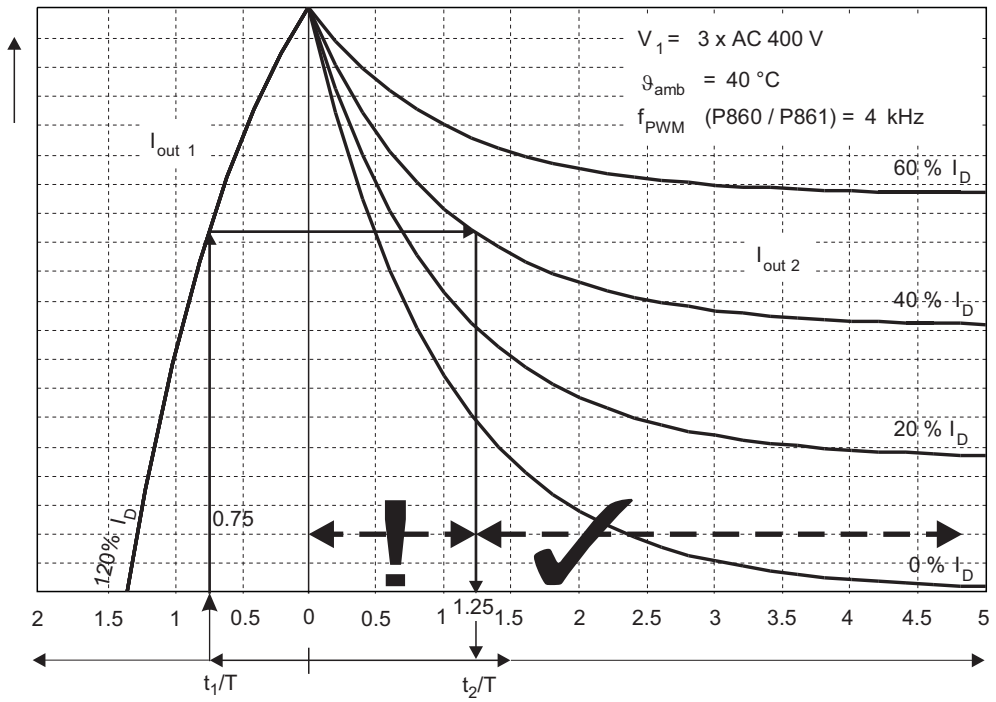
### 9.9.4 Overload capacity in the minute range

This is the overload capacity that corresponds to at least a quarter of the heat sink time constant (0.25 T). The overload usually lasts a few minutes. The overload capacity can be determined as follows:

Overload time $t_1 \geq 0.25 \times T \rightarrow$ determine using the diagrams

**Example**

Overload times $t_1 \geq 0.25 \times T$:




2932198411

Sample overload diagram

The time axis is separate. The left part shows the overload time $t_1$ and the right part the low-load time $t_2$. The temperature profile of the maximum permitted overload current $I_{out\ 1}$ is shown above $t_1$ for the corresponding peripheral conditions. The temperature profiles of the various low-load currents $I_{out\ 2}$ are shown in a series of curves above $t_2$.

Using the sample data above and the load cycle, the overload capacity (see figure) is determined as follows:

- When overload time $t_1 = 0.75 \times T$ vertically upwards until the intersection with $I_{out\ 1}$.
- Horizontally to the right up to the intersection with $I_{out\ 2} = 0.4 \times I_D$.
- Move vertically downwards and read the minimum low-load time $t_2 \rightarrow t_2 = 1.25 \times T$.

All times $t_2$ to the right of the point of intersection with $I_{out2}$ are permitted (√); all times $t_2$ to the left are not permitted (!).

In the load cycle from $t_2 = 1.5 \times T$, which means the overload capacity is given.

For overload times $t_1 < 0.25 \times T$, the reading accuracy of the diagrams is inadequate. The curves in this area are almost linear. This means you can use a linear formula for overload times $t_1 < 0.25 \times T$ instead of the diagrams.

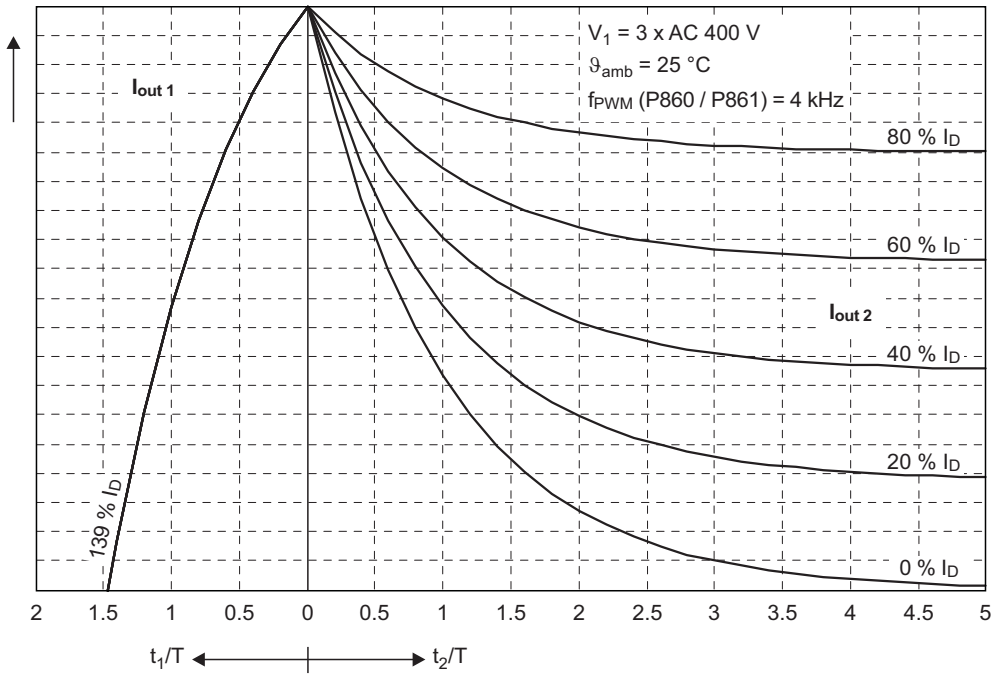
27793230/EN – 08/2022

For **overload times $t_1$ ≥ 0.25 × T** use the following diagrams to determine the overload capacity. Note the dependencies of $I_D$ on $I_N$.

27793230/EN – 08/2022

### MDX60B/61B, size 0 overload capacity at 400 V / 25 °C

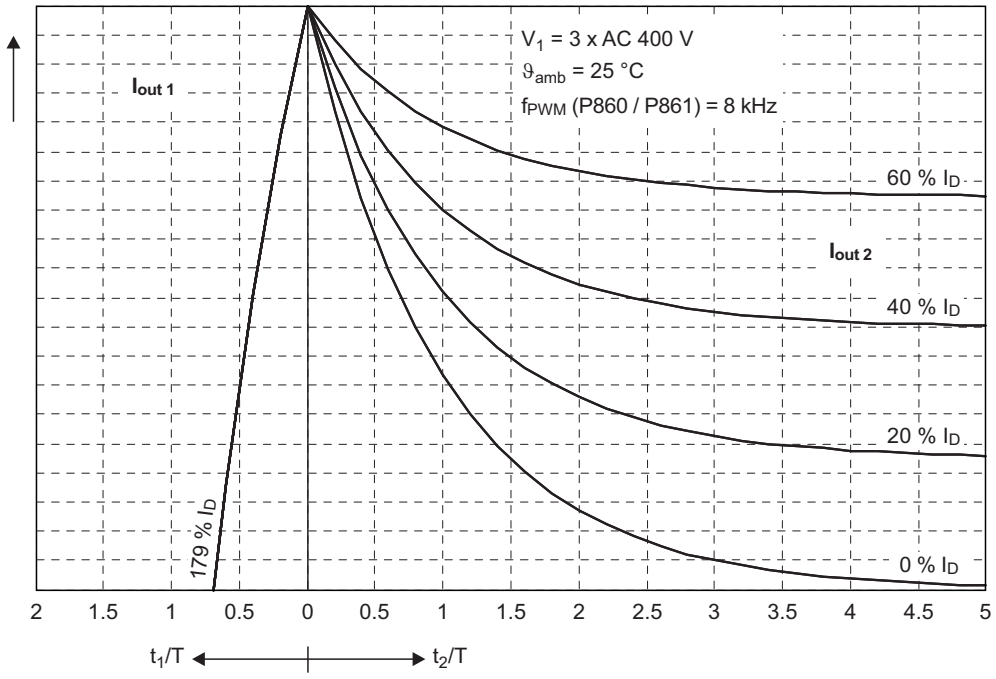
**Clock frequency $f_{PWM}$ = 4 kHz:**




*2932213899*

Overload capacity at $f_{PWM}$ = 4 kHz (400 V / 25 °C)

**Clock frequency $f_{PWM}$ = 8 kHz:**

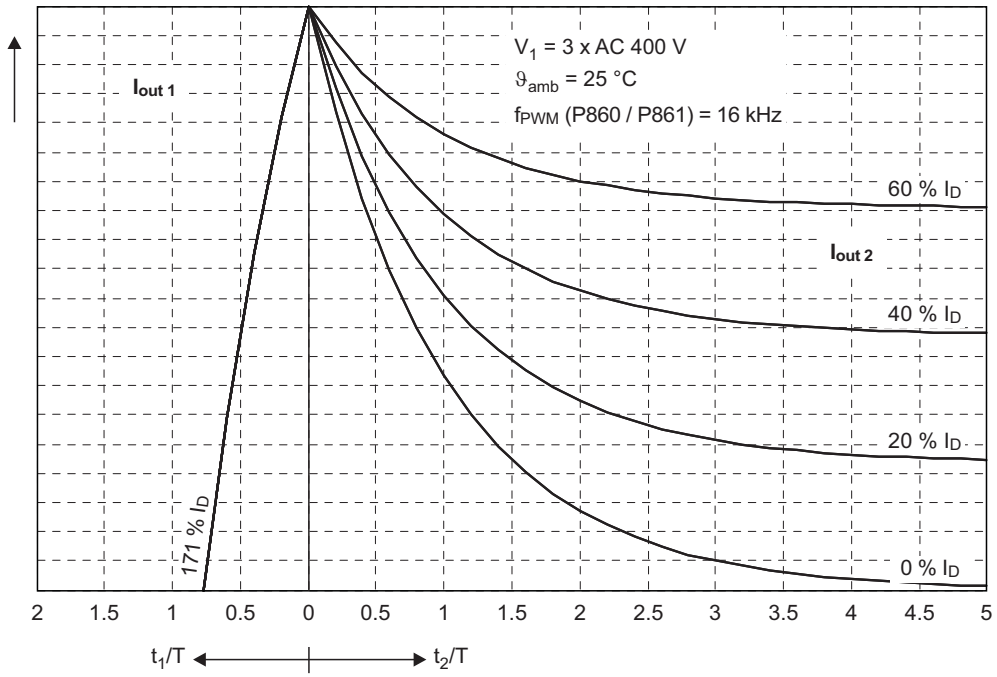



*2932215563*

Overload capacity at $f_{PWM}$ = 8 kHz (400 V / 25 °C)

27793230/EN – 08/2022

**Clock frequency $f_{PWM}$ = 16 kHz:**

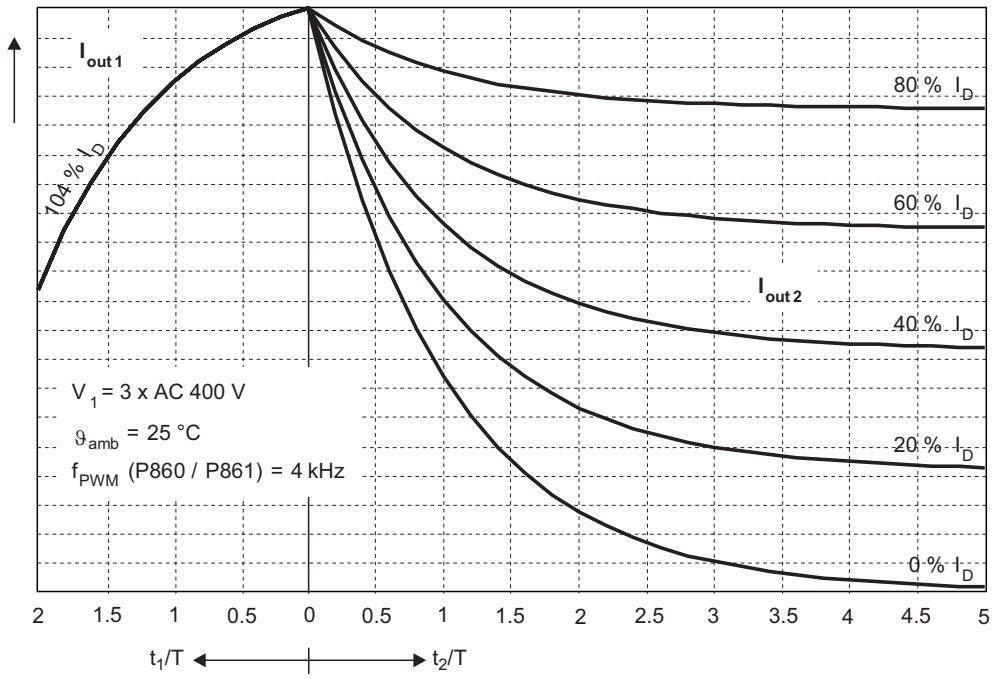



*2932217227*

Overload capacity at $f_{PWM}$ = 16 kHz (400 V / 25 °C)

### MDX61B, size 1 – 6 overload capacity at 400 V / 25 °C

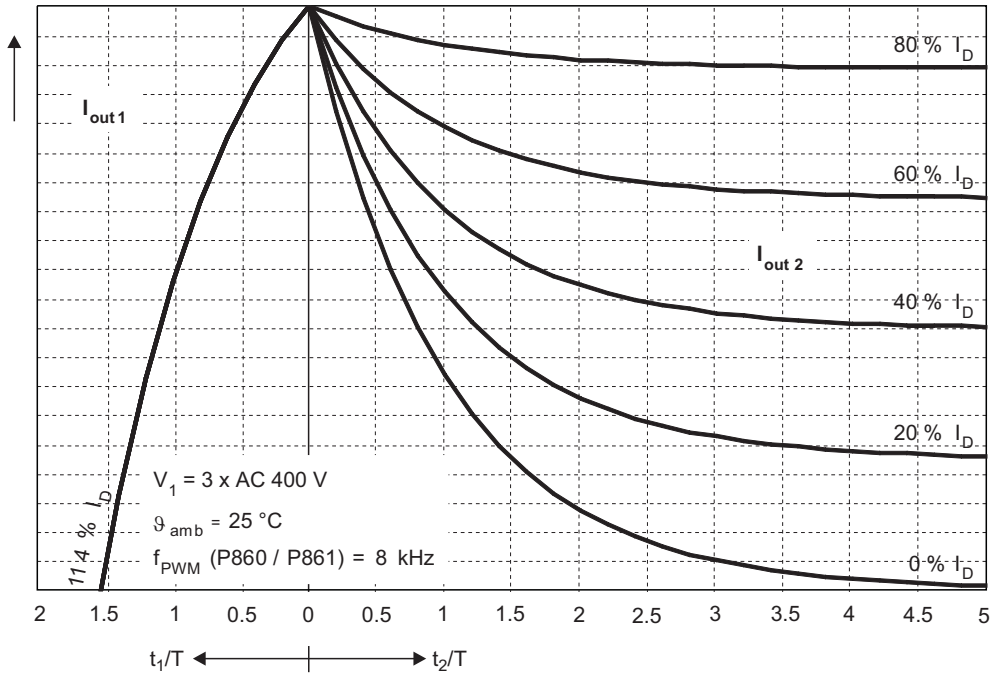
**Clock frequency $f_{PWM}$ = 4 kHz:**




*2932219915*

Overload capacity at $f_{PWM}$ = 4 kHz (400 V / 25 °C)

**Clock frequency $f_{PWM}$ = 8 kHz:**

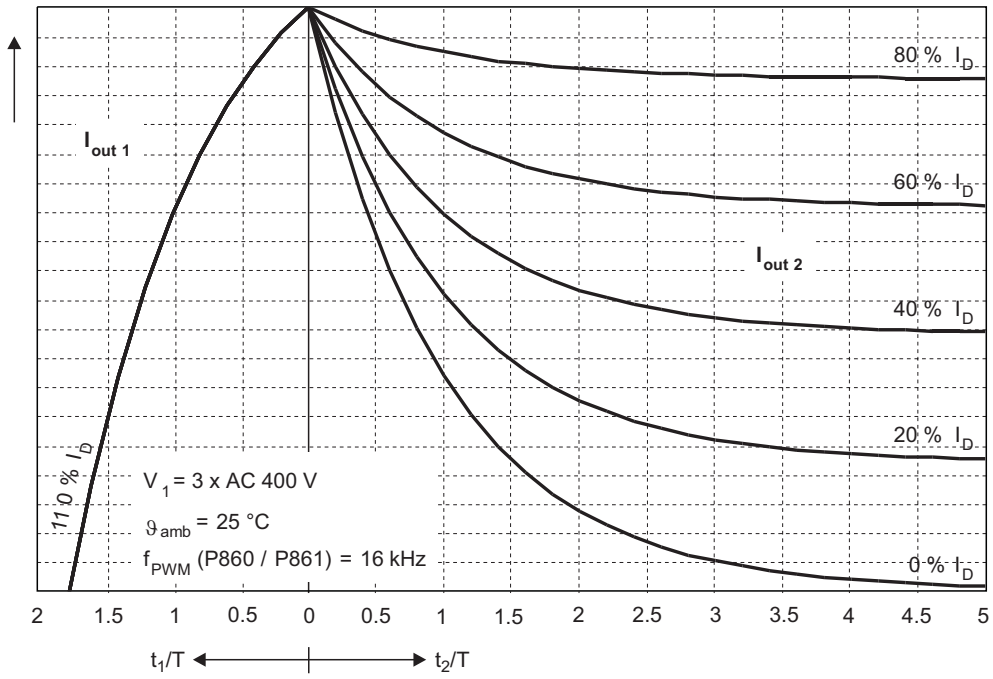



*2932221579*

Overload capacity at $f_{PWM}$ = 8 kHz (400 V / 25 °C)

27793230/EN – 08/2022

**Clock frequency $f_{PWM}$ = 16 kHz:**



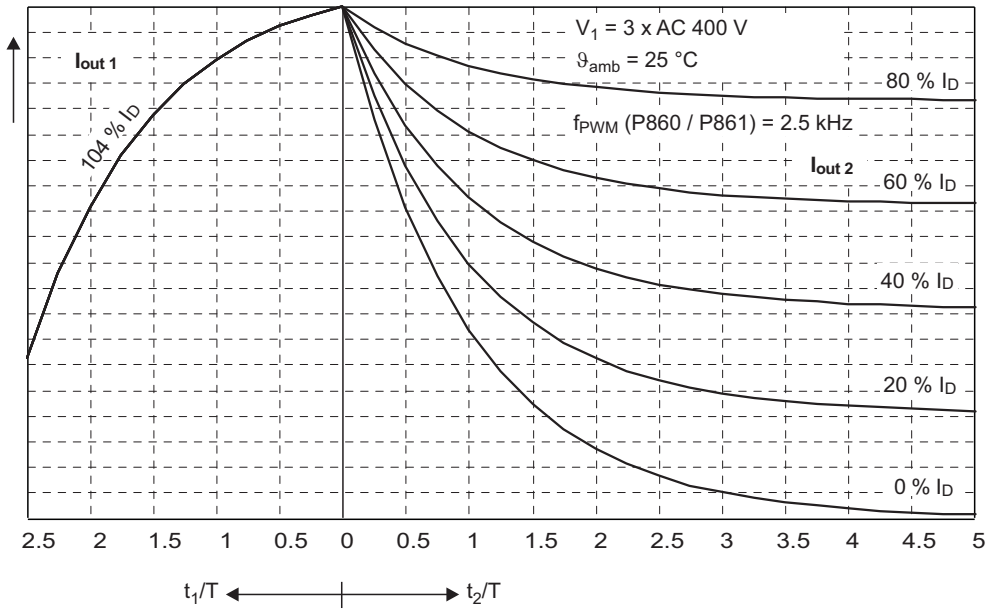

*2932223243*

Overload capacity at $f_{PWM}$ = 16 kHz (400 V / 25 °C)

27793230/EN – 08/2022

### MDX61B, size 7 overload capacity at 400 V / 25 °C

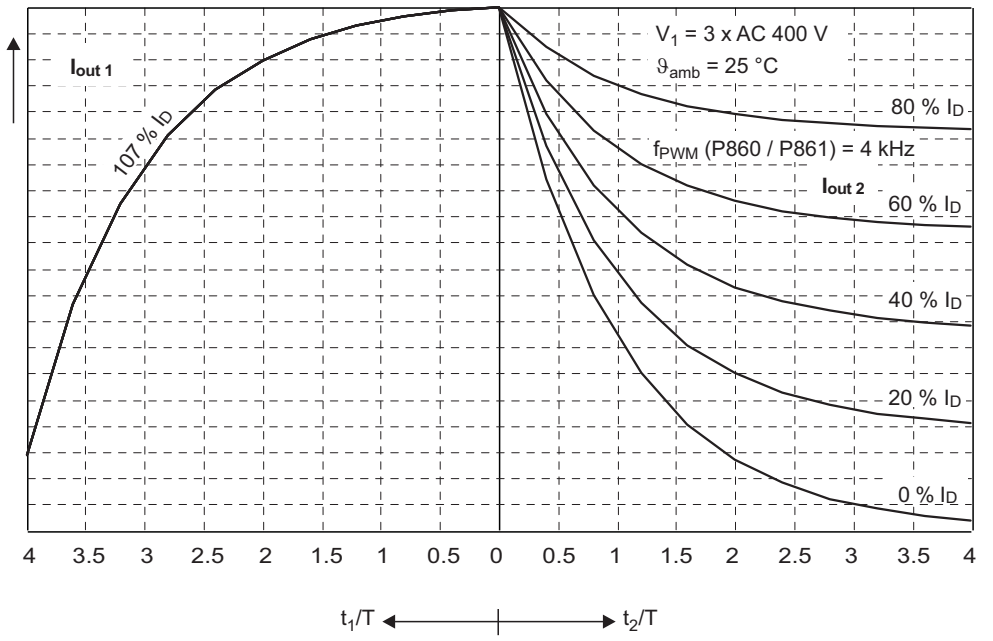
**Clock frequency $f_{PWM}$ = 2.5 kHz:**




*3171324171*

Overload capacity at $f_{PWM}$ = 2.5 kHz (400 V / 25 °C)

**Clock frequency $f_{PWM}$ = 4 kHz:**



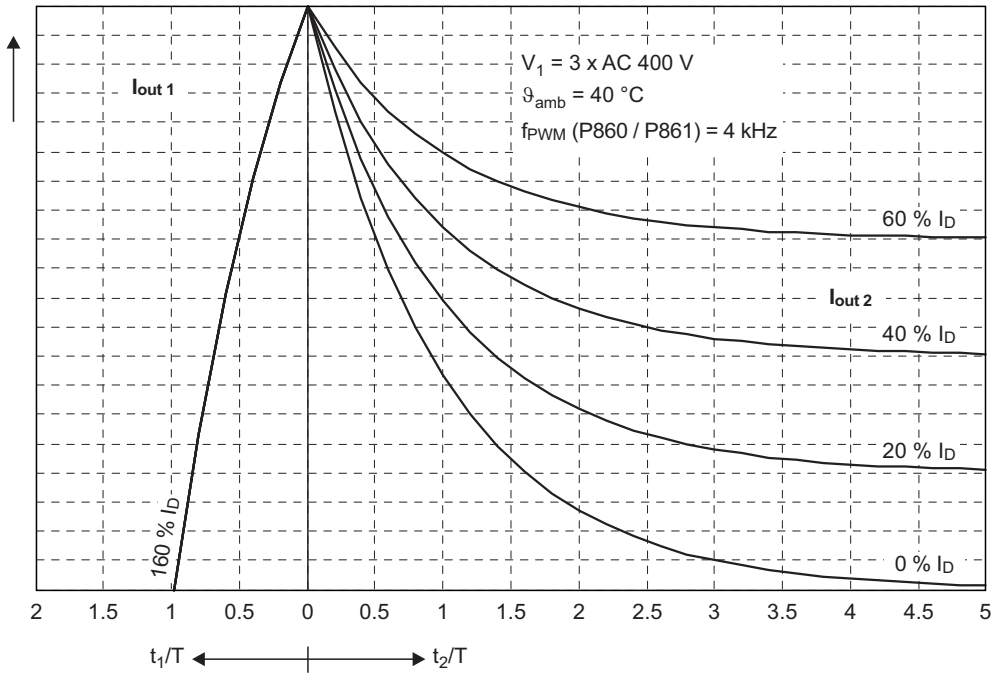

*3171403403*

Overload capacity at $f_{PWM}$ = 4 kHz (400 V / 25 °C)

27793230/EN – 08/2022

### MDX60B/61B, size 0 overload capacity at 400 V / 40 °C

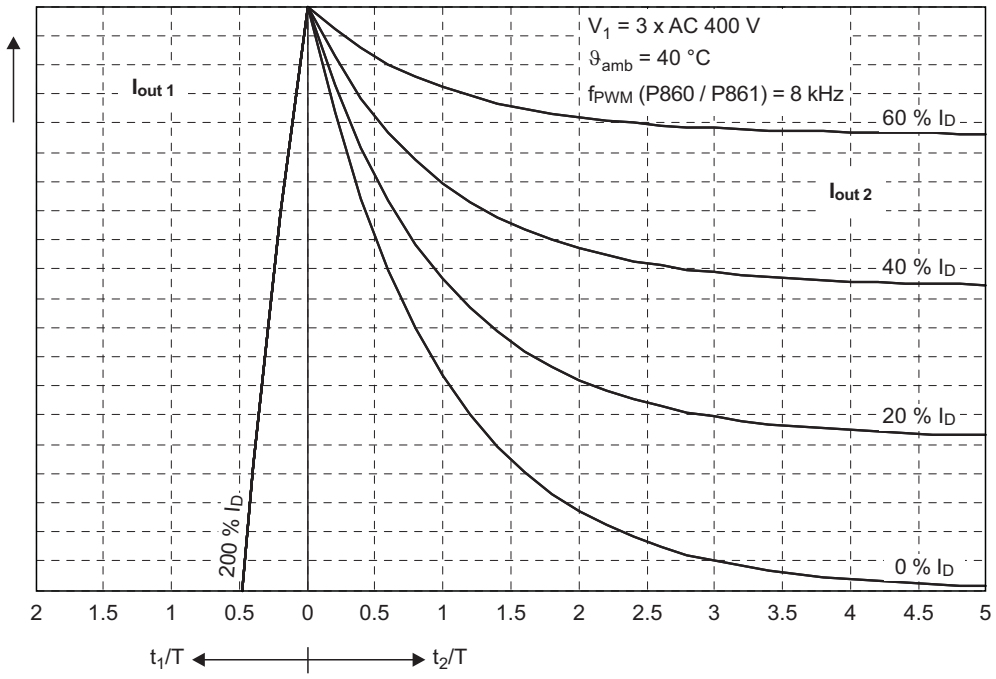
**Clock frequency $f_{PWM}$ = 4 kHz:**




*2932225931*

Overload capacity at $f_{PWM}$ = 4 kHz (400 V / 40 °C)

**Clock frequency $f_{PWM}$ = 8 kHz:**

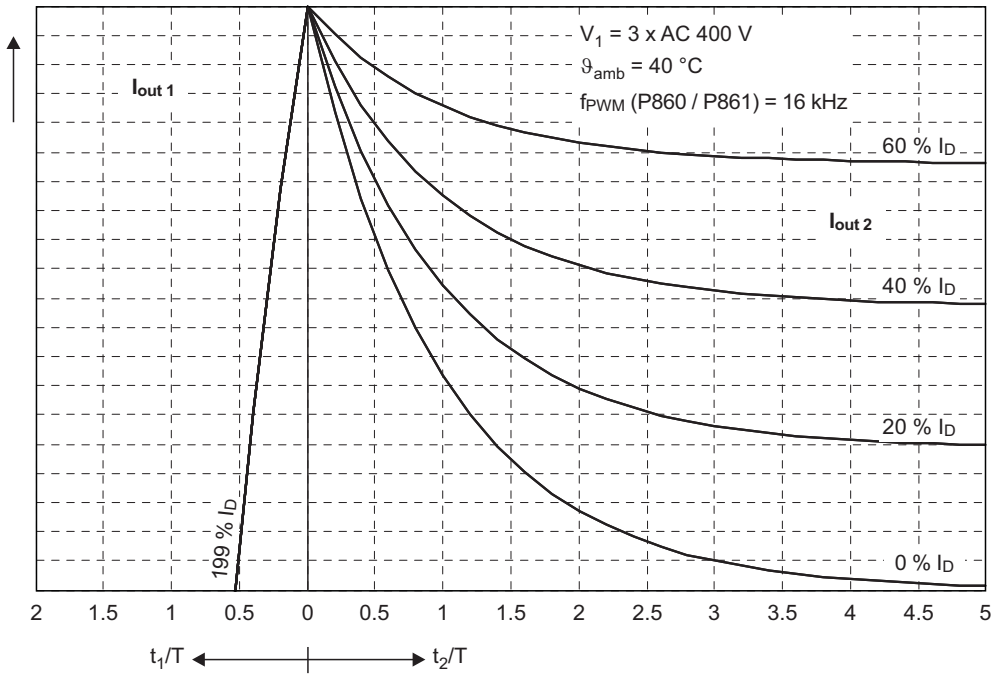



*2932227595*

Overload capacity at $f_{PWM}$ = 8 kHz (400 V / 40 °C)

27793230/EN – 08/2022

**Clock frequency $f_{PWM}$ = 16 kHz:**



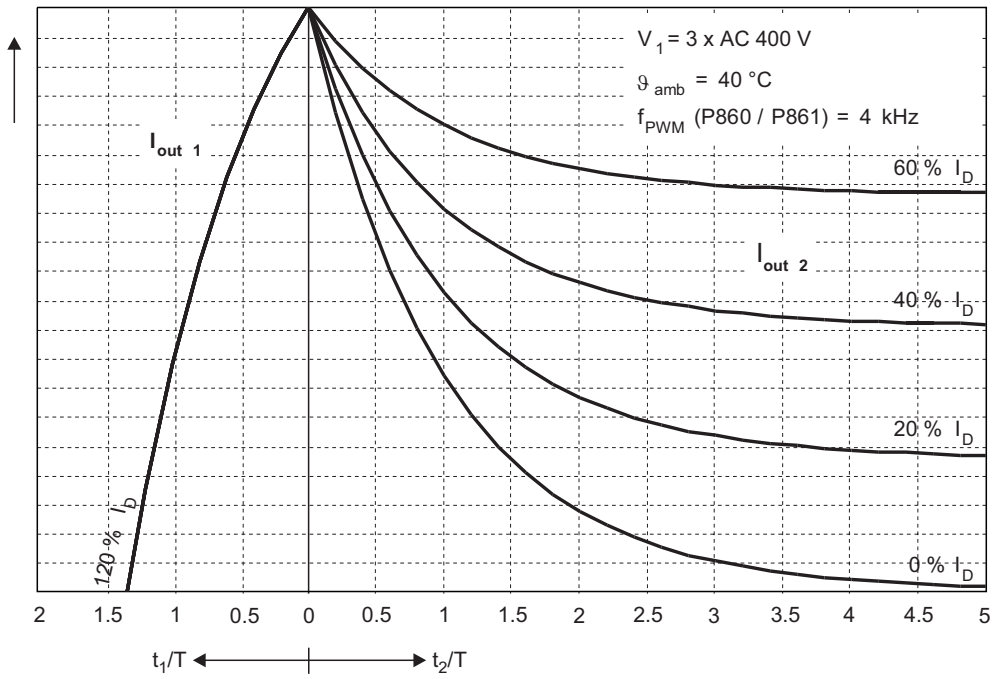

*2932229259*

Overload capacity at $f_{PWM}$ = 16 kHz (400 V / 40 °C)

27793230/EN – 08/2022

### MDX61B,size 1 – 6 overload capacity at 400 V / 40 °C

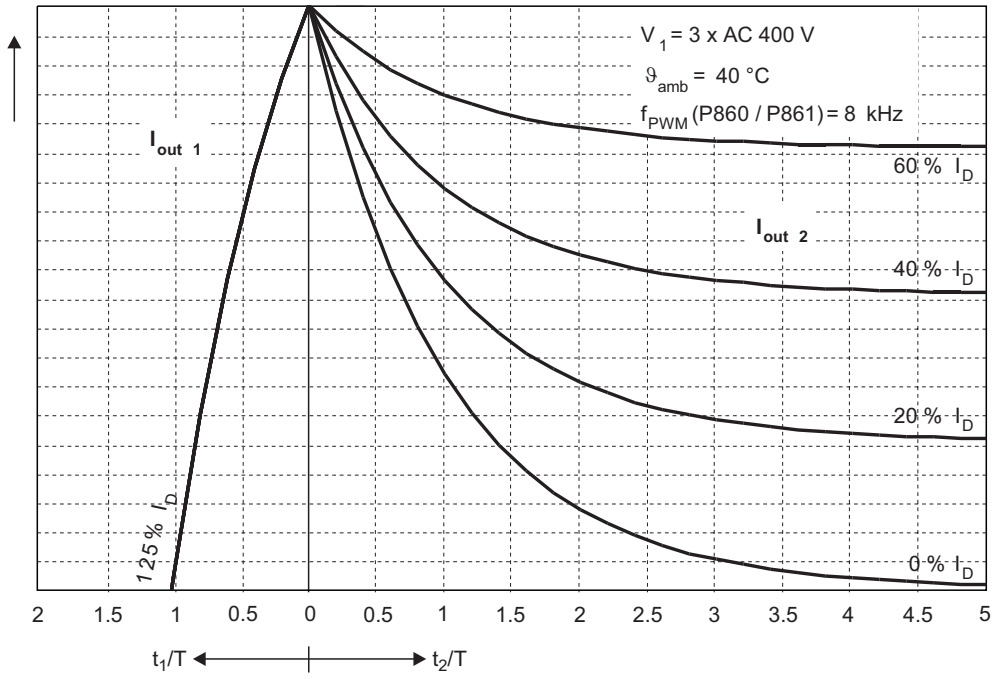
**Clock frequency $f_{PWM}$ = 4 kHz:**




*2932231947*

Overload capacity at $f_{PWM}$ = 4 kHz (400 V / 40 °C)

**Clock frequency $f_{PWM}$ = 8 kHz:**

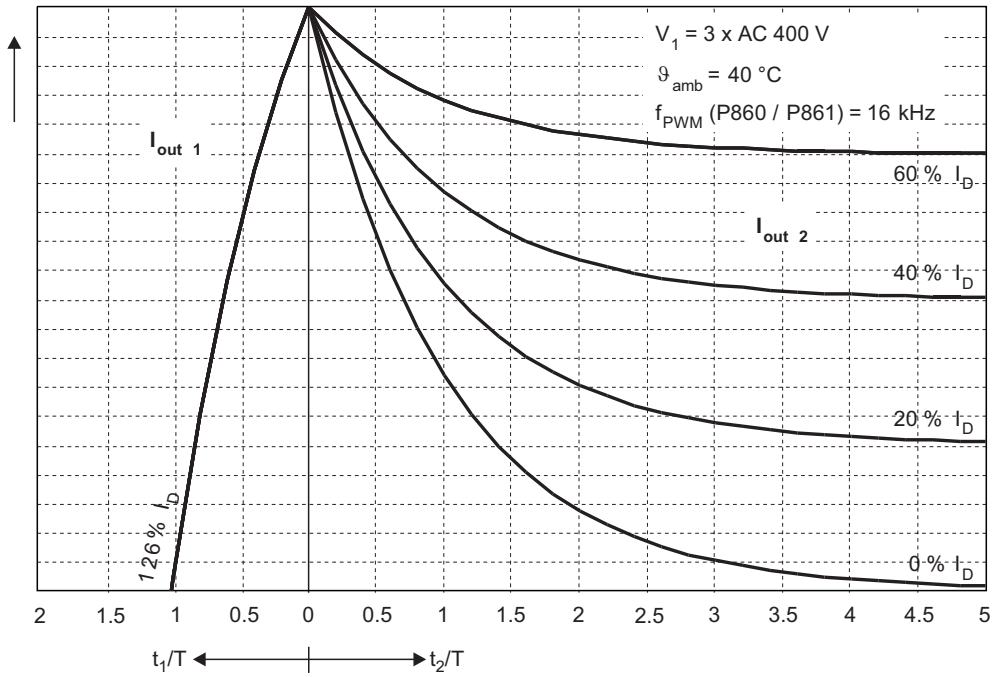



*2933351307*

Overload capacity at $f_{PWM}$ = 8 kHz (400 V / 40 °C)

27793230/EN – 08/2022

**Clock frequency $f_{PWM}$ = 16 kHz:**



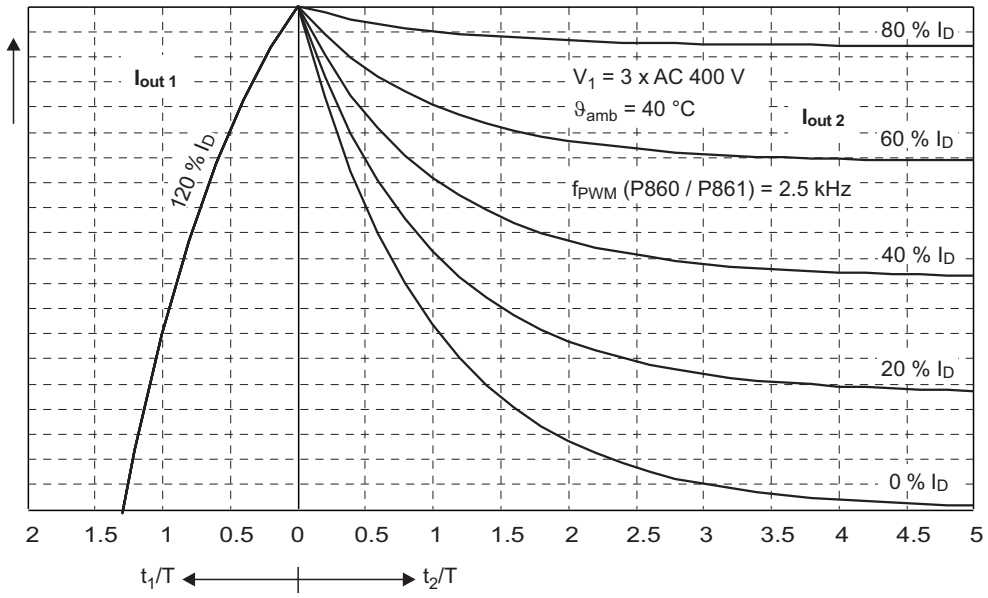

*2933353227*

Overload capacity at $f_{PWM}$ = 16 kHz (400 V / 40 °C)

27793230/EN – 08/2022

### MDX61B, size 7 overload capacity at 400 V / 40 °C

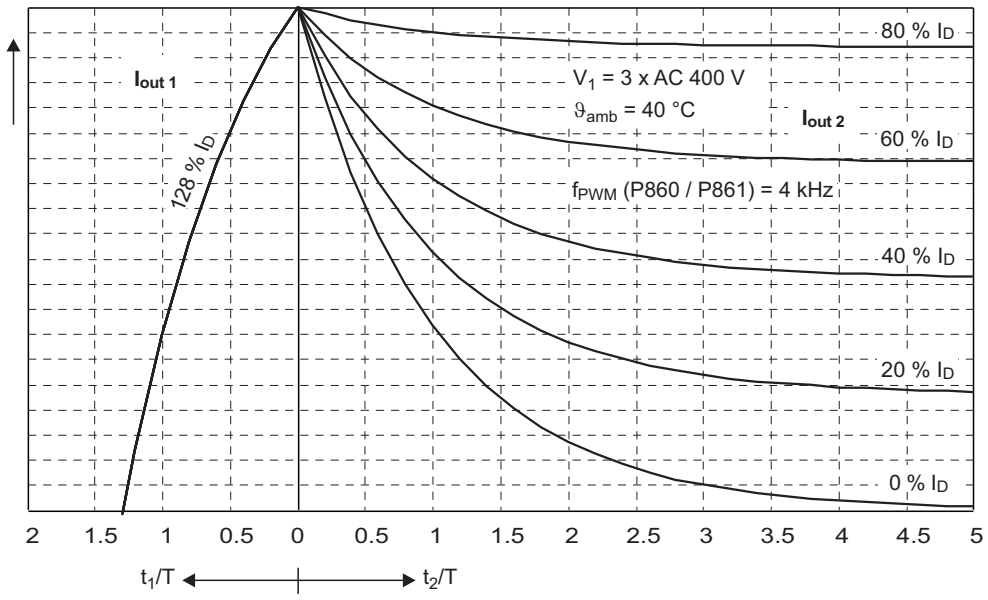
**Clock frequency $f_{PWM}$ = 2.5 kHz:**




*3171408267*

Overload capacity at $f_{PWM}$ = 2.5 kHz (400 V / 40 °C)

**Clock frequency $f_{PWM}$ = 4 kHz:**

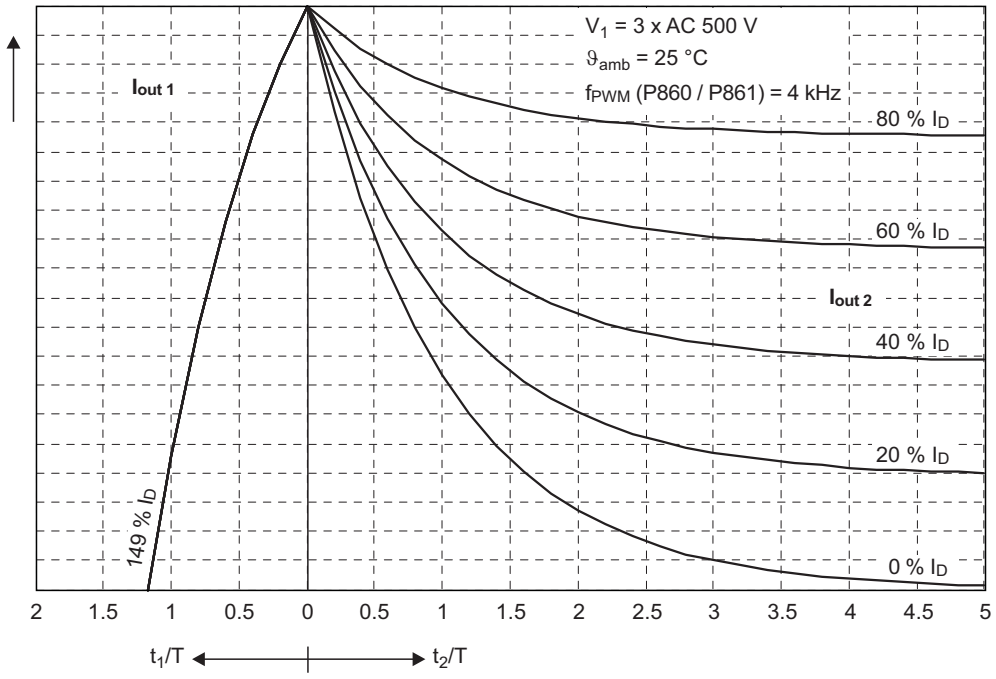



*3171410187*

Overload capacity at $f_{PWM}$ = 4 kHz (400 V / 40 °C)

### MDX60B/61B, size 0 overload capacity at 500 V / 25 °C

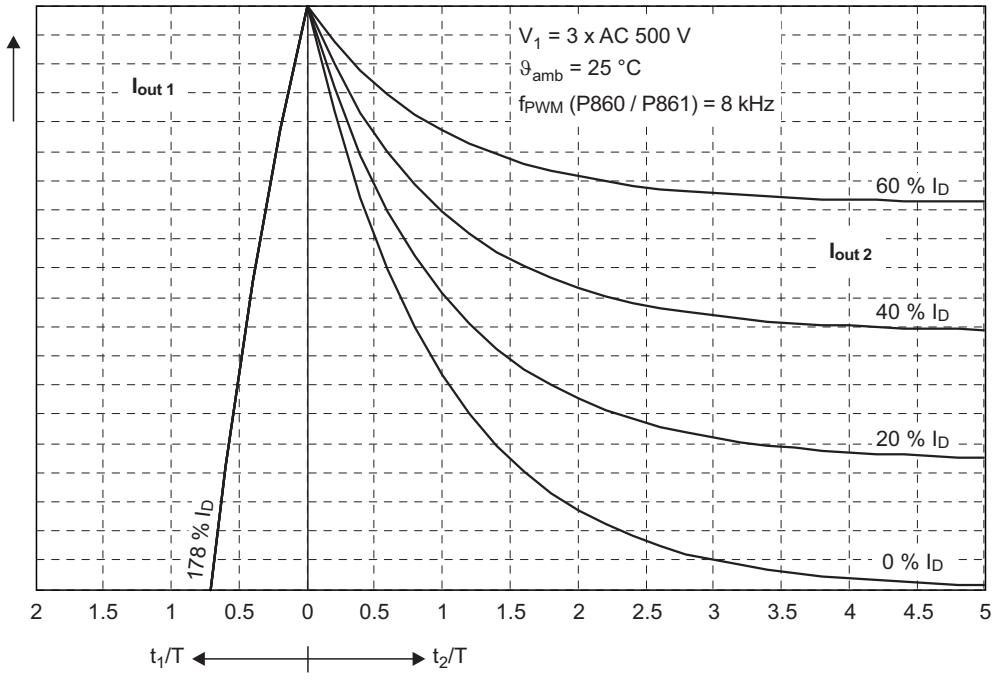
**Clock frequency $f_{PWM}$ = 4 kHz:**




*2932234635*

Overload capacity at $f_{PWM}$ = 4 kHz (500 V / 25 °C)

**Clock frequency $f_{PWM}$ = 8 kHz:**

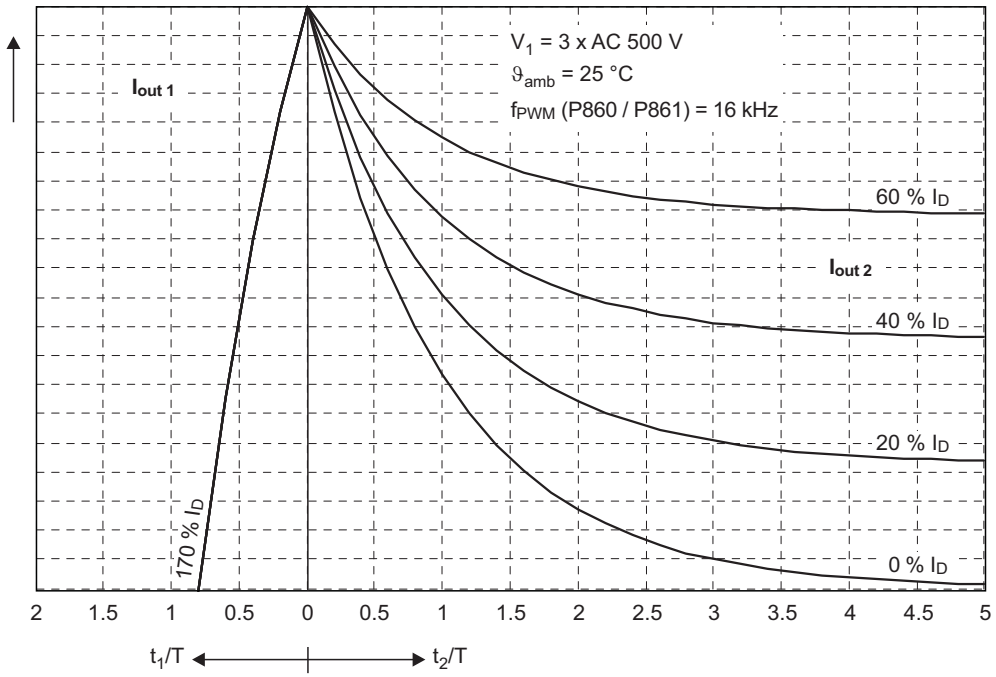



*2932236299*

Overload capacity at $f_{PWM}$ = 8 kHz (500 V / 25 °C)

27793230/EN – 08/2022

**Clock frequency $f_{PWM}$ = 16 kHz:**



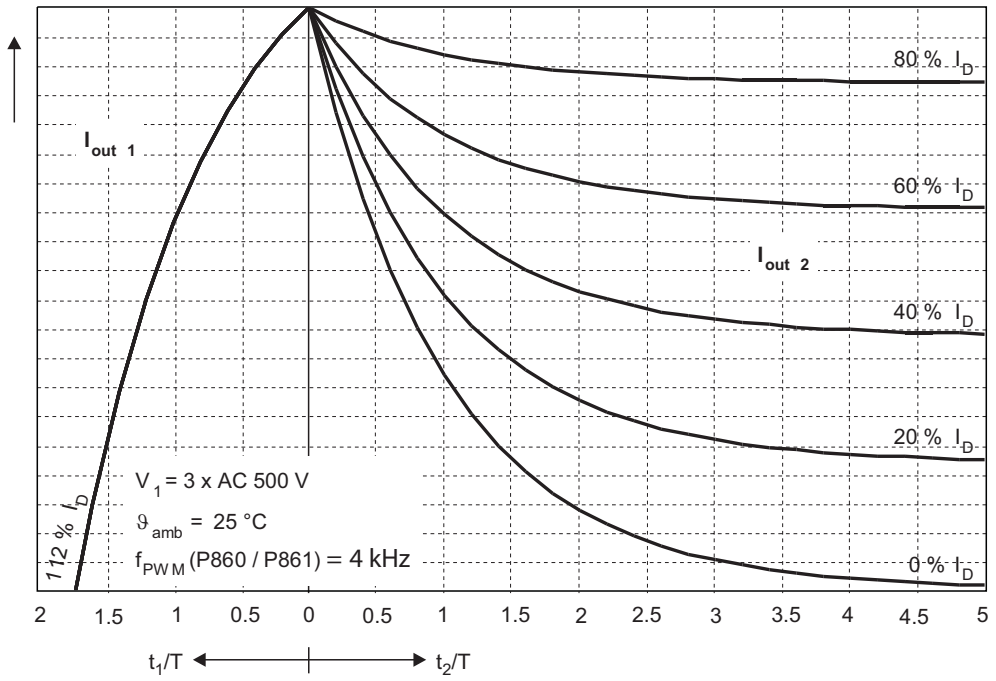

*2932237963*

Overload capacity at $f_{PWM}$ = 16 kHz (500 V / 25 °C)

27793230/EN – 08/2022

### MDX61B, size 1 – 6 overload capacity at 500 V / 25 °C

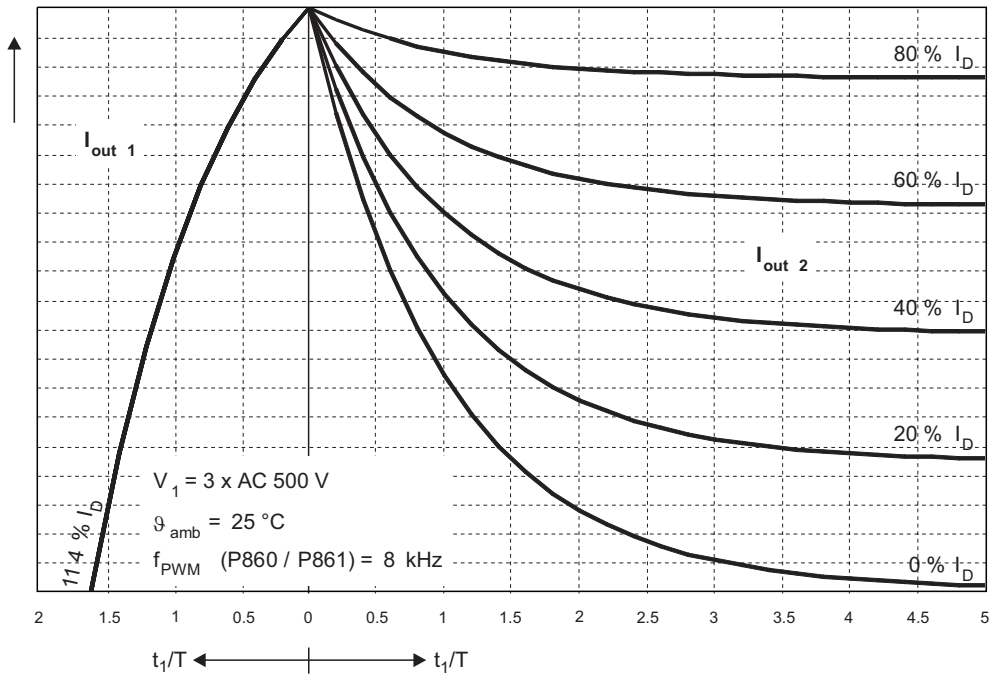
**Clock frequency $f_{PWM}$ = 4 kHz:**




*2932240651*

Overload capacity at $f_{PWM}$ = 4 kHz (500 V / 25 °C)

**Clock frequency $f_{PWM}$ = 8 kHz:**

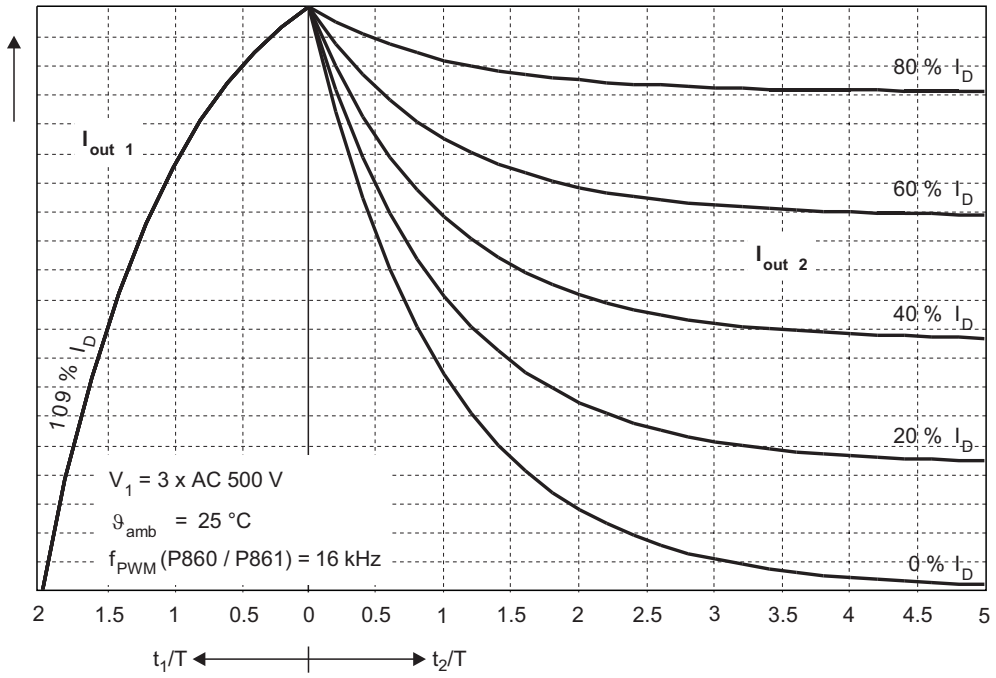



*2932242315*

Overload capacity at $f_{PWM}$ = 8 kHz (500 V / 25 °C)

27793230/EN – 08/2022

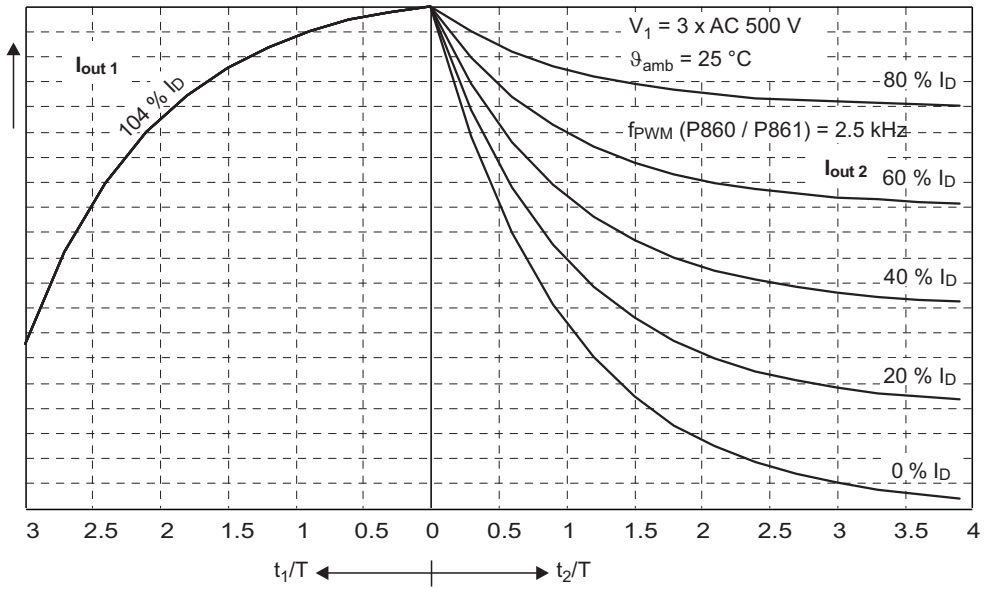
**Clock frequency $f_{PWM}$ = 16 kHz:**




*2932243979*

### MDX61B, size 7 overload capacity at 500 V / 25 °C

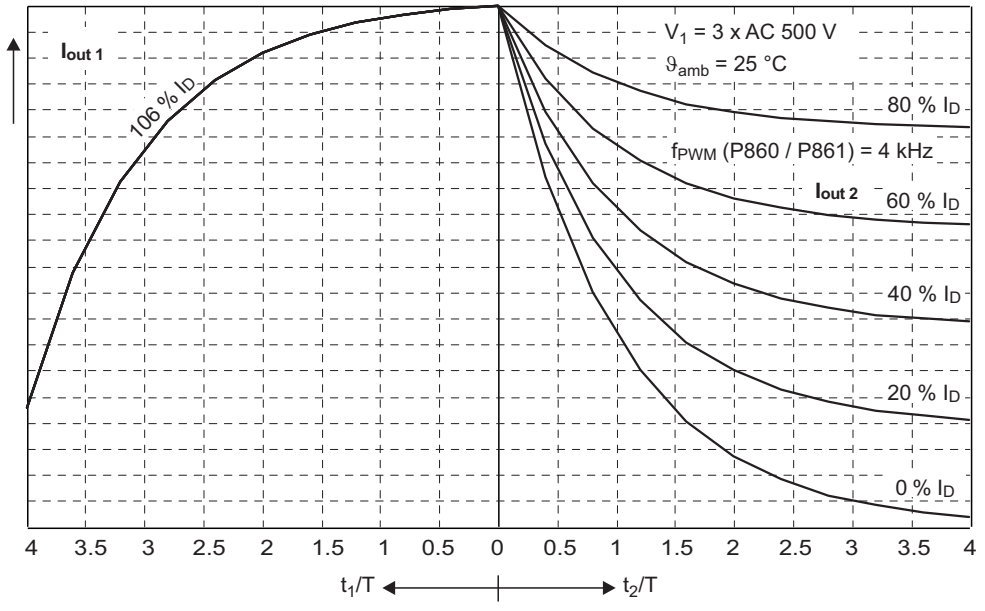
**Clock frequency $f_{PWM}$ = 2.5 kHz:**




*3171415179*

Overload capacity at $f_{PWM}$ = 2.5 kHz (500 V / 25 °C)

**Clock frequency $f_{PWM}$ = 4 kHz:**



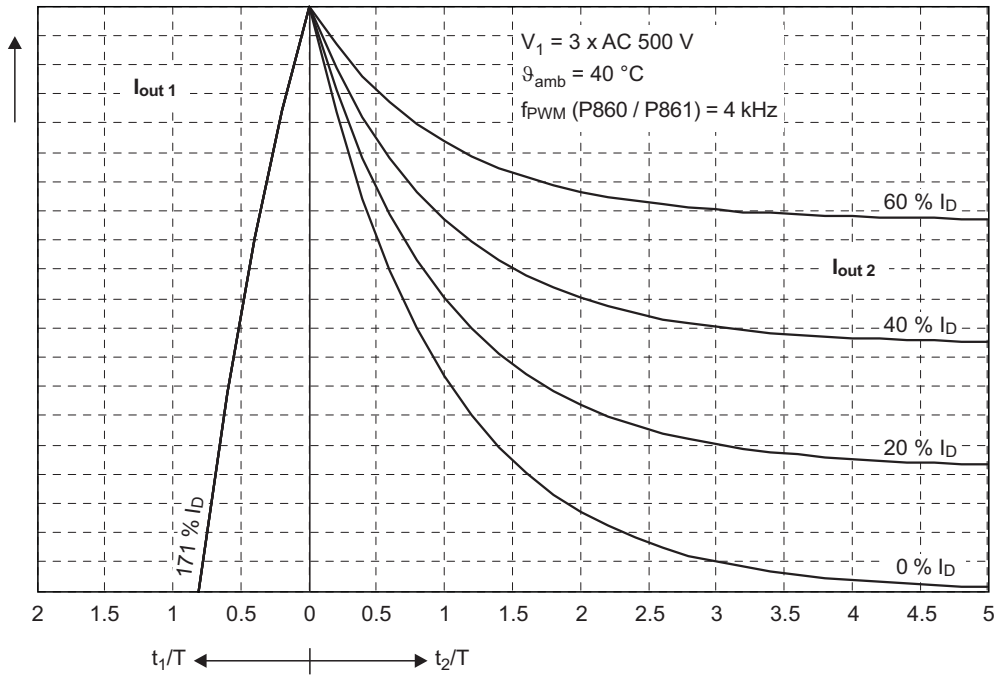

*3171417099*

Overload capacity at $f_{PWM}$ = 4 kHz (500 V / 25 °C)

27793230/EN – 08/2022

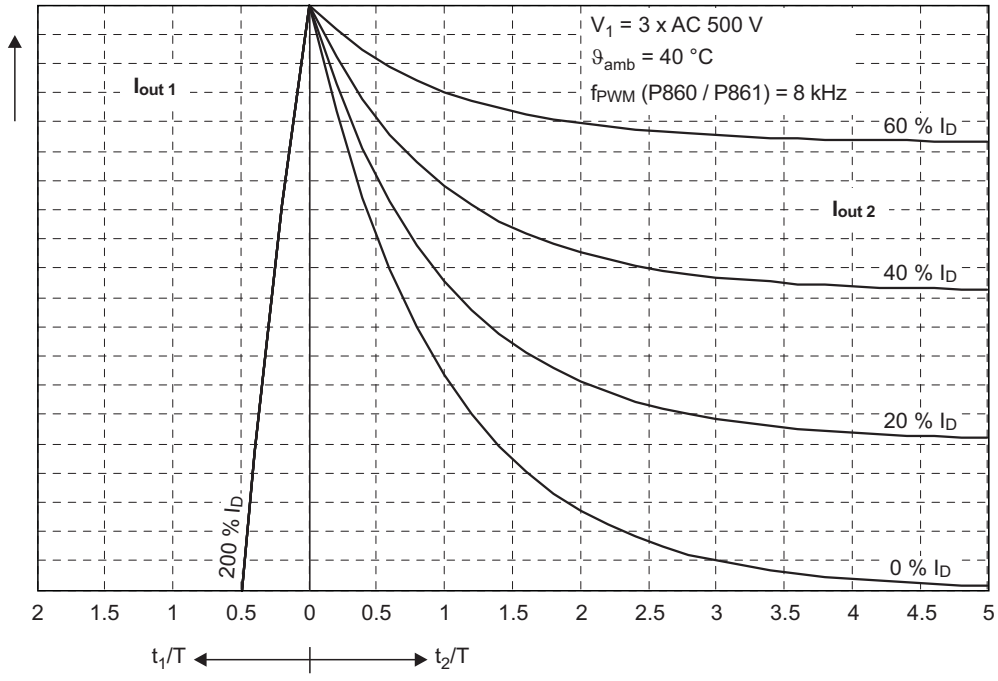
### MDX60B/61B, size 0 overload capacity at 500 V / 40 °C

**Clock frequency $f_{PWM}$ = 4 kHz:**




*2932246667*

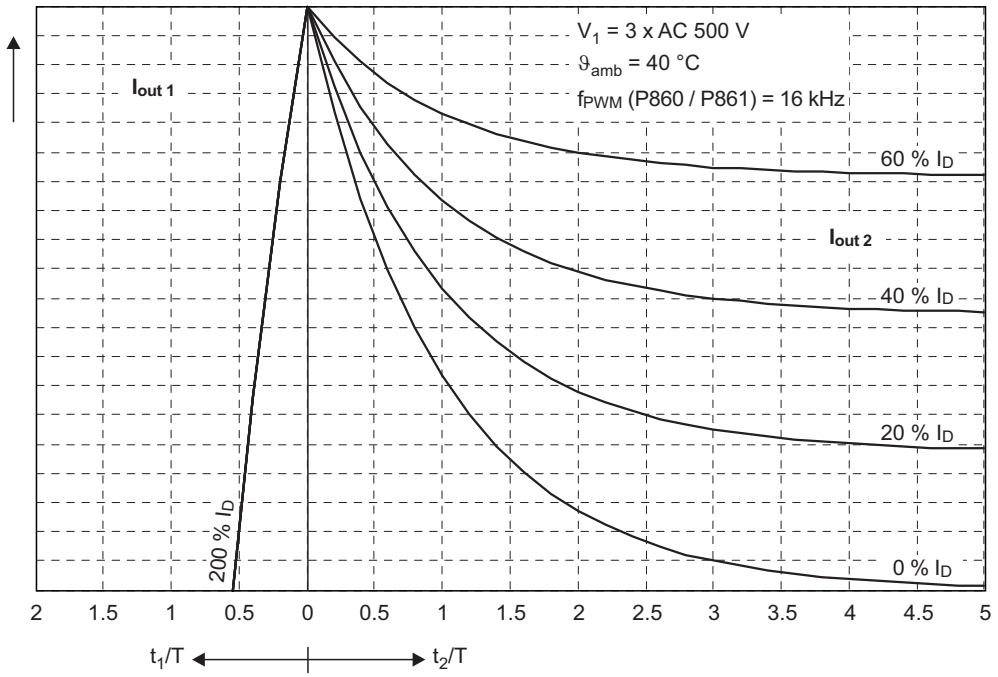
**Clock frequency $f_{PWM}$ = 8 kHz:**




*2932248331*

27793230/EN – 08/2022

**Clock frequency $f_{PWM}$ = 16 kHz:**



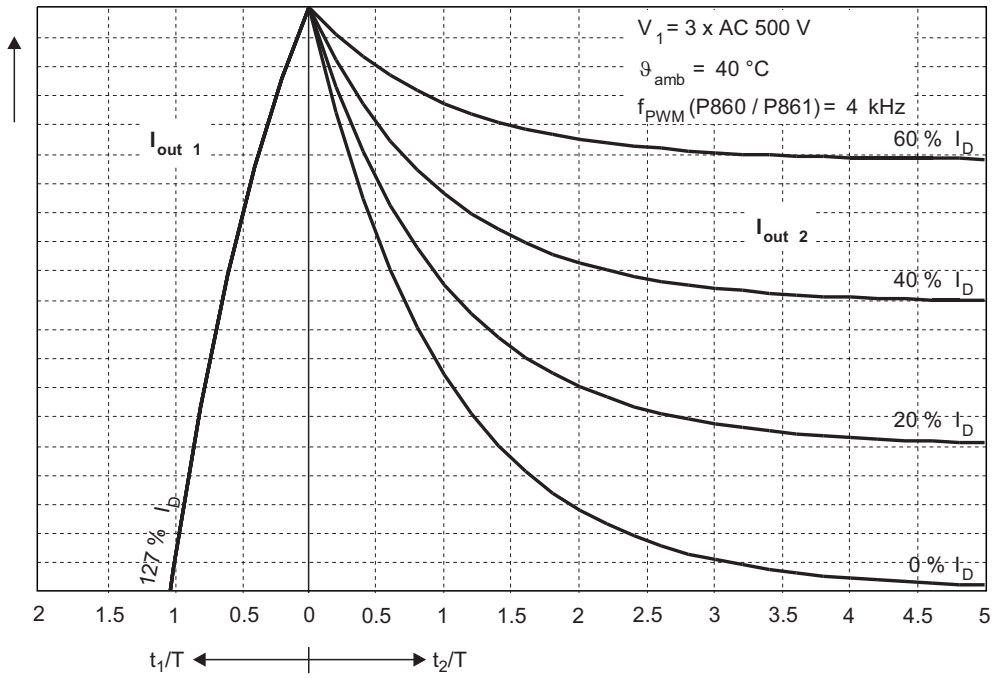

*2932249995*

Overload capacity at $f_{PWM}$ = 16 kHz (500 V / 40 °C)

27793230/EN – 08/2022

### MDX61B, size 1 – 6 overload capacity at 500 V / 40°C

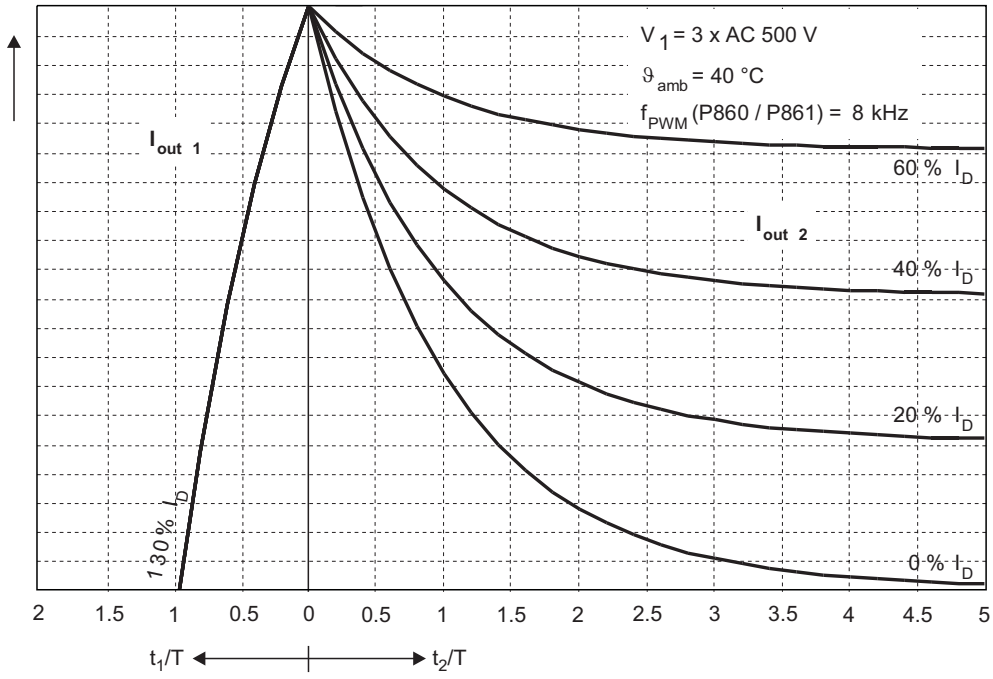
**Clock frequency $f_{PWM}$ = 4 kHz:**




*2933792139*

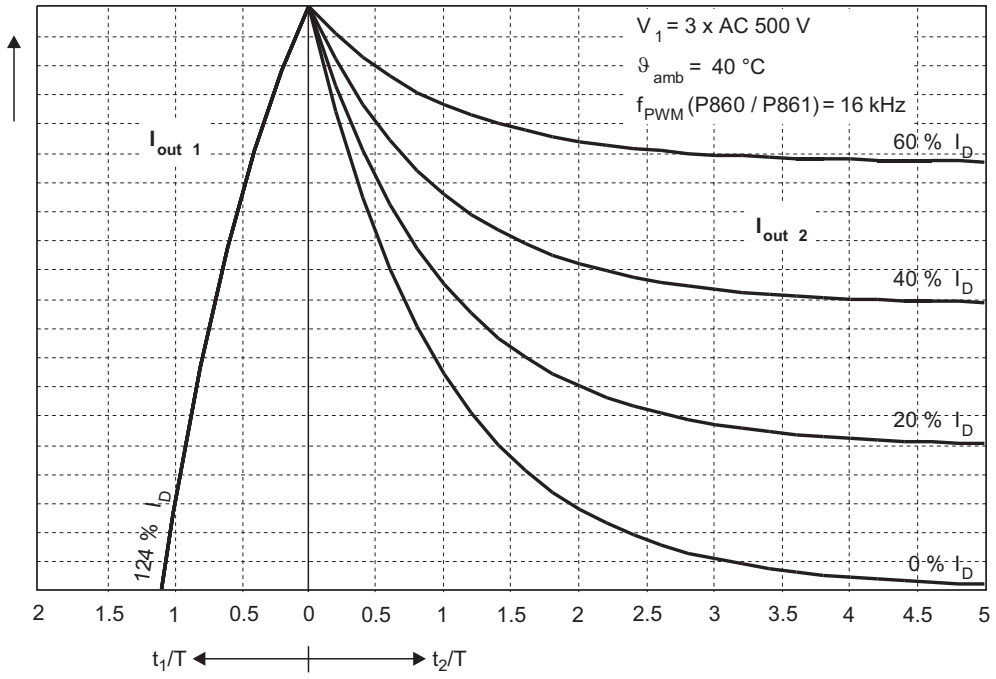
Overload capacity at $f_{PWM}$ = 4 kHz (500 V / 40 °C)

**Clock frequency $f_{PWM}$ = 8 kHz:**




*2932265483*

**Clock frequency $f_{PWM}$ = 16 kHz:**

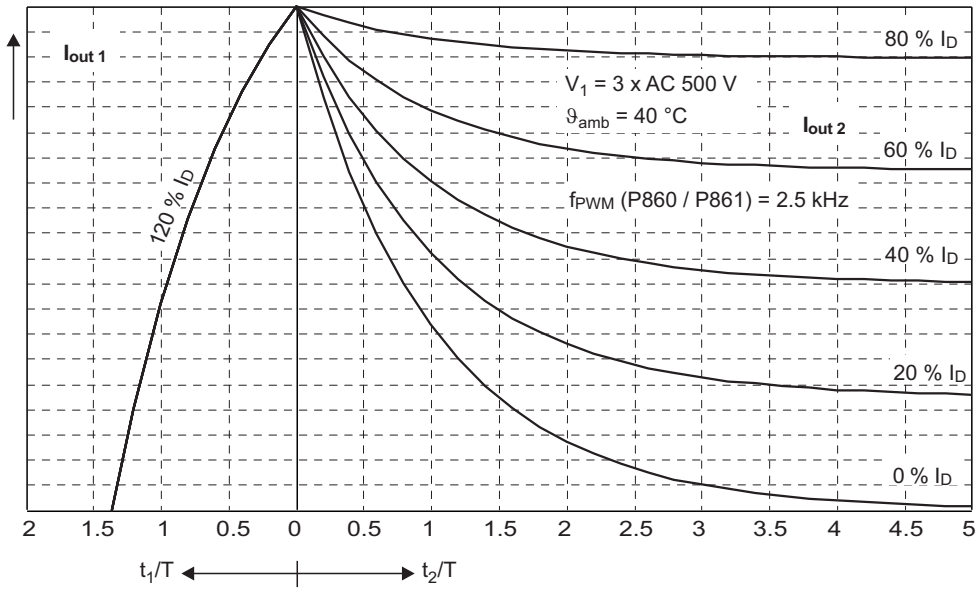



*2932267147*

27793230/EN – 08/2022

### MDX61B, size 7 overload capacity at 500 V / 40 °C

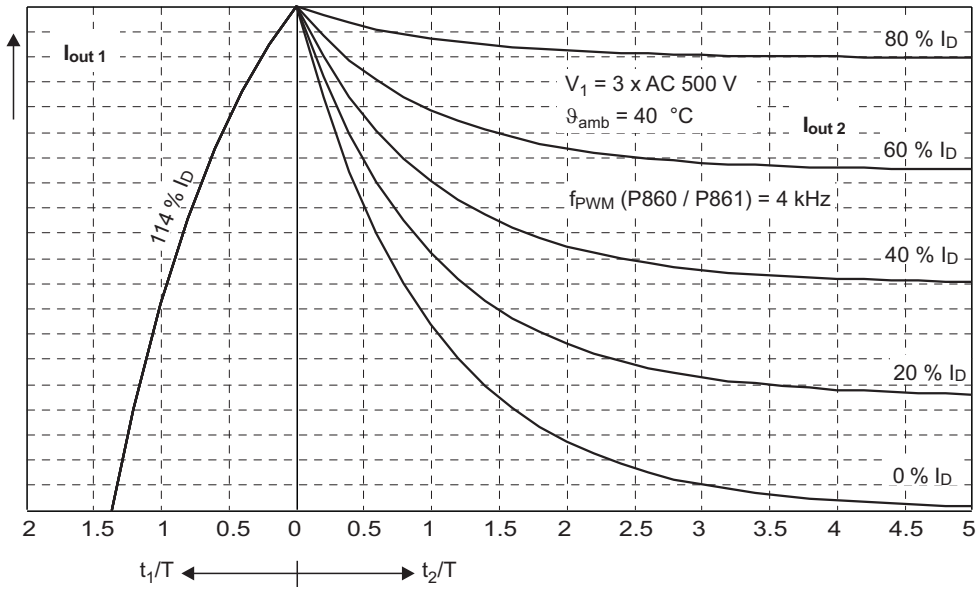
**Clock frequency $f_{PWM}$ = 2.5 kHz:**




*3171420555*

Overload capacity at $f_{PWM}$ = 2.5 kHz (500 V / 40 °C)

**Clock frequency $f_{PWM}$ = 4 kHz:**




*3171422475*

Overload capacity at $f_{PWM}$ = 4 kHz (500 V / 40 °C)

27793230/EN – 08/2022

### 9.9.5 Overload capacity in the second range

This is the overload capacity that corresponds at the most to a quarter of the heat sink time constant (0.25 T). The overload usually lasts a few seconds. In this time range, the characteristic curve is almost linear and the overload capacity can be determined as follows:

Overload time $t_1 < 0.25 \times T \rightarrow$ determine using a formula

#### Equation

At overload times $t_1 < 0.25 \times T$, the overload capacity can be calculated using the following formula:

**$t_2 > k \times t_1$ k = overload factor**

#### Example

The values for overload factors k are given in the following tables, depending on the line voltage $V_1$, ambient temperature $\vartheta$ and cycle frequency $f_{PWM}$.

Example with MOVIDRIVE® MDX61B0055 (size 2):

- Operation with line voltage $V_1$ = 3 × AC 400 V, ambient temperature $\vartheta$ = 40°C and clock frequency $f_{PWM}$ = 4 kHz.
- Nominal device current $I_N$ = AC 12.5 A and continuous output current $I_D = 125\% \times I_N$ = AC 15.6 A
- Overload time $t_1$ = 30 s = 0.1 × T
- Low-load current $I_{out\,2}$ = 6 A = 0.4 × $I_D \rightarrow$ k = 0.778

| Clock frequency $f_{PWM}$ | Continuous output current $I_D$ ($f_A$ > 2 Hz) | Overload current $I_{out\,1}$ (at $f_A$ > 2 Hz) | Overload factor k at low-load current $I_{out\,2}$ = | | | |
|---|---|---|---|---|---|---|
| | | | 0 | 0.2 × $I_D$ | 0.4 × $I_D$ | 0.6 × $I_D$ |
| 4 kHz | 125% $I_N$ | 120% $I_D$ (= 150% $I_N$) | 0.411 | 0.538 | 0.778 | 1.407 |

- The low-load time must be $t_2 > k \times t_1 > 0.778 \times 30$ s > 23.34 s.

For **overload times $t_1$ < 0.25 × T** use the formula $t_2 > k \times t_1$ to determine the overload capacity. The following tables show the overload factor k for various low-load currents. For additional information,the following tables include the value depending on $I_N$ (at $f_A$ > 2 Hz) in addition to the overload current.

#### MDX60B/61B, size 0 overload capacity at 400 V / 25 °C

| Clock frequency $f_{PWM}$ | Continuous output current $I_D$ ($f_A$ > 2 Hz) | Overload current $I_{out\,1}$ (at $f_A$ > 2 Hz) | Overload factor k at low-load current $I_{out\,2}$ = | | | | |
|---|---|---|---|---|---|---|---|
| | | | 0 | 0.2 × $I_D$ | 0.4 × $I_D$ | 0.6 × $I_D$ | 0.8 × $I_D$ |
| 4 kHz | 144% $I_N$ | 139% $I_D$ (= 200% $I_N$) | 0.368 | 0.456 | 0.588 | 0.838 | 1.456 |
| 8 kHz | 112% $I_N$ | 179% $I_D$ (= 200% $I_N$) | 1.182 | 1.545 | 2.091 | 3.545 | 14.364 |
| 16 kHz | 78% $I_N$ | 171% $I_D$ (= 133% $I_N$) | 1.000 | 1.313 | 1.813 | 2.938 | 9.250 |

#### MDX61B, size 1 – 6 overload capacity at 400 V / 25 °C

| Clock frequency $f_{PWM}$ | Continuous output current $I_D$ ($f_A$ > 2 Hz) | Overload current $I_{out\,1}$ (at $f_A$ > 2 Hz) | Overload factor k at low-load current $I_{out\,2}$ = | | | | |
|---|---|---|---|---|---|---|---|
| | | | 0 | 0.2 × $I_D$ | 0.4 × $I_D$ | 0.6 × $I_D$ | 0.8 × $I_D$ |
| 4 kHz | 144% $I_N$ | 104% $I_D$ (= 150% $I_N$) | 0.085 | 0.107 | 0.145 | 0.226 | 0.508 |
| 8 kHz | 112% $I_N$ | 114% $I_D$ (= 128% $I_N$) | 0.314 | 0.408 | 0.582 | 1.016 | 4.160 |
| 16 kHz | 78% $I_N$ | 110% $I_D$ (= 86% $I_N$) | 0.235 | 0.303 | 0.427 | 0.720 | 2.324 |

27793230/EN – 08/2022

### MDX61B, size 7 overload capacity at 400 V / 25 °C

| Clock frequency $f_{PWM}$ | Continuous output current $I_D$ ($f_A$ > 2 Hz) | Overload current $I_{out\,1}$ (at $f_A$ > 2 Hz) | Overload factor k at low-load current $I_{out\,2}$ = | | | | |
|---|---|---|---|---|---|---|---|
| | | | 0 | 0.2 × $I_D$ | 0.4 × $I_D$ | 0.6 × $I_D$ | 0.8 × $I_D$ |
| 2.5 kHz | 144% $I_N$ | 104% $I_D$ (= 150% $I_N$) | 0.068 | 0.096 | 0.123 | 0.192 | 0.411 |
| 4 kHz | 120% $I_N$ | 107% $I_D$ (= 128% $I_N$) | 0.018 | 0.024 | 0.029 | 0.047 | 0.082 |

### MDX60B/61B, size 0 overload capacity at 400 V / 40 °C

| Clock frequency $f_{PWM}$ | Continuous output current $I_D$ ($f_A$ > 2 Hz) | Overload current $I_{out\,1}$ (at $f_A$ > 2 Hz) | Overload factor k at low-load current $I_{out\,2}$ = | | | |
|---|---|---|---|---|---|---|
| | | | 0 | 0.2 × $I_D$ | 0.4 × $I_D$ | 0.6 × $I_D$ |
| 4 kHz | 125% $I_N$ | 160% $I_D$ (= 200% $I_N$) | 0.727 | 0.909 | 1.212 | 1.818 |
| 8 kHz | 100% $I_N$ | 200% $I_D$ (= 200% $I_N$) | 1.931 | 2.690 | 4.069 | 9.448 |
| 16 kHz | 67% $I_N$ | 199% $I_D$ (= 133% $I_N$) | 0.737 | 0.912 | 1.211 | 1.825 |

### MDX61B, size 1 – 6 overload capacity at 400 V / 40 °C

| Clock frequency $f_{PWM}$ | Continuous output current $I_D$ ($f_A$ > 2 Hz) | Overload current $I_{out\,1}$ (at $f_A$ > 2 Hz) | Overload factor k at low-load current $I_{out\,2}$ = | | | |
|---|---|---|---|---|---|---|
| | | | 0 | 0.2 × $I_D$ | 0.4 × $I_D$ | 0.6 × $I_D$ |
| 4 kHz | 125% $I_N$ | 120% $I_D$ (= 150% $I_N$) | 0.411 | 0.538 | 0.778 | 1.407 |
| 8 kHz | 100% $I_N$ | 125% $I_D$ (= 125% $I_N$) | 0.678 | 0.928 | 1.473 | 3.639 |
| 16 kHz | 68% $I_N$ | 126% $I_D$ (= 86% $I_N$) | 0.676 | 0.922 | 1.448 | 3.438 |

### MDX61B, size 7 overload capacity at 400 V / 40 °C

| Clock frequency $f_{PWM}$ | Continuous output current $I_D$ ($f_A$ > 2 Hz) | Overload current $I_{out\,1}$ (at $f_A$ > 2 Hz) | Overload factor k at low-load current $I_{out\,2}$ = | | | | |
|---|---|---|---|---|---|---|---|
| | | | 0 | 0.2 × $I_D$ | 0.4 × $I_D$ | 0.6 × $I_D$ | 0.8 × $I_D$ |
| 2.5 kHz | 125% $I_N$ | 120% $I_D$ (= 150% $I_N$) | 0.458 | 0.625 | 0.833 | 1.458 | 5.833 |
| 4 kHz | 100% $I_N$ | 128% $I_D$ (= 128% $I_N$) | 0.297 | 0.378 | 0.486 | 0.757 | 1.514 |

### MDX60B/61B, size 0 overload capacity at 500 V / 25 °C

| Clock frequency $f_{PWM}$ | Continuous output current $I_D$ ($f_A$ > 2 Hz) | Overload current $I_{out\,1}$ (at $f_A$ > 2 Hz) | Overload factor k at low-load current $I_{out\,2}$ = | | | | |
|---|---|---|---|---|---|---|---|
| | | | 0 | 0.2 × $I_D$ | 0.4 × $I_D$ | 0.6 × $I_D$ | 0.8 × $I_D$ |
| 4 kHz | 134% $I_N$ | 149% $I_D$ (= 200% $I_N$) | 0.558 | 0.674 | 0.907 | 1.326 | 2.674 |
| 8 kHz | 100% $I_N$ | 178% $I_D$ (= 178% $I_N$) | 1.154 | 1.538 | 2.077 | 3.462 | 11.615 |
| 16 kHz | 67% $I_N$ | 170% $I_D$ (= 114% $I_N$) | 1.000 | 1.278 | 1.778 | 2.778 | 7.944 |

### MDX61B, size 1 – 6 overload capacity at 500 V / 25 °C

| Clock frequency $f_{PWM}$ | Continuous output current $I_D$ ($f_A$ > 2 Hz) | Overload current $I_{out\,1}$ (at $f_A$ > 2 Hz) | Overload factor k at low-load current $I_{out\,2}$ = | | | | |
|---|---|---|---|---|---|---|---|
| | | | 0 | 0.2 × $I_D$ | 0.4 × $I_D$ | 0.6 × $I_D$ | 0.8 × $I_D$ |
| 4 kHz | 134% $I_N$ | 112% $I_D$ (= 150% $I_N$) | 0.245 | 0.316 | 0.443 | 0.741 | 2.287 |
| 8 kHz | 100% $I_N$ | 114% $I_D$ (= 114% $I_N$) | 0.286 | 0.369 | 0.522 | 0.888 | 3.040 |
| 16 kHz | 67% $I_N$ | 109% $I_D$ (= 73% $I_N$) | 0.182 | 0.232 | 0.321 | 0.521 | 1.385 |

### MDX61B, size 7 overload capacity at 500 V / 25 °C

| Clock frequency $f_{PWM}$ | Continuous output current $I_D$ ($f_A$ > 2 Hz) | Overload current $I_{out\,1}$ (at $f_A$ > 2 Hz) | Overload factor k at low-load current $I_{out\,2}$ = | | | | |
|---|---|---|---|---|---|---|---|
| | | | 0 | 0.2 × $I_D$ | 0.4 × $I_D$ | 0.6 × $I_D$ | 0.8 × $I_D$ |
| 2.5 kHz | 133% $I_N$ | 104% $I_D$ (= 138% $I_N$) | 0.040 | 0.053 | 0.067 | 0.107 | 0.220 |
| 4 kHz | 110% $I_N$ | 106% $I_D$ (= 117% $I_N$) | 0.016 | 0.024 | 0.032 | 0.040 | 0.072 |

27793230/EN – 08/2022

### MDX60B/61B, size 0 overload capacity at 500 V / 40 °C

| Clock frequency $f_{PWM}$ | Continuous output current $I_D$ ($f_A$ > 2 Hz) | Overload current $I_{out\,1}$ (at $f_A$ > 2 Hz) | Overload factor k at low-load current $I_{out\,2}$ = | | | |
|---|---|---|---|---|---|---|
| | | | 0 | 0.2 × $I_D$ | 0.4 × $I_D$ | 0.6 × $I_D$ |
| 4 kHz | 117% $I_N$ | 171% $I_D$ (= 200% $I_N$) | 1.000 | 1.268 | 1.805 | 3.049 |
| 8 kHz | 89% $I_N$ | 200% $I_D$ (= 178% $I_N$) | 1.882 | 2.529 | 3.824 | 8.412 |
| 16 kHz | 57% $I_N$ | 200% $I_D$ (= 114% $I_N$) | 1.667 | 2.208 | 3.167 | 5.792 |

### MDX61B, size 1 – 6 overload capacity at 500 V / 40 °C

| Clock frequency $f_{PWM}$ | Continuous output current $I_D$ ($f_A$ > 2 Hz) | Overload current $I_{out\,1}$ (at $f_A$ > 2 Hz) | Overload factor k at low-load current $I_{out\,2}$ = | | | |
|---|---|---|---|---|---|---|
| | | | 0 | 0.2 × $I_D$ | 0.4 × $I_D$ | 0.6 × $I_D$ |
| 4 kHz | 117% $I_N$ | 128% $I_D$ (= 150% $I_N$) | 0.662 | 0.897 | 1.395 | 3.176 |
| 8 kHz | 89% $I_N$ | 126% $I_D$ (= 112% $I_N$) | 0.745 | 1.022 | 1.627 | 4.103 |
| 16 kHz | 59% $I_N$ | 123% $I_D$ (= 73% $I_N$) | 0.595 | 0.803 | 1.234 | 2.695 |

### MDX61B, size 7 overload capacity at 500 V / 40 °C

| Clock frequency $f_{PWM}$ | Continuous output current $I_D$ ($f_A$ > 2 Hz) | Overload current $I_{out\,1}$ (at $f_A$ > 2 Hz) | Overload factor k at low-load current $I_{out\,2}$ = | | | | |
|---|---|---|---|---|---|---|---|
| | | | 0 | 0.2 × $I_D$ | 0.4 × $I_D$ | 0.6 × $I_D$ | 0.8 × $I_D$ |
| 2.5 kHz | 115% $I_N$ | 120% $I_D$ (= 138% $I_N$) | 0.385 | 0.538 | 0.769 | 1.308 | 3.846 |
| 4 kHz | 100% $I_N$ | 114% $I_D$ (= 114% $I_N$) | 0.314 | 0.400 | 0.571 | 0.914 | 2.657 |

27793230/EN – 08/2022

### 9.9.6 Overload capacity for an overload time < 1 s

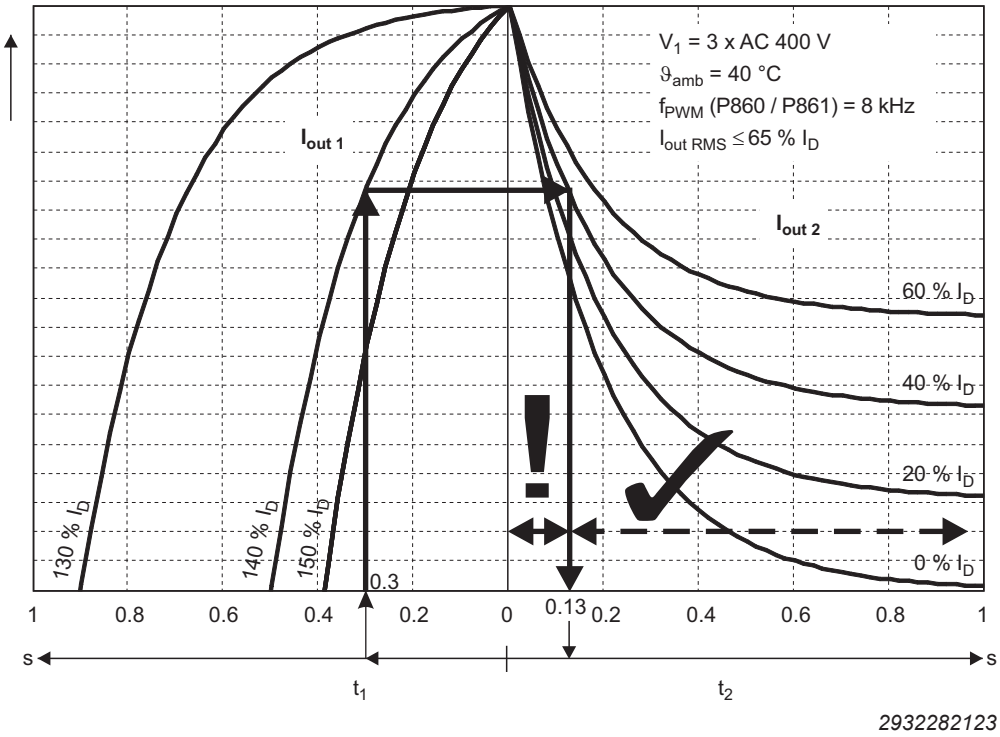
**Determining the overload capacity**

The inverter dimensioning is supported by the SEW-Workbench project planning software.

The overload capacity for the short overload time ($t_1$ < 1 s) is determined as follows:

- For MDX61B sizes 1 – 6 using the diagrams (→ following figure)
- For MDX60B/61B sizes 0 and 7 according to chapter "Overload capacity in the second range" (→ 🗎 466).

The mean inverter output current $I_{out\ RMS}$ during the load cycle must not exceed a certain value.




2932282123

The time axis is separate. The left part shows the overload time $t_1$ and the right part the low-load time $t_2$. The temperature profiles of the various overload currents $I_{out\ 1}$ are shown in a series of curves above $t_1$. The temperature profiles of the various low-load currents $I_{out\ 2}$ are shown in a series of curves above $t_2$.

Example:

- Following specifications:
  - Overload current $I_{out\ 1}$ = 140% $I_D$
  - Overload time $t_1$ = 0.3 s
  - Low-load current $I_{out\ 2}$ = 40% $I_D$
  - Low-load time $t_2$ = 1.0 s
- At an overload time of $t_1$ = 0.3 s move vertically upwards until the point of intersection with $I_{out\ 1}$ = 140% $I_D$.
- Move horizontally to the right until the point of intersection with $I_{out\ 2}$ = 0.4 × $I_D$.
- Move vertically downward and then read the minimum low-load time $t_2$ → $t_2$ = 0.13 s

27793230/EN – 08/2022

All times $t_2$ to the right of the point of intersection with $I_{out2}$ are permitted (√); all times $t_2$ to the left are not permitted (!).

According to the diagram, the overload capacity is given. In addition to the diagram, you now have to check that the permitted mean inverter output current $I_{out\ RMS}$ is not exceeded:

$$I_{out\ 1} \times \frac{t_1}{t_1 + t_2} + I_{out\ 2} \times \frac{t_2}{t_1 + t_2} \leq I_{out\ RMS}$$

$$140\%\ I_D \times \frac{0.3\ s}{1.3\ s} + 40\%\ I_D \times \frac{1.0\ s}{1.3\ s} \leq 65\%\ I_D$$

$$32.31\%\ I_D + 30.77\%\ I_D = 63.08\%\ I_D \leq 65\%\ I_D$$

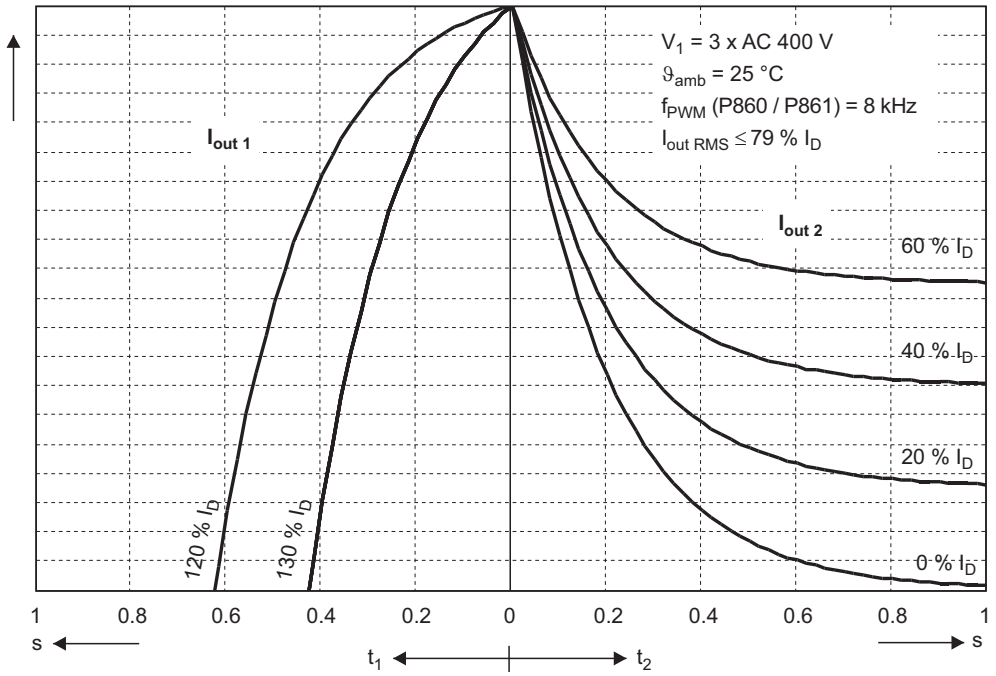
*2932283787*

The permitted mean inverter output current is $I_{out\ RMS} \leq 65\%\ I_D$. In the specified load cycle, $I_{out\ RMS} = 63.08\%\ I_D$. Therefore, the load cycle is permitted.

### MDX61B, size 1 – 6 overload capacity at 400 V / 25 °C

**Clock frequency $f_{PWM}$ = 8 kHz:**

The permitted mean inverter output current is $I_{out\ RMS} \leq 79\%\ I_D$.

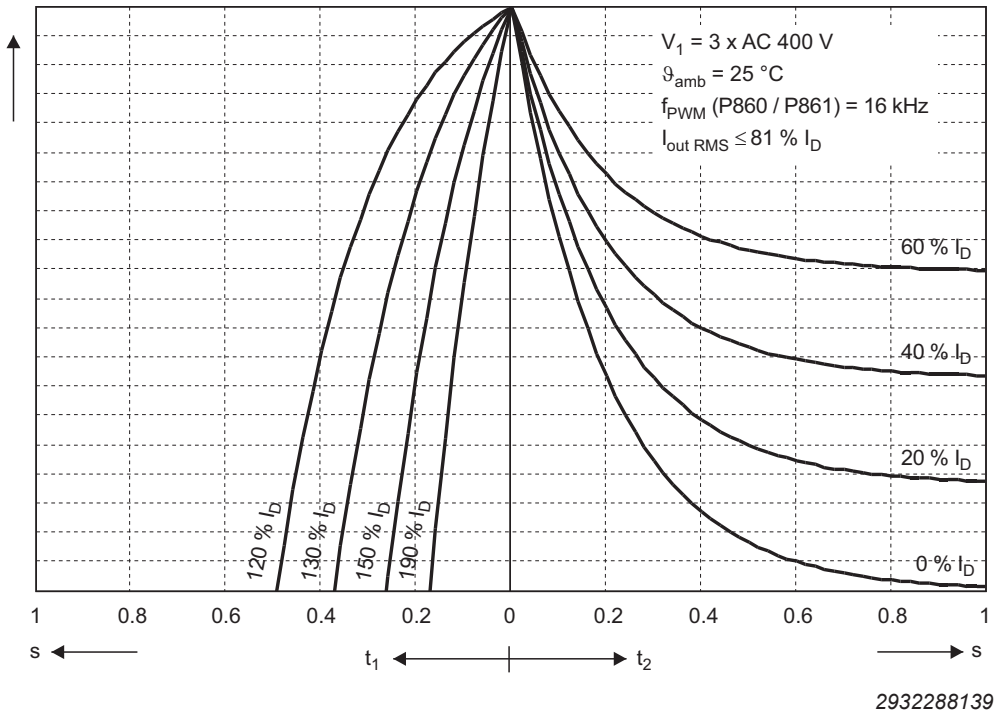



2932286475

Short-time overload capacity at $f_{PWM}$ = 8 kHz (400 V / 25 °C)

**Clock frequency $f_{PWM}$ = 16 kHz:**

The permitted mean inverter output current is $I_{out\ RMS} \leq 81\%\ I_D$.



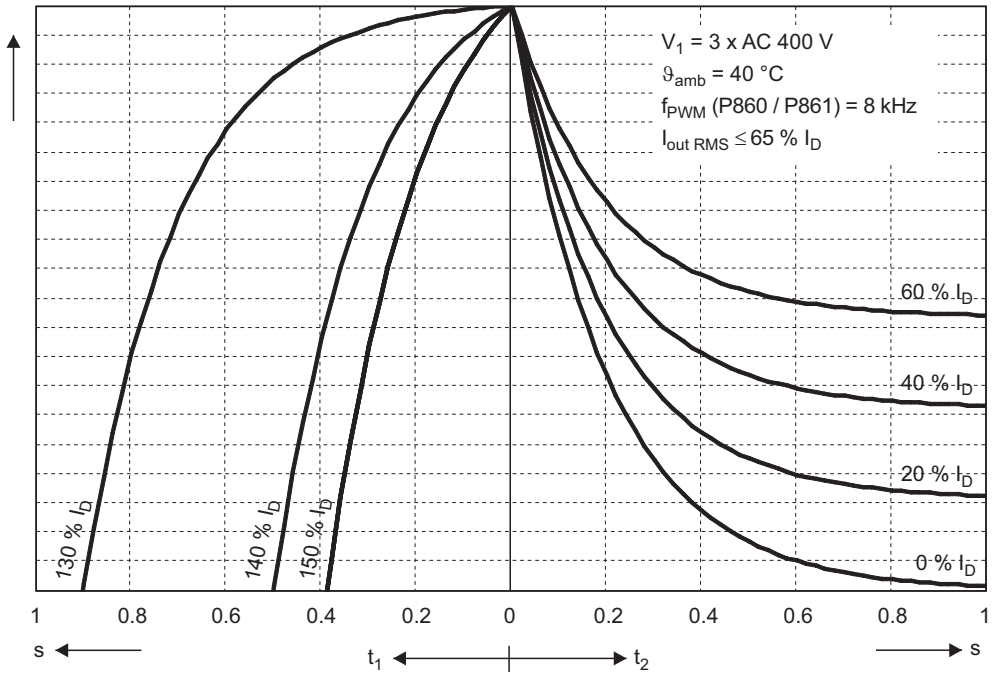

2932288139

Short-time overload capacity at $f_{PWM}$ = 16 kHz (400 V / 25 °C)

### MDX61B, size 1 – 6 overload capacity at 400 V / 40 °C

**Clock frequency $f_{PWM}$ = 8 kHz:**

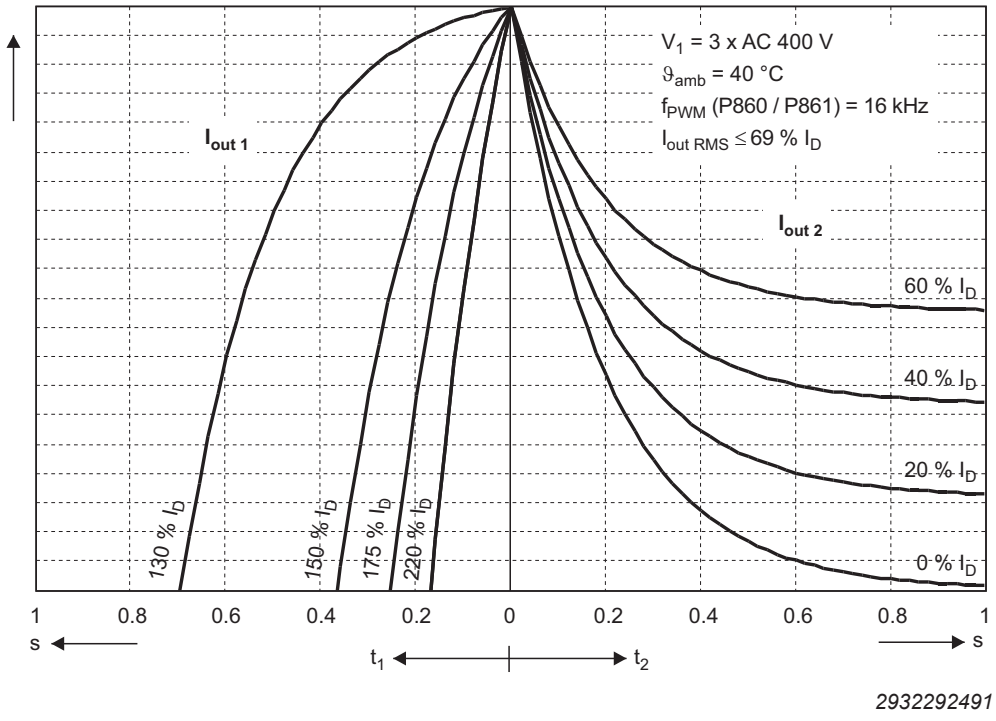
The permitted mean inverter output current is $I_{out\ RMS} \leq 65\%\ I_D$.




Short-time overload capacity at $f_{PWM}$ = 8 kHz (400 V / 40 °C)

**Clock frequency $f_{PWM}$ = 16 kHz:**

The permitted mean inverter output current is $I_{out\ RMS} \leq 69\%\ I_D$.



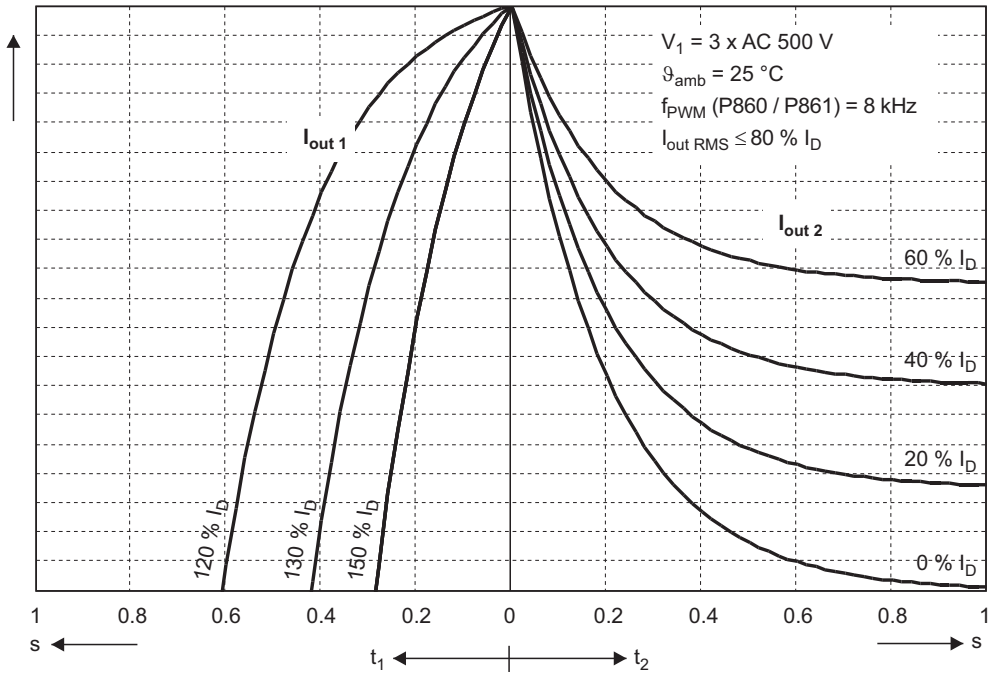

Short-time overload capacity at $f_{PWM}$ = 16 kHz (400 V / 40 °C)

27793230/EN – 08/2022

### MDX61B, size 1 – 6 overload capacity at 500 V / 25 °C

**Clock frequency $f_{PWM}$ = 8 kHz:**

The permitted mean inverter output current is $I_{out\ RMS} \leq 80\%\ I_D$.

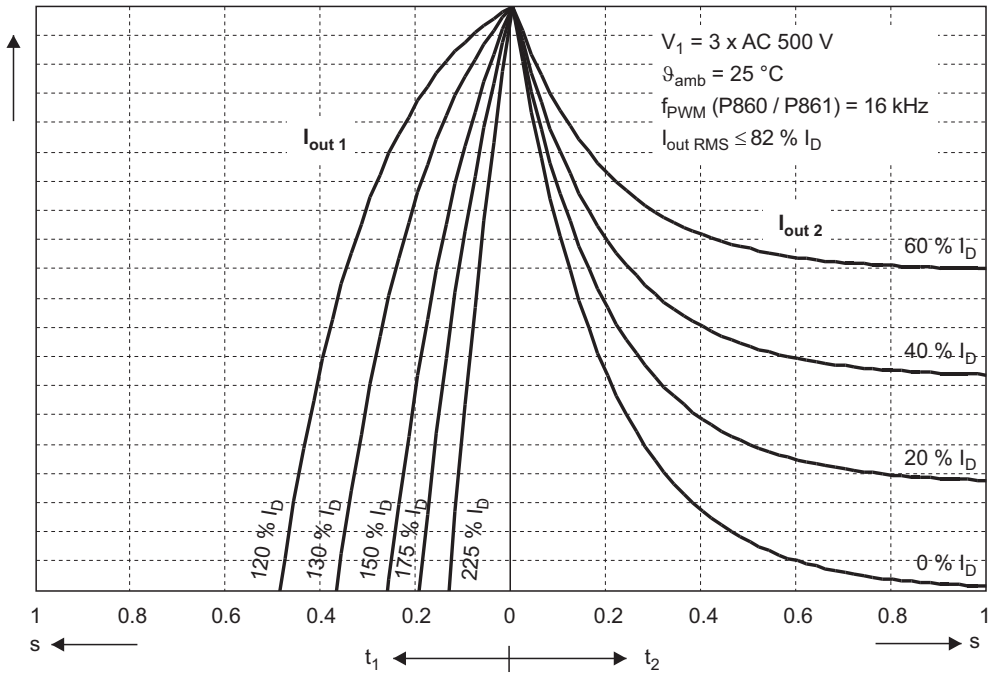



2932295179

Short-time overload capacity at $f_{PWM}$ = 8 kHz (500 V / 25 °C)

**Clock frequency $f_{PWM}$ = 16 kHz:**

The permitted mean inverter output current is $I_{out\ RMS} \leq 82\%\ I_D$.



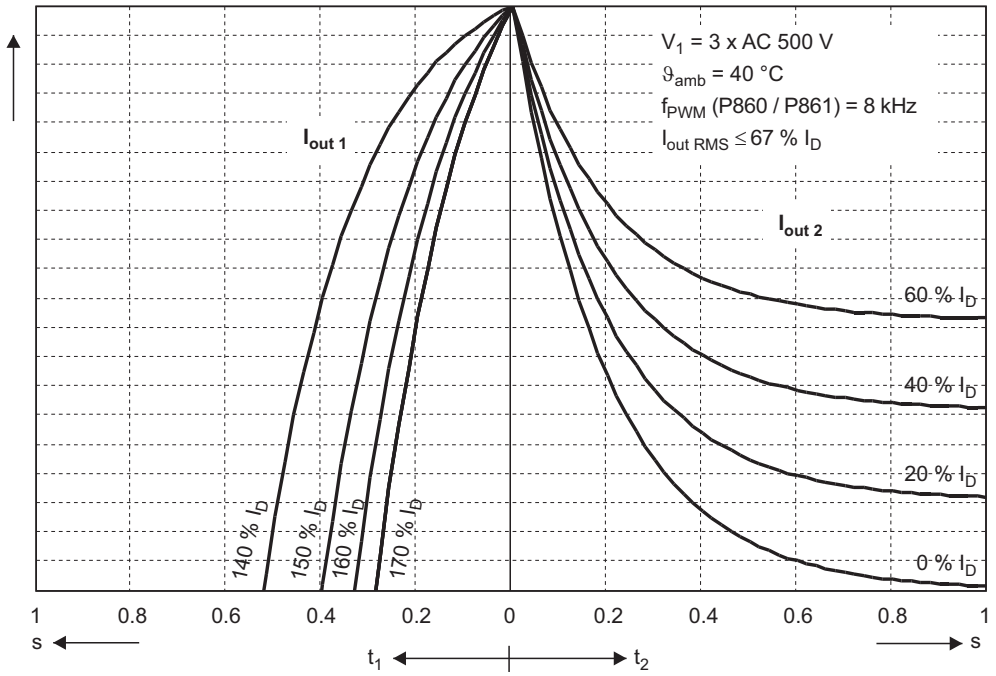

2932296843

Short-time overload capacity at $f_{PWM}$ = 16 kHz (500 V / 25 °C)

### MDX61B, size 1 – 6 overload capacity at 500 V / 40 °C

**Clock frequency $f_{PWM}$ = 8 kHz:**

The permitted mean inverter output current is $I_{out\ RMS} \leq 67\%\ I_D$.

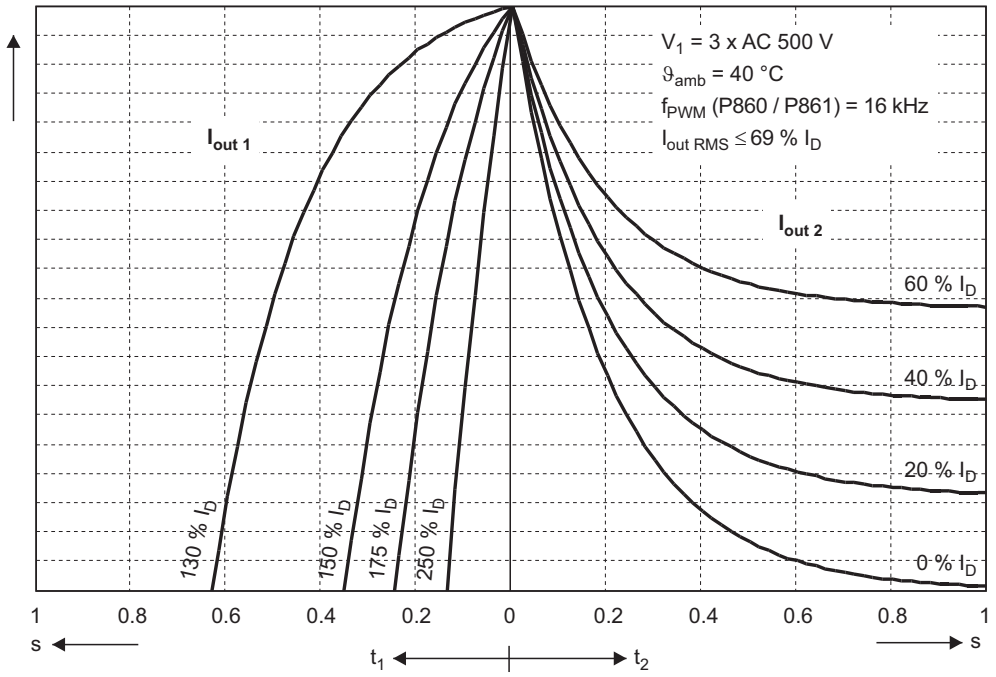



2932299531

Short-time overload capacity at $f_{PWM}$ = 8 kHz (500 V / 40 °C)

**Clock frequency $f_{PWM}$ = 16 kHz:**

The permitted mean inverter output current is $I_{out\ RMS} \leq 69\%\ I_D$.




2932301195

Short-time overload capacity at $f_{PWM}$ = 16 kHz (500 V / 40 °C)

27793230/EN – 08/2022

## 9.10 Braking resistor selection

### ⚠ WARNING



The The supply cables to the braking resistor carry a high DC voltage (ca. DC 900 V).

- The braking resistor cables must be suitable for this high DC voltage.
- Install the braking resistor cables according to the regulations.

### ⚠ CAUTION



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.

### INFORMATION



- The data applies to BW..., BW...-T and BW...-P braking resistors.
- For BW..., BW...-T and BW...-P braking resistors, plan for a load derating of 4% per 10 K from an ambient temperature of 40 °C. Do not exceed a maximum ambient temperature of 80 °C.
- The overload factor of the BW..-T and BW...-P braking resistors is limited by using an integrated temperature relay:
  - BW...-T up to overload factor 12
  - BW...-P up to overload factor 40
- The **maximum permitted line length** between **MOVIDRIVE®** and the braking resistor is **100 m**.
- 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 V0/V = 300 V/500 V (in accordance with DIN VDE 0298).
- 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.

27793230/EN – 08/2022

### 9.10.1 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.

### 9.10.2 Peak braking power

Due to the DC link voltage and the resistance value, the peak braking power can be less than the load capacity of the braking resistor. The peak braking power is determined as follows:

$$P_{max} = \frac{U^2_{DC}}{R}$$

*3172394379*

$V_{DCL}$ is the maximum permitted DC link voltage. Its value is

- for MOVIDRIVE® MDX60/61B...-5_3 (AC 400/500 V devices) $V_{DCL}$ = DC 970 V and
- for MOVIDRIVE® MDX61B...-2_3 (AC 230 V devices) $V_{DCL}$ = DC 485 V.

The following table lists the peak braking power levels that are possible for the different resistance values.

| Resistance value | Peak braking power | |
|---|---|---|
| | MDX60/61B...-5_3 (AC 400/500 V devices) | MDX61B...-2_3 (AC 230 V devices) |
| 100 Ω | 9.4 kW | 2.3 kW |
| 72 Ω | 13.0 kW | 3.2 kW |
| 68 Ω | 13.8 kW | 3.2 kW |
| 47 Ω | 20.0 kW | 5.0 kW |
| 39 Ω | 24.0 kW | 6.0 kW |
| 27 Ω | 34.8 kW | 8.7 kW |
| 18 Ω | 52.2 kW | 13.0 kW |
| 15 Ω | 62.7 kW | 15.6 kW |
| 12 Ω | 78.4 kW | 19.6 kW |
| 9 Ω (2 X BW018 parallel) | 104 kW | 26.1 kW |
| 7.5 Ω (2 × BW915 parallel) | 125 kW | 31.3 kW |
| 6 Ω | 156 kW | 39.2 kW |
| 3 Ω (2 × BW106/206 parallel) | 313 kW | 78.4 kW |
| 2.5 Ω | 376 kW | – |
| 1.4 Ω | 670 kW | – |

27793230/EN – 08/2022

**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 $mm^2$/ 1 Nm |
| Switching capacity of the temperature switch signal contact | • DC 2 A / DC 24 V (DC11)<br>• AC 2 A / AC 230 V (AC11) |
| Switch contact (NC contact) | According to EN 60730 |

27793230/EN – 08/2022

### 9.10.3 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[1] | 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 **regenerative power limit** of the inverter. (= 150% of the recommended motor power → Technical Data) | | | | | | |
| Resistance value $R_{BW}$ | 90 Ω ±35% | 100 Ω ±10% | | 72 Ω ±10% | | 68 Ω ±10% | |
| Tripping current (of F16) $I_F$ | - | 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 mm² (AWG13) 0.5 Nm | Cables | | Ceramic terminals 2.5 mm² (AWG13) 0.5 Nm | |
| Degree of protection | IP20 | IP54 | IP20 (when installed) | IP54 | | IP20 (when installed) | |
| Ambient temperature $\vartheta_{amb}$ | -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[1] | 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[2]. | 7.2 kW | 15.6 kW | 24.0 kW[2] |
| 6% cdf | 11 kW | 19 kW | 20 kW[2] | 11.4 kW | 24.0 kW | 24.0 kW[2] |
| | Observe the **regenerative power limit** of the inverter. (= 150% of the recommended motor power → Technical Data) | | | | | |
| Resistance value $R_{BW}$ | 47 Ω ±10% | | | 39 Ω ±10% | | |
| Tripping current (of F16) $I_F$ | 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 mm² (AWG13) / 0.5 Nm BW347-T: Ceramic terminals 10 mm² (AWG8) / 1.6 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) | 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 |
| Load capacity 50% cdf[1] | 2.5 kW | 5.9 kW | 12.7 kW | 27.2 kW |

27793230/EN – 08/2022

| Braking resistor type BW... | BW018-015 | | | |
|---|---|---|---|---|
| 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[2)] |
| 6% cdf | 11.4 kW | 26.6 kW | 52.2 kW[2)] | 62.7 kW[2)] |
| | Observe the **regenerative power limit** of the inverter. (= 150% of the recommended motor power → Technical Data) | | | |
| Resistance value $R_{BW}$ | 18 Ω ±10% | | | 15 Ω ±10% |
| Tripping current (of F16) $I_F$ | 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 2.5 mm² (AWG13) / 0.5 Nm BW018-015-P: Terminal 2.5 mm² (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 [3)] | | | 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[1)] | 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 **regenerative power limit** of the inverter. (= 150% of the recommended motor power → Technical Data) | | |
| Resistance value $R_{BW}$ | 12 Ω ±10% | | |
| Tripping current (of F16) $I_F$ | 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[1)] | 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 $R_{BW}$ | 6 Ω ± 10% | | 1.4 Ω ± 10% | 2.5 Ω ± 10% |
| Tripping current (of F16) $I_F$ | 47.4 A | 54.7 A | 110 A | 129 A |
| Design | Grid resistor | | | |

| Braking resistor type BW..-T/-P | BW106-T | BW206-T | BW1.4-170 | BW003-420-T |
|---|---|---|---|---|
| Connections / 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 0900/1100/1320[2)] | | 1600/2000/2500 | |

1) cdf = Cyclic duration factor of the braking resistor in relation to a cycle duration T D ≤ 120 s

2) When connected in parallel, the load capacity and tripping current are doubled.

27793230/EN – 08/2022

### 9.10.4 Assignment to AC 230 V devices (...-2_3)

| Braking resistor type BW... | BW039-003 | BW039-006 | BW039-012 | | BW027-006 | BW027-012 | | |
|---|---|---|---|---|---|---|---|---|
| Part number | 08216878 | 08216886 | 0821689 4 | | 8224226 | 8224234 | | |
| Braking resistor type BW...-T | | | BW039-012-T | BW039-026-T | | | BW018-015-P | BW018-035-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[1] | 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[2] | 1.9 kW | 3.8 kW | 4.5 kW | 10.5 kW |
| 12% cdf | 1.8 kW | 3.6 kW | 6.0 kW[2]. | 6.0 kW[2] | 3.6 kW | 7.2 kW | 6.7 kW | 13.0 kW[2] |
| 6% cdf | 2.8 kW | 5.7 kW | 6.0 kW | 6.0 kW[2] | 5.7 kW | 8.7 kW | 11.4 kW | 13.0 kW[2] |
| | Observe the **regenerative power limit** of the inverter. (= 150% of the recommended motor power → Technical Data) | | | | | | | |
| Resistance value $R_{BW}$ | 39 Ω ±10% | | | | 27 Ω ±10% | | 18 Ω ±10% | |
| Tripping current (of F16) $I_F$ | 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 mm² (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[3] | |

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[1] | 12.7 kW | 15.6 kW[2] | 4.2 kW | 8.5 kW | 17 kW | 23 kW | 30.6 kW |
| At 25% cdf | 13.0 kW | 15.6 kW[2] | 7.5 kW | 15.0 kW | 19.6 kW[2] | 39.2 kW[2] | 39.2 kW[2] |
| 12% cdf | 13.0 kW[2]. | 15.6 kW[2] | 11.2 kW | 19.6 kW | 19.6 kW[2] | 39.2 kW[2] | 39.2 kW[2] |
| 6% cdf | 13.0 kW[2] | 15.6 kW[2] | 19.0 kW | 19.6 kW[2] | 19.6 kW[2] | 39.2 kW[2] | 39.2 kW[2] |
| | Observe the **regenerative power limit** of the inverter. (= 150% of the recommended motor power → Technical Data) | | | | | | |
| Resistance value $R_{BW}$ | 18 Ω ±10% | 15 Ω ±10% | 12 Ω ±10% | | | 6 Ω ±10% | |
| Tripping current (of F16) $I_F$ | 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[3] | |

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.

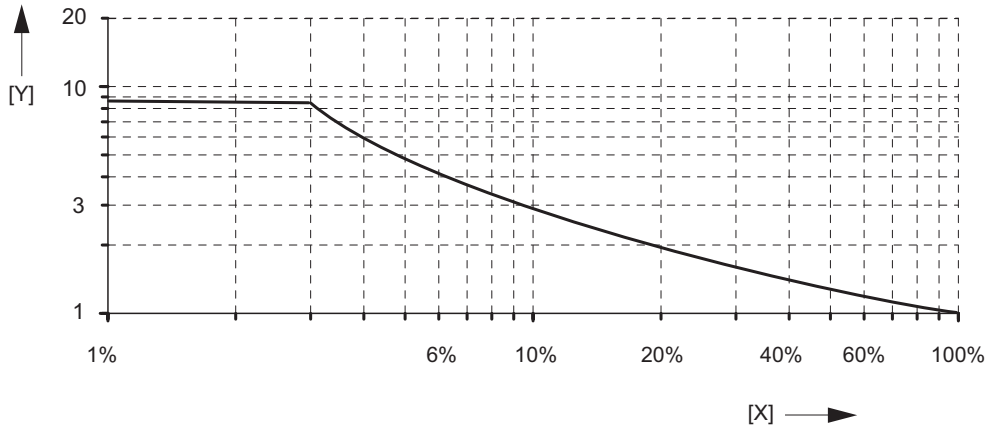
### 9.10.5 Overload factor for braking resistors

In braking operations within the cycle duration $T_D$ (standard: $T_D \leq 120$ s), the resulting cdf braking power can be determined using the overload factor (see following diagrams). Observe the conditional peak braking power due to the DC link voltage when determining the load capacity.

The cdf braking power is calculated using the following formula:

CDF braking power = continuous braking power × overload factor

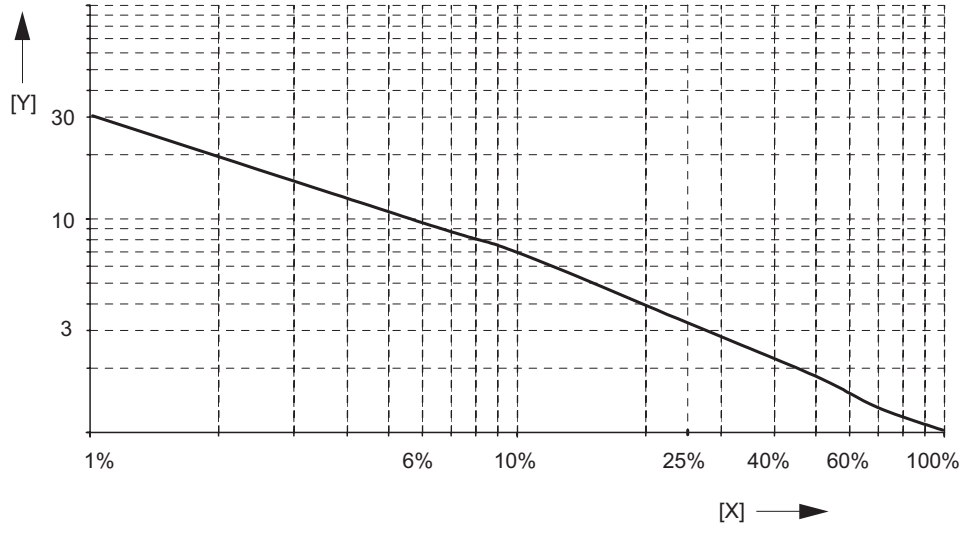
#### Overload factor for flat-type braking resistors




*2990427659*

| [X] Cyclic duration factor (cdf) | 1% | 3% | 6% | 15% | 25% | 40% | 60% | 80% | 100% |
|---|---|---|---|---|---|---|---|---|---|
| [Y] Overload factor | 8.7 | 8.6 | 4 | 2.6 | 1.83 | 1.5 | 1.2 | 1.12 | 1 |

#### Overload factor for wire resistors on ceramic core

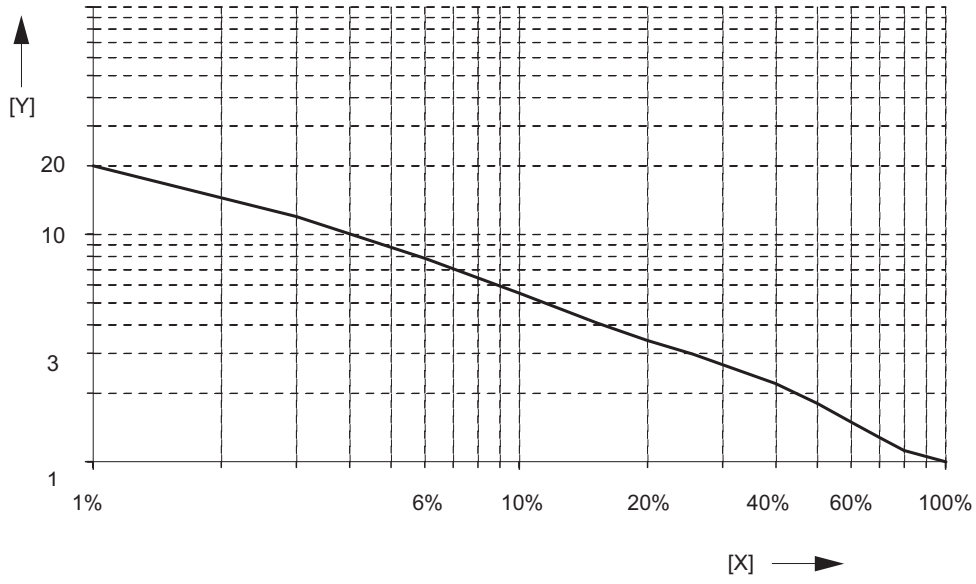



*2990447883*

| [X] Cyclic duration factor (cdf) | 1% | 3% | 6% | 15% | 25% | 40% | 60% | 80% | 100% |
|---|---|---|---|---|---|---|---|---|---|
| [Y] Overload factor | 30 | 15 | 9.5 | 5 | 3.2 | 2.2 | 1.5 | 1.12 | 1 |

27793230/EN – 08/2022

### Overload factor for grid resistors




*2990530187*

| [X] Cyclic duration factor (cdf) | 1% | 3% | 6% | 15% | 25% | 40% | 60% | 80% | 100% |
|---|---|---|---|---|---|---|---|---|---|
| [Y] Overload factor | 20 | 12 | 7.6 | 4 | 3 | 2.2 | 1.5 | 1.12 | 1 |

### Calculation example

Given:

- Peak braking power 13 kW
- Average braking power during the braking time 6.5 kW
- Cyclic duration factor cdf 6%

Required:

- BW.. braking resistor

27793230/EN – 08/2022

**Procedure**

1. **Determine the overload capacity.**

   First, determine the overload factor for a cyclic duration factor cdf of 6% from the respective diagrams.

2. **Calculate the continuous braking power.**

   Calculate the continuous braking power (= 100% cdf braking power) using the following formula: Mean braking power / overload factor

   Results:

   100% cdf braking power for wire resistors: 685 W.

   100% cdf braking power for grid resistors: 856 W.

3. **Determine the maximum braking resistor value depending on MOVIDRIVE® B.**

   The **maximum braking resistance value is 72 Ω** for a peak braking power of 13 kW when using a **MDX60B/61B...-5_3 (AC -400/500 V device)** (→ Peak braking power table).

   The **maximum braking resistance value is 18 Ω** for a peak braking power of 13 kW when using a **MDX60B/61B...-2_3 (AC -230 V device)** (→ Peak braking power table).

4. **Select the matching braking resistor:**

   Select the matching braking resistor from the assignment tables (AC -400/500 V devices or AC 230V devices) on the basis of the following aspects:

   - Maximum braking resistance value
   - MOVIDRIVE® B device used

   Result when using, for example, MDX61B0110-5_3: BW039-012 (or braking resistor with higher power)

   Result when using, for example, MDX61B0110-2_3: BW018-015-T (or braking resistor with higher power)

27793230/EN – 08/2022

## 9.11 Connecting AC brakemotors

For detailed information about the SEW brake system, refer to the Gearmotors catalog, which you can order from SEW-EURODRIVE.

SEW-EURODRIVE brake systems are disk brakes with a DC coil that release electrically and brake using spring force. A brake rectifier supplies the brake with DC voltage.

### INFORMATION

The brake rectifier must have a separate supply system cable for inverter operation; it must not be powered using the motor voltage!

### 9.11.1 Disconnecting the brake rectifier

The brake rectifier can be switched off, causing the brake to be applied, in two ways:

1. Cut-off in the AC circuit
2. Cut-off in the DC and AC circuit (faster disconnection)

Always use the cut-off in the DC and AC circuit of the brake:

- All hoist applications
- The CFC and SERVO operating modes

### 9.11.2 Activating the brake

Always activate the brake via digital output DBØØ "/Brake", do not use the PLC!

The digital output DOØ2 "/Brake" is configured as an output for operating a relay with free-wheeling diode and a control voltage of DC +24 V / max. 150 mA / 3.6 W. A power contactor can be controlled directly with a DC 24 V coil voltage or the BMK brake rectifier. This power contactor is used for switching the brake.

The startup function in the DBG60B keypad and in the MOVITOOLS® MotionStudio engineering software sets the brake parameters for the 2 and 4-pole motors from SEW-EURODRIVE. The brake parameters (P73_) must be set manually when using SEW-EURODRIVE motors with a higher number of poles and third-party motors.

### 9.11.3 Brake parameters

### INFORMATION

The brake parameters are adapted to the brake activation arrangement shown in the wiring diagram. If the values set for the brake release and application times are too short, e.g. for long response times in the brake control system, hoists, for example, may sag.

27793230/EN – 08/2022

## 9.12 Permitted voltage systems for MOVIDRIVE® B

### INFORMATION

MOVIDRIVE® B is intended for operation on TN and TT supply systems with directly grounded star point. Operation on voltage supply systems with a non-grounded star point (for example IT power systems) is also permitted. SEW-EURODRIVE recommends using suitable insulation monitors that may create ground capacitance. Using such devices prevents the earth-leakage monitor mis-tripping due to the ground capacitance of the inverter.

The line voltage tolerance (short-term overvoltage or undervoltage) must not exceed 10%.

Only operate the inverters on supply systems with a maximum line-to-ground voltage of AC 300 V.

## 9.13 Line contactors and line fuses

### 9.13.1 Line contactor

- Only use line contactors of utilization category AC-3 (EN 60947-4-1).

### NOTICE

- Do not use the **line contactor K11** (→ MOVIDRIVE® MDX60B/61B operating instructions, chapter "Wiring diagram for basic device") for jog mode but **only to switch the inverter on and off**. For jog mode, use the the commands "Enable/stop", "CW/stop" or "CCW/stop".
- Observe a minimum switch-off time of 10 s for the line contactor K11.

### 9.13.2 Line fuses, fuse types

**Sizes 0 – 6**

Line protection types in utilization category gL, gG:

- Nominal fusing voltage ≥ nominal line voltage
- Nominal fusing current must be designed for 100% or 125% of the nominal inverter current depending on the inverter utilization.

Miniature circuit breaker with characteristics B, C>

- Nominal circuit breaker voltage ≥ nominal line voltage
- The nominal current of the line protection circuit breaker must be 10% above the nominal inverter current.

**Size 7**

Line fuses type gS are recommended for protecting the device. This is a combination of semiconductor and line protection fuse and is required for protecting the input rectifier.

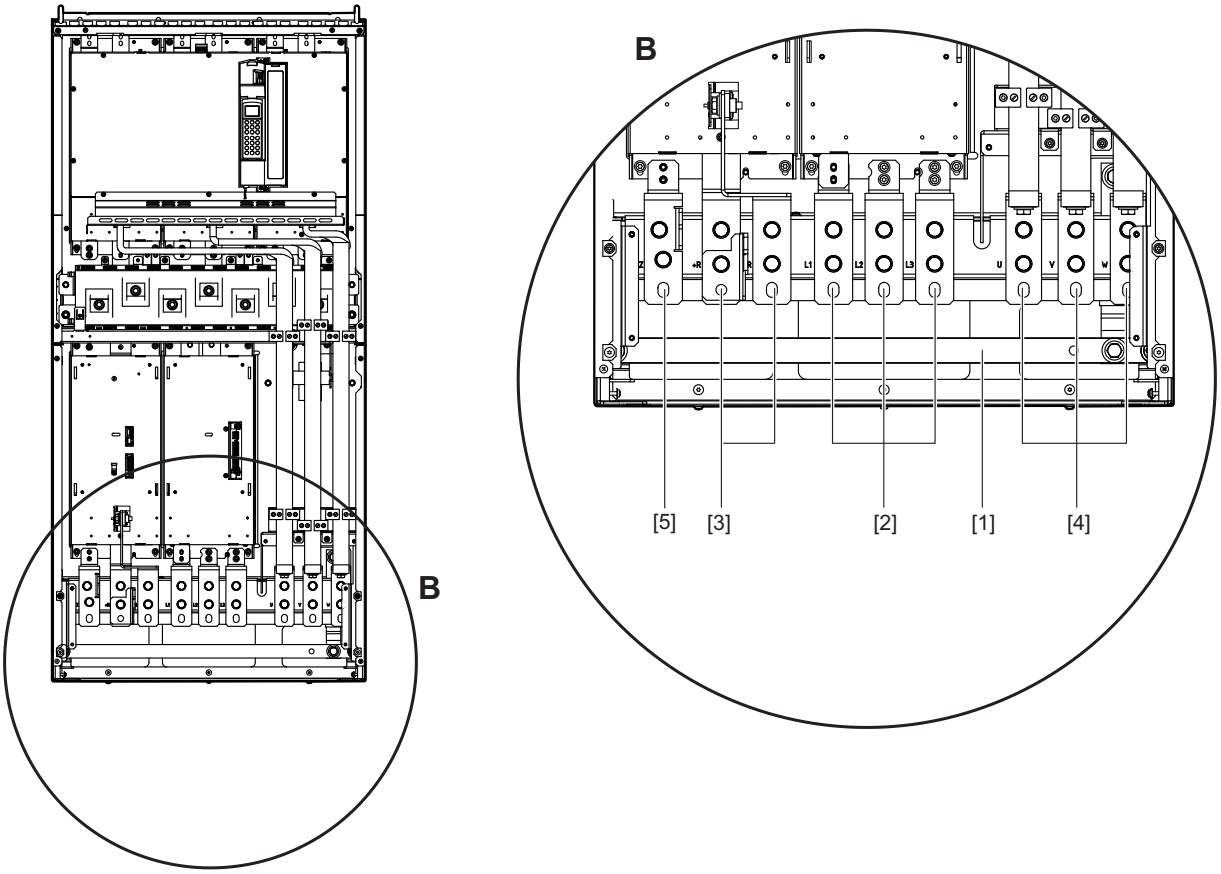
27793230/EN – 08/2022

## 9.14 Power connection for size 7

### 9.14.1 Power connections

MOVIDRIVE® B in size 7 has other connections than sizes 0 – 6. All power connections are made from underneath via M12 cable lugs.

PE is connected with specific shield terminal on the PE busbar. This is where also the motor shields can be applied.




*2077053963*

[1] PE connection rail (thickness = 10 mm)

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

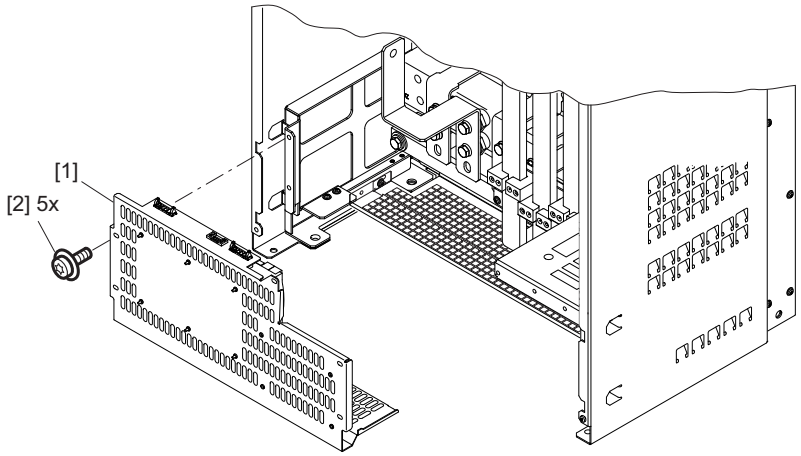
[3] X3: Braking resistor connection 8/+R, 9/–R

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

[5] $-U_Z$: Only with DC link adapter DLZ12B or DLZ14B accessories:

### 9.14.2 Auxiliary supply

Unlike sizes 0 to 6, size 7 has a switched-mode power supply unit that is not supplied from the DC link but requires its own AC 3 × 400 V supply. This voltage can be derived from the mains or (even better) from an auxiliary supply in the control circuit. The device cannot be taken into operation without connecting this power supply unit.



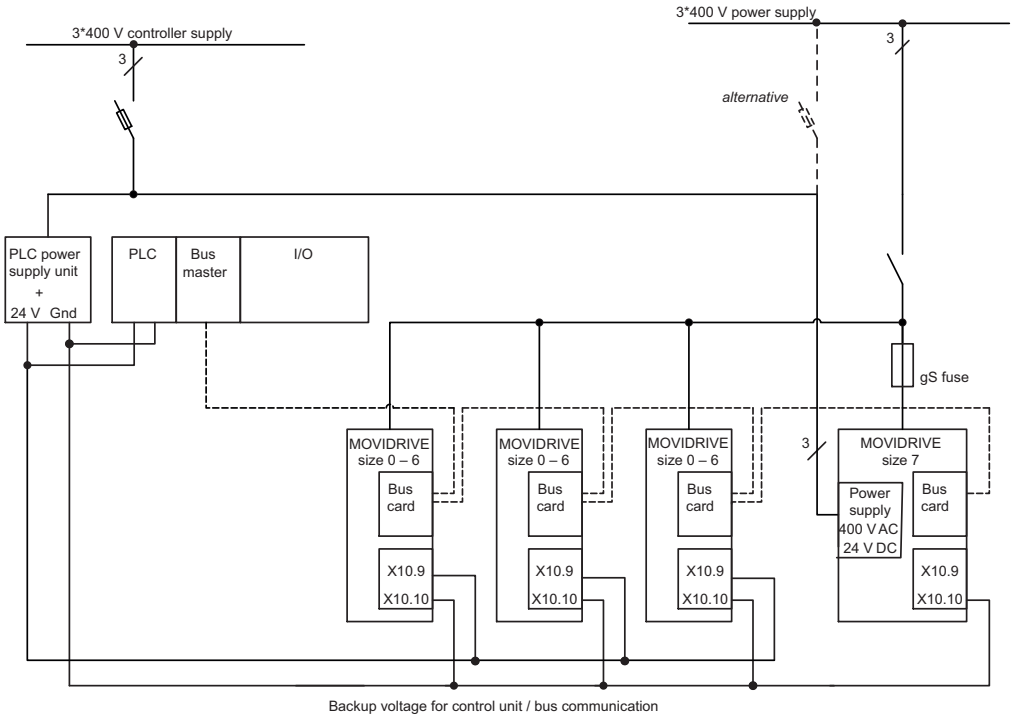

MDX61B size 7 power supply unit *20089692683*

[1] DC power supply unit

[2] Screw

## INFORMATION

Do not apply external 24 V to X10.9. The power supply unit must be supplied with 400 V.




*18014400932178059*

Auxiliary supply X10.9/10 on the control unit only supplies the control unit, not the power electronics and internal device communication of MOVIDRIVE® B size 7. This is why the device must be supplied as shown in the following figure.

For connecting the digital inputs and outputs, refer to the wiring diagram of the signal terminals.

## INFORMATION

- The power supply unit has a nominal line current of 2.4 A.
- The inrush current is max. 30 A (time-lag fuses required)

27793230/EN – 08/2022

## 9.15 Line and motor cables

### 9.15.1 Special regulations

Comply with the **regulations issued by specific countries and for specific machines** regarding fusing and the selection of cable cross sections. If required, also adhere to the notes on **UL compliant installation** (→ chapter "UL compliant installation").

### 9.15.2 Cable cross sections and fusing

If single-core copper cables with PVC insulation routed in cable ducts are used, SEW-EURODRIVE suggests the following cable cross-sections and fuses for an ambient temperature of 25 °C and rated line currents of 100% of the rated inverter current:

### 9.15.3 AC 400/500 V devices SI devices, $V_{line}$ = 3 × AC 400 V:

| **MDX60/61B...-5A3** | **0005** | **0008** | **0011** | **0014** | **0015** | **0022** | **0030** | **0040** |
|---|---|---|---|---|---|---|---|---|
| Size | 0S | | 0M | | 1 | | | |
| Fuses F11/F12/F13 $I_N$ | 16 A | | | | 16 A | | | |
| Supply system cable L1/L2/L3 | 1.5 mm² | | | | 1.5 mm² | | | |
| PE conductor | 2 × 1.5 mm² or 1 × 10 mm² | | | | 2 × 1.5 mm² or 1 × 10 mm² | | | |
| Motor cable U/V/W | 1.5 mm² | | | | 1.5 mm² | | | |
| Device terminal cross section of the power section | Separable terminal strip 4 mm² conductor end sleeve DIN 46228 | | | | Separable terminal strip 4 mm² conductor end sleeve DIN 46228 | | | |
| Tightening torque | 0.6 Nm | | | | | | | |

| **MDX61B...-503** | **0055** | **0075** | **0110** | **0150** | **0220** | **0300** |
|---|---|---|---|---|---|---|
| Size | 2S | | 2 | 3 | | |
| Fuses F11/F12/F13 $I_N$ | 16 A | | 25 A | 35 A | 50 A | 63 A |
| Supply system cable L1/L2/L3 | 2.5 mm² | | 4 mm² | 6 mm² | 10 mm² | 16 mm² |
| PE conductor | 2 × 2.5 mm² or 1 × 10 mm² | 2 × 4 mm² or 1 × 10 mm² | | 2 × 6 mm² or 1 × 10 mm² | 1 × 10 mm² | 1 × 16 mm² |
| Motor cable U/V/W | 2.5 mm² | | 4 mm² | 6 mm² | 10 mm² | 16 mm²[21)] |
| Device terminal cross section of the power section | Terminal strips 4 mm² conductor end sleeve DIN 46228 | | M4 screw and washer assembly with terminal clip 4 mm² conductor end sleeve DIN 46228 6 mm² crimp cable lug DIN 46234 | M6 screw and washer assembly with washer Max. 25 mm² Crimp cable lug DIN 46234 | | |
| Tightening torque | 1.5 Nm | | | 3.5 Nm | | |

1) For synchronous servo drives: Use motor with terminal box!

| MDX61B...-503 | 0370 | 0450 | 0550 | 0750 | 0900 | 1100 | 1320 |
|---|---|---|---|---|---|---|---|
| Size | 4 | | 5 | | 6 | | |
| Fuses F11/F12/F13 $I_N$ | 80 A | 100 A | | 125 A | 160 A | 200 A | 250 A |
| Supply system cable L1/L2/L3 | 25 mm² | 35 mm² | | 50 mm² | 70 mm² | 95 mm² | 150 mm² |
| PE conductor | 1 × 16 mm² | | | 25 mm² | 35 mm² | 50 mm² | 70 mm² |
| Motor cable U/V/W | 25 mm²[21)] | 35 mm² | | 50 mm² | 70 mm² | 95 mm² | 150 mm² |
| Device terminal cross section of the power section | M10 bolt with nut Max. 70 mm² Press cable lug DIN 46235 | | | | M12 bolt with nut Max. 185 mm² Press cable lug DIN 46235 | | |
| Tightening torque | 14 Nm | | | | 20 Nm | | |

1) For synchronous servo drives: Use motor with terminal box!

27793230/EN – 08/2022

**Size 7**

The fuse value depends on the application and must be adjusted when the device is operated in 125% mode.

| MDX61B...-503 | 1600 | 2000 | 2500 | 2500 in 125% mode |
|---|---|---|---|---|
| Size | 7 | | | |
| Fuses | 315A gS | 400A gS | 500A gS | 630A gS |
| Supply system cable L1/L2/L3 | 150 mm² / 2 × 50 mm² | 240 mm² / 2 × 70 mm² | 2 × 95 mm² | 2 × 150 mm² |
| PE conductor | 70 mm² / 2 × 25 mm² | 120 mm² / 2 × 35 mm² | 150 mm² / 2 × 50 mm² | 150 mm²/ 2 × 70 mm² |
| Motor cable U/V/W | 150 mm² / 2 × 50 mm² | 240 mm² / 2×70 mm² | 2 × 95 mm² | 2 × 150 mm² |
| Device terminal cross section of the power section | Connection bar with bore for M12 max. 2 × 240 mm²<br>Press cable lug DIN 46235 | | | |
| Tightening torque | 70 Nm | | | |

### 9.15.4 AC 230 V devices SI units, $V_{line}$ = 3 × AC 230 V:

| MDX61B...-2_3 | 0015 | 0022 | 0037 | 0055 | 0075 |
|---|---|---|---|---|---|
| Size | 1 | | | 2 | |
| Fuses F11/F12/F13 $I_N$ | 16 A | | 25 A | 25 A | 35 A |
| Supply system cable L1/L2/L3 | 1.5 mm² | | 4 mm² | 4 mm² | 6 mm² |
| PE conductor | 2 × 1.5 mm²<br>1 × 10 mm² | | 2 × 4 mm²<br>1 × 10 mm² | 2 × 4 mm²<br>1 × 10 mm² | 2 × 6 mm²<br>1 × 10 mm² |
| Motor cable U/V/W | 1.5 mm² | | 4 mm² | 4 mm² | 6 mm² |
| Device terminal cross section of the power section | Separable terminal strip<br>4 mm² conductor end sleeve DIN 46228 | | | M4 screw and washer assembly with terminal clip<br>4 mm² conductor end sleeve DIN 46228<br>6 mm² crimp cable lug DIN 46234 | |
| Tightening torque | 0.6 Nm | | | | |

| MDX61B...-2_3 | 0110 | 0150 | 0220 | 0300 |
|---|---|---|---|---|
| Size | 3 | | 4 | |
| Fuses F11/F12/F13 $I_N$ | 50 A | 63 A | 80 A | 100 A |
| Supply system cable L1/L2/L3 | 10 mm² | 16 mm² | 25 mm² | 35 mm² |
| PE conductor | 1 × 10 mm² | 1 × 16 mm² | 1 × 16 mm² | 1 × 16 mm² |
| Motor cable U/V/W | 10 mm² | 16 mm² | 25 mm² | 35 mm² |
| Device terminal cross section of the power section | M6 screw and washer assembly with washer<br>Max. 25 mm²<br>Crimp cable lug DIN 46234 | | M10 bolt with nut<br>Max. 70 mm²<br>Press cable lug DIN 46235 | |
| Tightening torque | 3.5 Nm | | 14 Nm | |

27793230/EN – 08/2022

### 9.15.5 Smallest wire bending space (EN 61800-5-1)

As stipulated in EN 61800-5-1, the distance between a power connection terminal and an obstruction toward which the wire is directed on leaving the terminal must correspond with the minimum values given in the table below.

| Cable cross section in $mm^2$ | Smallest wire bending space in mm | | |
|---|---|---|---|
| | Wires per connection terminal | | |
| | 1 | 2 | 3 |
| 10 – 16 | 40 | – | – |
| 25 | 50 | – | – |
| 35 | 65 | – | – |
| 50 | 125 | 125 | 180 |
| 70 | 150 | 150 | 190 |
| 95 | 180 | 180 | 205 |
| 120 | 205 | 205 | 230 |
| 150 | 255 | 255 | 280 |
| 185 | 305 | 305 | 330 |
| 240 | 305 | 305 | 380 |

27793230/EN – 08/2022

### 9.15.6 AC 400/500 V devices according to USA NEC, $V_{line}$ = 3 × AC 460 V:

| MDX61B...-5A3 | 0005 | 0008 | 0011 | 0014 | 0015 | 0022 | 0030 | 0040 |
|---|---|---|---|---|---|---|---|---|
| Size | 0S | | 0M | | 1 | | | |
| Fuses F11/F12/F13 $I_N$ | 6 A | 6 A | | 6 A | 6 A | 10A | | 15 A |
| Supply system cable L1/L2/L3 | AWG14 | | | | AWG14 | | | |
| PE conductor | AWG14 | | | | AWG14 | | | |
| Motor cable U/V/W | AWG14 | | | | AWG14 | | | |
| Device terminal cross section of the power section | Separable terminal strip AWG10 conductor end sleeve | | | | Separable terminal strip AWG10 conductor end sleeve | | | |
| Tightening torque | 0.6 Nm | | | | | | | |

| MDX61B...-503 | 0055 | 0075 | 0110 | 0150 | 0220 | 0300 |
|---|---|---|---|---|---|---|
| Size | 2S | | 2 | 3 | | |
| Fuses F11/F12/F13 $I_N$ | 20 A | | 30 A | 40 A | 60 A | 80 A |
| Supply system cable L1/L2/L3 | AWG12 | | AWG10 | AWG8 | AWG6 | AWG4 |
| PE conductor | AWG12 | | AWG10 | AWG10 | | AWG8 |
| Motor cable U/V/W | AWG12 | | AWG10 | AWG8 | AWG6[1)] | AWG4[1)] |
| Device terminal cross section of the power section | Terminal strips 4 mm² conductor end sleeve DIN 46228 | | M4 screw and washer assembly with terminal clip AWG10 conductor end sleeve AWG10 crimp cable lug | M6 screw and washer assembly with washer max. AWG4 crimp cable lug | | |
| Tightening torque | 1.5 Nm | | | 3.5 Nm | | |

1) For synchronous servo drives: Use motor with terminal box!

| MDX61B...-503 | 0370 | 0450 | 0550 | 0750 | 0900 | 1100 | 1320 |
|---|---|---|---|---|---|---|---|
| Size | 4 | | 5 | | 6 | | |
| Fuses F11/F12/F13 $I_N$ | 90 A | 110 A | 150 A | 175 A | 175 A | 200 A | 230 A |
| Supply system cable L1/L2/L3 | AWG4 | AWG3 | AWG1 | AWG2/0 | AWG2/0 | AWG3/0 | AWG4/0 |
| PE conductor | AWG8 | AWG6 | AWG6 | | AWG6 | AWG6 | AWG4 |
| Motor cable U/V/W | AWG4 [1)] | AWG3 | AWG1 | AWG2/0 | AWG2/0 | AWG3/0 | Kcmil 250 |
| Device terminal cross section of the power section | M10 bolt with nut Max. AWG2/0 crimp cable lug | | | | M12 bolt with nut max. Kcmil 350 Crimp cable lug | | |
| Tightening torque | 14 Nm | | | | 20 Nm | | |

1) For synchronous servo drives: Use motor with terminal box!

| MDX61B...-503 | 1600 | 2000 | 2500 |
|---|---|---|---|
| Size | 7 | | |
| Fuses | 315 A | 400 A | 500 A |
| Supply system cable L1/L2/L3 | 400 kcmil 2 × AWG2/0 | 2 × AWG3/0 | 2 × 250 Kcmil |
| PE conductor | AWG3 | AWG3 | AWG2 |
| Motor cable U/V/W | 400 kcmil 2 × AWG2/0 | 2 × AWG3/0 | 2 × 250 Kcmil |
| Device terminal cross section of the power section | Connection rail with bore for M12 max. 2 × 450 Kcmil Crimp cable lug | | |
| Tightening torque | 70 Nm | | |

27793230/EN – 08/2022

### 9.15.7 AC 230 V devices according to USA NEC, $V_{line}$ = 3 × AC 230 V:

| MDX61B...-2_3 | 0015 | 0022 | 0037 | 0055 | 0075 |
|---|---|---|---|---|---|
| Size | 1 | | | 2 | |
| Fuses F11/F12/F13 $I_N$ | 16 A | | 25 A | 25 A | 35 A |
| Supply system cable L1/L2/L3 | AWG14 | | AWG12 | AWG10 | |
| PE conductor | AWG14 | | AWG12 | AWG10 | |
| Motor cable U/V/W | AWG14 | | AWG12 | AWG10 | |
| Device terminal cross section of the power section | Separable terminal strip<br>AWG10 conductor end sleeve | | | M4 screw and washer assembly with terminal clip<br>AWG10 conductor end sleeve<br>AWG10 crimp cable lug | |
| Tightening torque | 0.6 Nm | | | | |

| MDX61B...-2_3 | 0110 | 0150 | 0220 | 0300 |
|---|---|---|---|---|
| Size | 3 | | 4 | |
| Fuses F11/F12/F13 $I_N$ | 50 A | 60 A | 80 A | 90 A |
| Supply system cable L1/L2/L3 | AWG6 | AWG4 | AWG4 | AWG3 |
| PE conductor | AWG10 | AWG8 | AWG8 | AWG6 |
| Motor cable U/V/W | AWG6 | AWG4 | AWG4 | AWG3 |
| Device terminal cross section of the power section | M6 screw and washer assembly with washer<br>max. AWG4 crimp cable lug | | M10 bolt with nut<br>Max. AWG2/0 crimp cable lug | |
| Tightening torque | 3.5 Nm | | 14 Nm | |

### 9.15.8 Permitted motor cable lengths

The **maximum motor cable length** is depending on:

- Cable type
- Voltage drop in the cable
- Set PWM frequency P860/P861.
- The connection of an output filter.
  - An output filter is only permitted in VFC operating mode.
  - If an HF... output filter is connected, the cable length is not restricted by these limiting values, but exclusively by the voltage drop along the motor cable.
- The encoder type.
  - For encoder connection (VFC-n control, CFC, SERVO): Maximum cable length for the encoder connection is 100 m at a capacitance per unit length ≤ 120 nF/km (exception: 200 m for HTL encoders with interface adapter DWE12B, and 300 m with DEU21B and HTL encoder by SEW-EURODRIVE)

**MOVIDRIVE® MDX60/61B...-5_3:**

| MDX60/61B...-5_3 (at $V_{line}$ = 3 × AC 400 V) | 0005–0014 | 0015 | 0022 | 0030 | 0040 | 0055 | 0075–1320 | 1600–2500 |
|---|---|---|---|---|---|---|---|---|
| | Maximum motor cable length in m | | | | | | | |
| | Shielded cable | | | | | | | |
| PWM frequency 2.5 kHz | – | – | – | – | – | – | – | 400 |
| (P860/P861) 4 kHz | 120 | 120 | 200 | 250 | 300 | 300 | 400 | 300 |
| 8 kHz | 80 | 80 | 120 | 150 | 250 | 250 | 300 | – |
| 12 kHz | 50 | 50 | 80 | 120 | 200 | 200 | 250[1)] | – |
| 16 kHz | 40 | 40 | 60 | 100 | 150 | 150 | 200[1)] | – |
| | Unshielded line | | | | | | | |
| PWM frequency 2.5 kHz | – | – | – | – | – | – | – | 1200 |
| (P860/P861) 4 kHz | 360 | 360 | 600 | 750 | 900 | 900 | 1200 | 900 |
| 8 kHz | 240 | 240 | 360 | 450 | 750 | 750 | 900 | – |
| 12 kHz | 150 | 150 | 240 | 360 | 600 | 600 | 750[1)] | – |
| 16 kHz | 120 | 120 | 180 | 300 | 450 | 450 | 600[1)] | – |

1) Not valid for size 6

27793230/EN – 08/2022

**MOVIDRIVE® MDX61B...-2_3:**

| MDX61B...-2_3 (at $V_{line}$ = 3 × AC 230 V) | 0015 | 0022 | 0037 | 0055 | 0075 | 0110–0300 |
|---|---|---|---|---|---|---|
| | Maximum motor cable length in m | | | | | |
| | Shielded cable | | | | | |
| PWM frequency 4 kHz (P860/ | 120 | 200 | 250 | 300 | 300 | 400 |
| P861) 8 kHz | 80 | 120 | 150 | 250 | 250 | 300 |
| 12 kHz | 50 | 80 | 120 | 200 | 200 | 250 |
| 16 kHz | 40 | 60 | 100 | 150 | 150 | 200 |
| | Unshielded line | | | | | |
| PWM frequency 4 kHz | 360 | 600 | 750 | 900 | 900 | 1200 |
| (P860/P861) 8 kHz | 240 | 360 | 450 | 750 | 750 | 900 |
| 12 kHz | 150 | 240 | 360 | 600 | 600 | 750 |
| 16 kHz | 120 | 180 | 300 | 450 | 450 | 600 |

## INFORMATION

SEW-EURODRIVE recommends not to use a residual current device. Leakage currents caused by cable capacitances can lead to false tripping.

### 9.15.9 Voltage drop

The cable cross section of the motor cable should be selected so the **voltage drop is as small as possible**. An excessively large voltage drop means that the full motor torque is not achieved.

The expected voltage drop can be determined using the following tables (the voltage drop can be calculated in proportion to the length if the cables are shorter or longer):

| Line Cross section | Load with I in A = | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 4 | 6 | 8 | 10 | 13 | 16 | 20 | 25 | 30 | 40 | 50 | 63 | 80 | 100 | 125 | 150 | 200 | 250 | 300 | 350 | 400 |
| Copper | Voltage drop ΔV in V with length = 100 m and ϑ = 70 °C | | | | | | | | | | | | | | | | | | | | |
| 1.5 mm² | 5.3 | 8 | 10.6 | 13.3 | 17.3 | 21.3 | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) |
| 2.5 mm² | 3.2 | 4.8 | 6.4 | 8.1 | 10.4 | 12.8 | 16 | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) |
| 4 mm² | 1.9 | 2.8 | 3.8 | 4.7 | 6.5 | 8.0 | 10 | 12.5 | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) |
| 6 mm² | | | | | 4.4 | 5.3 | 6.4 | 8.3 | 9.9 | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) |
| 10 mm² | | | | | | 3.2 | 4.0 | 5.0 | 6.0 | 8.2 | 10.2 | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) |
| 16 mm² | | | | | | | | 3.3 | 3.9 | 5.2 | 6.5 | 7.9 | 10.0 | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) |
| 25 mm² | | | | | | | | | 2.5 | 3.3 | 4.1 | 5.1 | 6.4 | 8.0 | 1) | 1) | 1) | 1) | 1) | 1) | 1) |
| 35 mm² | | | | | | | | | | | 2.9 | 3.6 | 4.6 | 5.7 | 7.2 | 8.6 | 1) | 1) | 1) | 1) | 1) |
| 50 mm² | | | | | | | | | | | | | | 4.0 | 5.0 | 6.0 | 1) | 1) | 1) | 1) | 1) |
| 70 mm² | | | | | | | | | | | | | | | | | 5.8 | 1) | 1) | 1) | 1) |
| 95 mm² | | | | | | | | | | | | | | | | | 4.2 | 5.3 | 1) | 1) | 1) |
| 150 mm² | | | | | | | | | | | | | | | | | | 3.3 | 4.0 | 1) | 1) |
| 185 mm² | | | | | | | | | | | | | | | | | | | 3.2 | 3.8 | 1) |
| 240 mm² | | | | | | | | | | | | | | | | | | | 2.5 | 2.9 | 3.3 |

1) Load not permitted according to IEC 60364-5-52.

| Line Cross section | Load with I in A = | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 4 | 6 | 8 | 10 | 13 | 16 | 20 | 25 | 30 | 40 | 50 | 63 | 80 | 100 | 125 | 150 | 200 | 250 | 300 | 350 | 350 |
| Copper | Voltage drop ΔV in V with length = 100 m and ϑ = 70 °C | | | | | | | | | | | | | | | | | | | | |
| AWG16 | 7.0 | 10.5 | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) |
| AWG14 | 4.2 | 6.3 | 8.4 | 10.5 | 13.6 | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) |
| AWG12 | 2.6 | 3.9 | 5.2 | 6.4 | 8.4 | 10.3 | 12.9 | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) |
| AWG10 | | | | | 5.6 | 6.9 | 8.7 | 10.8 | 13.0 | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) |
| AWG8 | | | | | | 4.5 | 5.6 | 7.0 | 8.4 | 11.2 | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) |
| AWG6 | | | | | | | | 4.3 | 5.1 | 6.9 | 8.6 | 10.8 | 13.7 | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) |
| AWG4 | | | | | | | | | 3.2 | 4.3 | 5.4 | 6.8 | 8.7 | 10.8 | 13.5 | 1) | 1) | 1) | 1) | 1) | 1) |
| AWG3 | | | | | | | | | 2.6 | 3.4 | 4.3 | 5.1 | 6.9 | 8.6 | 10.7 | 12.8 | 13.7 | 1) | 1) | 1) | 1) |
| AWG2 | | | | | | | | | | | 3.4 | 4.2 | 5.4 | 6.8 | 8.5 | 10.2 | 10.9 | 13.6 | 1) | 1) | 1) |
| AWG1 | | | | | | | | | | | | 3.4 | 4.3 | 5.4 | 6.8 | 8.1 | 8.6 | 10.8 | 13.5 | 1) | 1) |
| AWG1/0 | | | | | | | | | | | | 2.6 | 3.4 | 4.3 | 5.4 | 6.4 | 6.7 | 8.6 | 10.7 | 13.2 | 1) |
| AWG2/0 | | | | | | | | | | | | | 2.7 | 3.4 | 4.3 | 5.1 | 5.4 | 6.8 | 8.5 | 10.5 | 12.0 |
| AWG3/0 | | | | | | | | | | | | | | 2.6 | 3.3 | 4.0 | 4.1 | 5.2 | 6.5 | 8.3 | 9.5 |
| AWG4/0 | | | | | | | | | | | | | | | 3.1 | 3.8 | 4.0 | 5.0 | 6.2 | 6.6 | 7.5 |
| Kcmil 250 | | | | | | | | | | | | | | | | 3.0 | 3.2 | 4.0 | 5.0 | 5.6 | 6.4 |
| Kcmil 300 | | | | | | | | | | | | | | | | | 2.6 | 3.3 | 4.0 | 4.6 | 5.3 |
| Kcmil 350 | | | | | | | | | | | | | | | | | | 2.8 | 3.4 | 4.0 | 4.5 |
| Kcmil 400 | | | | | | | | | | | | | | | | | | | 3.0 | 3.5 | 4.0 |
| Kcmil 450 | | | | | | | | | | | | | | | | | | | | 3.1 | 3.5 |

1) More than 3% voltage drop in relation to Vline = AC 460 V. Observe the applicable guidelines regarding the load of the cables.

27793230/EN – 08/2022

## 9.16 Group drive in VFC mode

In VFC & group operating mode, a group of asynchronous motors can be operated on one inverter. In this operating mode, the inverter operates without slip compensation and with a constant V/f ratio. The motors are operated without encoder feedback.

### INFORMATION

The parameter settings apply to all connected motors.

### 9.16.1 Motor currents

The total of the nominal motor currents must not exceed the nominal output current of the inverter.

For group drives, schedule a reserve of 20%.

### 9.16.2 Motor cables and fusing

Comply with the regulations issued by specific countries and for specific machines regarding fusing and the selection of supply system leads and motor cables.

Determine the permitted length of all motor cables connected in parallel as follows:

$$I_{tot} \leq \frac{I_{max}}{n}$$

*3172400139*

$I_{tot}$ = Total length of the motor cables connected in parallel

$I_{max}$ = Recommended maximum motor cable length

n = Number of motors connected in parallel

No additional fusing is required if the cross section of the motor cable corresponds to the cross section of the supply system lead. If the cross section of the motor cable is smaller than the cross section of the supply system lead, you must protect the motor cable against a short circuit for the corresponding cross section. Motor protection switches are suited to this purpose.

### 9.16.3 Motor size

The motors in a group must not be more than three motor types apart.

### 9.16.4 Output filter

An HF... output filter is required if the maximum motor cable length ($I_{max}$) given in the table "Permitted motor cable lengths" is exceeded. This may be the case in large groups (n) or when there are long motor cable lengths connected in parallel ($I_{tot}$). In this case, the maximum motor cable length is not limited by the limit value given in the table but by the voltage drop on the motor cable. The total value of the rated motor currents must not exceed the rated throughput current of the output filter.

27793230/EN – 08/2022

## 9.17 Connecting explosion-proof AC motors

Observe the following instructions when connecting explosion-protected AC motors to MOVIDRIVE® B drive inverters:

- The inverter must be installed outside of the potentially explosive atmosphere.
- Observe industry and country-specific regulations.
- Observe the regulations and information of the motor manufacturer with regard to operation on a frequency inverter, e.g. mandatory sine filter.
- All operating resources in the potentially explosive atmosphere must comply with directive 94/9/EC (ATEX 100a).
- The TF/TH input of MOVIDRIVE® B must not be used for thermal monitoring of the motor. Use a TF/TH trip switch for thermal monitoring that is approved for use in potentially explosive atmospheres.
- In case of motors with speed feedback the speed sensor must also be approved for potentially explosive atmospheres. The speed sensor can be directly connected to MOVIDRIVE® B.

### INFORMATION

For more information on the operation of explosion-protected AC motors, refer to the "Explosion-Protected AC Motors, Asynchronous Servomotors" operating instructions. You can order the operating instructions from SEW-EURODRIVE.

## 9.18 EMC-compliant installation in accordance with EN 61800-3

Drive systems with MOVIDRIVE® are designed as components for installation in machinery and systems. They comply with the EMC product standard EN 61800-3 "Variable-speed electrical drives". Provided the information relating to EMC-compliant installation is observed, products from SEW-EURODRIVE meet the appropriate requirements for CE marking on the basis of the EMC Directive 2014/30/EU.

MOVIDRIVE® MDX60/61B drive inverters of size 0, 1, and 2 are equipped with a line filter as standard. The line filter on the supply system end complies with limit class C2 to EN 61800-3 without further measures.

### 9.18.1 Interference immunity

MOVIDRIVE® meets **all** the requirements stipulated in EN 61800-3 with regard to interference immunity.

### 9.18.2 Interference emission

Higher levels of interference are permitted in industrial environments. In such an environment, it may be possible to dispense with the measures described below depending on the situation of the supply system and the machine configuration.

27793230/EN – 08/2022

#### Limit class C3

EMC-compliant installation according to EN 61800-3, **limit class C3**, is achieved as follows for size 7:

| Limit class C3 | Motor end | Line end |
|---|---|---|
| | Size 7 | Size 7 |
| 1. Option | Output choke HD005 | No measure required |
| 2. Option | Shielded motor cable | No measure required |

#### Limit class C2

Three options are available for EMC-compliant installation of sizes 0 – 6 in accordance with EN 61800-3, **limit class C2**, depending on the system configuration:

| Limit class C2 | Motor end | Line end | |
|---|---|---|---|
| | Size 0 to 6 | Size 0 to 2 | Size 3 to 6 |
| 1. Option | HD... output choke | No measure required | NF...-... line filter |
| 2. Option | Shielded motor cable | No measure required | NF...-... line filter |
| 3. Option | HF... output filter | No measure required | NF...-... line filter |

EMC-compliant installation according to EN 61800-3, **limit class C2**, is achieved as follows for size 7:

| Limit class C2 | Motor end | Line end |
|---|---|---|
| | Size 7 | Size 7 |
| | Output choke HD005 | NF600-503 line filter |

#### Limit class C1

Three options are available for EMC-compliant installation in accordance with EN 61800-3, **limit class C1**, depending on the system configuration:

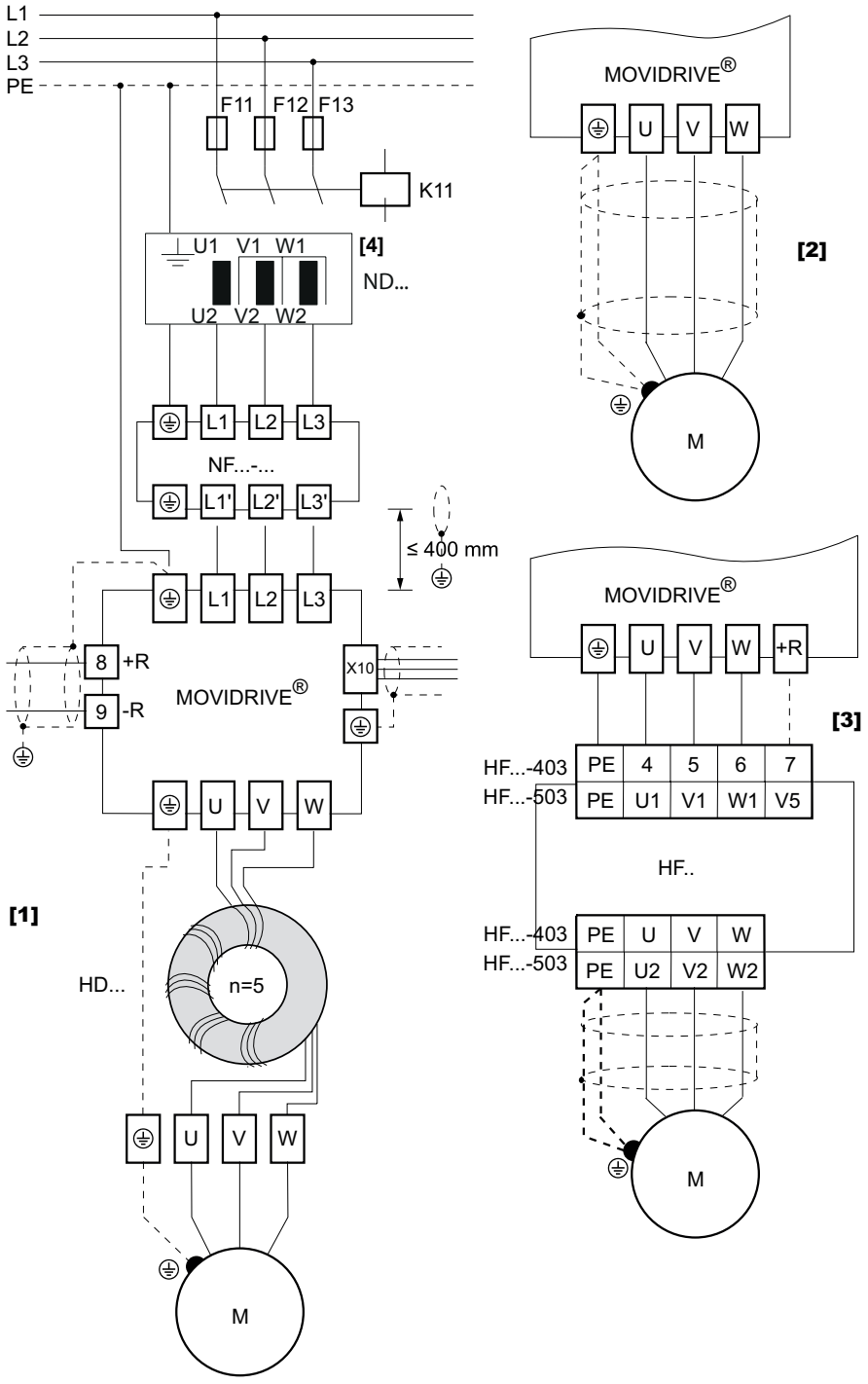
| Limit class C1 | Motor end | Line end |
|---|---|---|
| | Size 0 to 5 | Size 0 to 5 |
| 1. Option | HD... output choke | NF...-... line filter |
| 2. Option | Shielded motor cable | NF...-... line filter |
| 3. Option | HF... output filter | NF...-... line filter |

### 9.18.3 IT systems

## INFORMATION

No EMC limits are specified for interference emission in voltage supply systems without a grounded star point (IT systems).

### 9.18.4 Block diagram of class C1 limit




*9007202256064523*

EMC-compliant installation according to class C1 limit

[1] = First possible solution with HD... output choke

[2] = Second possible solution with shielded motor cable

[3] = Third possible solution with HF... output filter (See chapter "HF output filter")

[4] = Optional line choke

27793230/EN – 08/2022

For more information, refer to the publication entitled Drive Engineering – Practical Implementation, Electromagnetic Compatibility. You can order the publication from SEW-EURODRIVE.

## 9.19 HF… output filter type

### 9.19.1 Important information

Observe the following instructions when using output filters:

- Operate output filters in V/f and VFC operating modes only. Output filters may not be used in CFC and SERVO 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.
- Flying start function is not possible with HF.. output filter.
- Observe the increased noise level during operation when output filters are used.

27793230/EN – 08/2022

**Installation, connection and operation**

## INFORMATION

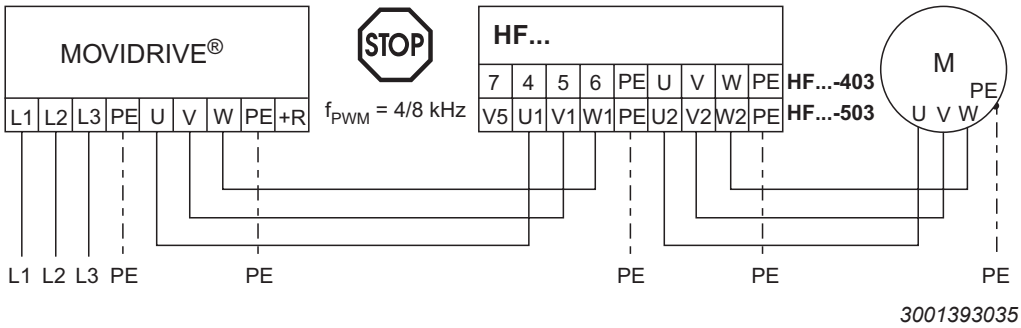
- Install output filters next to the corresponding inverter. Leave a ventilation space of at least 100 mm below and above the output filter.
- Limit the connection cable between the inverter and output filter to the absolute minimum length required. Maximum 1 m with an unshielded cable and 10 m for a shielded cable.
- An unshielded motor line is sufficient when using an output filter. **Note the following information when you use an output filter together with a shielded motor cable:**
  - The maximum permitted motor cable length for operation without $U_Z$ connection is 20 m.
  - Observe the notes "Operation with $U_Z$ connection" on the next page.
  - Operation with $U_Z$ connection is required if the motor cable is longer than 20 m.
- The rated through current of the output filter must be higher than or equal to the output current of the inverter. Note whether the projected output current of the inverter is 100% $I_N$ (= rated output current) or 125% $I_N$ (= continuous output current).
- Several motors can be connected to one output filter when operating a motor group from one inverter. The sum of the rated motor currents must not exceed the rated through current of the output filter.
- It is possible to connect two output filters of the same type to one inverter output to increase the rated through current. All like connections must be connected in parallel on the output filters.
- Considerable noise (magnetostriction) may occur in the output filter especially if operating with $f_{PWM}$ = 4 kHz. In environments susceptible to noise, SEW-EURODRIVE recommends operation with $f_{PWM}$ = 12 kHz (or 16 kHz) and $U_Z$ connection. Observe the notes regarding $U_Z$ connection.
- When the inverter is operated with $f_{PWM}$ = 4 or 8 kHz, the output filter connection V5 (with HF…-503) or 7 (with HF…-403) must **not** be connected (no $U_Z$ connection).
- For HF450-503, please note that an $I_N$ reduction always has to be considered depending on the PWM frequency.

27793230/EN – 08/2022

### $U_Z$ connection

**Operation without $U_Z$ connection:**

- Approved only for PWM frequency 4 kHz or 8 kHz.




HF...-... output filter connection without $U_Z$ connection

## INFORMATION

**Operation with $U_Z$ connection:**

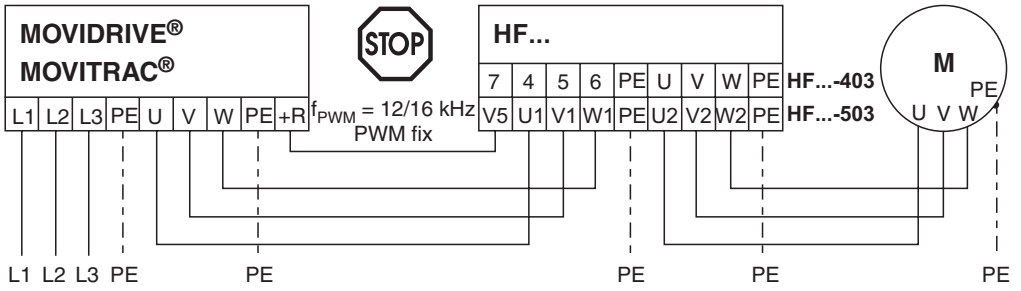
**(Connection of inverter terminal + R with HF…-503 terminal V5 or HF…-403 terminal 7):**

- Only approved for PWM frequency 12 kHz or 16 kHz. Take into account that increased losses (= power reduction) occur in the inverter when operating the inverter with 12 or 16 kHz.
- Optimized grounded filter effect.
- Improved filter effect in the low-frequency range (≤ 150 kHz).
- Set PMW fix = on; the inverter must not be able to reduce the PWM frequency automatically.
- The $U_Z$ connection increases the inverter load. The DC link connection increases the required inverter output current in relation to the rated output current of the inverter as shown in the following table.
- HF180 and HF325 output filters can only be operated without $U_Z$ connection.

| $f_{PWM}$ | (at $V_{line}$ = 3 × AC 230 V) | (at $V_{line}$ = 3 × AC 400 V) | (at $V_{line}$ = 3 × AC 500 V) |
|---|---|---|---|
| 12 kHz | 4% | 12% | 15% |
| 16 kHz | 3% | 8% | 12% |

27793230/EN – 08/2022

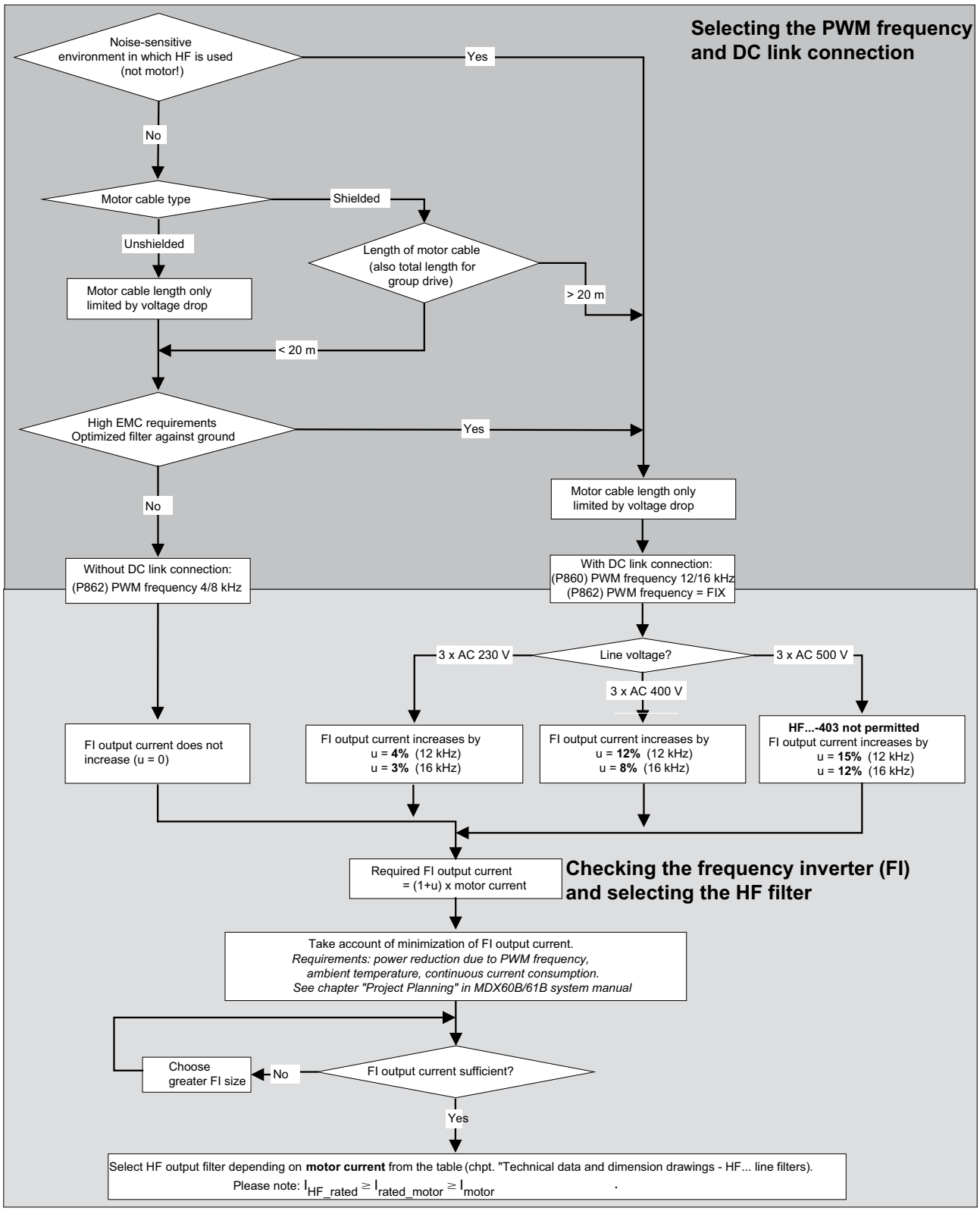
The increased power requirement causes an additional load on the inverter. Take this aspect into account during project planning of the drive. Failure to comply with this aspect may cause the inverter to shut down due to overload.




*3001394699*

HF...-... output filter connection with $U_Z$ connection

The procedure for selecting the PWM frequency and checking the inverter is summarized in the following figure.




*3001396363*

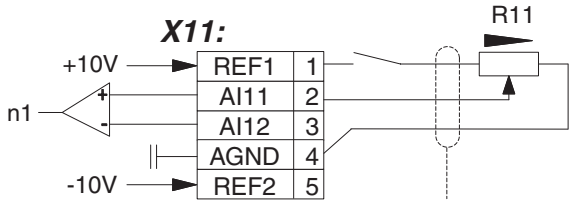
27793230/EN – 08/2022

## 9.20 Electronics Cables and Signal Generation

- The electronics terminals of the basic device are suitable for the following cross sections:
  - For single core 0.20 – 2.5 mm² (AWG24 – 12)
  - For double core 0.20 – 1 mm² (AWG24 – 17)

Route electronics cables separately from power cables, contactor control cables or braking resistor cables. If you use shielded electronics cables, ground the shield at both ends.

- Use setpoint potentiometer with R ≥ 5 kΩ.
- If necessary, potentiometer setpoints are switched using the 10 V voltage rather than via the wiper lead.




Switch potentiometer setpoint

- Never connect 0 V cables (AGND, DGND, DCOM) for generating signals. The 0 V cables of several electrical units which are connected should not be looped from device to device, but rather wired up in a star configuration. This means:
  - Install the units in adjacent control cabinet compartments rather than distributing them widely.
  - Lay the 0 V cables with 1.5 mm² (AWG16) cross section from a central point to each individual device by the shortest possible route.
- If coupling relays are used, they should always have encapsulated, dust-proof electronics contacts suitable for switching small voltages and currents (5 – 20 V, 0.1 – 20 mA).
- Digital inputs/outputs

The digital inputs are electrically isolated by optocouplers. Digital input commands can also be issued directly as a 0/1 command from the PLC instead of using a coupling relay (signal level → electronics data).

The digital outputs are short-circuit proof and protected against external voltage up to DC 30 V.

- The inverter starts a self-test (ca. 3 s) when the power supply or 24 V supply is connected. All signal outputs have the level "0" throughout the self-test.
- DC 24 V voltage supply VI24:

According to EN 61131-2, $V_N$ = +24 V -15% / +20%. A total AC voltage component with a peak value of 5% of the rated voltage (+24 V) is permitted in addition to the specified voltage tolerances.

- Max. line length inverter – encoder/resolver:
  - 50 m at 70 nF/km < capacitance per unit length ≤ 120 nF/km
  - 100 m at capacitance per unit length ≤ 70 nF/km with DER11B, DEH11B, DEH21B, 300 m with DEU21B

27793230/EN – 08/2022

## 9.21 External voltage supply DC 24 V

### 9.21.1 General information

The internal switched-mode power supply of MOVIDRIVE® B has a maximum power of 29 W. An external DC 24 V power supply unit must be connected if a higher power is needed due to installed options. **In this case, switch on the external DC 24 V power supply unit prior to the input contactor or simultaneously with the line contactor.**

The following tables show the power demand of the MOVIDRIVE® B devices with no options and the power demand of the individual options. MOVIDRIVE® B without option does not require external DC 24 V supply.

The following conditions apply to the information about the power demand without option:

- The DC 24 V outputs (VO24) are not subject to load.
- The digital outputs DBØØ and DOØ2 – DOØ5 are not subject to load.

The following conditions apply to the information about the DEH11B and DER11B options:

- The motor encoder/resolver is supplied from MOVIDRIVE® B.
- An external encoder (synchronous encoder) is not connected to X14. Observe the power ratings of the manufacturer when connecting an external encoder (ca. 4 W with SEW encoder).
- Use only certified devices with a **limited output voltage** ($U_{max}$ = DC 30 V) and **limited output current** ($I_{max}$ = 8 A) as an **external DC 24 V voltage source**.

27793230/EN – 08/2022

### 9.21.2 Power demand

The power values of the options are basic values **without** load on the inputs and outputs.

## INFORMATION

- The load of the outputs depends on the connected consumer.
- The digital inputs have an internal resistance of 3 kΩ. This results in a power demand of 0.2 W per terminal. You have to take this power into account when you supply terminals via the DC 24 V output of MOVIDRIVE® B.
- The power ratings of the DIP11B, DEH21B, DIO11 and DRS11B options do not include the voltage supply of the encoder. The encoders and digital outputs of these option cards are only supplied when DC 24 V is connected to the card. You have to take the additional power into account when MOVIDRIVE® B is to provide the voltage supply for these options. Note that MOVIDRIVE® B delivers a maximum total current of DC 400 mA for the DC 24 V outputs.

- DC 24 V power demand of MOVIDRIVE® MDX60/61B **without option**:

| Size MDX60B/61B | DC 24 V power demand without option | Power consumption X17:4 |
|---|---|---|
| 0 | 15.6 W | 4 W |
| 1 | 17.6 W | 5 W |
| 2, 2S | | 6 W |
| 3 | 23.6 W | 7.5 W |
| 4 | 25.6 W | 8 W |
| 5 | | 10 W |
| 6 | | 6 W |
| 7 | – | 6 W |

- Additional DC 24 V power demand of MOVIDRIVE® MDX60/61B with option (size 0: only available with option-capable MDX61B units):

| Additional DC 24 V power demand with installed option | | | | | |
|---|---|---|---|---|---|
| DEU21B | DEH11B, DEH21B | DER11B | Fieldbus options[1)] | DIO11B | DRS11B, DIP11B |
| 6 W | 5 W | 6 W | 3 W | 6 W | 2.5 W |

1) Fieldbus options are: DFP21B, DFI11B, DFI21B, DFE32B, DFE33B, DFE24B, DFD11B, DFC11B, DFS..B

| Additional DC 24 V power demand with installed option | | | | |
|---|---|---|---|---|
| DHP11B | OST11B | DHE21/41B | DHF21/41B | DHR21/41B |
| 4.5 W | 1.5 W | 6.5 W | 8 W | 9.5 W |

- The safety monitor options DCS21B/22B/31B32B always require external DC 24 V voltage supply.

27793230/EN – 08/2022

**Example 1**

MOVIDRIVE® MDX61B0022-5A3-4-00 (size 1) with fieldbus interface option type DFI11B. MOVIDRIVE® B supplies the digital inputs DI00 (controller inhibit), DI01 (CW/Stop), DI02 (CCW/Stop), DI03 (Enable/Stop) with voltage. The motor brake is controlled via DB00. The coil of the brake relay requires DC 100 mA at DC 24 V.

- Calculating the total power demand:
  - Power demand of the basic device: 17.6 W
  - Power demand of the DFI11B option: 3 W
  - Power demand of the digital inputs: 4 x 0.2 W = 0.8 W
  - Power demand of the brake coil on DB00; 24 V x 0.1 A = 2.4 W

  The total power demand is 23.8 W. No external DC 24 V voltage supply is required in this case.

**Example 2**

MOVIDRIVE® MDX61B0110-5A3-4-00 (size 2) with the options HIPERFACE® encoder card DEH11B, fieldbus interface DFP21B and input/output card DIO11B. Four inputs of the basic device and four inputs of the DIO11B option are used. The motor brake is controlled via terminal DB00. The coil of the brake relay requires DC 100 mA at DC 24V. Additionally, six outputs of the DIO11B option are subject to a load of DC 25 mA.

- Calculating the total power demand:
  - Power demand of the basic device: 17.6 W
  - Power demand of the DEH11B option: 5 W
  - Power demand of the DFP21B option: 3 W
  - Power demand of the DIO11B option without terminals: 6 W
  - Power demand of the inputs (basic device + DIO11B): 8 x 0.2 W = 1.6 W
  - Power demand of the brake coil on DB00; 24 V x 0.1 A = 2.4 W
  - Power demand of the digital outputs: 6 x 24 V x 0.025 A = 3.6 W

  The total power demand is 39.2 W. An external DC 24 V voltage supply is required in this case.

27793230/EN – 08/2022

## 9.22 Parameter set switchover

This function serves for operating two motors on one inverter using two different parameter sets.

The parameter set changeover is performed via a digital input or fieldbus. A digital input must be programmed to the "Parameter set switchover" function (→ P60_/P61_) for this purpose. You can then change from parameter set 1 to 2 and vice versa in "Inhibited" inverter status.

| Function | Effect in case of | |
|---|---|---|
| | "0" signal | "1" signal |
| Parameter set switchover | Parameter set 1 active | Parameter set 2 active |

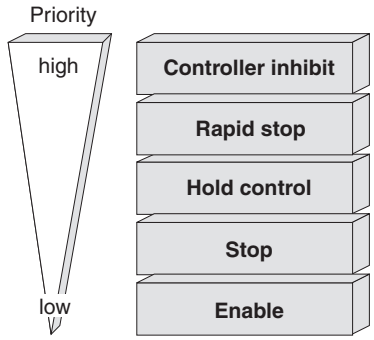
### INFORMATION

- In operation with encoder feedback, switching between the parameter sets must not be faster than every 2 seconds. This makes sure that the encoders can be initialized.
- A changeover contactor should be provided for each of the two motor cables when two motors are operated alternately on the same inverter with the parameter set switchover function in use (→ P60_/P61_ parameter set switchover). Only switch changeover contactors when the device is inhibited.
- Parameter set 2 allows for VFC operating modes without speed control only. Speed control or CFC and SERVO operating modes are not possible.

27793230/EN – 08/2022

## 9.23 Priority of the operating states and link between control signals

### 9.23.1 Priority of the operating states




Priority of the operating states

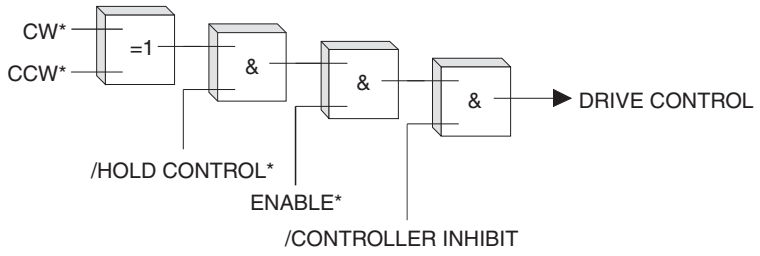
### 9.23.2 Interrelation between control signals

The following table shows the interrelation between control signals. “/Controller inhibit” is programmed to digital input DIØØ and cannot be changed. The other control signals are only in effect if a digital input is programmed to this function (→ parameter P60_).

| /Controller inhibit (DIØØ) | The digital input is programmed to | | | | Inverter status |
|---|---|---|---|---|---|
| | Enable/stop | /Position hold control | CW/stop | CCW/stop | |
| "0" | 1) | 1) | 1) | 1) | Inhibited |
| "1" | "0" | 2) | 2) | 2) | |
| "1" | "1" | "0" | 2) | 2) | |
| "1" | "1" | "1" | "1" | "0" | CW enabled |
| "1" | "1" | "1" | "0" | "1" | CCW enabled |

1) Not relevant if "/Controller inhibit (DIØØ)" = "0"

2) Not relevant if "Enable/stop" = "0"




Interrelation between control signals

* If a digital input is programmed to this function.

## 9.24 Limit switches

### 9.24.1 Limit switch processing

Limit switch processing makes sure that the travel range of a drive is observed. To do this, it is possible to program the digital inputs to the functions "/limit switch positive" and "/limit switch negative". The limit switches are connected to these digital inputs. The limit switches must be "0" active and continuously actuated in the limit switch area (= movement up to limit switch).

“0” active means:

- Limit switch not contacted (= not activated) → 24 V signal
- Limit switch contacted (= actuated) → 0 V signal
- The limit switches must supply a "1" signal continuously in the travel range.

### 9.24.2 Limit switch hit (“0” signal)

- The drive is stopped at the emergency ramp t14/t24.
- When brake function is activated, the brake is applied.
- In IPOS$^{PLUS®}$ operating modes, contacting a limit switch generates a fault message. A reset is then required in order to move clear from the limit switch (→ IPOS$^{PLUS®}$ manual).

### 9.24.3 Clearing from limit switch

- The inverter must be enabled via the digital inputs.
- Hold control must be inactive.
- The inverter receives a setpoint value from the setpoint source that guides it in the right direction.
- With activated setpoint stop function: Setpoint > start setpoint

### 9.24.4 Behavior of the drive when moving clear

- Once a limit switch is hit, the drive can be moved clear of the limit switch in the other direction.
- When the brake function is activated, the brake is first released and then the drive is moved clear ("0" → "1" signal). on the Intranet.

If the drive leaves the limit switch range without having been moved clear of the switch automatically, for example when the drive is moved manually, the drive can still be moved afterwards in the standard operating mode.

### 9.24.5 Limit switch monitoring

- The inverter monitors whether the limit switches are missing, whether there is a break in a wire or whether the limit switches have been mixed up.
- If this is the case, the inverter triggers an emergency stop and displays fault F27 “Limit switches missing.”

27793230/EN – 08/2022

# 10 General information

## 10.1 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.

## 10.2 Structure of the safety notes

### 10.2.1 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 |
|---|---|---|
| ⚠ **DANGER** | Imminent hazard | Severe or fatal injuries |
| ⚠ **WARNING** | Possible dangerous situation | Severe or fatal injuries |
| ⚠ **CAUTION** | Possible dangerous situation | Minor injuries |
| **NOTICE** | Possible damage to property | Damage to the product or its environment |
| **INFORMATION** | Useful information or tip: Simplifies handling of the product. | |

### 10.2.2 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 |

27793230/EN – 08/2022

| 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 |

### 10.2.3 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.

## 10.3 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.

## 10.4 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.

## 10.5 Other applicable documentation

Observe the corresponding documentation for all additional components.

27793230/EN – 08/2022

## 10.6 Product names and trademarks

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

## 10.7 Copyright notice

© 2022 SEW-EURODRIVE. All rights reserved. Unauthorized reproduction, modification, distribution or any other use of the whole or any part of this documentation is strictly prohibited.

27793230/EN – 08/2022

# 11 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.

## 11.1 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.

## 11.2 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.

27793230/EN – 08/2022

## 11.3 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.

### 11.3.1 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.

## 11.4 Transportation and storage

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

## 11.5 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.

27793230/EN – 08/2022

## 11.6 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.

## 11.7 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.

## 11.8 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.

27793230/EN – 08/2022



## ⚠ 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.

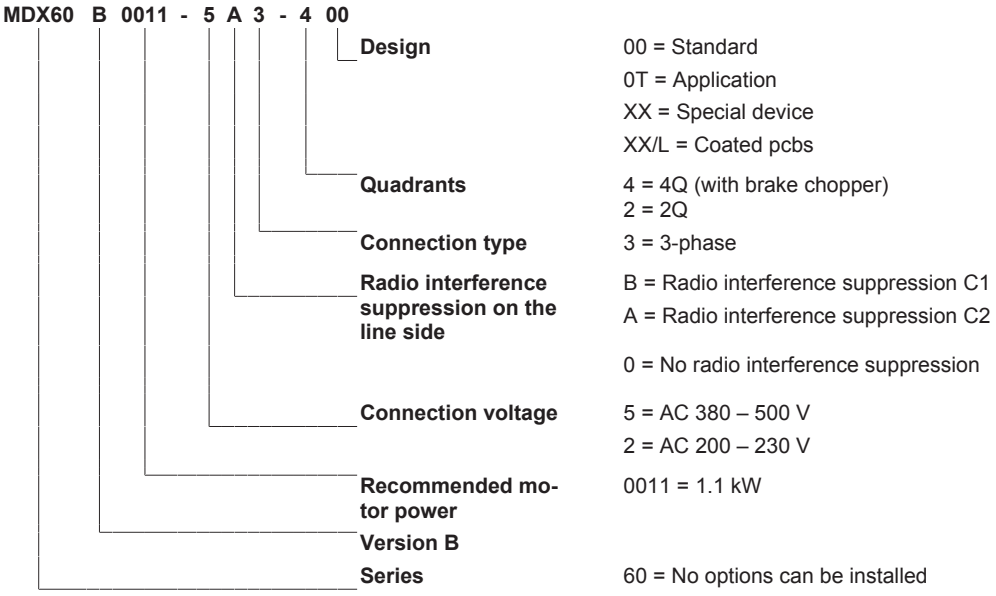
27793230/EN – 08/2022

# 12 Device structure

## 12.1 Type designation, nameplates and scope of delivery

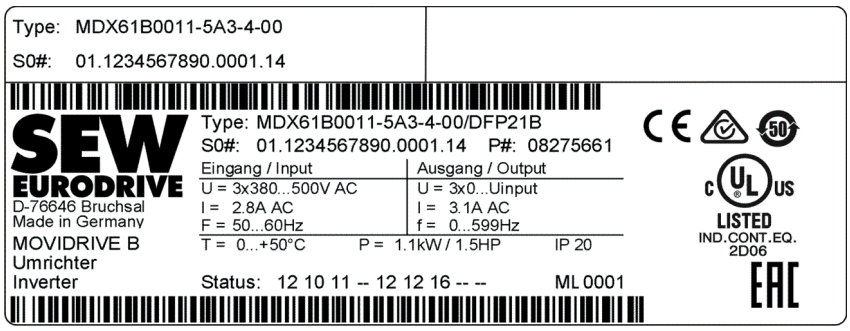
### 12.1.1 Type designation

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




### 12.1.2 System nameplate size 0

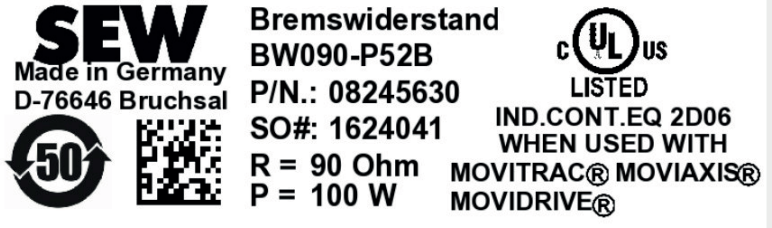
The **system nameplate** for MDX60B/61B size 0 is attached to the side of the device.




*27021599563947147*

### 12.1.3 Nameplate for BW090-P52B braking resistor

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




*9007201054468235*

27793230/EN – 08/2022

### 12.1.4 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

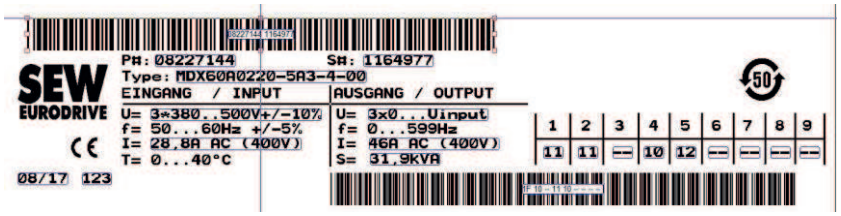



*18014400309212299*

### 12.1.5 Power section nameplate for sizes 1 – 7

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

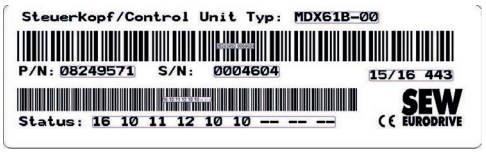
- On the side of the device in size 1 – 2
- On the front of the device in size 3 – 6
- Top left inside the size 7 device




*9007201054499979*

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

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




*9007201054503051*

### 12.1.7 Option card nameplate




*9007201054506123*

## 12.2 Scope of Delivery

### 12.2.1 Sizes 0 – 7

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

### 12.2.2 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

27793230/EN – 08/2022

### 12.2.3 Sizes 1 – 7

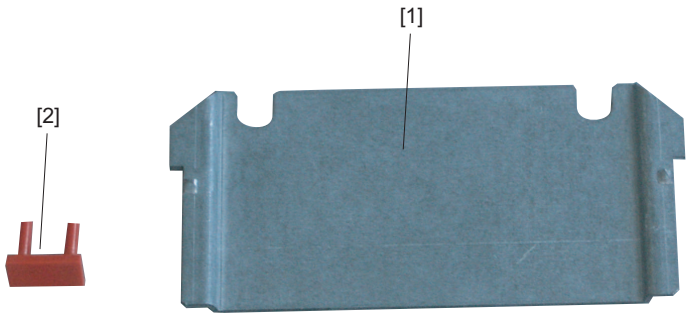
- 1 set of shield clamps for signal cable, not installed. The set of shield clamps comprises:
  - 1 shield clamp for signal cable (1 contact clip)
  - 2 contact clips
  - 2 screws for attaching the contact clips
  - 1 screw for attaching the shield clamp to the device
- Only for size 6: Carrying bar 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" (→ 591))

### 12.2.4 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: $-U_z$/$+U_z$ 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

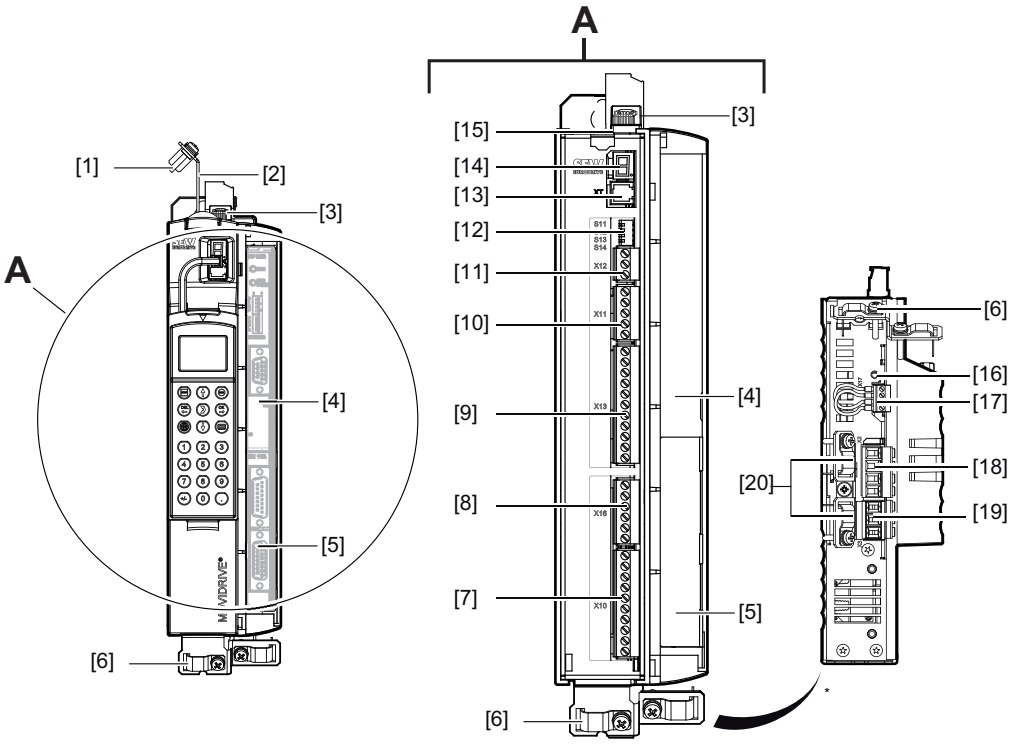
    If neither of the two conditions is fulfilled, the degree of protection is IP10.




*2059029259*

## 12.3 Size 0

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

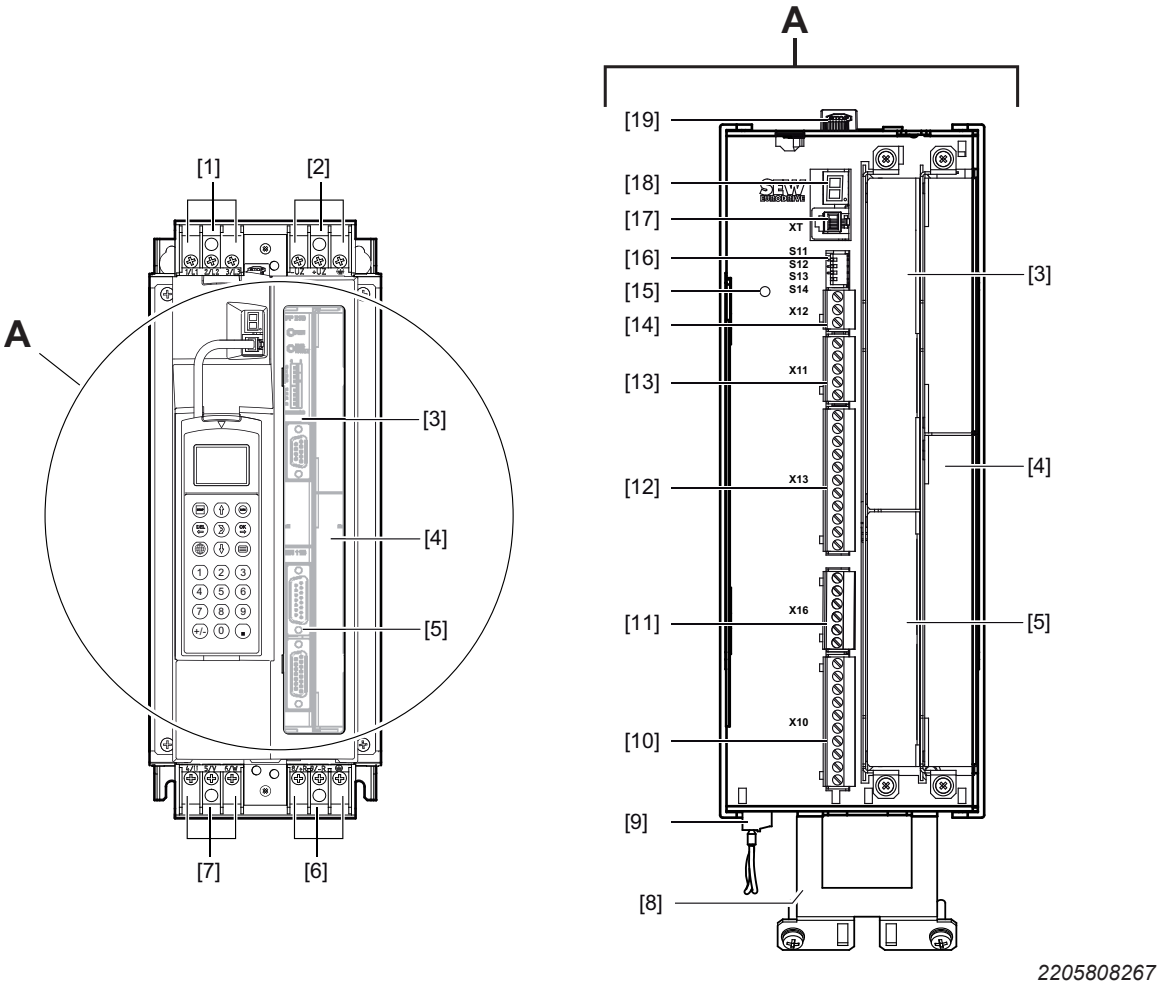



*View of the bottom of the device
[1] Power shield clamp for supply system connection and DC link connection
[2] X4: Connection for DC link coupling $-U_Z$ $+U_Z$ and PE connection, separable
[3] X1: Power supply connection L1, L2, L3 and PE connection, separable
[4] Only with MDX61B: Fieldbus slot
[5] 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

27793230/EN – 08/2022

## 12.4 Size 1

MDX61B-5A3 (AC 400/500 V devices): 0015/0022/0030/0040
MDX61B-2A3 (AC 230 V devices): 0015/0022/0037




[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

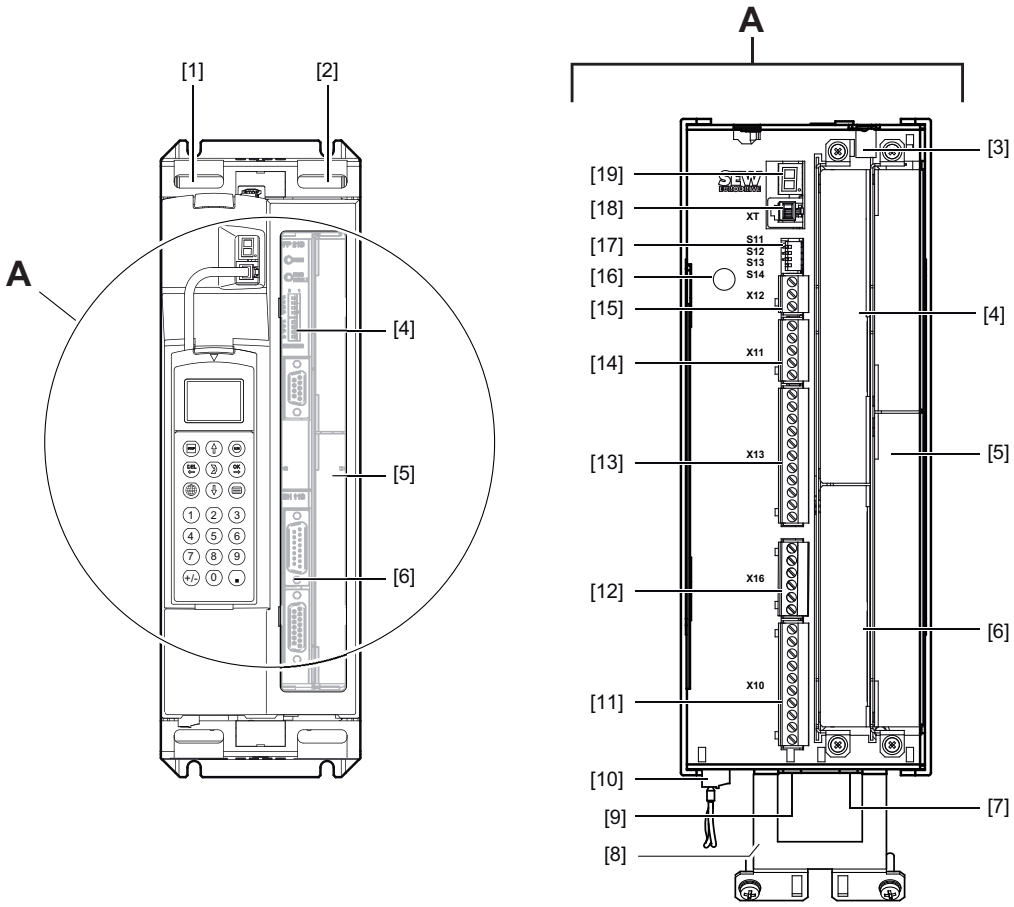
[18] 7-segment display

[19] Memory card

27793230/EN – 08/2022

## 12.5 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

27793230/EN – 08/2022

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

[16] Grounding screw M4 × 14

[17] DIP switches S11 – S14

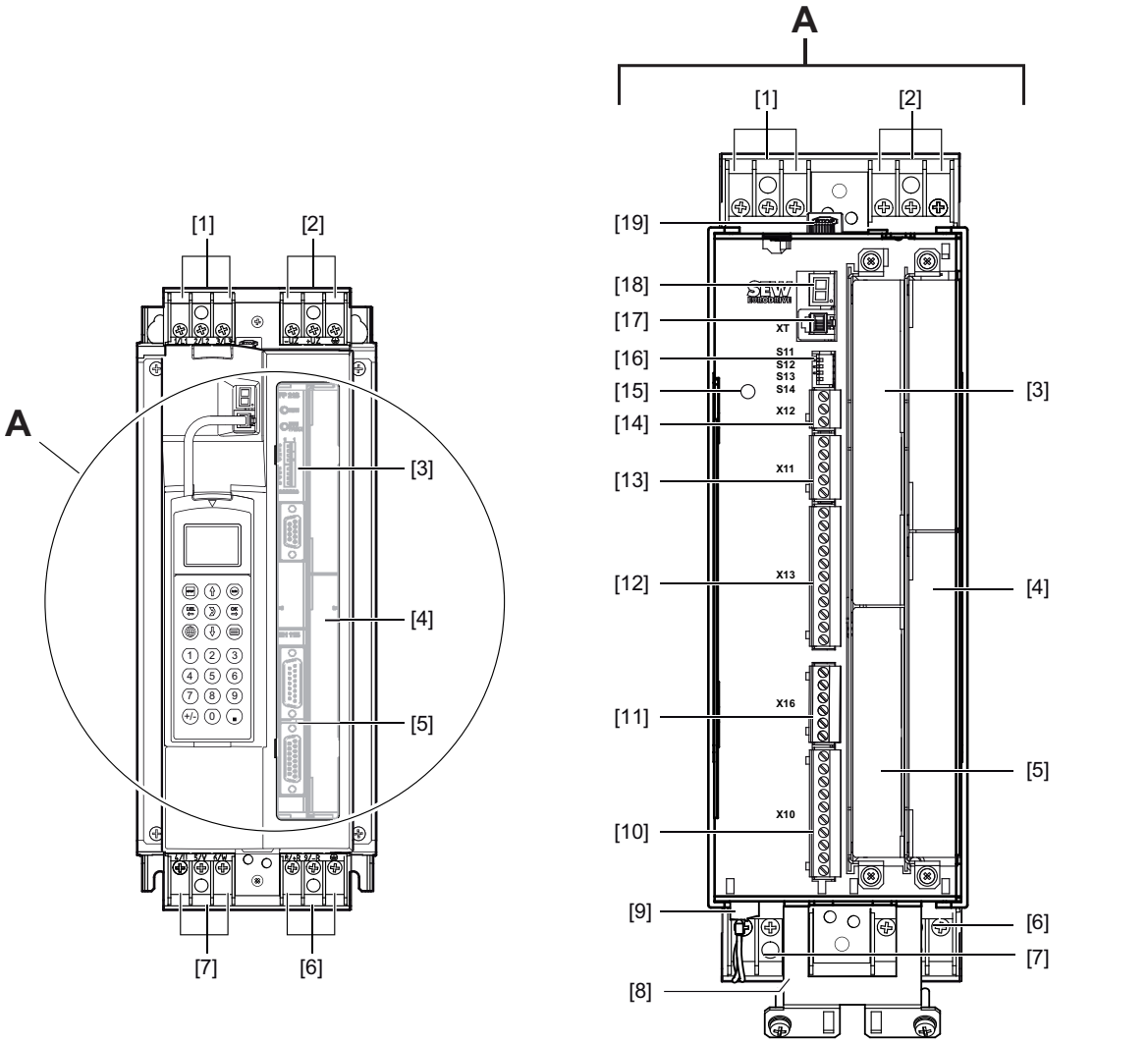
[18] XT: Slot for DBG60B keypad or USB11A/UWS21B serial interface

[19] 7-segment display

27793230/EN – 08/2022

## 12.6 Size 2

MDX61B-5A3 (AC 400/500 V devices): 0110
MDX61B-2A3 (AC 230 V devices): 0055/0075




[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

27793230/EN – 08/2022

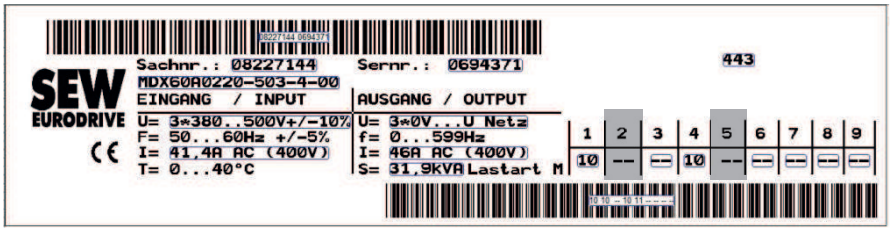
## 12.7 Size 3

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

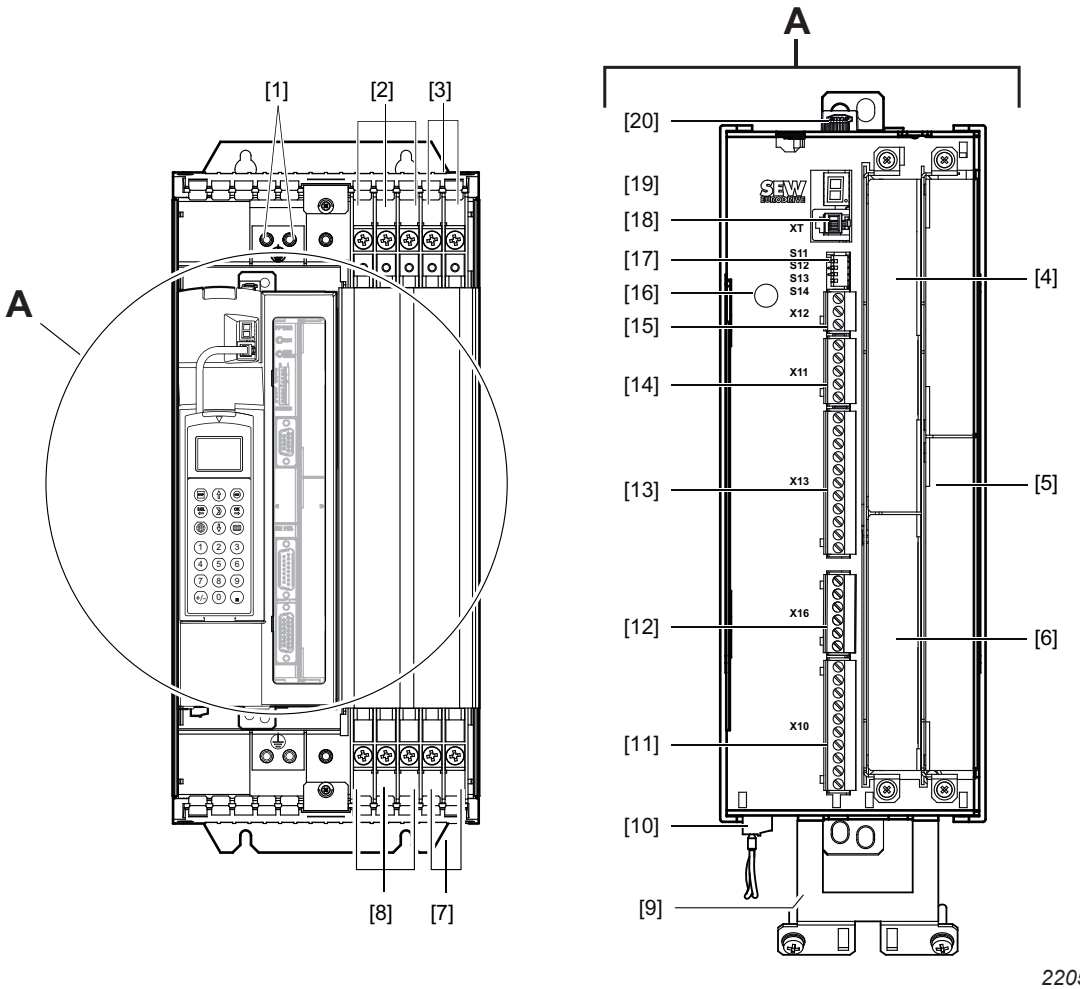
MDX61B-503 (AC 400/500 V devices): 0150/0220/0300

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.




19517356811




2205798667

[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

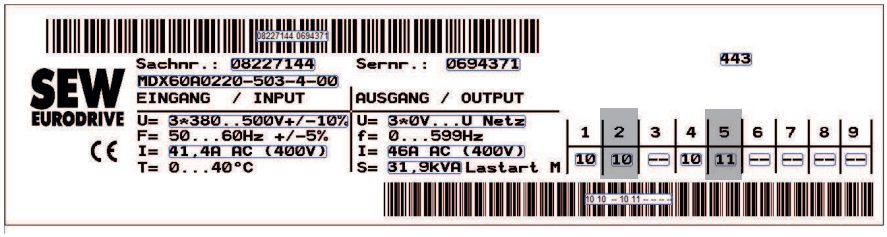
[19] 7-segment display

[20] Memory card

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

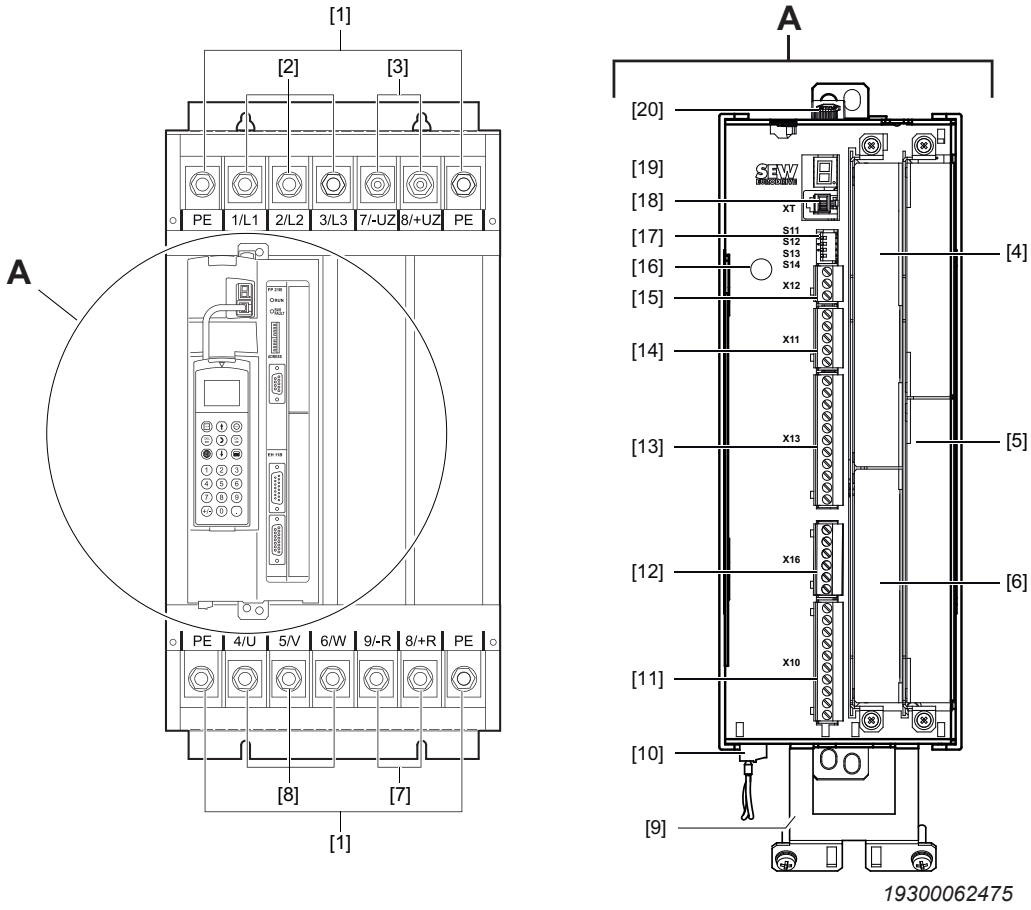
MDX61B-203 (AC 230 V units): 0110/0150

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




*19517360395*

27793230/EN – 08/2022




19300062475

[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

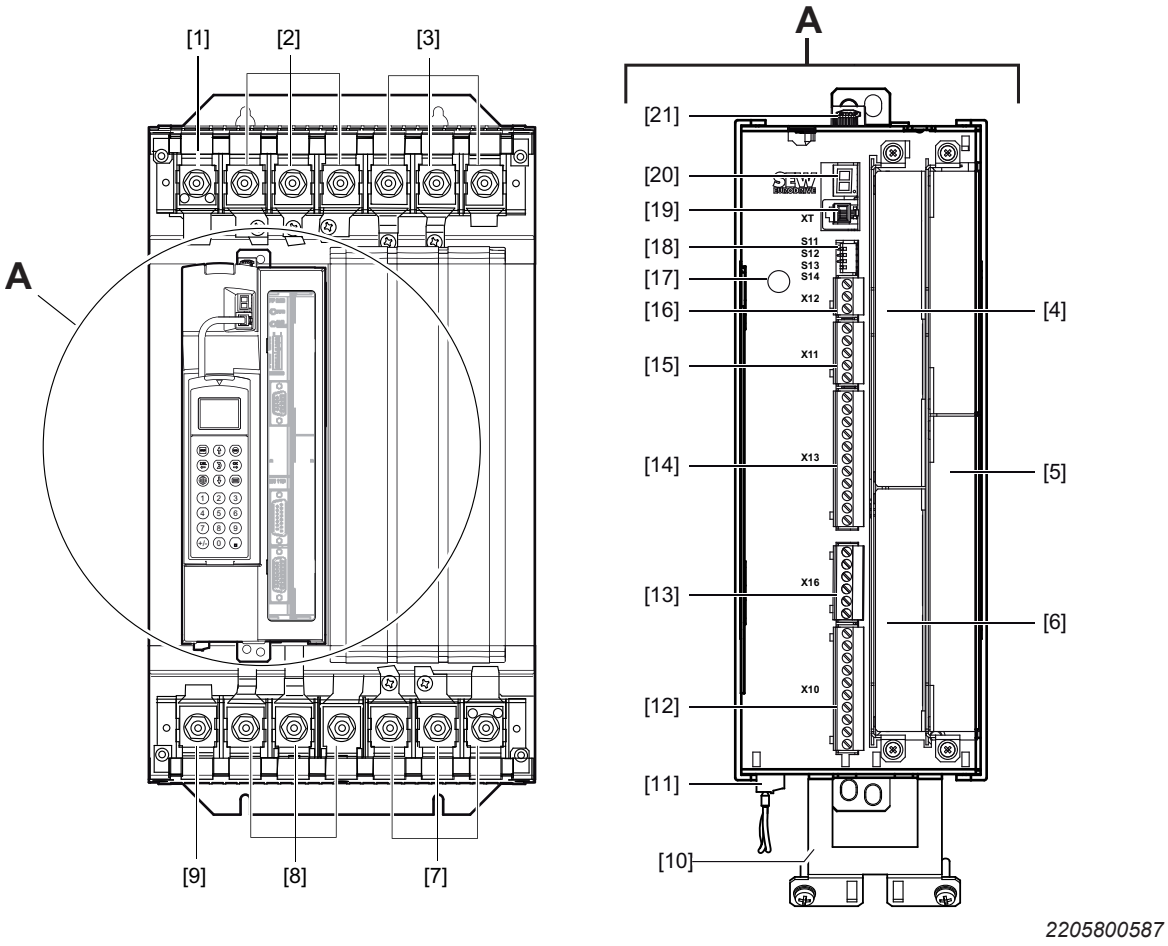
[19] 7-segment display

[20] Memory card

27793230/EN – 08/2022

## 12.8 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

27793230/EN – 08/2022

[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

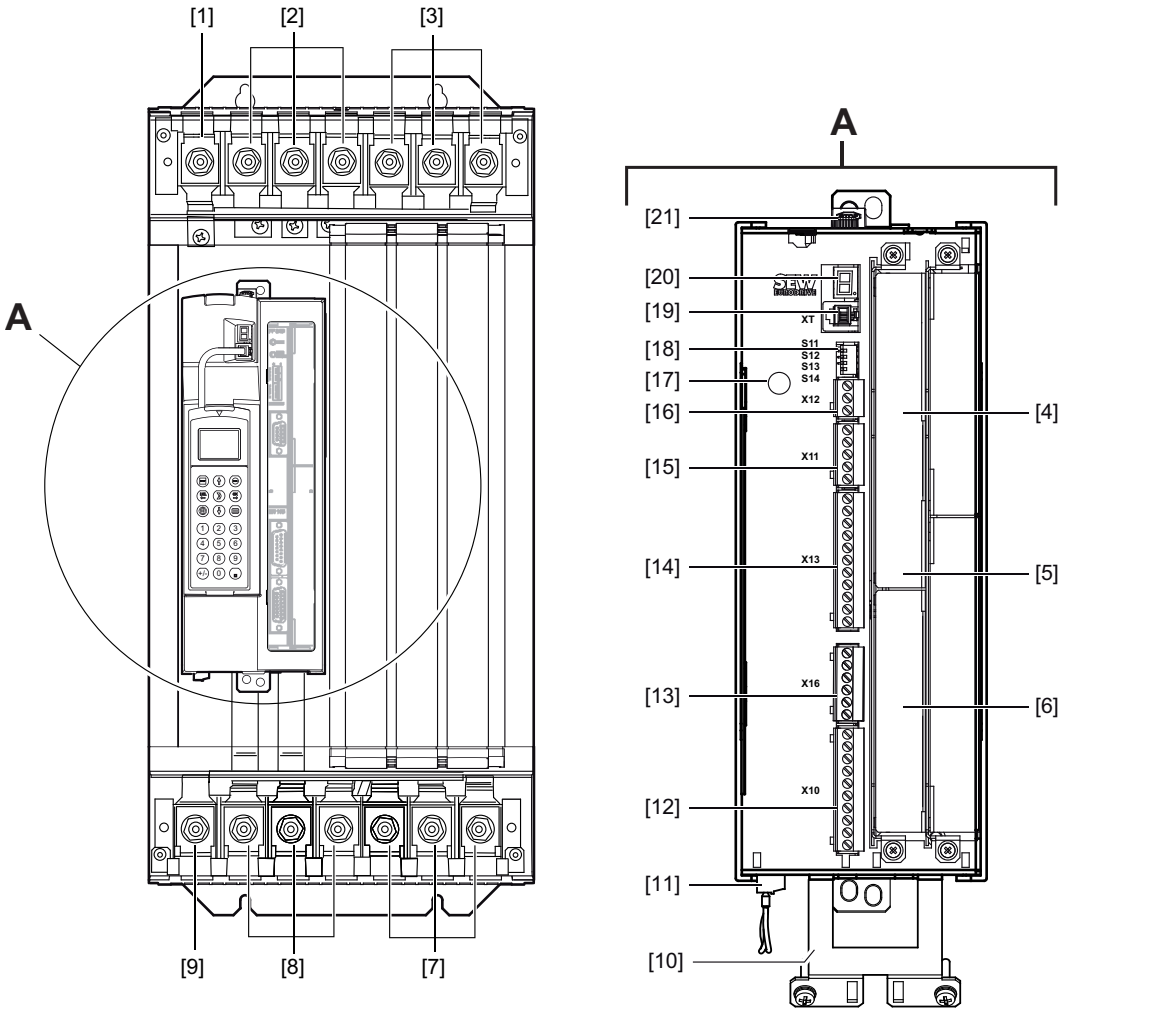
[20] 7-segment display

[21] Memory card

27793230/EN – 08/2022

## 12.9 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

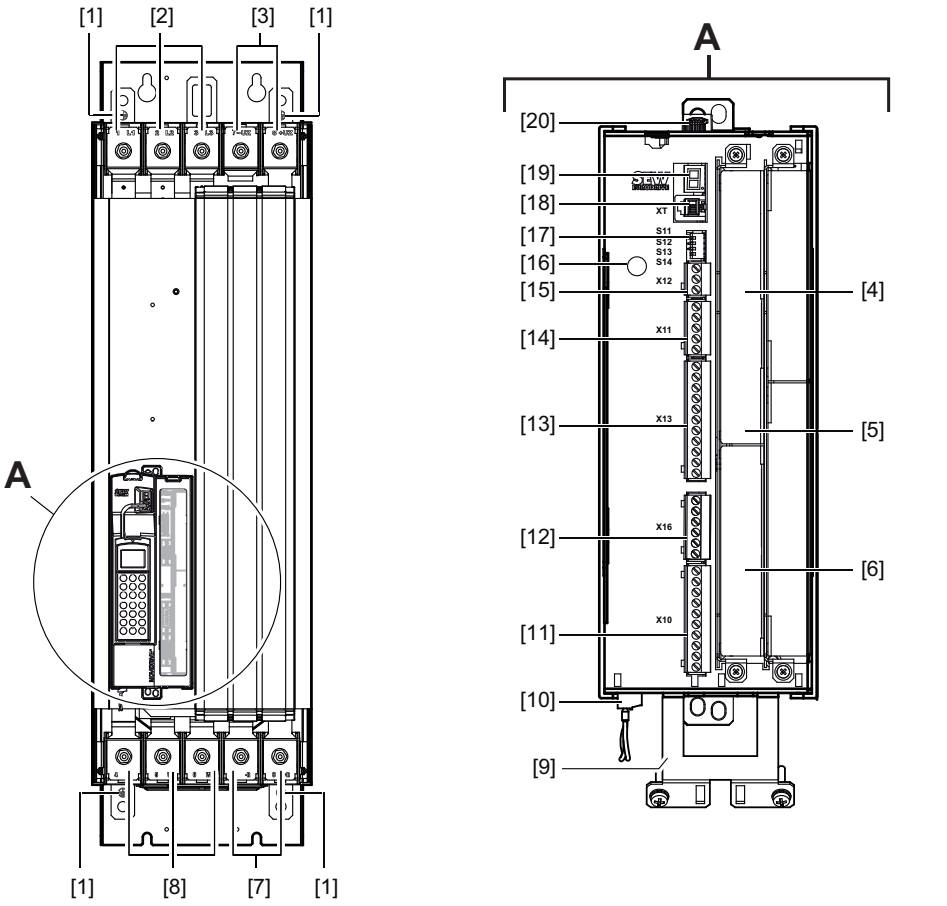
27793230/EN – 08/2022

[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

27793230/EN – 08/2022

## 12.10 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

27793230/EN – 08/2022

[17] DIP switches S11 – S14

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

[19] 7-segment display

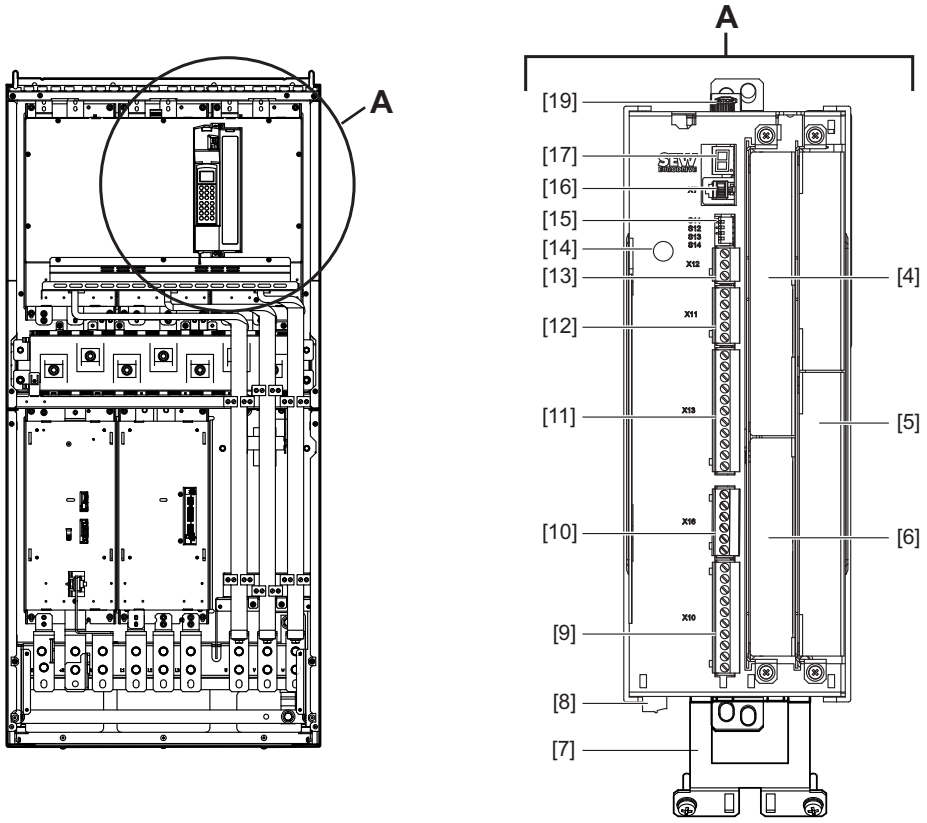
[20] Memory card

27793230/EN – 08/2022

## 12.11 Size 7

### 12.11.1 Control unit

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




*2077051275*

[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

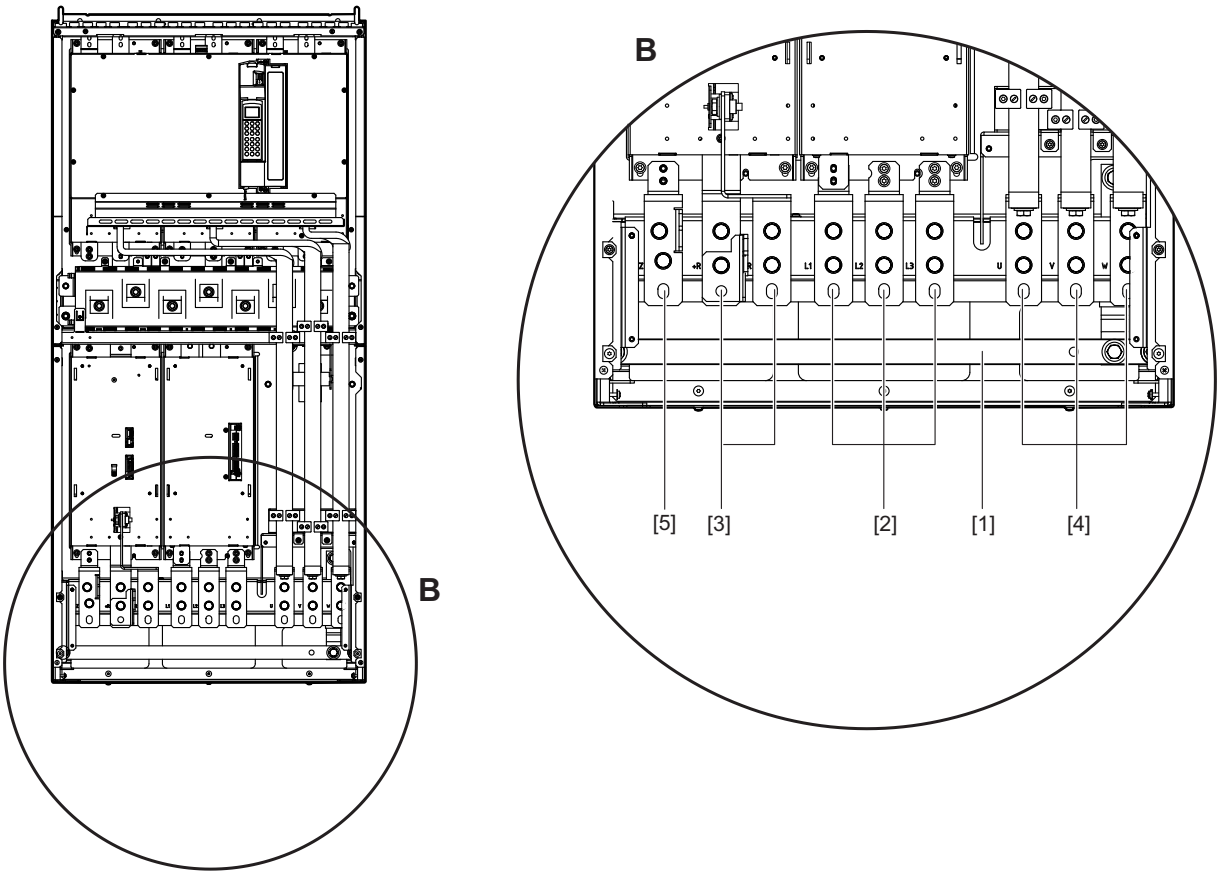
[17] 7-segment display

[19] Memory card

27793230/EN – 08/2022

### 12.11.2 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

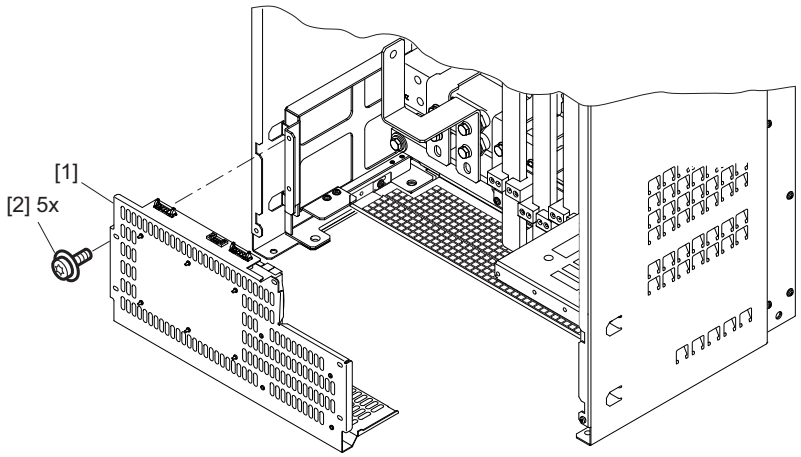
[3] X3: Braking resistor connection 8/+R, 9/–R

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

[5] $-U_Z$: Only with DC link adapter accessory

### 12.11.3 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)**

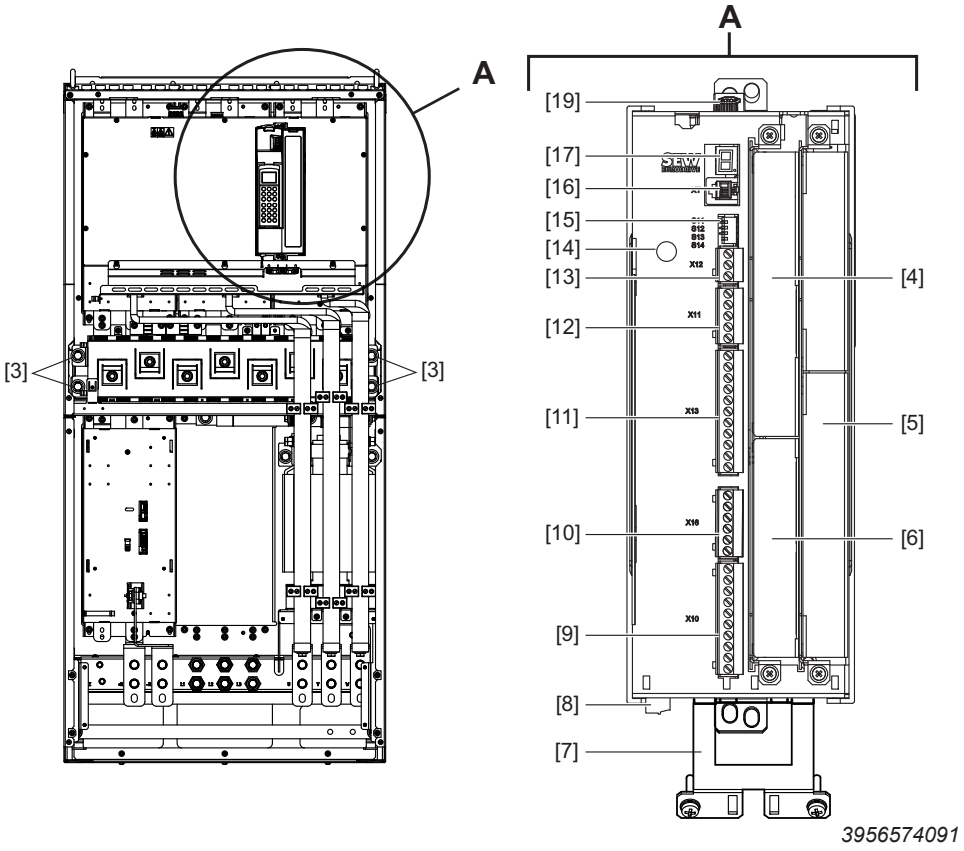
- Cross section: 6 $mm^2$
- Tightening torque ≤ 4 $mm^2$ = 0.5 Nm
- Tightening torque > 4 $mm^2$ = 0.7 Nm – 0.8 Nm

27793230/EN – 08/2022

## 12.12 MOVIDRIVE® MDX62B motor inverter size 7

### 12.12.1 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

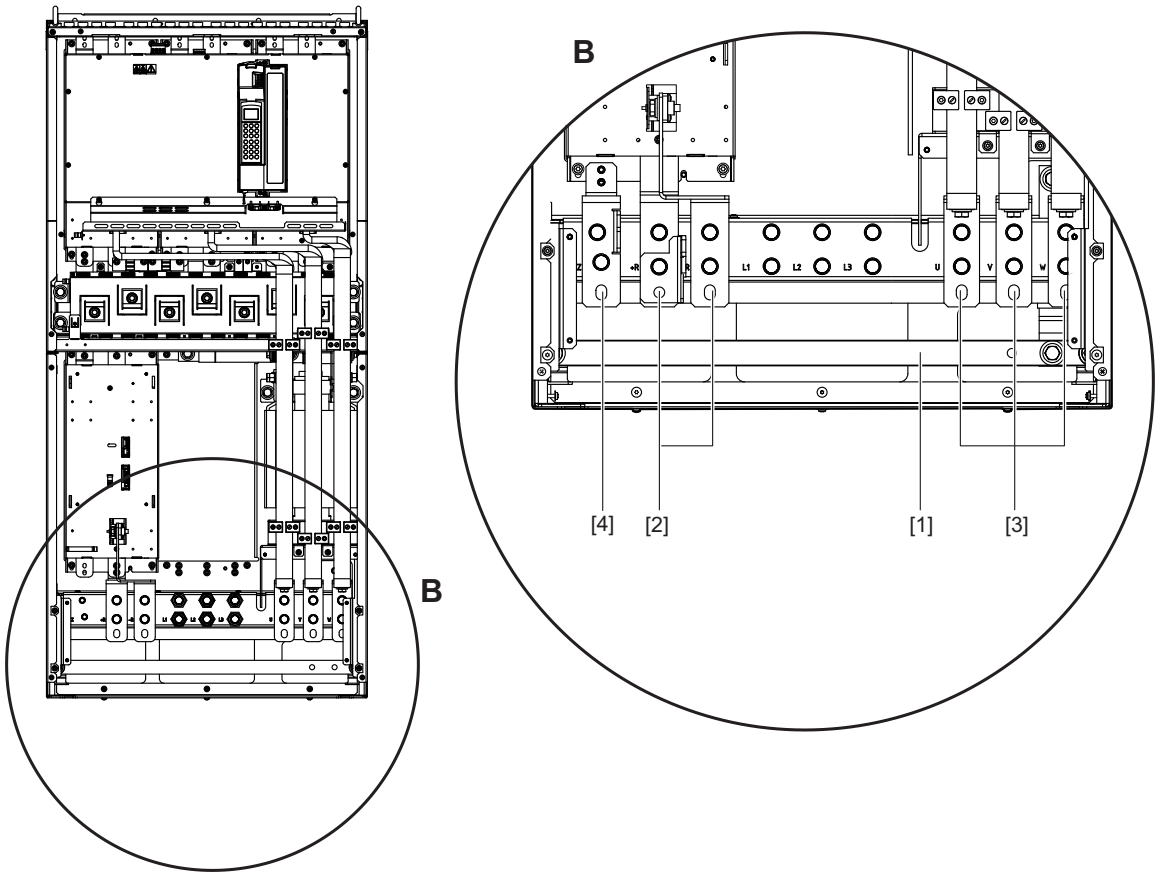
[17] 7-segment display

[19] Memory card

27793230/EN – 08/2022

### 12.12.2 Power section

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




*3956576011*

[1] PE connection rail (thickness = 10 mm)

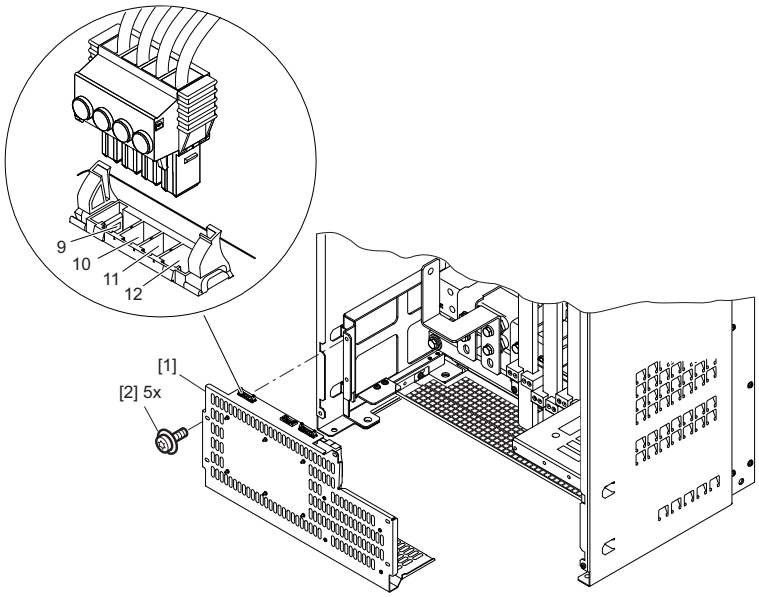
[2] X3: Braking resistor connection 8/+R, 9/–R

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

[4] $-U_Z$: Only with DC link adapter accessory

### 12.12.3 DC power supply unit

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




*9007201561717259*

[1] DC power supply unit

[2] Screw

27793230/EN – 08/2022

# 13 Installation

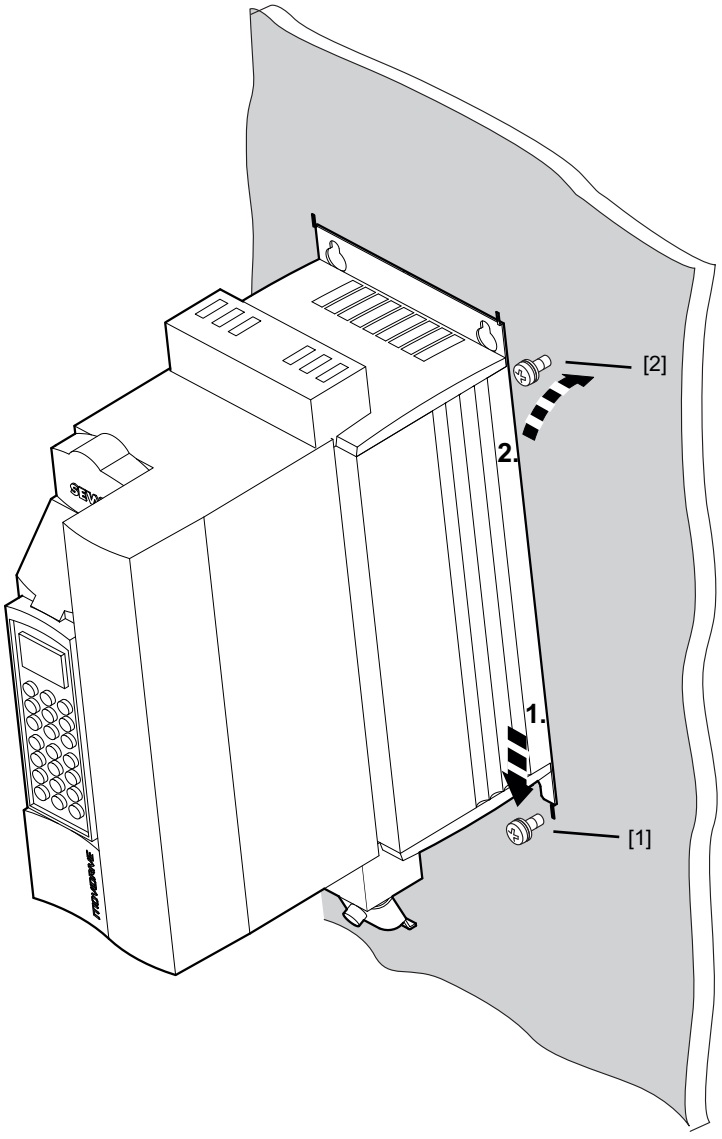
MOVIDRIVE® B application inverters are exclusively suitable for control cabinet installation according to the degree of protection.

## 13.1 Installation instructions for the basic unit

### 13.1.1 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.




*20524209675*

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. 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 |

27793230/EN – 08/2022

### 13.1.2 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

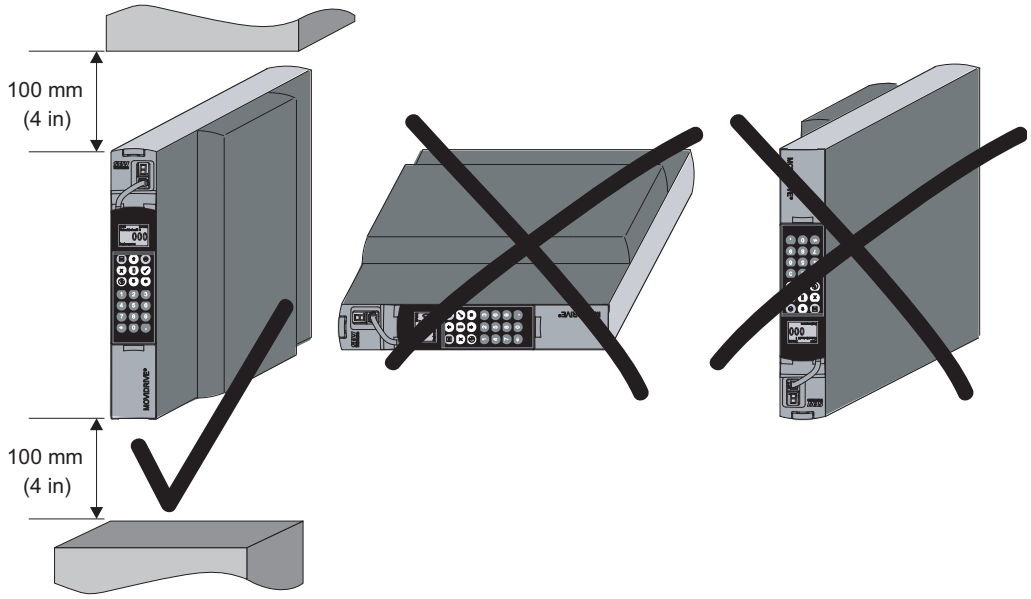
Note the permitted tightening torques:

| 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 |

27793230/EN – 08/2022

### 13.1.3 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).




*1802306443*

### 13.1.4 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.

27793230/EN – 08/2022

### 13.1.5 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 at the supply end of the product.

### 13.1.6 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.

27793230/EN – 08/2022

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

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

- **Supply system lead < 10 mm²:**

  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 mm²**.

- **Supply system cable 10 mm² – 16 mm²**:

  Route a copper PE conductor with the same cable cross section as the supply system cable.

- **Supply system cable 16 mm² – 35 mm²**:

  Route a copper PE conductor with a cable cross section of 16 mm².

- **Supply system cable > 35 mm²**:

  Route a copper PE conductor with half the cross section of the supply system cable.

### 13.1.8 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.

### 13.1.9 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 mm² (AWG 24 – 13)
  - 2 cores per terminal 0.25 – 1 mm² (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 mm² (AWG 28 – 16)
  - 2 cores per terminal 0.25 – 1 mm² (AWG 23 – 17)

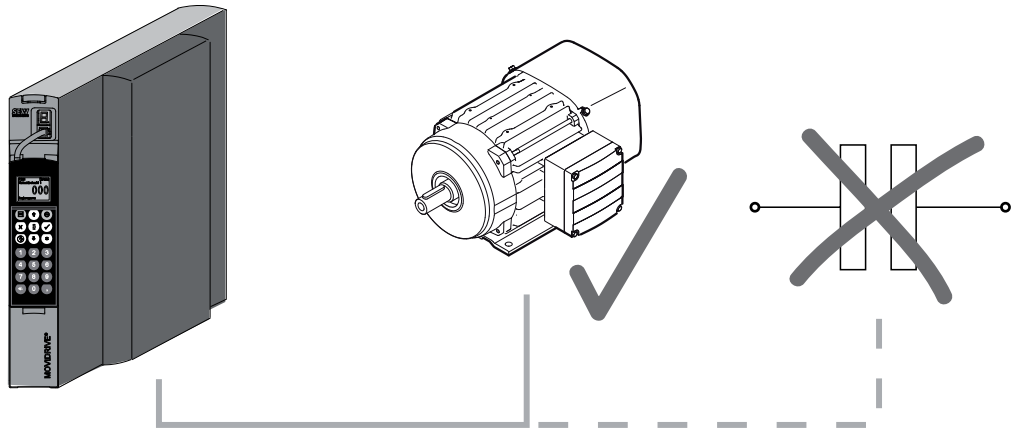
27793230/EN – 08/2022

### 13.1.10 Unit output

## NOTICE

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

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



1804838667

### 13.1.11 Permitted mounting the braking resistors

## ⚠ WARNING

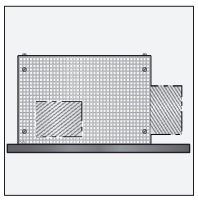
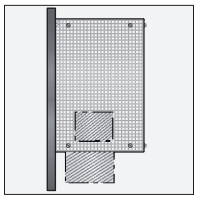
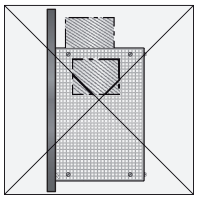
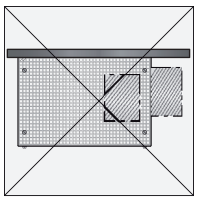
Non-permissible installation might lead to an accumulation of heat in the braking resistor due to reduced convection. A tripping temperature contact or an overheated braking resistor can lead to a system standstill.

Adhere to the following minimum clearances:

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

### Grid resistors

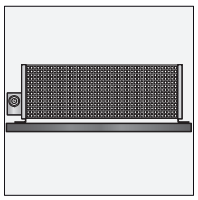
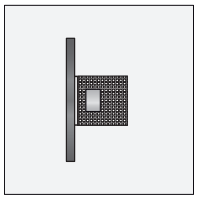
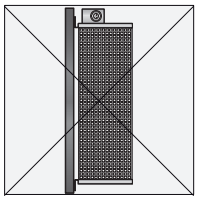
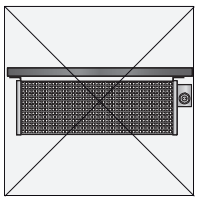
You must fulfill the following requirements for mounting the grid resistors:

-  **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).

27793230/EN – 08/2022

**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.

### 13.1.12 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 V/500 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**.

### 13.1.13 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.

### 13.1.14 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.

### 13.1.15 EMC-compliant installation

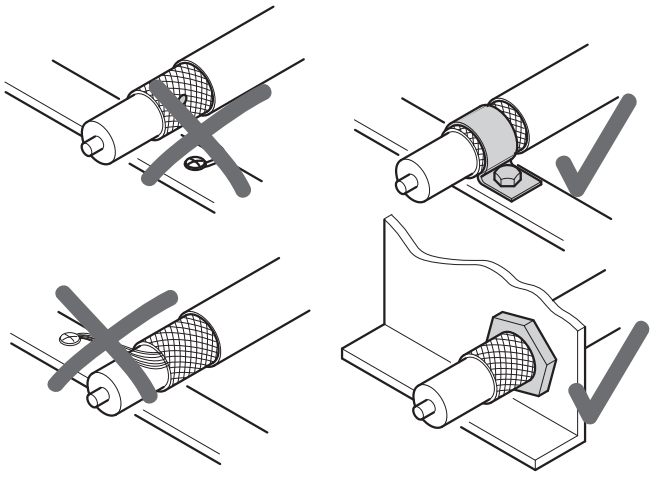
- All cables except for the power supply line **must be shielded**. As an alternative to the shielding, the option HD.. (output choke) or HF (output filter) can be used for the motor cable to achieve the emitted interference limit values.




*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.

27793230/EN – 08/2022



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)

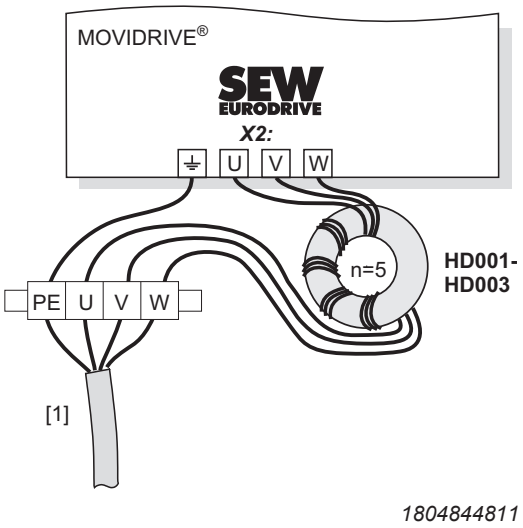
#### Interference emission category

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.

27793230/EN – 08/2022

### 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.




*Connection of output choke HD001 – HD003*

[1] Motor cable

### 13.1.16 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.



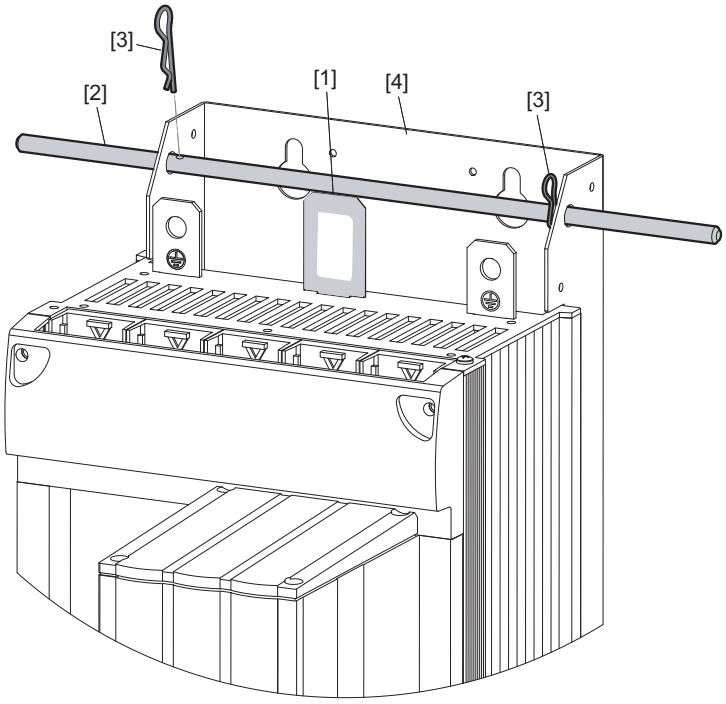
**⚠ WARNING**

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

### 13.1.17 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.

27793230/EN – 08/2022

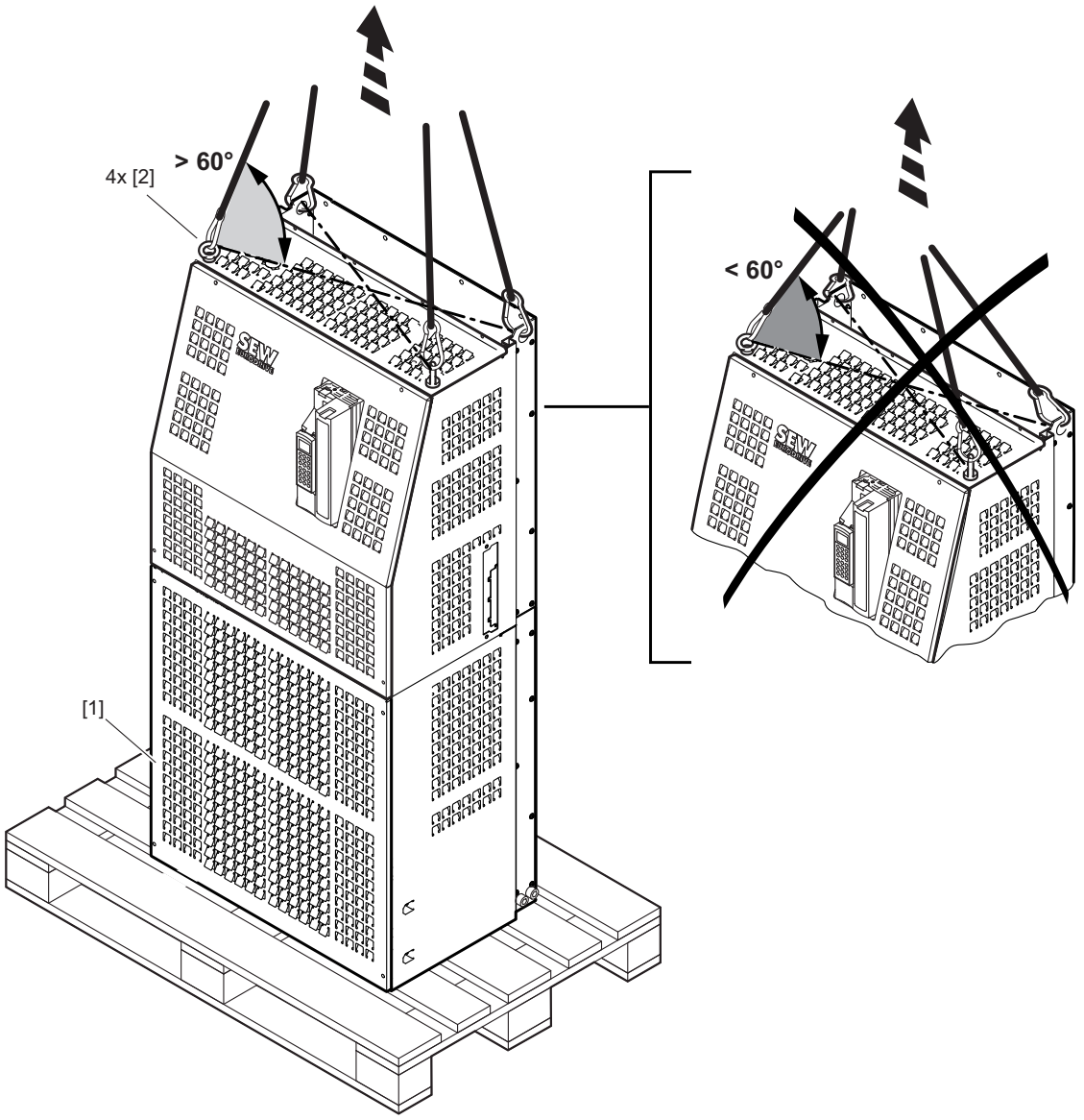
## ⚠ WARNING



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




18014400586880139

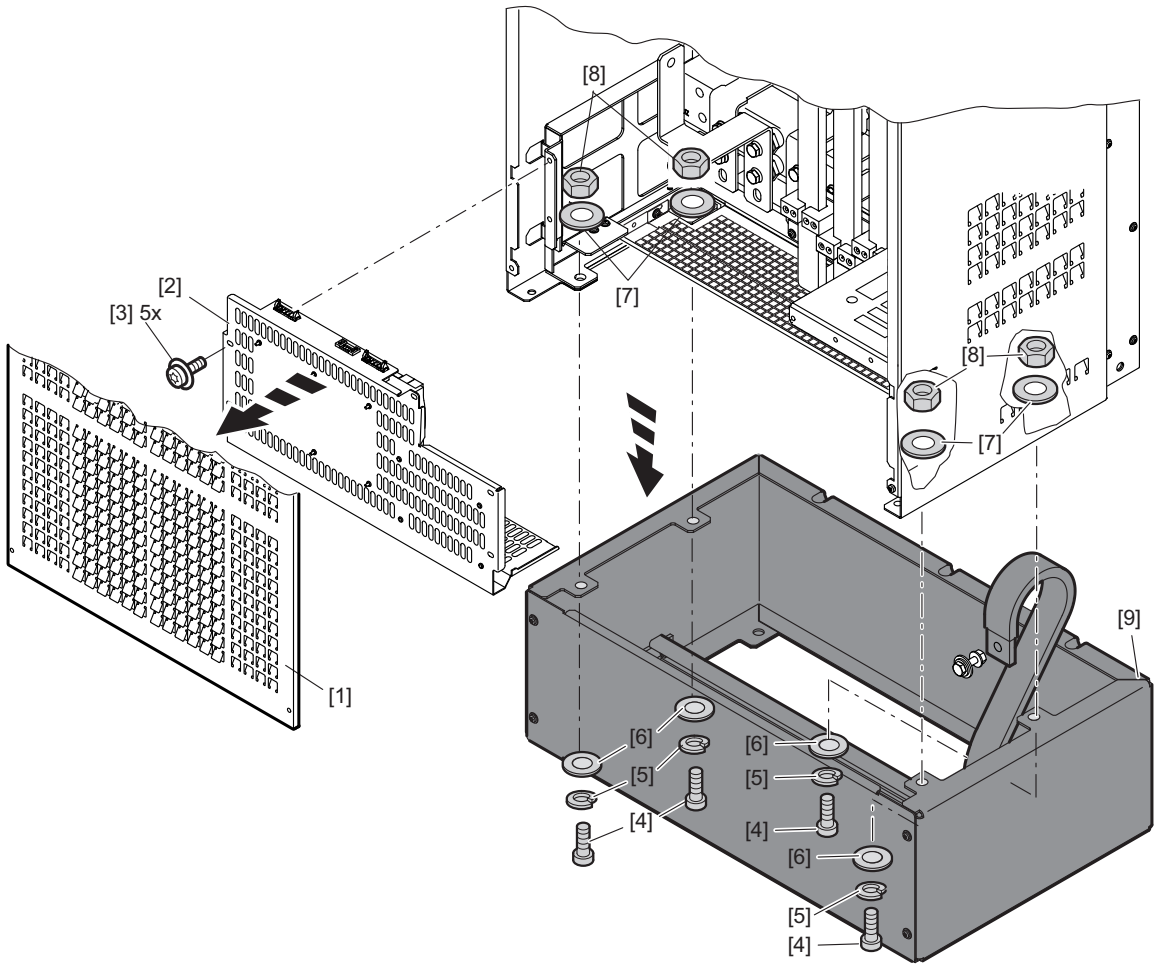
[1] Installed front cover

[2] 4 lifting eyes

### 13.1.18 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] centrically between inverter and mounting base [9].

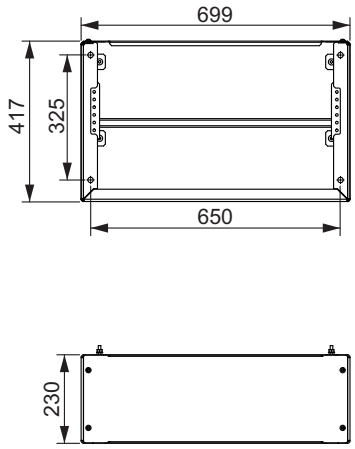
27793230/EN – 08/2022

- 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*

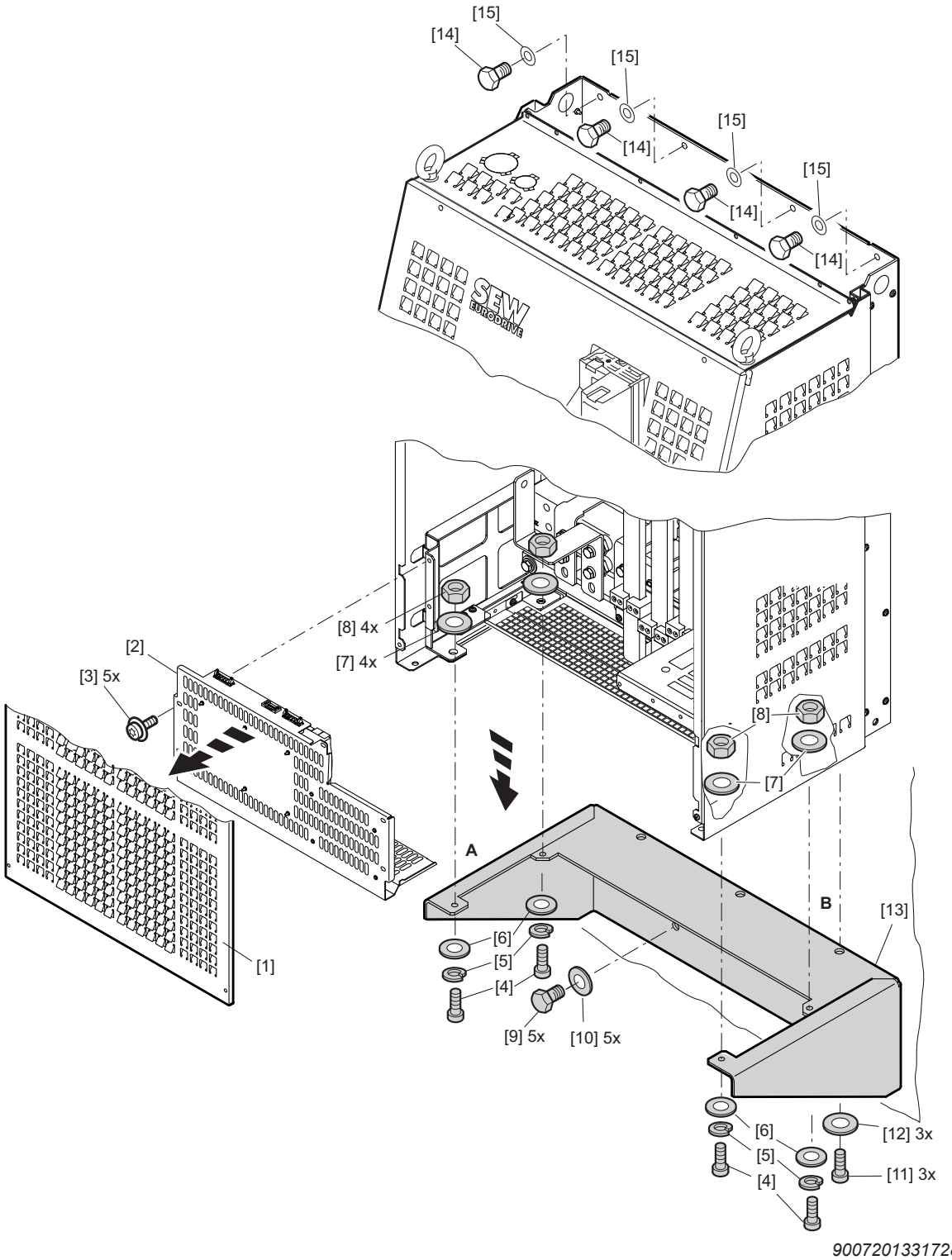
The following figure shows the dimensions of the DLS11B mounting base.




*2076984331*

### 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.




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

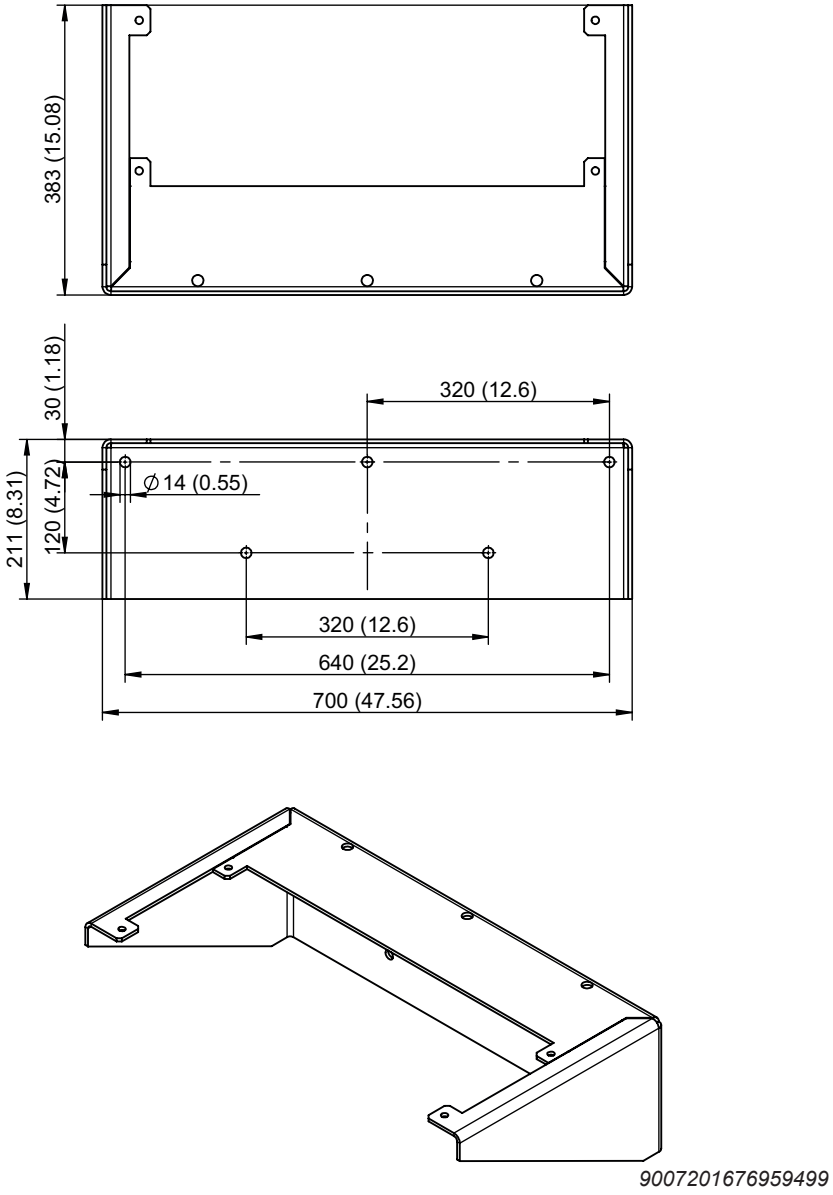
27793230/EN – 08/2022

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 centrically 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].

27793230/EN – 08/2022

*Dimension drawing for DLH11B wall bracket*

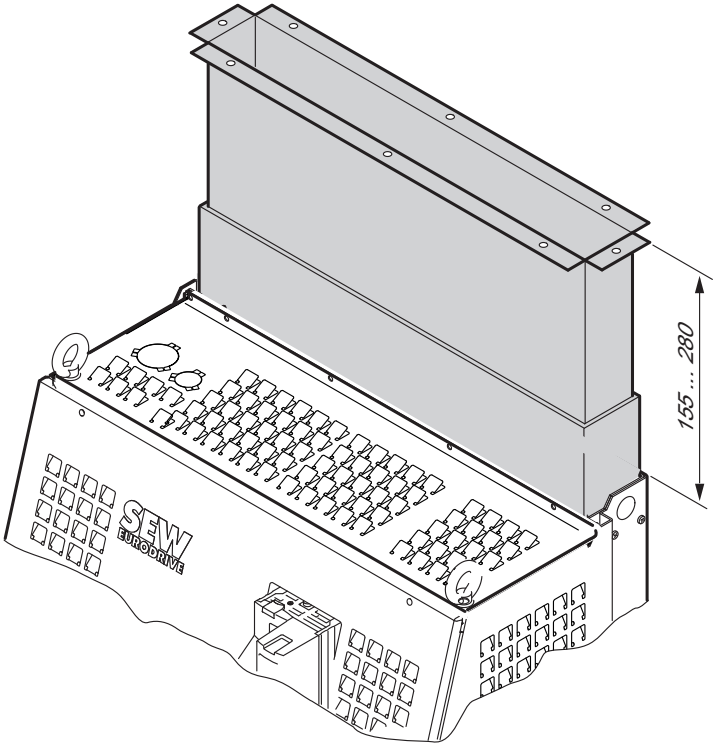



*9007201676959499*

27793230/EN – 08/2022

### DLK11B air duct

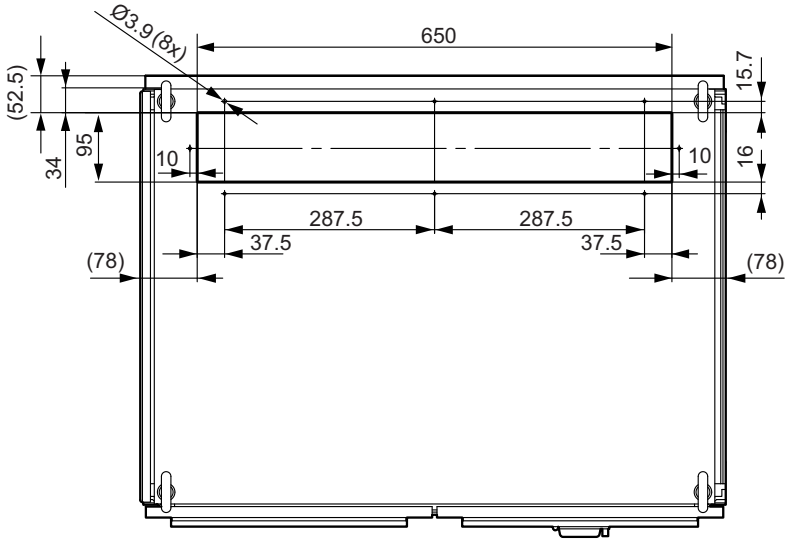
An optional **DLK11B air duct** (part no.: 18226035) is available to dissipate heat of MOVIDRIVE® B size 7. Install the air duct in such a way that it points vertically upwards (see figure below).




*18014400586472715*

*Roof cut-out for DLK11B air duct*

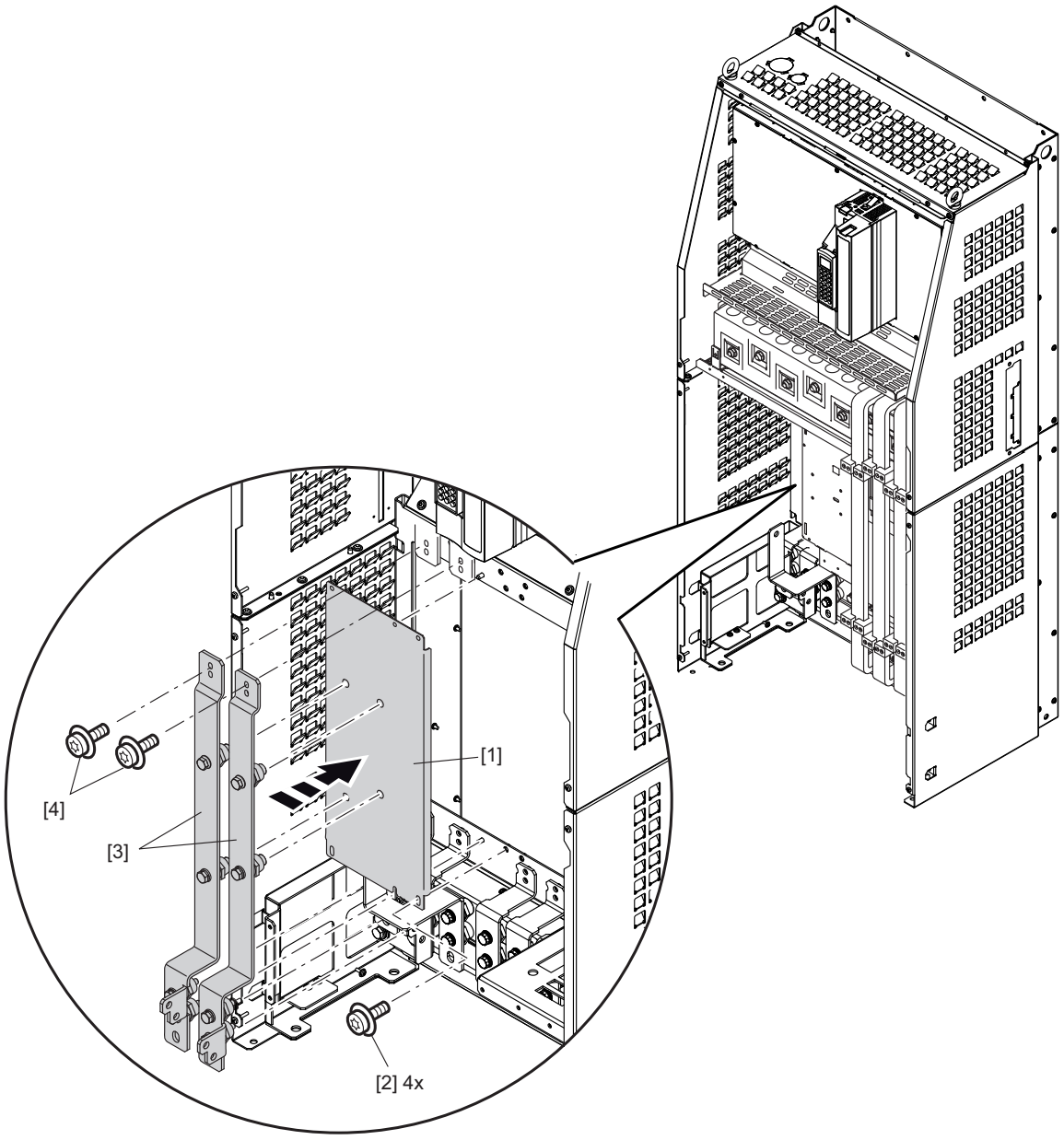
The following figure shows the cut-out of the control cabinet roof for the DLK11B air duct.




*18014400586475403*

### 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:




*9007201531077515*

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).

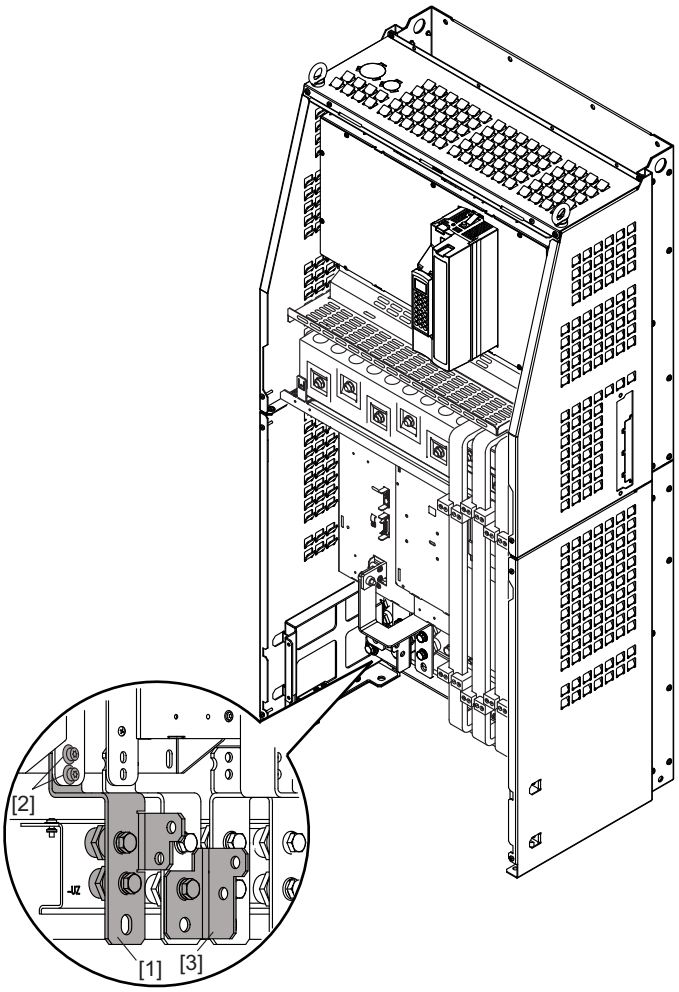
27793230/EN – 08/2022

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.

27793230/EN – 08/2022

### 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] $-U_z$ on the brake chopper module (bottom left) on the insulating spacer.
4. Position the 2 screws of the conductor rail [1] $-U_z$ on the insulating spacer.
5. Tighten all screws of the mounting lug $-U_z$.
6. Screw on the angle bracket [3].
7. Replace the covers.

27793230/EN – 08/2022

### 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.

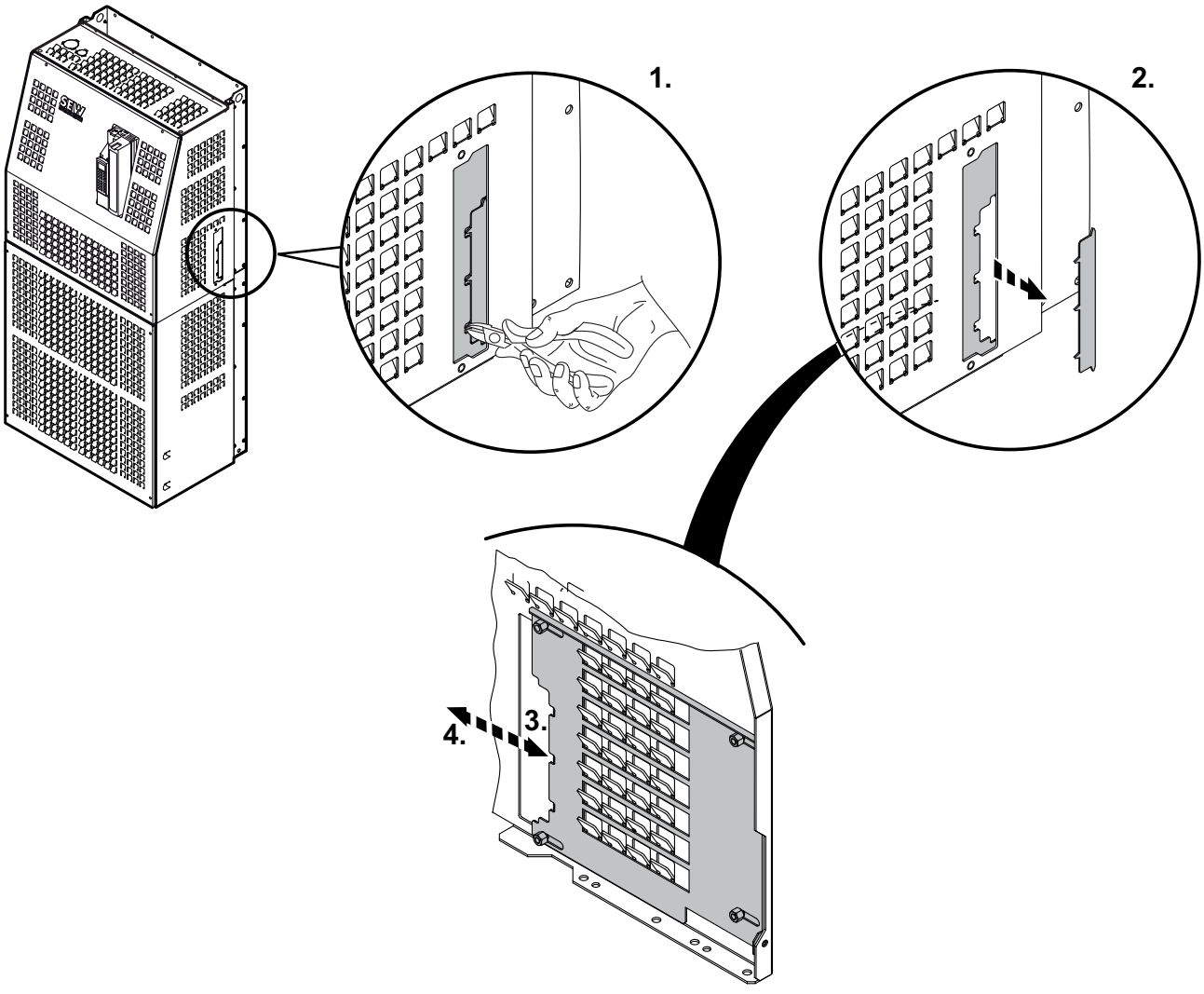
Proceed as follows to prepare MOVIDRIVE® for the side-by-side connection:

**⚠ 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:

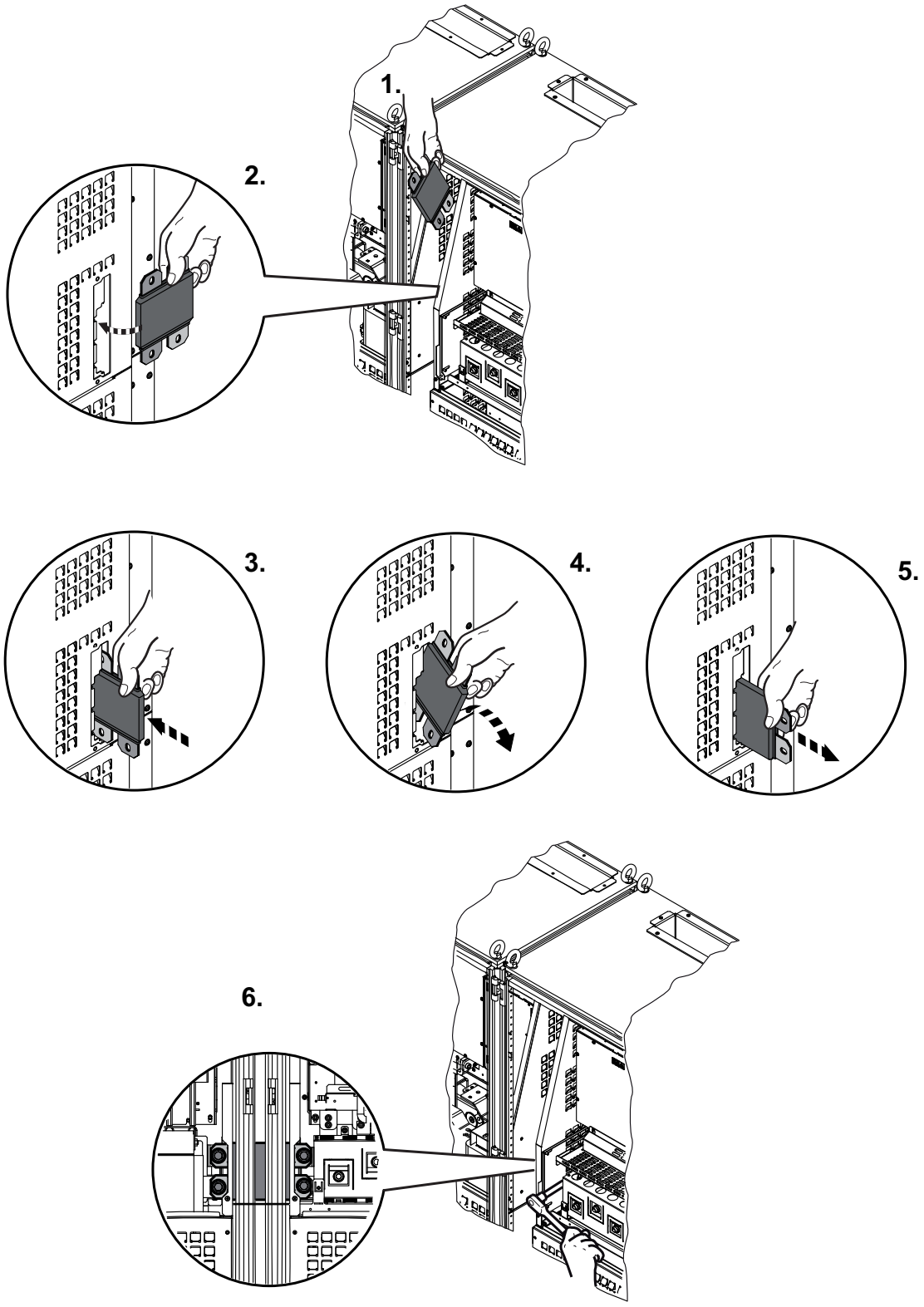
- 100 mm (part number: 18231934)
- 200 mm (part number: 18235662)
- 300 mm (part number: 18235670)

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" (→ 🗎 571).
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.

27793230/EN – 08/2022

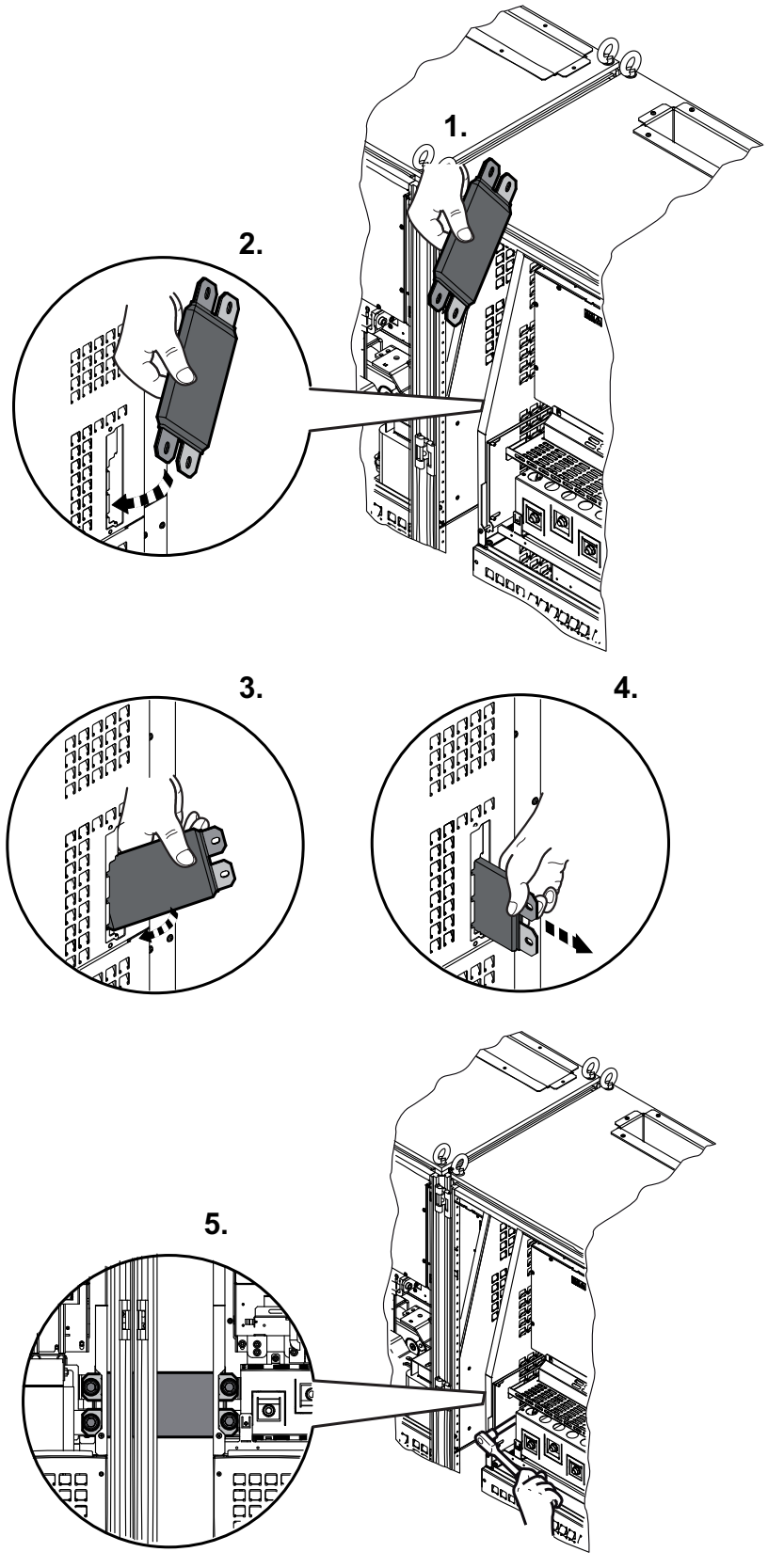
- Tip the DC link connection into the second device from above




*9007201531079435*

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

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




*3919719051*

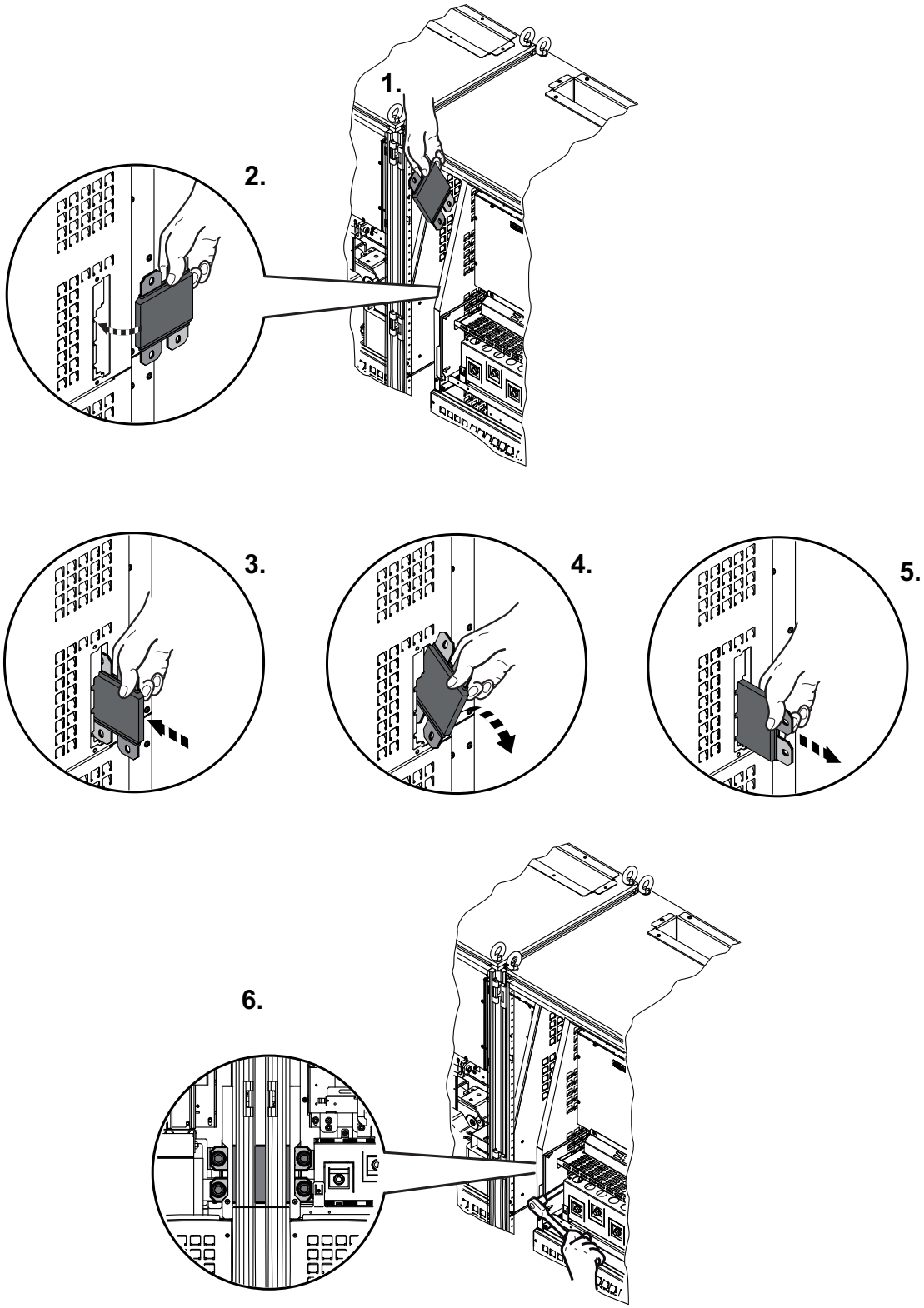
27793230/EN – 08/2022

- 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.

27793230/EN – 08/2022

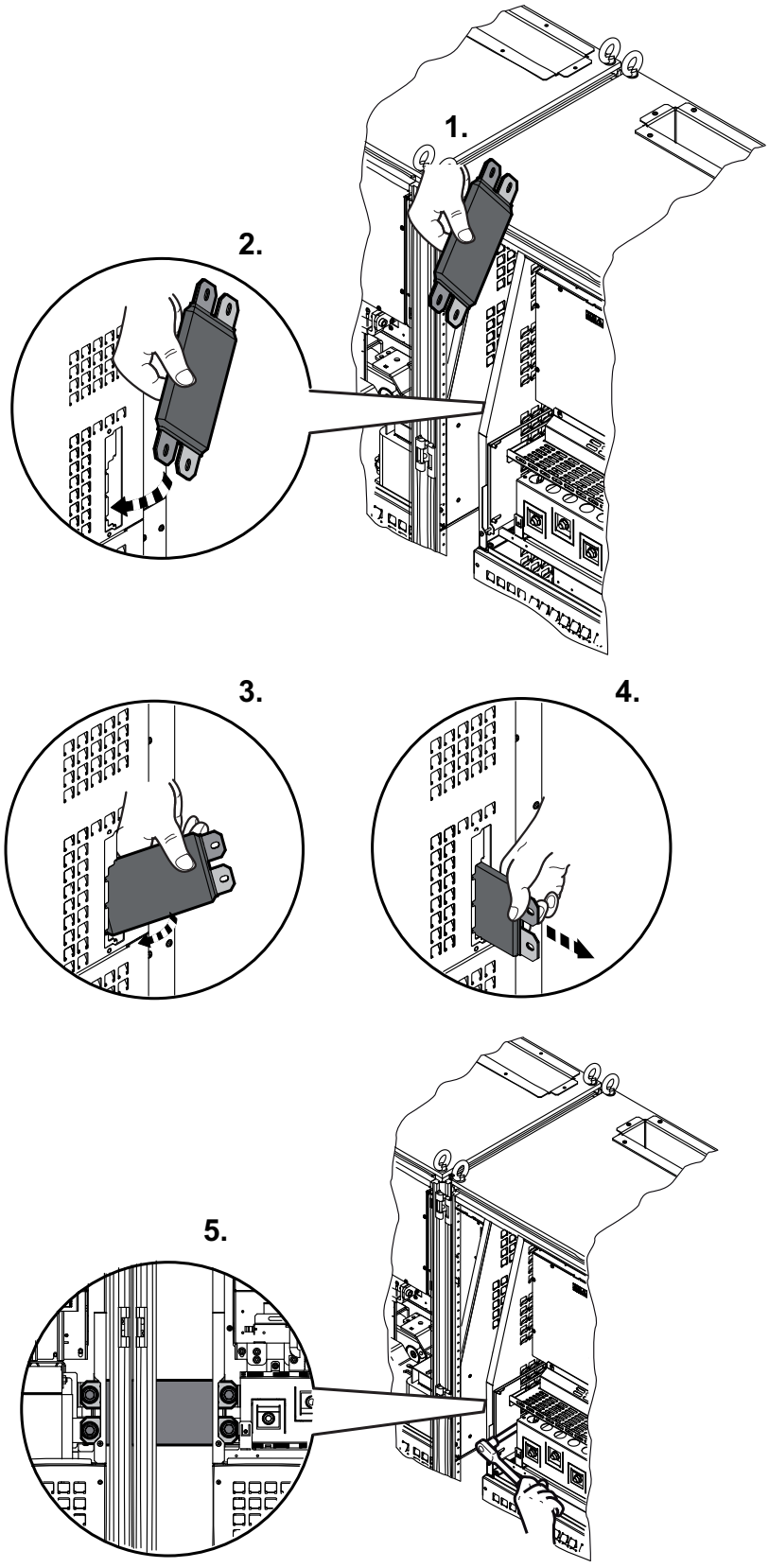
8. Replace the covers.




*9007201531079435*

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

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



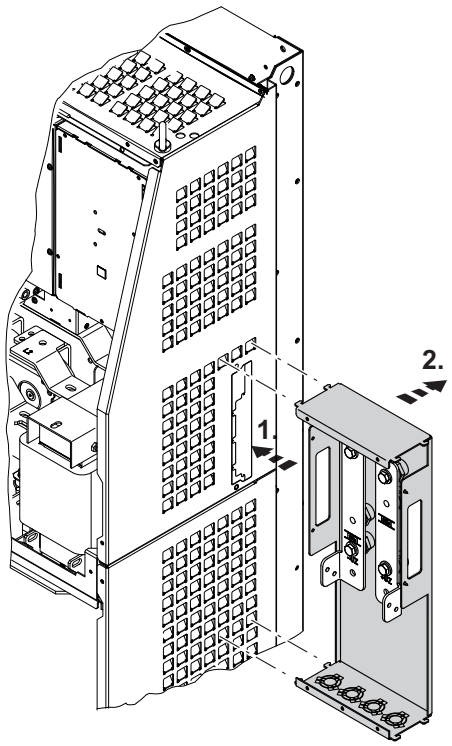

*3919719051*

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

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):

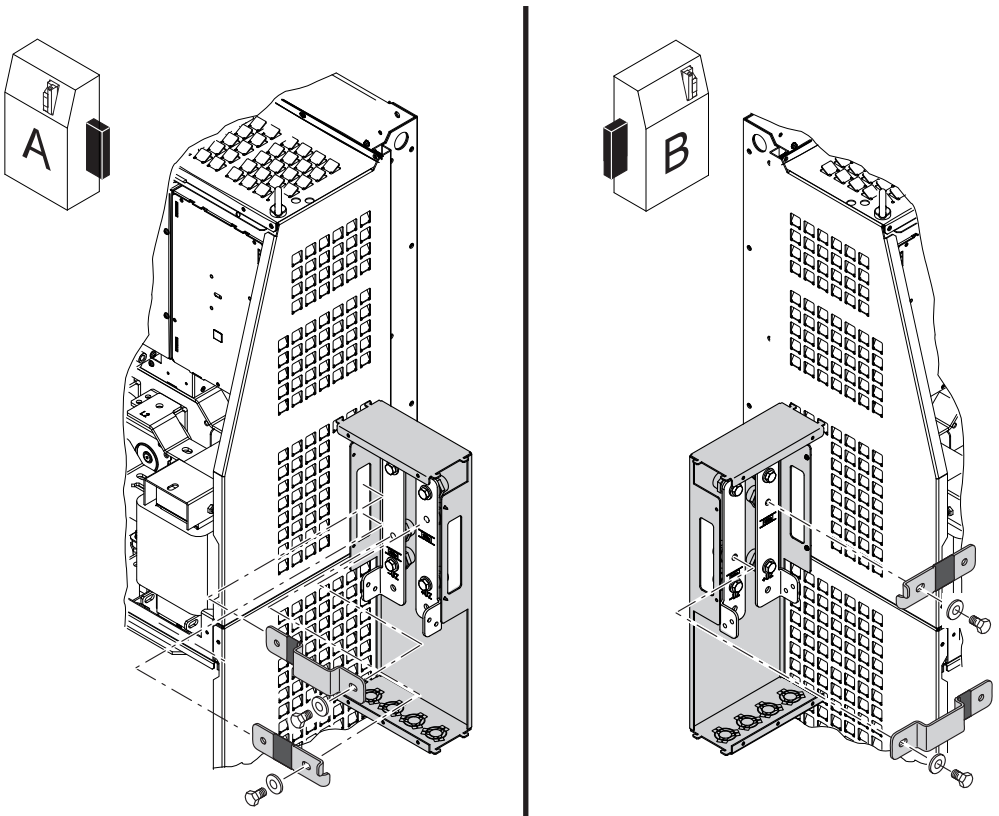



*3435514891*

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" (→ 🗎 571).
4. Mount the DC link coupling to the side panel of the size 7 device.

27793230/EN – 08/2022

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.

27793230/EN – 08/2022

*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

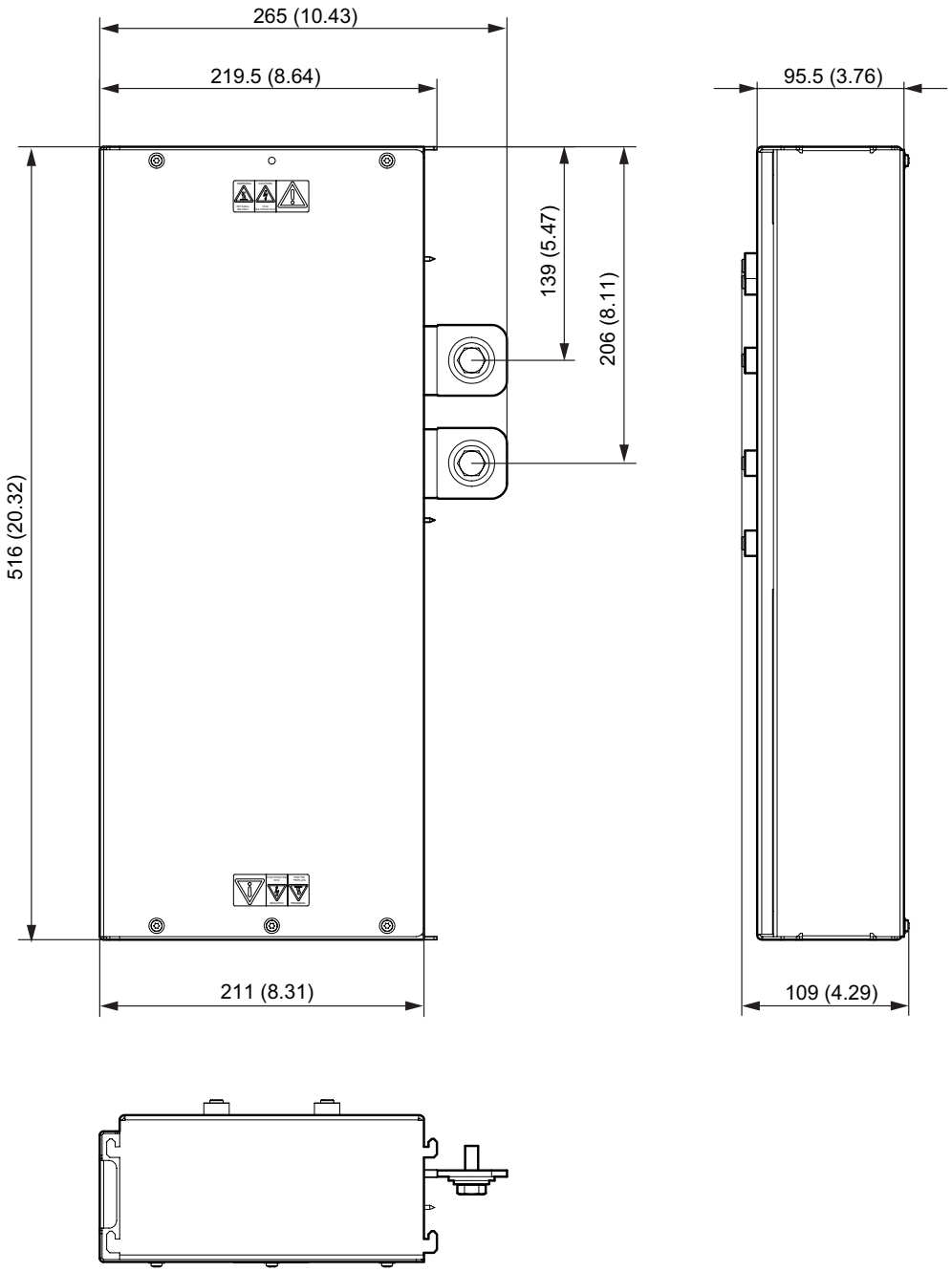
Observe the following installation notes in addition:

- Connection of max 2 × 150 $mm^2$ 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 ≥ 150 $mm^2$.

27793230/EN – 08/2022

*DLZ31B DC link coupling dimension drawing*

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



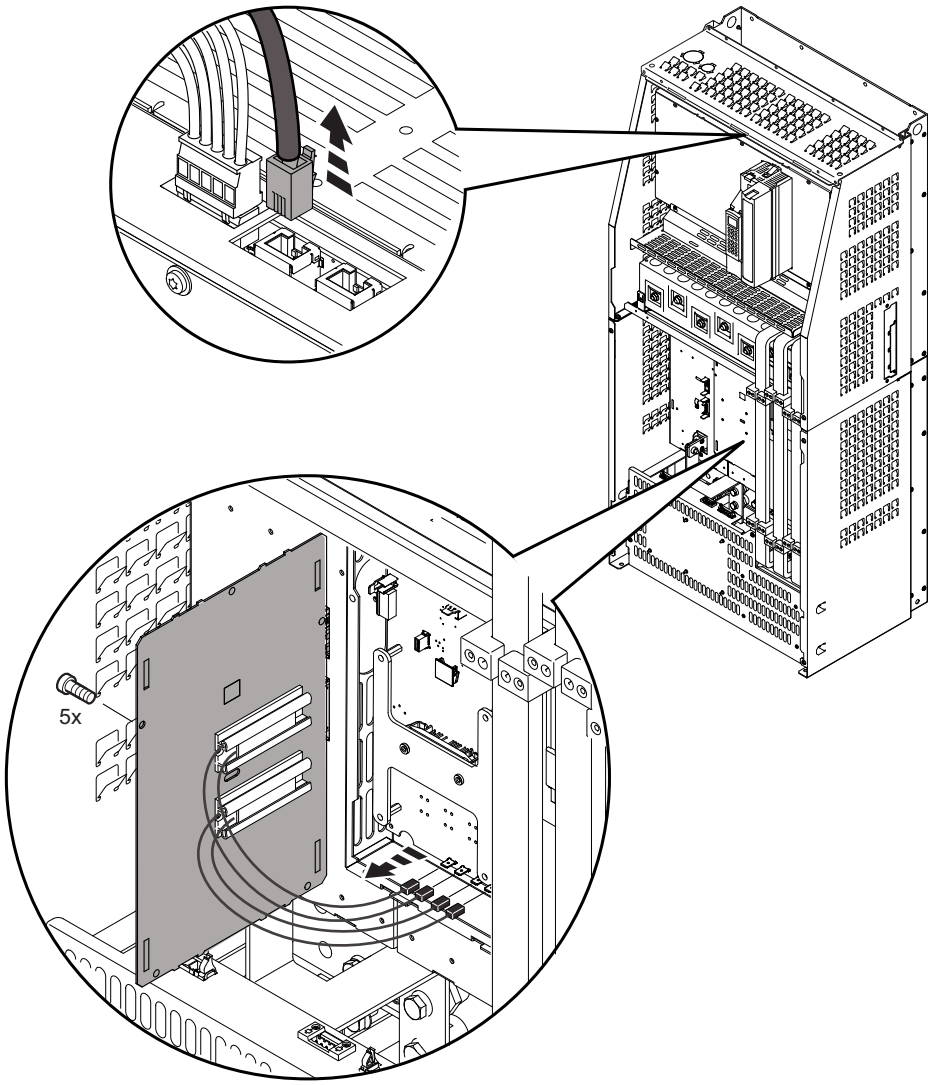

*4099258123*

### 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:




*3437047051*

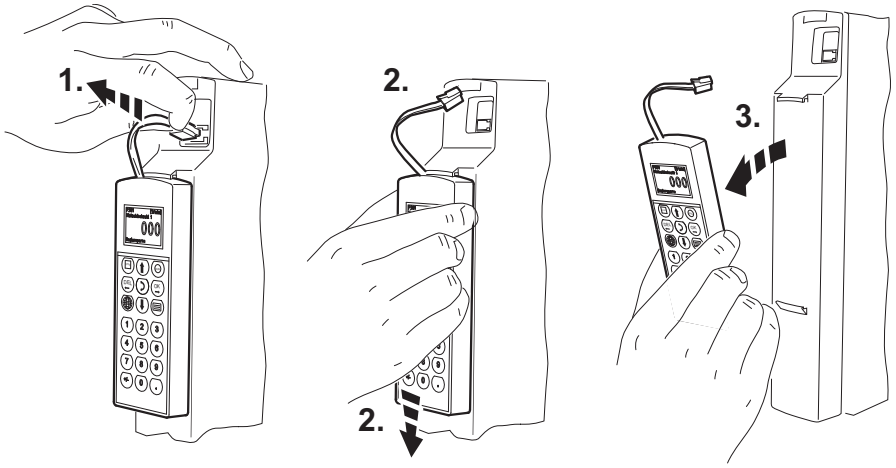
- Loosen the 4 screws of the upper cover and remove it.
- Loosen the 4 screws of the lower cover and remove it.
- Pull the CAN bus plug (RJ45) at the top of the inverter.
- Loosen the 5 screws of the cover of the precharge and discharge control and remove the cover.
- Pull the 4 flat plugs of the discharge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

27793230/EN – 08/2022

## 13.2 Removing/installing the keypad

### 13.2.1 Removing the keypad

Proceed as follows:

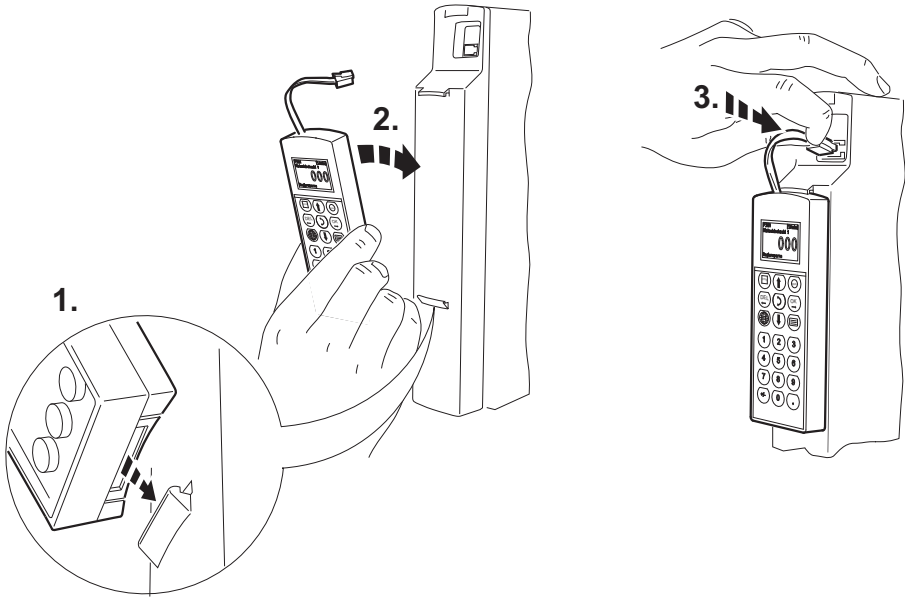



*1804920715*

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!).

### 13.2.2 Installing the keypad

Proceed as follows:




*1804922635*

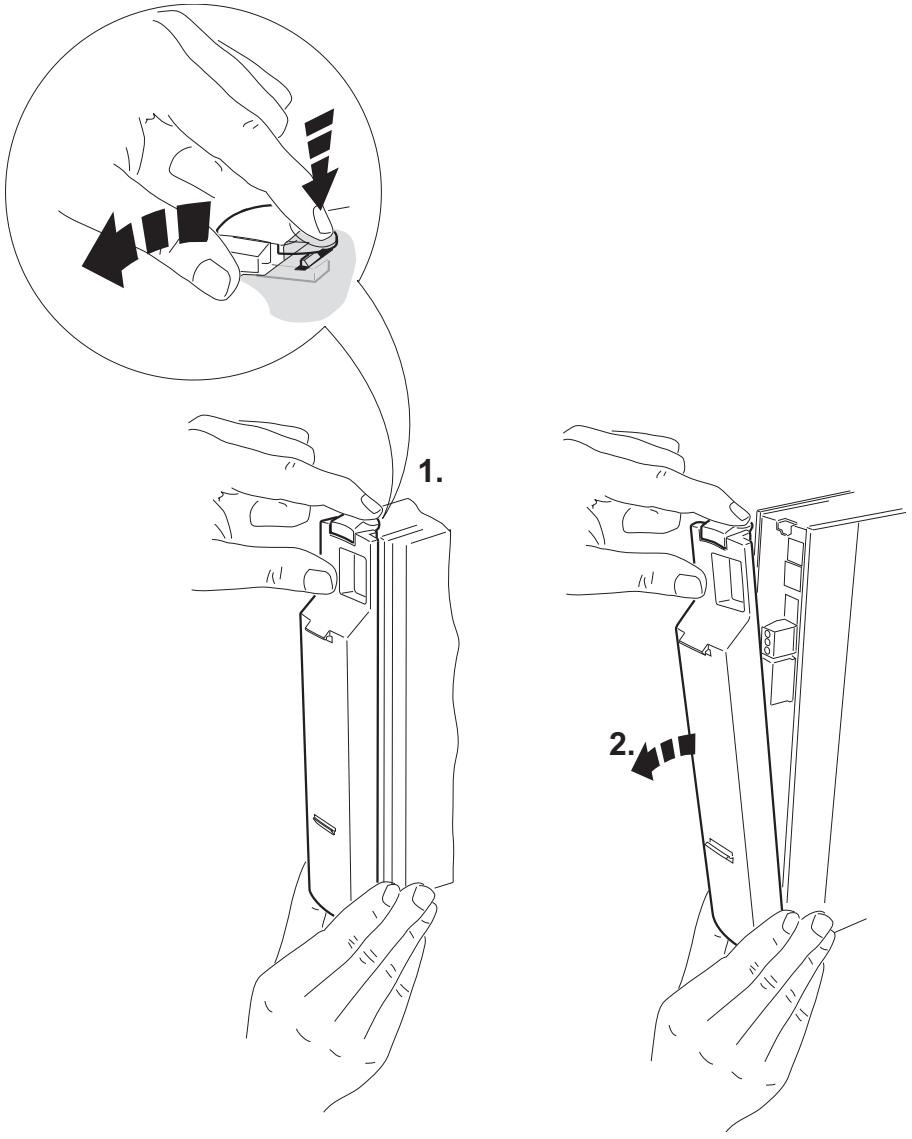
1. Place the underside of the keypad onto the lower fixture of the front cover.
2. Push the keypad into the upper fixture of the front cover.
3. Plug the connecting cable into the XT slot.

27793230/EN – 08/2022

## 13.3 Removing/installing the front cover

### 13.3.1 Removing the front cover

Proceed as follows to remove the front cover:



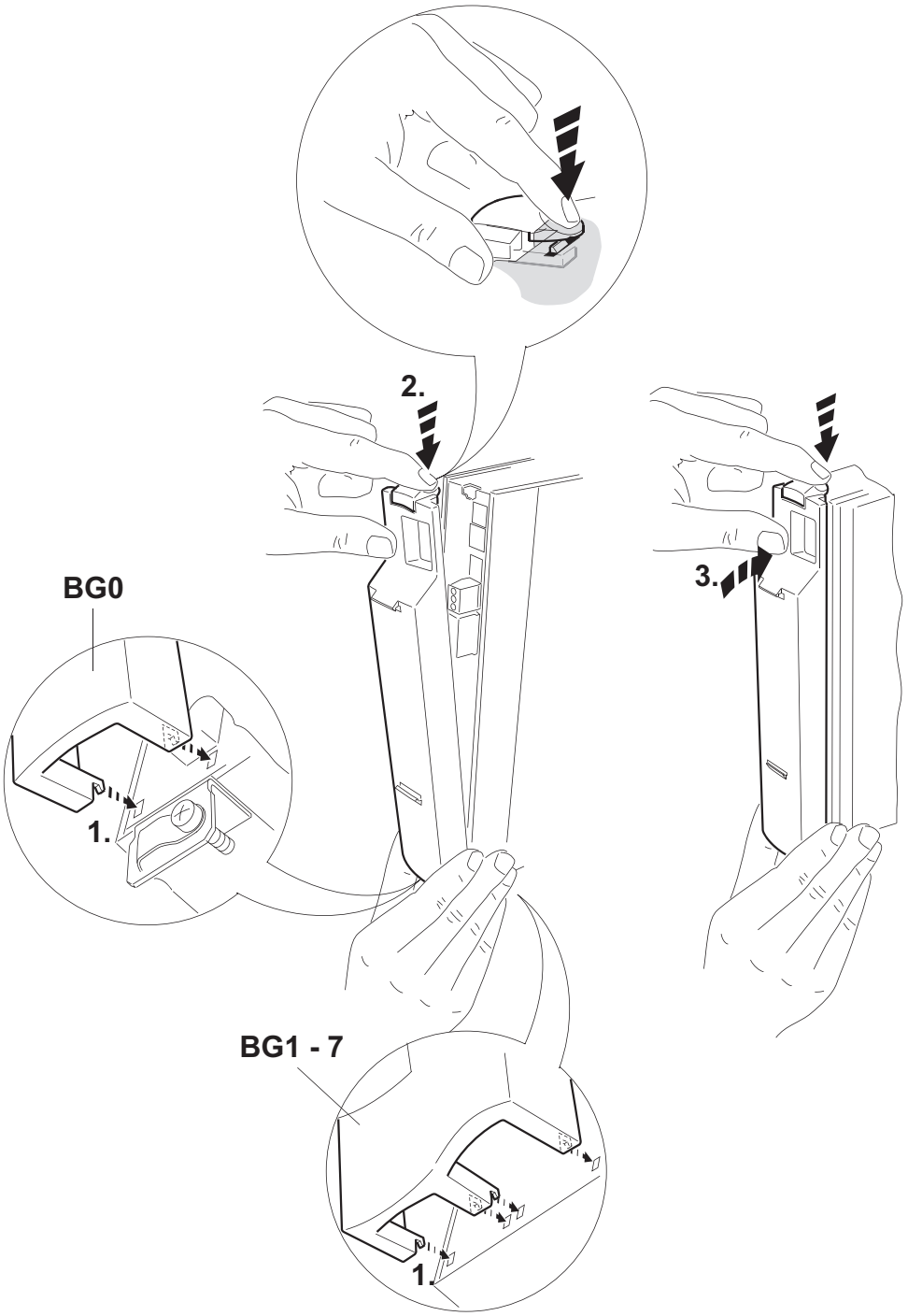

*1804955147*

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.

27793230/EN – 08/2022

### 13.3.2 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.

## 13.4 Information regarding UL

### INFORMATION

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

### 13.4.1 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® 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.

### 13.4.2 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.

27793230/EN – 08/2022

### 13.4.3 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 when protected by: | SCCR: 200 kA/ 500 V when protected by | SCCR: 65 kA/ 480 V: when protected by[1]: | 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, 0005 (Size 0S) | 15 A / 600 V | 25 A/ 500 V | ABB, Model MS132-2.5 Rated 480 V, 1 HP | Rockwell Automation Model 140M-C2E-B25, Rated 460 V, 1.5 HP |
| MOVIDRIVE® MODEL, 0008 (Size 0S) | 15 A / 600 V | 25 A / 500 V | ABB, Model MS132-4.0 Rated 480 V, 2 HP | Rockwell Automation Model 140M-C2E-B40, Rated 460 V, 3 HP |
| MOVIDRIVE® MODEL, 0011 (Size 0M) | 15 A / 600 V | 25 A / 500 V | ABB, Model MS132-4.0 Rated 480 V, 2 HP | Rockwell Automation Model 140M-C2E-B40, Rated 460 V, 3 HP |
| MOVIDRIVE® MODEL, 0014 (Size 0M) | 15 A / 600 V | 25 A / 500 V | ABB, Model MS132-6.3 Rated 480 V, 3 HP | Rockwell Automation Model 140M-C2E-B63, Rated 460 V, 5 HP |
| MOVIDRIVE® MODEL, 0015 (Size 1) | 35 A / 600 V | 25 A / 500 V | ABB, Model MS132-6.3 Rated 480 V, 3 HP | Rockwell Automation Model 140M-C2E-B63, Rated 460 V, 5 HP |
| MOVIDRIVE® MODEL, 0022 (Size 1) | 35 A / 600 V | 25 A / 500 V | ABB, Model MS132-6.3 Rated 480 V, 3 HP | Rockwell Automation Model 140M-C2E-B63, Rated 460 V, 5 HP |
| MOVIDRIVE® MODEL, 0030 (Size 1) | 35 A / 600 V | 25 A / 500 V | ABB, Model MS132-10 Rated 480 V, 5 HP | Rockwell Automation Model 140M-C2E-C10, Rated 460 V, 7.5 HP |
| MOVIDRIVE® MODEL, 0040 (Size 1) | 35 A / 600 V | 25 A / 500 V | ABB, Model MS132-12 Rated 480 V, 7.5 HP | Rockwell Automation Model 140M-D8E-C16, Rated 460 V, 10 HP |
| MOVIDRIVE® MODEL, 0055 (Size 2S) | 60 A / 600 V | 25 A / 500 V | ABB, Model MS132-16 Rated 480 V, 10 HP | Rockwell Automation Model 140M-D8E-C16, Rated 460 V, 10 HP |
| MOVIDRIVE® MODEL, 0075 (Size 2S) | 60 A / 600 V | 25 A / 500 V | ABB, Model MS132-20 Rated 480 V, 10 HP | Rockwell Automation Model 140M- D8E-C20, Rated 460 V, 15 HP |
| MOVIDRIVE® MODEL, 0110 (Size 2) | 60 A / 600 V | - | ABB, Model MS132-32 Rated 480 V, 20 HP | Rockwell Automation Model 140M-F8E-C32, Rated 460 V, 25 HP |
| MOVIDRIVE® MODEL, 0150 (Size 3) | 175 A / 600 V | 90 A / 500 V | ABB, Model MS450-40E Rated 480 V, 30 HP | Rockwell Automation Model 140M-F8E-C45, Rated 460 V, 30 HP |
| MOVIDRIVE® MODEL, 0220 (Size 3) | 175 A / 600 V | 90 A / 500 V | ABB, Model MS495-63E Rated 480 V, 50 HP | - |
| MOVIDRIVE® MODEL, 0300 (Size 3) | 175 A / 600 V | 90 A / 500 V | ABB, Model MS495-75E Rated 480 V, 60 HP | - |
| MOVIDRIVE® MODEL, 0370 (Size 4) | 350 A / 600 V | 175 A / 500 V | ABB, Model MS495-90E Rated 480 V, 75 HP | - |
| MOVIDRIVE® MODEL, 0450 (Size 4) | 350 A / 600 V | 175 A / 500 V | - | - |
| MOVIDRIVE® MODEL, 0550 (Size 5) | 225 A / 600 V | 175 A / 500 V | - | - |
| MOVIDRIVE® MODEL, 0750 (Size 5) | 225 A / 600 V | 175 A / 500 V | - | - |
| MOVIDRIVE® MODEL, 0900 (Size 6) | 250 A / 600 V | 300 A / 500 V | - | - |

| 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[1]: | 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 (Size6) | 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:[1] | 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.

### 13.4.4 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.

27793230/EN – 08/2022

### 13.4.5 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** ($V_{max}$ = DC 30 V) and **limited output current** ($I_{max}$ = 8 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).

### 13.4.6 Environmental Conditions

The units are for use in pollution degree 2 environments.

27793230/EN – 08/2022

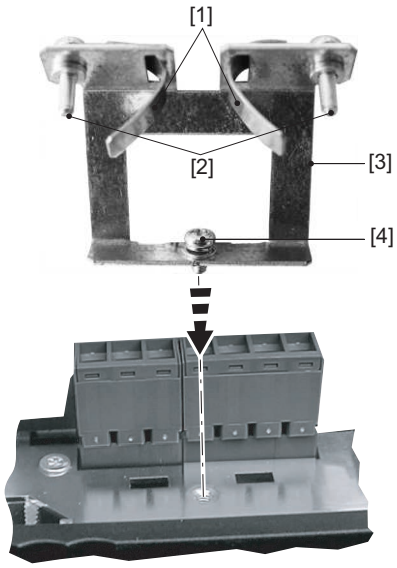
## 13.5 Shield clamps

### 13.5.1 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.




*1805286795*

[1] Contact clips

[2] Retaining screws for contact clip

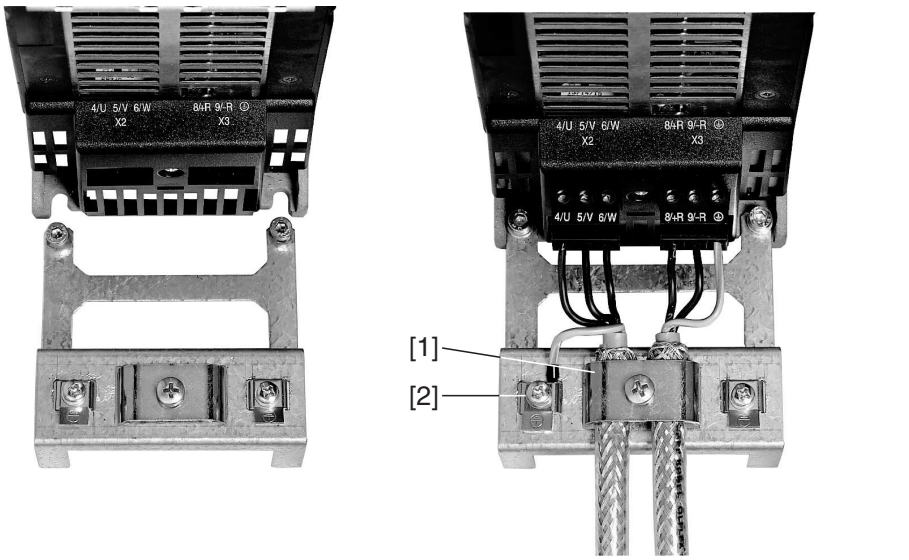
[3] Shield plate

[4] Retaining screw for shield clamp

27793230/EN – 08/2022

### 13.5.2 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.

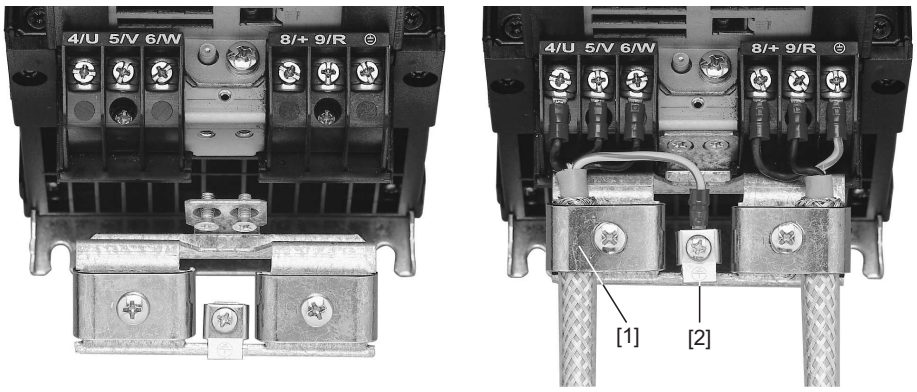



1805289867

[1] Power section shield clamp [2] PE connection

### 13.5.3 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.

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

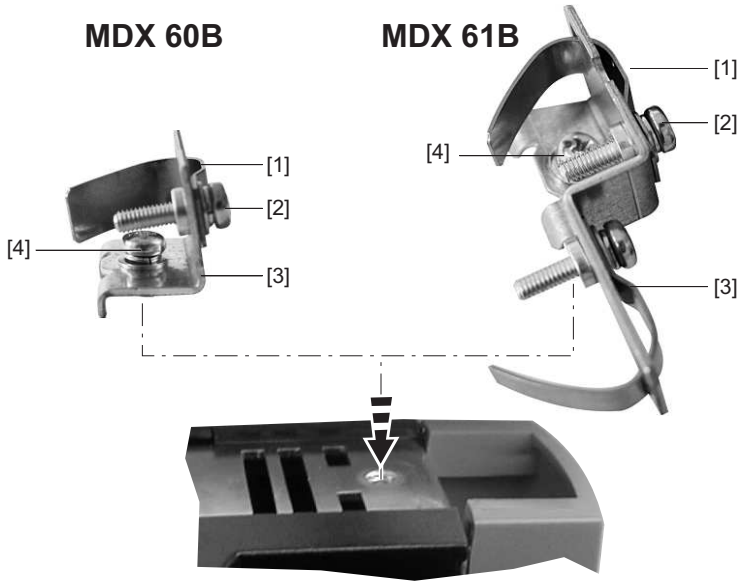
No shield clamps for the power section are supplied with MOVIDRIVE® MDX61B sizes 3 – 7. Use commercially available shield clamps for installing the shielding of motor and brake cables. Apply the shield as closely as possible to the inverter.

### 13.5.5 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.

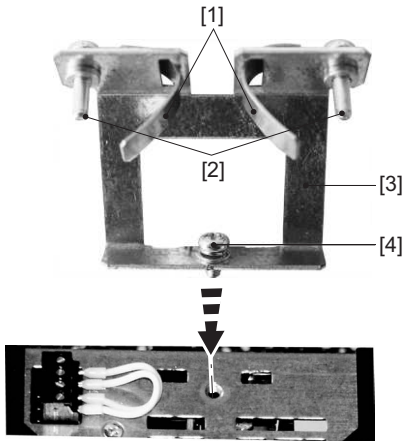
**Size 0**




*1805296011*

27793230/EN – 08/2022

**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

27793230/EN – 08/2022

## 13.6 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.

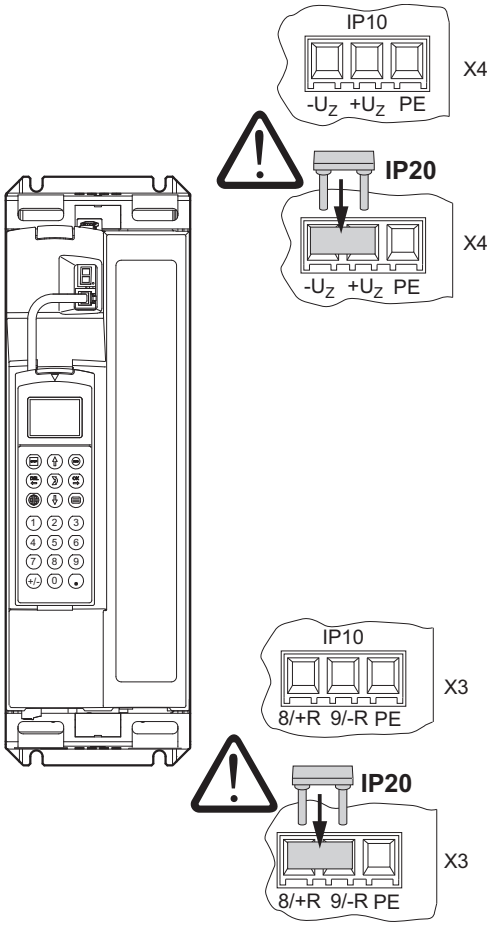
### 13.6.1 Size 2S

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.



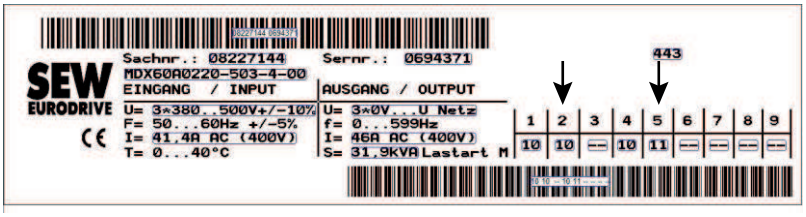

*1805410571*

27793230/EN – 08/2022

### 13.6.2 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.

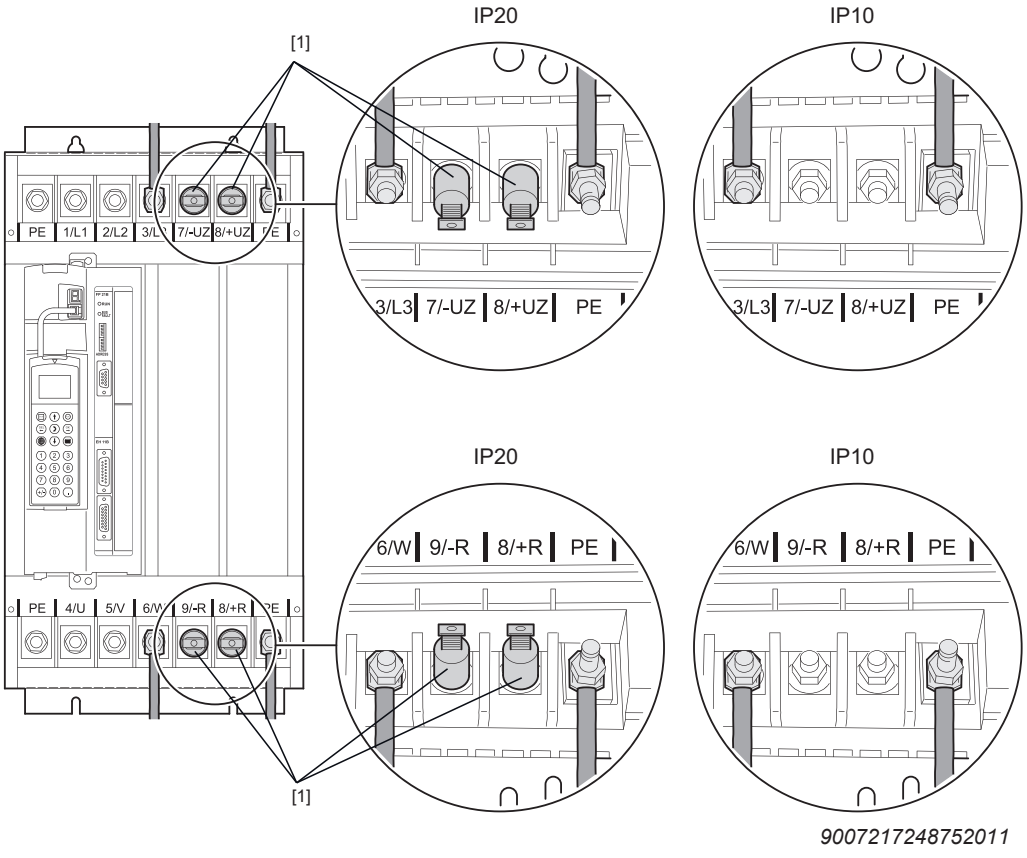



At the factory, the power connections 7/-UZ, 8/+UZ, 9/-R and 8/+R of inverters of size 3 are equipped with insulation caps for protection against contact, see figure. If the insulation caps are removed without connecting cables with insulating tubing, the inverters only have degree of protection IP10.

## 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.

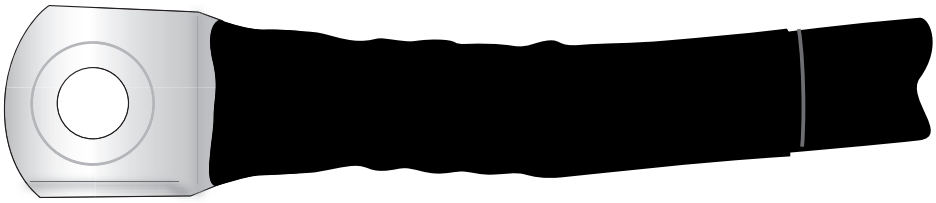



*9007217248752011*

[1] Insulation caps

### 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.



*19302265483*

27793230/EN – 08/2022

### 13.6.3 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 ≥ 35 mm² (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 mm² (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

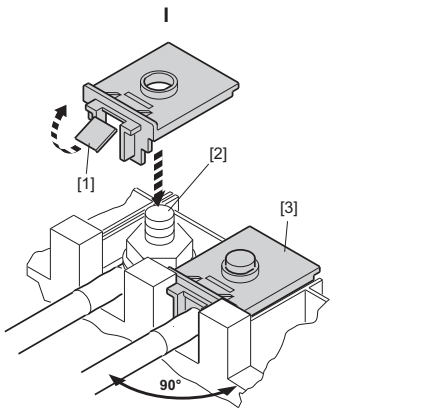
Proceed as follows when installing the **DLB11B touch guard**:

- Figure I: Power terminal with connected power cable with a cable cross section of < 35 mm² (AWG2):

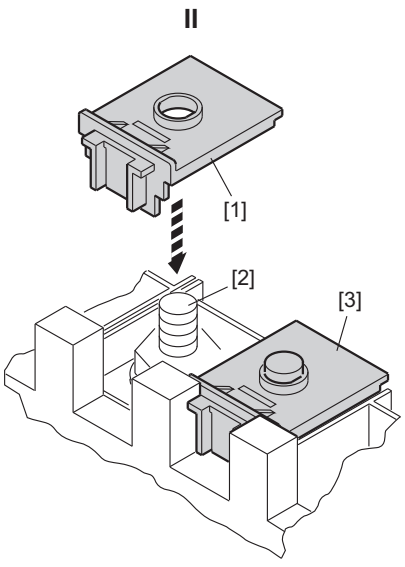
  Remove the plastic lug [1] and push the DLB11B touch guard [3] on the respective terminal stud [2] of the power terminal. Make sure that the cable output is straight. Install the safety cover for the power terminals.

- 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

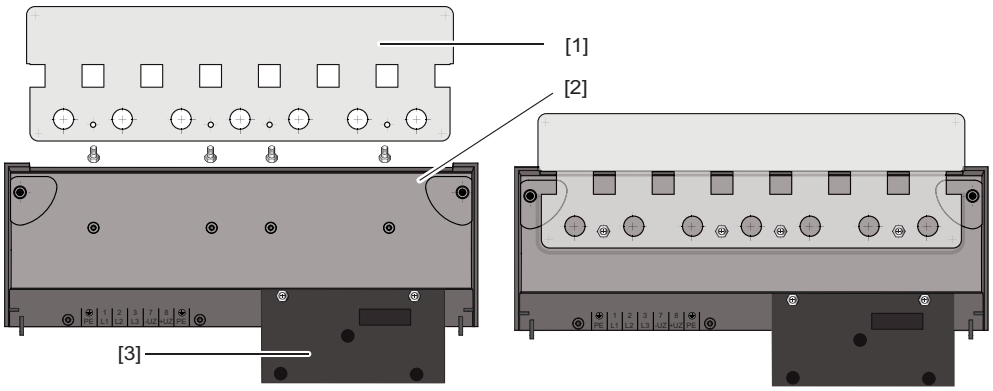
For additional information on the X1, X2, X3 and X4 power terminals, refer to chapter "Technical data".

27793230/EN – 08/2022

### 13.6.4 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:

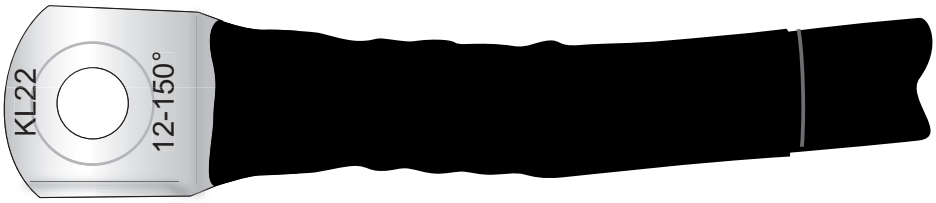
[1] Cover plate

[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)




*1805525259*

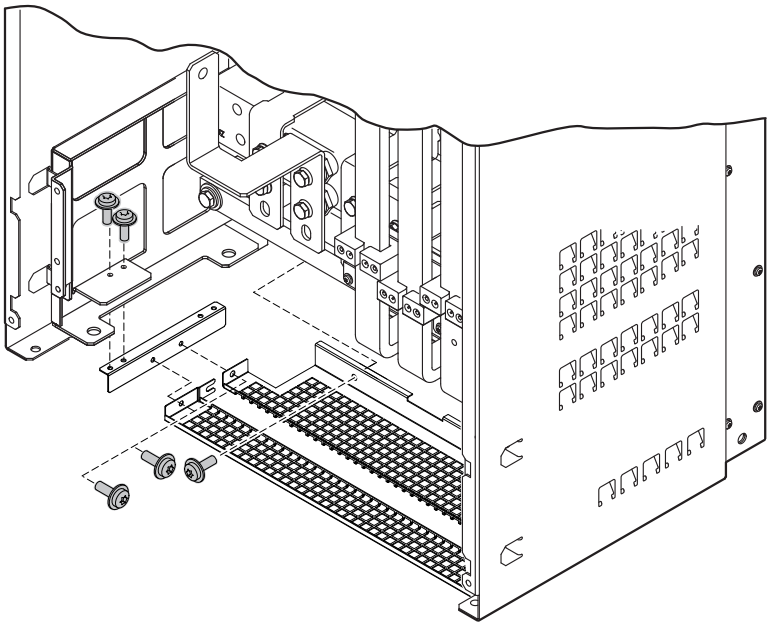
## INFORMATION

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

### 13.6.5 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.



*2307312139*

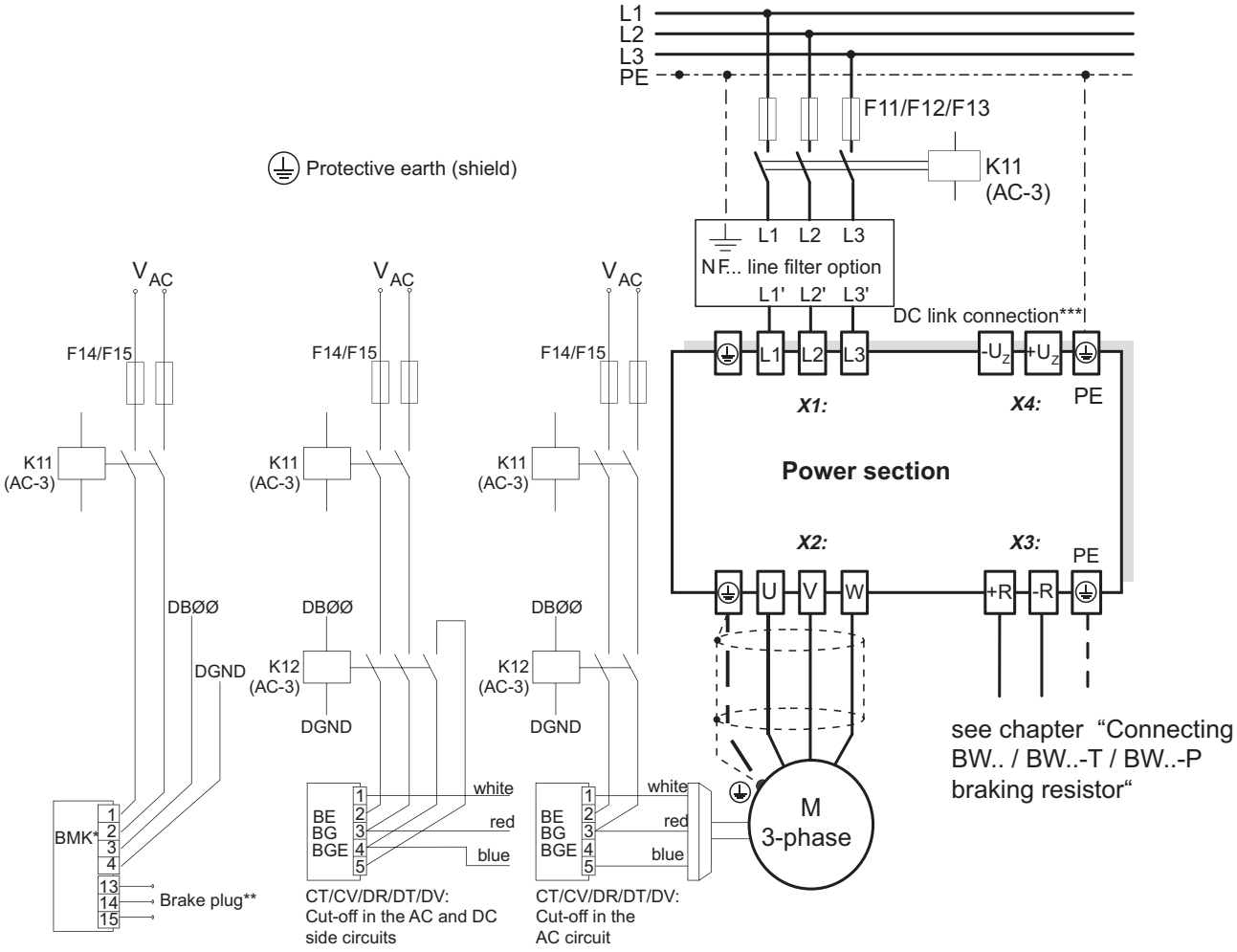
## INFORMATION

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

27793230/EN – 08/2022

## 13.7 Wiring diagrams for basic device

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




CT/CV, CM71 ... 112: Cut-off in the DC and AC circuits

*9007201060300683*

** **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

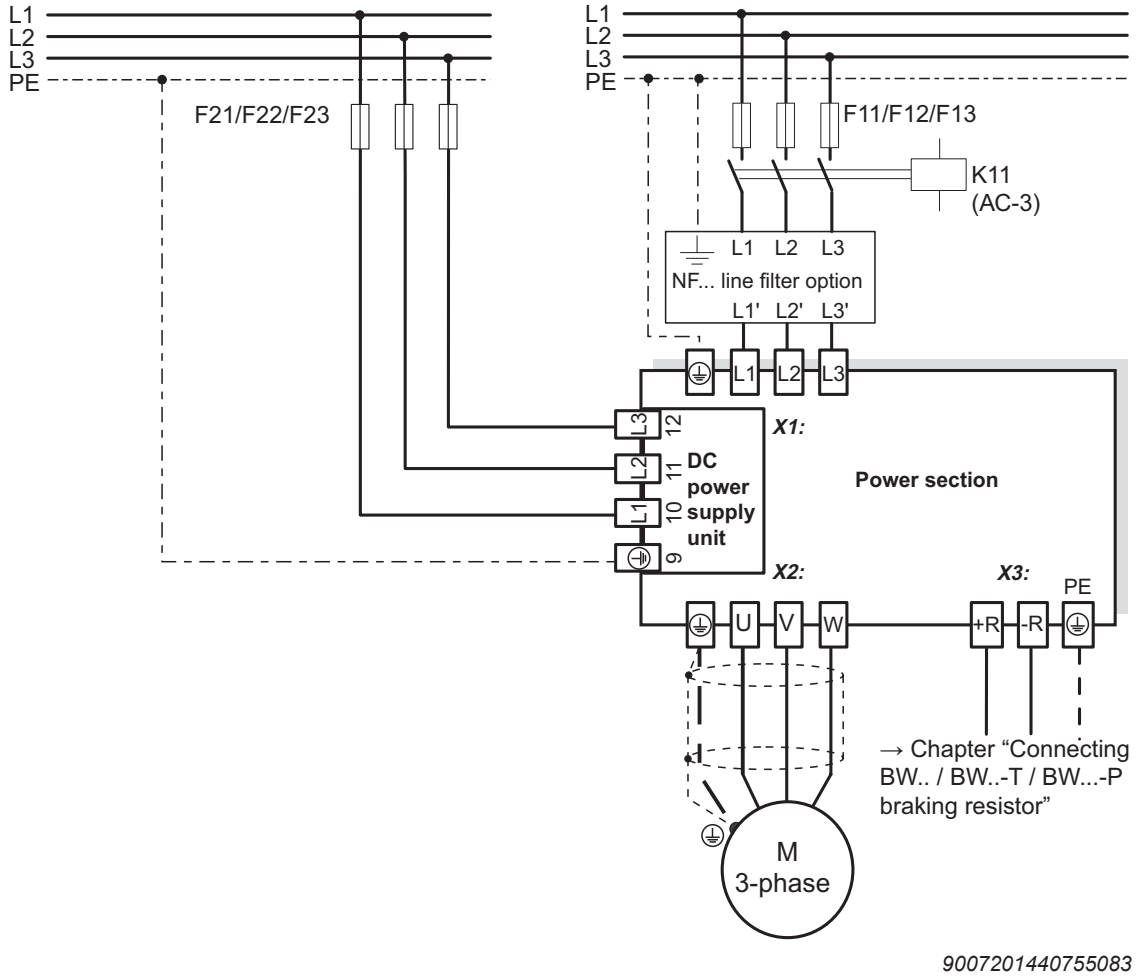
- Connect the brake rectifier using a separate supply system lead.
- **Supply via the motor voltage is not permitted.**

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.

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

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




**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.

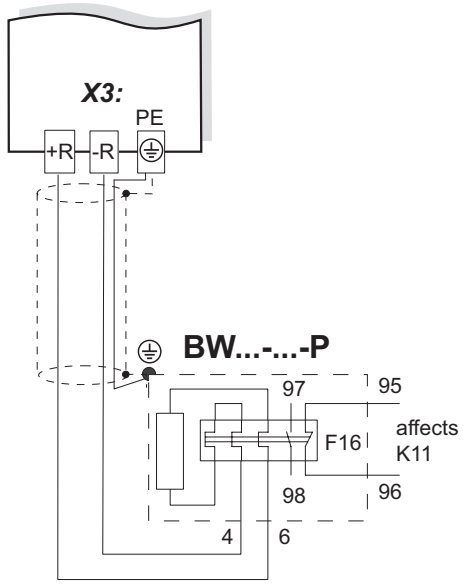
27793230/EN – 08/2022

### 13.7.3 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.

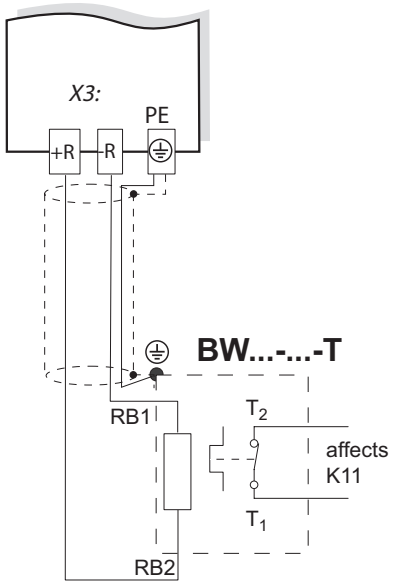
### 13.7.4 Braking resistor BW... / BW...-...-T /BW...-...-P

**Power section**



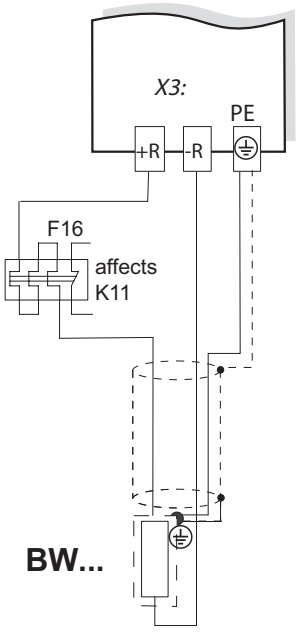

When the signal contact F16 trips, K11 must be opened and DIØØ/"controller inhibit" must receive a "0" signal. The resistor circuit must not be interrupted.

**Power section**




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.

**Power section**



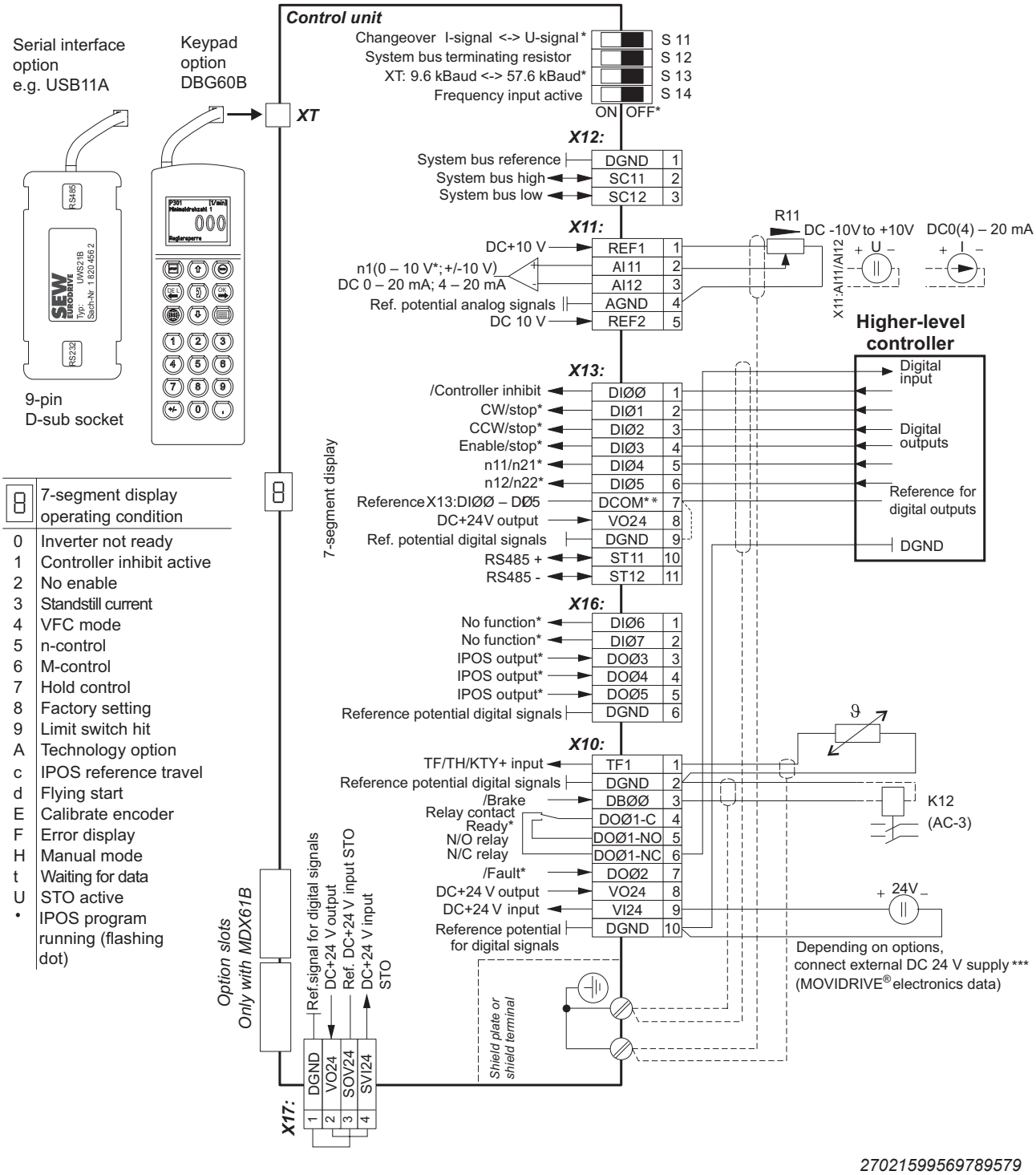

When the external bimetallic relay (F16) trips, K11 must be opened and DIØØ/"controller inhibit" must receive a "0" signal. The resistor circuit must not be interrupted.

*9007201060304139*

| | Overload protection | | |
|---|---|---|---|
| **Braking resistor type** | **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 | - | - |

27793230/EN – 08/2022

### 13.7.5 MDX60B/61B signal terminals




*27021599569789579*

* 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®.

27793230/EN – 08/2022

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.

27793230/EN – 08/2022

### 13.7.6 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: | $+U_Z$/$-U_Z$ (PE) | DC link connection | |
| 9,10,11,12 | **L1/L2/L3/PE** | 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" | • The digital inputs are electrically isolated by opto-couplers.<br>• Selection options for digital inputs 2 – 6 (DIØ1 – DIØ5) → Parameter menu P60_ |
| 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)<br>• Switching digital inputs with DC+24 V external voltage: Connection X13:7 (DCOM) must be connected to the reference potential of the external voltage.<br>– Without jumper X13:7-X13:9 (DCOM-DGND) → Isolated digital inputs<br>– With jumper X13:7-X13:9 (DCOM-DGND) → Non-isolated digital inputs<br>• 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). | |
| X13:8 | VO24 | Auxiliary voltage output DC+24 V (max. load X13:8 **and** 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" | • The digital inputs are electrically isolated by opto-couplers.<br>• Selection options for digital inputs 7 to 8 (DIØ6/ DIØ7) → Parameter menu P60_<br>• Selection options for digital outputs 3 to 5 (DOØ3 – DOØ5) → Parameter menu P62_ |
| 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>**Do not connect external voltage to digital outputs X16:3 (DOØ3) and X16:5 (DOØ5)!** | |
| 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 **and** X10:8 = 400 mA) for external command switches | |

27793230/EN – 08/2022

| 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>**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)" (→ 602)**.** |
| X17:1 | DGND | Reference potential for X17:2 |
| X17:2 | VO24 | Auxiliary voltage output DC+24 V, **only to supply X17:4 on the same device. Maximally 1 additional BST may be connected** |
| 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 |

27793230/EN – 08/2022

## 13.8 Assignment of braking resistors, chokes and filters

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

| MOVIDRIVE® MDX60/61B...-5A3 | | | | 0005 | 0008 | 0011 | 0014 |
|---|---|---|---|---|---|---|---|
| **Size** | | | | **0** | | | |
| Braking resistors BW... / BW..-..-T | Tripping current | Part number BW... | Part number BW...-...-T | | | | |
| BW090-P52B[1] | - | 08245630 | | | | | |
| BW072-003 | $I_F$ = 0.8 A | 08260583 | | | | | |
| BW072-005 | $I_F$ = 1.2 A | 08260605 | | | | | |
| BW168/BW168-T | $I_F$ = 3.6 A | 0820604X | 18201334 | | | | |
| BW100-006 BW100-006-T | $I_F$ = 2.4 A | 08217017 | 18204198 | | | | |
| Line chokes | | Part number | | | | | |
| ND020-013 | Total current = AC 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 mm² (AWG 16 – 6) | | | |
| HD002 | d = 23 mm | 08135576 | | For cable cross sections ≤ 1.5 mm² (AWG 16) | | | |
| Output filter (only in operating modes VFC or V/f) | | Part number | | | | | |
| HF008-503 | | 0826029X | | | **A** | | |
| HF015-503 | | 08260303 | | | **B** | | **A** |
| HF022-503 | | 08260311 | | | | | **B** |

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

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

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

27793230/EN – 08/2022

### 13.8.2 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 BW... / BW..-..-T | Tripping current | Part number BW... | Part number BW...-...-T | | | | | | | |
| BW100-005 | $I_F$ = 1.0 A | 08262691 | | | | | | | | |
| BW100-006/ **BW100-006-T** | $I_F$ = 2.4 A | 08217017 | 18204198 | | | | | | | |
| BW168/BW168-T | $I_F$ = 3.6 A | 0820604X | 18201334 | | | | | | | |
| BW268/BW268-T | $I_F$ = 4.2 A | 08207151 | 18204171 | | | | | | | |
| BW147/BW147-T | $I_F$ = 5.1 A | 08207135 | 18201342 | | | | | | | |
| BW247/BW247-T | $I_F$ = 6.5 A | 08207143 | 18200842 | | | | | | | |
| BW347/BW347-T | $I_F$ = 9.2 A | 08207984 | 18201350 | | | | | | | |
| BW039-012/ **BW039-012-T** | $I_F$ = 5.5 A | 08216894 | 18201369 | | | | | | | |
| **BW039-026-T** | $I_F$ = 8.2 A | | 18204155 | | | | | | | |
| **BW039-050-T** | $I_F$ = 11.3 A | | 18201377 | | | | | | | |
| Line chokes | | Part number | | | | | | | | |
| ND020-013 | Total current = AC 20 A | 08260125 | | | | | | | | |
| ND045-013 | Total current = AC 45 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 mm² (AWG 16 – 26) | | | | | | |
| HD002 | d = 23 mm | 08135576 | | For cable cross sections ≤ 1.5 mm² (AWG 16) | | | | | | |
| HD003 | d = 88 mm | 08135584 | | For cable cross sections > 16 mm² (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%)**

27793230/EN – 08/2022

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

| MOVIDRIVE® MDX61B...-503 | | | | | 0150 | 0220 | 0300 | 0370 | 0450 |
|---|---|---|---|---|---|---|---|---|---|
| Size | | | | | 3 | | | 4 | |
| Braking resistors BW... / BW...-...-T BW...-...-P | Tripping current | Part number BW... | Part number BW...-...-T | Part number BW...-...-P | | | | | |
| BW018-015/ BW018-015-P | $I_F$ = 9.1 A | 08216843 | | 18204163 | | | | **C** | **C** |
| BW018-035-T | $I_F$ = 13.9 A | | 18201385 | | | | | **C** | **C** |
| BW018-075-T | $I_F$ = 20.4 A | | 18201393 | | | | | **C** | **C** |
| BW915-T | $I_F$ = 32.7 A | | 18204139 | | | | | | |
| BW012-025/ BW012-025-P | $I_F$ = 14.4A | 08216800 | | 18204147 | | | | | |
| BW012-050-T | $I_F$ = 20.4 A | | 18201407 | | | | | | |
| BW012-100-T | $I_F$ = 28.9 A | | 18201415 | | | | | | |
| BW106-T | $I_F$ = 47.4 A | | 18200834 | | | | | | |
| BW206-T | $I_F$ = 54.8 A | | 18204120 | | | | | | |
| Line chokes | | Part number | | | | | | | |
| ND045-013 | Total current = AC 45 A | 08260133 | | | | **A** | | | |
| ND085-013 | Total current = AC 85 A | 08260141 | | | | **B** | | | **A** |
| ND150-013 | Total current = AC 150 A | 08255482 | | | | | | | **B** |
| ND300-0053 | Total current = AC 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 mm² (AWG 16 – 6) | | | | | | |
| HD003 | d = 88 mm | 08135584 | For cable cross sections > 16 mm² (AWG 6) | | | | | | |
| Output filter (only in operating modes VFC 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 × $I_F$)**

**D** **Connect three braking resistors in parallel and set three times the tripping current on F16 (3 × $I_F$)**

**E** **Connect four braking resistors in parallel and set four times the tripping current on F16 (4 × $I_F$)**

**H** **Two filter in parallel**

27793230/EN – 08/2022

### 13.8.4 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 BW...-...-T | Tripping current | Part number BW...-...-T | | | | | | | | |
| BW106-T | $I_F$ = 47.4 A | 18200834 | | | **C** | **C** | **C** | D | E | F |
| BW206-T | $I_F$ = 54.8 A | 18204120 | | | **C** | **C** | **C** | D | E | F |
| BW1.4-170 | $I_F$ = 110 A | 13301527 | | | | | | | | |
| BW003-420-T | $I_F$ = 129 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 mm² (AWG 16 – 6) | | | | | | | |
| HD003 | d = 88 mm | 08135584 | For cable cross sections > 16 mm² (AWG 6) | | | | | | | |
| HD004 | Connection with M12 bolt | 08168857 | | | | | | | | |
| HD005 | Connection With M12 cable lug, M10 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 × $I_F$)**

**D** **Connect three braking resistors in parallel and set three times the tripping current on F16 (3 × $I_F$)**

**E** **Connect four braking resistors in parallel and set four times the tripping current on F16 (4 × $I_F$)**

**F** **Connect five braking resistors in parallel and set five times the tripping current on F16 (5 × $I_F$)**

**H** **Two filter in parallel**

27793230/EN – 08/2022

### 13.8.5 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 BW...-.../ BW...-...-T BW...-...-P | Tripping current | Part number BW... | Part number BW...-...-T | | | | | | | | | |
| BW039-003 | $I_F$ = 2.7 A | 08216878 | | | | | | | | | | |
| BW039-006 | $I_F$ = 3.9 A | 08216886 | | | | | | | | | | |
| BW039-012 BW039-012-T | $I_F$ = 5.5 A | 08216894 | 18201369 | | | | | | | | | |
| BW039-026-T | $I_F$ = 8.1 A | | 18204155 | | | | | | | | | |
| BW027-006 | $I_F$ = 4.7 A | 08224226 | | | | | | | | | | |
| BW027-012 | $I_F$ = 6.6 A | 08224234 | | | | | | | | | | |
| BW018-015-T | $I_F$ = 9.1 A | | 18204163 | | | | | | C | C | C | C |
| BW018-035-T | $I_F$ = 13.9 A | | 18201385 | | | | | | C | C | C | C |
| BW018-075-T | $I_F$ = 20.4 A | | 18201393 | | | | | | C | C | C | C |
| BW915-T | $I_F$ = 32.6 A | | 18204139 | | | | | | C | C | C | C |
| BW012-025-P | $I_F$ = 14.4 A | | 18204147 | | | | | | | | | |
| BW012-050-T | $I_F$ = 20.4 A | | 18201407 | | | | | | | | | |
| BW012-100-T | $I_F$ = 28.8 A | | 18201415 | | | | | | | | | |
| BW106-T | $I_F$ = 47.4 A | | 18200834 | | | | | | | | C | C |
| BW206-T | $I_F$ = 54.7 A | | 18204120 | | | | | | | | C | C |
| Line chokes | | Part number | | | | | | | | | | |
| ND020-013 | Total current = AC 20 A | 08260125 | | | | | A | | | | | |
| ND045-013 | Total current = AC 45 A | 08260133 | | | | | B | | A | | | |
| ND085-013 | Total current = AC 85 A | 0826014 | | | | | | | B | | A | |
| ND150-013 | Total current = AC 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 | Inner diameter | Part number | | | | | | | | | | |
| HD001 | d = 50 mm | 08133255 | | For cable cross sections 1.5 – 16 mm² (AWG 16 – 6) | | | | | | | | |
| HD002 | d = 23 mm | 08135576 | | For cable cross sections ≤ 1.5 mm² (AWG 16) | | | | | | | | |
| HD003 | d = 88 mm | 08135584 | | For cable cross sections > 16 mm² (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 × $I_F$)**

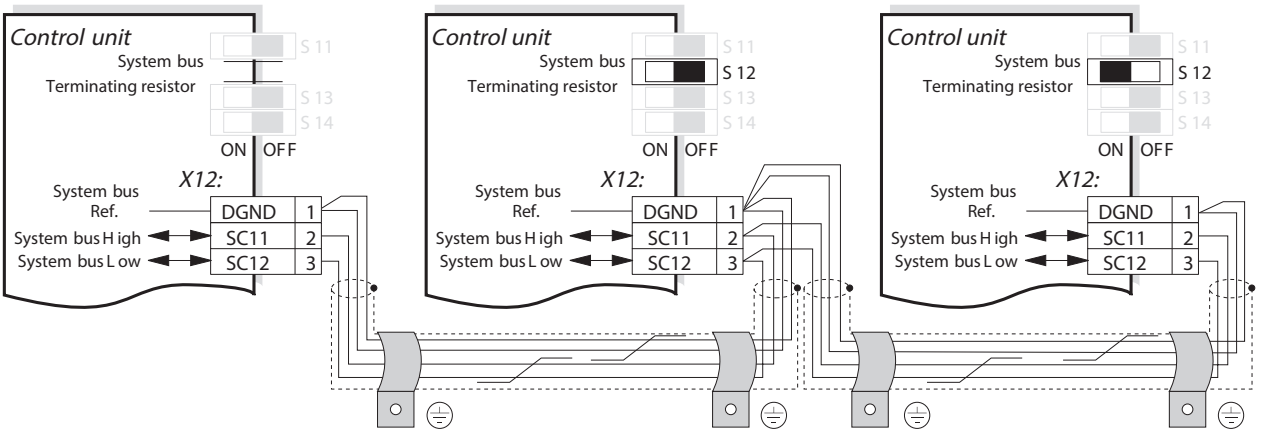
27793230/EN – 08/2022

## 13.9 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.

### 13.9.1 SBus wiring diagram




**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$^2$ (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.

### 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.

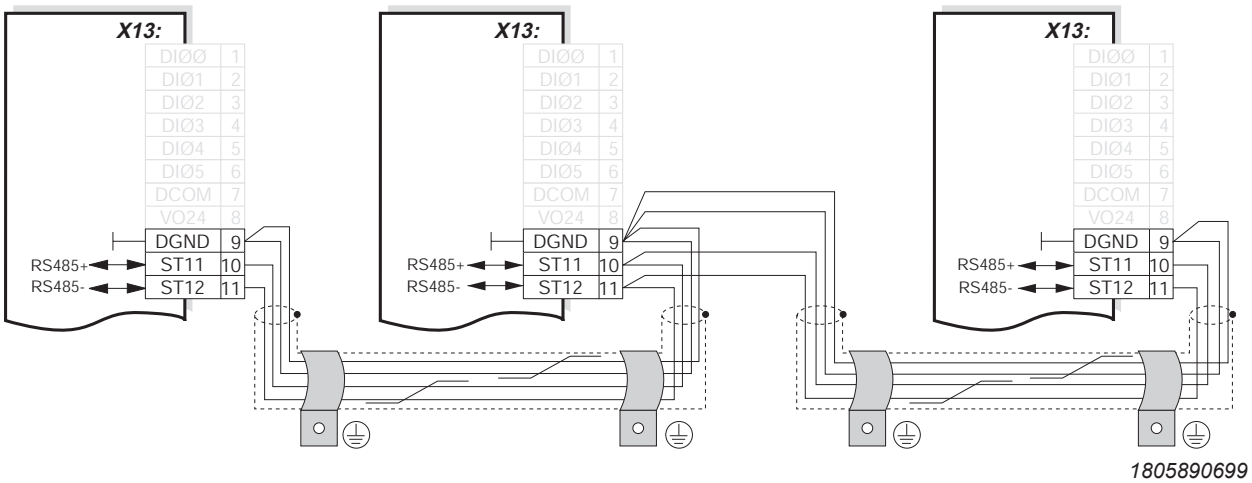
Take suitable measures to avoid potential shift, e.g. by connecting the unit ground connectors using a separate cable.

27793230/EN – 08/2022

## 13.10 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.

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




*1805890699*

**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 mm² – 0.75 mm² (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.

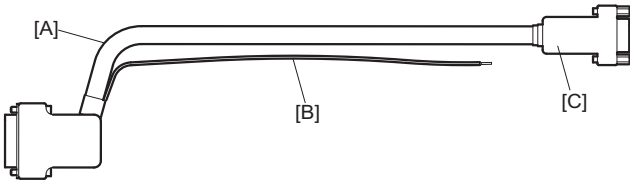
Take suitable measures to avoid potential shift, e.g. by connecting the device ground connectors using a separate cable.

## 13.11 Connecting the DWE11B/12B interface adapter

### 13.11.1 Part number and description

- DWE11B, part number 01881876

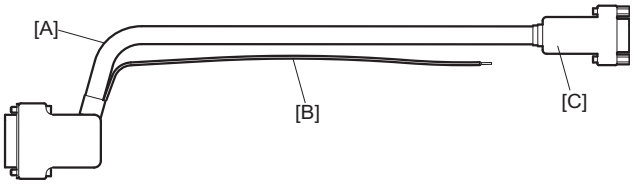
  The interface adapter DWE11B (HTL → TTL) in the form of an adapter cable is used to **connect single-ended HTL encoders to the DEH11B/DEH21B options**. Only the A, B and C tracks are connected. The interface adapter is suitable for all HTL encoders that were operated on MOVIDRIVE® A, MDV and MCV and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




*1805896331*

- 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.




*1805896331*

27793230/EN – 08/2022

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

### 13.12.1 Part number

Interface adapter option UWS21B: 18204562

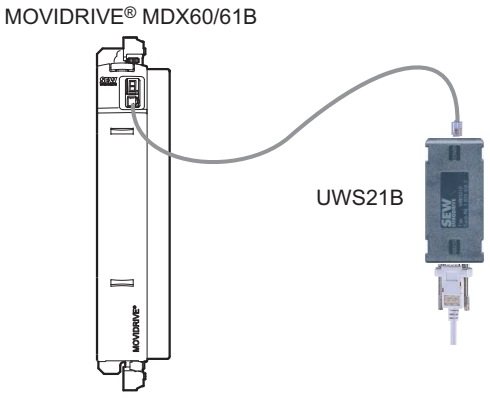
### 13.12.2 Scope of Delivery

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®

### 13.12.3 MOVIDRIVE® – UWS21B connection

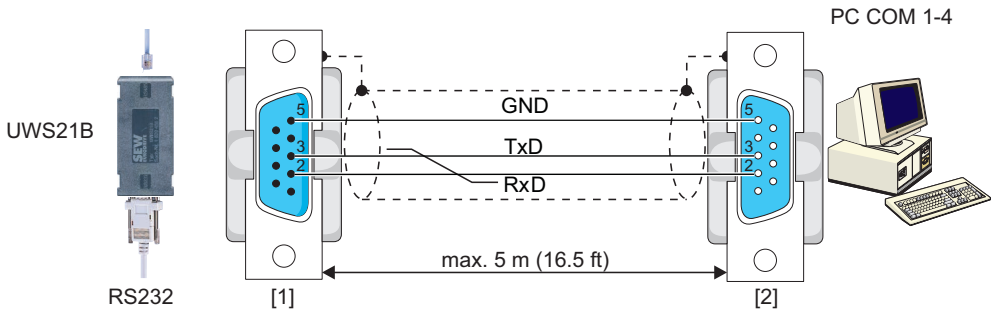
- Use the connection cable included in the delivery to connect the UWS21B option to MOVIDRIVE®.
- Plug the connection cable into the XT terminal socket of MOVIDRIVE®.
- Note that the DBG60B keypad and the UWS21B serial interface cannot be connected to the MOVIDRIVE® at the same time.
- The following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




*1805915915*

### 13.12.4 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

## 13.13 Connecting the USB11A interface adapter

### 13.13.1 Part number

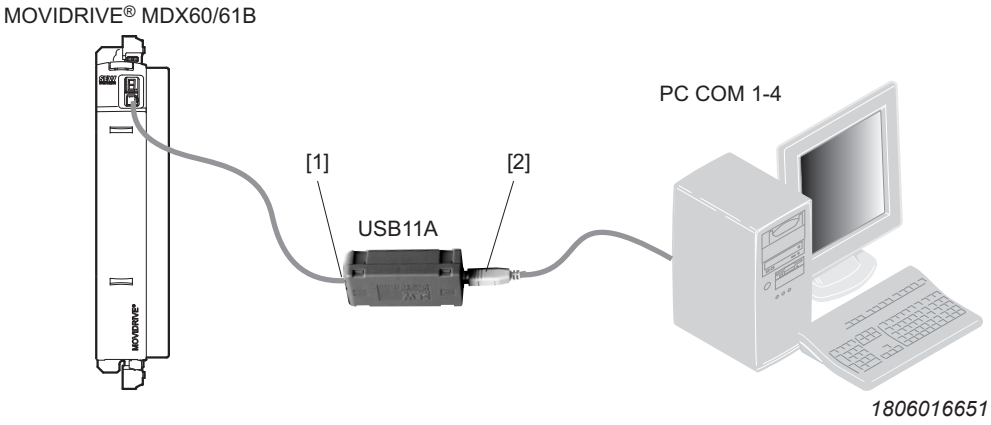
Interface adapter option USB11A: 08248311

### 13.13.2 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.

### 13.13.3 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.



### 13.13.4 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.

### 13.13.5 Operation with MOVITOOLS® MotionStudio

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

## INFORMATION



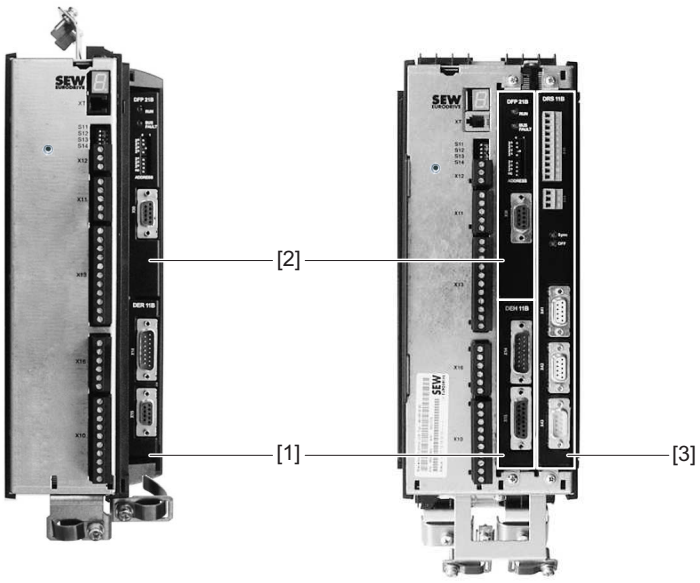
If the connection between the PC and USB11A is interrupted, you have to restart MOVITOOLS® MotionStudio.

27793230/EN – 08/2022

## 13.14 Option combinations for MDX61B

### 13.14.1 Configuration of option slots

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




*1806023691*

[1] Encoder slot for encoder options

[2] Fieldbus option slot for communication options

[3] Expansion slot for communication options (only sizes 1 – 6)

27793230/EN – 08/2022

### 13.14.2 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[1)] | Encoder input absolute encoder | X | | |
| DEU21B[2)] | Encoder input absolute encoder | X | | |
| DER11B | Encoder input<br>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[3)] |
| DRS11B[2)] | Phase-synchronous operation | | | X |
| DIP11B[1)] | SSI encoder interface | | | |
| DHP11B | User-programmable MOVI-PLC® *basic* controller | | X | X[3)] |
| DHE41B | User-programmable MOVI-PLC® *advanced* controller | | X | X[3)] |
| DHF41B | User-programmable MOVI-PLC® *advanced* controller | | | X |

27793230/EN – 08/2022

| 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® *advanced* controller | | | X |
| DHP11B + OST11B | DHP11B + OST11B (RS485 interface, only in combination with DHP11B) | OST11B | DHP11B | DHP11B + OST11B[4] |

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

27793230/EN – 08/2022

## 13.15 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.

### 13.15.1 Before you start

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

### NOTICE

Electrostatic discharge.

Damage to electronic components.

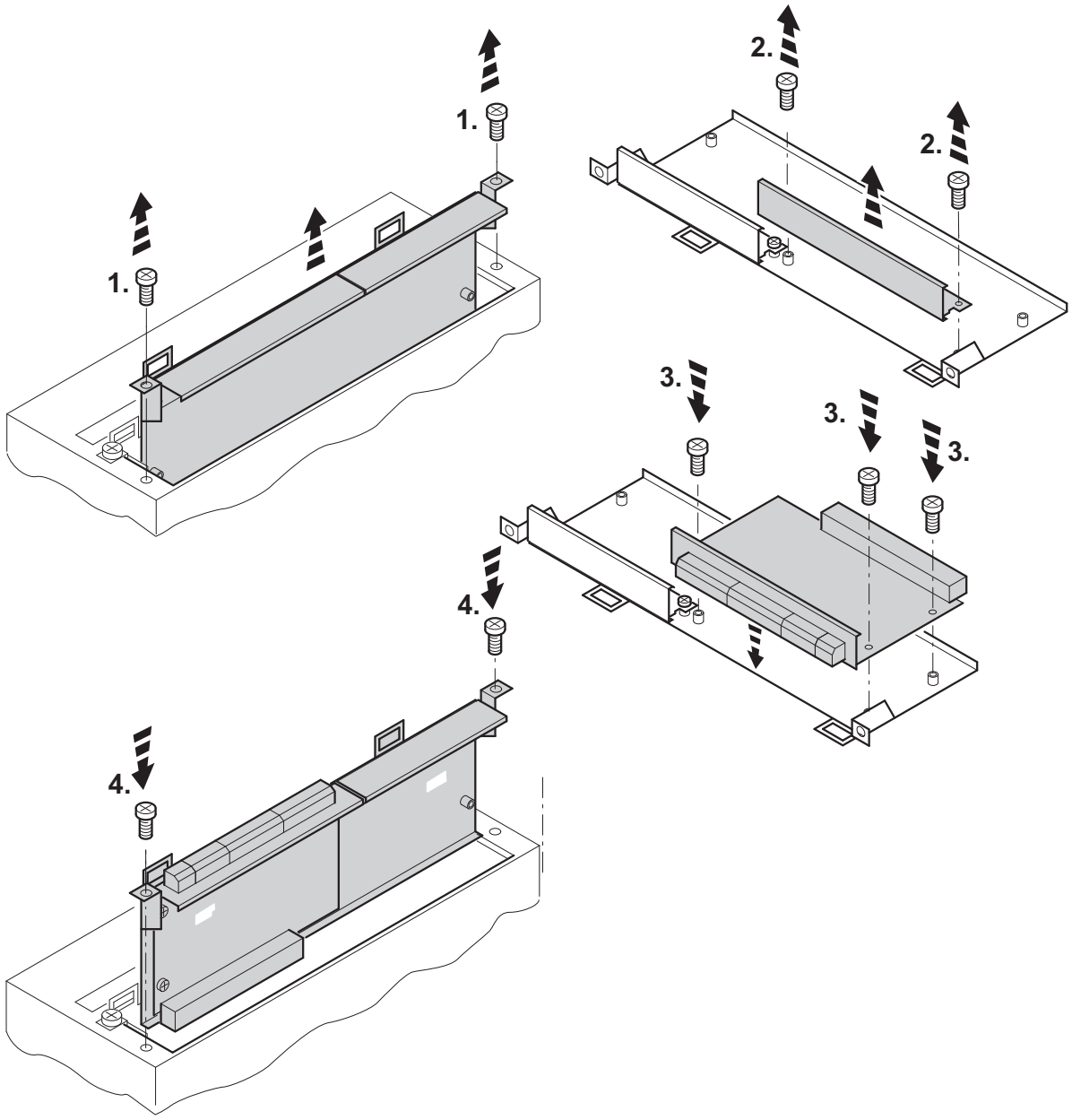
- Disconnect the inverter from the power. Switch off the DC 24 V and the supply voltage.
- Take appropriate measures to protect the option card from electrostatic charge (use discharge strap, conductive shoes, etc.) before touching it.

- **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.

27793230/EN – 08/2022

### 13.15.2 Basic procedure for installing/removing an option card

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




*9007201196765451*

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.

## 13.16 Connecting encoders and resolvers

### INFORMATION

- 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.

#### 13.16.1 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 nF < capacitance per unit length ≤ 120 nF/km
  - 100 m at capacitance per unit length ≤ 70 nF/km with DER11B, DEH11B, DEH21B, 300 m with DEU21B
- Cable cross section: 0.20 – 0.5 $mm^2$ (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.

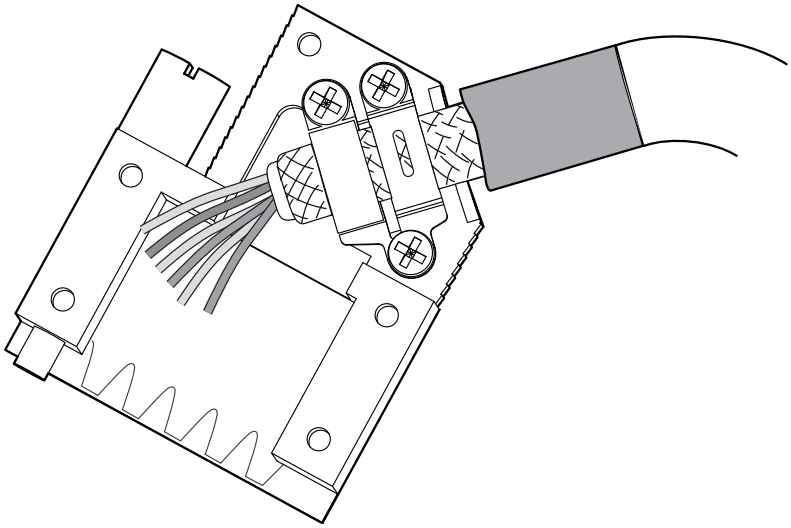
27793230/EN – 08/2022

### 13.16.2 Shield contact

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

**On the inverter**

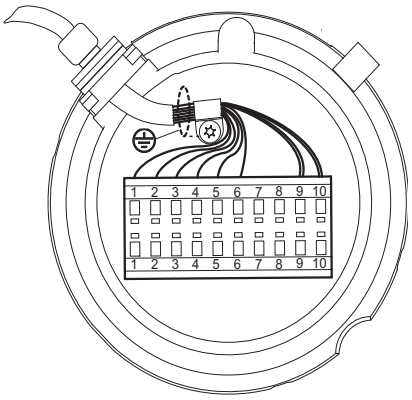
Connect the shield on the inverter end in the housing of the D-sub connector (→ following figure).



*2286956939*

**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.




*1806052363*

### 13.16.3 Prefabricated cables

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

27793230/EN – 08/2022

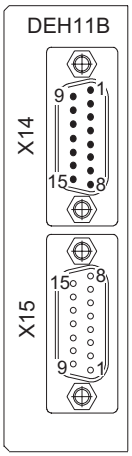
## 13.17 Connection and terminal description of the DEH11B option (HIPERFACE®)

### 13.17.1 Part number

Option HIPERFACE® encoder card type DEH11B: 08243107 or 28297806

## 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 DEH11B | 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 $\overline{A}$ (**K1**)<br>(SIN–) Signal track $\overline{B}$ (**K2**)<br>Signal track $\overline{C}$ (**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 $\overline{A}$ (**K1**)<br>(SIN–) Signal track $\overline{B}$ (**K2**)<br>Signal track $\overline{C}$ (**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

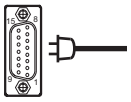
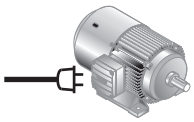
27793230/EN – 08/2022

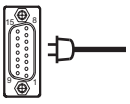
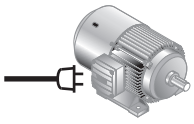
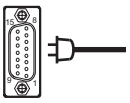
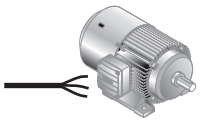
### 13.17.2 Permissible encoders at X:14

Refer to chapter "Connecting external encoders to X:14" (→ 🗎 635).

### 13.17.3 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>ES7R<br>AS7W | X15  |  |  <br>13622021<br>13622048 |
| DR160 – DR225 | EG7S<br>EG7R<br>AG7W | | | |
| DR71 – DR132 | ES7S<br>ES7R<br>AS7W | |  | <br>13617621<br>13617648 |
| DR160 – DR225 | EG7S<br>EG7R<br>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>ES1H<br>AK0H<br>EK0H<br>AV1H<br>AF1H<br>EG7C |  |  | <br>13324535<br>13324551 |
| CM71 – 112 | AS1H<br>ES1H<br>AV1H<br>AF1H<br>EG7C |  |  | <br>13324578<br>13324543 |

## 13.18 Connection and terminal description of the DEH21B option

### 13.18.1 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 |
|---|---|---|---|
| 1806096139<br>DEH21B<br>X62<br>X60<br>X15 | 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 $\overline{A}$ (**K1**)<br>(SIN–) Signal track $\overline{B}$ (**K2**)<br>Signal track $\overline{C}$ (**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

27793230/EN – 08/2022

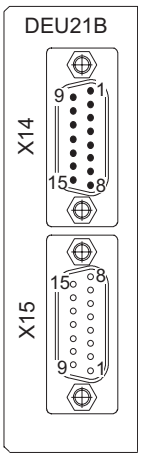
## 13.19 Connection and terminal description of the DEU21B option

### 13.19.1 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 |
|---|---|---|---|
|  | X14: Input for external encoder or output for incremental encoder simulation<br>Output for incremental encoder simulation:<br>• Signal level to RS422<br>• The number of pulses is the same as on X15 motor encoder input | 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<br>X14:14<br>X14:15 | (COS+) signal track A (K1)<br>(SIN+) signal track B (K2)<br>Signal track C (K0) / pulse +<br>DATA+ CANHigh<br>Reserved<br>Switch between<br>Reference potential DGND<br>(COS–) Signal track $\overline{A}$ (**K1**)<br>(SIN–) Signal track $\overline{B}$ (**K2**)<br>Signal track $\overline{C}$ (**K0**) / pulse –<br>DATA- CANLow<br>DC 24 V encoder supply[1)]<br>Reserved<br>DC 12 V encoder supply[2)] |
| | 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) / pulse +<br>DATA+<br>Reserved<br>Reference potential TF/TH/KTY–/PK<br>Reserved<br>Reference potential DGND<br>(COS–) Signal track $\overline{A}$ (**K1**)<br>(SIN–) Signal track $\overline{B}$ (**K2**)<br>Signal track $\overline{C}$ (**K0**) / pulse –<br>DATA-<br>DC 24 V encoder supply[1)]<br>TF/TH/KTY+/PK connection<br>DC 12 V (tolerance range DC 10.5 – 13 V)[2)] |

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.

27793230/EN – 08/2022

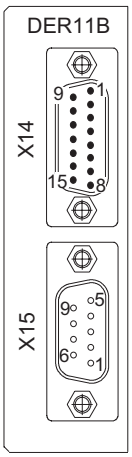
## 13.20 Connection and terminal description of the DER11B (resolver) option

### 13.20.1 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 DEUU21B, 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 $\overline{A}$ (**K1**)<br>(sin–) Signal track $\overline{B}$ (**K2**)<br>Signal track $\overline{C}$ (**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.

### 13.20.2 Permissible encoders at X:14

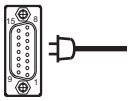
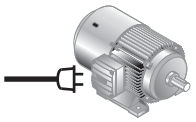
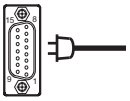
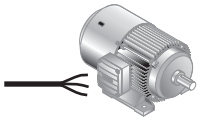
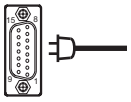
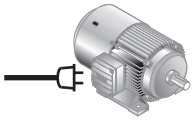
Refer to chapter "Connecting external encoders to X:14" (→ 🗎 635).

27793230/EN – 08/2022

### 13.20.3 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 ± 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:

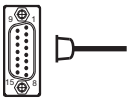
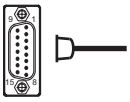
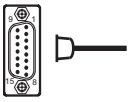
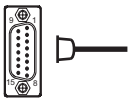
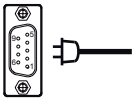
| Encoders on DT../DV.. and CM.. series motors – MOVIDRIVE® | | | | |
|---|---|---|---|---|
| Motor type | Encoder | MOVIDRIVE® drive inverters | Motor | Cable |
| CM71 – 112 | Resolver |  |  |  01994875 01993194 |
| CM71 – 112 | Resolver |  |  |  01995898 01995901 |
| CMP | Resolver |  |  |  01994875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

27793230/EN – 08/2022

## 13.21 Connecting external encoders to X:14

### 13.21.1 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 | |

27793230/EN – 08/2022

## 13.22 Connection of encoder options

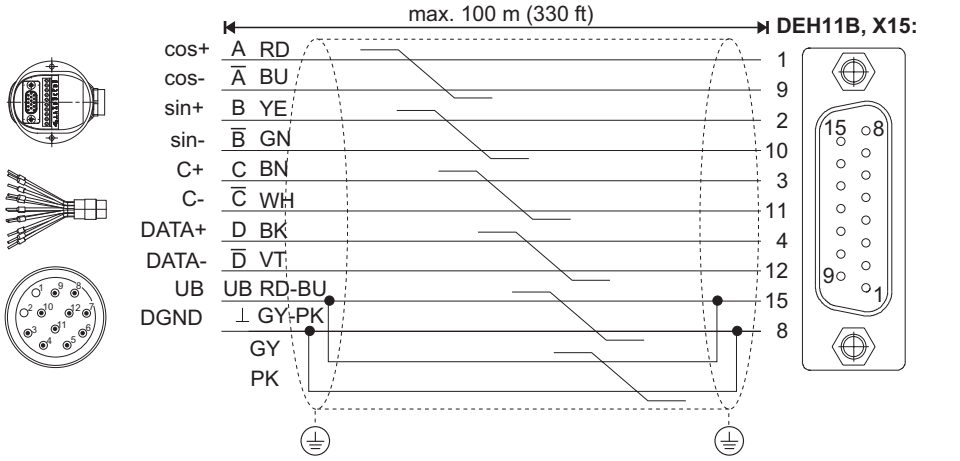
### 13.22.1 Connection of DEH11B option

**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*

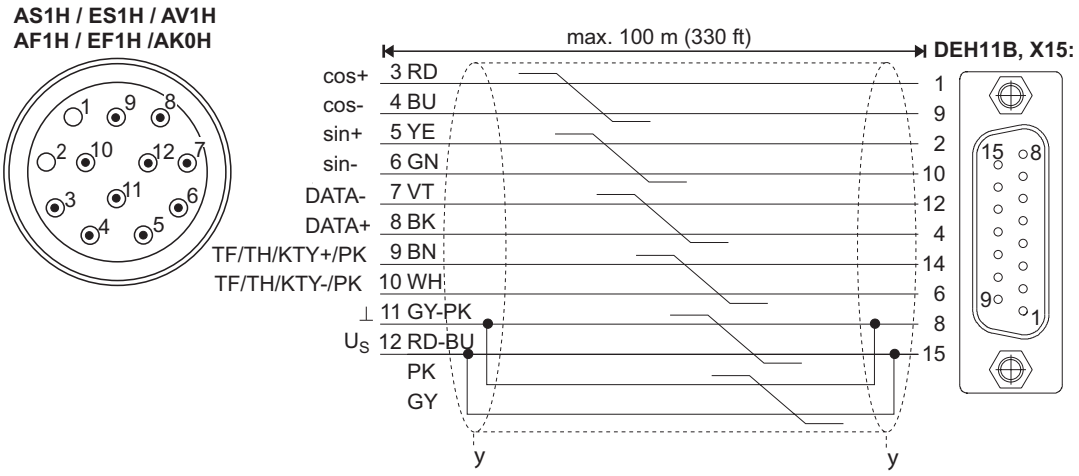
Connect the encoder to the option DEH11B as follows:




*18014400817423627*

*CM71 – 112/CMP with plug connector*

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

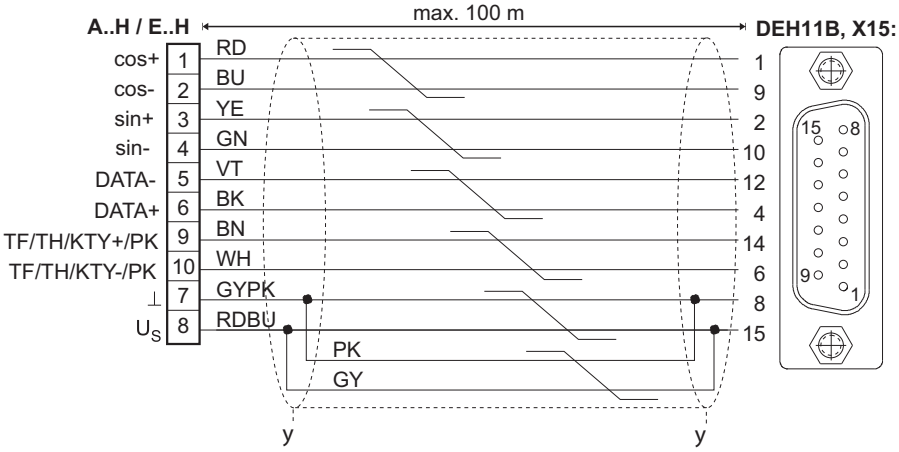



*18014400315547531*

27793230/EN – 08/2022

*CM71 – 112 with terminal box*

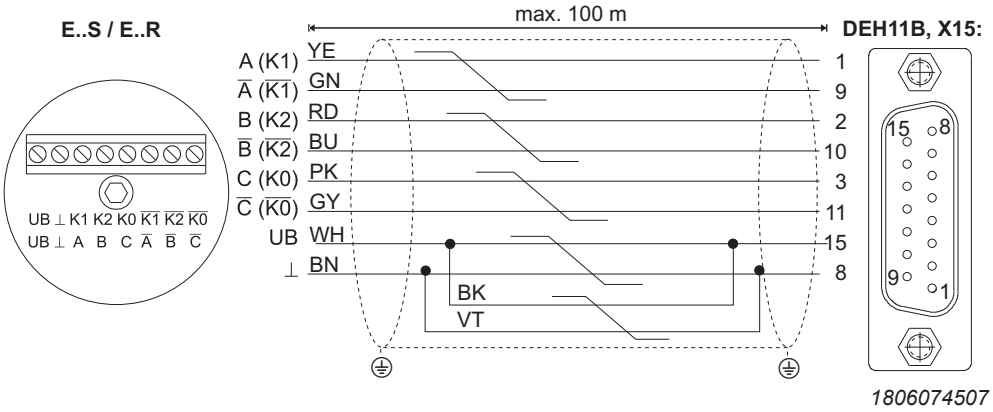
Connect the HIPERFACE® encoder to the DEH11B option as follows:




*9007201060812171*

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

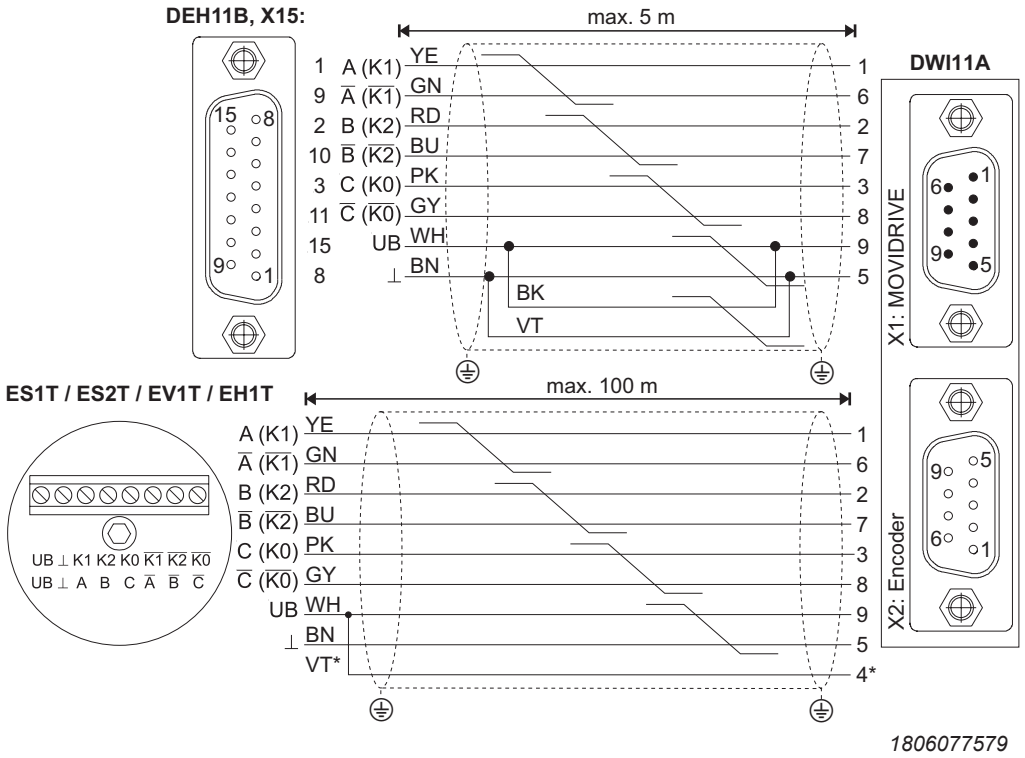
The high resolution sin/cos encoders and TTL encoders with DC 24 V supply can also be connected to DEH11B. Proceed as follows to connect sin/cos encoders and TTL encoders with DC 24 V supply to the DEH11B option:




1806074507

### 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:




1806077579

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

### 13.22.2 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.

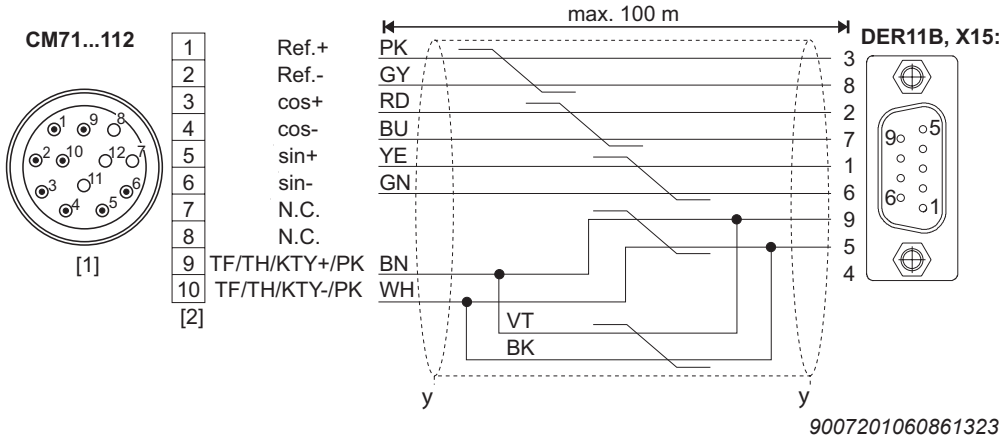
Plug connector CM..: Intercontec, type ASTA021NN00 10 000 5 000

| 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 +/PK | Motor protection | Brown (BN) / violet (VT) |
| 10 | TF/TH/ 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:




[1] Plug connector

[2] Terminal strip

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

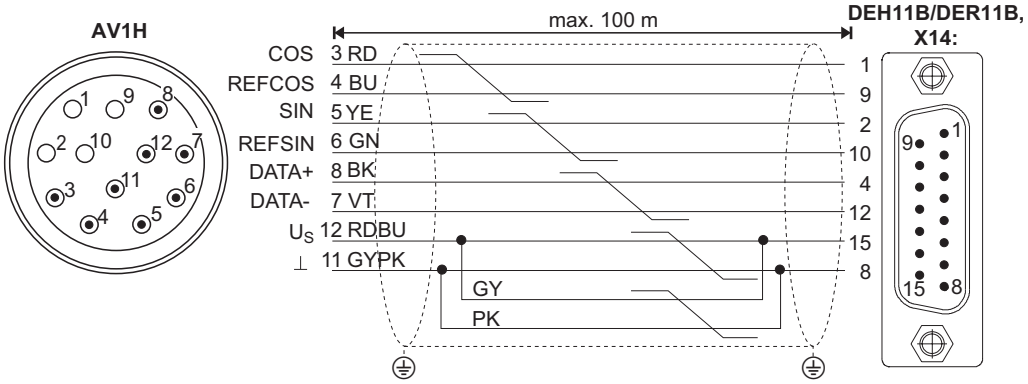
#### Voltage supply

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).

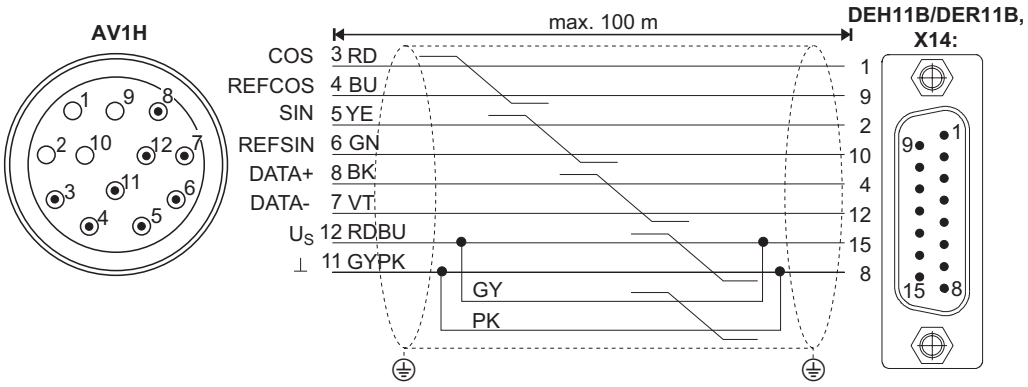
#### HIPERFACE® encoder connection

Connect the HIPERFACE® encoder AV1H as follows:




*1806128523*

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

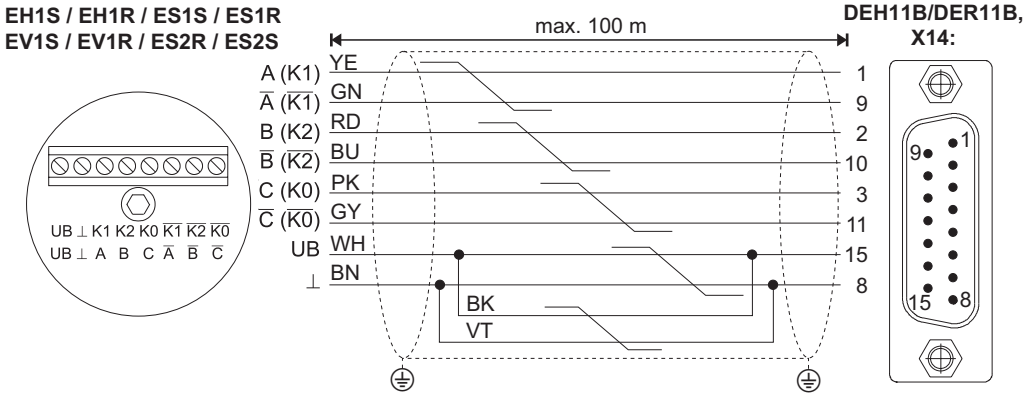



*1806128523*

27793230/EN – 08/2022

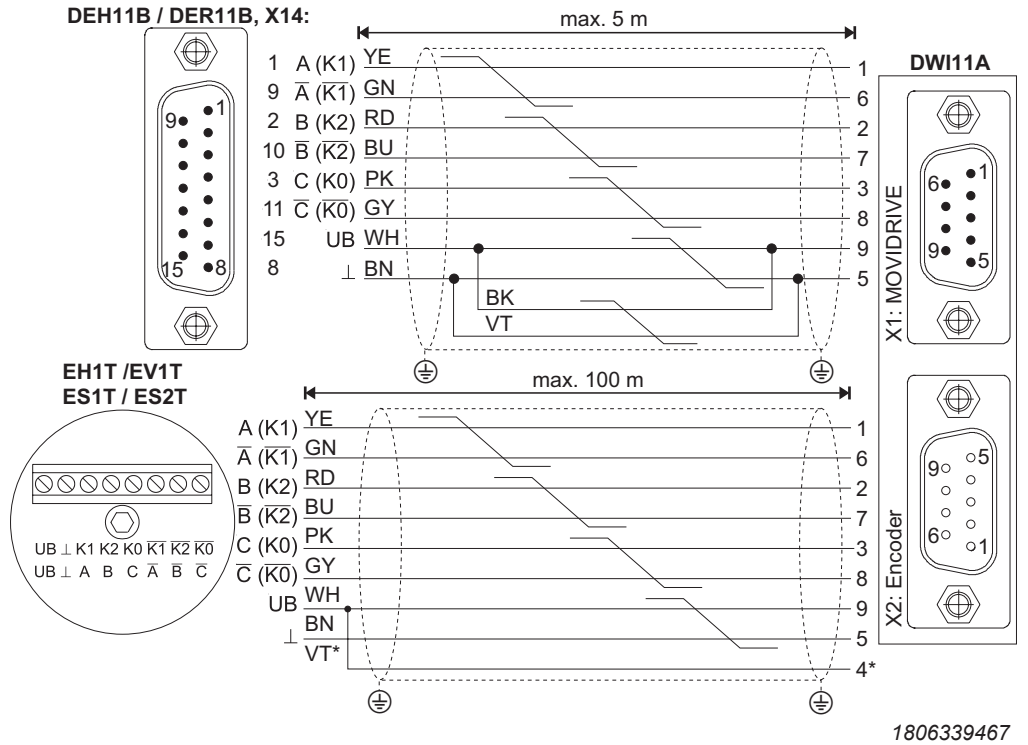
### Connection of sin/cos and TTL encoders (DC 24 V)

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:



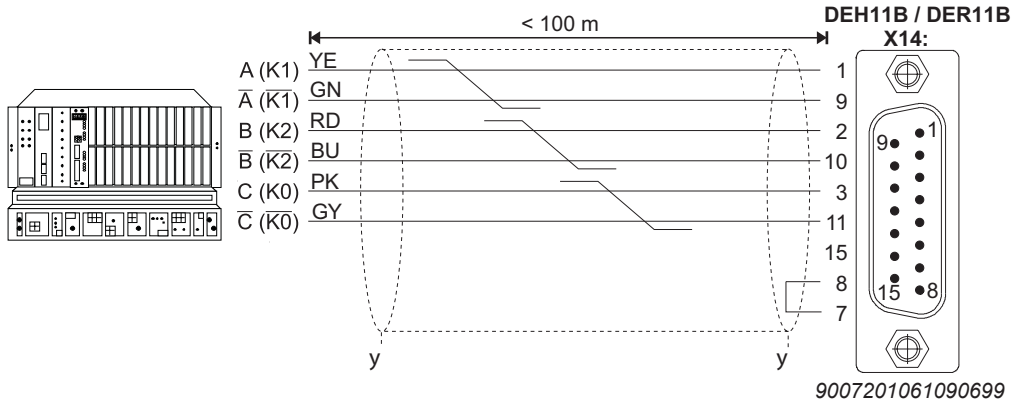

* Connect the sensor cable (VT) on the encoder to UB, do not jumper with DWI11A!

## 13.23 Connection of incremental encoder simulation

### 13.23.1 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




*9007201061090699*

Part number of the prefabricated cable:

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

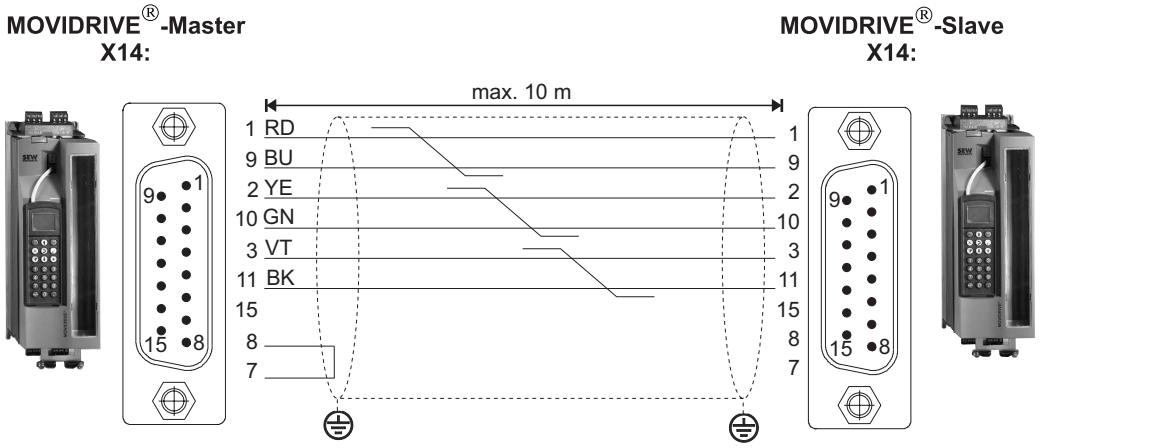
27793230/EN – 08/2022

## 13.24 Master/slave connection

### 13.24.1 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**.

27793230/EN – 08/2022

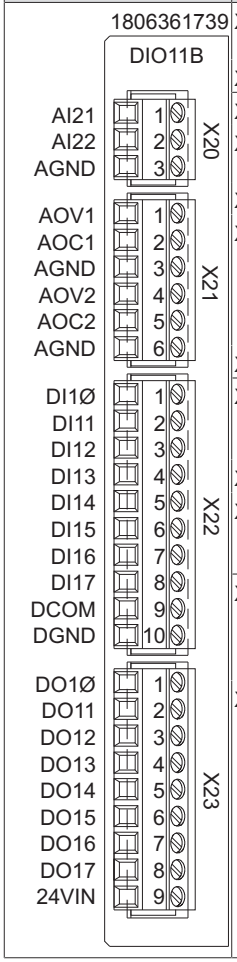
## 13.25 Connection and terminal description of the DIO11B option

### 13.25.1 Part number

Option input/output card type DIO11B: 08243085 or 28300130

## 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).

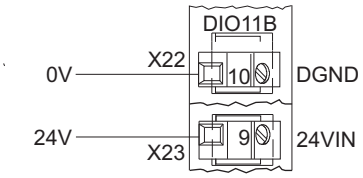
| Front view of DIO11B | Terminal | Function |
|---|---|---|
|  | X20:1/2 AI21/22 | Setpoint input n2, DC-10 V – 0 – 10 V or DC 0 – 10 V<br>(Differential input or input with AGND reference potential) |
| | X20:3 AGND | Reference potential for analog signals (REF1, REF2, A.., AO..) |
| | X21:1 AOV1 | Analog voltage output V1, factory setting: "actual speed" |
| | X21:4 AOV2 | Analog voltage output V2, factory set to "output current"<br>Current-carrying capacity of the analog voltage outputs: $I_{max}$ = DC 10 mA |
| | X21:2 AOC1 | Analog current output C1, factory setting: actual speed |
| | 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 |
| | X21:3/6 AGND | Reference potential for analog signals (REF1, REF2, AI.., AO..) |
| | X22:1 – 8 DI1Ø – 17 | Binary inputs 1 – 8, factory setting: "No function"<br>The binary inputs are electrically isolated by optocouplers.<br>Selection options for the binary inputs → Parameter menu P61_ |
| | X22:9 DCOM | Reference potential for the binary inputs DI1Ø – 17 |
| | X22:10 DGND | Reference potential for binary signals<br>• Without jumper X22:9-X22:10 (DCOM-DGND) → Isolated binary inputs<br>• With jumper X22:9-X22:10 (DCOM-DGND) → Non-isolated binary inputs |
| | X23:1 – 8 DO1Ø – 17 | Binary outputs 1 – 8, factory setting: "No function"<br>Current-carrying capacity of the binary outputs: $I_{max}$ = DC 50 mA (short-circuit proof, protected against external voltage to DC 30 V)<br>**Do not connect external voltage to the binary outputs.** |
| | X23:9 24VIN | Supply voltage DC +24 V for binary outputs D01Ø - D017, non-isolated (reference potential DGND) |

### 13.25.2 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).

27793230/EN – 08/2022

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



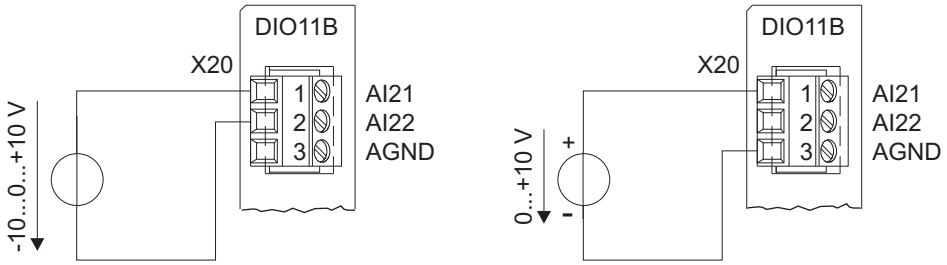

*1806364811*

### 13.25.3 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



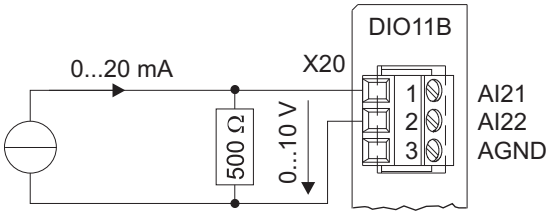

*1806367883*

### 13.25.4 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 Ω → DC 0 – 20 mA = DC 0 – 10 V

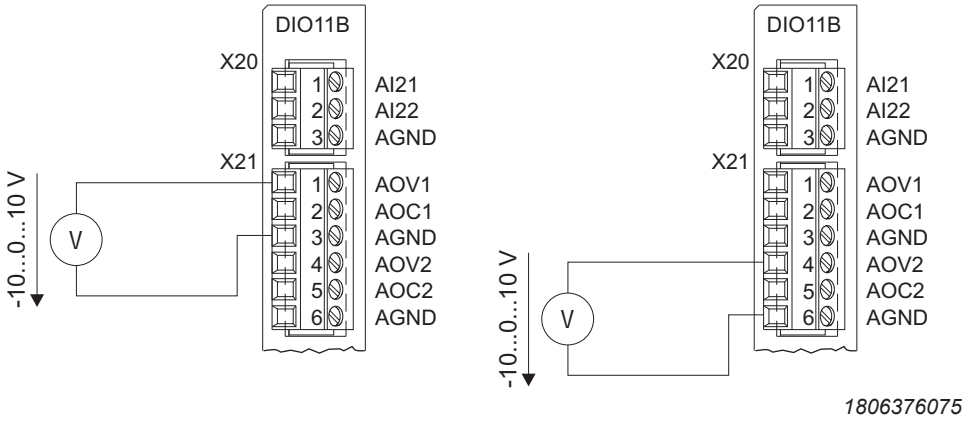
The following figure shows the current input with external load.




*1806370955*

### 13.25.5 Voltage outputs AOV1 and AOV2

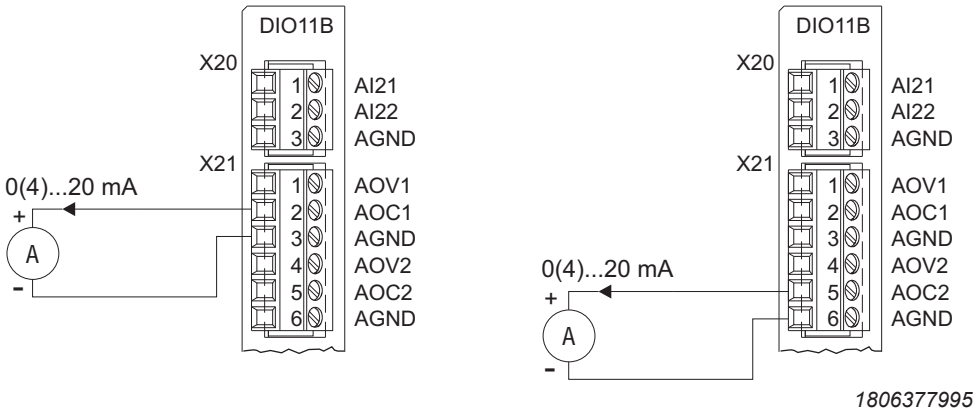
Assign the analog voltage outputs AOV1 and AOV2 in accordance with the following figure:




*1806376075*

### 13.25.6 Current outputs AOC1 and AOC2

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




*1806377995*

27793230/EN – 08/2022

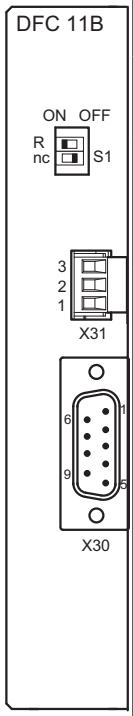
## 13.26 Connection and terminal description of the DFC11B option

### 13.26.1 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 |
|---|---|---|---|
|  1806384907 | 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[1)] |
| | 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[1)]<br>Reserved<br>Reserved<br>DGND CAN[1)]<br>CAN High (jumpered with X31:2)<br>Reserved |

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

### 13.26.2 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.

27793230/EN – 08/2022

# 14 Startup

## 14.1 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.

### 14.1.1 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.

### 14.1.2 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.

### 14.1.3 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" (→ 🗎 666).

**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.

27793230/EN – 08/2022

### 14.1.4 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 |

27793230/EN – 08/2022

**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 |

### 14.1.5 Lifting applications

**⚠ WARNING**



Danger of fatal injury if the hoist falls.

Severe or fatal injuries.

27793230/EN – 08/2022

## 14.2 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.

27793230/EN – 08/2022

## 14.3 Startup with DBG60B keypad

### 14.3.1 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 φ 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!

27793230/EN – 08/2022

### 14.3.2 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.



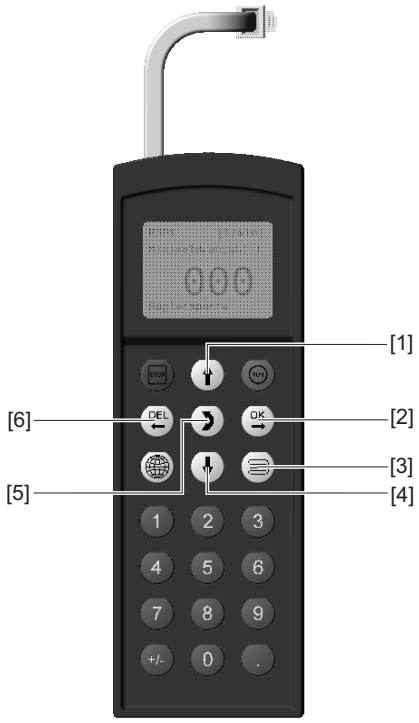
*1810055819*

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 [OK] key. The basic display is now shown in your chosen language.

### 14.3.3 Startup

The figure below shows the keys required for startup.




*1810058891*

[1] Key ↑ Move up to the next menu item

[2] Key OK 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 DEL Cancel or abort startup

27793230/EN – 08/2022

### 14.3.4 Startup procedure

## INFORMATION



This example refers to a 400 V device.

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

| |
|---|
| 0.00rpm |
| 0.000Amp |
| CONTROLLER INHIBIT |

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 OK 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 OK 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.

| |
|---|
| C0**0***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 |

27793230/EN – 08/2022

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

| C02*MOTOR TYPE 1 |
|---|
| DRN80M42 |
| **DRN90S4** |
| DRN90L4 |

| C02*MOTOR TYPE 1 |
|---|
| **THIRD-PARTY MOTOR** |
| DT63K4/DR63S4 |

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

    Example: Nameplate 230△ / 400⅄ 50 Hz

    ⅄Connection → Enter "400 V".

    △Connection → Enter "230 V".

    The full torque up to 87 Hz is available in△ 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△/690⅄ 50 Hz

    △Connection → Enter "400 V".

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

    Press the ↑ 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△/400⅄ 50 Hz

    Enter "50 Hz" in ⅄ and △ connection.

    Press the ↑ 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**

27793230/EN – 08/2022

12. Enter the following motor nameplate data:
    - C10* nominal motor current, note the connection type (⅄ or △).
    - C11* nominal motor power
    - C12* power factor cos φ
    - 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 DEL key to return to the context menu.

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

27793230/EN – 08/2022

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

| |
|---|
| SIGNATURE |
| **QUIT** |
| BASIC VIEW |

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

| |
|---|
| 0.00rpm |
| 0.000Amp |
| CONTROLLER INHIBIT |

27793230/EN – 08/2022

### 14.3.5 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. RESOLUT. |
| --- |
| 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 |

27793230/EN – 08/2022

| | |
|---|---|
| 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$^2$<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*CALCULA-TION<br>**NO**<br>YES |
| 10. The calculation is performed. After calculation, the next menu item appears automatically. | C06*SAVE<br>**NO**<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 DEL key to return to the context menu. | MANUAL MODE<br>**STARTUP**<br>COPY TO DBG<br>COPY TO MDX |
| 13. Press the ↓ key to scroll down until the menu item "EXIT" is selected. | SIGNATURE<br>**QUIT**<br>BASIC VIEW |
| 14. Confirm your selection using the OK key. The basic display appears. | 0.00rpm<br>0.000Amp<br>CONTROLLER IN-HIBIT |

- 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 OK key. The parameter set is copied from MOVIDRIVE® to the DBG60B.

27793230/EN – 08/2022

  - 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 OK 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**.

### 14.3.6 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 OK 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 OK 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.

27793230/EN – 08/2022

## 14.4 Operation of MOVITOOLS® MotionStudio

### 14.4.1 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**.

27793230/EN – 08/2022

### 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.

27793230/EN – 08/2022

### 14.4.2 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

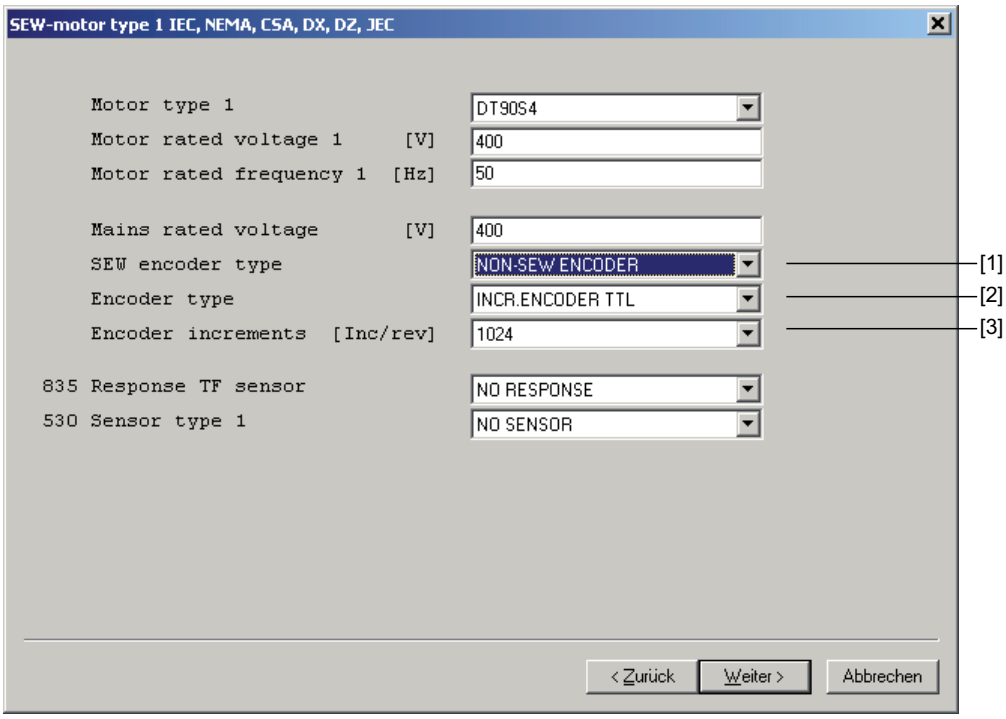
3. Select the unit you want to startup.
4. Open the context menu and select the [Startup] / [Startup] command.

   The Startup wizard opens.
5. Follow the instructions of the startup wizard and then load the startup data into your unit.

27793230/EN – 08/2022

### 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.




*1810081419*

[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.

## 14.5 Starting the motor

### 14.5.1 Analog setpoint input

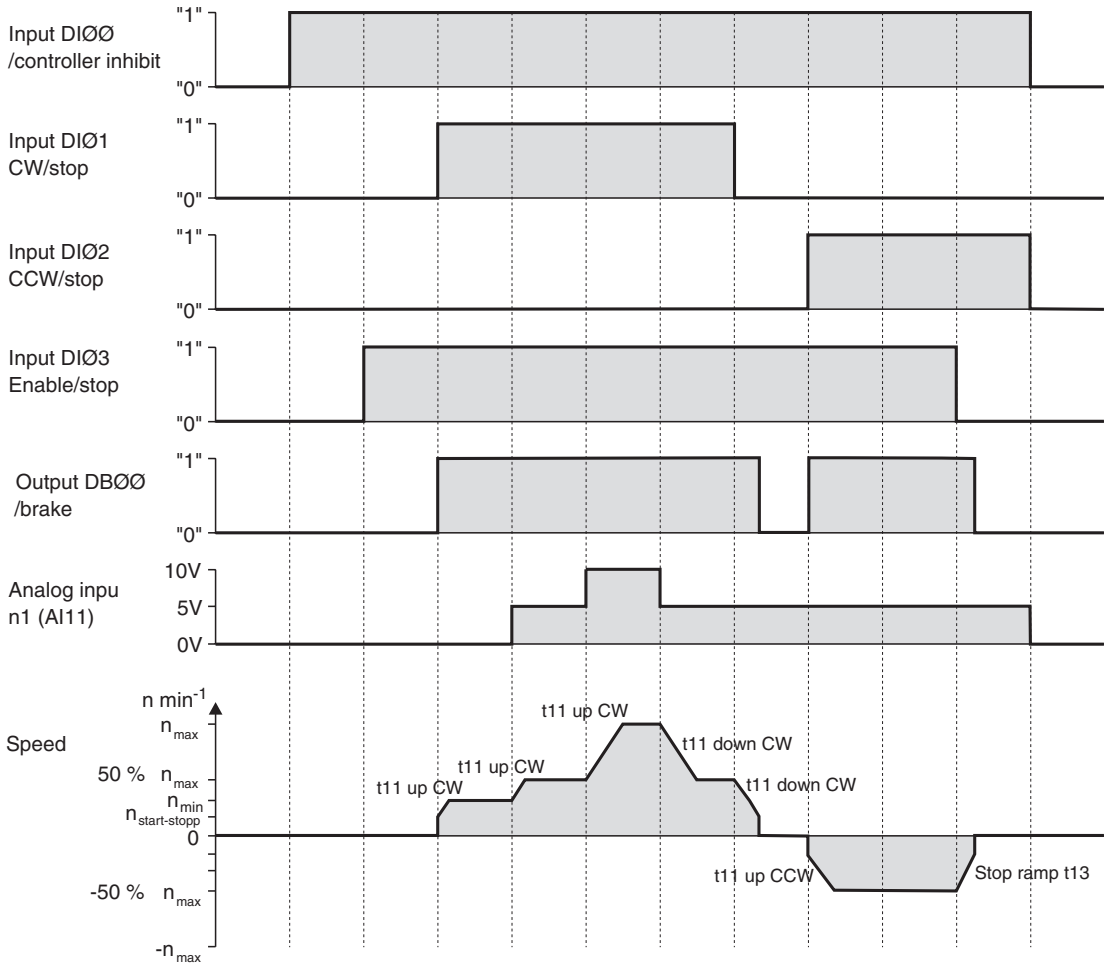
The following table shows the signals that must be present on terminals X11:2 (AI1) and X13:1 – X13:6 (DIØØ – DIØ5) when the "UNIPOL/FIX.SETPT" setpoint is selected (P100) to operate the drive with an analog setpoint input.

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

27793230/EN – 08/2022

### 14.5.2 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.




*1810131851*

## INFORMATION

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

### 14.5.3 Fixed setpoints

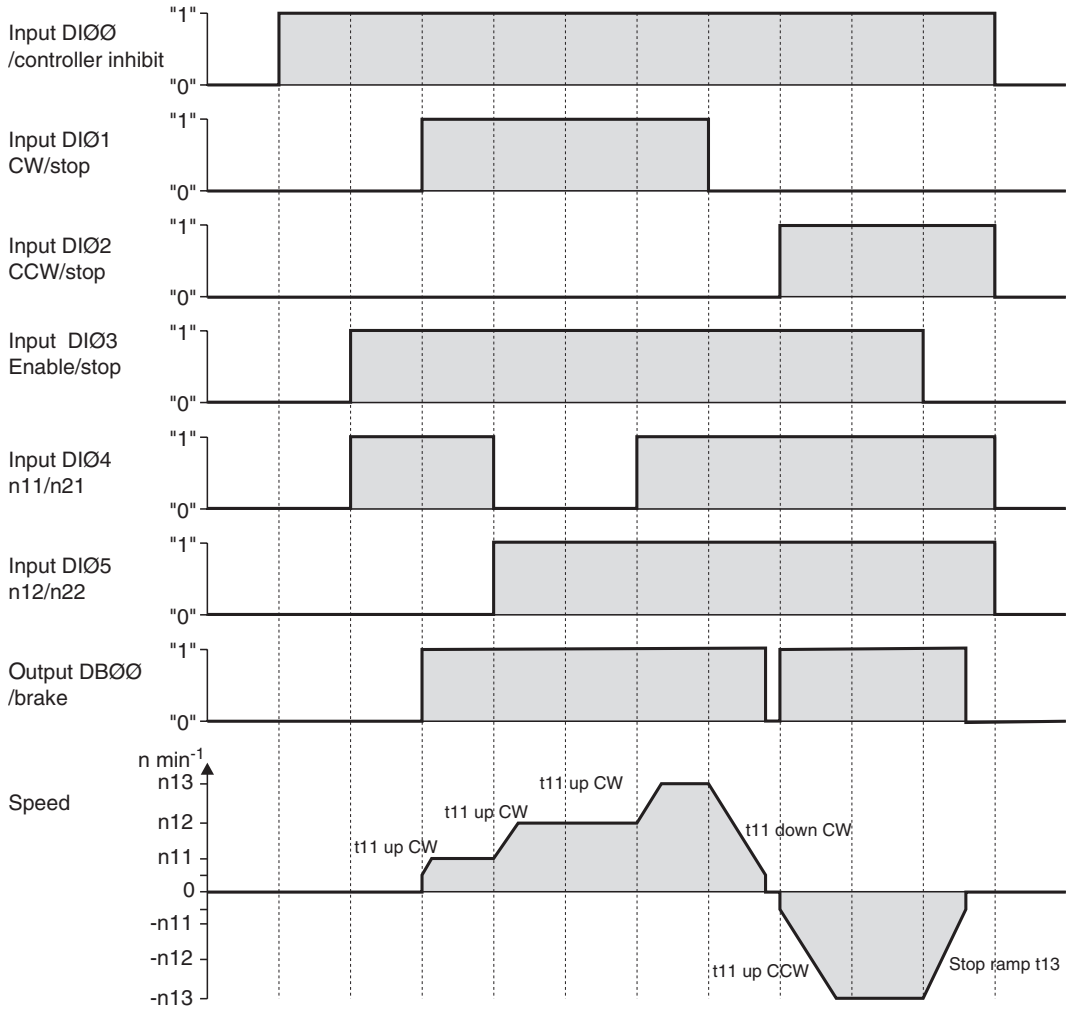
The following table shows the signals that must be present on terminals X13:1 – X13:6 (DIØØ – DIØ5) when the "UNIPOL/FIX.SETPT" setpoint is selected (P100) to operate the drive with the fixed setpoints.

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

27793230/EN – 08/2022

### 14.5.4 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.




*1810136203*

## INFORMATION

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

### 14.5.5 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.

27793230/EN – 08/2022

### 14.5.6 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.

27793230/EN – 08/2022

# 15 Operation

## 15.1 Operating displays

### 15.1.1 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 (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$^{PLUS®}$ 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$^{PLUS®}$ program is running |
| Flashing display | - | STOP via DBG60B |
| ꟻ | - | 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.

27793230/EN – 08/2022

### 15.1.2 DC link voltage display of size 7

## INFORMATION

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

### 15.1.3 DBG60B keypad

**Basic displays:**

| | |
|---|---|
| 0.00rpm<br>0.000Amp<br>CONTROLLER IN-HIBIT | Display when X13:1 (DIØØ "/controller inhibit") = "0". |
| 0.00rpm<br>0.000Amp<br>NO ENABLE | Display when X13:1 (DIØØ "/controller inhibit") = "1" and inverter is not enabled ("enable/stop" = "0"). |
| 950.00rpm<br>0.990Amp<br>ENABLE (VFC) | Display for enabled inverter. |
| INFORMATION 6:<br>VALUE TOO HIGH | Information message |
| (DEL)=Quit<br>ERROR 9<br>STARTUP | Error info |

27793230/EN – 08/2022

## 15.2 Information messages

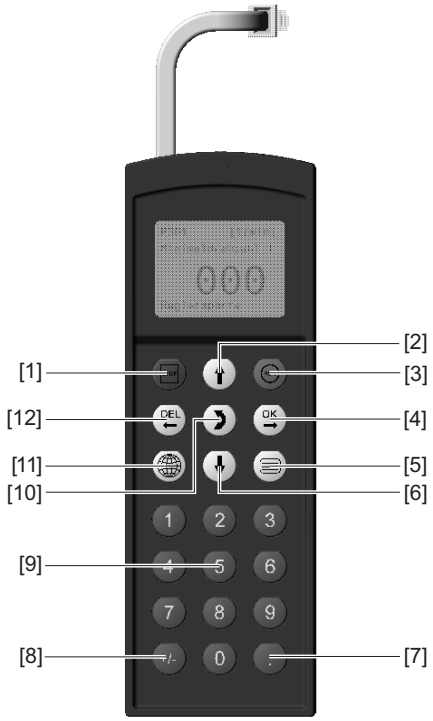
Information messages on the DBG60B (ca. 2 s in duration) or in MOVITOOLS® MotionStudio (message that can be acknowledged):

| No. | Text DBG60B/ MotionStudio | Description |
|---|---|---|
| 1 | ILLEGAL INDEX | Index addressed via interface not available. |
| 2 | NOT IMPLEMENT. | • Attempt to execute a non-implemented function.<br>• An incorrect communication service has been selected.<br>• Manual operation selected via invalid interface (e.g. fieldbus). |
| 3 | READ ONLY VALUE | Attempt to edit a read-only value. |
| 4 | PARAM. INHIB-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-ING | The option card required for the selected function is miss-ing. |
| 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 MISSING | Set terminal DIØØ "/Controller inhibit" = "0" for the selected function. |
| 14 | INVALID VALUE | Attempt to enter an invalid value. |
| 16 | PARAM. NOT SAVED | Overflow of EEPROM buffer, e.g. through cyclic write ac-cess. Parameter not stored in non-volatile EEPROM. |
| 17 | INVERTER EN-ABLED | • Parameter to be changed can only be set in the state "CONTROLLER INHIBIT".<br>• You tried to change to manual mode during live opera-tion. |

27793230/EN – 08/2022

## 15.3 Functions of the DBG60B keypad

### 15.3.1 Key assignments for DBG60B




*1810609803*

| | | | |
|---|---|---|---|
| [1] | Key | STOP | Stop |
| [2] | Key | ↑ | Up arrow, moves up to the next menu item |
| [3] | Key | RUN | Start |
| [4] | Key | OK | 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 | DEL | Delete previous entry |

27793230/EN – 08/2022

### 15.3.2 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 [OK] 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 [OK] key.

### 15.3.3 Parameter mode

Proceed as follows to set the parameters in parameter mode:

1. Press the [≡] key to activate the context menu.

| |
|---|
| BASIC VIEW |
| **PARAMETER MODE** |
| VARIABLE MODE |
| WAKE UP PARAMETER |

2. Press the [OK] 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.

| |
|---|
| P **0**00 1/min |
| SPEED |
| 0.0 |
| CONTROLLER INHIBIT |

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.

| |
|---|
| P **1**.. SETPOINTS/ |
| RAMP GENERATORS |
| CONTROLLER INHIBIT |

4. Press the [OK] key to activate the parameter subgroup selection in the required main parameter group. The flashing cursor moves one position to the right.

| |
|---|
| P 1.. SETPOINTS/ |
| RAMP GENERATORS |
| CONTROLLER INHIBIT |

5. Use the [↑] or [↓] key to select the desired parameter subgroup. The flashing cursor is positioned under the number of the parameter subgroup.

| |
|---|
| \ 1**3**. SPEED |
| RAMPS 1 |
| CONTROLLER INHIBIT |

6. Press the [OK] key to activate the parameter selection in the required parameter subgroup. The flashing cursor moves one position to the right.

| |
|---|
| \ 13**.** SPEED |
| RAMPS 1 |
| CONTROLLER INHIBIT |

27793230/EN – 08/2022

7. Use the ↑ or ↓ key to select the desired parameter. The flashing cursor is positioned under the third digit of the parameter number.

| \ 13**2** s |
| --- |
| T11 UP CCW |
| 0.13 |
| CONTROLLER IN-HIBIT |

8. Press the OK key to activate the setting mode for the selected parameter. The cursor is positioned under the parameter value.

| \ 132 s |
| --- |
| T11 UP CCW |
| 0.13_ |
| CONTROLLER IN-HIBIT |

9. Use the ↑ or ↓ key to set the required parameter value.

| \ 132 s |
| --- |
| T11 UP CCW |
| 0.20_ |
| CONTROLLER IN-HIBIT |

10. Press the OK 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.

| \ 13**2** s |
| --- |
| T11 UP CCW |
| 0.20 |
| CONTROLLER IN-HIBIT |

11. Use the ↑ or ↓ key to select another parameter, or press the DEL key to switch to the menu of the parameter subgroups.

| \ 13**.** SPEED |
| --- |
| RAMPS 1 |
| CONTROLLER IN-HIBIT |

12. Use the ↑ or ↓ key to select another parameter subgroup or press the DEL key to switch to the menu of the main parameter groups.

| P **1**.. SETPOINTS/ |
| --- |
| RAMP GENERATORS |
| CONTROLLER IN-HIBIT |

13. Use the ☰ key to return to the context menu.

| BASIC VIEW |
| --- |
| **PARAMETER MODE** |
| VARIABLE MODE |
| WAKE UP PARAMETER |

27793230/EN – 08/2022

### 15.3.4 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 OK key The variable mode display appears.
- Use the ↻ key to edit the variables.

### 15.3.5 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 OK 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 OK 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 OK 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 OK key. The selected parameter is deleted from the user menu.

27793230/EN – 08/2022

### 15.3.6 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 OK key.

### 15.3.7 IPOS$^{PLUS®}$

MOVITOOLS® MotionStudio is required for programming IPOS$^{PLUS®}$. You can only use the DBG60B keypad to edit or change IPOS$^{PLUS®}$ variables (H__).

The IPOS$^{PLUS®}$ 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® unit.

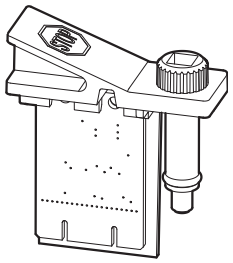
Parameter P931 can be used to start and stop the IPOS$^{PLUS®}$ program from the DBG60B keypad.

27793230/EN – 08/2022

## 15.4 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.



*1810728715*

Part number: 08248834

### 15.4.1 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® MDX60B/61B... | New inverter MOVIDRIVE® 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 DCS21B/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 DCS21B/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.

27793230/EN – 08/2022

# 16 Service

## 16.1 Damages to the device

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

## 16.2 Fault information

### 16.2.1 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.

### 16.2.2 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).

27793230/EN – 08/2022

### 16.2.3 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.

### 16.2.4 Inverter is waiting for data

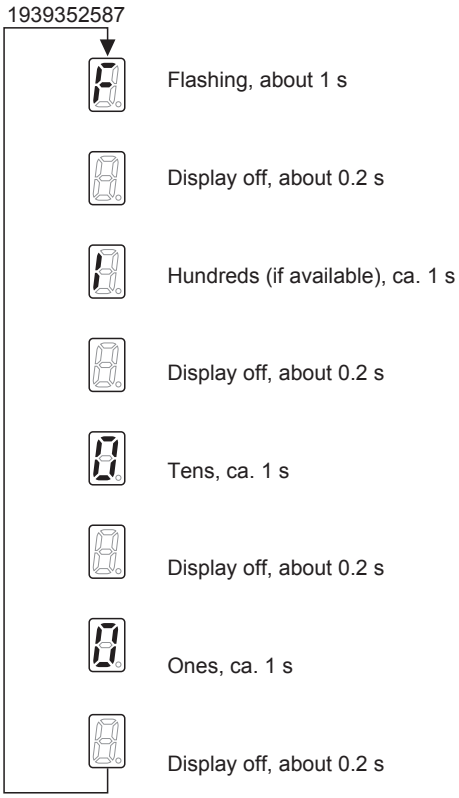
If the inverter is controlled via a communication interface (fieldbus, RS485 or SBus) and the power was switched off and back on again or a fault reset was performed, then the enable remains ineffective until the inverter receives valid data again via the interface, which is monitored with a timeout.

27793230/EN – 08/2022

## 16.3 Fault messages and list of faults

### 16.3.1 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.

### 16.3.2 Subfault code display

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

27793230/EN – 08/2022

### 16.3.3 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$^{PLUS®}$). 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 | | | Subfault | | | |
|---|---|---|---|---|---|---|
| Code | Designation | Response (P) | Code | Designation | Possible cause | Measure |
| 00 | No fault | | | | | |
| 01 | Overcurrent | Immediate stop | 0 | Output stage | • Short circuit at output<br>• Motor too large<br>• Defective output stage<br>• Current supply for current transformer<br>• Ramp limit is deactivated and set ramp time is too short<br>• Defective phase module<br>• Supply voltage 24 V or 24 V generated from it is instable<br>• Interruption or short circuit on the signal lines from the phase modules | • Rectify the short circuit<br>• Connect a smaller motor<br>• Contact the SEW Service if the output stage is defective<br>• Activate P 138 and/or increase ramp time |
| | | | 1 | $V_{CE}$ monitoring or undervoltage monitoring of the gate driver | | |
| | | | 5 | Inverter remains in hardware current limit | | |
| | | | 6 | $V_{CE}$ monitoring or undervoltage 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<br>• in the motor lead<br>• in the inverter<br>• in the motor | • Eliminate ground fault<br>• Consult SEW Service |
| 04 | Brake chopper | Immediate stop | 0 | DC link voltage too high in 4Q operation | • Too much regenerative power<br>• Braking resistor circuit interrupted<br>• Short circuit in the braking resistor circuit<br>• Braking resistance too high<br>• Brake chopper is defective | • Extend deceleration ramps<br>• Check supply cable to braking resistor<br>• Check technical data of braking resistor<br>• Install a new MOVIDRIVE® if the brake chopper is defective |
| | | | 1 | | | |
| 06 | Line phase failure | Immediate stop | 0 | Voltage for adapting DC link is periodically too low | • Phase failure<br>• Inadequate line voltage quality | • Check the supply system cable<br>• Check configuration of the supply system<br>• Check supply (fuses, contactor) |
| | | | 3 | Line voltage failure | | |
| | | | 4 | Line frequency fault | | |
| 07 | DC link overvoltage | Immediate stop | 0 | DC link voltage too high in 2Q operation | DC link voltage too high | • Extend deceleration ramps<br>• Check supply cable to the braking resistor<br>• Check technical data of braking resistor |
| | | | 1 | | | |
| | | | 2 | DC link voltage too high in 4Q operation .. ..Phase U | | |
| | | | 3 | ..Phase V | | |
| | | | 4 | ..Phase W | | |

27793230/EN – 08/2022

| Fault | | | Subfault | | | |
|---|---|---|---|---|---|---|
| Code | Designation | Response (P) | Code | Designation | Possible cause | Measure |
| 08 | Speed monitoring | Immediate stop (P) | 0 | Inverter in current limiting or in slip limit | • 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<br>• Encoder not connected correctly or incorrect direction of rotation<br>• $n_{max}$ is exceeded during torque control<br>• In operating mode VFC: Output frequency ≥ 150 Hz<br>• In operating mode V/f: Output frequency ≥ 599 Hz | • Reduce load<br>• Increase deceleration time setting (P501 or P503)<br>• Check encoder connection, swap A/A and B/B pairs if necessary<br>• Check encoder voltage supply<br>• Check current limiting<br>• Extend ramps if necessary<br>• Check motor cable and motor<br>• Check line phases |
| | | | 3 | System limit "actual speed" exceeded. Speed difference between ramp setpoint and actual value for 2 × ramp time higher than expected slip | | |
| | | | 4 | Maximum rotating field speed exceeded 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$^{PLUS®}$ command | • Incorrect command detected during execution of the IPOS$^{PLUS®}$ program<br>• Incorrect conditions during command execution | • Check the content of the program memory and, if necessary, correct<br>• Load the correct program into the program memory<br>• Check program sequence (→ IPOS$^{PLUS®}$ manual) |
| 11 | Overtemperature | Emergency stop (P) | 0 | Heat sink temperature too high or temperature sensor defective | • Thermal overload of inverter<br>• Temperature sensor of a phase module faulty (size 7) | • Reduce load and/or ensure adequate cooling<br>• Check fan<br>• 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) |
| | | | 3 | Overtemperature switched-mode power supply | | |
| | | | 6 | Heat sink temperature too high or temperature sensor defective.. ..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) |

27793230/EN – 08/2022

| Fault | | | Subfault | | | |
|---|---|---|---|---|---|---|
| Code | Designation | Response (P) | Code | Designation | Possible cause | Measure |
| 14 | Encoder | Immediate stop | 0 | Encoder not connected, defective encoder, defective encoder cable | • Encoder cable or shield not connected correctly.<br>• Short circuit / broken wire in encoder cable<br>• Encoder is defective.<br>• When 2 inverters are connected via X14 and P505 is set to YES F14 SubC 27. | • Check encoder cable and shield for correct connection, short circuit and broken wire |
| | | | 25 | Encoder fault X15 – Speed range exceeded Encoder exceeds 6542 $min^{-1}$ | | |
| | | | 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 | • Encoder cable or shield not connected correctly.<br>• Short circuit / broken wire in encoder cable<br>• Encoder is defective.<br>• When 2 inverters are connected via X14 and P505 is set to YES F14 SubC 27. | • Check encoder cable and shield for correct connection, short circuit and broken wire |
| | | | 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 | • Check grounding and shielding and improve, if necessary<br>• Consult SEW Service if the fault occurs again. |
| 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 | • Restore factory settings, perform reset and reset parameters.<br>• Consult SEW service if the fault reoccurs<br>• Replace memory card |
| | | | 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 |

27793230/EN – 08/2022

| Fault | | | Subfault | | | |
|---|---|---|---|---|---|---|
| Code | Designation | Response (P) | Code | Designation | Possible cause | Measure |
| 27 | No limit switches | Emergency stop | 0 | Limit switches missing or wire break | • Wire break/both limit switches missing<br>• Limit switches are swapped over in relation to direction of rotation of motor | • Check wiring of limit switches<br>• Replace limit switch connections<br>• Reprogram terminals |
| | | | 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 | • Check communications routine of the master<br>• Extend fieldbus timeout time (P819)/deactivate monitoring |
| | | | 2 | Fieldbus interface does not boot | | |
| 29 | Limit switch hit | Emergency stop | 0 | Hardware limit switch hit | A limit switch was hit in IPOS$^{PLUS®}$ operating mode | • Check travel range<br>• Correct operator program |
| 30 | Emergency stop timeout | Immediate stop | 0 | Timeout stop emergency stop ramp | • Drive overloaded<br>• Emergency stop ramp too short | • Project planning check<br>• Extend emergency stop ramp |
| 31 | TF/TH trigger | No response (P) | 0 | Thermal motor protection fault | • Motor too hot, TF/TH has triggered<br>• TF/TH of the motor not connected or connected incorrectly<br>• Connection between MOVIDRIVE® and TF/TH on motor interrupted | • The motor **must** cool off, then reset the fault<br>• Check connections/link between MOVIDRIVE® and TF/TH<br>• If no TF/TH is connected: Jumper X10:1 with X10:2<br>• Set P835 to "No response". |
| 32 | IPOS index overflow | Emergency stop | 0 | IPOS program defective | Programming principles violated leading to system-internal stack overflow | Check and correct the IPOS$^{PLUS®}$ user program (→ IPOS$^{PLUS®}$ 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 | • Extend the downwards ramps<br>• Eliminate overload |
| 35 | Operating mode | Immediate stop | 0 | Operating mode not available | • Operating mode not defined or defined incorrectly<br>• P916 was used to set a ramp type that requires a MOVIDRIVE® device in technology version<br>• P916 was used to set a ramp type that does not match the selected technology function<br>• P916 was used to set a ramp type that does not match the selected synchronization time (P888) | • Use P700 or P701 to set correct operating mode.<br>• Use MOVIDRIVE® in technology version (..OT)<br>• From the "Startup → Select technology function..." menu, select the technology function that matches P916<br>• Check the settings of P916 and P888 |
| | | | 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 | • Type of option card not allowed<br>• Setpoint source, control signal source or operating mode not permitted for this option card<br>• Incorrect encoder type set for DIP11B | • Use correct option card<br>• Set correct setpoint source (P100)<br>• Set correct control signal source (P101)<br>• Set correct operating mode (P700 or P701)<br>• Set the correct encoder type |
| 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 |

27793230/EN – 08/2022

| Fault | | | Subfault | | | |
|---|---|---|---|---|---|---|
| Code | Designation | Response (P) | Code | Designation | Possible cause | Measure |
| 39 | Reference travel | Immediate stop (P) | 0 | "Reference travel" fault | • The reference cam is missing or does not switch<br>• Limit switches are connected incorrectly<br>• Reference travel type was changed during reference travel | • Check reference cam<br>• Check limit switch connection<br>• Check reference travel type setting and required parameters. |
| 40 | Boot synchronization | Immediate stop | 0 | Timeout at boot synchronization with option | • Fault during boot synchronization between inverter and option<br>• Synchronization ID not/incorrectly transmitted | Install a new option card if this fault reoccurs |
| 41 | Watchdog option | Immediate stop | 0 | Fault – Watchdog timer from/to option | • Fault in communication between system software and option software<br>• Watchdog in the IPOS$^{PLUS®}$ program | • Consult SEW Service |
| | | | 17 | Watchdog IPOS fault | • An application module has been loaded in a MOVIDRIVE® B unit without technology version<br>• The wrong technology function has been set if an application module is used | • Check IPOS program<br>• Check whether the unit has been activated for the application version (P079)<br>• Check the selected technology function (P078) |
| 42 | Lag fault | Immediate stop (P) | 0 | Positioning lag fault | • Rotary encoder connected incorrectly<br>• Acceleration ramps too short<br>• P component of positioning controller too small<br>• Incorrect speed controller parameters<br>• Value of lag fault tolerance too small | • Check rotary encoder connection<br>• Extend ramps<br>• Set P component to higher value<br>• Reset speed controller parameters<br>• Increase lag fault tolerance<br>• Check wiring of encoder, motor and line phase.<br>• Check whether mechanical system components can move freely or if they are blocked |
| 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 | • Device utilization (I × t value) > 125% | • Decrease power output<br>• Extend ramps<br>• If suggested actions not possible, use larger inverter<br>• Reduce load |
| | | | 8 | UL monitoring fault | | |

27793230/EN – 08/2022

| Fault | | | Subfault | | | |
|---|---|---|---|---|---|---|
| Code | Designation | Response (P) | Code | Designation | Possible cause | Measure |
| 45 | Initialization | Immediate stop | 0 | General fault during initialization | • No parameters set for EEPROM in power section set incorrectly<br>• Option card not in contact with backplane bus | • Restore the factory settings. Contact the SEW Service for advice if the fault still cannot be reset<br>• Insert the option card correctly |
| | | | 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:<br>• Encoder signal from master/distance encoder faulty<br>• Hardware required for synchronous operation is faulty | • Check encoder signals of master/distance encoder<br>• Check encoder wiring<br>• Install a new synchronous operation card |
| 57 | "TTL encoder" | Immediate stop | 512 | X15: Fault in amplitude control | • Encoder cable or shield not connected correctly<br>• Short circuit / broken wire in encoder cable<br>• Encoder defective<br>• EMC interference | • Check encoder cable and shield for correct connection, short circuit and broken wire<br>• Replace encoder<br>• Providing for EMC measures |
| | | | 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 | • Encoder cable or shield not connected correctly<br>• Short circuit / broken wire in encoder cable<br>• Encoder defective<br>• EMC interference | • Check encoder cable and shield for correct connection, short circuit and broken wire<br>• Replace encoder<br>• Providing for EMC measures |
| | | | 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 | | |

27793230/EN – 08/2022

| Fault | | | Subfault | | | |
|---|---|---|---|---|---|---|
| Code | Designation | Response (P) | Code | Designation | Possible cause | Measure |
| 59 | "Encoder communication" | for rapid stop | 1 | X15: Track signal fault | • Encoder cable or shield not connected correctly<br>• Short circuit / broken wire in encoder cable<br>• Encoder defective<br>• EMC interference | • Check encoder cable and shield for correct connection and broken wire<br>• Replace encoder<br>• Providing for EMC measures |
| | | | 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 | Only in IPOS$^{PLUS®}$ mode:<br>• Attempt was made to set an invalid automatic mode (via external control)<br>• P916 = BUS RAMP is set | • Check serial connection to external controller<br>• Check write values of external controller<br>• Set correct value for P916 |
| 78 | IPOS SW limit switch | No response (P) | 0 | Software limit switch hit | Only in IPOS$^{PLUS®}$ mode:<br>Programmed target position is outside travel range delimited by software limit switches | • Check user program<br>• Check position of the software limit switches |
| 79 | Hardware configuration | Immediate stop | 0 | Deviating hardware configuration when replacing the memory card | The following values no longer match after memory card replacement:<br>• Power<br>• Nominal voltage<br>• Variant ID<br>• Device family<br>• Design as Technology/ Standard unit<br>• Option cards | 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 | Only in "VFC hoist" mode:<br>The motor could not be supplied with the correct amount of current during the pre-magnetizing time:<br>• Nominal motor power too small in relation to rated inverter power<br>• Motor cable cross section too small.<br>Only for operation with a linear motor (as of firmware 18):<br>• 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. | • Check startup data and perform new startup, if necessary.<br>• Check connection between inverter and motor<br>• Check cross section of motor cable and increase if necessary<br>• 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. |

27793230/EN – 08/2022

| Fault | | | Subfault | | | |
|---|---|---|---|---|---|---|
| Code | Designation | Response (P) | Code | Designation | Possible cause | Measure |
| 82 | Open output | Immediate stop | 0 | Output open with "VFC hoist" | Only in "VFC hoist" mode:<br>• Two or all output phases are interrupted.<br>• Nominal motor power too small in relation to rated inverter power | • Check connection between inverter and motor<br>• Check startup data and perform new startup, if necessary. |
| 84 | Motor protection | Emergency stop (P) | 0 | "Motor temperature emulation" fault | • Motor utilization too high.<br>• $I_N$-$U_L$ monitoring triggered<br>• P530 set later to "KTY" | • The motor **must** cool off, then reset the fault<br>• Reduce load<br>• Extend ramps<br>• Observe longer pause times<br>• Check P345/346<br>• Select a larger motor |
| | | | 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 | • No memory card<br>• Memory card defective | • Tighten knurled screw<br>• Insert and secure memory card<br>• Replace memory card<br>• Load delivery status and parameter set |
| 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 | Only in VFC n-CTRL operating mode:<br>Actual speed > 6000 rpm when inverter enabled | Only enable a actual speed ≤ 6000 $min^{-1}$ |
| 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 | The encoder signals a fault, e.g. power failure<br>• Connection cable between the encoder and DIP11B does not meet the requirements (twisted pair, shielded)<br>• Clock frequency too high for cable length<br>• Permitted max. speed/acceleration of encoder exceeded<br>• Encoder defective | • Check absolute encoder connection<br>• Check connection cables<br>• Set correct clock frequency<br>• Reduce maximum travel speed or ramp<br>• Replacing absolute encoders. |
| 94 | EEPROM checksum | Immediate stop | 0 | Power section parameters | Inverter electronics disrupted. Possibly due to EMC influence or defect. | 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 | No plausible position could be determined<br>• Incorrect encoder type set<br>• IPOS$^{PLUS®}$ travel parameter set incorrectly<br>• Numerator/denominator factor set incorrectly<br>• Zero adjustment performed<br>• Encoder defective | • Set the correct encoder type<br>• Check IPOS$^{PLUS®}$ travel parameters.<br>• Check travel speed.<br>• Correct numerator/denominator factor<br>• Reset after zero adjustment<br>• Replacing absolute encoders. |
| 97 | Copy fault | Immediate stop | 0 | Parameter set upload is/was faulty | • Memory card cannot be written or read<br>• Fault during data transmission | • Repeat copying process<br>• Restore delivery state (P802) and repeat copying process |
| | | | 1 | Download of parameter set to unit canceled. | | |
| | | | 2 | Not possible to adopt parameters<br>Not possible to adopt parameters from memory card | | |

27793230/EN – 08/2022

| Fault | | | Subfault | | | |
|---|---|---|---|---|---|---|
| Code | Designation | Response (P) | Code | Designation | Possible cause | Measure |
| 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$^{PLUS®}$ 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$^{PLUS®}$ 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 | • Let oil cool down<br>• Check if the gear unit cools properly |
| 105 | Oil aging ready signal | Display fault (P) | 0 | Oil aging ready signal | Oil aging sensor is not ready for operation | • Check voltage supply of oil aging sensor<br>• Check and, if necessary, replace the oil aging sensor |
| 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 | • Check main contactor<br>• Check control cables. |
| 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. | • Reload the configuration files.<br>• Then switch the DCS..B option off and on again. |
| | | | 2 | Invalid configuration data for software version of the DCS..B option. | DCS..B option configured using a wrong software version. | • Configure the DCS..B option with the permitted MOVISAFE® software version.<br>• Then switch the DCS..B option off and on again. |
| | | | 3 | Unit was programmed with incorrect software interface. | Program or configuration data was loaded into the unit with an incorrect MOVISAFE® software. | • Check the DCS..B version and parameterize it again using a valid MOVISAFE® software.<br>• Then switch the DCS..B option off and on again. |
| | | | 4 | Incorrect reference voltage | • Incorrect reference voltage<br>• Faulty supply voltage of the DCS..B option<br>• Faulty component on the DCS..B option | • Check supply voltage of DCS..B option.<br>• Switch DCS..B option off and on again. |
| | | | 5 | | | |
| | | | 6 | Faulty system voltage | • Faulty supply voltage of the DCS..B option<br>• Faulty component on the DCS..B option | • Check supply voltage of DCS..B option.<br>• Switch DCS..B option off and on again. |
| | | | 7 | | | |
| | | | 10 | Incorrect supply voltage. | • DC 24 V supply voltage of the DCS..B option is faulty.<br>• Faulty component on the DCS..B option | • Check supply voltage of DCS..B option.<br>• Switch DCS..B option off and on again. |

27793230/EN – 08/2022

| Fault | | | Subfault | | | |
|---|---|---|---|---|---|---|
| Code | Designation | Response (P) | Code | Designation | Possible cause | Measure |
| 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 | • Check ZSC activation<br>• Check JSS activation<br>• Check DMC activation (only for monitoring via position) |
| | | | 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. | Program or configuration data was loaded into the unit with an incorrect MOVISAFE® software. | • Check the DCS..B version and parameterize it again using a valid MOVISAFE® software.<br>• Then switch the DCS..B option off and on again. |
| | | | 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. | - | • Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |
| | | | 24 | | | |
| | | | 25 | Fault while calculating firmware configuration data. | - | • Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |
| | | | 26 | | | |
| | | | 27 | CRC of firmware configuration data invalid. | - | • Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |
| | | | 28 | | | |
| | | | 29 | Fault during internal transmission of firmware configuration data. | - | • Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |
| | | | 30 | | | |
| | | | 31 | The range check of the device description is faulty. | Faulty configuration data of the device description. | • Reload the configuration data. Next switch the DCS..B option off and on again.<br>• If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version. |

| Fault | | | Subfault | | | |
|---|---|---|---|---|---|---|
| Code | Designation | Response (P) | Code | Designation | Possible cause | Measure |
| 108 | DCS fault | Display fault | 32 | The range check of the access data is faulty. | Faulty configuration data of the device description. | • Reload the configuration data. Next switch the DCS..B option off and on again.<br>• If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version. |
| | | | 33 | EMU range check is faulty. | Faulty configuration data of the EMU function. | • Undo the changes in the EMU configuration or enter new values.<br>• Reload the configuration data. Next switch the DCS..B option off and on again.<br>• If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version. |
| | | | 34 | PSC range check is faulty. | Faulty configuration data of the PSC function. | • Undo the changes in the PSC configuration or enter new values.<br>• Reload the configuration data. Next switch the DCS..B option off and on again.<br>• If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version. |

27793230/EN – 08/2022

| Fault | | | Subfault | | | |
|---|---|---|---|---|---|---|
| Code | Designation | Response (P) | Code | Designation | Possible cause | Measure |
| 108 | DCS fault | Display fault | 35 | ESS range check is faulty. | Faulty configuration data of the ESS function. | • Undo the changes in the ESS configuration or enter new values.<br>• Reload the configuration data. Next switch the DCS..B option off and on again.<br>• If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version. |
| | | | 36 | ELC range check is faulty. | Faulty configuration data of the ELC function. | • Undo the changes in the ELC configuration or enter new values.<br>• Reload the configuration data. Next switch the DCS..B option off and on again.<br>• If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version. |
| | | | 37 | OLC range check is faulty. | Faulty configuration data of the OLC function. | • Undo the changes in the OLC configuration or enter new values.<br>• Reload the configuration data. Next switch the DCS..B option off and on again.<br>• If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version. |

27793230/EN – 08/2022

| Fault | | | Subfault | | | |
|---|---|---|---|---|---|---|
| Code | Designation | Response (P) | Code | Designation | Possible cause | Measure |
| 108 | DCS fault | Display fault | 38 | ZSC range check is faulty. | Faulty configuration data of the ZSC function. | • Undo the changes in the ZSC configuration or enter new values.<br>• Reload the configuration data. Next switch the DCS..B option off and on again.<br>• If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version. |
| | | | 39 | MSC range check is faulty. | Faulty configuration data of the MSC function. | • Undo the changes in the MSC configuration or enter new values.<br>• Reload the configuration data. Next switch the DCS..B option off and on again.<br>• If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version. |
| | | | 40 | DMC range check is faulty. | Faulty configuration data of the DMC function. | • Undo the changes in the DMC configuration or enter new values.<br>• Reload the configuration data. Next switch the DCS..B option off and on again.<br>• If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version. |

27793230/EN – 08/2022

| Fault | | | Subfault | | | |
|---|---|---|---|---|---|---|
| Code | Designation | Response (P) | Code | Designation | Possible cause | Measure |
| 108 | DCS fault | Display fault | 41 | JSS range check is faulty. | Faulty configuration data of the JSS function. | • Undo the changes in the JSS configuration or enter new values.<br>• Reload the configuration data. Next switch the DCS..B option off and on again.<br>• If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version. |
| | | | 42 | PLC range check is faulty. | Incorrect IL application program. | • Compile the application program again, load it, and switch the DCS..B option off and on again.<br>• If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version. |
| | | | 43 | Shutdown channel range check is faulty. | Internal configuration data fault. | • Undo the changes in the disconnection (configuration) or enter new values.<br>• Reload the configuration data. Next switch the DCS..B option off and on again.<br>• If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version. |

27793230/EN – 08/2022

| Fault | | | Subfault | | | |
|---|---|---|---|---|---|---|
| Code | Designation | Response (P) | Code | Designation | Possible cause | Measure |
| 108 | DCS fault | Display fault | 44 | Digital output range check is faulty. | Faulty configuration data of digital outputs. | • Undo the changes in the disconnection matrix of the digital outputs or enter new values.<br>• Reload the configuration data. Next switch the DCS..B option off and on again.<br>• If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version. |
| | | | 45 | Digital output range check is faulty. | Faulty configuration data of digital outputs. | • Undo the changes in the disconnection matrix of the digital outputs or enter new values.<br>• Reload the configuration data. Next switch the DCS..B option off and on again.<br>• If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version. |
| | | | 46 | Encoder type range check is faulty. | Incorrectly configured encoder type. | • Undo the changes in the encoder configuration or enter new values.<br>• Reload the configuration data. Next switch the DCS..B option off and on again.<br>• If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version. |

27793230/EN – 08/2022

| Fault | | | Subfault | | | |
|---|---|---|---|---|---|---|
| Code | Designation | Response (P) | Code | Designation | Possible cause | Measure |
| 108 | DCS fault | Display fault | 47 | Encoder scaling range check is faulty. | Incorrectly configured encoder distance. | • Undo changes made to the encoder distance (measuring length, resolution or max. speed) or enter new values.<br>• Reload the configuration data. Next switch the DCS..B option off and on again.<br>• If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version. |
| | | | 48 | Encoder position range check is faulty. | Incorrectly configured encoder distance. | • Undo changes made to the encoder distance (measuring length, resolution or max. speed) or enter new values.<br>• Reload the configuration data. Next switch the DCS..B option off and on again.<br>• If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version. |
| | | | 49 | PDM range check is faulty. | Faulty configuration of the PDM function. | • Undo the changes in the PDM configuration or enter new values.<br>• Reload the configuration data. Next switch the DCS..B option off and on again.<br>• If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version. |

27793230/EN – 08/2022

| Fault | | | Subfault | | | |
|---|---|---|---|---|---|---|
| Code | Designation | Response (P) | Code | Designation | Possible cause | Measure |
| 108 | DCS fault | Display fault | 50<br>51 | Fault during internal data transmission. | - | • Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |
| | | | 52<br>53 | Fault during internal data transmission. | - | • Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |
| | | | 54<br>55 | Internal program fault. | - | • Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |
| | | | 56<br>57 | Faulty watchdog test. | Faulty feedback of internal shutdown channel of the digital outputs. | • Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |
| | | | 58<br>59 | Faulty process data. | - | • Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |
| | | | 62<br>63 | Internal processing fault in user program. | - | • Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |
| 108 | DCS fault | Display fault | 64<br>65 | Internal processing fault in user program. | - | • Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |
| | | | 66<br>67 | Internal processing fault in user program. | - | • Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |
| | | | 68<br>69 | Internal processing fault of input element | - | • Reload the configuration data. Next switch the DCS..B option off and on again.<br>• If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version. |
| | | | 70<br>71 | Internal processing fault of input element | - | • Reload the configuration data. Next switch the DCS..B option off and on again.<br>• If the fault occurs again, contact SEW-EURODRIVE Service for the proper MOVISAFE® software version. |
| | | | 72<br>73 | Internal processing fault in user program | - | • Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |

27793230/EN – 08/2022

| Fault | | | Subfault | | | |
|---|---|---|---|---|---|---|
| Code | Designation | Response (P) | Code | Designation | Possible cause | Measure |
| 108 | DCS fault | Display fault | 74<br>75 | Runtime fault. | - | • Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |
| | | | 80 | Runtime fault | - | • Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |
| | | | 82<br>83 | Interrupt fault during time monitoring. | - | • Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |
| | | | 85<br>86 | Runtime fault. | - | • Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |
| | | | 87<br>88 | Program fault. | - | • Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |
| | | | 89<br>90 | Internal CPU fault. | - | • Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |
| 108 | DCS fault | Display fault | 91<br>92 | Internal CPU fault. | - | • Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |
| | | | 93<br>94 | Internal CPU fault. | - | • Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |
| | | | 95<br>96 | Internal RAM fault. | - | • Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |
| | | | 97<br>98 | Internal flash fault. | - | • Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |
| | | | 99<br>100 | Internal CPU fault | - | • Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |
| | | | 101<br>102 | Internal processing fault PROFIsafe. | - | • Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |

27793230/EN – 08/2022

| Fault | | | Subfault | | | |
|---|---|---|---|---|---|---|
| Code | Designation | Response (P) | Code | Designation | Possible cause | Measure |
| 108 | DCS fault | Display fault | 103<br>104 | Internal processing fault PROFIsafe. | - | • Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |
| | | | 105<br>106 | Internal processing fault PROFIsafe. | - | • Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |
| | | | 107<br>108 | Fault during internal data transmission. | - | • Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |
| | | | 109<br>110 | Fault during internal data transmission. | - | • Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |
| | | | 111<br>112 | Fault during internal data transmission. | - | • Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |
| 108 | DCS fault | Display fault | 113<br>114 | Fault during internal data transmission. | - | • Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |
| | | | 117<br>118 | Fault during internal data transmission. | - | • Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |
| | | | 119 | Fault during internal data transmission. | - | • Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |
| | | | 140<br>141 | Faulty core voltage DMP1. | • Incorrect core voltage of the DCS..B option.<br>• Faulty component on the DCS..B option | • Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |
| | | | 142<br>143 | Faulty core voltage DMPM. | • Incorrect core voltage of the DCS..B option.<br>• Faulty component on the DCS..B option | • Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |
| | | | 156<br>157 | Faulty RAM test. | - | • Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |
| 108 | DCS fault | Display fault | 160<br>161 | Faulty test of static registers. | - | • Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |

27793230/EN – 08/2022

| 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. | • Check hardware connection to MOVIDRIVE® B.<br>• Check firmware version of MOVIDRIVE® B.<br>• Apply braided shield of encoder cable, motor cable, and TF cable over a large area.<br>• Establish equipotential bonding. |
| | | | 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). | • Check configuration of the DI1 digital input according to configuration and wiring diagram.<br>• Check the wiring. |
| | | | 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). | • Check configuration of the DI2 digital input according to configuration and wiring diagram.<br>• Check the wiring. |
| | | | 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). | • Check configuration of the DI3 digital input according to configuration and wiring diagram.<br>• Check the wiring. |
| | | | 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). | • Check configuration of the DI4 digital input according to configuration and wiring diagram.<br>• Check the wiring. |

27793230/EN – 08/2022

| Fault | | | Subfault | | | |
|---|---|---|---|---|---|---|
| Code | Designation | Response (P) | Code | Designation | Possible cause | Measure |
| 109 | DCS alarm | Display fault | 10<br>11 | Pulse 1 plausibility fault at digital input DI5. | The configured pulse 1 voltage is not present at digital input DI5 (X81:7). | • Check configuration of the DI5 digital input according to configuration and wiring diagram.<br>• Check the wiring. |
| | | | 12<br>13 | Pulse 1 plausibility fault at digital input DI6. | The configured pulse 1 voltage is not present at digital input DI6 (X81:8). | • Check configuration digital input DI6 according to configuration and wiring diagram.<br>• Check the wiring. |
| | | | 14<br>15 | Pulse 1 plausibility fault at digital input DI7. | The configured pulse 1 voltage is not present at digital input DI7 (X81:9). | • Check configuration of the DI7 digital input according to configuration and wiring diagram.<br>• Check the wiring. |
| | | | 16<br>17 | Pulse 1 plausibility fault at digital input DI8. | The configured pulse 1 voltage is not present at digital input DI8 (X81:10). | • Check configuration of digital input DI8 according to configuration and wiring diagram.<br>• Check the wiring. |
| | | | 18<br>19 | Pulse 2 plausibility fault at digital input DI1. | The configured pulse 2 voltage is not present at digital input DI1 (X81:2). | • Check configuration of the DI1 digital input according to configuration and wiring diagram.<br>• Check the wiring. |
| | | | 20<br>21 | Pulse 2 plausibility fault at digital input DI2. | The configured pulse 2 voltage is not present at digital input DI2 (X81:3). | • Check configuration of the DI2 digital input according to configuration and wiring diagram.<br>• Check the wiring. |
| | | | 22<br>23 | Pulse 2 plausibility fault at digital input DI3. | The configured pulse 2 voltage is not present at digital input DI3 (X81:4). | • Check configuration of the DI3 digital input according to configuration and wiring diagram.<br>• Check the wiring. |
| | | | 24<br>25 | Pulse 2 plausibility fault at digital input DI4. | The configured pulse 2 voltage is not present at digital input DI4 (X81:5). | • Check configuration of the DI4 digital input according to configuration and wiring diagram.<br>• Check the wiring. |

27793230/EN – 08/2022

| Fault | | | Subfault | | | |
|---|---|---|---|---|---|---|
| Code | Designation | Response (P) | Code | Designation | Possible cause | Measure |
| 109 | DCS alarm | Display fault | 26<br>27 | Pulse 2 plausibility fault at digital input DI5. | The configured pulse 2 voltage is not present at digital input DI5 (X81:7). | • Check configuration of the DI5 digital input according to configuration and wiring diagram.<br>• Check the wiring. |
| | | | 28<br>29 | Pulse 2 plausibility fault at digital input DI6. | The configured pulse 2 voltage is not present at digital input DI6 (X81:8). | • Check configuration digital input DI6 according to configuration and wiring diagram.<br>• Check the wiring. |
| | | | 30<br>31 | Pulse 2 plausibility fault at digital input DI7. | The configured pulse 2 voltage is not present at digital input DI7 (X81:9). | • Check configuration of the DI7 digital input according to configuration and wiring diagram.<br>• Check the wiring. |
| | | | 32<br>33 | Pulse 2 plausibility fault at digital input DI8. | The configured pulse 2 voltage is not present at digital input DI8 (X81:10). | • Check configuration of digital input DI8 according to configuration and wiring diagram.<br>• Check the wiring. |
| | | | 34<br>35 | Plausibility fault in the speed detection. | The difference between the two speed sensors is higher than the configured speed switch-off threshold. | • Check track again with the set data in the encoder configuration.<br>• Check speed sensor.<br>• Use the SCOPE function to set speed signals so that they are congruent. |
| 109 | DCS alarm | Display fault | 36<br>37 | Plausibility fault in the position detection. | The difference between the two position signals is higher than the configured increment switch-off threshold. | • Check track with the configured data of the encoder setting.<br>• Check position signal.<br>• Are all signals connected to the 9-pin encoder connector?<br>• Check the encoder connector for correct connection.<br>• Use the SCOPE function to set positions signals so that they are congruent.<br>• If the absolute value is to be used via the backplane bus, it may be necessary to adapt the *Switch-off Threshold Incr.* parameter. |
| | | | 38<br>39 | Plausibility fault incorrect position range. | The current position is outside the configured measurement range. | • Check track with the configured data of the encoder setting.<br>• Check position signal, correct offset if necessary.<br>• Use the SCOPE function to set positions signals so that they are congruent. |
| | | | 40<br>41 | Plausibility fault incorrect speed. | The current speed exceeds the configured maximum speed. | • The drive moves outside the permitted and configured speed range.<br>• Check the configuration (encoder screen: max. set speed).<br>• Analyze the speed profile using the SCOPE function. |

| Fault | | | Subfault | | | |
|---|---|---|---|---|---|---|
| Code | Designation | Response (P) | Code | Designation | Possible cause | Measure |
| 109 | DCS alarm | Display fault | 42<br>43 | Plausibility fault incorrect acceleration. | The current acceleration exceeds the configured maximum acceleration. | • Check the configuration (encoder screen: max. set speed).<br>• Analyze the speed/acceleration profile using the SCOPE function. |
| | | | 44<br>45 | Plausibility fault in encoder interface (A3401 = encoder 1 and A3402 = encoder 2). | The encoder interface does not match the configured data | • Check encoder type and configuration (SSI/incremental)<br>• Check the encoder connection/wiring<br>• Check the polarity of the encoder data<br>• Check function of the encoder |
| | | | 46<br>47 | 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). | • Overload in the supply voltage of the encoder; internal polyswitch fuse has tripped.<br>• Check supply voltage of DCS..B option. |
| | | | 48<br>49 | 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 |
| | | | 50<br>51 | Difference level RS485 driver 1. Fault Faulty "B" or "Cycle" signal. | • No encoder connection.<br>• Incorrect encoder type connected. | • Check encoder connection.<br>• Check encoder cabling. |
| | | | 52<br>53 | Difference level RS485 driver 2. Fault Faulty "A" or "DATA" signal. | | |
| | | | 54<br>55 | Difference in incremental counter | | |
| 109 | DCS alarm | Display fault | 56<br>57 | Plausibility fault in encoder interface (A3401 = encoder 1 and A3402 = encoder 2) | The encoder interface does not match the configured data | • Check encoder type and configuration (SSI/incremental)<br>• Check the encoder connection/wiring<br>• Check the polarity of the encoder data<br>• Check function of the encoder |
| | | | 58<br>59 | Plausibility fault SIN/COS encoder connection. | Incorrect encoder type connected. | Check encoder connection and cabling. |
| | | | 60<br>61<br>62<br>63 | Plausibility fault in the incremental encoder connection | Phase fault of the incremental or SIN/COS encoder. | • Check encoder connection<br>• Replace defective encoder |
| | | | 64<br>65 | Plausibility fault - SSI encoder connection (master mode). | Connected encoder type does not correspond to the configuration. | • Check configuration.<br>• Check connected encoder. |
| | | | 66<br>67 | Plausibility fault SSI encoder connection (slave mode). | Connected encoder type does not correspond to the configuration. | • Check configuration.<br>• Check connected encoder. |
| | | | 68<br>69 | 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. |
| | | | 70<br>71 | 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. |
| | | | 72<br>73 | 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. |

27793230/EN – 08/2022

| Fault | | | Subfault | | | |
|---|---|---|---|---|---|---|
| Code | Designation | Response (P) | Code | Designation | Possible cause | Measure |
| 109 | DCS alarm | Display fault | 74<br>75 | 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. |
| | | | 76<br>77 | 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. |
| | | | 78<br>79 | 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. |
| | | | 80<br>81 | 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. |
| | | | 82<br>83 | Timeout fault MET. | Input element with time monitoring is faulty. | Check input element wiring. |
| | | | 84<br>85 | Timeout fault MEZ. | Two-hand control with time monitoring is faulty. | Check input element wiring. |
| | | | 86<br>87 | EMU1 monitoring fault. | • Faulty output control<br>• Faulty feedback | Check wiring at digital output. |
| | | | 88<br>89 | EMU2 monitoring fault | | |
| | | | 90<br>91 | Plausibility fault position changeover. | Position changeover during ZSC, JSS or DMC is permanently activated. | • Check ZSC (SOS) activation.<br>• Check JSS (SDI) activation.<br>• Check DMC (SDI) activation only for monitoring the position. |
| 109 | DCS alarm | Display fault | 92<br>93 | SSI encoder fault. | Encoder step SSI value within one cycle is too large. | • Check encoder configuration.<br>• Check encoder cabling. |
| | | | 94<br>95 | SSI encoder fault. | Plausibility fault for position adjustment. | • Check encoder configuration.<br>• Check encoder cabling. |
| | | | 96<br>97 | Plausibility fault of incremental encoder tracks. | • Different counting signals on A/B encoder tracks.<br>• Defective component at RS485 interface.<br>• Encoder operates outside tolerances of encoder interface. | • Check encoder configuration.<br>• Check encoder cabling.<br>• Check encoder signal levels.<br>• Check maximum counting frequency of incremental encoder. |
| | | | 98<br>99 | Plausibility fault analog/ digital comparison at Schmitt trigger output – encoder input X84. | • Connected encoder type does not correspond to the configuration.<br>• Faulty encoder signals<br>• Hardware defective | • Check configuration.<br>• Check connected encoder.<br>• Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |
| | | | 100<br>101 | Plausibility fault analog/ digital comparison at Schmitt trigger output – encoder input X85. | • Connected encoder type does not correspond to the configuration.<br>• Faulty encoder signals<br>• Hardware defective | • Check configuration.<br>• Check connected encoder.<br>• Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |
| | | | 110<br>111 | Position processing range check for DCS22B/32B. | Position processing activated for DCS22B/32B options. | • Check configuration data.<br>• Deactivate position processing. |
| | | | 112<br>113 | Faulty OSSD input check. | Faulty OSSD test. | • Check DC 24 V input voltage of all OSSD inputs.<br>• Switch DCS..B option off and on again. |

27793230/EN – 08/2022

| Fault | | | Subfault | | | |
|---|---|---|---|---|---|---|
| Code | Designation | Response (P) | Code | Designation | Possible cause | Measure |
| 109 | DCS alarm | Display fault | 114<br>115 | 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. |
| | | | 116<br>117 | 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. |
| | | | 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<br>125 | Deactivation of digital input test faulty | Digital inputs are still active after deactivation. | • Check digital input wiring.<br>• Switch DCS..B option off and on again.<br>• Replace DCS..B option. |
| | | | 134<br>135 | Plausibility fault in the speed recording | The difference between the two speed sensors is higher than the configured speed switch-off threshold. | • Check track again with the set data in the encoder configuration.<br>• Check speed sensor.<br>• Use the SCOPE function to set speed signals so that they are congruent. |
| 109 | DCS alarm | Display fault | 136<br>137 | Plausibility fault in the position detection. | The difference between the two position signals is higher than the configured increment switch-off threshold. | • Check track with the configured data of the encoder setting.<br>• Check position signal.<br>• Are all signals connected correctly to the 9-pin encoder connector?<br>• Check encoder connector for correct connection.<br>• Use the SCOPE function to set positions signals so that they are congruent. |
| | | | 138<br>139 | Plausibility fault incorrect position range. | The current position is outside the configured measurement range. | • Check track with the configured data of the encoder setting.<br>• Check position signal, correct offset if necessary.<br>• Use the SCOPE function to set positions signals so that they are congruent. |
| | | | 140<br>141 | Plausibility fault incorrect speed. | The current speed exceeds the configured maximum speed. | • The drive moves outside the permitted and configured speed range.<br>• Check the configuration (encoder screen: max. set speed).<br>• Analyze the speed profile using the SCOPE function. |
| | | | 142<br>143 | Plausibility fault incorrect acceleration. | The current acceleration is outside the configured acceleration range. The drive has exceeded the permitted acceleration range | • Check the configuration (encoder screen: max. set speed).<br>• Analyze the speed/acceleration profile using the SCOPE function. |

27793230/EN – 08/2022

| Fault | | | Subfault | | | |
|---|---|---|---|---|---|---|
| Code | Designation | Response (P) | Code | Designation | Possible cause | Measure |
| 109 | DCS alarm | Display fault | 146<br>147 | 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). | • Overload in the supply voltage of the encoder; internal polyswitch fuse has tripped.<br>• Check supply voltage of DCS..B option. |
| | | | 150<br>151 | Difference level RS485 driver. Fault Faulty "B" or "Cycle" signal. | • No encoder connection.<br>• Incorrect encoder type connected. | • Check encoder connection.<br>• Check encoder cabling. |
| | | | 152<br>153 | Difference level RS485 driver. Fault Faulty "A" or "DATA" signal. | • No encoder connection.<br>• Incorrect encoder type connected. | • Check encoder connection.<br>• Check encoder cabling. |
| | | | 158<br>159 | Plausibility fault SIN/COS encoder connection. | Incorrect encoder type connected. | Check encoder connection and cabling. |
| | | | 164<br>165 | Plausibility fault - SSI encoder connection (master mode). | Connected encoder type does not correspond to the configuration. | • Check encoder connection and cabling.<br>• Check encoder. |
| | | | 166<br>167 | Plausibility fault SSI encoder connection (slave mode). | Connected encoder type does not correspond to the configuration | • Check encoder connection and cabling.<br>• Check encoder. |
| | | | 186<br>187 | EMU1 monitoring fault. | Faulty monitoring of the external shutdown channel. | • Check hardware connections.<br>• Pick-up or release time too short.<br>• Check switch contacts. |
| | | | 188<br>189 | EMU2 monitoring fault. | Faulty monitoring of the external shutdown channel. | • Check hardware connections.<br>• Pick-up or release time too short.<br>• Check switch contacts. |
| 109 | DCS alarm | Display fault | 190<br>191 | Plausibility fault position changeover. | Position changeover during ZSC, JSS or DMC is permanently activated. | • Check ZSC (SOS) activation.<br>• Check JSS (SDI) activation.<br>• Check DMC (SDI) activation only for monitoring the position. |
| | | | 192<br>193 | SSI encoder fault. | Encoder step SSI value within one cycle is too large. | • Check encoder configuration.<br>• Check encoder cabling. |
| | | | 194<br>195 | SSI encoder fault. | Plausibility fault for position adjustment. | • Check encoder configuration.<br>• Check encoder cabling. |
| | | | 196<br>197 | Plausibility fault of incremental encoder tracks. | • Different counting signals on A/B encoder tracks.<br>• Defective component at RS485 interface.<br>• Encoder operates outside tolerances of encoder interface. | • Check encoder configuration.<br>• Check encoder cabling.<br>• Check encoder signal levels.<br>• Check maximum counting frequency of incremental encoder. |
| | | | 198<br>199 | Plausibility fault analog/ digital comparison at Schmitt trigger output – encoder input X84. | • Connected encoder type does not correspond to the configuration.<br>• Faulty encoder signals<br>• Hardware defective | • Check configuration.<br>• Check connected encoder.<br>• Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |
| | | | 200<br>201 | Plausibility fault analog/ digital comparison at Schmitt trigger output – encoder input X85. | • Connected encoder type does not correspond to the configuration.<br>• Faulty encoder signals<br>• Hardware defective | • Check configuration.<br>• Check connected encoder.<br>• Replace DCS..B option.<br>• Send faulty DCS..B option with fault number to SEW-EURODRIVE for fault diagnostics. |

27793230/EN – 08/2022

| Fault | | | Subfault | | | |
|---|---|---|---|---|---|---|
| Code | Designation | Response (P) | Code | Designation | Possible cause | Measure |
| 110 | "Ex-e protection" fault | Emergency stop | 0 | Duration of operation below 5 Hz exceeded | Duration of operation below 5 Hz exceeded | • Check configuration<br>• Shorten duration of operation below 5 Hz |
| 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 | | • Check startup<br>• Check wiring |
| 122 | "Absolute encoder option" | Immediate stop | 2 | X15: Unknown encoder type | Connected encoder type unknown | Replace encoder |
| | | | 16386 | X14: Unknown encoder type | | |
| | | | 1 | X15: Plausibility monitoring | • Encoder cable or shield not connected correctly<br>• Short circuit / broken wire in encoder cable<br>• Encoder defective<br>• EMC interference | • Check encoder cable and shield for correct connection, short circuit and broken wire<br>• Replace encoder<br>• Providing for EMC measures |
| | | | 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 | • Encoder cable or shield not connected correctly<br>• Short circuit / broken wire in encoder cable<br>• Encoder defective<br>• EMC interference | • Check encoder cable and shield for correct connection, short circuit and broken wire<br>• Replace encoder<br>• Providing for EMC measures |
| | | | 256 | X15: Voltage dip | | |
| | | | 257 | X15: Interrupted clock or data line | | |
| | | | 258 | X15: Change of position | | |
| | | | 261 | X15: No high level present | • Encoder cable or shield not connected correctly<br>• Short circuit / broken wire in encoder cable<br>• Encoder defective<br>• EMC interference | • Check encoder cable and shield for correct connection, short circuit and broken wire<br>• Replace encoder<br>• Providing for EMC measures |
| | | | 513 | X15: Plausibility monitoring | | |
| | | | 768 | X15: PDO timeout | | |
| | | | 770 | X15: Change of position | | |

27793230/EN – 08/2022

| Fault | | | Subfault | | | |
|---|---|---|---|---|---|---|
| Code | Designation | Response (P) | Code | Designation | Possible cause | Measure |
| 122 | "Absolute encoder option" | Immediate stop | 16385 | X14: Plausibility monitoring | • Encoder cable or shield not connected correctly<br>• Short circuit / broken wire in encoder cable<br>• Encoder defective<br>• EMC interference | • Check encoder cable and shield for correct connection, short circuit and broken wire<br>• Replace encoder<br>• Providing for EMC measures |
| | | | 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 | • Encoder cable or shield not connected correctly<br>• Short circuit / broken wire in encoder cable<br>• Encoder defective<br>• EMC interference | • Check encoder cable and shield for correct connection, short circuit and broken wire<br>• Replace encoder<br>• Providing for EMC measures |
| | | | 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 | • Encoder cable or shield not connected correctly<br>• Short circuit / broken wire in encoder cable<br>• Encoder defective<br>• EMC interference | • Check encoder cable and shield for correct connection, short circuit and broken wire<br>• Replace encoder<br>• Providing for EMC measures |
| | | | 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 | | |

27793230/EN – 08/2022

| Fault | | | Subfault | | | |
|---|---|---|---|---|---|---|
| Code | Designation | Response (P) | Code | Designation | Possible cause | Measure |
| 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 | • Improve ventilation and cooling conditions<br>• Improve air supply to the control cabinet; check filter mats |

27793230/EN – 08/2022

| Fault | | | Subfault | | | |
|---|---|---|---|---|---|---|
| Code | Designation | Response (P) | Code | Designation | Possible cause | Measure |
| 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 | • Consult SEW Service<br>• Replace precharge/discharge control |
| | | | 3 | Inverter coupling | Defective inverter coupling | • Consult SEW Service<br>• Replace inverter coupling |
| | | | 4 | Inverter coupling reference voltage | Defective inverter coupling | • Consult SEW Service<br>• Replace inverter coupling |
| | | | 5 | Power sections configuration | Different phase modules installed in the unit | • Inform the SEW Service<br>• Check and replace phase modules |
| | | | 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 | • Check the cabling.<br>• Consult SEW Service |
| | | | 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 | Control unit configuration | Missing PLD functionality for EEPROM data set size 7 | Replace control unit |
| | | | 15 | Inverter coupling fault | Inverter coupling processor has signaled internal fault | • Consult SEW Service if the fault occurs again.<br>• Replace inverter coupling |
| | | | 16 | Inverter coupling fault: PLD version incompatible | | Replace inverter coupling |
| | | | 17 | Precharge/discharge control fault | Precharge/discharge control processor has signaled internal fault | • Consult SEW Service if the fault occurs again.<br>• Replace precharge/discharge controller |
| | | | 18 | Defective DC link fan | Faulty DC link fan | • Consult SEW Service<br>• Check whether DC link choke fan is connected or faulty |
| | | | 19 | Communication power section control unit | Faulty communication with inverter coupling during operation: more than 1 internal fault per second | • Consult SEW Service if the fault occurs again.<br>• Replace inverter coupling |
| | | | 20 | Communication power section control unit | The control unit has not sent any messages to the inverter coupling for a while | • Consult SEW Service if the fault occurs again.<br>• Replace inverter coupling |
| | | | 21 | Uz measurement not plausible<br>Phase R | Defective phase module | Consult SEW Service if the fault occurs again. |
| | | | 22 | Ur measurement not plausible<br>Phase S | | |
| | | | 23 | Uz measurement not plausible<br>Phase T | | |

27793230/EN – 08/2022

| Fault | | | Subfault | | | |
|---|---|---|---|---|---|---|
| Code | Designation | Response (P) | Code | Designation | Possible cause | Measure |
| 197 | Supply system | Immediate stop | 1 | Line overvoltage (motor inverter only at start of precharging process) | Inadequate line voltage quality | • Check supply (fuses, contactor)<br>• Check configuration of the supply system |
| | | | 2 | Line undervoltage (only with line inverter) | | |
| 199 | DC link charging | Immediate stop | 4 | Precharging was aborted | Unable to charge DC link | • Precontrol overload<br>• Connected DC link capacity too high<br>• Short circuit in the DC link; check DC link connection in case of several units |

27793230/EN – 08/2022

## 16.4 SEW-EURODRIVE electronics service

### 16.4.1 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, ⅄ or ⅄ connection)
- Nature of the fault
- Accompanying circumstances
- Your own presumptions as to what has happened
- Any unusual events preceding the problem, etc.

## 16.5 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.

27793230/EN – 08/2022

## 16.6 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

27793230/EN – 08/2022

# 17 Declarations of conformity

## 17.1 MOVIDRIVE®

### 17.1.1 Declaration of conformity

## EU Declaration of Conformity

SEW EURODRIVE

**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**<br>**(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**<br>**(L 96, March 29, 2014, 79-106)** | **4)** |
| **RoHS Directive** | **2011/65/EU**<br>**(L 174, July 1, 2011, 88-110)** | |
| **Applied harmonized standards:** | **EN ISO 13849-1:2008/AC:2009**<br>**EN 61800-5-1:2007**<br>**EN 61800-3:2004/A1:2012**<br>**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<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

27793230/EN – 08/2022

## 17.2 MOVIDRIVE® with DFS11B/DFS21B

### 17.2.1 Declaration of conformity

# EU Declaration of Conformity

SEW EURODRIVE

**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**<br>**DFS21B PROFINET IO with PROFIsafe** |
| **in accordance with** | |
| **Machinery Directive** | **2006/42/EC**<br>**(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**<br>**(L 96, March 29, 2014, 79-106)** | **4)** |
| **RoHS Directive** | **2011/65/EU**<br>**(L 174, July 1, 2011, 88-110)** | |
| **Applied harmonized standards:** | **EN ISO 13849-1:2008/AC:2009**<br>**EN 61800-5-1:2007**<br>**EN 61800-3:2004/A1:2012**<br>**EN 50581:2012** | |
| **Other applied standards:** | **EN 61508:2001 (part 1-7)**<br>**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** | Johann Soder | |
|---|---|---|---|
| Place | Date | 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

27793230/EN – 08/2022

## 17.3 MOVIDRIVE® with DCS2.B/DCS3.B

### 17.3.1 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

| | |
|---|---|
| **Frequency inverters of the product family** | **MOVIDRIVE® MDX6.B....-..3-.-../.** |
| **with built-in** | **DCS2.B with DFS12B PROFIBUS-DP-V1 with PROFIsafe**<br>**DCS2.B with DFS22B PROFINET IO with PROFIsafe**<br>**DCS3.B** |
| **in accordance with** | |
| **Machinery Directive** | **2006/42/EC**<br>**(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**<br>**(L 96, March 29, 2014, 79-106)** | **4)** |
| **RoHS Directive** | **2011/65/EU**<br>**(L 174, July 1, 2011, 88-110)** | |
| **Applied harmonized standards:** | **EN ISO 13849-1:2008/AC:2009**<br>**EN 61800-3:2004/A1:2012**<br>**EN 61800-5-1:2007**<br>**EN 61800-5-2:2007**<br>**EN 50581:2012** | |
| **Other applied standards:** | **EN 61508:2001 (part 1-7)**<br>**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.

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** | Johann Soder | |
|---|---|---|---|
| Place | Date | 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

27793230/EN – 08/2022

# 18 Address list

| | | | |
|---|---|---|---|
| **Argentina** | | | |
| 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>http://www.sew-eurodrive.com.ar<br>sewar@sew-eurodrive.com.ar |
| **Australia** | | | |
| 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>http://www.sew-eurodrive.com.au<br>enquires@sew-eurodrive.com.au |
| | 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>enquires@sew-eurodrive.com.au |
| **Austria** | | | |
| 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>http://www.sew-eurodrive.at<br>sew@sew-eurodrive.at |
| **Bangladesh** | | | |
| Sales | Bangladesh | SEW-EURODRIVE INDIA PRIVATE LIMITED<br>345 DIT Road<br>East Rampura<br>Dhaka-1219, Bangladesh | Tel. +88 01729 097309<br>salesdhaka@seweurodrivebangladesh.com |
| **Belarus** | | | |
| Sales | Minsk | Foreign unitary production enterprise SEW-EURODRIVE<br>Novodvorskij village council 145<br>223016, Minsk region | Tel. +375 17 319 47 56 / +375 17 378 47 58<br>Fax +375 17 378 47 54<br>http://www.sew-eurodrive.by<br>sew@sew-eurodrive.by |
| **Belgium** | | | |
| 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>http://www.sew-eurodrive.be<br>info@sew-eurodrive.be |
| Service Competence Center | Industrial Gears | SEW-EURODRIVE n.v./s.a.<br>Rue du Parc Industriel, 31<br>6900 Marche-en-Famenne | Tel. +32 84 219-878<br>Fax +32 84 219-879<br>http://www.sew-eurodrive.be<br>info@sew.be |
| **Brazil** | | | |
| Production<br>Sales<br>Service | São Paulo | SEW-EURODRIVE Brasil Ltda.<br>Estrada Municipal José Rubim, 205 – Rodovia Santos Dumont Km 49<br>Indaiatuba – 13347-510 – SP | Tel. +55 19 3835-8000<br>sew@sew.com.br |
| 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>montadora.rc@sew.com.br |
| | Joinville | SEW-EURODRIVE Brasil Ltda. Jvl / Ind<br>Rua Dona Francisca, 12.346 – Pirabeiraba<br>89239-270 – Joinville / SC | Tel. +55 47 3027-6886<br>Fax +55 47 3027-6888<br>filial.sc@sew.com.br |
| **Bulgaria** | | | |
| Sales | Sofia | BEVER-DRIVE GmbH<br>Bogdanovetz Str.1<br>1606 Sofia | Tel. +359 2 9151160<br>Fax +359 2 9151166<br>bever@bever.bg |

27793230/EN – 08/2022

| | | | |
|---|---|---|---|
| **Cameroon** | | | |
| Sales | Douala | SEW-EURODRIVE SARLU<br>Ancienne Route Bonabéri<br>P.O. Box<br>B.P 8674<br>Douala-Cameroun | Tel. +237 233 39 12 35<br>Fax +237 233 39 02 10<br>www.sew-eurodrive.ci/<br>info@sew-eurodrive.cm |
| **Canada** | | | |
| 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>http://www.sew-eurodrive.ca<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>2001 Ch. de l'Aviation<br>Dorval<br>Quebec H9P 2X6 | Tel. +1 514 367-1124<br>Fax +1 514 367-3677<br>n.paradis@sew-eurodrive.ca |
| **Chile** | | | |
| Assembly<br>Sales<br>Service | Santiago de Chile | SEW-EURODRIVE CHILE LTDA<br>Las Encinas 1295<br>Parque Industrial Valle Grande<br>LAMPA<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>http://www.sew-eurodrive.cl<br>ventas@sew-eurodrive.cl |
| **China** | | | |
| 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>http://www.sew-eurodrive.cn<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 |

27793230/EN – 08/2022

| | | | |
|---|---|---|---|
| **Colombia** | | | |
| 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>http://www.sew-eurodrive.com.co<br>sew@sew-eurodrive.com.co |
| **Croatia** | | | |
| 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>kompeks@inet.hr |
| **Czech Republic** | | | |
| 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>http://www.sew-eurodrive.cz<br>sew@sew-eurodrive.cz |
| **Denmark** | | | |
| 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>http://www.sew-eurodrive.dk<br>sew@sew-eurodrive.dk |
| Service | Vejle | SEW-EURODRIVE A/S<br>Bødkervej 2<br>7100 Vejle | Tel. +45 43 9585 00<br>http://www.sew-eurodrive.dk<br>sew@sew-eurodrive.dk |
| **Egypt** | | | |
| Representation: United Arab Emirates | | | |
| **Estonia** | | | |
| Sales | Tallin | ALAS-KUUL AS<br>Loomäe tee 1, Lehmja küla<br>75306 Rae vald Harjumaa | Tel. +372 6593230<br>Fax +372 6593231<br>http://www.alas-kuul.ee<br>info@alas-kuul.ee |
| **Finland** | | | |
| 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>http://www.sew-eurodrive.fi<br>sew@sew.fi |
| Service | Hollola | SEW-EURODRIVE OY<br>Keskikankaantie 21<br>15860 Hollola | Tel. +358 201 589-300<br>Fax +358 3 780-6211<br>http://www.sew-eurodrive.fi<br>sew@sew.fi |
| | Tornio | SEW-EURODRIVE Oy<br>Lossirannankatu 5<br>95420 Tornio | Tel. +358 201 589 300<br>Fax +358 3 780 6211<br>http://www.sew-eurodrive.fi<br>sew@sew.fi |
| 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>http://www.sew-eurodrive.fi<br>sew@sew.fi |
| **France** | | | |
| Production<br>Sales | Haguenau | SEW USOCOME<br>48-54 route de Soufflenheim<br>B. P. 20185<br>67506 Haguenau Cedex | Tel. +33 3 88 73 67 00<br>http://www.usocome.com<br>sew@usocome.com |
| 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 |

27793230/EN – 08/2022

| France | | | |
|---|---|---|---|
| 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>dtcbordeaux@usocome.com |
| | Haguenau | SEW USOCOME<br>48-54 route de Soufflenheim<br>B. P. 20185<br>67506 Haguenau Cedex | Tel. +33 3 88 73 67 00<br>dtchaguenau@usocome.com |
| | Lyon | SEW USOCOME<br>75 rue Antoine Condorcet<br>38090 Vaulx-Milieu | Tel. +33 4 74 99 60 00<br>dtclyon@usocome.com |
| | 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>dtcnantes@usocome.com |
| | Paris | SEW USOCOME<br>Zone industrielle<br>2 rue Denis Papin<br>77390 Verneuil l'Étang | Tel. +33 1 64 42 40 80<br>dtcparis@usocome.com |

| Gabon |
|---|
| Representation: Cameroon |

| 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>http://www.sew-eurodrive.de<br>sew@sew-eurodrive.de |
| Production / Industrial 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 / Precision Gear Units | 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>sew@sew-eurodrive.de |
| 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 |
| Service Competence Center | Mechanics / 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>scc-mechanik@sew-eurodrive.de |
| | Electronics | SEW-EURODRIVE GmbH & Co KG<br>Christian-Pähr-Straße 12<br>76646 Bruchsal | Tel. +49 7251 75-1780<br>Fax +49 7251 75-1769<br>scc-elektronik@sew-eurodrive.de |
| | MAXOLUTION® Factory Automation | SEW-EURODRIVE GmbH & Co KG<br>Eisenbahnstraße 11<br>76646 Bruchsal | Tel. +49 7251 75-0<br>Fax +49 7251 75-1970<br>sew@sew-eurodrive.de |
| Drive Technology Center | North | SEW-EURODRIVE GmbH & Co KG<br>Alte Ricklinger Straße 43<br>30823 Garbsen (Hannover) | Tel. +49 5137 8798-30<br>Fax +49 5137 8798-55<br>dtc-nord@sew-eurodrive.de |
| | East | SEW-EURODRIVE GmbH & Co KG<br>Dänkritzer Weg 1<br>08393 Meerane (Zwickau) | Tel. +49 3764 7606-0<br>Fax +49 3764 7606-20<br>dtc-ost@sew-eurodrive.de |
| | South | SEW-EURODRIVE GmbH & Co KG<br>Domagkstraße 5<br>85551 Kirchheim (München) | Tel. +49 89 909551-21<br>Fax +49 89 909551-50<br>dtc-sued@sew-eurodrive.de |
| | West | SEW-EURODRIVE GmbH & Co KG<br>Siemensstraße 1<br>40764 Langenfeld (Düsseldorf) | Tel. +49 2173 8507-10<br>Fax +49 2173 8507-50<br>dtc-west@sew-eurodrive.de |
| 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>dc-berlin@sew-eurodrive.de |
| | Bremen | SEW-EURODRIVE GmbH & Co KG<br>Allerkai 4<br>28309 Bremen | Tel. +49 421 33918-10<br>Fax +49 421 33918-22<br>tb-bremen@sew-eurodrive.de |

27793230/EN – 08/2022

| | | | |
|---|---|---|---|
| **Germany** | | | |
| | Hamburg | SEW-EURODRIVE GmbH & Co KG<br>Hasselbinnen 11<br>22869 Schenefeld | Tel. +49 40298109-60<br>Fax +49 40298109-70<br>dc-hamburg@sew-eurodrive.de |
| | 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>dc-saarland@sew-eurodrive.de |
| | Ulm | SEW-EURODRIVE GmbH & Co KG<br>Dieselstraße 18<br>89160 Dornstadt | Tel. +49 7348 9885-0<br>Fax +49 7348 9885-90<br>dc-ulm@sew-eurodrive.de |
| | 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 |
| **Great Britain** | | | |
| 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>http://www.sew-eurodrive.co.uk<br>info@sew-eurodrive.co.uk |
| **Greece** | | | |
| 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>http://www.boznos.gr<br>info@boznos.gr |
| **Hungary** | | | |
| Sales<br>Service | Budapest | SEW-EURODRIVE Kft.<br>Csillaghegyí út 13.<br>1037 Budapest | Tel. +36 1 437 06-58<br>Fax +36 1 437 06-50<br>http://www.sew-eurodrive.hu<br>office@sew-eurodrive.hu |
| **Iceland** | | | |
| Sales | Reykjavik | Varma & Vélaverk ehf.<br>Knarrarvogi 4<br>104 Reykjavík | Tel. +354 585 1070<br>Fax +354 585)1071<br>https://vov.is/<br>vov@vov.is |
| **India** | | | |
| Registered Office<br>Assembly<br>Sales<br>Service | Vadodara | SEW-EURODRIVE India Private Limited<br>302, NOTUS IT PARK,<br>Sarabhai Campus,<br>Beside Notus Pride, Genda Circle,<br>Vadodara 390023<br>Gujarat | Tel. +91 265 3045200<br>Fax +91 265 3045300<br>http://www.seweurodriveindia.com<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 |
| Sales<br>Service | Gurgaon | SEW-EURODRIVE India Private Limited<br>Drive Center Gurugram<br>Plot no 395, Phase-IV, UdyogVihar<br>Gurugram , 122016 Haryana | Tel. +91 99588 78855<br>salesgurgaon@seweurodriveindia.com |

27793230/EN – 08/2022

| | | | |
|---|---|---|---|
| **Indonesia** | | | |
| Sales | Medan | PT. Serumpun Indah Lestari<br>Jl.Pulau Solor no. 8, Kawasan Industri Medan II<br>Medan 20252 | Tel. +62 61 687 1221<br>Fax +62 61 6871429 / +62 61 6871458 / +62 61 30008041<br>sil@serumpunindah.com<br>serumpunindah@yahoo.com<br>http://www.serumpunindah.com |
| | Jakarta | PT. Cahaya Sukses Abadi<br>Komplek Rukan Puri Mutiara Blok A no 99, 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 Industri Terpadu, Pantai indah Kapuk Tahap III, Blok E No. 27<br>Jakarta 14470 | Tel. +62 21 2921-8899<br>Fax +62 21 2921-8988<br>aplindo@indosat.net.id<br>http://www.aplindo.com |
| | Surabaya | PT. TRIAGRI JAYA ABADI<br>Jl. Sukosemolo No. 63, Galaxi Bumi Permai G6 No. 11<br>Surabaya 60111 | Tel. +62 31 5990128<br>Fax +62 31 5962666<br>sales@triagri.co.id<br>http://www.triagri.co.id |
| | 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>http://www.cvmultimas.com |
| **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>http://www.alperton.ie<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>http://www.liraz-handasa.co.il<br>office@liraz-handasa.co.il |
| **Italy** | | | |
| Assembly<br>Sales<br>Service | Milan | SEW-EURODRIVE S.a.s. di SEW S.r.l. & Co.<br>Via Bernini,12<br>20033 Solaro (Milano) | Tel. +39 02 96 980229<br>Fax +39 02 96 980 999<br>http://www.sew-eurodrive.it<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 27 21 21 81 05<br>Fax +225 27 21 25 30 47<br>info@sew-eurodrive.ci<br>http://www.sew-eurodrive.ci |
| **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>http://www.sew-eurodrive.co.jp<br>sewjapan@sew-eurodrive.co.jp |
| **Kazakhstan** | | | |
| Sales<br>Service | 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>http://www.sew-eurodrive.com<br>kazakhstan@sew-eurodrive.com |
| | Tashkent | Representative Office SEW-EURODRIVE<br>Representative office in Uzbekistan<br>95A Amir Temur ave, office 401/3<br>100084 Tashkent | Tel. +998 97 134 01 99<br>http://www.sew-eurodrive.uz<br>sew@sew-eurodrive.uz |
| | Ulaanbaatar | IM Trading LLC<br>Olympic street 28B/3<br>Sukhbaatar district,<br>Ulaanbaatar 14230, MN | Tel. +976-77109997<br>Fax +976-77109997<br>imt@imt.mn |

27793230/EN – 08/2022

| | | | |
|---|---|---|---|
| **Latvia** | | | |
| Sales | Riga | SIA Alas-Kuul<br>Katlakalna 11C<br>1073 Riga | Tel. +371 6 7139253<br>Fax +371 6 7139386<br>http://www.alas-kuul.lv<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 , Saudi Arabia, Syria) | Beirut | 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>http://www.medrives.com<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>http://www.irseva.lt<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>http://www.boznos.mk |
| **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 |
| **Mexico** | | | |
| 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>http://www.sew-eurodrive.com.mx<br>scmexico@seweurodrive.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>http://www.sew-eurodrive.com.mx<br>scmexico@seweurodrive.com.mx |
| **Mongolia** | | | |
| Technical Office | Ulaanbaatar | IM Trading LLC<br>Olympic street 28B/3<br>Sukhbaatar district,<br>Ulaanbaatar 14230, MN | Tel. +976-77109997<br>Tel. +976-99070395<br>Fax +976-77109997<br>http://imt.mn/<br>imt@imt.mn |
| **Morocco** | | | |
| Sales<br>Service<br>Assembly | Bouskoura | SEW-EURODRIVE Morocco SARL<br>Parc Industriel CFCIM, Lot. 55/59<br>27182 Bouskoura<br>Grand Casablanca | Tel. +212 522 88 85 00<br>Fax +212 522 88 84 50<br>http://www.sew-eurodrive.ma<br>sew@sew-eurodrive.ma |
| **Namibia** | | | |
| Sales | Swakopmund | DB MINING & INDUSTRIAL SUPPLIES CC<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 |

27793230/EN – 08/2022

| | | | |
|---|---|---|---|
| **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>http://www.sew-eurodrive.nl<br>info@sew-eurodrive.nl |
| **New Zealand** | | | |
| 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>http://www.sew-eurodrive.co.nz<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 |
| **Nigeria** | | | |
| Sales | Lagos | Greenpeg Nig. Ltd<br>64C Toyin Street Opebi-Allen<br>Ikeja Lagos-Nigeria | Tel. +234-701-821-9200-1<br>http://www.greenpegltd.com<br>sales@greenpegltd.com |
| **Norway** | | | |
| 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>http://www.sew-eurodrive.no<br>sew@sew-eurodrive.no |
| **Pakistan** | | | |
| Sales | Karachi | Industrial Power Drives<br>Al-Fatah Chamber A/3, 1st Floor Central Commercial Area,<br>Sultan Ahmed Shah Road, Block 7/8,<br>Karachi | Tel. +92 21 452 9369<br>Fax +92-21-454 7365<br>seweurodrive@cyber.net.pk |
| **Paraguay** | | | |
| Sales | Fernando de la Mora | SEW-EURODRIVE PARAGUAY S.R.L<br>Nu Guazu No. 642 casi Campo Esperanza<br>Santisima Trinidad<br>Asuncion | Tel. +595 991 519695<br>Fax +595 21 3285539<br>sewpy@sew-eurodrive.com.py |
| **Peru** | | | |
| 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>http://www.sew-eurodrive.com.pe<br>sewperu@sew-eurodrive.com.pe |
| **Philippines** | | | |
| 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>http://www.ptcerna.com |
| **Poland** | | | |
| 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>http://www.sew-eurodrive.pl<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 |
| **Portugal** | | | |
| 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>http://www.sew-eurodrive.pt<br>infosew@sew-eurodrive.pt |

27793230/EN – 08/2022

| | | | |
|---|---|---|---|
| **Romania** | | | |
| 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>http://www.sialco.ro<br>sialco@sialco.ro |
| **Russia** | | | |
| Assembly<br>Sales<br>Service | St. Petersburg | ЗАО «СЕВ-ЕВРОДРАЙФ»<br>188660, Russia, Leningrad Region, Vse-volozhsky District, Korabselki, Aleksandra Nevskogo str.<br>building 4, block 1<br>P.O. Box 36<br>195220 St. Petersburg | Tel. +7 812 3332522 / +7 812 5357142<br>Fax +7 812 3332523<br>http://www.sew-eurodrive.ru<br>sew@sew-eurodrive.ru |
| **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>http://www.senemeca.com<br>senemeca@senemeca.sn |
| **Serbia** | | | |
| Sales | Belgrade | DIPAR d.o.o.<br>Ustanicka 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>http://www.sew-eurodrive.com.sg<br>sewsingapore@sew-eurodrive.com |
| **Slovakia** | | | |
| Sales | Bernolákovo | SEW-Eurodrive SK s.r.o.<br>Priemyselná ulica 6267/7<br>900 27 Bernolákovo | Tel.+421 2 48 212 800<br>http://www.sew-eurodrive.sk<br>sew@sew-eurodrive.sk |
| **Slovenia** | | | |
| Sales<br>Service | Celje | Pakman - Pogonska Tehnika d.o.o.<br>UI. 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>32 O'Connor Place<br>Eurodrive House<br>Aeroton<br>Johannesburg 2190<br>P.O.Box 90004<br>Bertsham 2013 | Tel. +27 11 248-7000<br>Fax +27 11 248-7289<br>http://www.sew.co.za<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 |

27793230/EN – 08/2022

| | | | |
|---|---|---|---|
| **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>http://www.sew-eurodrive.kr<br>master.korea@sew-eurodrive.com |
| | 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 |
| Assembly<br>Service | Siheung | SEW-EURODRIVE Korea Co., Ltd.<br>35, Emtibeui 26-ro 58beon-gil,<br>Siheung-si, Gyeonggi-do | http://www.sew-eurodrive.kr |
| **Spain** | | | |
| 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>http://www.sew-eurodrive.es<br>sew.spain@sew-eurodrive.es |
| **Sri Lanka** | | | |
| Sales | Colombo | SM International (Pte) Ltd<br>254, Galle Raod<br>Colombo 4, Sri Lanka | Tel. +94 1 2584887<br>Fax +94 1 2582981 |
| **Swaziland** | | | |
| Sales | Manzini | C G Trading Co. (Pty) Ltd<br>Simunye street<br>Matsapha, Manzini | Tel. +268 7602 0790<br>Fax +268 2 518 5033<br>charles@cgtrading.co.sz<br>www.cgtradingswaziland.com |
| **Sweden** | | | |
| 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>http://www.sew-eurodrive.se<br>jonkoping@sew.se |
| **Switzerland** | | | |
| 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>http://www.imhof-sew.ch<br>info@imhof-sew.ch |
| **Taiwan** | | | |
| 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>sewtwn@ms63.hinet.net<br>http://www.tingshou.com.tw |
| | 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>sewtwn@ms63.hinet.net<br>http://www.tingshou.com.tw |
| **Tanzania** | | | |
| 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>http://www.sew-eurodrive.co.tz<br>info@sew.co.tz |
| **Thailand** | | | |
| 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>sewthailand@sew-eurodrive.com |
| **Tunisia** | | | |
| 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>http://www.tms.com.tn<br>tms@tms.com.tn |

27793230/EN – 08/2022

| | | | |
|---|---|---|---|
| **Turkey** | | | |
| Assembly<br>Sales<br>Service | Kocaeli-Gebze | SEW-EURODRIVE Ana Merkez<br>Gebze Organize Sanayi Böl. 400 Sok No. 401<br>41480 Gebze Kocaeli | Tel. +90 262 9991000 04<br>Fax +90 262 9991009<br>http://www.sew-eurodrive.com.tr<br>sew@sew-eurodrive.com.tr |
| **Ukraine** | | | |
| Assembly<br>Sales<br>Service | Dnipropetrovsk | SEW-EURODRIVE, LLC<br>Robochya str., bld. 23-B, office 409<br>49008 Dnipro | Tel. +380 56 370 3211<br>Fax +380 56 372 2078<br>http://www.sew-eurodrive.ua<br>sew@sew-eurodrive.ua |
| **United Arab Emirates** | | | |
| Drive Technology Center | Dubai | SEW-EURODRIVE FZE<br>PO Box 263835<br>Jebel Ali Free Zone – South,<br>P.O. Box<br>Dubai, United Arab Emirates | Tel. +971 (0)4 8806461<br>Fax +971 (0)4 8806464<br>info@sew-eurodrive.ae |
| **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>sewuy@sew-eurodrive.com.uy |
| **USA** | | | |
| Production<br>Assembly<br>Sales<br>Service | Southeast Region | SEW-EURODRIVE INC.<br>220 Finch Rd<br>P.O. Box 518<br>Wellford SC , 29385 | 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>http://www.seweurodrive.com<br>cslyman@seweurodrive.com |
| Assembly<br>Sales<br>Service | Northeast 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>csbridgeport@seweurodrive.com |
| | Midwest 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>cstroy@seweurodrive.com |
| | Southwest Region | SEW-EURODRIVE INC.<br>202 W. Danieldale Rd.<br>DeSoto, TX 75115 | Tel. +1 214 330-4824<br>Fax +1 214 330-4724<br>csdallas@seweurodrive.com |
| | Western 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>cshayward@seweurodrive.com |
| | 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>IGOrders@seweurodrive.com |
| | Additional addresses for service provided on request! | | |
| **Vietnam** | | | |
| Sales | Ho Chi Minh City | SEW-EURODRIVE PTE. LTD. RO at Hochiminh City<br>Floor 8, KV I, Loyal building, 151-151 Bis Vo Thi Sau street, ward 6, District 3, Ho Chi Minh City, Vietnam | Tel. +84 937 299 700<br><br>huytam.phan@sew-eurodrive.com |
| | Hanoi | MICO LTD<br>Quảng Trị - North Vietnam / All sectors except Construction Materials<br>8th Floor, Ocean Park Building, 01 Dao Duy Anh St, Ha Noi, Viet Nam | Tel. +84 4 39386666<br>Fax +84 4 3938 6888<br>nam_ph@micogroup.com.vn<br>http://www.micogroup.com.vn |
| **Zambia** | | | |
| Representation: South Africa | | | |

27793230/EN – 08/2022

# Index

## Numerical

2Q DLZ12B DC link adapter ..... 149, 568
4Q DLZ14B DC link adapter ..... 151, 570
4-quadrant operation 1 ..... 299
4-quadrant operation 2 ..... 299
703 Dynamic response ..... 283
7-segment display ..... 683

## A

Absolute encoder (SSI) ..... 325
Absolute encoder card DEH21B/DIP11B ..... 96
Acceleration precontrol filter ..... 243
Accessories set, size 2S ..... 523
Active current ..... 219
Actual position ..... 218
Actual position source ..... 321
Actual value description PI1 ..... 307
Actual value description PI2 ..... 307
Actual value description PI3 ..... 307
Additional functions ..... 24
AI1 Offset ..... 229
AI1 operating mode ..... 230
AI1 scaling ..... 229
AI1 speed offset ..... 232
AI1 voltage offset ..... 231
AI2 operating mode ..... 237
Analog input AI1 ..... 229
Analog input AI1/AI2 ..... 221
Analog inputs option ..... 237
Analog output AO1 ..... 279
Analog output AO2 ..... 279
Analog outputs optional ..... 279
Analog setpoints ..... 221
Application modules ..... 28
Applications
  Project planning for hoists ..... 350
  Project planning for pumps and fans ..... 352
  Selecting the inverter ..... 350
Assignment
  Braking resistor ..... 608
  Line choke ..... 608
  Line filter ..... 608
Auto reset ..... 303
Automatic adjustment 1 ..... 253
Automatic adjustment 2 ..... 253
Automatic encoder replacement detection ..... 324

## B

Basic device firmware ..... 222
Baud rate ..... 295
Baud rate SBus 1 ..... 308
Baud rate SBus 2 ..... 308
Boost 1 ..... 254
Boost 2 ..... 254
Brake application time 1 ..... 287
Brake application time 2 ..... 287
Brake function ..... 286
Brake function 1 ..... 286
Brake function 2 ..... 286
Brake release time 1 ..... 287
Brake release time 2 ..... 287
Braking operation ..... 299
Braking resistor assignment ..... 608
Braking resistor, selection
  Peak braking power ..... 476
Braking resistors
  BW... / BW...-T / BW...-P ..... 152
  Parallel connection ..... 153, 476
  UL and cUL approval ..... 153
  Assignment to AC 400/500 V devices ..... 154, 478
  Assignment to AC 230 V devices ..... 157, 481
  Flat design ..... 152
  Wire and grid resistors ..... 153
BS... touch guard ..... 162
BST ..... 139
BST brake module ..... 139
Bus diagnostics ..... 224
Bus setpoint source ..... 318
Bus setpoint, source ..... 318

## C

Cable sets for DC link connection ..... 177
Cable sets for DC link connection, MDR60A regenerative power supply units ..... 92
Cam distance ..... 313
CANopen 1 address ..... 309
CANopen 2 address ..... 309
CANopen address ..... 309
CANopen DFC11B ..... 120

27793230/EN – 08/22

CE marking ..... 38
Certifications ..... 23
CFC ..... 340
CFC & IPOS ..... 343
CFC & synchronous operation ..... 343
CFC & torque control ..... 342
Clock frequency ..... 325
Combinations of options ..... 621
Communication ..... 23
Communication options ..... 9
Configuration
  Schematic procedure ..... 347
  Hoist ..... 350
  Pumps and fans ..... 352
  Selecting the inverter ..... 350
  SEW-Workbench ..... 37
Configuration of option slots ..... 621
Connecting brakemotors;Connecting AC brakemotors ..... 485
Connecting explosion-protected AC motors ..... 498
Connection
  DEH11B ..... 628, 636
  DEH21B ..... 630
  DER11B ..... 633, 639
  DEU21B ..... 631
  External encoder ..... 635
  DFC11B ..... 647
  DIO11B ..... 644
  Encoder ..... 626
  Incremental encoder simulation ..... 642
  Resolver ..... 626
  RS485 interface ..... 615
  System bus (SBus) ..... 613
Connection set DLA11B ..... 146
Connector adapter ..... 98
  Encoder adapter X14 DAE14B; DAE14B encoder adapter X14 ..... 98
Control characteristics
  Characteristics ..... 348
  Control behavior ..... 349
Control function ..... 22
Control functions ..... 282
Control modes, general description ..... 16
Control options ..... 11
Control signal source ..... 227
Control signals, interrelations ..... 511
Control unit sizes 7 ..... 541, 544
Controller parameters ..... 242
Conversion to motor inverter ..... 582
Copy DBG → MDX ..... 297
Copy MDX → DBG ..... 298
Copyright notice ..... 515
Counter LED display ..... 265
Counting direction ..... 325
CRC DCS ..... 271
cUL approval
  Braking resistors ..... 153
Current limit 1 / 2 ..... 253
Current limit A ..... 273
Current limit B ..... 273
Current limit C ..... 273
Current offset AI1 ..... 231
Current parameter set ..... 220
Current reference signal ..... 262
Current reference value ..... 262

## D

DAE15B ..... 98
Damage ..... 681
DAT11B ..... 98
DBG60B ..... 75
  Copy function ..... 676
  IPOS parameters, editing ..... 679
  Basic displays ..... 673
  Delivery state ..... 653
  Functions for startup ..... 654
  Functions of the keys. ..... 675
  Information messages ..... 674
  Language selection ..... 653
  Parameter mode ..... 676
  Setting parameters ..... 661
  Startup menu procedure ..... 655
  Startup of speed controller ..... 659
  User menu ..... 678
  Variable mode ..... 678
  Wake-up parameter ..... 679
DBG60B keypad ..... 75
DBM60B ..... 77
DBM60B/DKG60B housing ..... 77
DC link voltage ..... 219
DCS actual position source ..... 271
DCS alarm response ..... 271

27793230/EN – 08/22

DCS error response ..... 271
DCS safety module ..... 270
Deceleration time ..... 259, 260, 261, 262
Declaration of conformity
MOVIDRIVE® ..... 717
MOVIDRIVE® with DCS2.B/DCS3.B ..... 719
MOVIDRIVE® with DFS11B/DFS21B ..... 718
DEH11B ..... 93
Connection ..... 628, 636
Terminal description ..... 628
DEH21B ..... 96
Connection ..... 630
Delay time 1/2 ..... 263
Delay time lag error signal ..... 264
Delay time position signal ..... 265
DER11B ..... 94
Connection ..... 633, 639
Description, general ..... 12
DEU21B ..... 95
Connection ..... 631
DEU21B type multi-encoder card ..... 95
Device concept ..... 13
Device design ..... 223
Device functions ..... 296
Device properties ..... 21
Device structure
MDX61B size 7 ..... 541
MDX60B/61B size 0 ..... 524
MDX61B size 1 ..... 525
MDX61B size 2 ..... 529
MDX61B size 2S ..... 527
MDX61B size 3 ..... 531
MDX61B size 4 ..... 535
MDX61B size 5 ..... 537
MDX61B size 6 ..... 539
MDX61B size 7 control unit ..... 541
MDX61B size 7 power section ..... 542
MDX61B size 7 power supply unit ..... 543
MDX62B size 7 ..... 544
MDX62B size 7 control unit ..... 544
MDX62B size 7 power section ..... 545
MDX62B size 7 power supply unit ..... 546
Device type ..... 222
DeviceNet™ DFD11B ..... 119
DFC11B ..... 120
Connection ..... 647
DFD11B ..... 119
DFE24B ..... 118
DFE32B ..... 114
DFE33B ..... 116
DFI11B ..... 112
DFI21B ..... 113
DFP21B ..... 111
DFS11B ..... 124
DFS12B ..... 126
DFS21B ..... 127
DFS22B ..... 129
DH.21B/41B Controller
Freely programmable controller (MOVI-PLC®) ..... 134
DHE/DHF/DHR21 ..... 134
DHE/DHF/DHR21 controller ..... 134
DHE/DHF/DHR41B ..... 134
DHE/DHF/DHR41B controller ..... 134
DHP11B ..... 132
Digital input DI01 ..... 274
Digital input DI02 ..... 274
Digital input DI03 ..... 274
Digital input DI04 ..... 274
Digital input DI05 ..... 274
Digital input DI06 ..... 274
Digital input DI07 ..... 274
Digital input DI10 ..... 221, 275
Digital input DI11 ..... 221, 275
Digital input DI12 ..... 221, 275
Digital input DI13 ..... 221, 275
Digital input DI14 ..... 221, 275
Digital input DI15 ..... 221, 275
Digital input DI16 ..... 221, 275
Digital input DI17 ..... 221, 275
Digital inputs DCS DI1 – DI8 ..... 270
Digital inputs DI00 – DI07 ..... 221
Digital inputs DI10 – DI17 ..... 221
Digital inputs of basic device ..... 221, 274
Digital inputs option ..... 221, 275
Digital output DO01 ..... 276
Digital output DO02 ..... 276
Digital output DO03 ..... 276
Digital output DO04 ..... 276
Digital output DO05 ..... 276
Digital output DO10 ..... 277

27793230/EN – 08/22

Digital output DO11 ..... 277
Digital output DO12 ..... 277
Digital output DO13 ..... 277
Digital output DO14 ..... 277
Digital output DO15 ..... 277
Digital output DO16 ..... 277
Digital output DO17 ..... 277
Digital outputs basic device ..... 222, 276
Digital outputs DB00, DO01 – DO05 ..... 222
Digital outputs DCS DO0_P – DO2_M ..... 271
Digital outputs DO10 – DO17 ..... 222
Digital outputs option ..... 222, 277
Dimension drawings
Size 0M ..... 58, 59, 61
Size 0S ..... 56, 60
Size 1 ..... 62
Size 2 ..... 65
Size 2S ..... 63
Size 3 ..... 68
Size 4 ..... 69
Size 5 ..... 70
Size 6 ..... 71
Braking resistors BW.. /BW...-T/BW...-P ..... 159
BW003-420-T braking resistor ..... 161
BW1.4-170 braking resistor ..... 161, 162
DBG60B ..... 76
DBM60B / DKG60B ..... 77
DKB11A heat sink ..... 163
HF...-403 output filter ..... 176
HF...-503 output filter ..... 175
MOVIDRIVE® MDR60A0150 ..... 86
MOVIDRIVE® MDR60A0370 ..... 87
MOVIDRIVE® MDR60A0750 ..... 88
MOVIDRIVE® MDR60A1320 ..... 89
MOVIDRIVE® MDR61B1600 ..... 90
MOVIDRIVE® MDR61B2500 ..... 90
MOVIDRIVE® MDX62B1600 ..... 91
MOVIDRIVE® MDX62B2000 ..... 91
MOVIDRIVE® MDX62B2500 ..... 91
ND020.. line choke / ND030.. / ND045.. / ND085.. ..... 165
ND150.. line choke / ND200.. / ND300 ..... 165
NF009-503 – NF300-503 line filter ..... 168
NF600-503 line filter ..... 169
Output choke HD001 – HD003 ..... 170
Output choke HD004 ..... 171
Output choke HD005 ..... 172
Size 7 ..... 72
USB11A ..... 106
UWS11A ..... 102
UWS21B ..... 104
DIO11B ..... 109
Connection ..... 644
DIO11B input/output board ..... 109
DIP11B ..... 96
Direction of motor rotation, parameter ..... 258
Direction of rotation reversal 1 ..... 258
Direction of rotation reversal 2 ..... 258
Display values ..... 218
Distance encoder ..... 247
Distance encoder counting direction (X14) ..... 323
Distance encoder monitoring ..... 264
Distance encoder resolution ..... 248
Distance encoder type (X14) ..... 323
DKB11A ..... 163
DKB11A heat sink for braking resistors in flatpack design ..... 163
DKG60B ..... 77
DLA11B ..... 146
DLB11B ..... 142
DLB11B touch guard ..... 142
DLB212B ..... 600
DLB21B ..... 143
DLH11B ..... 145, 564
DLH11B wall bracket ..... 145, 564
DLK11B ..... 147, 567
DLK11B air duct ..... 147, 567
DLS11B ..... 144, 562
DLS11B mounting base ..... 144, 562
DLZ11B ..... 148, 572
DLZ11B DC link coupling ..... 148, 572
DLZ12B ..... 149, 568
DLZ14B ..... 151, 570
DLZ31B ..... 578
DLZ31B DC link coupling ..... 578
DMP11B ..... 141
DMP11B mounting panel ..... 141
DPRAM synchronization ..... 329
DRS11B ..... 122
DWE11B ..... 616
DWE11B/12B ..... 100
DWE12B ..... 616

27793230/EN – 08/22

DWI11A ..... 107

## E

EAC ..... 38
Electronic cam ..... 24
Electronics Cables and Signal Generation ..... 506
Electronics service ..... 715
Embedded safety notes ..... 514
EMC-compliant installation according to EN 61800-3 ..... 498
Block diagram of class C1 limit ..... 500
Interference emission;Interference emission 498
Interference immunity;Interference immunity 498
Limit class C1;Limit class C1 ..... 499
Limit class C2;Limit class C2 ..... 499
Limit value class C3;Limit value class C3 .... 499
Emergency stop ramp t14 ..... 238
Emergency stop ramp t24 ..... 238
Enable hours ..... 221
Encoder adapter X15, DAE15B ..... 98
Encoder cable
For CMP.., CM.. motors ..... 199
For distance encoders ..... 202
For DR.. motors ..... 194
For resolver ..... 204
Encoder card
Installation/removal ..... 625
Encoder monitoring ..... 265, 266
Encoder monitoring motor ..... 263
Encoder options ..... 9
Encoder scaling ..... 326
Encoder scaling ext. Encoder (X14) ..... 322
Encoder slot option ..... 222
Encoder supply (5 V) DWI11A ..... 107
Encoder type ..... 325
Energy-saving function ..... 294
Engineering software ..... 36
Error response to wire break AI1 ..... 228
Error status ..... 220
Establishing communication with devices ..... 662
EtherCAT® DFE24B ..... 118
Ethernet configuration ..... 294
EtherNet/IP™ DFE33B ..... 116
EtherNet/IP™ startup configuration ..... 295
Exclusion of liability ..... 514
Ex-e motor current limit ..... 272
Ex-e motor current limiting ..... 272
Expansion of the system ..... 23
Expert characteristic ..... 233
Extended storage ..... 39, 715
External current limiting ..... 221
External DC 24 V voltage supply ..... 507
Power demand of options ..... 508
External encoder connection ..... 635, 640

## F

Factory setting ..... 296
Fault list ..... 684
Fault memory ..... 224, 681
Fault message via 7-segment display ..... 683
Fault responses ..... 300
Features of the devices ..... 21
Fieldbus address ..... 224
Fieldbus baud rate ..... 224
Fieldbus interface
CANopen DFC11B ..... 120
INTERBUS DFI11B ..... 112
INTERBUS FOC DFI21B ..... 113
PROFIBUS DFP21B ..... 111
PROFIBUS DP-V1 with PROFIsafe DFS11B ..... 124
PROFIBUS DP-V1 with PROFIsafe DFS12B ..... 126
PROFINET IO RT DFE32B ..... 114
PROFINET IO with PROFIsafe DFS21B ..... 127
PROFINET IO with PROFIsafe DFS22B ..... 129
DeviceNet™ DFD11B ..... 119
EtherCAT® DFE24B ..... 118
EtherNet/IP™ DFE33B ..... 116
Fieldbus options ..... 10
Fieldbus slot option ..... 222
Fieldbus timeout interval ..... 299
Fieldbus type ..... 224
Filter actual speed value ..... 243
Filter setpoint ..... 233
Firmware digital operator panel ..... 222
Fixed setpoints 1/2 ..... 241
Freely programmable controller (MOVI-PLC®) .. 134
Frequency ..... 218
Frequency A ..... 273
Frequency B ..... 273
Frequency C ..... 273

27793230/EN – 08/22

Frequency scaling ..... 228
Functions of the devices..... 21

## G

Gain of acceleration precontrol ..... 243
Gain X controller..... 314
Grid resistors ..... 153
Group address SBus 1 ..... 308
Group address SBus 2 ..... 308
Group drive (VFC) ..... 497

## H

Hazard symbols
  Meaning..... 513
HD... output choke..... 170
Heat sink temperature ..... 220
HF output filter
  Connection ..... 501
  Installation, connection and operation..... 502
HF... output filter..... 173
HIPERFACE® encoder card DEH11B ..... 93
HIPERFACE® offset X14 ..... 324
Hold controller ..... 244
HTL -> TTL ..... 100
Hysteresis..... 259, 261, 262

## I

Imax signal ..... 262
Incremental encoder simulation
  Connection ..... 642
Information messages on the DBG60B..... 674
Installation
  2Q DLZ12B DC link adapter..... 568
  4Q DLZ14B DC link adapter..... 570
  BW braking resistor ..... 555
  Cable cross sections ..... 552
  Cables and fuses..... 550
  DLB21B ..... 600
  DLH11B..... 564
  DLH11B wall bracket..... 564
  DLK11B ..... 567
  DLK11B air duct ..... 567
  DLS11B ..... 562
  DLS11B mounting base ..... 562
  DLZ11B DC link coupling ..... 572
  DLZ12B ..... 568
  DLZ14B ..... 570
  DLZ31B ..... 578
  DLZ31B DC link coupling ..... 578
  HD output choke..... 559
  IT systems ..... 552
  PE connection ..... 552
  Shielded control cables ..... 556
  Size 6 ..... 560
  Size 7 ..... 560
  Supply system and brake contactors ..... 551
  Touch guard DLB21B..... 600
Installing and removing option cards..... 624
INTERBUS DFI11B ..... 112
INTERBUS FOC DFI21B..... 113
Interface adapters
  DWE11B/12B ..... 100
  USB11A..... 105
  UWS11A..... 101
  UWS21B..... 103
  DWE11B..... 616
  DWE12B..... 616
  USB11A..... 619
  UWS21B..... 617
Internal synchronous operation ..... 26
Interval for motor protection ..... 257
Inverter status..... 220
IP address ..... 294
IPOS CTRL.W Task 1 ..... 320
IPOS CTRL.W Task 2 ..... 320
IPOS encoder..... 321
IPOS monitoring ..... 318
IPOS parameters..... 310
IPOS reference travel..... 310
IPOS synchronization..... 329
IPOS Travel parameters..... 314
IPOS variables edit..... 321
IPOSplus® features..... 73
IPOSplus® modulo function ..... 327
IPOSplus®, general description ..... 17, 73
IxR adjustment 1 ..... 254
IxR adjustment 2 ..... 254

## J

Jerk time..... 320

27793230/EN – 08/22

## K

KC certificate ..... 38

## L

Lag error limit ..... 264
Lag error prewarning ..... 264
Lag error window ..... 319
Language ..... 296
Limit switches ..... 512
Limits 1 ..... 252
Limits 2 ..... 252
Line choke assignment ..... 608
Line contactors and line fuses, notes;Line contactor;Line fuses ..... 486
Line filter assignment ..... 608
Load precontrol CFC ..... 243
Load precontrol VFC ..... 244
Lock run/stop keys ..... 294

## M

MAC address ..... 295
Mains OFF response ..... 266
Mains OFF response time ..... 266
Manual operation ..... 294
Manual reset ..... 302
Master encoder resolution ..... 248
Master gear ratio factor ..... 245
Master/slave connection ..... 643
Master/slave function ..... 288
Maximum offset + actual value ..... 251
Maximum speed 1 / 2 ..... 252
MDR60A regenerative power supply unit
- Cable sets for DC link connection ..... 92
- Description ..... 78
- General technical data ..... 79
- UL approval ..... 78

Meaning of the icons ..... 192
Memory card ..... 680
Menu structure of the parameters in DBG60B .. 206
Message = "1" if: ..... 259, 261, 262
Minimum clearance ..... 550
Minimum offset + actual value ..... 251
Minimum output PID controller ..... 251
Minimum speed 1 / 2 ..... 252
Mode selection ..... 245
Modular design ..... 13
Modulation ..... 304
Modulo denominator ..... 327
Modulo encoder resolution ..... 327
Modulo function ..... 327
Modulo numerator ..... 327
Monitoring functions ..... 263
Motor category ..... 283
Motor compensation (asynchronous) 1/2 ..... 253
Motor inverter conversion ..... 582
Motor parameters ..... 252
Motor potentiometer ..... 239
Motor protection ..... 255
Motor protection 1 ..... 255
Motor protection 2 ..... 255
Motor Selection
- Asynchronous AC motors ..... 354
- Asynchronous servomotors ..... 359
- Recommendations for motor selection ..... 353
- Synchronous servomotors (SERVO) ..... 423

Motor selection for asynchronous AC motors (VFC)
- Dynamic applications ..... 356
- Speed/torque characteristics ..... 355
- Voltage/frequency characteristic ..... 354

Motor selection for asynchronous servomotors (CFC)
- CFC mode with speed control ..... 360
- CFC mode with torque control ..... 361
- Cooling the motor ..... 360
- Information on DRL.. motors ..... 366
- Magnetizing current ..... 359
- Motor characteristics ..... 359

Motor selection for SL2 synchronous linear motors ..... 437
Motor temperature 1/2 ..... 221
Motor temperature protection ..... 267
Motor utilization 1/2 ..... 219
Mounting position ..... 550
MOVIDRIVE® block diagram ..... 20
MOVIDRIVE® device family ..... 13
MOVILINK®, general description ..... 17
MOVI-PLC® basic DHP11B.. controller ..... 132
MOVISAFE® DCS21B/22B/31B/32B safety module
- MOVISAFE® DCS21B/22B/31B/32B safety module ..... 130

MOVITOOLS® MotionStudio ..... 36, 662

27793230/EN – 08/22

## N


Nameplate
- Braking resistor BW090-P52B ... 520
- Control unit, sizes 1 – 7 ... 522
- Option card ... 522
- Power section, size 1 – 7 ... 521
- Size 0 ... 520
- sizes 1 - 7 ... 521

ND.. line chokes ... 164
NF...-... line filter ... 166
Nominal output current ... 222
Notes
- Designation in the documentation ... 513
- Meaning of the hazard symbols ... 513


## O


Offset 1/2/3 ... 247
Oil aging/overtemperature ... 269
Oil aging/ready signal ... 270
Online help ... 37, 663
Operating displays ... 673
- 7-segment display ... 672

Operating hours ... 220
Operating mode
- CFC ... 340
- CFC & IPOS ... 343
- CFC & synchronous operation ... 343
- CFC & torque control ... 342
- SERVO ... 344
- SERVO & IPOS ... 345
- SERVO & Sync ... 346
- SERVO & torque control ... 345
- V/f characteristic curve ... 330
- VFC ... 330
- VFC & DC braking ... 334
- VFC & flying start function ... 335
- VFC & Group ... 332
- VFC & Hoist ... 333
- VFC n-control ... 336
- VFC n-control & group ... 338
- VFC n-control & hoist ... 333
- VFC n-control & IPOS ... 339
- VFC n-control & synchronous operation ... 339

Operating mode 1 ... 282
Operating mode 2 ... 282
Operating mode AI2 ... 237
Operating mode AO1 ... 280
Operating mode AO2 ... 280
Operating modes ... 282, 330
Operating state ... 220
Operating states, priority ... 511
Operation ... 23
Option
- 2Q DLZ12B DC link adapter ... 149
- 4Q DLZ14B DC link adapter ... 151
- Absolute encoder card DEH21B/DIP11B ... 96
- CANopen fieldbus interface DFC11B ... 120
- Connection set DLA11B ... 146
- DBG60B keypad ... 75
- DEU21B type multi-encoder card ... 95
- DIO11B input/output board ... 109
- DKB11A heat sink for braking resistors ... 163
- DLB11B touch guard ... 142
- DLH11B wall bracket ... 145
- DLK11B air duct ... 147
- DLS11B mounting base ... 144
- DLZ11B DC link coupling ... 148
- DWE11B/12B interface adapter ... 100
- Encoder supply (5 V) DWI11A ... 107
- Fieldbus interface PROFIBUS DP-V1 with PROFIsafe DFS11B ... 124
- Fieldbus interface PROFIBUS DP-V1 with PROFIsafe DFS12B ... 126
- Fieldbus interface PROFINET IO RT DFE32B ... 114
- INTERBUS fieldbus interface DFI11B ... 112
- INTERBUS FOC fieldbus interface DFI21B ... 113
- OST11B ... 133
- PROFIBUS DFP21B fieldbus interface ... 111
- PROFINET IO fieldbus interface with PROFIsafe DFS21B ... 127
- PROFINET IO fieldbus interface with PROFIsafe DFS22B ... 129
- Resolver card type DER11B ... 94
- Safety-related BST brake module ... 139
- Synchronous operation card DRS11B ... 122
- Touch guard DLB21B ... 143
- USB11A interface adapter ... 105
- UWS11A interface adapter ... 101
- UWS21B interface adapter ... 103
- DBM60B/DKG60B housing ... 77


27793230/EN – 08/22

DeviceNet™ DFD11B fieldbus interface ..... 119
DFE33B fieldbus interface for EtherNet/IP™ 116
DHE/DHF/DHR21 controller ..... 134
DHE/DHF/DHR41B controller ..... 134
EtherCat® DFE24B fieldbus interface ..... 118
HD... output choke ..... 170
HF... output filter ..... 173
HIPERFACE® encoder card DEH11B ..... 93
MOVI-PLC® basic DHP11B.. controller ..... 132
ND.. line chokes ..... 164
NF...-... line filter ..... 166
Option 3 ..... 222
Option card
Installation and removal ..... 624
Installation/removal ..... 625
Option card slots ..... 14, 621
Option overview
Communication ..... 9
Encoder ..... 9
Fieldbus ..... 10
Controller ..... 11
Safety ..... 12
OST11B ..... 133
Output current ..... 219
Overload capacity for braking resistors ..... 482
Calculation example ..... 483
Flat design ..... 482
Grid resistors ..... 483
On ceramic core ..... 482
Overload capacity of the inverter ..... 437
Device utilization ..... 443
Load cycle;load cycle ..... 438
Overload capacity determination;Determining the overload capacity ..... 437
Overload capacity for an overload time < 1 s 469
Overload capacity in the minute range ..... 444
Overload capacity in the second range ..... 466
Temperature-controlled fan ..... 443
Override ..... 320
Overview of MOVIDRIVE® devices ..... 18
Overview of the system ..... 8


## P


P gain hold controller ..... 244
P gain n-controller ..... 242
P000 Speed ..... 218
P001 User display ..... 218
P002 Frequency ..... 218
P003 Actual position ..... 218
P004 Output current ..... 219
P005 Active current ..... 219
P008 DC link voltage ..... 219
P009 Output current ..... 219
P010 Inverter status ..... 220
P011 Operating state ..... 220
P012 Fault status ..... 220
P013 Current parameter set ..... 220
P014 Heat sink temperature ..... 220
P015 Power-applied hours ..... 220
P016 Enable hours ..... 221
P017 Work ..... 221
P02. Analog setpoints ..... 221
P022 External current limiting ..... 221
P03. Digital inputs of basic device ..... 221
P039 Digital inputs DI00 – DI07 ..... 221
P04. Digital inputs option ..... 221
P040 Digital input DI10 ..... 221
P041 Digital input DI11 ..... 221
P042 Digital input DI12 ..... 221
P043 Digital input DI13 ..... 221
P044 Digital input DI14 ..... 221
P045 Digital input DI15 ..... 221
P046 Digital input DI16 ..... 221
P047 Digital input DI17 ..... 221
P048 Digital inputs DI10 – DI17 ..... 221
P05. Digital outputs basic device ..... 222
P050 – P055 Digital output DB00, DO01 – DO05 ..... 222
P059 Digital outputs DB00, DO01 – DO05 ..... 222
P06. Digital outputs option ..... 222
P060 – P067 Digital output DO10 – DO17 ..... 222
P068 Digital outputs DO10 – DO17 ..... 222
P07 Firmware digital operator panel ..... 222
P07. Device data ..... 222
P070 Device type ..... 222
P071 Nominal output current ..... 222
P072 Option encoder slot ..... 222
P073 Option fieldbus option slot ..... 222
P074 Option 3 ..... 222
P076 Firmware basic device ..... 222
P078 Technology function ..... 223
P079 Device design ..... 223


27793230/EN – 08/22

P08. Fault memory ..... 224
P080 – P084 Faults t-0 – t-4 ..... 224
P09. Bus diagnostics ..... 224
P090 PD configuration ..... 224
P091 Fieldbus type ..... 224
P092 Fieldbus baud rate ..... 224
P093 Fieldbus address ..... 224
P094 – P096 PO1 – PO3 setpoint ..... 224
P097 – P099 PI1 – PI3 actual value ..... 225
P10. Setpoint selection ..... 226
P100 Setpoint source ..... 226
P101 Control signal source ..... 227
P102 Frequency scaling ..... 228
P105 Error response to wire break AI1 ..... 228
P11. Analog input AI1 ..... 229
P110 AI1 scaling ..... 229
P111 AI1 Offset ..... 229
P112 AI1 operating mode ..... 230
P113 AI1 voltage offset ..... 231
P114 AI1 speed offset ..... 232
P115 Filter setpoint ..... 233
P12. Analog inputs option ..... 237
P120 AI2 Operating mode ..... 237
P13. Speed ramps 1 ..... 237
P134 Ramp t12 up=down ..... 237
P136/P146 Stop ramp t13 / t23 ..... 238
P137 Emergency stop ramp t14 ..... 238
P138 Ramp limit VFC ..... 239
P139 Ramp monitoring 1 ..... 239
P14. Speed ramps 2 ..... 237
P144 Ramp t22 up=down ..... 237
P147 Emergency stop ramp t24 ..... 238
P149 Ramp monitoring 2 ..... 239
P15. Motor potentiometer ..... 239
P152 Save last setpoint ..... 240
P20. Speed control ..... 242
P200 P gain n controller ..... 242
P201 Time constant n-controller ..... 243
P202 Gain acceleration precontrol ..... 243
P203 Filter acceleration precontrol ..... 243
P204 Actual speed value filter ..... 243
P205 Load precontrol CFC ..... 243
P206 Sampling cycle n-controller ..... 243
P207 Load precontrol VFC ..... 244
P21. Hold controller ..... 244
P210 P-gain hold controller ..... 244
P22. Synchronous operation control ..... 244
P220 P-gain DRS ..... 244
P221 Master gear ratio factor ..... 245
P222 Slave gear ratio factor ..... 245
P223 Mode selection ..... 245
P224 Slave counter ..... 247
P228 Precontrol filter DRS ..... 247
P23. Synchronous operation with distance encoder ..... 247
P230 Distance encoder ..... 247
P231 Slave-encoder factor ..... 247
P232 Slave-distance-encoder factor ..... 247
P233 Distance encoder resolution ..... 248
P234 Master encoder resolution ..... 248
P24. Synchronous operation with catch up ..... 248
P240 Synchronization speed ..... 248
P241 Synchronization ramp ..... 248
P26. Process controller parameter ..... 248
P260 Operating mode ..... 248
P261 Cycle time ..... 248
P262 Interruption ..... 249
P263 Factor KP ..... 249
P264 Integral time TN ..... 249
P265 Derivative time TV ..... 249
P266 Precontrol ..... 249
P27. Process controller input values ..... 250
P270 Setpoint source ..... 250
P271 Setpoint ..... 250
P272 IPOS setpoint address ..... 250
P273 Time constant ..... 250
P274 Scaling setpoint ..... 250
P275 Actual value source ..... 250
P276 IPOS actual value address ..... 250
P277 Scaling actual value ..... 250
P278 Offset actual value ..... 251
P279 Time constant actual value ..... 251
P28. Process controller limits ..... 251
P280 Minimum offset + actual value ..... 251
P281 Maximum offset + actual value ..... 251
P282 PID controller minimum output ..... 251
P283 PID controller maximum output ..... 251
P284 Process controller minimum output ..... 251
P285 Process controller maximum output ..... 251
P30. Limits 1 ..... 252
P304 Torque limit ..... 253

27793230/EN – 08/22

P31. Limits 2 ..... 252
P32./33. Motor compensation (asynchronous) 1/2 ..... 253
P320 Automatic adjustment 1 ..... 253
P321 Boost 1 ..... 254
P322 IxR adjustment 1 ..... 254
P323/P333 Premagnetization time 1/2 ..... 254
P324/P334 Slip compensation 1/2 ..... 254
P330 Automatic adjustment 2 ..... 253
P331 Boost 2 ..... 254
P332 IxR adjustment 2 ..... 254
P34. Motor protection ..... 255
P340 Motor protection 1 ..... 255
P341 Type of cooling 1 ..... 257
P342 Motor protection 2 ..... 255
P343 Type of cooling 2 ..... 257
P344 Motor protection interval ..... 257
P345/346 IN/UL monitoring 1/2 ..... 257
P35. Direction of motor rotation ..... 258
P350 Direction of rotation reversal 1 ..... 258
P351 Direction of rotation reversal 2 ..... 258
P36. Startup ..... 258
P360 Startup ..... 258
P40. Speed reference value ..... 259
P400 Speed reference value ..... 259
P401 Hysteresis ..... 259
P402 Delay time ..... 259
P403 Signal = "1" if: ..... 259
P41. Speed window signal ..... 260
P410 Window center ..... 260
P411 Range width ..... 260
P412 Deceleration time ..... 260
P413 Signal = "1" if: ..... 260
P42. Speed setpoint / actual value comparison 261
P420 Hysteresis ..... 261
P421 Deceleration time ..... 261
P422 Signal = "1" if: ..... 261
P43. Current reference signal ..... 262
P430 Current reference value ..... 262
P431 Hysteresis ..... 262
P432 Deceleration time ..... 262
P433 Signal = "1" if: ..... 262
P44. Imax signal ..... 262
P440 Hysteresis ..... 262
P441 Deceleration time ..... 262
P442 Signal = "1" if: ..... 262
P50. Speed monitoring ..... 263
P500 Speed monitoring 1 ..... 263
P501 Delay time 1 ..... 263
P502 Speed monitoring 2 ..... 263
P503 Delay time 2 ..... 263
P504 Encoder monitoring motor ..... 263
P505 Distance encoder monitoring ..... 264
P51. Synchronous operation monitoring ..... 264
P510 Positional tolerance slave ..... 264
P511 Lag error prewarning ..... 264
P512 lag error limit ..... 264
P513 Delay time lag error signal ..... 264
P514 Counter LED display ..... 265
P515 Delay time position signal ..... 265
P516 X41 Encoder monitoring ..... 265
P517 X41 Pulse count monitoring ..... 265
P518 X42 Encoder monitoring ..... 266
P519 X42 Pulse count monitoring ..... 266
P52. Power off monitoring ..... 266
P520 Power off response time ..... 266
P521 Power off response ..... 266
P522 Phase failure monitoring ..... 267
P53. Motor temperature protection ..... 267
P530 Sensor type 1 ..... 267
P531 Sensor type 2 ..... 267
P54. Gear unit/motor monitoring ..... 268
P540 Drive vibration response/warning ..... 269
P541 Drive vibration response/fault ..... 269
P542 Response oil aging/warning ..... 269
P543 Response oil aging/fault ..... 269
P544 Oil aging/overtemperature ..... 269
P545 Oil aging/ready signal ..... 270
P549 Response to brake wear ..... 270
P55. DCS safety module ..... 270
P550 DCS safety module status ..... 270
P551 Digital inputs DCS DI1 – DI8 ..... 270
P552 Digital outputs DCS DO0_P – DO2_M .... 271
P553 Serial number DCS ..... 271
P554 CRC DCS ..... 271
P555 DCS error response ..... 271
P556 DCS alarm response ..... 271
P557 DCS actual position source ..... 271
P56. Ex-e motor current limiting ..... 272
P560 Current limitation Ex-e motor ..... 272
P561 Frequency A ..... 273

27793230/EN – 08/22

P562 Current limit A ..... 273
P563 Frequency B ..... 273
P564 Current limit B ..... 273
P565 Frequency C ..... 273
P566 Current limit C ..... 273
P60. Digital inputs of basic device ..... 274
P600 Digital input DI01 ..... 274
P601 Digital input DI02 ..... 274
P602 Digital input DI03 ..... 274
P603 Digital input DI04 ..... 274
P604 Digital input DI05 ..... 274
P605 Digital input DI06 ..... 274
P606 Digital input DI07 ..... 274
P61. Digital inputs option ..... 275
P610 Digital input DI10 ..... 275
P611 Digital input DI11 ..... 275
P612 Digital input DI12 ..... 275
P613 Digital input DI13 ..... 275
P614 Digital input DI14 ..... 275
P615 Digital input DI15 ..... 275
P616 Digital input DI16 ..... 275
P617 Digital input DI17 ..... 275
P62. Digital outputs basic device ..... 276
P620 Digital output DO01 ..... 276
P621 Digital output DO02 ..... 276
P622 Digital output DO03 ..... 276
P623 Digital output DO04 ..... 276
P624 Digital output DO05 ..... 276
P63. Digital outputs option ..... 277
P630 Digital output DO10 ..... 277
P631 Digital output DO11 ..... 277
P632 Digital output DO12 ..... 277
P633 Digital output DO13 ..... 277
P634 Digital output DO14 ..... 277
P635 Digital output DO15 ..... 277
P636 Digital output DO16 ..... 277
P637 Digital output DO17 ..... 277
P64. Analog outputs optional ..... 279
P640 Analog output AO1 ..... 279
P642 Operating mode AO1 ..... 280
P643 Analog output AO2 ..... 279
P645 Operating mode AO2 ..... 280
P70. Operating modes ..... 282
P700 Operating mode 1 ..... 282
P701 Operating mode 2 ..... 282
P702 Motor category ..... 283
P704 VFC-n with output filter ..... 283
P71. Standstill current ..... 284
P72. Stop by setpoint function ..... 285
P721 Stop setpoint 1 ..... 285
P723 Stop by setpoint function 2 ..... 285
P724 Stop setpoint 2 ..... 285
P725 Start offset 2 ..... 286
P73. Brake function ..... 286
P730 Brake function 1 ..... 286
P731 Brake release time 1 ..... 287
P732 Brake application time 1 ..... 287
P733 Brake function 2 ..... 286
P734 Brake release time 2 ..... 287
P735 Brake application time 2 ..... 287
P74. Speed skip function ..... 287
P742 Skip window center 2 ..... 288
P743 Skip bandwidth 2 ..... 288
P75. Master/slave function ..... 288
P750 Slave setpoint ..... 293
P751 Scaling slave setpoint ..... 294
P76. Manual operation ..... 294
P760 Lock run/stop keys ..... 294
P77. Energy-saving function ..... 294
P770 Energy-saving function ..... 294
P78. Ethernet configuration ..... 294
P780 IP address ..... 294
P781 Subnet mask ..... 294
P782 Standard gateway ..... 294
P783 Baud rate ..... 295
P784 MAC address ..... 295
P785 EtherNet/IP™ Startup Configuration ..... 295
P80. Setup ..... 296
P800 Quick menu ..... 296
P801 Language ..... 296
P802 Factory setting ..... 296
P803 Parameter lock ..... 297
P804 Reset statistic data ..... 297
P806 Copy DBG → MDX ..... 297
P807 Copy MDX → DBG ..... 298
P81. Serial communication ..... 298
P810 RS485 Address ..... 298
P811 RS485 group address ..... 298
P812 RS485 timeout interval ..... 298
P819 Fieldbus timeout interval ..... 299

27793230/EN – 08/22

P82. Braking operation ..... 299
P820 4-Quadrant operation 1 ..... 299
P821 4-Quadrant operation 2 ..... 299
P83. Fault responses ..... 300
P830 Response to "External fault" ..... 301
P831 'Fieldbus timeout' response ..... 301
P832 Response to "Motor overload" ..... 301
P833 'RS485 timeout' response ..... 301
P834 Response to "Lag error" ..... 302
P835 'TF signal' response ..... 302
P836 SBus response 'Timeout SBus 1' ..... 302
P837 SBus response 'Timeout SBus 2' ..... 302
P838 Response SW LIMIT SWITCH ..... 302
P839 Response to "Positioning interruption" ..... 302
P84. Reset behavior ..... 302
P840 Manual reset ..... 302
P841 Auto reset ..... 303
P842 Restart time ..... 303
P85. Scaling actual speed value ..... 304
P850 Scaling factor numerator ..... 304
P851 Scaling factor denominator ..... 304
P852 User unit ..... 304
P86. Modulation ..... 304
P860 PWM frequency 1 ..... 304
P861 PWM frequency 2 ..... 304
P862 PWM fix 1 ..... 305
P863 PWM fix 2 ..... 305
P864 PWM frequency CFC ..... 305
P87. Process data description ..... 306
P870 Setpoint description PO1 ..... 306
P871 Setpoint description PO2 ..... 306
P872 Setpoint description PO3 ..... 306
P873 Actual value description PI1 ..... 307
P874 Actual value description PI2 ..... 307
P875 actual value description PI3 ..... 307
P876 PO data enable ..... 307
P88./P89. Serial communication SBus 1/2 ..... 308
P880 Protocol SBus 1 ..... 308
P881 Address SBus 1 ..... 308
P882 Group address SBus 1 ..... 308
P883 SBus timeout delay 1 ..... 308
P884 Baud rate SBus 1 ..... 308
P885 Synchronization ID SBus 1 ..... 308
P886 CANopen 1 address ..... 309
P887 Synchronization ext. controller ..... 309
P888 Synchronization time ..... 309
P889/P899 Parameter channel 2 ..... 309
P890 Protocol SBus 2 ..... 308
P891 SBus 2 address ..... 308
P892 Group address SBus 2 ..... 308
P893 SBus timeout delay 2 ..... 308
P894 Baud rate SBus 2 ..... 308
P895 Synchronization ID SBus 2 ..... 308
P896 CANopen 2 address ..... 309
P90. IPOS reference travel ..... 310
P900 reference offset ..... 311
P901 Reference speed 1 ..... 311
P902 Reference speed 2 ..... 311
P903 Reference travel type ..... 312
P904 Reference travel to zero pulse ..... 313
P905 HIPERFACE® offset X15 ..... 313
P906 Cam distance ..... 313
P91. IPOS Travel parameters ..... 314
P910 Gain X controller ..... 314
P911 Positioning ramp 1 ..... 314
P912 Positioning ramp 2 ..... 314
P913/P914 Travel speed CW/CCW ..... 314
P915 Velocity precontrol ..... 314
P916 Ramp type ..... 315
P917 Ramp mode ..... 318
P918 Bus setpoint source ..... 318
P92. IPOS monitoring ..... 318
P920 SW limit switch CW ..... 318
P921 SW limit switch CCW ..... 318
P922 Position window ..... 319
P923 Lag error window ..... 319
P924 Positioning interruption detection ..... 319
P93. Special IPOS functions ..... 320
P930 Override ..... 320
P931 IPOS CTRL word Task 1 ..... 320
P932 IPOS CTRL word Task 2 ..... 320
P933 Jerk time ..... 320
P938 Speed for task 1 ..... 320
P939 Speed for task 2 ..... 320, 321
P94. IPOS encoder ..... 321
P940 IPOS variables edit ..... 321
P941 Source actual position ..... 321
P942/P943 Encoder factor numerator/denominator ..... 321
P944 Encoder scaling ext. Encoder (X14) ..... 322
P945 Distance encoder type (X14) ..... 323

27793230/EN – 08/22

P946 Distance encoder counting direction (X14) ..... 323
P947 HIPERFACE® offset X14 ..... 324
P948 Automatic encoder replacement detection ..... 324
P95. Absolute encoder (SSI) ..... 325
P950 Encoder type ..... 325
P951 Counting direction ..... 325
P952 Clock frequency ..... 325
P953 Position offset ..... 325
P954 Zero offset ..... 326
P955 Encoder scaling ..... 326
P96. IPOSplus® modulo function ..... 327
P960 Modulo function ..... 327
P961 Modulo numerator ..... 327
P962 Modulo denominator ..... 327
P963 Modulo encoder resolution ..... 327
P97. IPOS synchronization ..... 329
P970 DPRAM synchronization ..... 329
P971 Synchronization phase ..... 329
Parallel connection
Braking resistors ..... 153, 476
Parameter channel 2 ..... 309
Parameter description
Menu structure of the parameters in DBG60B ..... 206
Introduction ..... 206
Overview in table format ..... 207
Parameter group 2: Controller parameters ..... 242
Parameter group 3: Motor parameter P3xx Motor parameter ..... 252
Parameter group 4: Reference signals ..... 259
Parameter group 5: Monitoring functions ..... 263
Parameter group 6: Terminal assignment ..... 274
Parameter group 7: Control functions ..... 282
Parameter group 8: Device functions ..... 296
Parameter group 9: IPOS parameters ..... 310
Parameter group
P7.. Control functions ..... 282
Parameter group 0: Display values ..... 218
Parameter group 1: Setpoints/ramp generators 226
Parameter group 2: Controller parameters ..... 242
Parameter group 3: Motor parameter P3xx Motor parameter ..... 252
Parameter group 4: Reference signals ..... 259
Parameter group 5: Monitoring functions ..... 263
Parameter group 6: Terminal assignment;terminal assignment ..... 274
Parameter group 7: Control functions ..... 282
Parameter group 8: Device functions ..... 296
Parameter group 9: IPOS parameters ..... 310
Parameter lock ..... 297
Parameter set switchover ..... 510
PD configuration ..... 224
P-gain DRS ..... 244
Phase failure monitoring ..... 267
PID controller maximum output ..... 251
PO data enable ..... 307
Position offset ..... 325
Position window ..... 319
Positional tolerance slave ..... 264
Positioning ramp 1 ..... 314
Positioning ramp 2 ..... 314
Power cables for CFM.. motors ..... 179
Power cables for CMP.. motors ..... 184
Power components ..... 8
Power off monitoring ..... 266
Power section, size 7 ..... 542, 545
Power shield clamp ..... 590
Power supply unit size 7 ..... 543, 546
Precontrol filter DRS ..... 247
Prefabricated cables ..... 177
Encoder cables for CMP.., CM.. motors ..... 199
Encoder cables for distance encoders ..... 202
Encoder cables for DR.. motors ..... 194
Encoder cables for resolvers ..... 204
Meaning of the icons ..... 192
Overview ..... 177
Power cables for CFM.. motors ..... 179
Power cables for CMP.. motors ..... 184
Premagnetizing time 1/2 ..... 254
Process controller limits ..... 251
Process controller maximum output ..... 251
Process controller minimum output ..... 251
Process data description ..... 306
Process values ..... 218
Product names ..... 515
PROFIBUS DFP21B ..... 111
PROFIBUS DP-V1 with PROFIsafe DFS11B ..... 124
PROFIBUS DP-V1 with PROFIsafe DFS12B ..... 126
PROFINET IO RT DFE32B ..... 114
PROFINET IO with PROFIsafe DFS21B ..... 127

27793230/EN – 08/22

PROFINET IO with PROFIsafe DFS22B ..... 129
Properties of the devices ..... 21
Protocol SBus 1 ..... 308
Protocol SBus 2 ..... 308
PTC resistor BW090-P52B ..... 152
Pulse count monitoring ..... 265, 266
PWM fix 1 ..... 305
PWM fix 2 ..... 305
PWM frequency 1 ..... 304
PWM frequency 2 ..... 304
PWM frequency CFC ..... 305

## Q

Quick menu ..... 296

## R

Ramp generators ..... 226
Ramp limit VFC ..... 239
Ramp mode ..... 318
Ramp monitoring ..... 239
Ramp monitoring 1 ..... 239
Ramp monitoring 2 ..... 239
Ramp t11/t21 up/down CCW/CW ..... 237
Ramp t12 UP=DOWN ..... 237
Ramp t22 up=down ..... 237
Ramp t3 up/down ..... 239
Ramp type ..... 315
Range width ..... 260
RCM approval ..... 38
Reference offset ..... 311
Reference signals ..... 259
Reference speed 1 ..... 311
Reference speed 1/2 ..... 311
Reference speed 2 ..... 311
Reference travel to zero pulse ..... 313
Reference travel type ..... 312
Regenerative power supply unit MDR61B
  General technical data ..... 80
Removing/installing the front cover ..... 584
Removing/installing the keypad ..... 583
Repair ..... 681, 715
Reset ..... 682
Reset behavior ..... 302
Reset statistical data ..... 297
Resolver card type DER11B ..... 94
Response "Fieldbus timeout" ..... 301
Response SW LIMIT SWITCH ..... 302
Response to "external error" ..... 301
Response to "lag error" ..... 302
Response to "motor overload" ..... 301
Response to brake wear ..... 270
Response to drive vibration/fault ..... 269
Response to drive vibration/warning ..... 269
Response to oil aging/fault ..... 269
Response to oil aging/warning ..... 269
Response to 'positioning interruption' ..... 302
Response to 'TF signal' ..... 302
Restart time ..... 303
Rights to claim under limited warranty ..... 514
RS485 address ..... 298
RS485 Group address ..... 298
RS485 interface ..... 615
RS485 timeout interval ..... 298
RS485 timeout response ..... 301
Run/stop keys ..... 294

## S

S pattern t12 / t22 ..... 238
Safety notes
  Designation in the documentation ..... 513
  Meaning of the hazard symbols ..... 513
  Structure of embedded ..... 514
  Structure of the section-related ..... 513
Safety options ..... 12
Safety-related BST brake module ..... 139
Sampling cycle n-controller ..... 243
Save last setpoint ..... 240
SBus 1 address ..... 308
SBus 1 synchronization ID ..... 308
SBus 2 address ..... 308
SBus 2 synchronization ID ..... 308
SBus response 'Timeout SBus 1' ..... 302
SBus response 'Timeout SBus 2' ..... 302
Scaling actual speed value ..... 304
Scaling AO1/AO2 ..... 280
Scaling factor denominator ..... 304
Scaling factor numerator ..... 304
Scaling slave setpoint ..... 294
Scope of Delivery ..... 522
  MDX60B/61B size 2S ..... 523
  MDX60B/61B size 0 ..... 522
  MDX60B/61B size 1 – 7 ..... 523

27793230/EN – 08/22

Section-related safety notes ... 513
Sensor type 1 ... 267
Sensor type 2 ... 267
Serial communication ... 298
Serial communication SBus 1/2 ... 308
Serial number DCS ... 271
SERVO ... 344
SERVO & IPOS ... 345
SERVO & torque control ... 345
Setpoint description PO1 ... 306
Setpoint description PO2 ... 306
Setpoint description PO3 ... 306
Setpoint selection ... 226
Setpoint source ... 226
Setpoint technology ... 22
Setpoints ... 226
Setpoints/ramp generators ... 226
Setup ... 296
SEW-Workbench ... 37
Shield clamps ... 590
Signal = "1" ... 260
Signal words in safety notes ... 513
Skip bandwidth 1/2 ... 288
Skip window center 1/2 ... 288
Slave counter ... 247
Slave gear ratio factor ... 245
Slave setpoint ... 293
Slave-distance-encoder factor ... 247
Slave-encoder factor ... 247
Slip compensation 1 / 2 ... 254
Special IPOS functions ... 320
Speed ... 218
Speed control ... 242
Speed for task 1 ... 320
Speed for task 2 ... 320, 321
Speed monitoring ... 263
Speed monitoring 1 ... 263
Speed monitoring 2 ... 263
Speed offset AI1 ... 232
Speed ramps 1 ... 237
Speed ramps 2 ... 237
Speed reference value ... 259
Speed setpoint / actual value comparison ... 261
Speed skip function ... 287
Speed window signal ... 260
Standard gateway ... 294
Standards ... 23
Standstill current ... 284
Standstill current 1 / 2 ... 284
Start offset 1/2 ... 286
Start/stop speed 1 / 2 ... 252
Starting the motor
  Analog setpoint input ... 666
  Fixed setpoints ... 668
  Manual mode ... 670
Startup ... 258
  With DBG60B keypad ... 652
  General information ... 648
  Preliminary work and resources ... 651
Status DCS safety module ... 270
Status displays ... 220
Stop by setpoint function ... 285
Stop ramp t13 / t23 ... 238
Storage temperature ... 39
Structure
  MDX61B size 7 ... 541
  MDX60B/61B size 0 ... 524
  MDX61B size 1 ... 525
  MDX61B size 2 ... 529
  MDX61B size 2S ... 527
  MDX61B size 3 ... 531
  MDX61B size 4 ... 535
  MDX61B size 5 ... 537
  MDX61B size 6 ... 539
  MDX61B size 7 control unit ... 541
  MDX61B size 7 power section ... 542
  MDX61B size 7 power supply unit ... 543
  MDX62B size 7 ... 544
  MDX62B size 7 control unit ... 544
  MDX62B size 7 power section ... 545
  MDX62B size 7 power supply unit ... 546
Subnet mask ... 294
Supply system cables and motor cables
  Cable cross sections and fusing ... 490
  Permitted motor line lengths ... 494
  Special regulations ... 490
  Voltage drop ... 496
SW limit switch LEFT ... 318
SW limit switch RIGHT ... 318
Switch-off responses in case of faults ... 681

27793230/EN – 08/22

Synchronization ext. controller ..... 309
Synchronization phase ..... 329
Synchronization time ..... 309
Synchronous operation ..... 346
Synchronous operation card DRS11B ..... 122
Synchronous operation control ..... 244
Synchronous operation monitoring ..... 264
Synchronous operation with catch up ..... 248
Synchronous operation with distance encoder .. 247
Synchronous ramp ..... 248
Synchronous speed ..... 248
System bus (SBus) ..... 17
System bus (SBus), connection ..... 613
System expansion ..... 23

## T

Technical data
- Braking resistor BW...-T / BW...-P ..... 158, 477
- DRL.. servomotors, 4-pole, 50 Hz, 400 V ..... 362
- Electronics data of basic devices ..... 54
- General information ..... 39
- MDR60A regenerative power supply unit ..... 79
- MOVIDRIVE® MDR60A0150 ..... 81
- MOVIDRIVE® MDR60A0370 ..... 81
- MOVIDRIVE® MDR60A0750 ..... 82
- MOVIDRIVE® MDR60A1320 ..... 82
- MOVIDRIVE® MDR61B1600 ..... 84
- MOVIDRIVE® MDR61B2500 ..... 84
- MOVIDRIVE® MDR62B1600 ..... 85
- MOVIDRIVE® MDX62B2000 ..... 85
- MOVIDRIVE® MDX62B2500 ..... 85
- Regenerative power supply unit MDR61B ..... 80
- Size 0 (AC 400/500 V devices) ..... 41
- Size 1 (AC 400/500 V devices) ..... 43
- Size 1 (AC 230 V devices) ..... 50
- Size 2 (AC 400/500 V devices) ..... 44
- Size 2 (AC 230 V devices) ..... 51
- Size 2S (AC 400/500 V devices) ..... 44
- Size 3 (230 V devices) ..... 52
- Size 3 (AC 400/500 V devices) ..... 45
- Size 4 (AC 230 V devices) ..... 53
- Size 4 (AC 400/500 V devices) ..... 46
- Size 5 (AC 400/500 V devices) ..... 47
- Size 6 (AC 400/500 V devices) ..... 48
- Size 7 (AC 400/500 V devices) ..... 49

Technical support ..... 36, 662
Technology function ..... 223
Technology version ..... 24
Terminal adapter DAT11B ..... 98
Terminal assignment ..... 274
Terminal description
- DEH11B ..... 636
- DEH21B ..... 630
- DER11B ..... 633, 639
- DEU21B ..... 631
- Basic device ..... 606
- DFC11B ..... 647
- DIO11B ..... 644

Tightening torques ..... 549
Time constant n-controller ..... 243
Timeout active ..... 682
Timeout interval SBus 1 ..... 308
Timeout interval SBus 2 ..... 308
Torque limit ..... 253
Touch guard DLB21B ..... 143, 600
Touch guard for power terminals ..... 594
Trademarks ..... 515
Travel speed CW/CCW ..... 314
Type designation ..... 520
Type of cooling 1 ..... 257
Type of cooling 2 ..... 257

## U

UL approval ..... 38
- Braking resistors ..... 153
- MDR60A regenerative power supply unit ..... 78

USB11A ..... 105, 619
User display ..... 218
User unit ..... 304
UWS11A ..... 101
UWS21B ..... 103, 617

## V

V/f characteristic curve ..... 330
Velocity precontrol ..... 314
VFC ..... 330
VFC & DC braking ..... 334
VFC & flying start function ..... 335
VFC & Group ..... 332
VFC & Hoist ..... 333
VFC n-control ..... 336
VFC n-control & group ..... 338

27793230/EN – 08/22

VFC n-control & hoist ..... 333
VFC n-control & IPOS ..... 339
VFC n-control & synchronous operation ..... 339
Voltage systems, permitted;Permitted voltage systems..... 486

## W

Window center..... 260
Wire resistors..... 153
Wiring diagram
Braking resistor BW... / BW...-T / BW...-P .... 603
DC power supply unit (size 7) ..... 602
Power section and brake..... 601
Signal terminals..... 604
Work ..... 221
Workbench ..... 37

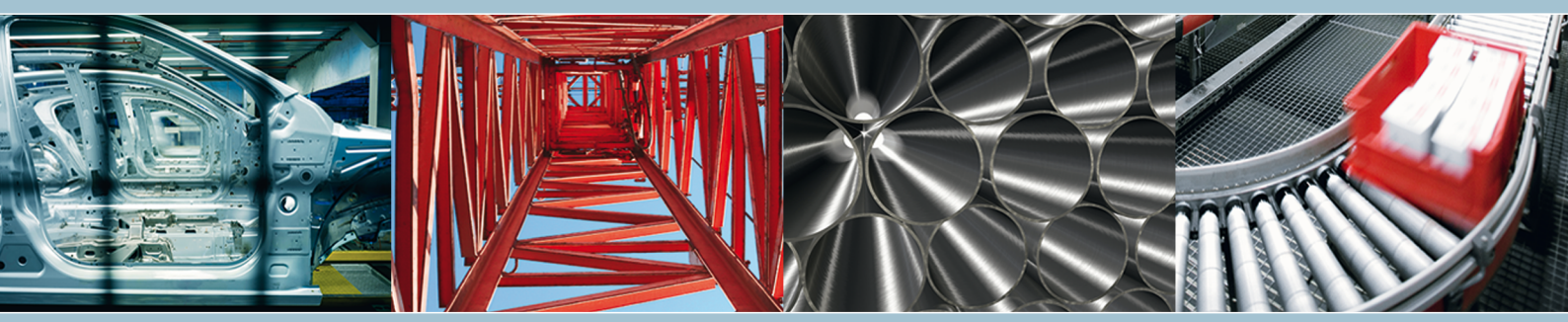
## X

X41 Encoder monitoring..... 265
X41 Pulse count monitoring ..... 265
X42 Encoder monitoring..... 266
X42 Pulse count monitoring ..... 266

## Z

Zero point offset ..... 326

27793230/EN – 08/22





**SEW-EURODRIVE**
**Driving the world**

SEW-EURODRIVE GmbH & Co KG
Ernst-Blickle-Str. 42
76646 BRUCHSAL
GERMANY
Tel. +49 7251 75-0
Fax +49 7251 75-1970
sew@sew-eurodrive.com
→ www.sew-eurodrive.com

Climate neutral
Print product
ClimatePartner.com/53552-1902-1001