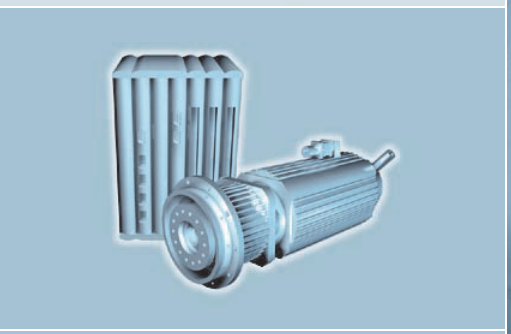
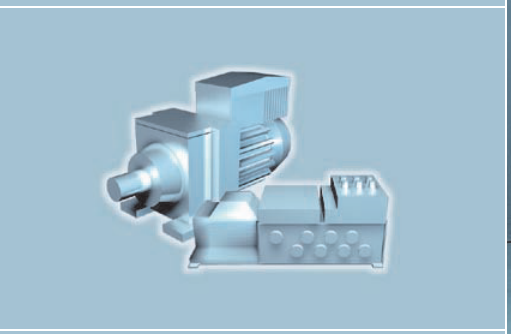
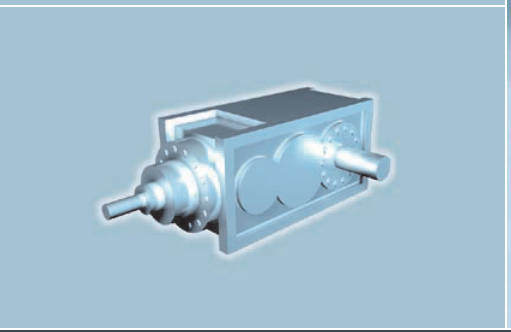
SEW EURODRIVE







MOVIDRIVE® MDX60B / 61B

DA360000

Edition 09/2006

11428228 / EN

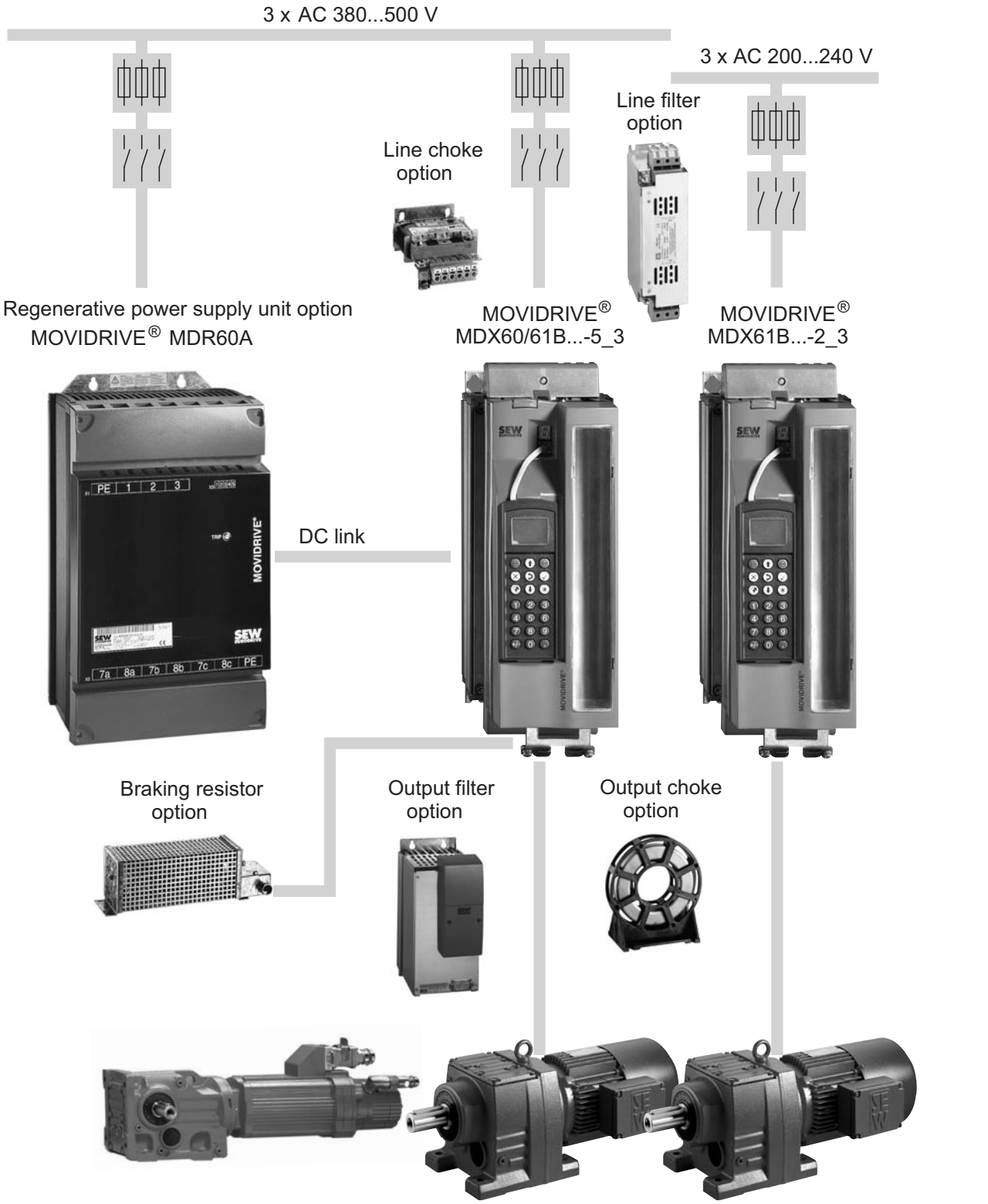
Catalog

SEW EURODRIVE

1 System Description

1.1 System overview of MOVIDRIVE® MDX60B/61B

Power components

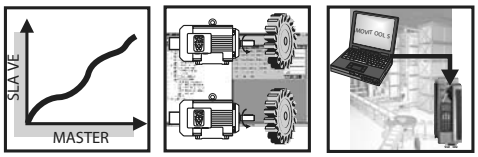


Encoder and communication options

MDX60/61B standard version IPOS plus® as standard

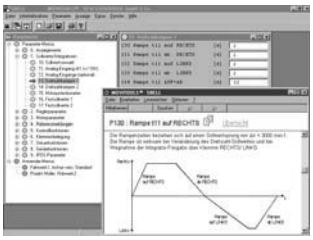
System bus (SBus)

MDX60/61B application version for using "Electronic cam", "Internal synchronous operation" or the application modules.



Keypad option

MOVITOOLS® operating software



Encoder connection options

HIPERFACE® (sin/cos, TTL)
Resolver

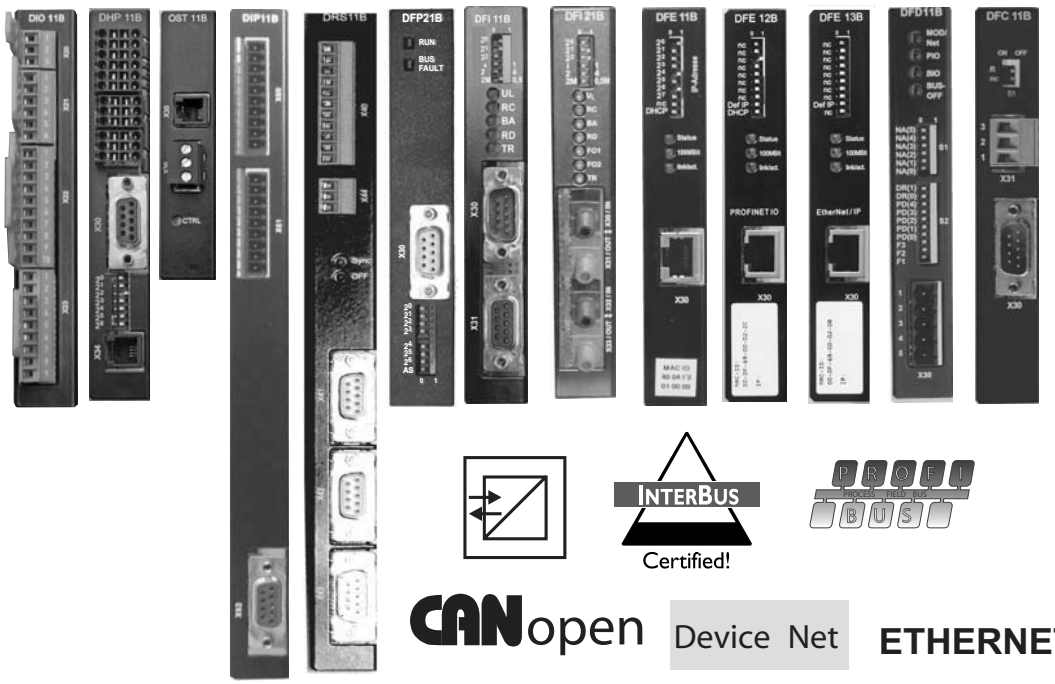
Interface adapter option

UWS 21B

UWS 11A

USB 11A

Input/output card / MOVI-PLC® / Fieldbus interface options



CANopen Device Net ETHERNET

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General description

MOVIDRIVE® MDX60B/61B is the new generation of drive inverters from SEW-EURODRIVE. The new series B MOVIDRIVE® drive inverters feature a modular design, provide enhanced functions in the lower power range, more basic functions and greater overload capacity.

AC drives with the latest digital inverter technology can now be used without restrictions in the 0.55 to 160 kW power range. The levels of dynamic performance and control quality that can now be achieved with MOVIDRIVE® for asynchronous AC motors were previously only possible using servo drives or DC motors. 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 regards to the application range, project planning, startup and operation.

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 processes are in line with the RoHS EU Directive and the law on electronic equipment.

Unit range

The **MOVIDRIVE®** unit range includes three series:

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

Unit versions

MOVIDRIVE® MDX60B/61B drive inverters are each available in two versions, namely the standard version and the application version.

Standard version

The units are equipped with the integrated IPOS$^{plus®}$ positioning and sequence control system 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 unit designation.

Application version

In addition to the features of the standard version, these units include the technology functions "electronic cam" and "internal synchronous operation." You can also use all the application modules available in the MOVITOOLS® software package with the application versions.

The application version is indicated by the "0T" digits at the end of the unit designation.

Modular unit concept

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

- Size 0 (0005 ... 0014) → 2 option slots
  - 1 option slot for encoder connection
  - 1 option slot for a communication option
- Sizes 1 ... 6 (0015 ... 1320) → 3 option slots
  - 1 option slot for encoder connection
  - 1 option slot for a communication option
  - 1 option slot for an expansion option

	NOTES
	• **Option cards can only be installed and removed later by customers for MDX61B sizes 1 to 6. The firmware of the option cards and the basic unit must be compatible.** • For **MDX61B size 0 units, option cards can only be installed and removed later by SEW-EURODRIVE.** Please take this aspect into account when you place your order/perform project planning.

Size 0 (0005 ... 0014) Sizes 1 ... 6 (0015 ... 1320)

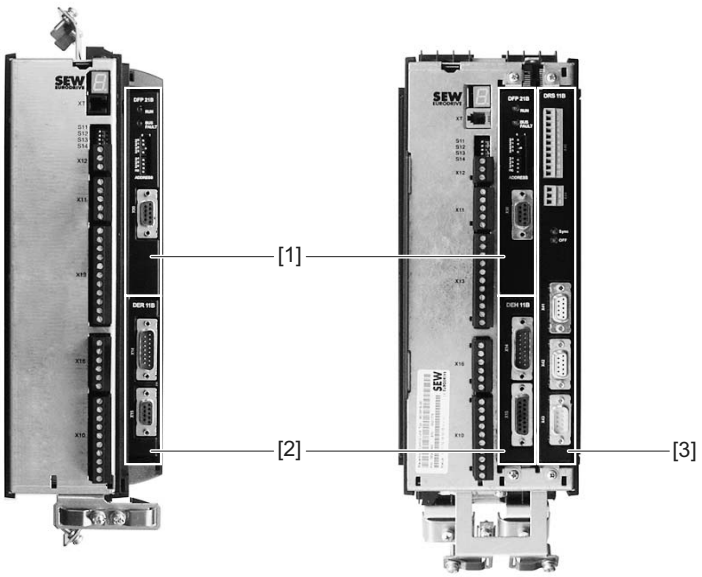

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Figure 1: Options slots for MOVIDRIVE® MDX61B

[1] Fieldbus slot for communication option

[2] Encoder slot for encoder option

[3] Expansion slot for communication option (only sizes 1 - 6)

The modular unit 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 slot
Encoder option		
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	
Communication option		
User-programmable MOVI-PLC® controller	MOVI-PLC® *basic* DHP11B controller	2 2 (3 only if slot 2 is occupied)
Additional RS485 interface (only in combination with option DHP11B)	DHP11B + OST11B	• DHP11B in 2, OST11B in 1 • If 1 is occupied: DHP11B + OST11B in 3
Additional analog and binary inputs/outputs are required	Input/output card type DIO11B	2 2 (3 only if slot 2 is occupied)
Integration into a PROFIBUS system	PROFIBUS interface? type DFP21B	2
Integration into an INTERBUS system	INTERBUS interface type DFI11B / DFI21B	
Integration into an Ethernet system	Ethernet interface type DFE11B, DFE12B, DFE13B	
Integration into a DeviceNet system	DeviceNet interface type DFD11B	
Integration into a CANopen system	CANopen interface type DFC11B	
Expansion option		
SSI encoder interface	DIP11B absolute encoder card	3
Phase-synchronous operation	Synchronous operation board DRS11B	

Control modes

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

System bus (SBus)

The system bus (SBus) is available as standard. It allows several MOVIDRIVE® drive inverters to be networked together. This system bus enables fast data exchange between the units. The MOVILINK® unit profile is used for communication via the SBus. MOVILINK® is the uniform SEW-EURODRIVE standard for serial communication. The SBus can be switched to CANopen.

MOVILINK®

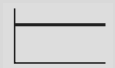
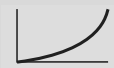
MOVILINK® always uses the same message format independent of the selected interface (SBus, RS232, RS485, fieldbus interfaces). As a result, the control software is independent of the selected interface.

IPOS$^{plus®}$

A significant feature of MOVIDRIVE® drive inverters is that the IPOS$^{plus®}$ positioning and sequence control system is integrated as standard. IPOS$^{plus®}$ enables you to control sequences of motion directly in the inverter close to the machine. This way, load is taken off the master controller and modular concepts can be implemented more easily.

Overview of the units

MOVIDRIVE® MDX60/61B for 3 × AC 380 ... 500 V supply voltage (400/500 V units):

Recommended motor power (VFC)		Continuous output current	MOVIDRIVE® type		Size
		(CFC)	MDX60B not option-capable	MDX61B option-capable	(Techn. data)
0.55 kW	0.75 kW	AC 2.0 A	0005-5A3-4-..	0005-5A3-4-..	0 (→ page 31)
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 (→ page 33)
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 (→ page 35)
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 (→ page 37)
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 (→ page 39)
45 kW	55 kW	AC 89 A	–	0450-503-4-..	
55 kW	75 kW	AC 105 A	–	0550-503-4-..	5 (→ page 41)
75 kW	90 kW	AC 130 A	–	0750-503-4-..	
90 kW	110 kW	AC 170 A	–	0900-503-4-..	6 (→ page 43)
110 kW	132 kW	AC 200 A	–	1100-503-4-..	
132 kW	160 kW	AC 250 A	–	1320-503-4-..	

MOVIDRIVE® MDX60/61B for 3 × AC 200 ... 240 V supply voltage (230 V units):

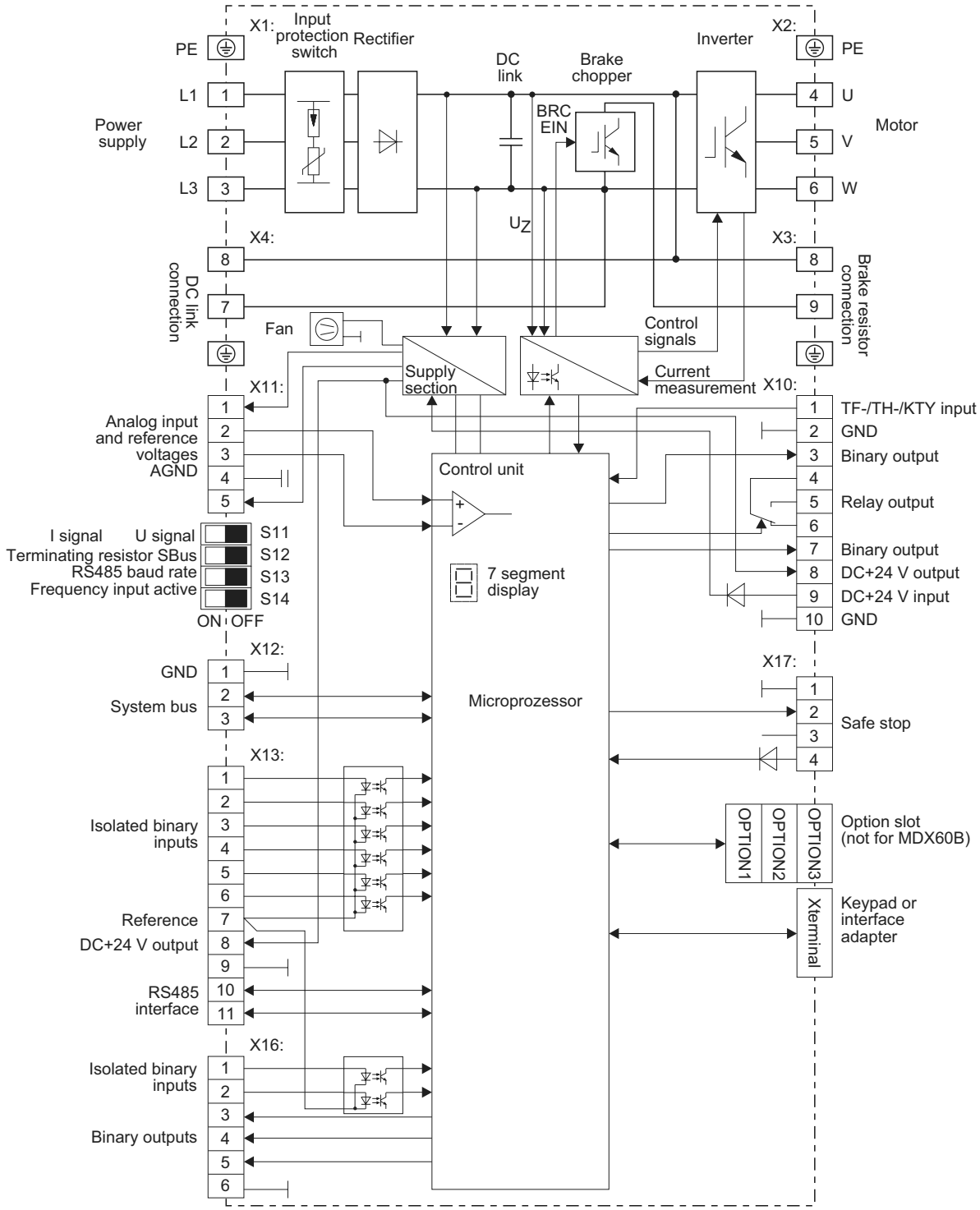
Recommended motor power (VFC)		Continuous output current (CFC)	MOVIDRIVE® type MDX61B option-capable	Size (Technical data)
1.5 kW	2.2 kW	AC 7.3 A	0015-2A3-4-..	1 (→ page 45)
2.2 kW	3.7 kW	AC 8.6 A	0022-2A3-4-..	
3.7 kW	5.0 kW	AC 14.5 A	0037-2A3-4-..	
5.5 kW	7.5 kW	AC 22 A	0055-2A3-4-..	2 (→ page 47)
7.5 kW	11 kW	AC 29 A	0075-2A3-4-..	
11 kW	15 kW	AC 42 A	0110-203-4-..	3 (→ page 49)
15 kW	22 kW	AC 54 A	0150-203-4-..	
22 kW	30 kW	AC 80 A	0220-203-4-..	4 (→ page 51)
30 kW	37 kW	AC 95 A	0300-203-4-..	

MOVIDRIVE® MDR60A regenerative power supply units for 400/500 V units:

MOVIDRIVE® MDR60A regenerative power supply units		Size (technical data)	MOVIDRIVE®MDX60B/61B...-5_3
0370-503-00	I_{mains} = AC 66 A, $I_{DC\ link}$ = DC 70 A	3 (→ page 72)	0005 ... 0370
0750-503-00	I_{mains} = AC 117 A, $I_{DC\ link}$ = DC 141 A	4 (→ page 73)	0005 ... 0750
1320-503-00	I_{mains} = AC 260 A, $I_{DC\ link}$ = DC 340 A	6 (→ page 74)	0005 ... 1320

Block circuit diagram

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



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1.2 Functions

Unit features

- Wide voltage range
  - 400 / 500 V units for the voltage range 3 × AC 380 ... 500 V
  - 230 V units for the voltage range 3 × AC 200 ... 240 V
- High overload capacity
  - Size 0: 200 % I_N for at least 60 s
  - Sizes 1 ... 6: 150 % I_N for at least 60 s
  - All sizes: 125 % I_N for sustained operation without overload (pumps, fans)
- With 4 kHz switching frequency, I_N is permitted for an ambient temperature ϑ = 50
- 4Q capability due to integrated brake chopper installed as standard
- Compact unit mounting position for minimum control cabinet space requirement and optimum utilization of control cabinet volume
- Integrated input filter fitted as standard in sizes 0, 1, 2S and 2, adherence to class A limit on the input side without any additional measures
- Eight isolated binary inputs and six binary outputs, one of which is a relay output; programmable inputs/outputs
- One TF / TH / KTY input for motor protection using a PTC thermistor or thermocontact
- 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 size 0 and 1 units

Control functionality

- VFC or CFC control modes for field-oriented operation (asynchronous servo)
- IPOS$^{plus®}$ positioning and sequence control system integrated as standard
- Two complete parameter sets
- Automatic motor calibration
- 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 static 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 protection through sliding current limitation in the field weakening range
- Function to hide speed window to avoid mechanical resonances
- Heating current for avoiding condensation in the motor
- Parameter lock for protection against changes to parameters
- Speed controller and encoder input with the option cards DEH11B (incremental or Hiperface® encoder) and DER11B (resolver); user-friendly controller setting tool in the user interface
- Protective functions for complete protection of the inverter and motor (short-circuit, overload, overvoltage/undervoltage, low-impedance ground fault, overtemperature in the inverter, motor stall prevention, overtemperature 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 (8 channels, real-time capable)
- Fault memory (5 memory locations) with all relevant operating data at time of the fault
- Elapsed-time counter for hours of operation (unit connected to supply system or DC 24 V) and enable hours (output stage energized)
- Modular option technology for application-specific unit configuration
- Uniform operation, identical parameter setting and the same unit connection technology for the entire MOVIDRIVE® unit series

Setpoint technology

- Ramp switchover (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

Communication / operation

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

System expansion

- Extensive expansion options, for example:
  - Removable plain text keypad with parameter memory
  - USB11A, RS232 ↔ RS485 interface adapter
  - Fieldbus interface, either PROFIBUS, INTERBUS, Ethernet, DeviceNet, CAN / CANopen
  - Input/output card
  - Braking resistors, line filters, line chokes, output chokes, output filters
- MOVITOOLS® operating software with SCOPE process data visualization
- Application version with access to technology functions and application modules for specific applications
- MOVIDRIVE® MDR60A 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.

Standards / certificates

- UL, cUL, C-Tick approval. The MOVIDRIVE® MDR60A1320-503-00 unit does not have UL or cUL or C-Tick approval.
- Safe disconnection of power and electronic connections according to EN 61800-5-1.
- Fulfills all the requirements for CE certification of machines and plants equipped with MOVIDRIVE® units on the basis of the EC Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC. Complies with the EMC product standard EN 61800-3.
- Complies with the safety requirement "Safe stop" according to EN 954-1, category 3

1.3 Additional functions of the application version

SEW-EURODRIVE offers additional functions for special applications. You can use these additional functions with MOVIDRIVE® units in the application version (...-0T).

The following additional functions are available:

- Electronic cam
- Internal synchronous operation

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

Electronic cam;

You can use the MOVIDRIVE® range of units with "electronic cam" 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. You also have the option of importing existing cam data 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 MOVIDRIVE® MDX61B units in application 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.
- The "electronic cam" is only available in parameter set 1.
- The "synchronous operation board type DRS11B" 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:
  - CT/CV asynchronous servomotor, high-resolution sin/cos encoder installed as standard or HIPERFACE® encoder
  - DT/DV/D AC motors with incremental encoder, preferably high-resolution sin/cos encoder or HIPERFACE® encoder.
  - DS/CM/CMD/CMP synchronous servomotors, resolver (installed as standard) or HIPERFACE® encoder.

High-resolution speed measurement is required for optimum operation of the electronic cam. The encoder installed as standard in the CT/CV and DS/CM/CMD/CMP motors meets the requirements. SEW-EURODRIVE recommends using high-resolution sin/cos encoders as incremental encoders if DT/DV/D motors are used.

Example

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

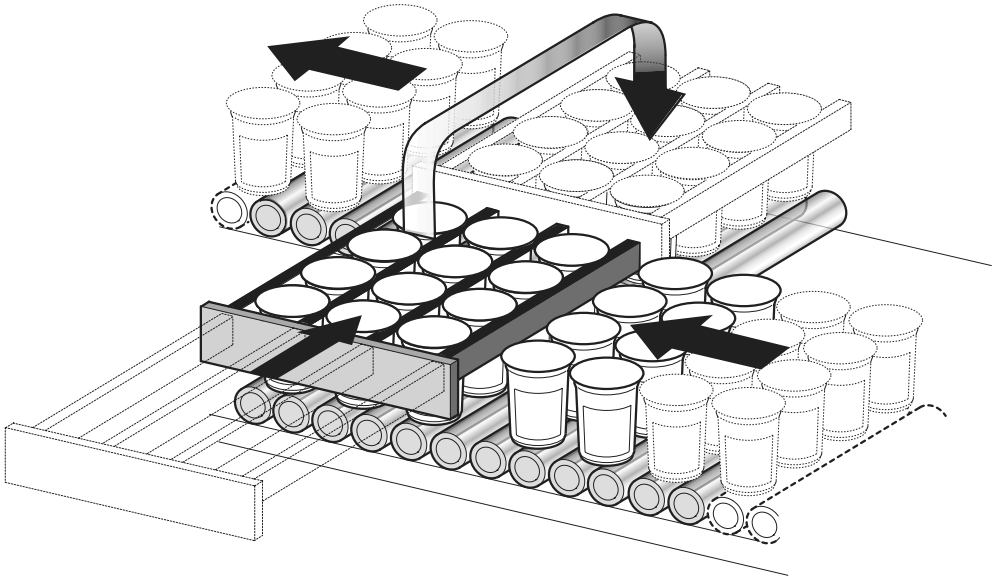

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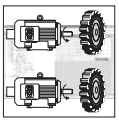
Figure 2: Application example for the "electronic cam."

Internal synchronous operation



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

Note the following points:

- "Internal synchronous operation" can only be implemented with MOVIDRIVE® MDX61B units in application version (...-0T).
- Encoder feedback is mandatory. This is why "internal synchronous 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 "synchronous operation board DRS11B" option cannot be used together with "internal synchronous operation."

Motors and encoders

Use the following motor types:

- For operation with MOVIDRIVE® MDX61B...-4-0T:
  - CT/CV asynchronous servomotor, high-resolution sin/cos encoder installed as standard or HIPERFACE® encoder
  - DT/DV/D AC motors with incremental encoder, preferably high-resolution sin/cos encoder or HIPERFACE® encoder.
  - DS/CM/CMD/CMP synchronous servomotors, resolver (installed as standard) or HIPERFACE® encoder.

High-resolution speed measurement is required for optimum operation of the "internal synchronous operation." The encoder installed as standard in the CT/CV and DS/CM/CMD/CMP motors meets the requirements. SEW-EURODRIVE recommends using high-resolution sin/cos encoders as incremental encoders if DT/DV/D motors are used.

Example

The figure below shows a typical application for the "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.

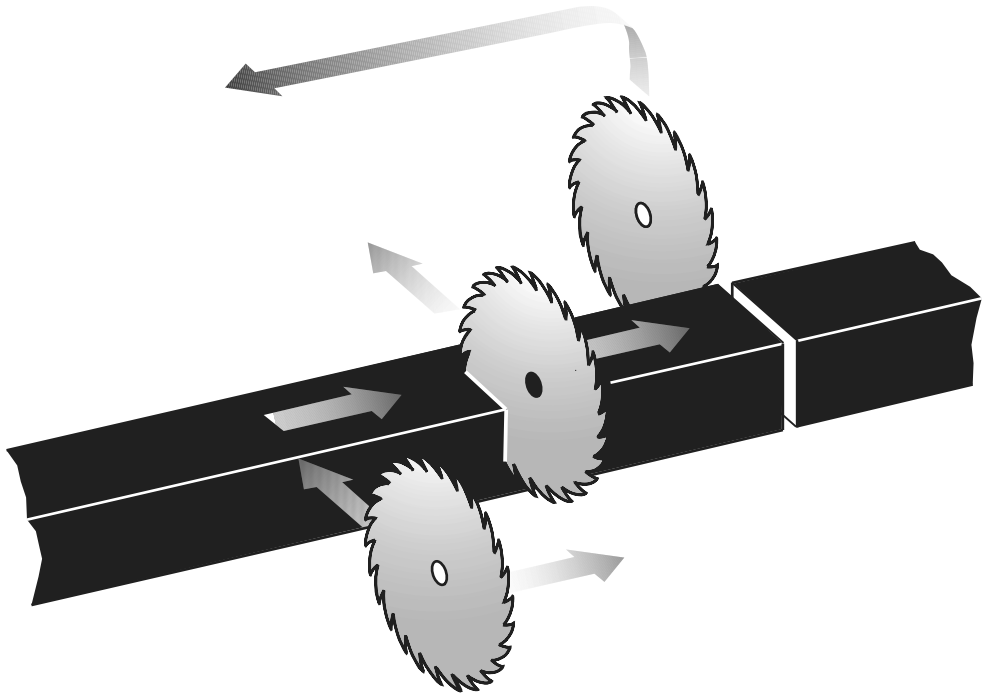


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Figure 3: Typical application for the "internal synchronous operation" function

1.4 Application modules for MOVIDRIVE® MDX61B

The drive application

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.

The solution with 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 part of the MOVITOOLS® operating software and can be used with units in application 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 and loads it into the inverter. MOVIDRIVE® takes over complete control of the motion processes, the load is taken off the machine control 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 process instead of complicated programming
- No programming know-how required
- No lengthy training, therefore quick project planning and startup
- All movement functions are controlled directly in MOVIDRIVE®
- Decentralized concepts can be implemented more easily

Scope of delivery and documentation

The application modules are part of the MOVITOOLS® operating software and can be used with MOVIDRIVE® MDX61B units in application version (...-0T). The individual application manuals can also be downloaded as PDFs from the SEW homepage.

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:

- Positioning via bus
- Extended positioning via bus
- Absolute positioning (Rapid / creep speed positioning)

Rotary motion:

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

Winding

- Center winder

Controlling

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

Application

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

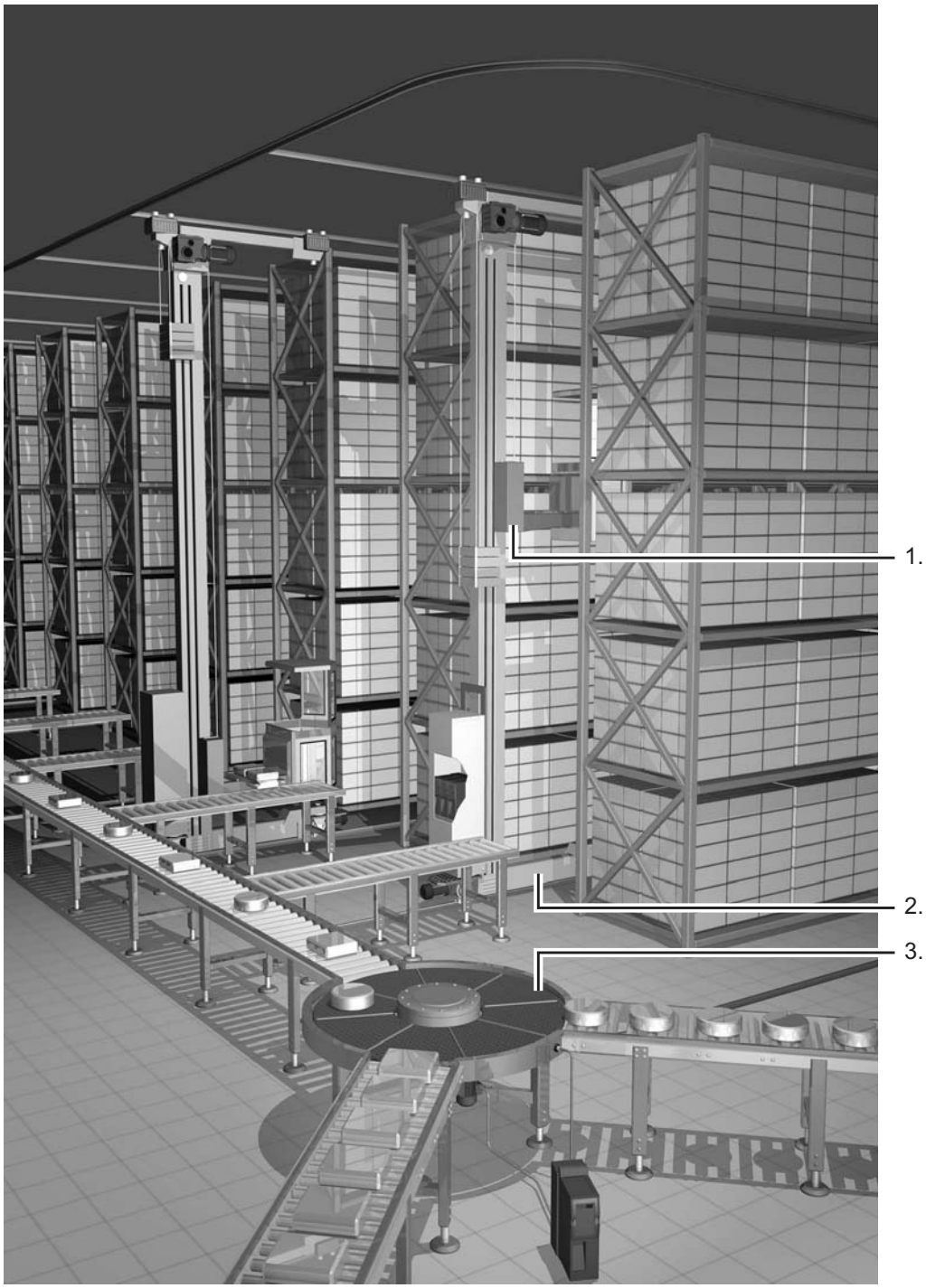

Figure 4: Use in a high-bay warehouse

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

Positioning

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

For example, trolleys, hoists, gantries, rotary tables, swiveling devices as well as storage and retrieval units.

Linear positioning

In the case of linear positioning application modules, SEW-EURODRIVE distinguishes between whether the movement records are managed in the inverter or in the master PLC.

Movement records in the inverter

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

These application modules are suited to applications in which movement only has to take place to a limited number of different target positions and in which the highest possible degree of independence from the machine control 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 binary inputs of the inverter or via the virtual terminals (fieldbus, system bus). These application modules come with the following range of 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 increment or absolute encoders can be evaluated.
- Guided startup and diagnosis.

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: Higher-level PLC controls the process automatically.

Movement records in the PLC

- **Positioning via bus**
- **Extended positioning via bus**

These application modules are suited to applications with a large number of different target positions.

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. These application modules come with the following range of features:

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

- Guided startup and diagnosis.

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: Higher-level PLC controls the process automatically.

- **Absolute positioning (Rapid / creep speed positioning)**

This application module is suitable for applications in which there is a high tendency to vibrate, for example storage and retrieval units for high-bay warehouses or heavy trolleys.

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 comes with the following range of 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 diagnosis.

The following operating modes are available for controlling the machine:

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

Rotational positioning

- **Modulo positioning**

A large number of movements have to be controlled in automated conveyor and logistics applications to transport the material. Linear movements in the form of trolleys or hoists, and rotary movements via rotary tables play an important role in these applications.

Rotary movements are often synchronized (circular transfer tables); the material is fed at a specific degree value. However, there are also many rotational applications in which the material should be moved to its destination by the shortest possible route (distance-optimized positioning) or in which it is only permitted to move to the target position 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 binary 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 diagnosis
- Users do not need any programming experience
- Rapid familiarization with the system

Winding

- **Center winder**

The "Central 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.

Control takes place either via the binary inputs of the inverter or using the virtual terminals (fieldbus, system bus).

The "Central winder" application module comes with the following range of features:

- Constant tensile force or web speed 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 master controller (PLC).
- Guided startup and diagnosis.

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.

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 comes with the following range of features:

- Choice of fieldbus or terminal control.
- Cut edge protection or sorting using the "pulling a gap" function.
- Immediate cut function by manual interrupt.
- Counter for material length.
- Straightforward connection to the higher-level controller.
- Guided startup and diagnosis.

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 operation

- **DriveSync via fieldbus**

The "DriveSync via fieldbus" application module makes it possible to implement conveyor systems and machinery with drives that have to move at a synchronous angle to one another occasionally or permanently.

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 comes with the following range of features:

- Guided startup as well as extensive diagnostic functions.
- High degree of similarity with "Extended positioning via bus."
- One program module for the master and slave drive.
- The selected IPOS$^{plus®}$ encoder source is also effective in synchronous operation.
- The master value for the "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 operation
  - 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
  - Trolleys
  - Hoists
  - Rail vehicles
- Logistics
  - Storage and retrieval units
  - Transverse carriages

1.5 MOVITOOLS® operating software

Description

MOVITOOLS® is a program package comprising SHELL, SCOPE and the IPOS$^{plus®}$ Compiler. You can use MOVITOOLS® to address either of the unit series: MOVIDRIVE® MDX60B/61B, MOVIDRIVE® *compact* and MOVITRAC® 07A.

- SHELL can be used to start up the drive and set its parameters quickly and easily.
- SCOPE provides extensive oscilloscope functions for drive diagnostics.
- IPOS$^{plus®}$ Compiler provides a convenient way of writing programs for applications in a high-level language.
- The assembler enables you to write programs directly on the machine.
- The device status shows you the status of the connected unit.

Various application modules, such as table positioning, are already stored in MOVITOOLS® as IPOS$^{plus®}$ programs and can be activated using the application version units.

MOVITOOLS® is supplied on a CD-ROM and can also be downloaded from the SEW homepage (http://www.sew-eurodrive.de). MOVITOOLS® can be operated with the following operating systems:

- Windows® 95
- Windows® 98
- Windows NT® 4.0
- Windows® 2000
- Windows® Me
- Windows® XP

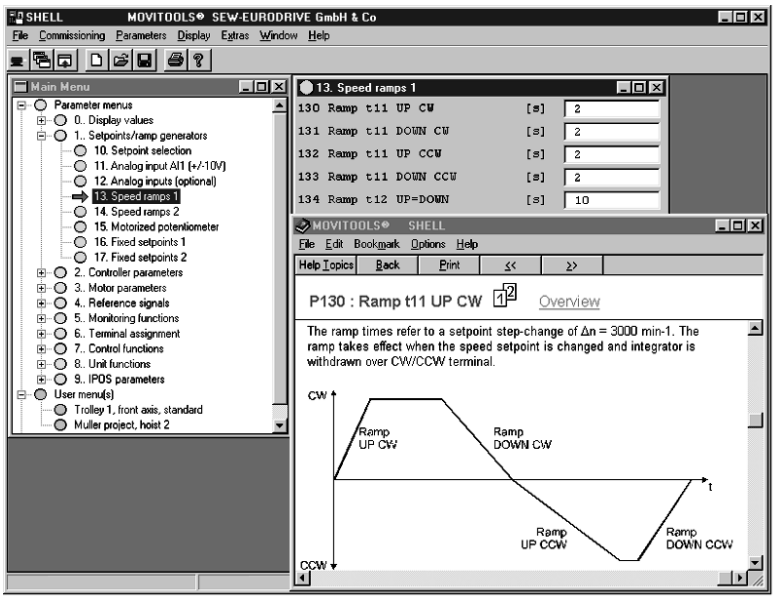

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Figure 5: MOVITOOLS® window

2 Technical Data and Dimension Drawings

2.1 CE marking, UL approval and unit designation

CE marking

- Low voltage directive

  MOVIDRIVE® MDX60B/61B drive inverters comply with the regulations of the Low Voltage Directive 73/23/EEC.
- 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 the installation instructions are complied with, they satisfy the appropriate requirements for CE marking of the entire machine/system in which they are installed, on the basis of the EMC Directive 89/336/EEC.
- Compliance with limit class A or B has been tested on a specified test setup. SEW-EURODRIVE can provide detailed information on request.

CE

The CE mark on the nameplate indicates conformity with the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC. We can provide a copy of the declaration of conformity on request.

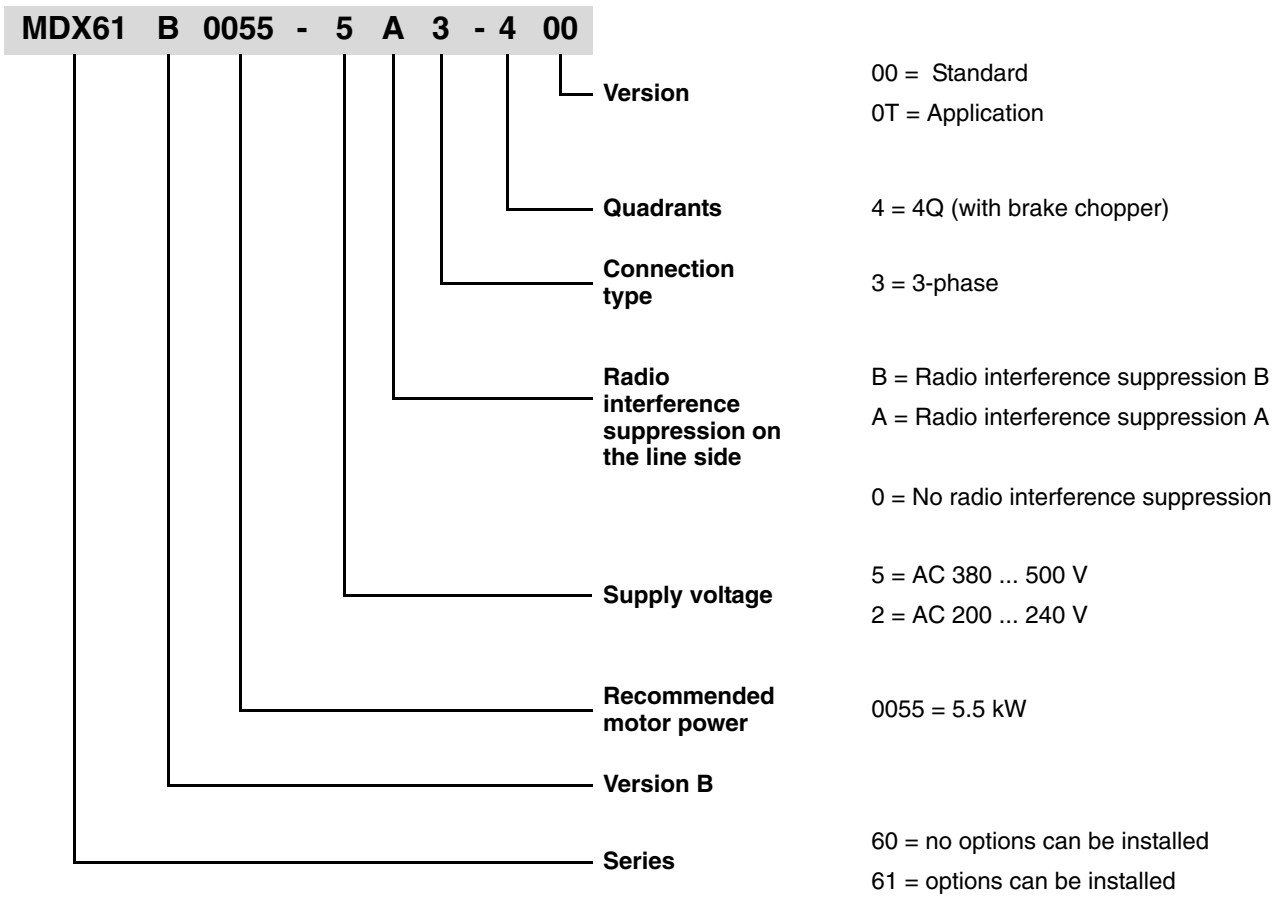
UL / cUL / GOST-R

UL, cUL approval (USA) and the GOST-R certificate (Russia) have been approved for the MOVIDRIVE® MDX60B/61B unit series. cUL is equivalent to CSA approval.

C-Tick

C-Tick approval has been granted for the MOVIDRIVE® MDX60B/61B series. C-Tick certifies conformity with ACA (Australian Communications Authority) standards.

Sample unit designation



2.2 General technical data

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

MOVIDRIVE® MDX60B/61B	All sizes
Interference immunity	Fulfills EN 61800-3
Interference emission with EMC compliant installation	Sizes 0 to 6 meet EN 61800-3 Sizes 0 to 5: In accordance with limit value class B to EN 55011 and EN 55014 with corresponding line filter Sizes 0, 1, and 2 in accordance with limit value class A to EN 55011 and EN 55014 without additional measures Size 6 in accordance with limit value class A to EN 55011 and EN 55014 with corresponding line filter
Ambient temperature ϑ_U **Derating ambient temperature** **Climate class**	0 °C...+50 °C when I_D = 100 % I_N and f_{PWM} = 4 kHz 0 °C...+40 °C when I_D = 125 % I_N and f_{PWM} = 4 kHz 0 °C...+40 °C when I_D = 100 % I_N and f_{PWM} = 8 kHz Derating: • 2.5 % I_N per K between 40 °C - 50 °C • 3 % I_N per K for 50 °C - 60 °C EN 60721-3-3, class 3K3
Storage temperature[1] ϑ_L	–25 °C...+70 °C (EN 60721-3-3, class 3K3) DBG keypad: –20 °C...+60 °C
Cooling type (DIN 51751)	Forced cooling (temperature-controlled fan, response threshold 45 °C)
Enclosure **Sizes 0 to 3** **EN 60529** **Sizes 4 to 6** **(NEMA1)**	IP20 IP00 (power connections) IP10 (power connections) with • fitted plexiglass cover supplied as standard and • shrink tubing (not included in scope of delivery)
Operating mode	Continuous operation with 50 % overload (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)
Installation altitude **h**	Up to h ≤ 1000 m without restrictions. The following restrictions apply at heights ≥ 1000 m: • From 1000 m (3,280 ft.) to max. 4,000 m (6561 ft.): – I_N reduction by 1% per 100 m (330 ft) • From 2000 m (6,561 ft.) to max. 4000 m (13,123 ft.): – AC 230 V units: V_N reduction by AC 3 V per 100 m – AC 500 V units: V_N reduction by AC 6 V per 100 m Over 2000 m only overvoltage class 2, external measures are required for overvoltage class 3. Overvoltage classes according to DIN VDE 0110-1.

1) In case of long-term storage, the unit must be connected to the mains voltage for at least 5 minutes every two years, otherwise the unit's service life may be reduced.

MOVIDRIVE® MDX60B/61B series, size 0

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Figure 6: MOVIDRIVE® MDX60/61B series, size 0

MOVIDRIVE® MDX61B series, sizes 1 to 6

52159AXX

Figure 7: MOVIDRIVE® MDX61B series, sizes 1 to 6

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

Size 0 (400/500 V) **MDX60B0005 ... 0014, no options can be installed**
MDX61B0005 ... 0014, options can be installed

51485BXX

MOVIDRIVE® MDX60/61B		0005-5A3-4-0_	0008-5A3-4-0_	0011-5A3-4-0_	0014-5A3-4-0_
Size		0S		0M	
INPUT					
Supply voltage	U_{mains}	3 × AC 380 V –10 % ... 3 × AC 500 V +10 %			
Supply frequency	f_{mains}	50 Hz ... 60 Hz ± 5 %			
Rated supply current[1] (at V_{mains} = 3 × AC 400 V)	I_{mains} **100 %** **125 %**	AC 1.8 A AC 2.3 A	AC 2.2 A AC 2.7 A	AC 2.8 A AC 3.5 A	AC 3.6 A AC 4.5 A
OUTPUT					
Apparent output power[2] (at V_{mains} = 3 × AC 380...500 V)	S_N	1.4 kVA	1.6 kVA	2.1 kVA	2.8 kVA
Rated output current[1] (at V_{mains} = 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)I_D (at U_{mains} = 3 × AC 400 V and f_{PWM} = 4 kHz)		AC 2.5 A	AC 3 A	AC 3.8 A	AC 5 A
Continuous output current (= 100 % I_N)I_D (at U_{mains} = 3 × AC 400 V and f_{PWM} = 8 kHz)		AC 2 A	AC 2.4 A	AC 3.1 A	AC 4 A
Current limitation	I_{max}	Motor and regenerative 200 % I_N, duration depending on capacity utilization			
Internal current limitation		I_{max} = 0...200 % adjustable			
Minimum permitted braking resistor value (4Q operation)	R_{BRmin}	68 Ω			
Output voltage	U_A	Max. V_{mains}			
PWM frequency	f_{PWM}	Can be set: 4/8/12/16 kHz			
Speed range / resolution	n_A / Δn_A	–6000 ... 0 ... +6000 min^{-1} / 0.2 min^{-1} across the entire range			
GENERAL INFORMATION					
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	

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

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

MDX60B standard version	0005-5A3-4-00	0008-5A3-4-00	0011-5A3-4-00	0014-5A3-4-00
Part number	827 722 2	827 723 0	827 724 9	827 725 7
MDX60B Application version	0005-5A3-4-0T	0008-5A3-4-0T	0011-5A3-4-0T	0014-5A3-4-0T
Part number	827 726 5	827 727 3	827 728 1	827,729 X
Constant load Recommended motor power P_{Mot}	0.55 kW	0.75 kW	1.1 kW	1.5 kW
Variable torque load or constant load without overload Recommended motor power P_{Mot}	0.75 kW	1.1 kW	1.5 kW	2.2 kW
Weight	2.0 kg		2.5 kg	
Dimensions **W** × **H** × **D**	45 × 317 × 260 mm		67,5 × 317 × 260 mm	

MDX61B standard version (VFC/CFC/SERVO)	0005-5A3-4-00	0008-5A3-4-00	0011-5A3-4-00	0014-5A3-4-00
Part number	827 730 3	827 731 1	827,732 X	827 733 8
MDX61B application version (VFC/CFC/SERVO)	0005-5A3-4-0T	0008-5A3-4-0T	0011-5A3-4-0T	0014-5A3-4-0T
Part number	827 734 6	827 735 4	827 736 2	827 737 0
Weight	2.3 kg		2.8 kg	
Dimensions **W** × **H** × **D**	72,5 × 317 × 260 mm		95 × 317 × 260 mm	
Recommended motor power	→ MOVIDRIVE® B system manual, section 'Motor Selection'			

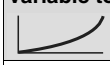
Size 1 (400/500 V) MDX61B0015 ... 0040, options can be installed in all units

53071AXX

MOVIDRIVE® MDX61B		0015-5A3-4-0_	0022-5A3-4-0_	0030-5A3-4-0_	0040-5A3-4-0_
INPUT					
Supply voltage	U_{mains}	3 × AC 380 V –10 % ... 3 × AC 500 V +10 %			
Supply frequency	f_{mains}	50 Hz ... 60 Hz ± 5 %			
Rated supply current[1] **(at V_{mains} = 3 × AC 400 V)**	I_{mains} **100 %** **125 %**	AC 3.6 A AC 4.5 A	AC 5.0 A AC 6.2 A	AC 6.3 A AC 7.9 A	AC 8.6 A AC 10.7 A
OUTPUT					
Apparent output power[2] **(at V_{mains} = 3 × AC 380...500 V)**	S_N	2.8 kVA	3.8 kVA	4.9 kVA	6.6 kVA
Rated output current[1] **(at V_{mains} = 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)I_D (at U_{mains} = 3 × AC 400 V and f_{PWM} = 4 kHz)		AC 5 A	AC 6.9 A	AC 8.8 A	AC 11.9 A
Continuous output current (= 100 % I_N)I_D (at U_{mains} = 3 × AC 400 V and f_{PWM} = 8 kHz)		AC 4 A	AC 5.5 A	AC 7 A	AC 9.5 A
Current limitation	I_{max}	Motor and regenerative 150 % I_N, duration depending on capacity utilization			
Internal current limitation		I_{max} = 0...150 % adjustable			
Minimum permitted braking resistor value (4Q operation)	R_{BRmin}	68 Ω			
Output voltage	U_A	Max. V_{mains}			
PWM frequency	f_{PWM}	Can be set: 4/8/12/16 kHz			
Speed range / resolution	n_A / Δn_A	–6000 ... 0 ... +6000 min^{-1} / 0.2 min^{-1} across the entire range			
GENERAL INFORMATION					
Power loss at S_N[2]	P_{Vmax}	85 W	105 W	130 W	180 W
Cooling air consumption		40 m^3/h			
Weight		3.5 kg			
Dimensions	**W × H × D**	105 × 314 × 234 mm			

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

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

MDX61B Standard version	0015-5A3-4-00	0022-5A3-4-00	0030-5A3-4-00	0040-5A3-4-00
Part number	827 957 8	827 958 6	827 959 4	827 960 8
MDX61B Application version	**0015-5A3-4-0T**	**0022-5A3-4-0T**	**0030-5A3-4-0T**	**0040-5A3-4-0T**
Part number	827 975 6	827 976 4	827 977 2	827 978 0
 **Constant load** **Recommended motor power** P_{Mot}	1.5 kW	2.2 kW	3.0 kW	4.0 kW
Variable torque load or constant load without overload  **Recommended motor power** P_{Mot}	2.2 kW	3.0 kW	4.0 kW	5.5 kW
Recommended motor power	→ MOVIDRIVE® B system manual, section 'Motor Selection'			

Size 2S, 2 (400/500 V)

MDX61B0055 ... 0110, options can be installed in all units

53072AXX

MOVIDRIVE® MDX61B		0055-5A3-4-0_	0075-5A3-4-0_	0110-5A3-4-0_
Size		2S		2
INPUT				
Supply voltage	U_{mains}	3 × AC 380 V –10 % ... 3 × AC 500 V +10 %		
Supply frequency	f_{mains}	50 Hz ... 60 Hz ± 5 %		
Rated supply current[1] **(at V_{mains} = 3 × AC 400 V)**	I_{mains} **100 %** **125 %**	AC 11.3 A AC 14.1 A	AC 14.4 A AC 18.0 A	AC 21.6 A AC 27.0 A
OUTPUT				
Apparent output power[2] **(at V_{mains} = 3 × AC 380...500 V)**	S_N	8.7 kVA	11.2 kVA	16.8 kVA
Rated output current[1] **(at V_{mains} = 3 × AC 400 V)**	I_N	AC 12.5 A	AC 16 A	AC 24 A
Continuous output current (= 125 % I_N)I_D (at U_{mains} = 3 × AC 400 V with f_{PWM} = 4 kHz)		AC 15.6 A	AC 20 A	AC 30 A
Continuous output current (= 100 % I_N)I_D (at U_{mains} = 3 × AC 400 V with f_{PWM} = 8 kHz)		AC 12.5 A	AC 16 A	AC 24 A
Current limitation	I_{max}	Motor and regenerative 150 % I_N, duration depending on capacity utilization		
Internal current limitation		I_{max} = 0...150 % adjustable		
Minimum permitted braking resistor value (4Q operation)	R_{BRmin}	47 Ω		22 Ω
Output voltage	U_A	Max. V_{mains}		
PWM frequency	f_{PWM}	Can be set: 4/8/12/16 kHz		
Speed range / resolution	n_A / Δn_A	–6000 ... 0 ... +6000 min^{-1} / 0.2 min^{-1} across the entire range		
GENERAL INFORMATION				
Power loss at S_N[2]	P_{Vmax}	220 W	290 W	400 W
Cooling air consumption		80 m^3/h		
Weight		6.6 kg		
Dimensions	**W × H × D**	105 × 335 × 294 mm		135 × 315 × 285 mm

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

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

MDX61B Standard version		0055-5A3-4-00	0075-5A3-4-00	0110-5A3-4-00
Part number		827 961 6	827 962 4	827 963 2
MDX61B Application version		0055-5A3-4-0T	0075-5A3-4-0T	0110-5A3-4-0T
Part number		827 979 9	827 980 2	827 981 0
Constant load Recommended motor power	P_{Mot}	5.5 kW	7.5 kW	11 kW
Variable torque load or constant load without overload Recommended motor power	P_{Mot}	7.5 kW	11 kW	15 kW
Recommended motor power		→ MOVIDRIVE® B system manual, section 'Motor Selection'		

Size 3 (400/500 V) MDX61B0150 ... 0300, options can be installed in all units

53073AXX

MOVIDRIVE® MDX61B		0150-503-4-0_	0220-503-4-0_	0300-503-4-0_
INPUT				
Supply voltage	U_{mains}	3 × AC 380 V –10 % ... 3 × AC 500 V +10 %		
Supply frequency	f_{mains}	50 Hz ... 60 Hz ± 5 %		
Rated supply current[1] **(at V_{mains} = 3 × AC 400 V)**	I_{mains} **100 %** **125 %**	AC 28.8 A AC 36 A	AC 41.4 A AC 51.7 A	AC 54 A AC 67.5 A
OUTPUT				
Apparent output power[2] **(at V_{mains} = 3 × AC 380...500 V)**	S_N	22.2 kVA	31.9 kVA	41.6 kVA
Rated output current[1] **(at V_{mains} = 3 × AC 400 V)**	I_N	AC 32 A	AC 46 A	AC 60 A
Continuous output current (= 125 % I_N)I_D (at U_{mains} = 3 × AC 400 V with f_{PWM} = 4 kHz)		AC 40 A	AC 57.5 A	AC 75 A
Continuous output current (= 100 % I_N)I_D (at U_{mains} = 3 × AC 400 V with f_{PWM} = 8 kHz)		AC 32 A	AC 46 A	AC 60 A
Current limitation	I_{max}	Motor and regenerative 150 % I_N, duration depending on capacity utilization		
Internal current limitation		I_{max} = 0...150 % adjustable		
Minimum permitted braking resistor value (4Q operation)	R_{BRmin}	15 Ω	12 Ω	
Output voltage	U_A	Max. V_{mains}		
PWM frequency	f_{PWM}	Can be set: 4/8/12/16 kHz		
Speed range / resolution	n_A / Δn_A	–6000 ... 0 ... +6000 min^{-1} / 0.2 min^{-1} across the entire range		
GENERAL INFORMATION				
Power loss at S_N[2]	P_{Vmax}	550 W	750 W	950 W
Cooling air consumption		180 m^3/h		
Weight		15.0 kg		
Dimensions	W × H × D	200 × 465 × 308 mm		

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

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

MDX61B Standard version		0150-503-4-00	0220-503-4-00	0300-503-4-00
Part number		827 964 0	827 965 9	827 966 7
MDX61B Application version		0150-503-4-0T	0220-503-4-0T	0300-503-4-0T
Part number		827 982 9	827 983 7	827 984 5
Constant load Recommended motor power	P_{Mot}	15 kW	22 kW	30 kW
Variable torque load or constant load without overload Recommended motor power	P_{Mot}	22 kW	30 kW	37 kW
Recommended motor power		→ MOVIDRIVE® B system manual, section 'Motor Selection'		

Size 4 (400/500 V) MDX61B0370 ... 0450, options can be installed in all units

53074AXX

MOVIDRIVE® MDX61B			0370-503-4-0_	0450-503-4-0_
INPUT				
Supply voltage		U_{mains}	3 × AC 380 V –10 % ... 3 × AC 500 V +10 %	
Supply frequency		f_{mains}	50 Hz ... 60 Hz ± 5 %	
Rated supply current[1] (at V_{mains} = 3 × AC 400 V)	I_{mains}	**100 %** **125 %**	AC 65.7 A AC 81.9 A	AC 80.1 A AC 100.1 A
OUTPUT				
Apparent output power[2] (at V_{mains} = 3 × AC 380...500 V)		S_N	51.1 kVA	62.3 kVA
Rated output current[1] (at V_{mains} = 3 × AC 400 V)		I_N	AC 73 A	AC 89 A
Continuous output current (= 125 % I_N)I_D (at U_{mains} = 3 × AC 400 V with f_{PWM} = 4 kHz)			AC 91 A	AC 111 A
Continuous output current (= 100 % I_N)I_D (at U_{mains} = 3 × AC 400 V with f_{PWM} = 8 kHz)			AC 73 A	AC 89 A
Current limitation		I_{max}	Motor and regenerative 150 % I_N, duration depending on capacity utilization	
Internal current limitation			I_{max} = 0...150 % adjustable	
Minimum permitted braking resistor value (4Q operation)		R_{BRmin}	6 Ω	
Output voltage		U_A	Max. V_{mains}	
PWM frequency		f_{PWM}	Can be set: 4/8/12/16 kHz	
Speed range / resolution		n_A / Δn_A	–6000 ... 0 ... +6000 min^{-1} / 0.2 min^{-1} across the entire range	
GENERAL INFORMATION				
Power loss at S_N[2]		P_{Vmax}	1200 W	1450 W
Cooling air consumption			180 m^3/h	
Weight			27 kg	
Dimensions		**W × H × D**	280 × 522 × 307 mm	

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

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

MDX61B Standard version		**0370-503-4-00**	**0450-503-4-00**
Part number		827 967 5	827 968 3
MDX61B Application version		**0370-503-4-0T**	**0450-503-4-0T**
Part number		827 985 3	827 986 1
Constant load **Recommended motor power**	**P_{Mot}**	37 kW	45 kW
Variable torque load or constant load without overload **Recommended motor power**	**P_{Mot}**	45 kW	55 kW
Recommended motor power		→ MOVIDRIVE® B system manual, section 'Motor Selection'	

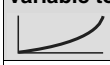
Size 5 (400/500 V) **MDX61B0550 ... 0750, options can be installed in all units**

53075AXX

MOVIDRIVE® MDX61B			0550-503-4-0_	0750-503-4-0_
INPUT				
Supply voltage		U_{mains}	3 × AC 380 V –10 % ... 3 × AC 500 V +10 %	
Supply frequency		f_{mains}	50 Hz ... 60 Hz ± 5 %	
Rated supply current[1] (at V_{mains} = 3 × AC 400 V)	I_{mains}	**100 %** **125 %**	AC 94.5 A AC 118.1 A	AC 117 A AC 146.3 A
OUTPUT				
Apparent output power[2] (at V_{mains} = 3 × AC 380...500 V)		S_N	73.5 kVA	91.0 kVA
Rated output current[1] (at V_{mains} = 3 × AC 400 V)		I_N	AC 105 A	AC 130 A
Continuous output current (= 125 % I_N) I_D (at U_{mains} = 3 × AC 400 V with f_{PWM} = 4 kHz)			AC 131 A	AC 162 A
Continuous output current (= 100 % I_N) I_D (at U_{mains} = 3 × AC 400 V with f_{PWM} = 8 kHz)			AC 105 A	AC 130 A
Current limitation		I_{max}	Motor and regenerative 150 % I_N, duration depending on capacity utilization	
Internal current limitation			I_{max} = 0...150 % adjustable	
Minimum permitted braking resistor value (4Q operation)		R_{BRmin}	6 Ω	4 Ω
Output voltage		U_A	Max. V_{mains}	
PWM frequency		f_{PWM}	Can be set: 4/8/12/16 kHz	
Speed range / resolution		n_A / Δn_A	–6000 ... 0 ... +6000 min^{-1} / 0.2 min^{-1} across the entire range	
GENERAL INFORMATION				
Power loss at S_N[2]	P_{Vmax}		1700 W	2000 W
Cooling air consumption			360 m^3/h	
Weight			35 kg	
Dimensions		**W × H × D**	280 × 610 × 330 mm	

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

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

MDX61B Standard version	0550-503-4-00	0750-503-4-00
Part number	827 969 1	827 970 5
MDX61B Application version	**0550-503-4-0T**	**0750-503-4-0T**
Part number	827 988 8	827 989 6
 **Constant load** **Recommended motor power** P_{Mot}	55 kW	75 kW
Variable torque load or constant load without overload  **Recommended motor power** P_{Mot}	75 kW	90 kW
Recommended motor power	→ MOVIDRIVE® B system manual, section 'Motor Selection'	

Size 6 (400/500 V) MDX61B0900 ... 1320, options can be installed in all units

53076AXX

MOVIDRIVE® MDX61B		0900-503-4-0_	1100-503-4-0_	1320-503-4-0_
INPUT				
Supply voltage	U_{mains}	3 × AC 380 V –10 % ... 3 × AC 500 V +10 %		
Supply frequency	f_{mains}	50 Hz ... 60 Hz ± 5 %		
Rated supply current[1] **(at V_{mains} = 3 × AC 400 V)**	I_{mains} **100 %** **125 %**	AC 153 A AC 191 A	AC 180 A AC 225 A	AC 225 A AC 281 A
OUTPUT				
Apparent output power[2] **(at V_{mains} = 3 × AC 380...500 V)**	S_N	118 kVA	139 kVA	174 kVA
Rated output current[1] **(at V_{mains} = 3 × AC 400 V)**	I_N	AC 170 A	AC 200 A	AC 250 A
Continuous output current (= 125 % I_N)I_D (at U_{mains} = 3 × AC 400 V with f_{PWM} = 4 kHz)		AC 212 A	AC 250 A	AC 312 A
Continuous output current (= 100 % I_N)I_D (at U_{mains} = 3 × AC 400 V with f_{PWM} = 4 kHz)		AC 170 A	AC 200 A	AC 250 A
Current limitation	I_{max}	Motor and regenerative 150 % I_N, duration depending on capacity utilization		
Internal current limitation		I_{max} = 0...150 % adjustable		
Minimum permitted braking resistor value (4Q operation)	R_{BRmin}	2.7 Ω		
Output voltage	U_A	Max. V_{mains}		
PWM frequency	f_{PWM}	Can be set: 4 or 8 kHz		
Speed range / resolution	n_A / Δn_A	–6000 ... 0 ... +6000 min^{-1} / 0.2 min^{-1} across the entire range		
GENERAL INFORMATION				
Power loss at S_N[2]	P_{Vmax}	2300 W	2500 W	2700 W
Cooling air consumption		600 m^3/h		
Weight		60 kg		
Dimensions	**W × H × D**	280 × 1000 × 382mm		

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

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

MDX61B Standard version		0900-503-4-00	1100-503-4-00	1320-503-4-00
Part number		827 971 3	827 972 1	827 974 8
MDX61B Application version		0900-503-4-0T	1100-503-4-0T	1320-503-4-0T
Part number		827 991 8	827 992 6	827 993 4
Constant load Recommended motor power	P_{Mot}	90 kW	110 kW	132 kW
Variable torque load or constant load without overload Recommended motor power	P_{Mot}	110 kW	132 kW	160 kW
Recommended motor power		→ MOVIDRIVE® B system manual, section 'Motor Selection'		

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

Size 1 (230 V) **MDX61B0015 ... 0037, options can be installed in all units**

53071AXX

MOVIDRIVE® MDX61B		0015-2A3-4-0_	0022-2A3-4-0_	0037-2A3-4-0_
INPUT				
Supply voltage	U_{mains}	3 × AC 200 V –10 % ... 3 × AC 240 V +10 %		
Supply frequency	f_{mains}	50 Hz ... 60 Hz ± 5 %		
Rated supply current I_{mains} **100 %** **(at V_{mains} = 3 × AC 230 V) 125 %**		AC 6.7 A AC 8.4 A	AC 7.8 A AC 9.8 A	AC 12.9 A AC 16.1 A
OUTPUT				
Apparent output power[1] **(at V_{mains} = 3 × AC 230..0.240 V)**	S_N	2.7 kVA	3.4 kVA	5.8 kVA
Rated output current **(at V_{mains} = 3 × AC 230 V)**	I_N	AC 7.3 A	AC 8.6 A	AC 14.5 A
Continuous output current (= 125 % I_N)I_D **(at U_{mains} = 3 × AC 230 V with f_{PWM} = 4 kHz)**		AC 9.1 A	AC 10.8 A	AC 18.1 A
Continuous output current (= 100 % I_N)I_D **(at U_{mains} = 3 × AC 230 V with f_{PWM} = 8 kHz)**		AC 7.3 A	AC 8.6 A	AC 14.5 A
Current limitation	I_{max}	Motor and regenerative 150 % I_N, duration depending on capacity utilization		
Internal current limitation		I_{max} = 0...150 % adjustable		
Minimum permitted braking resistor value (4Q operation)	R_{BRmin}	27 Ω		
Output voltage	U_A	Max. V_{mains}		
PWM frequency	f_{PWM}	Can be set: 4/8/12/16 kHz		
Speed range / resolution	n_A / Δn_A	–6000 ... 0 ... +6000 min^{-1} / 0.2 min^{-1} across the entire range		
GENERAL INFORMATION				
Power loss at S_N[1]	P_{Vmax}	110 W	126 W	210 W
Cooling air consumption		40 m^3/h		
Weight		2.8 kg		
Dimensions	**W × H × D**	105 × 314 × 234 mm		

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

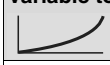
MDX61B Standard version	0015-2A3-4-00	0022-2A3-4-00	0037-2A3-4-00
Part number	827 994 2	827 995 0	827 996 9
MDX61B Application version	**0015-2A3-4-0T**	**0022-2A3-4-0T**	**0037-2A3-4-0T**
Part number	828 003 7	828 004 5	828 005 3
Constant load Recommended motor power P_{Mot}	1.5 kW	2.2 kW	3.7 kW
Variable torque load or constant load without overload Recommended motor power P_{Mot}	2.2 kW	3.7 kW	5.0 kW
Recommended motor power	→ MOVIDRIVE® B system manual, section 'Motor Selection'		

Size 2 (230 V) **MDX61B0055 ... 0075, options can be installed in all units**

53072AXX

MOVIDRIVE® MDX61B		0055-2A3-4-0_	0075-2A3-4-0_
INPUT			
Supply voltage	U_{mains}	3 × AC 200 V –10 % ... 3 × AC 240 V +10 %	
Supply frequency	f_{mains}	50 Hz ... 60 Hz ± 5 %	
Rated supply current I_{mains} **(at V_{mains} = 3 × AC 230 V)**	**100 %** **125 %**	AC 19.5 A AC 24.4 A	AC 27.4 A AC 34.3 A
OUTPUT			
Apparent output power[1] (at V_{mains} = 3 × AC 230..0.240 V)	S_N	8.8 kVA	11.6 kVA
Rated output current (at V_{mains} = 3 × AC 230 V)	I_N	AC 22 A	AC 29 A
Continuous output current (= 125 % I_N)I_D (at U_{mains} = 3 × AC 230 V with f_{PWM} = 4 kHz)		AC 27.5 A	AC 36.3 A
Continuous output current (= 100 % I_N)I_D (at U_{mains} = 3 × AC 230 V with f_{PWM} = 8 kHz)		AC 22 A	AC 29 A
Current limitation	I_{max}	Motor and regenerative 150 % I_N, duration depending on capacity utilization	
Internal current limitation		I_{max} = 0...150 % adjustable	
Minimum permitted braking resistor value (4Q operation)	R_{BRmin}	12 Ω	
Output voltage	U_A	Max. V_{mains}	
PWM frequency	f_{PWM}	Can be set: 4/8/12/16 kHz	
Speed range / resolution	n_A / Δn_A	–6000 ... 0 ... +6000 min^{-1} / 0.2 min^{-1} across the entire range	
GENERAL INFORMATION			
Power loss at S_N[1]	P_{Vmax}	300 W	380 W
Cooling air consumption		80 m^3/h	
Weight		5.9 kg	
Dimensions	**W × H × D**	135 × 315 × 285 mm	

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

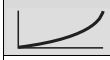
MDX61B Standard version	0055-2A3-4-00	0075-2A3-4-00
Part number	827 997 7	827 998 5
MDX61B Application version	**0055-2A3-4-0T**	**0075-2A3-4-0T**
Part number	828 006 1	828 008 8
 Constant load Recommended motor power P_{Mot}	5.5 kW	7.5 kW
Variable torque load or constant load without overload  Recommended motor power P_{Mot}	7.5 kW	11 kW
Recommended motor power	→ MOVIDRIVE® B system manual, section 'Motor Selection'	

Size 3 (230 V) **MDX61B0110 ... 0150, options can be installed in all units**

53073AXX

MOVIDRIVE® MDX61B			0110-203-4-0_	0150-203-4-0_
INPUT				
Supply voltage		U_{mains}	3 × AC 200 V –10 % ... 3 × AC 240 V +10 %	
Supply frequency		f_{mains}	50 Hz ... 60 Hz ± 5 %	
Rated supply current (at V_{mains} = 3 × AC 230 V)	I_{mains}	**100 %** **125 %**	AC 40 A AC 50 A	AC 49 A AC 61 A
OUTPUT				
Apparent output power[1] (at V_{mains} = 3 × AC 230..0.240 V)		S_N	17.1 kVA	21.5 kVA
Rated output current (at V_{mains} = 3 × AC 230 V)		I_N	AC 42 A	AC 54 A
Continuous output current (= 125 % I_N) (at U_{mains} = 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 U_{mains} = 3 × AC 230 V with f_{PWM} = 8 kHz)		I_D	AC 42 A	AC 54 A
Current limitation		I_{max}	Motor and regenerative 150 % I_N, duration depending on capacity utilization	
Internal current limitation			I_{max} = 0...150 % adjustable	
Minimum permitted braking resistor value (4Q operation)		R_{BRmin}	7.5 Ω	5.6 Ω
Output voltage		U_A	Max. V_{mains}	
PWM frequency		f_{PWM}	Can be set: 4/8/12/16 kHz	
Speed range / resolution		n_A / Δn_A	–6000 ... 0 ... +6000 min^{-1} / 0.2 min^{-1} across the entire range	
GENERAL INFORMATION				
Power loss at S_N[1]		P_{Vmax}	580 W	720 W
Cooling air consumption			180 m^3/h	
Weight			14.3 kg	
Dimensions		**W × H × D**	200 × 465 × 308 mm	

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

MDX61B Standard version	0110-203-4-00	0150-203-4-00
Part number	827 999 3	828 000 2
MDX61B Application version	**0110-203-4-0T**	**0150-203-4-0T**
Part number	828 009 6	828 011 8
 Constant load Recommended motor power P_{Mot}	11 kW	15 kW
Variable torque load or constant  load without overload Recommended motor power P_{Mot}	15 kW	22 kW
Recommended motor power	→ MOVIDRIVE® B system manual, section 'Motor Selection'	

Size 4 (230 V) **MDX61B0220 ... 0300, options can be installed in all units**

53074AXX

MOVIDRIVE® MDX61B			0220-203-4-0_	0300-203-4-0_
INPUT				
Supply voltage		U_{mains}	3 × AC 200 V –10 % ... 3 × AC 240 V +10 %	
Supply frequency		f_{mains}	50 Hz ... 60 Hz ± 5 %	
Rated supply current (at V_{mains} = 3 × AC 230 V)	I_{mains}	**100 %** **125 %**	AC 72 A AC 90 A	AC 86 A AC 107 A
OUTPUT				
Apparent output power[1] (at V_{mains} = 3 × AC 230..0.240 V)		S_N	31.8 kVA	37.8 kVA
Rated output current (at V_{mains} = 3 × AC 230 V)		I_N	AC 80 A	AC 95 A
Continuous output current (= 125 % I_N) I_D (at U_{mains} = 3 × AC 230 V with f_{PWM} = 4 kHz)			AC 100 A	AC 118 A
Continuous output current (= 100 % I_N) I_D (at U_{mains} = 3 × AC 230 V with f_{PWM} = 4 kHz)			AC 80 A	AC 95 A
Current limitation		I_{max}	Motor and regenerative 150 % I_N, duration depending on capacity utilization	
Internal current limitation			I_{max} = 0...150 % adjustable	
Minimum permitted braking resistor value (4Q operation)		R_{BRmin}	3.0 Ω	
Output voltage		U_A	Max. V_{mains}	
PWM frequency		f_{PWM}	Can be set: 4/8/12/16 kHz	
Speed range / resolution		n_A / Δn_A	–6000 ... 0 ... +6000 min^{-1} / 0.2 min^{-1} across the entire range	
GENERAL INFORMATION				
Power loss at S_N[1]		P_{Vmax}	1100 W	1300 W
Cooling air consumption			180 m^3/h	
Weight			26.3 kg	
Dimensions		**W × H × D**	280 × 522 × 307 mm	

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

MDX61B Standard version	0220-203-4-00	0300-203-4-00
Part number	828 001 0	828 002 9
MDX61B Application version	**0220-203-4-0T**	**0300-203-4-0T**
Part number	828 012 6	828 013 4
Constant load **Recommended motor power** P_{Mot}	22 kW	30 kW
Variable torque load or constant load without overload **Recommended motor power** P_{Mot}	30 kW	37 kW
Recommended motor power	→ MOVIDRIVE® B system manual, section 'Motor Selection'	

2.5 MOVIDRIVE® MDX60/61B electronics data

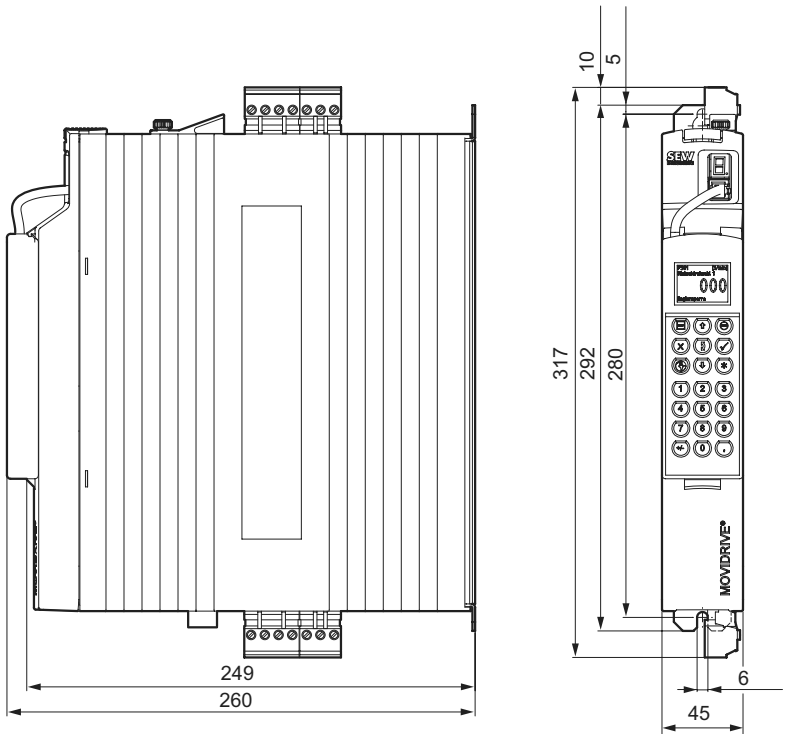
MOVIDRIVE® MDX60/61B		General electronics data	
Voltage supply for setpoint input	X11:1 X11:5	REF1: DC+10 V +5 % / –0 %, I_{max} = DC 3 mA REF2: DC–10 V +0 % / –5 %, I_{max} = DC 3 mA	Reference voltages for setpoint potentiometer
Setpoint input n1	X11:2/X11:3	AI11/AI12: Voltage or current input, can be set with S11 and P11_, sampling interval 1 ms	
(Differential input) Operating mode AI11/AI12 Resolution Internal resistance		Voltage input: n1 = DC 0...+10 V or DC –10 V...0...+10 V 12 bit R_i = 40 kΩ (external voltage supply) R_i = 20 kΩ (supply from REF1/REF2)	Current input: n1 = DC 0...20 mA or DC 4...20 mA 11 bit R_i = 250 Ω
Internal setpoints		Parameter set 1: n11/n12/n13 = –6000...0...+6000 min^{-1} Parameter set 2: n21/n22/n23 = –6000...0...+6000 min^{-1}	
Time ranges of the speed ramps at 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 ramp t14/t24 Down: 0...20 s Motor potentiometer t3 Up: 0.2...50 s Down: 0.2...50 s	
Auxiliary voltage output[1] X13:8/X10:8		VO24: V_{OUT} = DC 24 V, maximum current carrying capacity I_{max} = DC 400 mA	
External voltage supply[1] X10:9		VI24: U_{IN} = DC 24 V –15 % / +20 % according to EN 61131-2	
Binary inputs X13:1...X13:6 and X16:1/X16:2 Internal resistance		Isolated (optocoupler), PLC compatible (EN 61131), sampling interval 1 ms DIØØ...DIØ5 and DIØ6/DIØ7 $R_i \approx 3$ kΩ, $I_E \approx$ DC 10 mA	
Signal level		DC +13 V...+30 V= "1" = Contact closed DC–3 V...+5 V = "0" = Contact open	meets EN 61131
Function X13:2...X13:6, X16:1/X16:2	X13:1	DIØØ: fixed assignment with "/Controller inhibit" DIØ1...DIØ5, DIØ6/DIØ7: Selection option → Parameter menu P60_	
Binary outputs[1] X10:3/X10:7 and X16:3...X16:5		PLC-compatible (EN 61131-2), response time 1ms 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	
X10:7, X16:3...X16:5		DOØ2, DOØ3...DOØ5: Selection option → Parameter menu P62_, I_{max} = DC 50 mA, short-circuit proof, protected against external voltage to DC 30 V	
Relay output	X10:4...X10:6	DOØ1: Load capacity of the relay contacts U_{max} = DC 30 V, I_{max} = DC 800 mA	
Function	X10:4 X10:5 X10:6	DOØ1-C: Shared relay contact DOØ1-NO: Normally open contact DOØ1-NC: Normally closed contact	Selection option → Parameter menu P62_
System bus (SBus)	X12:1 X12:2 X12:3	DGND: Reference potential SC11: SBus high SC12: SBus low	CAN bus according to CAN specification 2.0, parts A and B, transmission technology according to ISO 11898, max. 64 stations, terminating resistor (120Ω) can be activated using DIP switch.
RS485 interface	X13:10 X13:11	ST11: RS485+ ST12: RS485-	EIA standard, 9.6 kBaud, max. 32 stations Max. cable length 200 m Dynamic terminating resistor with fixed installation
TF/TH/KTY input	X10:1	TF1: Response threshold at $R_{TF} \geq 2.9$ kΩ ±10 %	
Reference terminals X12:1/X13:9/X16:6/X10:2/X10:10	X11:4 X13:7	AGND: Reference potential for analog signals and terminals X11:1 and X11:5 (REF1/REF2) DGND: Reference potential for binary signals, system bus, RS485 interface and TF/TH DCOM: Reference potential for binary inputs X13:1...X13:6 and X16:1/X16:2 (DIØØ...DIØ5 and DIØ6/DIØ7)	
Permitted cable cross section		One conductor per terminal:0.20...2.5 mm^2 (AWG 24...12) Two conductors per terminal:0.25...1 mm^2 (AWG 22...17)	

1) The unit provides a current of I_{max} = DC 400 mA for the DC+24 V outputs (VO24, binary 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
Safety contact	X17:1	DGND: Reference potential for X17:3
	X17:2	VO24: : U_{OUT} = DC 24 V, only to supply X17:4 of the same unit; **it cannot be used** to supply other units.
	X17:3	SOV24: Reference potential for DC+24 V input "Safe stop" (safety contact)
	X17:4	SVI24: DC+24 V input "Safe stop" (safety contact)
Permitted cable cross section		One conductor per terminal: 0.08...1.5 mm^2 (AWG28...16) Two conductors per terminal: 0.25 ... 1.0 mm^2 (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
Input capacitance X17:4		Size 0: 27 µF Size 1...6: 270 µF
Time for restart Time to inhibit output stage		t_A = 200 ms $t_S \leq$ 100 ms
Signal level		DC +19.2 V...+30 V= "1" = Contact closed DC–30 V...+5 V = "0" = Contact open

2.6 MOVIDRIVE® MDX60B dimension drawings

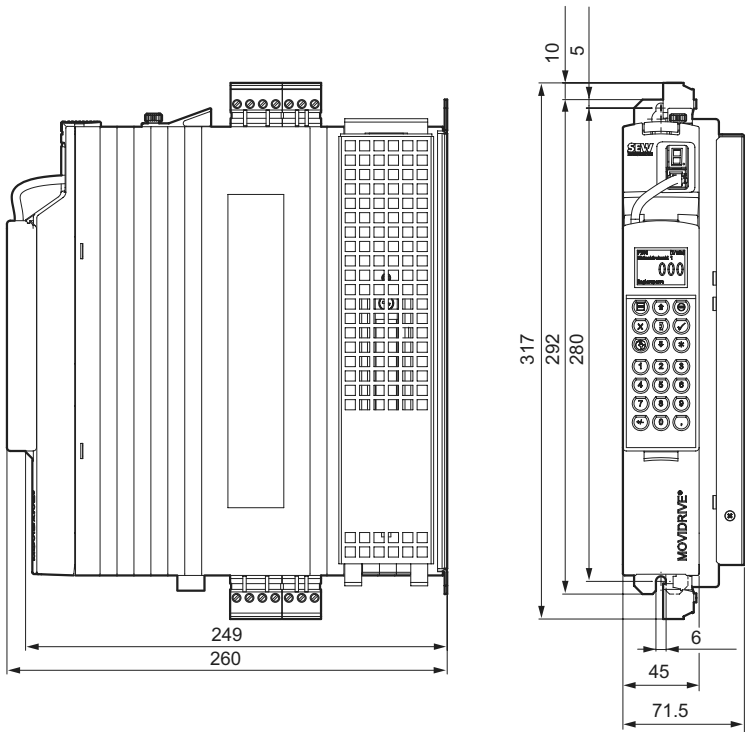
Size 0S



53019BXX

Figure 8: Dimension drawing for MDX60B size 0S, dimensions in mm

Size 0S with mounted braking resistor



53020BXX

Figure 9: Dimension drawing for MDX60B size 0S with braking resistor, dimensions in mm

Size 0SM

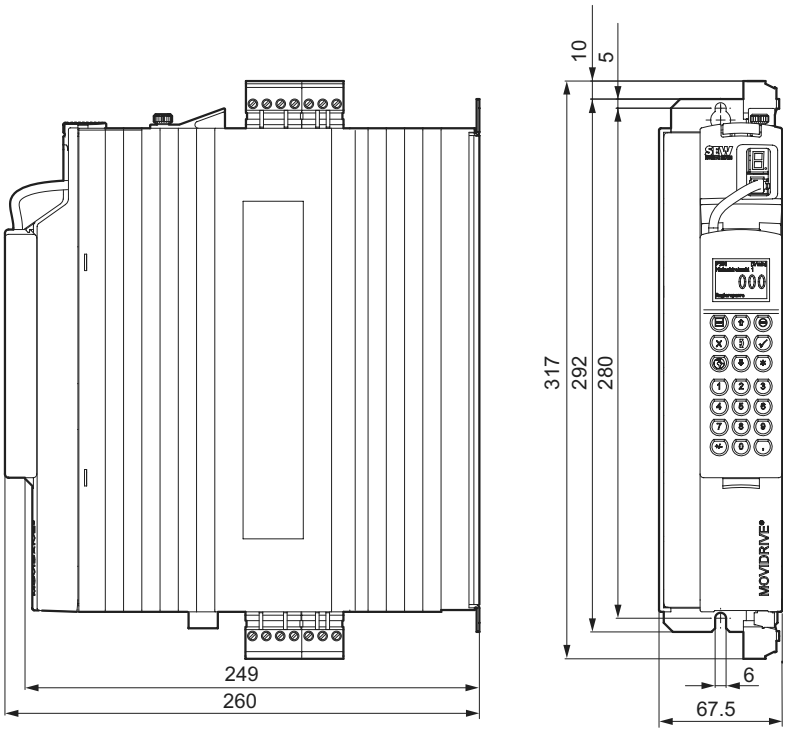


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Figure 10: Dimension drawing for MDX60B size 0M, dimensions in mm

Size 0M with mounted braking resistor

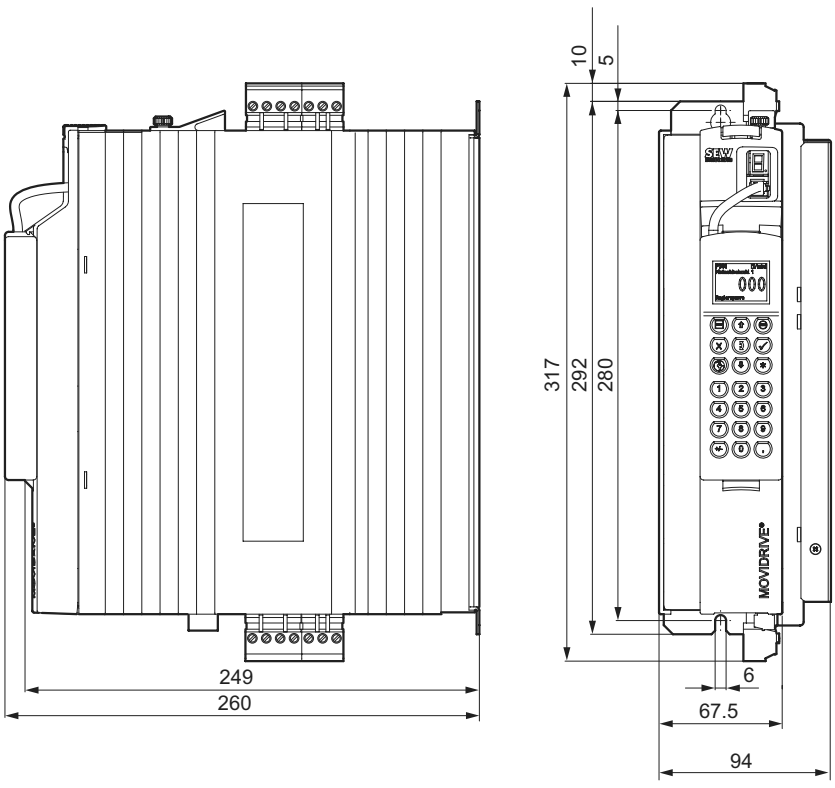

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Figure 11: Dimension drawing for MDX60B size 0M with braking resistor, dimensions in mm

2.7 MOVIDRIVE® MDX61B dimension drawings

	NOTE
	For MOVIDRIVE® MDX61B size 0, installing a braking resistor does not affect the dimensions. Therefore, all dimension drawings are shown without braking resistors.

Size 0S

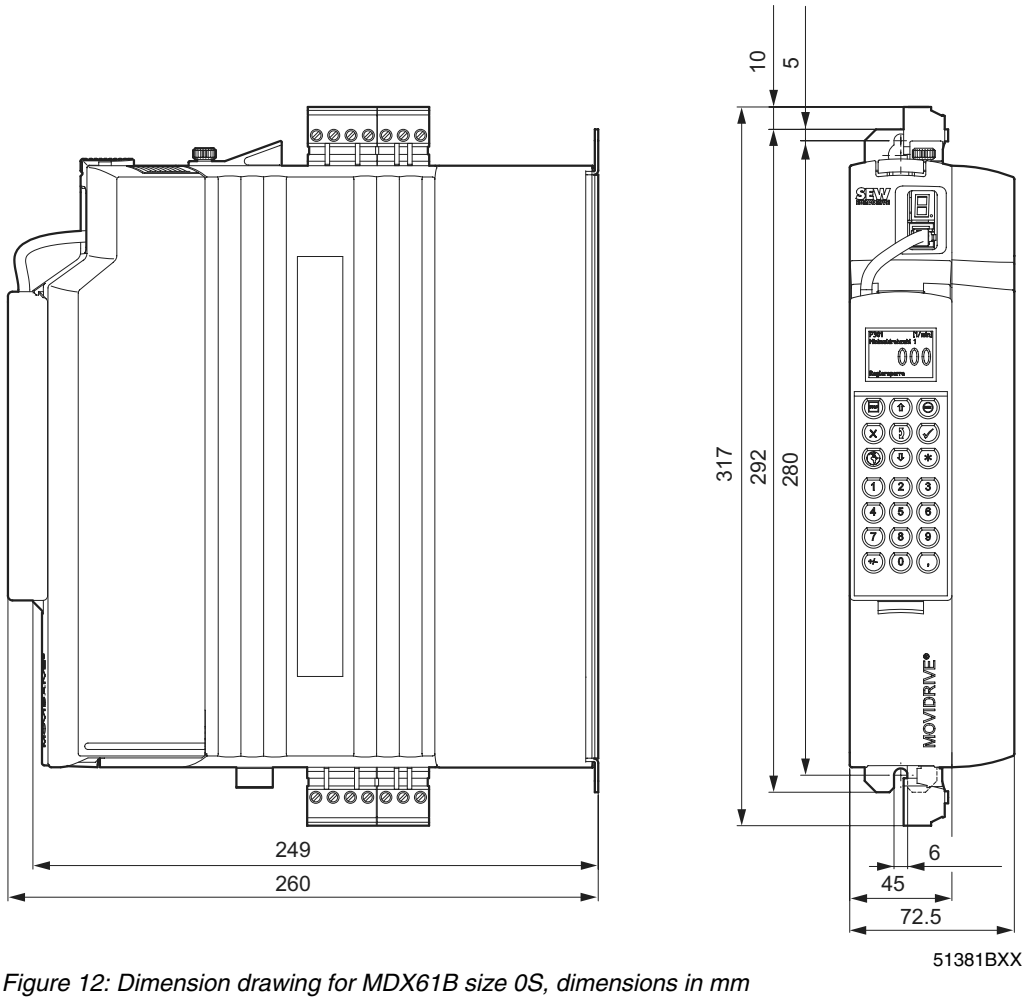


Figure 12: Dimension drawing for MDX61B size 0S, dimensions in mm

Size 0SM

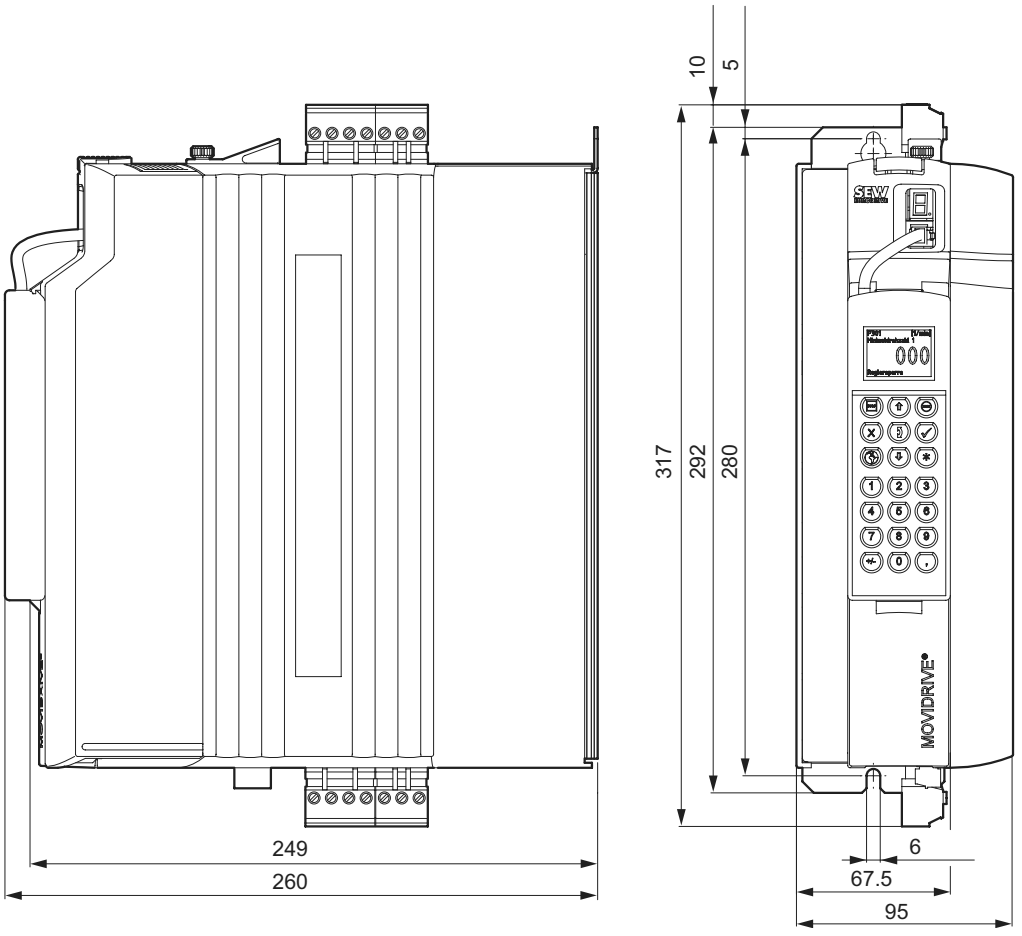


Figure 13: Dimension drawing for MDX61B size 0M, dimensions in mm

Size 1

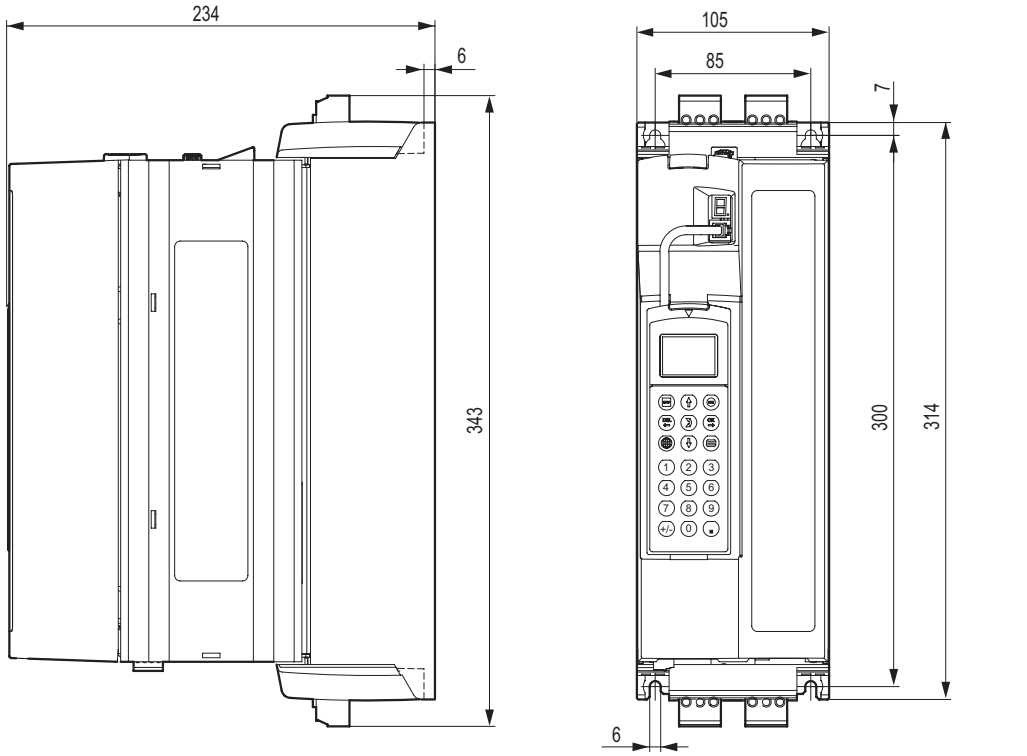
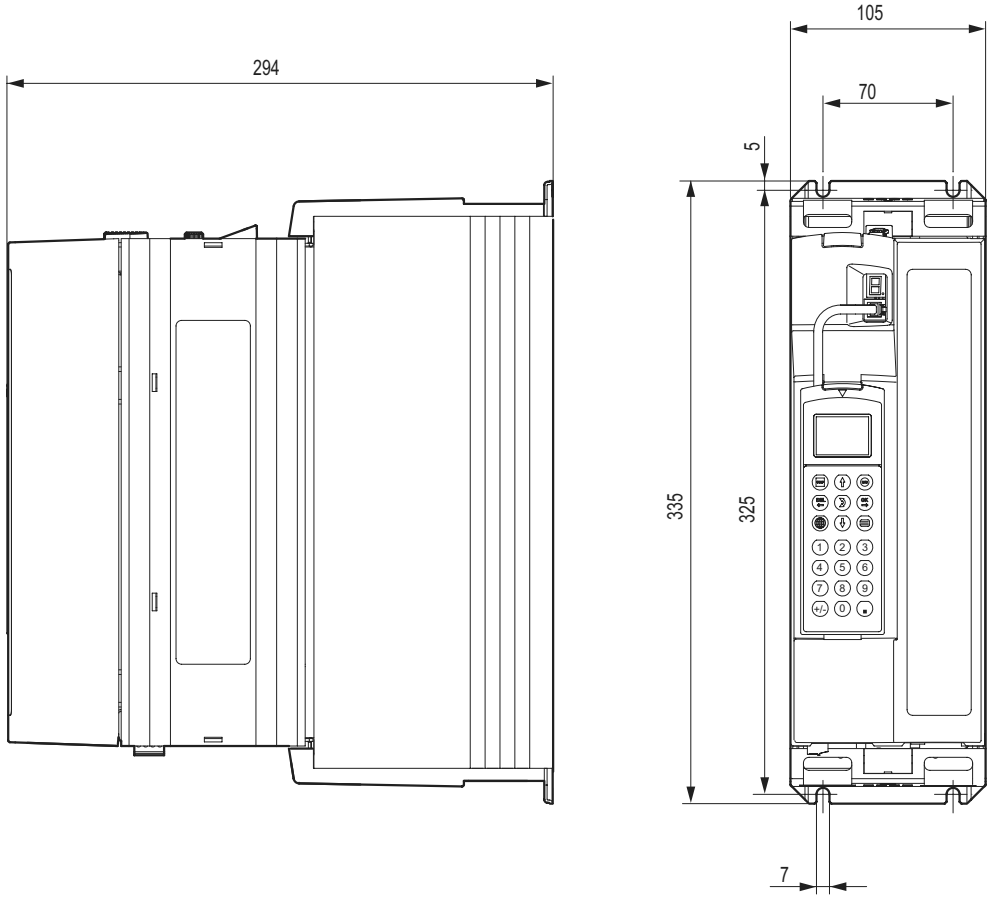


Figure 14: Dimension drawing for MDX61B size 1, dimensions in mm

Size 2S



52273BXX

Figure 15: Dimension drawing for MDX61B size 2S, dimensions in mm

Size 2

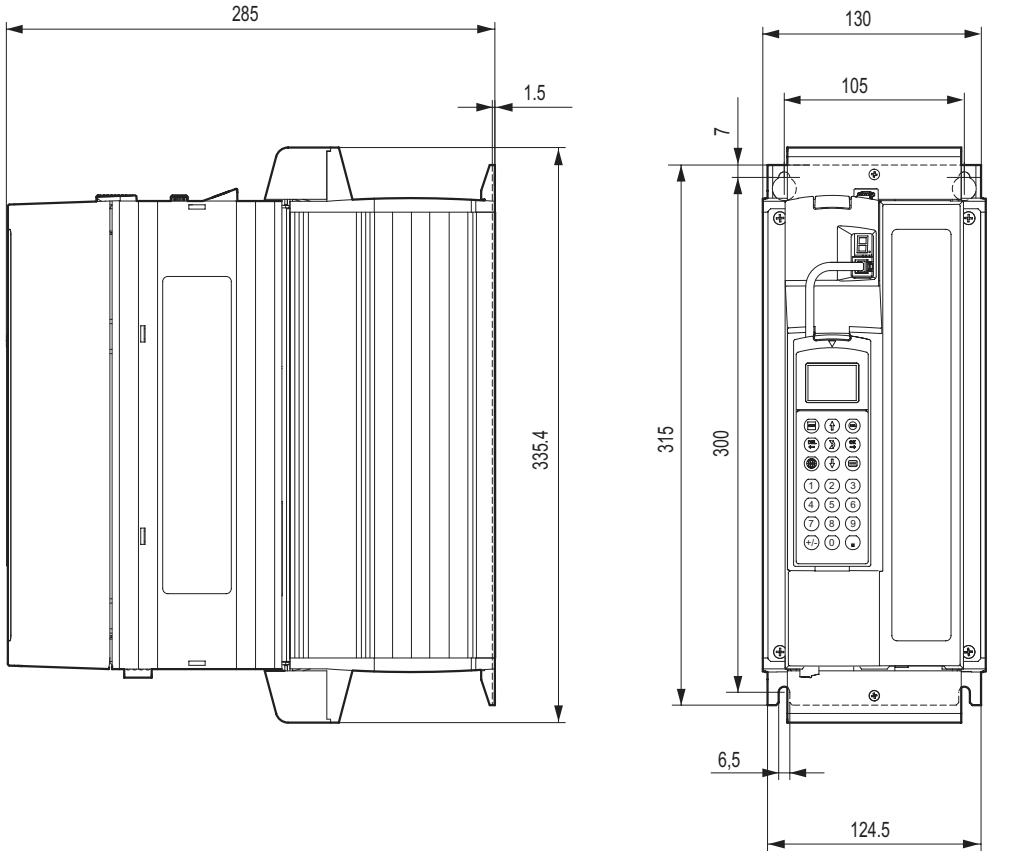
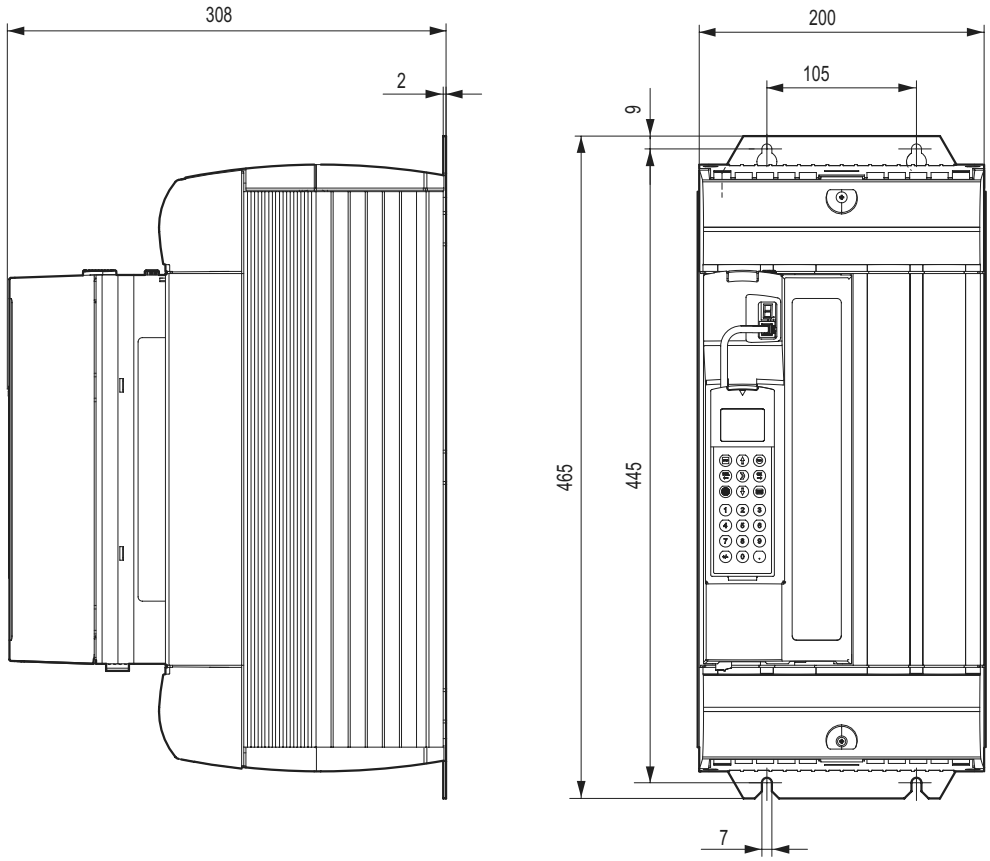


Figure 16: Dimension drawing for MDX61B size 2, dimensions in mm

Size 3



52315BXX

Figure 17: Dimension drawing for MDX61B size 3, dimensions in mm

Size 4

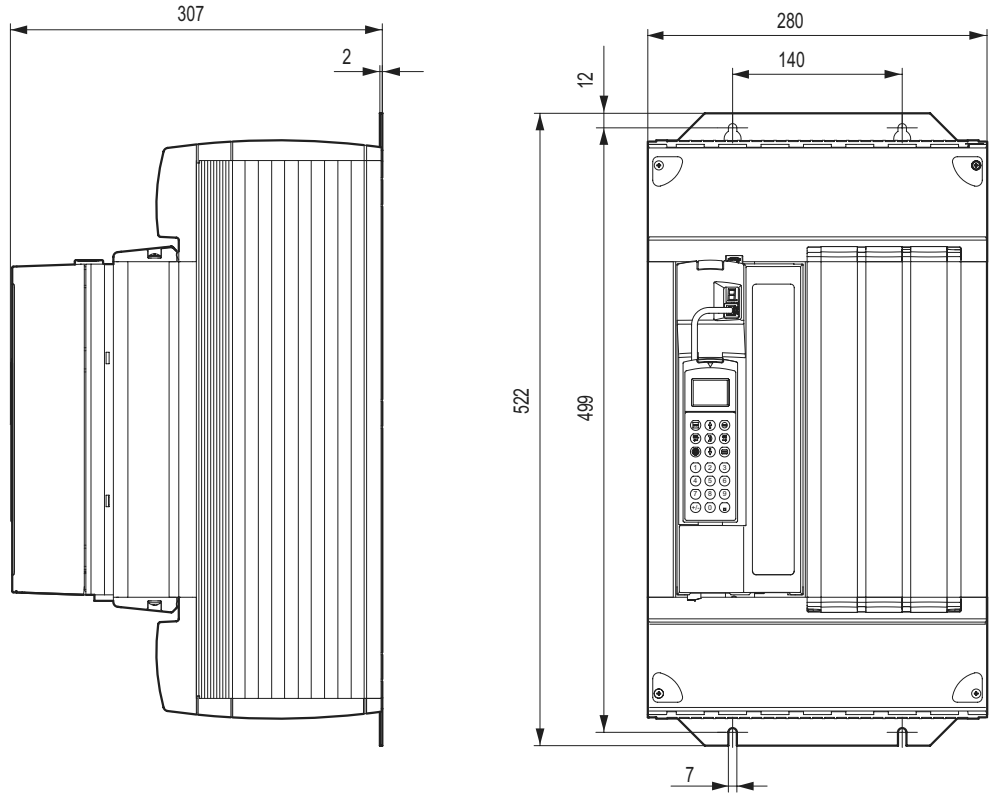


Figure 18: Dimension drawing for MDX61B size 4, dimensions in mm

Size 5

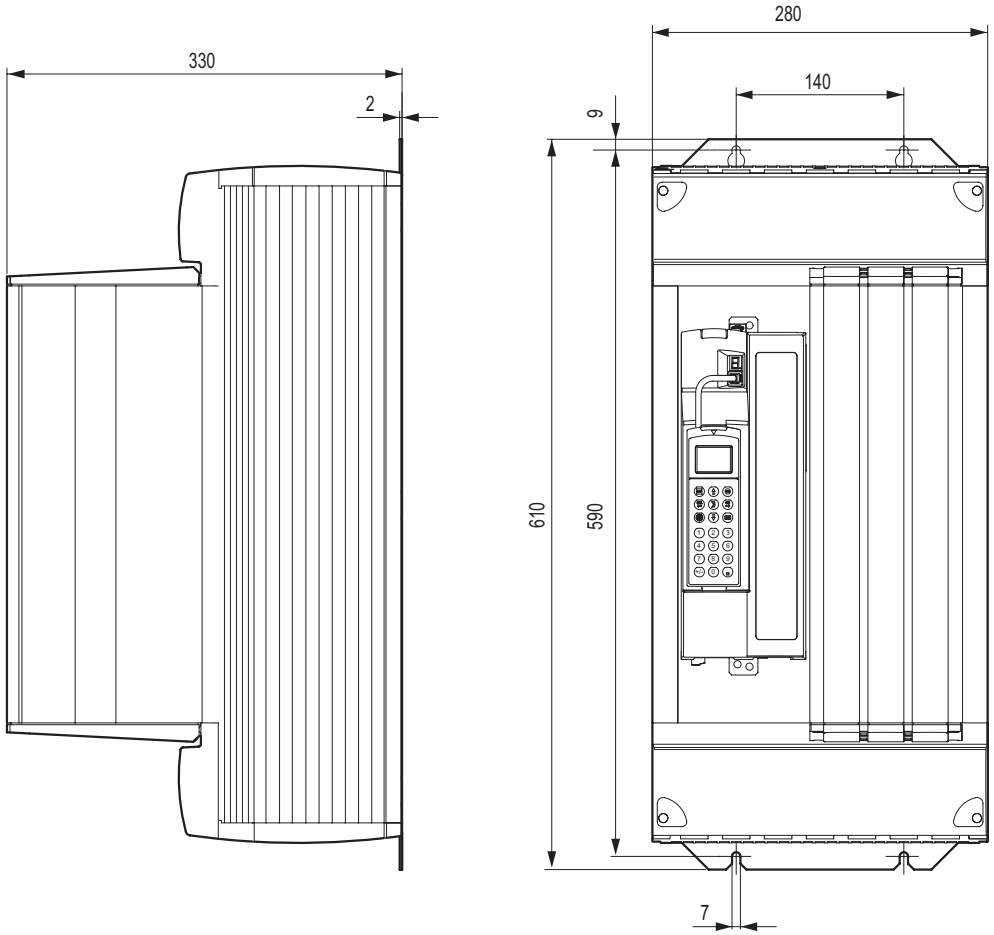


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Figure 19: Dimension drawing for MDX61B size 5, dimensions in mm

Size 6

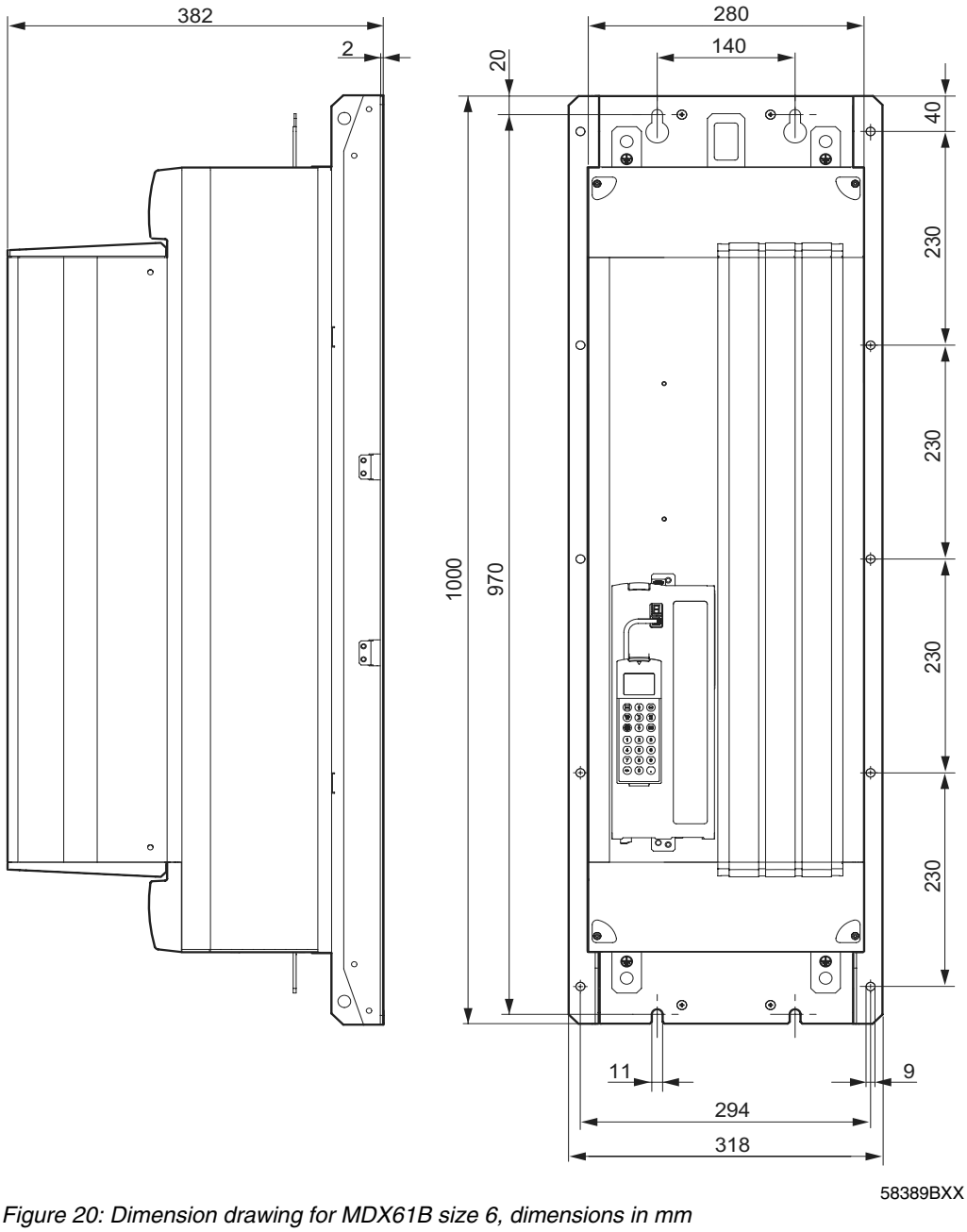

Figure 20: Dimension drawing for MDX61B size 6, dimensions in mm

2.8 MOVIDRIVE® MDR60A regenerative power supply unit

In MOVIDRIVE® drive inverters operating in regenerative mode (4Q operation), the MOVIDRIVE® MDR60A regenerative power supply unit can be used as an alternative to braking resistors. The prerequisite is a powerful supply system. For more detailed information, refer to the "MOVIDRIVE® MDR60A Regenerative Power Supply Unit" system manual. This manual can be ordered from SEW-EURODRIVE.

MOVIDRIVE® MDR60A supplies the DC link circuit of the connected MOVIDRIVE® drive inverter with electrical power from the supply system in motor operation and returns regenerative power to the supply system in regenerative operation.

UL approval

UL and cUL approval has been granted for the entire MOVIDRIVE® MDR60A0370-503-00 and MDR60A0750-503-00 range of units. cUL is equivalent to CSA approval. The MOVIDRIVE® MDR60A1320-503-00 unit does not have UL or cUL approval.

Protection and monitoring functions

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

54512AXX

Figure 21: MOVIDRIVE® MDR60A regenerative power supply units

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.
- Less installation work for several inverter (network and braking resistor connections). However, a braking resistor is required to bring 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.

General technical data

MOVIDRIVE® MDR60A	**0370-503-00 (size 3)** **0750-503-00 (size 4)**	**1320-503-00 (size 6)**
Interference immunity	Fulfills EN 61800-3	Meets EN 61000-6-1 and EN 61000-6-2
Interference emission with EMC-compliant installation	Fulfills EN 61800-3 • With NF085-503 line filter (size 3) • With NF150-503 line filter (size 4)	Meets EN 61000-6-4 with line filter NF300-503
Ambient temperature ϑ_U **Derating ambient temperature**	0 °C...+40 °C I_N reduction: 3 % I_N per K to max. 60 °C	0 °C...+40 °C I_N reduction: 3 % I_N per K to max. 55 °C
Climate class	EN 60721-3-3, class 3K3	
Storage temperature[1] ϑ_L	–25 °C...+70 °C (EN 60721-3-3, class 3K3)	–25 °C...+55 °C (EN 60721-3-3, class 3K3)
Cooling type (DIN 51751)	Forced cooling (temperature-controlled fan, response threshold 50 °C)	Forced cooling (temperature-controlled fan, response threshold 45 C)
Enclosure **Size 3** **EN 60529** **Size 4** **(NEMA1)**	IP20 IP00 (power connections) IP10 (power connections) • With fitted plexiglass cover supplied as standard • With shrink tubing (not included in scope of delivery)	IP20
Operating mode	continuous duty (EN 60149-1-1 and 1-3)	
Overvoltage category	III according to IEC 60664-1 (VDE 0110-1)	
Pollution class	2 according to IEC 60664-1 (VDE 0110-1)	
Installation altitude	There are no restrictions for heights ≤ 1000 m. The following restrictions apply at heights ≥ 1000 m: • From 1000 m (3,280 ft.) to max. 4,000 m (6561 ft.): – I_N reduction by 1% per 100 m (330 ft) • From 2000 m (6,561 ft.) to max. 4000 m (13,123 ft.): – V_N reduction by AC 6 V per 100 m Over 2000 m only overvoltage class 2, external measures are required for overvoltage class 3. Overvoltage classes according to DIN VDE 0110-1.	h ≤ 1000 m: No limitation From 1000 m (3,280 ft.) to max. 4,000 m (6561 ft.): I_N reduction: 0.5 % per 100 m

1) In case of long-term storage, the unit must be connected to the mains voltage for at least 5 minutes every two years, otherwise the unit's service life may be reduced.

Technical data of the MOVIDRIVE® MDR60A regenerative power supply unit

MOVIDRIVE® MDR60A		0370-503-00 (size 3)	0750-503-00 (size 4)	1320-503-00 (size 6)
Part number		826 658 1	826 556 9	827 952 7
INPUT				
Supply voltage	U_{mains}	3 × AC 380 V –10 % ... 3 × AC 500 V +10 %		
Supply frequency	f_{mains}	50 Hz ... 60 Hz ± 5 %		40 Hz ... 60 Hz ± 10 %
Rated connected load	P_N	37 kW	AC 66 A	AC 260A
Rated supply current (at V_{mains} = 3 × AC 400 V)	I_{mains}	AC 66 A	AC 117 A	AC 260 A
DC LINK				
Apparent output power (at V_{mains} = 3 × AC 380...500 V)	S_A	50 kVA	90 kVA	173 kVA
DC link voltage	U_{DClink}	DC 560 V ... 780 V		
Rated DC link current	I_{DClink}	DC 70 A	DC 141 A	DC 340 A
Max. DC link current	I_{DC_max}	DC 105 A	DC 212 A	DC 410 A
GENERAL INFORMATION				
Power loss at P_N	P_{Vmax}	950 W	1700 W	2650 W
Cooling air consumption		180 m^3/h	360 m^3/h	700 m^3/h
Connection for power terminals X1, X2 (L1, L2, L3 for size 6) **Permitted tightening torque** **Permitted cable cross section**		M6 screw with washer 3.5 Nm 25 mm^2 (AWG4)	M10 terminal studs 14 Nm 70 mm^2 (AWG2/0)	M10 terminal studs 3.5 Nm 25 mm^2 (AWG4)
Connection for DC link connection ±UG **Permitted cable cross section** **Permitted tightening torque**		-	-	150 mm^2 (power supply connection) / 30 Nm[1)] 185 mm^2 (DC link connection) / 32 Nm[1)]
Connection for electronics terminalsX3 (X2 for size 6)		Permitted cable cross section: • One conductor per terminal: 0.20...2.5 mm^2 (AWG24...13) • Two conductors per terminal:0.25...1 mm^2 (AWG23...17)		Permitted cable cross section: • 0.8...4 mm^2 (AWG18...12)
Weight		16 kg	24 kg	90 kg
Dimensions	**W × H × D**	200 × 465 × 221 mm	280 × 522 × 205 mm	380 × 937× 395 mm
Line choke (always required)		ND085-013 L_N = 0.1 mH Part number 826,014 1	ND200-0033 L_N = 0.03 mH Part number 826,579 8	Already installed
Line filter (optional)		NF085-503, part number 827 415 0	NF150-503, part number 827 417 7	NF300-503, part number 827 419 3
For MOVIDRIVE® MDX60B/61B...-5_3		0005 ... 0370	0005 ... 0750	0005 ... 1320

1) Important: Do not apply tightening torque directly at terminals L1, L2, L3 and ±UG; use a second wrench.

MDR60A dimension drawings

Provide at least 100 mm clearance above and below the unit. There is no need for clearance at the sides. You can line up the units directly next to one another. With sizes 4 and 6, do not install any components that are sensitive to high temperatures within 300 mm of the top of the unit, for example contactors or fuses.

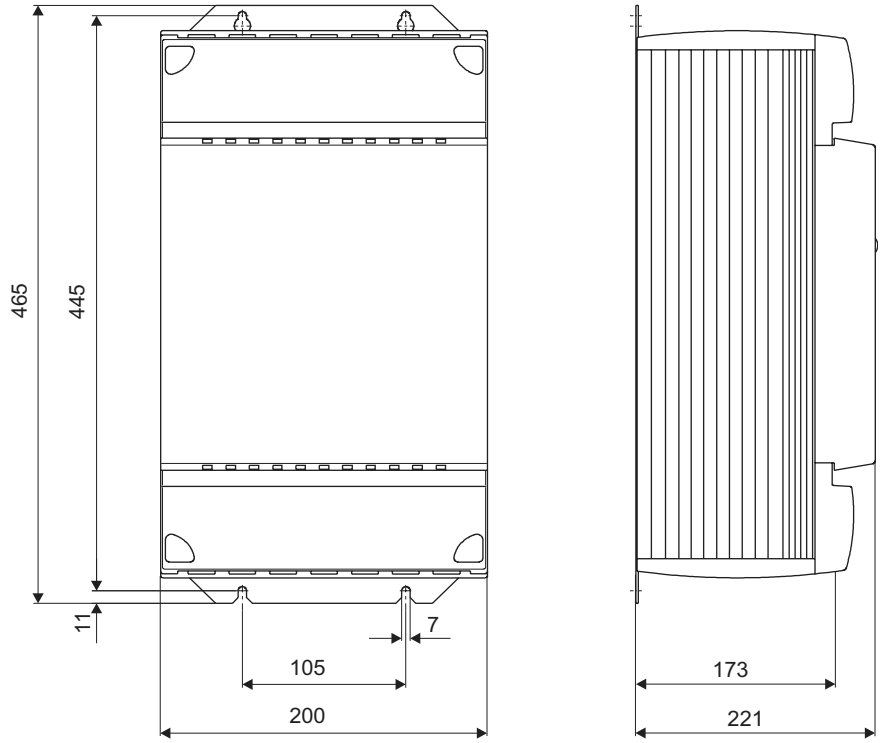

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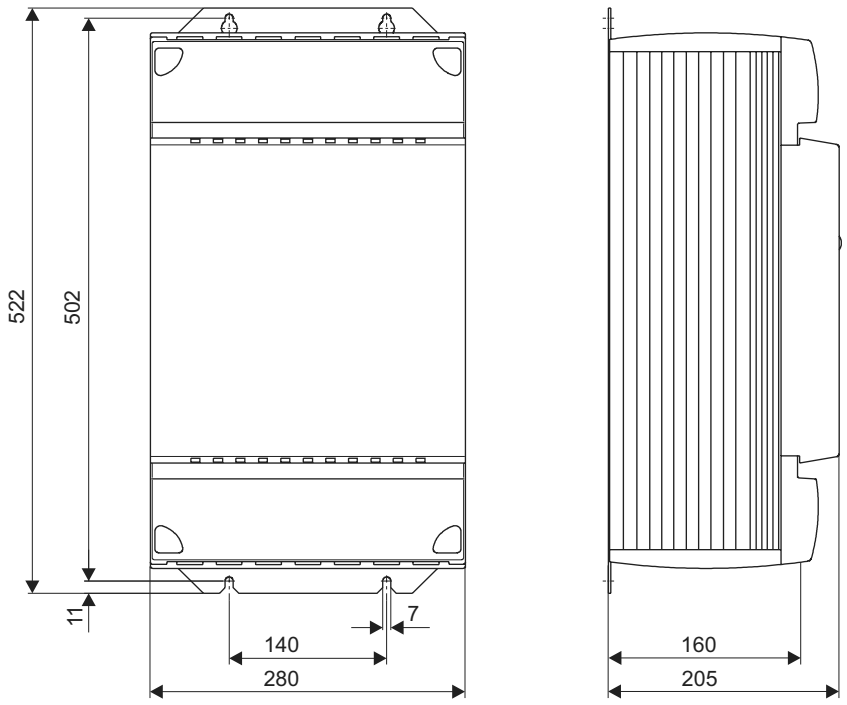
Figure 22: Dimension drawing for MDR60A size 3, dimensions in mm



54261BXX

Figure 23: Dimension drawing for MDR60A size 4, dimensions in mm

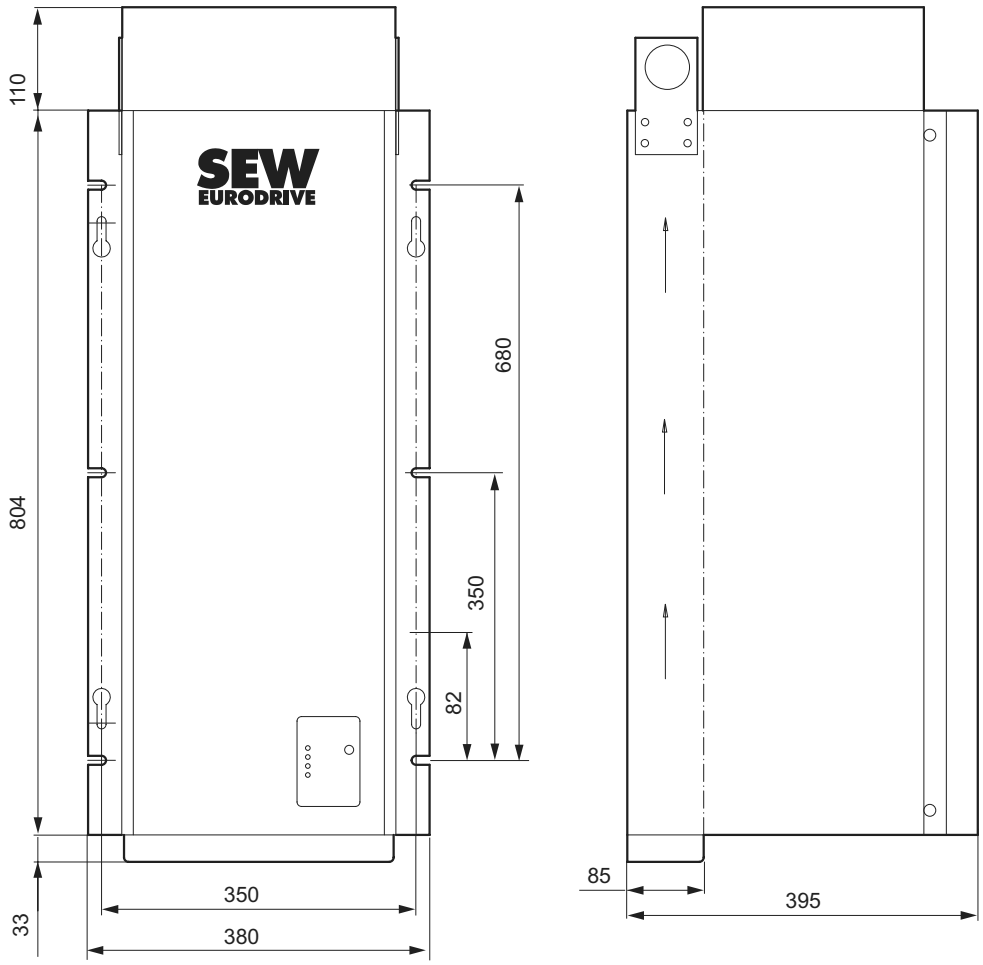


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Figure 24: Dimension drawing for MDR60A size 6, dimensions in mm

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 units. The lugs for connection to the regenerative power supply unit and an inverter are supplied with the cable set. Use commercially available 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	814 567 9	814 250 5	814 251 3	817 593 4
For connecting MOVIDRIVE®	0005 ... 0110	0150 ... 0370	0450 ... 0750	0900 ... 1320

NOTE

Refer to the "MOVIDRIVE® MDR60A Regenerative Power Supply Unit" system manual for information on the DC link connection. This manual can be ordered from SEW-EURODRIVE.

2.9 IPOS$^{plus®}$

Description

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

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

Features

- Program execution independent of encoder feedback and operating mode
- The user program is continued even if a unit 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, RS232 and fieldbus (direct communication with MOVIMOT® is possible)
- Processing of digital and analog input/output signals

Only with encoder feedback

- Positioning with selectable travel speed, positioning ramp and jerk limitation
- Feedforward 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
- Nine types of reference travel
- Possibility of changing the target position, travel speed, positioning ramp and torque while movement is in progress
- Possibility of "Endless positioning"
- Override function
- Cam control
- Synchronous operation and electronic cam

Technical data for assembler programming

Max. program length of task 1, task 2 and task 3	**Total of ca. 3200 program lines**
Command processing time per program line	1 ... 11 commands/ms can be configured
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 interval 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) 1 input (DC 0...10 V) 1 output (DC 0...20 mA, DC 4...20 mA)

2.10 DBG60B keypad

Description

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

Keypad		Language variants	Part number
 56555AXX	**DBG60B-01**	DE/EN/FR/IT/ES/PT/NL (German/English/French/Italian/Spanish/ Portuguese/Dutch)	1820 403 1
	DBG60B-02	DE/EN/FR/FI/SV/DA/TR (German/English/French/Finnish/ Swedish/Danish/Turkish)	1820 405 8
	DBG60B-03	DE/EN/FR/RU/PL/CS (German/English/France/Russian/Polish/ Czech)	1820 406 6
	DBG60B-04	DE/EN/FR/ZH (German/English/French/Chinese)	1820 850 9
	Door installation set[1]	**Description (= scope of delivery)**	**Part number**
	DBM60B	• Housing for DBG60B (IP65) • DKG60B extension cable, length 5 m	824 853 2
	Extension cable	**Description (= scope of delivery)**	**Part number**
	DKG60B	• Length 5 m • 4-core, shielded cable	817 583 7

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

Functions

- Process values and status displays
- Status display of binary inputs and outputs
- Error 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® units
- User-friendly startup menu for VFC mode
- Manual control for MOVIDRIVE®
- Manual operation of MOVIMOT® (→ Decentralized technology documentation)

Features

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

	NOTE
	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.

DBG60B dimension drawing

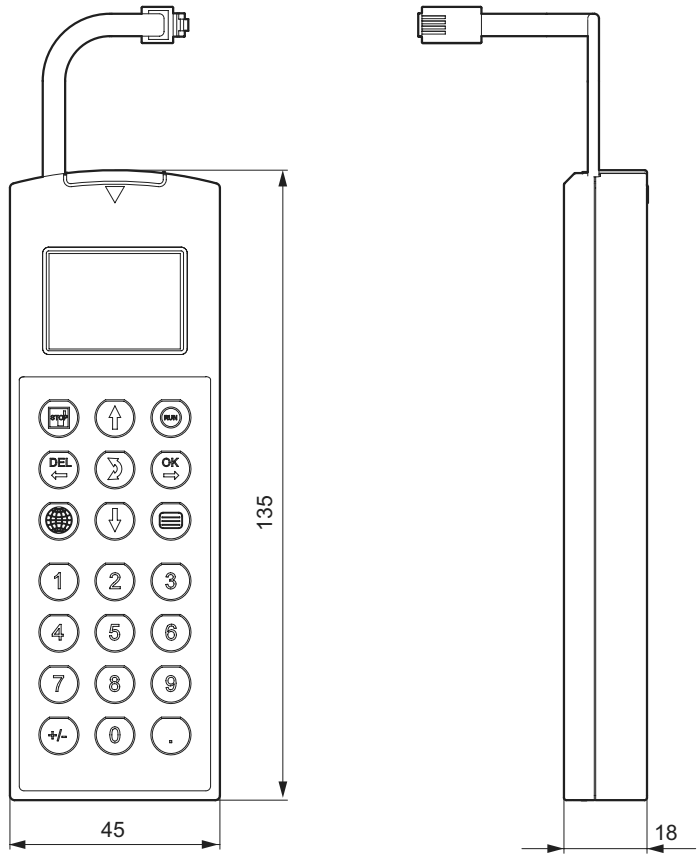

Figure 25: Dimension drawing for DBG60B, dimensions in mm

Dimension drawing for installation DBG60B housing

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 housing in enclosure IP65 and a 5 m DKG60B extension cable.

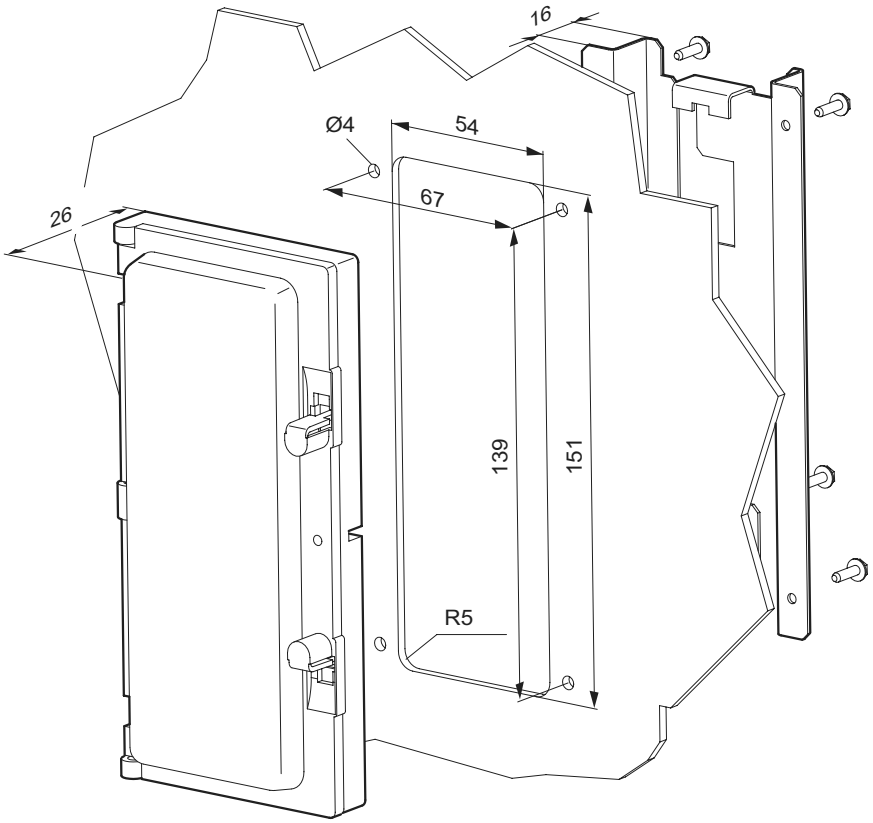

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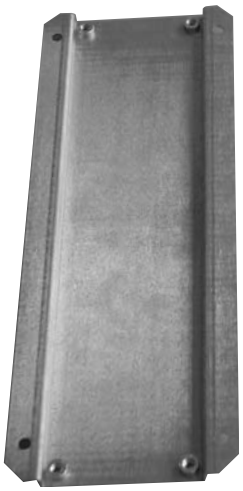
Figure 26: Dimension drawing for DBG60B housing, dimensions in mm

2.11 DMP11B mounting panel

Part number 818 398 8

Description

DMP11B



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If a MOVIDRIVE® MD_60A size 2 unit is to be replaced by MOVIDRIVE® MDX61B size 2S, the MDX61B size 2S can be fitted on the existing mounting plate with the DMP11B fitting panel. New retaining holes do not have to be drilled.

2.12 HIPERFACE® encoder card type DEH11B

Part number 824 310 7

Description The option-capable MOVIDRIVE® MDX61B units can be equipped with the HIPERFACE® encoder card type DEH11B. The encoder card offers one input for the motor encoder and one input for an external encoder, also referred to as synchronous encoder. The input for the external encoder can also be used as an output for incremental encoder simulation.

Electronics data

Option DEH11B			
 53156AXX	Output for incremental encoder simulation or external encoder input X14:	Output for incremental encoder simulation: Signal level to RS422 The number of pulses is: • 1024 pulses/revolution (Hiperface® encoder on X15) • as at X51: Motor encoder input (sin/cos encoder or TTL sensor with negated tracks at X15)	External encoder input (max. 200 kHz): Permitted encoder types: • HIPERFACE® encoder • sin/cos encoder AC 1 V_{SS} • TTL encoder with negated tracks • Encoder with signal level to RS422 Encoder power supply: DC+12 V, I_{max} = DC 650 mA[1)]
	Motor encoder input X15:	Permitted encoder types: • HIPERFACE® encoder • sin/cos encoder AC 1 V_{SS} • TTL encoder with negated tracks • Encoder with signal level to RS422 • Permitted resolution: 128/256/512/1024/2048 [increments/revolution] Encoder power supply: DC+12 V, I_{max} = DC 650 mA[1)]	
	Maximum cable length:	100 m	

1) Total current load of DC 12 V encoder supply ≤ DC 650 mA.

2.13 Resolver card type DER11B

Part number 824 307 7

Description Option-capable MOVIDRIVE® MDX61B units can be equipped with resolver card type DER11B. The resolver card offers one input for the resolver as motor encoder and one input for an external encoder, also referred to as synchronous encoder. The input for the external encoder can also be used as an output for incremental encoder simulation.

Electronics data

Option DER11B			
 53157AXX	Output for incremental encoder simulation or external encoder input X14:	Output for incremental encoder simulation: Signal level to RS422 The number of pulses is 1024 pulses/revolution	External encoder input (max. 200 kHz): Permitted encoder types: • HIPERFACE® encoder • sin/cos encoder AC 1 V_{SS} • TTL encoder with negated tracks Encoder power supply: DC+12 V, I_{max} = DC 650 mA
	Motor encoder input X15:	Resolver 2-pole, U_{ref} = AC 3.5 V_{eff}, 4 kHz U_{in} / U_{ref} = 0.5	
	Maximum cable length:	100 m	

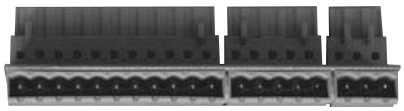
2.14 Connector adapter for replacing MD_60A - MDX60B/61B

The following adapters are available for rapid replacement of a MOVIDRIVE® A unit with a MOVIDRIVE® B unit during system operation.

- DAT11B: Terminal adapter, part number 824 671 8

  X10 can be rearranged directly when using MOVIDRIVE® MDF, MDV or MDS. Three plugs 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 (binary inputs).

DAT11B



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- DAE15B: Encoder adapter X15, part number 817 629 9

  If a motor with encoder on X15 is in operation on an MDV or MCV, the encoder is connected via a 9-pin plug 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 (→ section "DWE11B/12B interface adapter option).

DAE15B

54585AXX

Length of DAE15B: 200 mm±20 mm

Line cross section: 6 x 2 x 0.25 mm^2

Terminal of the 15-pin sub D plug (MOVIDRIVE® MDX61B, option DEH11B, X15)	Core color in prefabricated cable	Terminal of 9-pin sub D socket (encoder end)
1	Yellow (YE)	1
2	Red (RD)	2
3	Pink (PK)	3
4	Violet (VT)	4
8	Brown (BN)	5
9	Green (GN)	6
10	Blue (BU)	7
11	Gray (GY)	8
15	White (WH)	9

- DAE14B: Encoder adapter X14, part number 817 630 2

If a synchronous encoder at X14 is operated on MOVIDRIVE® MDV, MDS, MCV or MCS, connection takes place via a 9-pin connector. 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. This step makes for fail-safe and fast connection of existing drives.

DAE14B

54586AXX

Length of DAE14B: 200 mm±20 mm

Line cross section: 6 x 2 x 0.25 mm^2

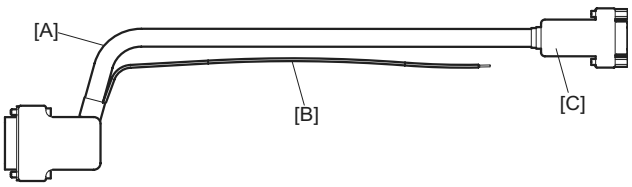
Terminal of the 15-pin sub D socket (MOVIDRIVE® MDX61B, option DEH11B/DER11B, X14)	Core color in prefabricated cable	Terminal of the 9-pin sub D connector (encoder end)
1	Yellow (YE)	1
2	Red (RD)	2
3	Pink (PK)	3
7	Violet (VT)	4
8	Brown (BN)	5
9	Green (GN)	6
10	Blue (BU)	7
11	Gray (GY)	8
15	White (WH)	9

2.15 Interface adapter type DWE11B/12B

Part number and description

- DWE11B, part number 188 187 6

  The interface adapter DWE11B (HTL→TTL) in the form of an adapter cable is used **to connect single-ended HTL encoders to the optional HIPERFACE® encoder card DEH11B**. 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.



58748AXX

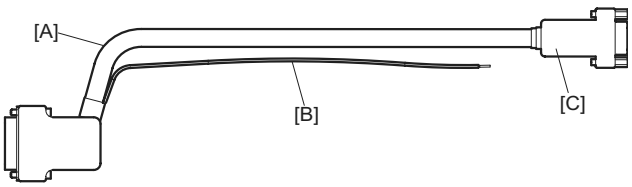
[A] 5 x 2 x 0.25 mm^2 / length 1000 mm /
Max. line length inverter - encoder: 100 m

[B] Connection DC 24 V for HTL encoder; 1 x 0.5 mm^2 / 250 mm long

Signal	Terminal of 9-pin sub D socket [C] (encoder end)
A	1
B	2
C	3
UB	9
GND	5

- DWE12B, part number 188 180 9

  The interface adapter DWE12B (HTL→TTL) in the form of an adapter cable is used **to connect push-pull HTL encoders to the optional HIPERFACE® encoder card DEH11B**. 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.



58748XX

[A] 4 x 2 x 0.25 mm^2 / 1000 mm long
Max. line length inverter - encoder: 200 m

[B] Connection DC 24 V for HTL encoder; 1 x 0.5 mm^2 / 250 mm long

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

2.16 Interface adapter type UWS11A

Part number 822,689 X

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 MOVIDRIVE® unit (ST11/ST12).

The UWS11A option requires a DC 24 V voltage supply (I_{max} = DC 50 mA).

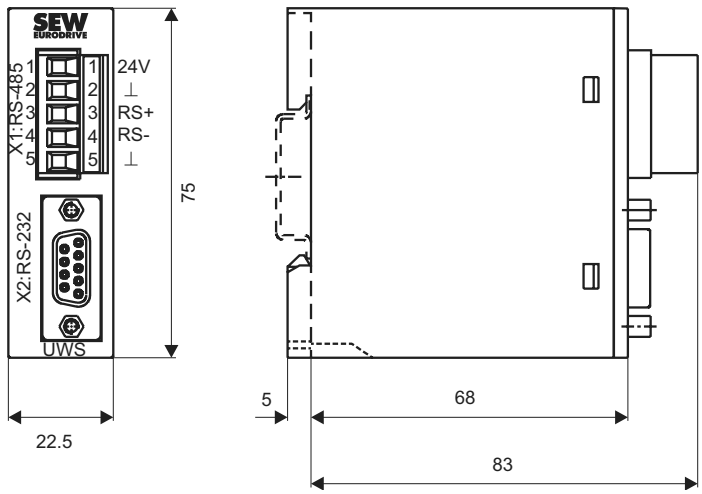
RS232 interface The connection between UWS11A and PC is made using a commercially available serial interface cable (shielded!).

RS485 interface Max. 32 MOVIDRIVE® units can be networked for communication (max. line length 200 m) via the RS485 interface of the UWS11A. Do not connect external terminating resistors because dynamic terminating resistors are already installed!

Permitted cable cross section: One core per terminal 0.20...2.5 mm^2 (AWG 24...12)

Two cores per terminal 0.20...1 mm^2 (AWG 24...17)

Dimension drawing UWS11A dimension drawing, dimensions in mm



59322AXX

Figure 27: UWS11A dimension drawing, dimensions in mm

The UWS11A option is mounted on a support rail (EN 50022-35 × 7.5) in the control cabinet.

Technical data

UWS11A	
Part number	822 689 X
Ambient temperature	0 ... 40 °C
Storage temperature	–25 °C ... +70 °C (according to EN 60721-3-3, class 3K3)
Enclosure	IP20
Current consumption	max. DC 50 mA
Weight	150 g
Dimensions	83 x 75 x 22.5 mm

2.17 Interface adapter type UWS21B

Part number 1820 456 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 MOVIDRIVE® B.

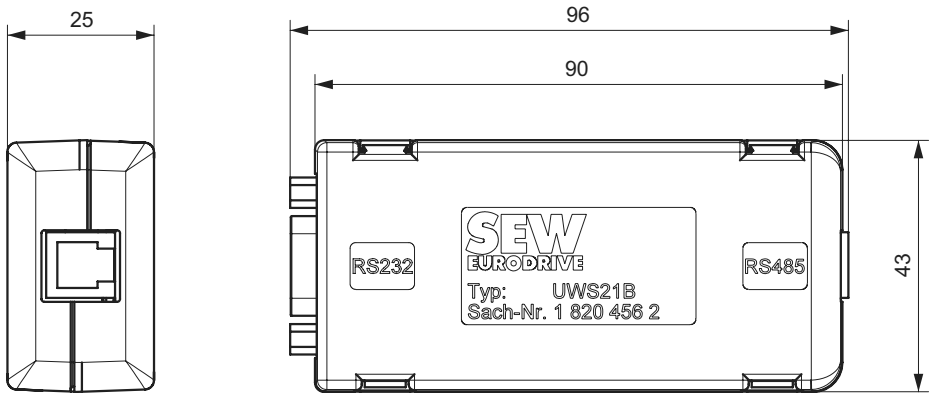
RS232 interface The connection between UWS21B and PC is made using a commercially available serial interface cable (shielded!).

RS485 interface UWS21B and MOVIDRIVE® B are connected using a serial interface cable with RJ10 connectors.

Scope of delivery The scope of delivery for the UWS21B option includes:

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

Dimension drawing



58558AXX

Figure 28: UWS21B dimension drawing, dimensions in mm

Technical data

UWS21B	
Part number	1 820 456 2
Ambient temperature	0 ... 40 °C
Storage temperature	–25 °C ... +70 °C (according to EN 60721-3-3, class 3K3)
Enclosure	IP20
Weight	300 g
Dimensions	96 x 43 x 25 mm

2.18 Interface adapter type USB11A

Part number 824 831 1

Description Option USB11A enables a PC or laptop with a USB interface to be connected to the XT slot of MOVIDRIVE® B. The USB11A interface adapter supports USB1.1 and USB2.0.

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

MOVIDRIVE® - USB11A MOVIDRIVE® B and USB11A are connected using a serial interface cable with RJ10 connectors.

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 connectors to connect USB11A and MOVIDRIVE® B
- CD-ROM with drivers and MOVITOOLS®

Dimension drawing

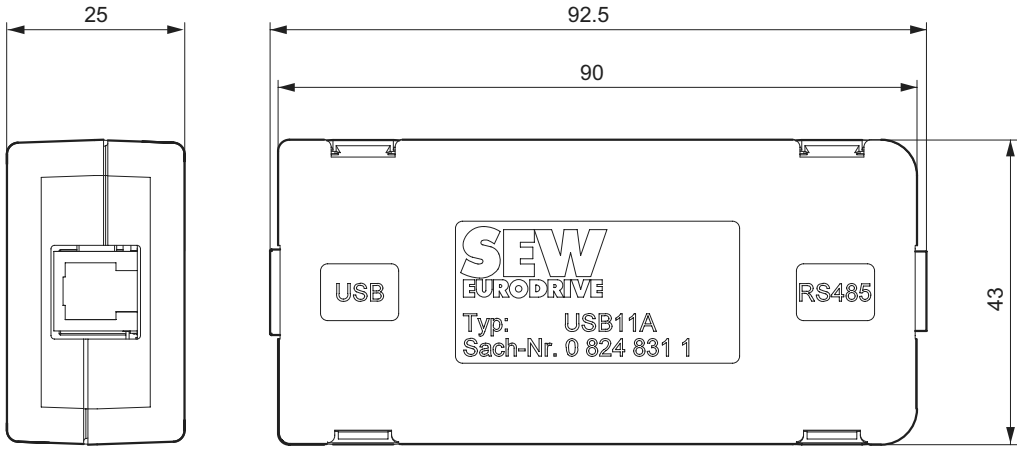


Figure 29: USB11A dimension drawing, dimensions in mm

Technical data

USB11A	
Part number	824 831 1
Ambient temperature	0 ... 40 °C
Storage temperature	–25 °C ... +70 °C (according to EN 60721-3-3, class 3K3)
Enclosure	IP20
Weight	300 g
Dimensions	92.5 x 43 x 25 mm

2.19 DC 5 V encoder supply type DWI11A

Part number 822 759 4

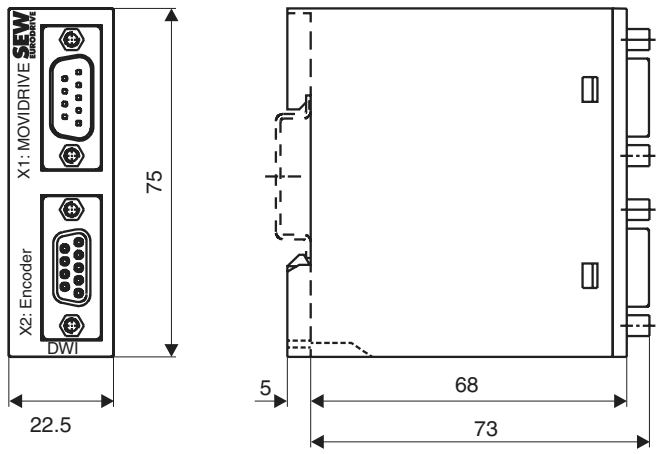
Description If you are using an incremental encoder with a DC 5 V encoder power supply, install the DC 5 V encoder power supply option type DWI11A between the inverter and the incremental encoder. This option provides a regulated DC 5 V power supply for the encoder. For this purpose, the DC 12 V power 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 power supply are not allowed to be connected directly to the encoder inputs X14: and X15: . This would cause irreparable damage to the encoder.

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

Recommendation Use prefabricated cables from SEW for the encoder connection.

Dimension drawing



01315CXX

Figure 30: DWI11A dimension drawing, dimensions in mm

The DWI11A option is mounted on a support rail (EN 50022-35 × 7.5) in the control cabinet.

Technical data

DC 5 V encoder power supply option type DWI11A	
Part number	822 759 4
Voltage input	DC 10...30 V, I_{max} = DC 120 mA
Encoder power supply	DC +5 V (up to $U_{max} \approx$ +10 V), I_{max} = DC 300 mA
Max. line length that can be connected	100 m total Use a shielded twisted-pair cable (A and $\overline{A}$, B and $\overline{B}$, C and $\overline{C}$) for connecting the encoder to the DWI11A and the DWI11A to MOVIDRIVE®.

2.20 Input/output card type DIO11B

Part number 824 308 5

Description The number of inputs/outputs of the basic MOVIDRIVE® B unit 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 binary inputs/outputs are the same as for the basic unit (→ parameter group P6__, terminal assignment).

Electronics data

DIO11B option			
 53159AXX	Setpoint input n2	X20:1/X20:2	AI21/AI22: Voltage input Differential input or input with AGND reference potential
	Mode AI21/AI22 Resolution Internal resistance		n2 = DC 0...+10 V or DC -10 V...0...+10 V 12 bit, sampling time 1 ms R_i = 40 kΩ
	Analog outputs	X21:1/X21:4	AOV1/AOV2: Voltage outputs DC -10 V...0...+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, short-circuit proof and protected against external voltage to DC 30 V, selection option → parameter menu P64_
	Response time Resolution		5 ms 12 bit
	Binary inputs X22:1...X22:8 Internal resistance		Isolated (optocoupler), PLC compatible (EN 61131) DI1Ø...DI17 R_i ≈ 3 kΩ, I_E ≈ DC 10 mA Sampling interval 1 ms
	Signal level		DC+13 V...+30 V= "1" = Contact closed DC-3 V...+5 V = "0" = Contact open — Fulfills EN 61131
	Function	X22:1...X22:8	DI10...DI17: Selection option → Parameter menu P61_
	Binary outputs	X23:1...X23:8	DO1Ø...DO17: PLC-compatible (EN 61131-2), response time 1ms
	Signal level		"0" = DC 0 V "1" = DC+24 V
	Function	X23:1...X23:8	DO10...DO17: Selection option → Parameter menu P63_, I_{max} = DC 50 mA, short-circuit proof and protected against external voltage to DC 30 V
	Reference terminals X20:3/X21:3/X21:6		AGND: Reference potential for analog signals (AI21/AI22/AO_1/AO_2) DCOM: Reference potential for binary inputs X22:1...X22:8 (DI1Ø...DI17)
		X22:9 X22:10	DGND: Reference potential for binary signals, reference potential for DC 24 V power supply
	Voltage input	X23:9	24VIN: Supply voltage DC +24 V for binary outputs DO1Ø...DO17
	Permitted line 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)

Functions

- 8 binary inputs
- 8 binary 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)

2.21 PROFIBUS fieldbus interface type DFP21B

Part number 824 240 2

Description

MOVIDRIVE® B can be equipped with a 12 Mbaud fieldbus interface for the PROFIBUS-DP serial bus system. For detailed information, refer to the PROFIBUS documentation package, which can be ordered from SEW-EURODRIVE. The documentation package contains the GSD files (device database files) and type files for MOVIDRIVE® B to help with project planning and to 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 units (e.g. drive inverters). The DFP21B option supports PROFIBUS-DP and DP-V1. In this way, MOVIDRIVE® B can be controlled via a PLC and PROFIBUS-DP / DP-V1.

Electronics data

DFP21B option		
 59523AXX	Protocol option	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 sub D socket, pin assignment to IEC 61158
	Bus terminator	Not integrated, implement using suitable PROFIBUS connector with terminating resistors that can be activated
	Station address	0 ... 125, adjustable via DIP switches
	Name of the GSD file	SEWA6003.GSD
	DP ident. number	6003_{hex} (24579_{dec})
	Max. number of process data	10 process data

2.22 INTERBUS fieldbus interface type DFI11B

Part number 824 309 3

Description MOVIDRIVE® B can be equipped with a fieldbus interface for the non-proprietary and standardized INTERBUS sensor/actuator bus system. For detailed information, refer to the INTERBUS documentation package, which can be ordered from SEW-EURODRIVE.

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 inverter can be controlled and configured in a user-friendly way.

Electronics data

DFI11B option		
 53160AXX	Supported baud rates	500 kBaud and 2 MBaud, can be selected via DIP switch
	Connection technology	Remote bus input: 9-pin sub-D connector Remote bus output: 9-pin Sub-D socket RS485 transmission technology, 6-core shielded and twisted-pair cable
	DP identity numbers	$E3_{hex} = 227_{dec}$ (1 PCP word) $E0_{hex} = 224_{dec}$ (2 PCP words) $E1_{hex} = 225_{dec}$ (4 PCP words) $38_{hex} = 56_{dec}$ (microprocessor not ready) $03_{hex} = 3_{dec}$ (no PCP word)
	Max. number of process data	6 process data

2.23 INTERBUS-LWL fieldbus interface type DFI21B

Part number 824 311 5

Description MOVIDRIVE® B can be equipped with a fieldbus interface for the non-proprietary and standardized INTERBUS sensor/actuator bus system / INTERBUS with fiber optic cables (INTERBUS-LWL). For detailed information, refer to the INTERBUS documentation package, which can be ordered from SEW-EURODRIVE.

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 inverter can be controlled and configured in a user-friendly way.

Electronics data

DFI21B option		
 55731AXX	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) $E0_{hex} = 224_{dec}$ (2 PCP words) $E1_{hex} = 225_{dec}$ (4 PCP words) $38_{hex} = 56_{dec}$ (microprocessor not ready) $03_{hex} = 3_{dec}$ (no PCP word)
	Max. number of process data	6 process data

2.24 Option Feldbus-Schnittstelle Modbus/TCP Typ DFE11B

Part number 1820 036 2

Description The MOVIDRIVE® MDX61B drive inverter enables you to use the DFE11B option to connect to higher-level automation, project planning and visualization systems via Ethernet thanks to its powerful, universal fieldbus interface. You can use option DFE11B to communicate directly with the inverters via Ethernet and operate the MOVITOOLS® software to change parameters and IPOS$^{plus®}$ programs. An integrated Web server makes it possible for the user to access diagnostic values quickly and easy using a standard browser (e.g. Internet Explorer).

Electronics data

Option DFE11B		
 55730AXX	Application protocol	• **MODBUS/TCP** (Transmission Control Protocol) to control and set parameters for the drive inverter. • **HTTP** (Hypertext Transfer Protocol) for diagnostics using a Web browser. • **SMLP** (Simple Movilink Protocol), protocol used by MOVITOOLS®. • **DHCP** (Dynamic Host Configuration Protocol) to assign address parameter automatically.
	Port numbers used	• 502 (MODBUS) • 300 (SMLP) • 80 (HTTP) • 67 / 68 (DHCP)
	EtherNet services	• ARP • ICMP (Ping)
	Automatic baud rate detection	10 MBaud / 100 MBaud
	Max. number of process data	10 process data
	Connection technology	RJ45 (modular jack 8-8)
	Addressing	4 byte IP address
	Tools for startup	• MOVITOOLS® software • DBG60B keypad

Functions

- MODBUS / TCP protocol
- RJ45 plug connection, star-type cabling
- Up to 10 process data and parameter data items can be transferred at the same time
- Three ways to allocate the IP address:
  1. Set the node address manually (byte 0 or IP address)
  2. Make the setting using the DBG60B keypad and MOVITOOLS®
  3. Use the DHCP server
- Engineering access using MOVITOOLS® via Ethernet-TCP/IP
- Inverter diagnostics using a standard browser (e.g. Internet Explorer) via the integrated Web server:
  - Transfer display values
  - Configure DFE11B (after login)

2.25 PROFINET IO RT fieldbus interface type DFE12B

Part number 1820 563 1

Description The MOVIDRIVE® MDX61B drive inverter enables you to use the DFE12B option to connect to higher-level automation, project planning and visualization systems via Ethernet thanks to its powerful, universal fieldbus interface. You can use option DFE12B to communicate directly with the inverters via Ethernet and operate the MOVITOOLS® software to change parameters and IPOS$^{plus®}$ programs. An integrated Web server makes it possible for the user to access diagnostic values quickly and easy using a standard browser (e.g. Internet Explorer).

Electronics data

Option DFE12B		
 58482AXX	Application protocol	• **PROFINET IO** to control and configure the drive inverter. • **HTTP** (Hypertext Transfer Protocol) for diagnostics using a Web browser. • **SMLP** (Simple Movilink Protocol), protocol used by MOVITOOLS®.
	Port numbers used	• 34962 - 34964 (PROFINET IO) • 300 (SMLP) • 80 (HTTP)
	Ethernet services	• ICMP (ping) • ARP
	Transmission rate	100 MBit full duplex
	Transmission process	100BASETX
	Max. number of process data	10 process data
	Connection technology	RJ45 (modular jack 8-8)
	Auto-negation	Yes
	GSD file	GSDML-V1.0-SEW-DFE12B-xxxxxxxx.xml (xxxxxxxx is a placeholder for year/month/day)
	SEW manufacturer ID	$010A_{hex}$
	Device ID	0001_{hex}
	Alarms	Diagnostic alarm in the event of a unit fault (can be activated)
	Diagnostics	Yes
	Configuration via PROFINET	In preparation
	Max. number of ARs	3
	Tools for startup	• MOVITOOLS® software • DBG60B keypad

Functions

- PROFINET IO protocol
- RJ45 plug connection, star-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® via Ethernet-TCP/IP
- Inverter diagnostics using a standard browser (e.g. Internet Explorer) via the integrated Web server:
  - Transfer display values
  - DFE11B configuration (after login)

2.26 EtherNet/IP fieldbus interface type DFE13B

Part number 1820 565 8

Description The MOVIDRIVE® MDX61B drive inverter enables you to use the DFE13B option to connect to higher-level automation, project planning and visualization systems via Ethernet thanks to its powerful, universal fieldbus interface. You can use option DFE13B to communicate directly with the inverters via Ethernet and operate the MOVITOOLS® software to change parameters and IPOS$^{plus®}$ programs. An integrated Web server makes it possible for the user to access diagnostic values quickly and easy using a standard browser (e.g. Internet Explorer).

Electronics data

Option DFE13B		
 58481AXX	Application protocol	• **EtherNet/IP** (Industrial Protocol) to control and set parameters for the drive inverter. • **HTTP** (Hypertext Transfer Protocol) for diagnostics using a Web browser. • **SMLP** (Simple Movilink Protocol), protocol used by MOVITOOLS®. • **DHCP** (Dynamic Host Configuration Protocol) to assign address parameter automatically.
	Port numbers used	• 44818 (EtherNet/IP TCP) • 2222 (EtherNet/IP UDP) • 300 (SMLP) • 80 (HTTP) • 67 / 68 (DHCP)
	EtherNet services	• ARP • ICMP (Ping)
	Automatic baud rate detection	10 MBaud / 100 MBaud
	Max. number of process data	10 process data
	Connection technology	RJ45 modular jack 8-8
	Addressing	4 byte IP address
	Manufacturer ID	$013B_{hex}$
	Tools for startup	• MOVITOOLS® software • DBG60B keypad

Functions

- EtherNet/IP protocol
- RJ45 plug connection, star-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. Make the setting using the DBG60B keypad and MOVITOOLS®
  2. Use the DHCP server
- Engineering access using MOVITOOLS® via Ethernet-TCP/IP
- Inverter diagnostics using a standard browser (e.g. Internet Explorer) via the integrated Web server:
  - Transfer display values
  - DFE13B configuration (after login)

2.27 DeviceNet fieldbus interface type DFD11B

Part number 824 972 5

Description The MOVIDRIVE® MDX61B drive inverter in conjunction with the DFD11B option allows connection to higher-level automation, project planning and visualization systems via the open and standardized DeviceNet fieldbus system thanks to the option's high-performance universal fieldbus interface.

The DeviceNet fieldbus interface type DFD11B can be plugged into the fieldbus slot on all MOVIDRIVE® MDX61B units. The DFD11B option enables communication with the machine control for a maximum of 10 process data. You need an EDS file to be able to integrated the DFD11B in the machine control. You can download this file from the SEW homepage in the Software section.

Electronics data

DFD11B option		
 55729AXX	Communication protocol	Master/slave connection set acc. to DeviceNet specification version 2.0
	Number of process data words	Adjustable via DIP switches: • 1 ... 10 process data words • 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 • 500 m at 125 kbaud • 250 m at 250 kbaud • 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-pole Phoenix terminal • Pin assignment according to DeviceNet specification
	MAC-ID	0 ... 63, can be set using DIP switch Max. 64 stations
	Supported services	• Polled I/O: 1 ... 10 words • Bit-Strobe I/O: 1 ... 4 words • Explicit message: – Get_Attribute_Single – Set_Attribute_Single – Reset – Allocate_MS_Connection_Set – Release_MS_Connection_Set
	Tools for startup	• MOVITOOLS® software • DBG60B keypad

2.28 CAN/CANopen fieldbus interface type DFC11B

Part number 824 317 4

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 using the MOVILINK® protocol designed especially for units from SEW-EURODRIVE.

The DeviceNet fieldbus interface type DFC11B can be plugged into the fieldbus slot on all MOVIDRIVE® MDX61B units. in this way, a second system bus (CAN) on MOVIDRIVE® is made available. The DFC11B option enables communication with the machine control 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 homepage in the Software section.

Electronics data

DFC11B option		
 55728AXX	Communication profile	• SEW-MOVILINK® • CANopen • CAN Layer 2
	Number of process data words	1 ... 10 process data words
	Baud rate	Setting using parameter P894: 125 kBaud / 250 kBaud / 500 kBaud / 1 MBaud
	Connection technology	Sub-D9 plug connector X30 (plug assigned to CIA standard) or via terminal X31
	Permitted line cross section X31 (CAN-Bus connection)	One core per terminal: 0.20 ... 2.5 mm^2 (AWG24 ... 12) Two cores per terminal: 0.25 ...1 mm^2 (AWG22 ... 17)
	Terminating resistor	120 Ω (setting at DIP switch S1-R)
	Addressing	Setting via parameter P891 (SBus MOVILINK) or P896 (CANopen)
	Tools for startup	• MOVITOOLS® software • DBG60B keypad

Functions

- CAN Layer 2 and communication profile MOVILINK® or CANopen
- Electrical isolation via optocoupler

NOTE

If electrical isolation is not required, the CAN-Bus can be connected directly to the basic unit at X12:SC11/SC12 without the DFC11B option. This does not effect the functionality.

2.29 Absolute encoder card type DIP11B

Part number 824 969 5

Description Option DIP11B extends the MOVIDRIVE® B system to include an SSI interface for absolute encoders. This option allows the following possibilities 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 distance, even without motor encoder feedback
- Free processing of the absolute position in the IPOS$^{plus®}$ program
- In addition to the basic unit, 8 digital inputs and 8 digital outputs are available
- 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

Electronics data

DIP11B option			
 55727AXX	Connection binary inputs	X60:1 ... 8	DI10 ... DI17 isolated via optocoupler; PLC compatible (EN 61131), Sampling interval 1 ms
	Internal resistance Signal level (EN 61131) Function	 X60:1 ... 8	$R_i \approx$ 3 kΩ , $I_E \approx$ DC 10 mA DC+13 V ... +30 V = "1" / DC–3 V ... +5 V = "0" DI10 ... DI17: Selection option → Parameter menu P61_
	Connection binary outputs	X61:1 ... 8	DO10 ... DO17, PLC-compatible (EN 61131), short-circuit proof and protected against external voltage to DC 30 V Response time 1 ms
	Signal level (EN 61131) Function	 X61:1 ... 8	DC +24 V = "1" DC 0 V = "0" **Important**: Do not apply external voltage! DO10 ... DO17: Selection option → Parameter menu P63_
	Encoder connection	X62:	SSI encoder input
	Reference terminals	X60:9 X60:10	DCOM: Reference potential for binary inputs (DI10 ... DI17) DGND: Reference potential for binary signals and 24VIN • Without jumper X60:9 -X60:10 (DCOM-DGND) isolated binary inputs • With jumper X60:9-X60:10 (DCOM-DGND) non-isolated binary inputs
	Permitted line cross section		One core per terminal: 0.08 ... 1.5 mm^2 (AWG28 ... 16) Two cores per terminal: 0.25 ... 1 mm^2 (AWG22 .. 17)
	Voltage input	X61:9	24VIN: Supply voltage DC+24 V for binary outputs DO10 ... DO17 and encoder (mandatory)

2.30 Synchronous operation board type DRS11B

Part number 824 672 6

Description The DRS11B option enables a group of motors to be operated at a synchronous angle to one another or in an adjustable proportional relationship. For detailed information, refer to the "Synchronous Operation Board Type DRS11B" 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. The motors must be fitted with encoders. The DRS11B option is plugged into the expansion slot.

Electronics data

Option DRS11B			
 56448AXX	Binary inputs	X40:1...X40:6	EINGØ...EING5: isolated (opto-coupler) PLC compatible (EN 61131)
	Internal resistance		$R_i \approx 3\ k\Omega$, $I_E \approx$ DC 10 mA Sampling interval 5 ms
	Signal level		DC+13 V...+30 V= "1" = Contact closed DC–3 V...+5 V = "0" = Contact open
	Function		Fixed assignment with: • EINGØ = Free-running • INP1 = Offset 1 • INP2 = Offset 2 • INP3 = Offset 3 • INP4 = IPOS$^{plus®}$ variable H477.0 • INP5 = IPOS$^{plus®}$ variable H477.1
	Binary outputs	X40:9/X40:10	OUTPØ/OUTP1: PLC compatible (EN 61131-2) Response time 5 ms
	Signal level		"0" = DC 0 V "1" = DC+24 V **Important:**Do not apply external voltage!
	Function		Fixed assignment with: • OUTPØ = IPOS$^{plus®}$ variable H476.0 • OUTP1 = IPOS$^{plus®}$ variable H476.1 I_{max} = DC 50 mA, short-circuit proof, protected against external voltage to DC 30 V
	Reference terminals	X40:11 X40:7	DGND: Reference potential for binary signals DCOM: Reference potential for binary inputs X40:1...X40:6 (INØ...IN5)
	Voltage output	X40:8	VO24: Voltage output DC +24 V, max. DC 100 mA
	Synchronous encoder input Encoder power supply	X41:	Max. 200 kHz, signal level according to RS422 or sin/cos DC +24 V, I_{max} = 650 mA[1)] 9-pin Sub-D socket
	Master encoder input Encoder power supply	X42:	Max. 200 kHz, signal level according to RS422 or sin/cos DC+24 V, I_{max} = DC 650 mA[1)] 9-pin Sub-D socket
	Encoder simulation output	X43:	Signal level to RS422 9-pin sub-D connector
	Voltage input	X44:1 X44:2 X44:3	GND DC+24 V supply voltage for binary outputs X40:9/X40:10 and encoder GND
	Permitted line cross section		One core per terminal: 0.08 ... 1.5 mm^2 (AWG28 ... 16) Two cores per terminal: 0.25 ... 1 mm^2 (AWG22 .. 17)

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

2.31 MOVI-PLC® basic controller DHP11B..

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.. unit versions	Description
1820 472 4	DHP11B-T0	MOVI-PLC® *basic* controller
1820 822 3	DHP11B-T1	Application version I (in addition to version T0, enables additional functions including electronic cam and synchronous operation)
1820 823 1	DHP11B-T2	Application version II (in addition to version T1, enables additional functions including handling)

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 units at the same time (MOVIDRIVE® A/B, MOVITRAC® 07/B, MOVIAXIS®, MOVIMOT®).

Electronics data

MOVI-PLC® basic controller DHP11B.. option		
 58585AXX	Status displays	LEDs for the voltage supply to the I/Os, firmware, program, PROFIBUS, system buses
	Fieldbus	• PROFIBUS DP and DP-V1 to IEC 61158 • Automatic detection of baud rate from 9.6 kbaud to 12 Mbaud • Bus termination must be implemented with a suitable connector • GSD file SEW_6007.GSD • DP ident. number 6007_{hex} (24579_{dec}) • Maximum 32 process data
	System bus	• 2 system buses (CAN) to control 12 inverters and CANopen I/O modules • CAN Layer 2 (SCOM cyclic, acyclic) or via the SEW MOVILINK® protocol • Baud rate: 125 kBaud ... 1 MBaud • External bus terminator • Address range: 0 ... 127
	Engineering	Via RS485, PROFIBUS and the system buses
	Panel operation	Via RS485 and CAN 2 (in preparation)
	Connection technology	• PROFIBUS: 9-pin Sub-D connector to IEC 61158 • System buses and I/Os: pluggable terminals • RS485: RJ10
	Binary inputs/outputs	• 8 I/Os to IEC 61131-2; can be configured as inputs or outputs. Five are interrupt-capable
	Memory	• Program: 512 kByte • Data: 128 kByte • Retain: 24 kByte
	Tools for startup	MOVITOOLS® MotionStudio with integrated PLC editor (programming languages IL, ST, LD, FBD, CFC, SFC; libraries for optimized inverter control)

2.32 Option OST11B

Part number 1820 544 5

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 MOVI-PLC® *basic* 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...

Electronics data

Option OST11B		
 58586AXX	RS485 interface COM2 X35:1 ... X35:4 X36:1 ... X36:3	• For connection of an engineering PC, a DOP11A operator terminal or a gearmotor with integrated MOVIMOT® frequency inverter • I/O standard, 57.6 kBaud, max. total cable length 200 m, dynamic terminating resistor permanently installed
	Potential level	COM2 is isolated from the MOVI-PLC® *basic* DHP11B.. controller.

2.33 Braking resistors type BW... / BW...-T / BW...-P

General

- Braking resistors BW... / BW...-T and BW...-P are adapted to the technical characteristics of MOVIDRIVE® drive inverters.
- Plan for a load derating of 4 % per 10 K from an ambient temperature of 45 °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) (→ section "Dimensions drawings for MOVIDRIVE® MDX60B")
- The MOVIDRIVE® units 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).

Flat-type braking resistors

- Protection against contact (IP54)
- Internal thermal overload protection (non-replaceable fuse)
- Touch guard and mounting rail attachment available from SEW as accessories

Wire and grid resistors

- Perforated sheet cover (IP20) open to mounting surface
- The short-term load capacity of the wire and grid resistors is higher than in the flat-type braking resistors (→ MOVIDRIVE® MDX60B/61B system manual, section "Selecting the braking resistor")
- 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 also protecting the wire and grid resistors against overload using a bimetallic relay with trip characteristics of trip class 10 or 10A (in accordance with EN 60947-4-1). Set the trip 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 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 resistor surfaces will get very hot under a load of P_N. Make sure to select an installation site that will accommodate these high temperatures. As a rule, therefore, braking resistors are mounted on the control cabinet roof.

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).

UL and cUL approval

Type BW... braking resistors are UL and cUL approved in conjunction with MOVIDRIVE® B drive inverters. SEW-EURODRIVE will provide a certificate on request. The BW...-T and BW...-P braking resistors have cRUus approval independent of the MOVIDRIVE® inverters.

Parallel connection

Two braking resistors with the same value must be connected in parallel for some inverter/resistor combinations. In this case, the trip 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.

Assignment to AC 400/500 V units (...-5_3)

Braking resistor type BW...	BW090-P52B	BW100-005	BW100-006	BW072-003	BW072-005	BW168	BW268
Part number	824 563 0	826 269 1	821 701 7	826 058 3	826 060 5	820,604 X	820 715 1
Braking resistor type BW...-T			**BW100-006-T**			**BW168-T**	**BW268-T**
Part number			1820 419 8			1820 133 4	1820 417 1
Cont. 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 **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 %	
Trip current (of F16) I_F	-	0.8 A_{RMS}	2.4 A_{RMS}	0.6 A_{RMS}	1 A_{RMS}	3.4 A_{RMS}	4.2 A_{RMS}
Design	PTC	Flat design	Wire resistor on ceramic core	Flat design		Wire resistor on ceramic core	
Connections/ Tightening torque	Cables	Cables	Ceramic terminals 2.5 mm^2 (AWG13) 0.5 Nm	Cables		Ceramic terminals 2.5 mm^2 (AWG13) 0.5 Nm	
Enclosure	IP20	IP54	IP20 (when installed)	IP54		IP20 (when installed)	
Ambient temperature ϑ_U	–20 ... +40 °C						
Type of cooling	KS = Self-cooling						
For MOVIDRIVE®	0005 ... 0014	0005 ... 0022	0015 ... 0040	0005 ... 0014		0005 ... 0040	0015 ... 0040

1) cdf = Cyclic duration factor of the braking resistor based on a cycle duration $T_D \leq 120$ s.

Braking resistor type BW...		BW147	BW247	BW347	BW039-012		
Part number		820 713 5	820 714 3	820 798 4	821 689 4		
Braking resistor type BW...-T		**BW147-T**	**BW247-T**	**BW347-T**	**BW039-012-T**	**BW039-026-T**	**BW039-050-T**
Part number		1820 134 2	1820 084 2	1820 135 0	1820 136 9	1820 415 5	1820 137 7
Cont. braking power (= 100 % cdf) Load capacity at	50 % cdf[1] 25 % cdf 12 % cdf 6 % cdf	1.2 kW 2.2 kW 3.8 kW 7.2 kW 11 kW	2.0 kW 3.6 kW 6.4 kW 12 kW 19 kW	4.0 kW 7.2 kW 12.8 kW 20 kW[2] 20 kW[2]	1.2 kW 2.1 kW 3.8 kW 7.2 kW 11.4 kW	2.6 kW 4.7 kW 8.3 kW 15.6 kW 24.0 kW[2]	5.0 kW 8.5 kW 15.0 kW 24.0 kW[2] 24.0 kW[2]
		Observe **regenerative power limit** of the inverter! (= 150 % of the recommended motor power → Technical Data)					
Resistance value	R_{BW}	47 Ω ±10 %			39 Ω ±10 %		
Trip current (of F16)	I_F	5 A_{RMS}	6.5 A_{RMS}	9.2 A_{RMS}	5.5 A_{RMS}	8.1 A_{RMS}	11.3 A_{RMS}
Design		Wire resistor on ceramic core					Grid resistor
Connections/ Tightening torque		Ceramic terminals 2.5 mm^2 (AWG13) / 0.5 Nm BW347-T: Ceramic terminals 10 mm^2 (AWG8) / 1.6 Nm					M8 stud / 6 Nm
Enclosure		IP20 (when installed)					
Ambient temperature	ϑ_U	–20 ... +40 °C					
Type of cooling		KS = Self-cooling					
For MOVIDRIVE®		0055/0075			0110		

1) cdf = Cyclic duration factor of the braking resistor based on a cycle duration $T_D \leq 120$ s.

2) Physical power limit due to DC link voltage and resistance value.

Braking resistor type BW...		BW018-015			
Part number		821 684 3			
Braking resistor type BW..-T/-P		**BW018-015-P**	**BW018-035-T**	**BW018-075-T**	**BW915-T**
Part number		1820 416 3	1820 138 5	1820 139 3	1820 413 9
Continuous braking power (= 100 % cdf) Load capacity at	50 % cdf[1] 25 % cdf 12 % cdf 6 % cdf	1.5 kW 2.5 kW 4.5 kW 6.7 kW 11.4 kW	3.5 kW 5.9 kW 10.5 kW 15.7 kW 26.6 kW	7.5 kW 12.7 kW 22.5 kW 33.7 kW 52.2 kW[2]	16 kW 27.2 kW 48 kW 62.7 kW[2] 62.7 kW[2]
		Observe **regenerative power limit** of the inverter! (= 150 % of the recommended motor power → Technical Data)			
Resistance value	R_{BW}	18 Ω ±10 %			15 Ω ±10 %
Trip current (of F16)	I_F	9.1 A_{RMS}	13.9 A_{RMS}	20.4 A_{RMS}	32.6 A_{RMS}
Design		Wire resistor on ceramic core	Steel-grid resistor		
Connections/ Tightening torque		BW018-015: Ceramic terminals 2.5 mm^2 (AWG13) / 0.5 Nm BW018-015-P: Terminal 2.5 mm^2 (AWG13) / 1 Nm	M8 bolt / 6 Nm		
Enclosure		IP20 (when installed)			
Ambient temperature	ϑ_U	–20 ... +40 °C			
Type of cooling		KS = Self-cooling			
For MOVIDRIVE®		0150/0220 and 2 × parallel for 0370/0450[3]			0220

1) cdf = Cyclic duration factor of the braking resistor based on a cycle duration $T_D \leq 120$ 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		821 680 0				
Braking resistor type BW..-T/-P		**BW012-025-P**	**BW012-050T**	**BW012-100-T**	**BW106-T**	**BW206-T**
Part number		1820 414 7	1820 140 7	1820 141 5	1820 083 4	1820 412 0
Cont. braking power (= 100 % cdf) Load capacity 50 % cdf[1] at 25 % cdf 12 % cdf 6 % cdf		2.5 kW 4.2 kW 7.5 kW 11.2 kW 19.0 kW	5.0 kW 8.5 kW 15.0 kW 22.5 kW 38.0 kW	10 kW 17 kW 30 kW 45 kW 76 kW	13.5 kW 23 kW 40 kW 61 kW 102 kW	18 kW 30.6 kW 54 kW 81 kW 136.8 kW
		Observe **regenerative power limit** of the inverter! (= 150 % of the recommended motor power → Technical Data)				
Resistance value	R_{BW}	12 Ω ±10 %			6 Ω ±10 %	
Trip current (of F16)	I_F	14.4 A_{RMS}	20.4 A_{RMS}	28.8 A_{RMS}	47.4 A_{RMS}	54.7 A_{RMS}
Design		Steel-grid resistor				
Connections/ Tightening torque		Ceramic terminals 2.5 mm^2 (AWG13) / 0.5 Nm BW012-025-P: Terminals 4 mm^2 (AWG12) / 1 Nm			M8 bolt / 6 Nm	
Enclosure		IP20 (when installed)				
Ambient temperature	ϑ_U	–20 ... +40 °C				
Type of cooling		KS = Self-cooling				
For MOVIDRIVE®		0300			0370...0750 and 2 × parallel for 0900/1100/1320[2]	

1) cdf = Cyclic duration factor of the braking resistor based on a cycle duration $T_D \leq 120$ s.

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

Assignment to AC 230 V units (...-2_3)

Braking resistor type BW...		BW039-003	BW039-006	BW039-012		BW027-006	BW027-012		
Part number		821 687 8	821 688 6	821 689 4		822 422 6	822 423 4		
Braking resistor type BW...T				BW039-012-T	BW039-026-T			BW018-015-T	BW018-035-T
Part number				1820 136 9	1820 415 5			1820 416 3	1820 138 5
Cont. 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[2]	6.0 kW[2]	5.7 kW	8.7 kW[2]	11.4 kW	13.0 kW[2]
		Observe **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 %	
Trip current (of F16)	I_F	2.7 A_{RMS}	3.9 A_{RMS}	5.5 A_{RMS}	8.1 A_{RMS}	4.7 A_{RMS}	6.6 A_{RMS}	9.1 A_{RMS}	13.9 A_{RMS}
Design		Wire resistor						Steel-grid resistor	
Connections/ Tightening torque		Ceramic terminals 2.5 mm² (AWG12) / 0.5 Nm							M8 stud / 6 Nm
Enclosure		IP20 (when installed)							
Ambient temperature	ϑ_U	–20 ... +40 °C							
Type of cooling		KS = Self-cooling							
For MOVIDRIVE®		0015/0022				0015...0037		2 × parallel with 0110[3]	

1) cdf = Cyclic duration factor of the braking resistor based on a cycle duration $T_D \leq 120$ 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		BW018-075-T	BW915-T	BW012-025-T	BW012-050-T	BW012-100-T	BW106-T	BW206-T
Part number		1820 139 3	1820 413 9	1820 414 7	1820 140 7	1820141 5	1820 083 4	1820 412 0
Cont. braking power (= 100 % cdf)		7.5 kW	15.6 kW[2]	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[2]	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[2]	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 **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 %	
Trip current (of F16)	I_F	20.4 A_{RMS}	32.6 A_{RMS}	14.4 A_{RMS}	20.4 A_{RMS}	28.8 A_{RMS}	47.4 A_{RMS}	54.7 A_{RMS}
Design		Steel-grid resistor						
Connections/ Tightening torque		M8 stud / 6 Nm						
Enclosure		IP20 (when installed)						
Ambient temperature	ϑ_U	–20 ... +40 °C						
Type of cooling		KS = Self-cooling						
For MOVIDRIVE®		2 × parallel with 0110[3]		0055/0075			0150 and 2 × parallel with 0220/0300[3]	

1) cdf = Cyclic duration factor of the braking resistor based on a cycle duration $T_D \leq 120$ s.

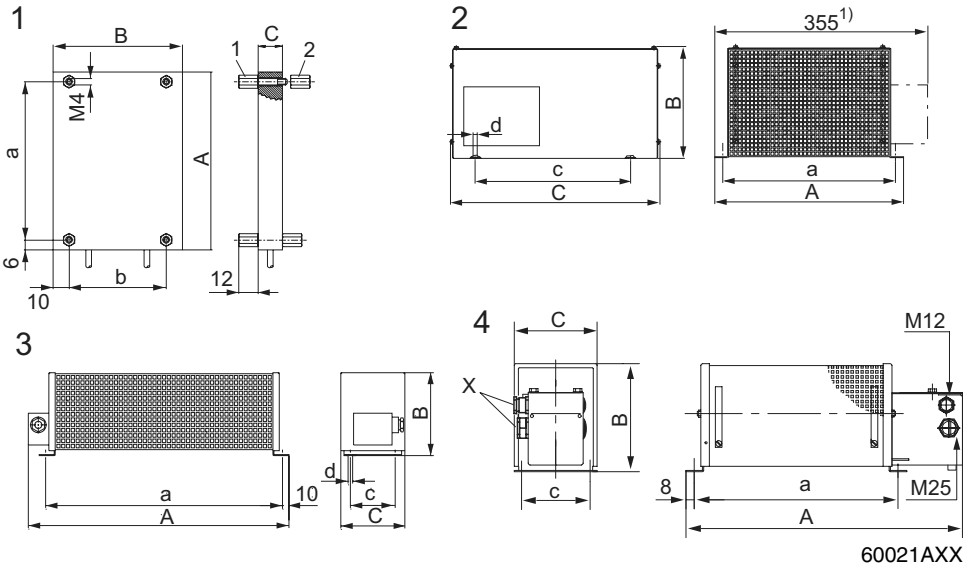
2) Physical power limit due to DC link voltage and resistance value.

3) When connected in parallel, the load capacity and trip current are doubled.

Technical data for braking resistors BW...-T / BW...-P

BW...-T / BW...-P	
Connection cross section for signal contact	1 x 2.5 mm²
Switching capability of the thermostat's signal contact	• DC 2 A / DC 24 V (DC11) • AC 2 A / AC 230V (AC11)
Switch contact (NC)	according to EN 61800-5-1

Dimension drawings for braking resistors BW... / BW...-T / BW...-P



BW... :
- 1 = Flat design
  The connecting lead is 500 mm long. The scope of delivery includes four 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.

Type BW...	Mounting position	Main dimensions [mm]			Fastening parts [mm]			Cable gland	Weight [kg]
BW..-T/ BW...-P		A	B	C	a	b/c	d		
BW106-T	2	795	270	490	770	380	10.5	-	32
BW206-T	2	995	270	490	970	380	10.5	-	40
BW012-025-P[1)]	2	295	260	490	270	380	10.5	M12 + M25	8.0
BW012-050-T	2	395	260	490	370	380	10.5	-	12
BW012-100-T	2	595	270	490	570	380	10.5	-	21
BW915-T	2	795	270	490	770	380	10.5	-	30
BW018-015	3	620	120	92	544	64	6.5	PG11	4.0
BW018-015-P	4	649	120	185	530	150	6.5	M12 + M25	5.8
BW018-035-T	2	295	270	490	270	380	10.5	-	9.0
BW018-075-T	2	595	270	490	570	380	10.5	-	18.5
BW027-006	3	486	120	92	430	64	6.5	PG11	2.2
BW027-012	3	486	120	185	426	150	6.5	PG11	4.3
BW039-003	3	286	120	92	230	64	6.5	PG11	1.5
BW039-006	3	486	120	92	430	64	6.5	PG11	2.2
BW039-012	3	486	120	185	426	150	6.5	PG11	4.3
BW039-012-T	4	549	120	185	426	150	6.5	M12 + M25	4.9
BW039-026-T	4	649	120	275	530	240	6.5	M12 + M25	7.5
BW039-050-T	2	395	260	490	370	380	10.5	-	12
BW147	3	465	120	185	426	150	6.5	PG13.5	4.3
BW147-T	4	549	120	185	426	150	6.5	M12 + M25	4.9
BW247	3	665	120	185	626	150	6.5	PG13.5	6.1
BW247-T	4	749	120	185	626	150	6.5	M12 + M25	9.2
BW347	3	670	145	340	630	300	6.5	PG13.5	13.2
BW347-T	4	749	210	185	630	150	6.5	M12 + M25	12.4
BW168	3	365	120	185	326	150	6.5	PG13.5	3.5
BW168-T	4	449	120	185	326	150	6.5	M12 + M25	3.6
BW268	3	465	120	185	426	150	6.5	PG13.5	4.3
BW268-T	4	549	120	185	426	150	6.5	M12 + M25	4.9
BW072-003	1	110	80	15	98	60	–	-	0.3
BW072-005	1	216	80	15	204	60	–	-	0.6
BW100-005	1	216	80	15	204	60	–	-	0.6
BW100-006	4	486	120	92	430	64	6.5	PG11	2.2
BW100-006-T	4	549	120	92	430	80	6.5	M12 + M25	3.0

BS... touch guard

Touch guards are available for braking resistors in flat design.

Touch guard	BS003	BS005
Part number	813 151 1	813,152 X
for braking resistor	BW027-003 BW072-003	BW027-005 BW072-005 BW100-005

Dimension drawing for touch guard BS...

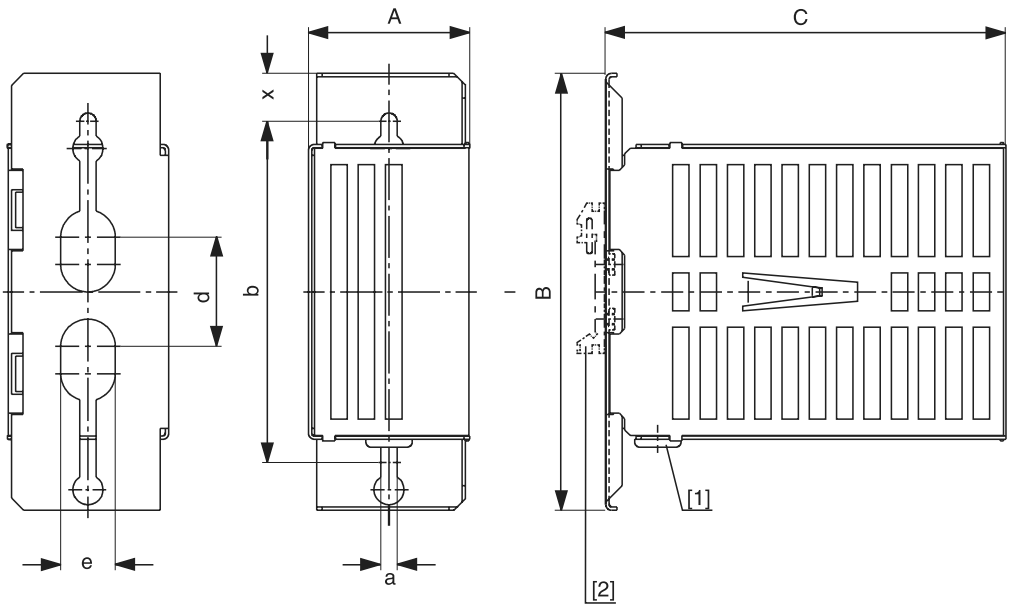


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Figure 31: Dimension drawing for BS touch guard with grommet [1] and mounting rail attachment [2]

Type	Main dimensions [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-003	60	160	252	125	40	20	6	17.5	0.5

Mounting rail installation

A mounting rail attachment is available from SEW-EURODRIVE as an accessory, part number 822 194 4, for mounting the touch guard on a mounting rail.

DKB11A heat sink for brake resistors in flatpack design

Part number 814 345 5

Description The DKB11A heat sink provides a space-saving means of mounting braking resistors in flatpack design (BW072-005, BW100-005) under MOVIDRIVE® B size 1 (400/500 V units: 0015...0040; 230 V units: 0015...0037). The resistor is inserted into the heat sink and attached using the supplied screws (M4 × 20).

Dimension drawing

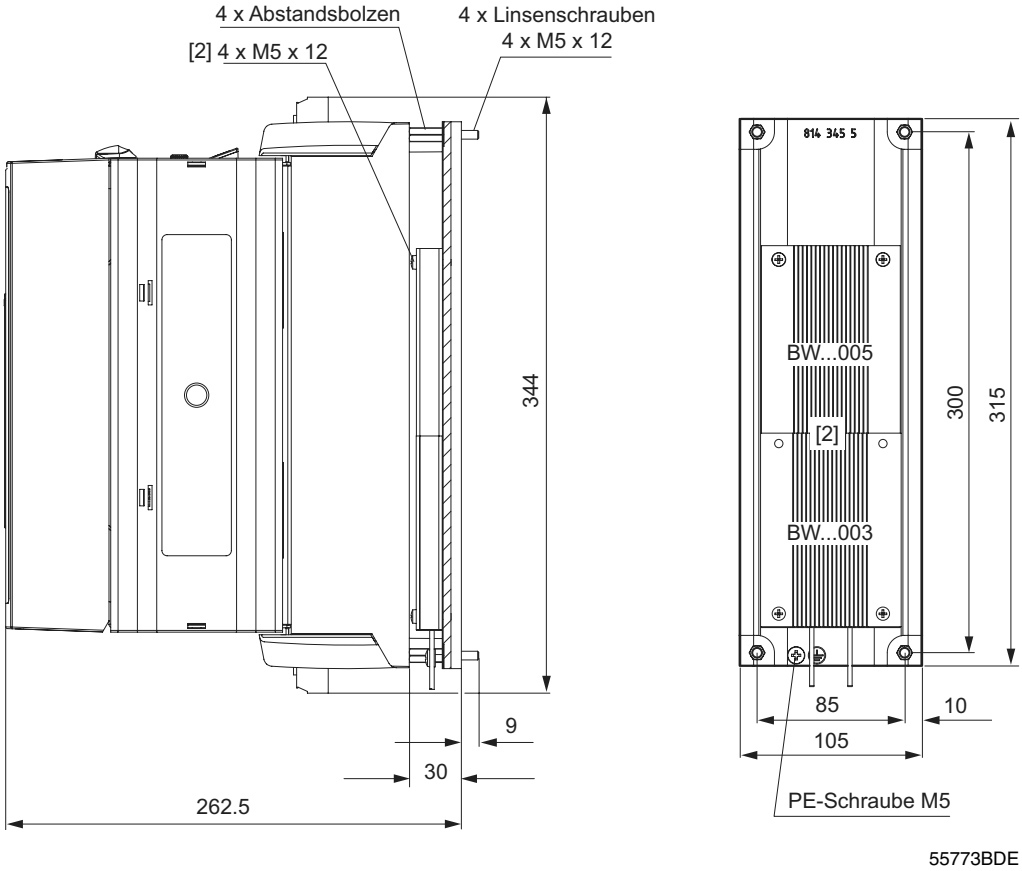

Figure 32: Dimension drawing for DKB11A heat sink, all dimensions in mm

1) Mounting surface for the braking resistor
2) Retaining screws are not included in the delivery scope

2.34 Line choke type ND..

- To increase overvoltage protection.
- To limit the charging current when several inverters are connected together in parallel on the input end with shared mains contactors (rated current of line choke = total of inverter currents).
- ND.. line filters have cRUus approval independent of the MOVIDRIVE® drive inverters.

Line choke type		ND020-013	ND030-023	ND045-013	ND085-013	ND150-013	ND200-0033	ND300-0053
Part number		826 012 5	827 151 8	826 013 3	826 014 1	825 548 2	826 579 8	827 721 4
Rated voltage	U_N	3 × AC 380 V -10 % ... 3 × AC 500 V +10 %, 50/60 Hz						
Rated current[1]	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	ϑ_U	–25 ... +45 °C						
Enclosure		IP 00 (EN 60529)						
Connections		Terminal strips 4 mm² (AWG12)	Terminal strips 2.5 mm²... 10 mm² (AWG13 ... AWG8)	Terminal blocks 10 mm² (AWG8)	Terminal blocks 35 mm² (AWG2)	M10 stud PI: M8 stud		M12 stud PI: 2 × M10
Tightening torque		0.6 ... 0.8 Nm	max. 2.5 Nm		3.2 ... 3.7 Nm	M10 stud: 10 Nm PI: 6 Nm		M12 stud: 15.5 Nm PI: 10 Nm
Assignment to AC 400/500 V units (MDX60/61B...-5_3)								
Rated operation (100 %)		0005...0075	0110...0220	0300...0450 and MDR60A0370	0550/0750	MDR60A0750		0900...1320
Increased power (125 %)		0005...0075	0110/0150	0220...0370	0450...0750			
Assignment to AC 230 V units (MDX61B...-2_3)								
Rated operation (100 %)		0015...0055	0075/0110	0150/0220	0300	-	-	
Increased power (125 %)		0015...0037	0055/0075	0110/0150	0220/0300	-	-	

1) If more than one MOVIDRIVE® unit is connected to a line choke, the **total value of the rated currents** of the connected units **must not exceed the rated current of the line choke**!

Dimension drawings for ND...

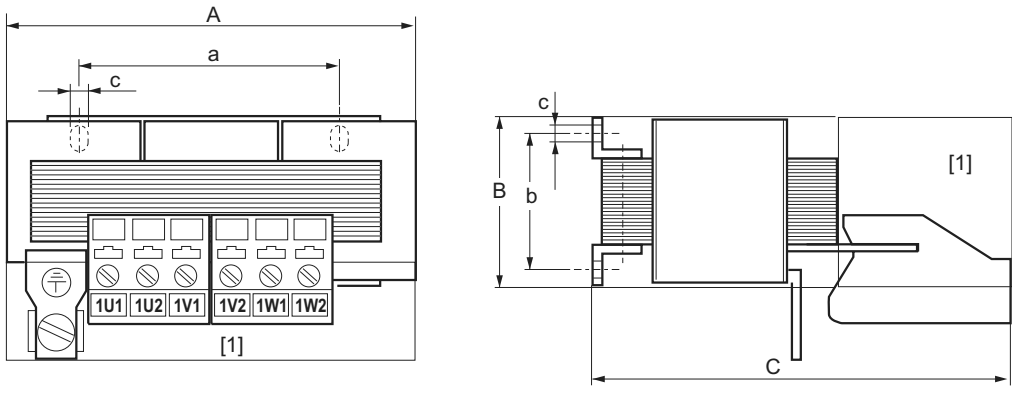

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Figure 33: Dimension drawing for line chokes ND020.. / ND030.. / ND045.. / ND085..

(1) Space for installation terminals

Input: 1U1, 1V1, 1W1

Output: 1U2, 1V2, 1W2

Any mounting position

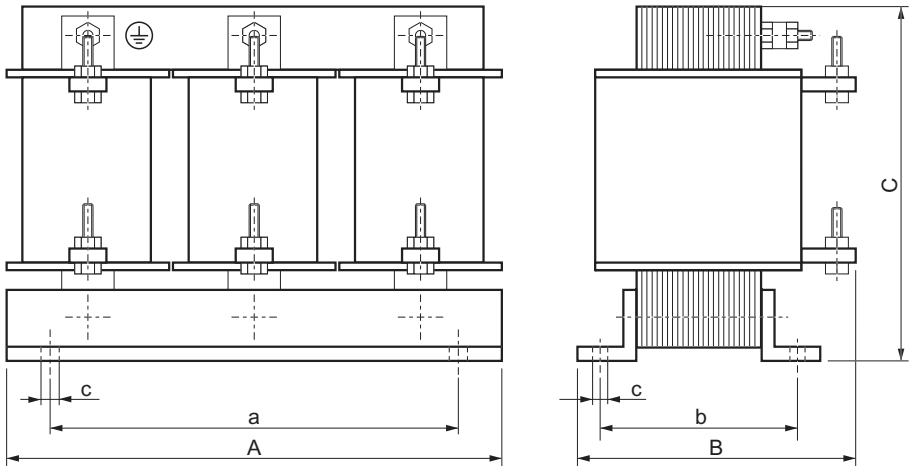

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Figure 34: Dimension drawing for line chokes ND150.. / ND200.. / ND300..

All dimensions in mm:

Line choke type	Main dimensions			Mounting dimensions		Hole dimension	Weight
	A	B	C	a	b	c	kg
ND020-013	85	60	120	50	31-42	5-10	0.5
ND030-023 **ND045-013**	125	95	170	84	55-75	6	2.5
ND085-013	185	115	235	136	56-88	7	8
ND150-013	255	140	230	170	77	8	17
ND200-0033	250	160	230	180	98	8	15
ND300-0053	300	190	295	255	145	11	35

2.35 Line filter option type NF...-...

- To suppress interference emission on the line side of inverters.
- Do not switch between the NF... line filter and MOVIDRIVE®.
- NF.. line filters have cRUus approval independent of the MOVIDRIVE® drive inverters.

Line filter type	NF009-503	NF014-503	NF018-503	NF035-503	NF048-503
Part number	827 412 6	827,116 X	827 413 4	827 128 3	827 117 8
Rated voltage U_N	3 × AC 380 V –10 % ... AC 500 V +10 %, 50/60 Hz				
Rated 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
Earth-leakage current at V_N	< 25 mA	< 25 mA	< 25 mA	< 25 mA	< 40 mA
Ambient temperature ϑ_U	–25 ... +40 °C				
Degree of protection	IP20 (EN 60529)				
Connections L1-L3/L1'-L3'	4 mm² (AWG 10)			10 mm² (AWG 8)	
PE	M5 stud			M5/M6 stud	
Tightening torque	0.8 Nm			1.8 Nm	
Assignment to AC 400/500 V units (MDX60/61B...-5_3)					
Rated operation (100 %)	0005...0040	0055/0075	-	0110/0150	0220
Increased power (125 %)	0005...0030	0040/0055	0075	0110	0150
Assignment to AC 230 V units (MDX61B...-2_3)					
Rated 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	NF300-503
Part number	827 414 2	827 415 0	827 416 9	827 417 7	827 418 5	827 419 3
Rated voltage U_N	3 × AC 380 V –10 % ... AC 500 V +10 %, 50/60 Hz					
Rated current I_N	AC 63 A	AC 85 A	AC 115 A	AC 150 A	AC 210 A	AC 300 A
Power loss at I_N P_V	30 W	35 W	60 W	90 W	150 W	180 W
Earth-leakage current at V_N	< 30 mA	< 30 mA	< 30 mA	< 30 mA	< 40 mA	< 45 mA
Ambient temperature ϑ_U	–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)	95 mm² (AWG4/0)	95 mm² (AWG4/0)	150 mm² (AWG300-2)
PE	M6	M8	M10	M10	M10	M12
Tightening torque	3 Nm	3.7 Nm	3.7 Nm	3.7 Nm	20 Nm	30 Nm
Assignment to AC 400/500 V units (MDX60/61B...-5_3)						
Rated operation (100 %)	0300	0370/0450	0550	0750	0900/1100	1320
Increased power (125 %)	0220	0300/0370	0450	0550/0750	0900	1100/1320
Assignment to AC 230 V units (MDX61B...-2_3)						
Rated operation (100 %)	0150	0220	0300	-	-	-
Increased power (125 %)	0110/0150	-	0220/0300	-	-	-

Dimension drawing for NF...

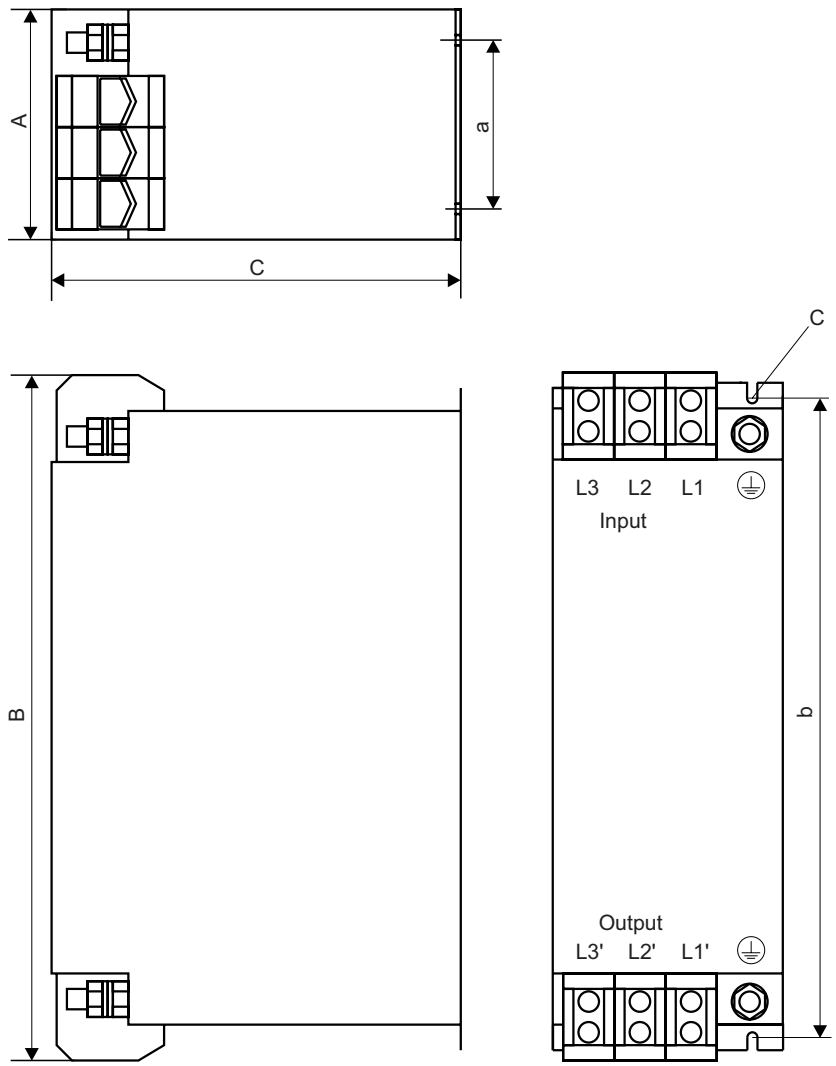


Figure 35: Dimension drawing for NF line filter

Any mounting position

All dimensions in mm:

Line filter type	Main dimensions			Mounting dimensions		Hole dimension	PE connection	Weight
	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

2.36 Output chokes option type HD...

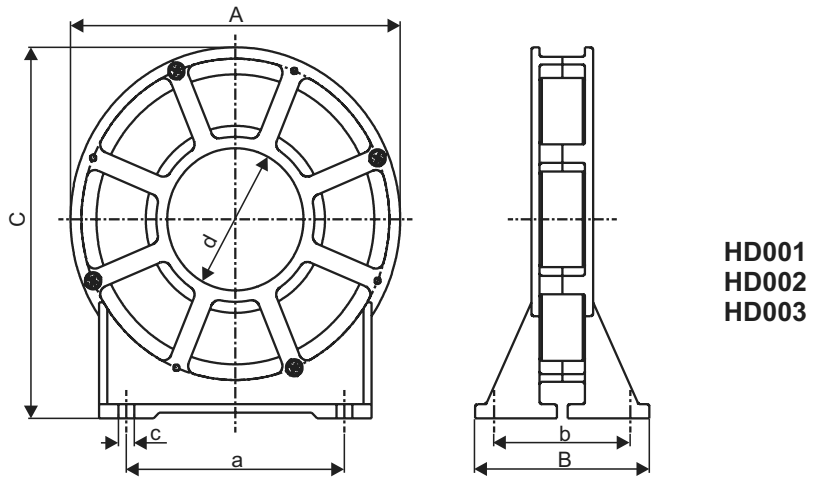
- For suppression of interference from the unshielded motor cable. For HD001 to HD003 we recommend routing the motor cable through the output choke with 5 loops. Only 5 loops are possible if the cable has a large diameter. To make up for this, 2 or 3 output chokes should be connected in series. Connect in series two output chokes in case of 4 windings and three output chokes in case of 3 windings.
- Output chokes HD001 to HD003 are allocated using the cable cross sections of the motor feeders. Consequently, there is no separate assignment table for the AC 230 V units.
- The HD004 output choke is assigned to size 6 units (0900 ... 1320).

Output choke type	HD001[1)]	HD002[1)]	HD003[1)]	HD004[2)]
Part number	813 325 5	813 557 6	813 558 4	816 885 7
Max. power loss P_{Vmax}	15 W	8 W	30 W	100 W
For cable cross sections/connections/ tightening torque	1.5...16 mm² (AWG 16...6)	≤1.5 mm² (AWG 16)	≥16 mm² (AWG 6)	M12 terminal studs 20 Nm
Enclosure	-	-	-	IP20

1) The HD... output choke is not a UL/cUL-relevant component.

2) UL/cUL approval is not available for the HD004 output choke

Dimension drawing for HD...



HD001
HD002
HD003

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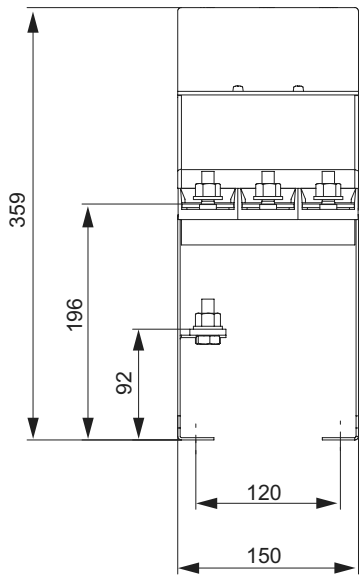

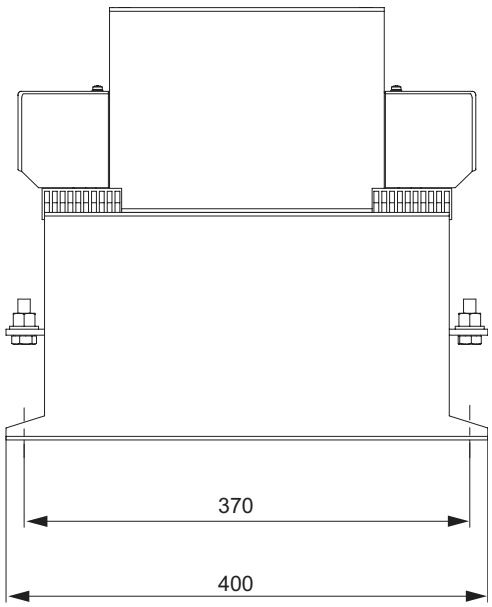

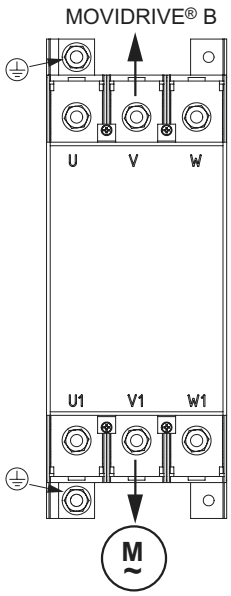

HD004

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All dimensions in mm:

Output choke type	Main dimensions			Mounting dimensions		Inside ∅	Hole dimension	Dimensions
	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
HD004	150	400	360	120	370	-	9.0	12.5

2.37 Output filter option type HF...

HF... output filters are sine filters used to smooth output voltage from inverters. HF... output filters (with the exception of HF450-503) are approved to UL/cUL in combination with MOVIDRIVE® drive 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 non-SEW motors which are not suitable for inverters.
- For protection against overvoltage peaks in long motor cables (> 100 m).

Please read the following notes carefully:

NOTE

- Operate output filters in V/f and VFC operating modes only. Do not use output filters in CFC / SERVO operating modes.
- Do not use output filters in hoist applications.
- During project planning of the drive, take into account the voltage drop in the output filter and consequently the reduced motor torque available. This applies particularly to AC 230 V units 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	826,029 X	826 030 3	826 031 1	826,032 X	826 311 6	826 312 4
Rated voltage U_N	3 × AC 380 V –10 % ... 3 × AC 500 V +10 %, 50/60 Hz[2]					
Earth-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 class B limit to EN 55011 and EN 55014 complies with EN 50081, parts 1 and 2					
Ambient temperature ϑ_U	0 ... +45 °C (reduction: 3 % I_N per K to max. 60 °C)					
Enclosure (EN 60529)	IP20					
Connections/ tightening torque	M4 terminal studs 1.6 Nm ± 20 %					
Weight	3.1 kg	4.4 kg			10.8 kg	
Assignment to AC 400/500 V units (MDX60/61B...-5_3)						
Voltage drop at I_N ΔV	< 6.5 % (7.5 %) at AC 400 V / < 4 % (5 %) at AC 500 V and f_{Amax} = 50 Hz (60 Hz)					
Rated through current[3] $I_{N\ 400\ V}$ (at V_{mains} = 3 × AC 400 V)	AC 2.5 A	AC 4 A	AC 6 A	AC 8 A	AC 10 A	AC 12 A
Rated through current[3] $I_{N\ 500\ V}$ (at V_{mains} = 3 × AC 500 V)	AC 2 A	AC 3 A	AC 5 A	AC 6 A	AC 8 A	AC 10 A
Rated 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 units (MDX61B...-2_3)						
Voltage drop at I_N ΔV	-	< 18.5 % (19 %) at AC 230 V with f_{Amax} = 50 Hz (60 Hz)				
Rated through current[3] $I_{N\ 230\ V}$ (at V_{mains} = 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
Rated operation (100 %) [3]	-	-	0015/0022	-	0037	0055
Increased power (125 %) [3]	-	-	0015/0022	-	-	0037

1) UL/cUL approval in combination with MOVIDRIVE® drive inverters. SEW-EURODRIVE will provide a certificate on request.

2) A reduction of 6 % I_N per 10 Hz applies above f_N = 60 Hz for the rated through current I_N.

3) Only applies to operation without $V_{DC\ link}$ connection. For operating the inverter with $V_{DC\ link}$ connection, observe the project planning notes in the system manual of the respective inverter.

Output filter type		HF075-503[1]	HF023-403[1]	HF033-403[1]	HF047-403[1]	HF450-503
Part number		826 313 2	825 784 1	825,785 X	825 786 8	826 948 3
Rated voltage	U_N	3 × AC 380 V –10 % ... 3 × AC 500 V +10 %, 50/60 Hz[2]				
Earth-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
Interference emission via unshielded motor cable		According to class B limit to EN 55011 and EN 55014 complies with EN 50081, parts 1 and 2				
Ambient temperature	ϑ_U	0 ... +45 °C (reduction: 3 % I_N per K to max. 60 °C)				
Enclosure (EN 60529)		IP 20?	IP20			IP 10
Connections/ tightening torque		M4 terminal studs 1.6 Nm ± 20 %	35 mm² (AWG 2) 3.2 Nm			
Weight		10.8 kg	15.9 kg	16.5 kg	23 kg	32 kg
Assignment to AC 400/500 V units (MDX60/61B...-5_3)						
Voltage drop at I_N	ΔV	< 6.5 % (7.5 %) at AC 400 V / < 4 % (5 %) at AC 500 V and f_{Amax} = 50 Hz (60 Hz)				
Rated through current[3] (at V_{mains} = 3 × AC 400 V)	$I_{N\ 400\ V}$	AC 16 A	AC 23 A	AC 33 A	AC 47 A	AC 90 A
Rated through current[3] (at V_{mains} = 3 × AC 500 V)	$I_{N\ 500\ V}$	AC 13 A	AC 19 A	AC 26 A	AC 38 A	AC 72 A
Rated operation (100 %) [3]		0075	0110	0150/0300[4]	0220	0370/0450/ 0550[4]/0750[4]/ 0900[4]
Increased power (125 %) [3]		0055	0075	0110/0220[4]	0150	0300/0370/0450/ 0550[4]/0750[4]
Assignment to AC 230 V units (MDX61B...-2_3)						
Voltage drop at I_N	ΔV	< 18.5 % (19 %) at AC 230 V with f_{Amax} = 50 Hz (60 Hz)				
Rated through current[3] (at V_{mains} = 3 × AC 230 V)	$I_{N\ 230\ V}$	AC 29 A	AC 42 A	AC 56.5 A	AC 82.6 A	AC 156 A
Rated operation (100 %) [3]		0075	0110	0150/0300[4]	0220	0300
Increased power (125 %) [3]		0055	0075	0110/0220[4]	0150	0220/0300

1) UL/cUL approval in combination with MOVIDRIVE® drive inverters. SEW-EURODRIVE will provide a certificate on request.

2) A reduction of 6 % I_N per 10 Hz applies above f_N = 60 Hz for the rated through current I_N.

3) Only applies for operation without $V_{DC\ link}$ connection. For operation with V_Z connection, observe the project planning instructions in the MOVIDRIVE® MDX6/61B system manual, section "Project Planning/Connecting the optional power components."

4) Connect **two HF...-... output filters in parallel** for operation with these MOVIDRIVE® units.

Dimension drawings for output filter HF...-503, all dimensions in mm

HF008/015/022/030-503

HF040/055/075-503

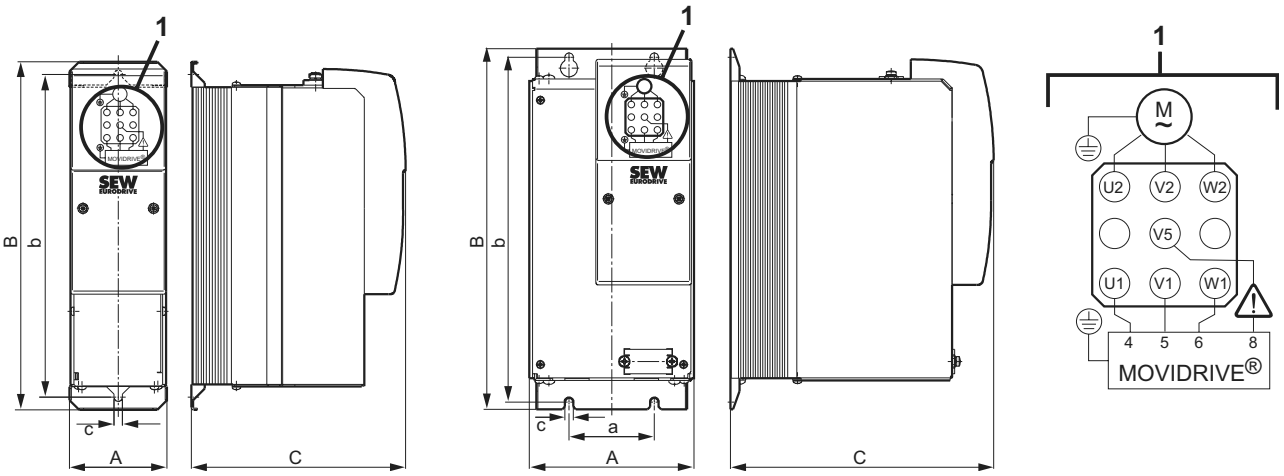

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Figure 36: Dimension drawings for output filters HF008...075-503

Only the mounting position shown in the dimension drawing is permitted.

Output filter type	Main dimensions			Mounting dimensions		Dimension	Ventilation clearances[1)]	
	A	B	C	a	b	c	Top	below
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 units next to one another.

HF450-503

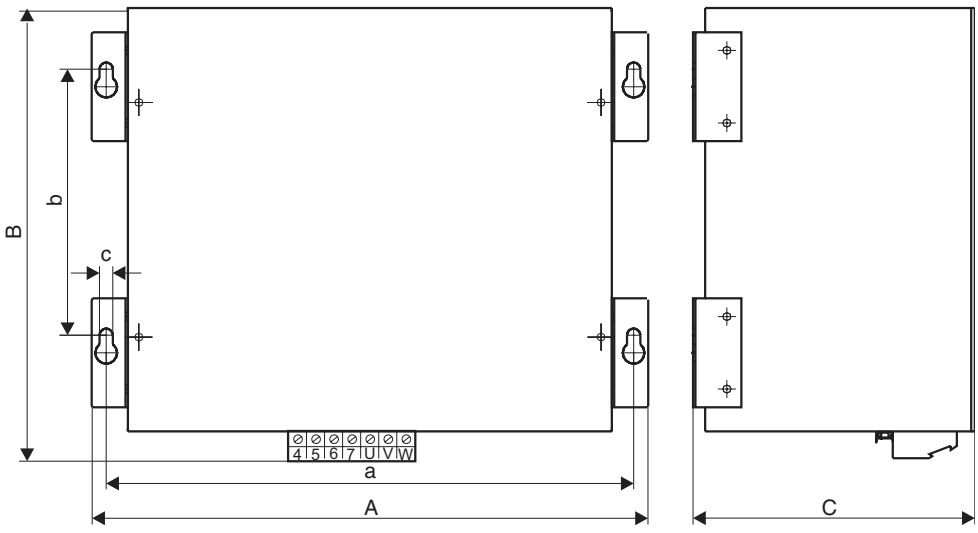

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Figure 37: Dimension drawing for output filter HF450-503

Only the mounting position shown in the dimension diagram is permitted

Output filter type	Main dimensions			Mounting dimensions		Hole dimension	Ventilation clearances	
	A	B	C	a	b	c	Top	below
HF450-503	465	385	240	436	220	8.5	100	100

Dimension drawing for HF...-403 output filter, dimensions in mm

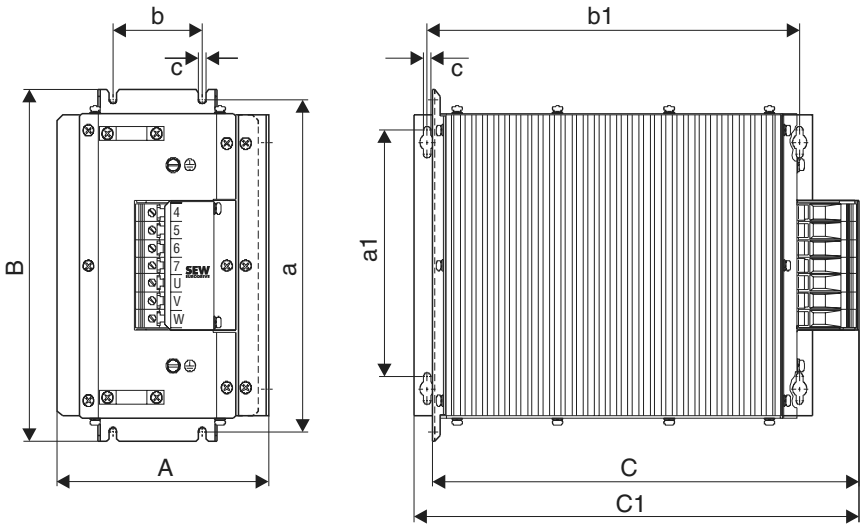

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Figure 38: Dimension drawing for HF...-403 output filter

Type	Main dimensions			Mounting dimensions				Hole dimension	Ventilation clearances		
				Standard mounting position		Horizontal mounting position					
	A	B	C/C1	a	b	a1	a2	c	Side	Above	Below
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						

2.38 Prefabricated cables

Overview

SEW-EURODRIVE offers cable sets and prefabricated cables for straightforward and fault-free connection of various system components to MOVIDRIVE®. The cables are prefabricated in 1 m steps to the required length. It is necessary to differentiate between whether the cables are intended for fixed routing or for cable carrier applications.

1. Cable sets for DC link connection MDR → MDX
2. Motor cables and extension cables for connecting CM motors
3. Motor cables and extension cables for connecting DS, CMD and CMP motors.
4. VR forced cooling fan cable and extension cable
5. Connection to DEH11B / DER11B: Encoder cable and extensions cable (Hiperface®, incremental encoder), resolver cable and extension cable in plug and terminal box design for motors.

1. Cables set for DC link connection MDR → MDX

Description

SEW-EURODRIVE strongly recommends using the cable sets listed in the table below. 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 units. The lugs for connection to the regenerative power supply unit and an inverter are supplied with the cable set. Use commercially available cable lugs to connect other inverters. In this case, connect inverters in star configuration to the regenerative power supply unit. Use a busbar subdistributor if the DC link terminals of the regenerative power supply unit are not sufficient.

Routing type

Only fixed routing is possible.

Cable set type	DCP12A	DCP13A	DCP15A	DCP16A
Part number	814 567 9	814 250 5	814 251 3	817 593 4
For connecting MOVIDRIVE®	0015...0110	0150...0370	0450...0750	0900...1320

2. Prefabricated cables and extension cables for connecting CM motors to MDX

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

Number of cores and line cross section	Part number	Routing type	For motor
4× 1.5 mm²	199 179 5	Fixed routing	CM..SM51
4× 1.5 mm² + 3 × 1.0 mm²	199 189 2		CM..BR SB51
4× 2.5 mm²	199 181 7		CM..SM52
4× 2.5 mm² + 3 × 1.0 mm²	199 191 4		CM..BR SB52
4× 4 mm²	199 183 3		CM..SM54
4× 4 mm² + 3 × 1.0 mm²	199 193 0		CM..BR SB54
4× 6 mm²	199,185 X		CM..SM56
4×6 mm² + 3×1.5 mm²	199 195 7		CM..BR SB56
4× 10 mm²	199 187 6		CM..SM59
4×10 mm² + 3×1.5 mm²	199 197 3		CM..BR SB59

Number of cores and line cross section	Part number	Routing type	For motor
4× 1.5 mm²	1 333 114 0	Cable carrier installation	CM..SM51
4×1.5 mm² + 3×1.0 mm²	1 333 116 7		CM..BR SB51
4× 2.5 mm²	1 333 115 9		CM..SM52
4× 2.5 mm² + 3 × 1.0 mm²	1 333 117 5		CM..BR SB52
4× 4 mm²	199 184 1		CM..SM54
4× 4 mm² + 3 × 1.0 mm²	199 194 9		CM..BR SB54
4× 6 mm²	199 186 8		CM..SM56
4×6 mm² + 3×1.5 mm²	199 196 5		CM..BR SB56
4× 10 mm²	199 188 4		CM..SM59
4×10 mm² + 3×1.5 mm²	199 198 1		CM..BR SB59

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

Number of cores and line cross section	Part number	Routing type	For motor
4× 1.5 mm²	199 549 9	Fixed routing	CM..SM51
4×1.5 mm² + 3×1.0 mm²	199,199 X		CM..BR SB51
4× 2.5 mm²	199 551 0		CM..SM52
4× 2.5 mm² + 3 × 1.0 mm²	199 201 5		CM..BR SB52
4× 4 mm²	199 553 7		CM..SM54
4× 4 mm² + 3 × 1.0 mm²	199 203 1		CM..BR SB54
4× 6 mm²	199 555 3		CM..SM56
4×6 mm² + 3×1.5 mm²	199 205 8		CM..BR SB56
4× 10 mm²	199,557 X		CM..SM59
4×10 mm² + 3×1.5 mm²	199 207 4		CM..BR SB59

Number of cores and line cross section	Part number	Routing type	For motor
4× 1.5 mm²	1 333 118 3	Cable carrier installation	CM..SM51
4×1.5 mm² + 3×1.0 mm²	1 333 120 5		CM..BR SB51
4× 2.5 mm²	1 333 119 1		CM..SM52
4× 2.5 mm² + 3 × 1.0 mm²	1 333 121 3		CM..BR SB52
4× 4 mm²	199 554 5		CM..SM54
4× 4 mm² + 3 × 1.0 mm²	199,204 X		CM..BR SB54
4× 6 mm²	199 556 1		CM..SM56
4×6 mm² + 3×1.5 mm²	199 206 6		CM..BR SB56
4× 10 mm²	199 558 8		CM..SM59
4×10 mm² + 3×1.5 mm²	199 208 2		CM..BR SB59

3. Prefabricated cables and extension cables for connecting DS/CMD/CMP motors

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

Number of cores and line cross section	Part number	Routing type	For motor
4× 1.5 mm²	590 454 4	Fixed routing	DS56 /CMD.. / CMP.. SM11
4×1.5 mm² + 2×1 mm²	1 332 485 3		DS56..B / CMD..BP / CMP..BP SB11
4× 2.5 mm²	590 455 2		DS56 /CMD.. / CMP.. SM12
4×2.5 mm² + 2×1 mm²	1 333 213 9		DS56..B / CMD..BP / CMP..BP SB12
4×4 mm²	590 456 0		DS56 /CMD.. / CMP.. SM14
4×4 mm² + 2×1 mm²	1 333 214 7		DS56..B / CMD..BP / CMP..BP SB14

Number of cores and line cross section	Part number	Routing type	For motor
4× 1.5 mm²	590 624 5	Cable carrier installation	DS56 /CMD.. / CMP.. SM11
4×1.5 mm² + 2×1 mm²	1 333 122 1		DS56..B / CMD..BP / CMP..BP SB11
4× 2.5 mm²	590 625 3		DS56 /CMD.. / CMP.. SM12
4×2.5 mm² + 2×1 mm²	1 333 215 5		DS56..B / CMD..BP / CMP..BP SB12
4×4 mm²	590 480 3		DS56 /CMD.. / CMP.. SM14
4×4 mm² + 2×1 mm²	1 333 216 3		DS56..B / CMD..BP / CMP..BP SB14

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

Number of cores and line cross section	Part number	Routing type	For motor
4× 1.5 mm²	1 333 254 7	Cable carrier installation	DS56 /CMD.. / CMP.. SM11
4×1.5 mm² + 2×1 mm²	1 333 248 1		DS56..B / CMD..BP / CMP..BP SB11
4× 2.5 mm²	1 333 246 5		DS56 /CMD.. / CMP.. SM12
4×2.5 mm² + 2×1 mm²	1 333 250 3		DS56..B / CMD..BP / CMP..BP SB12
4×4 mm²	1 333 247 3		DS56 /CMD.. / CMP.. SM14
4×4 mm² + 2×1 mm²	1 333 251 1		DS56..B / CMD..BP / CMP..BP SB14

4. Prefabricated cables and extension cables for connecting the VR forced cooling fan

VR forced cooling fan cable:

Number of cores and line cross section	Part number	Routing type
3× 1 mm²	198 634 1	Fixed routing
3× 1 mm²	199,560 X	Cable carrier installation

Extension cable for the VR forced cooling fan cable:

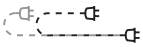
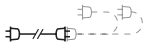
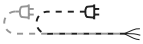
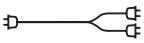
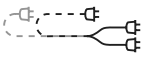
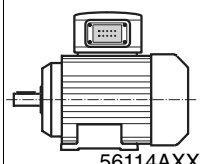
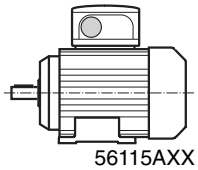
Number of cores and line cross section	Part number	Routing type
3× 1 mm²	199 561 8	Fixed routing
3× 1 mm²	199 562 6	Cable carrier installation

5. Prefabricated cables for connecting option DEH11B / DER11B

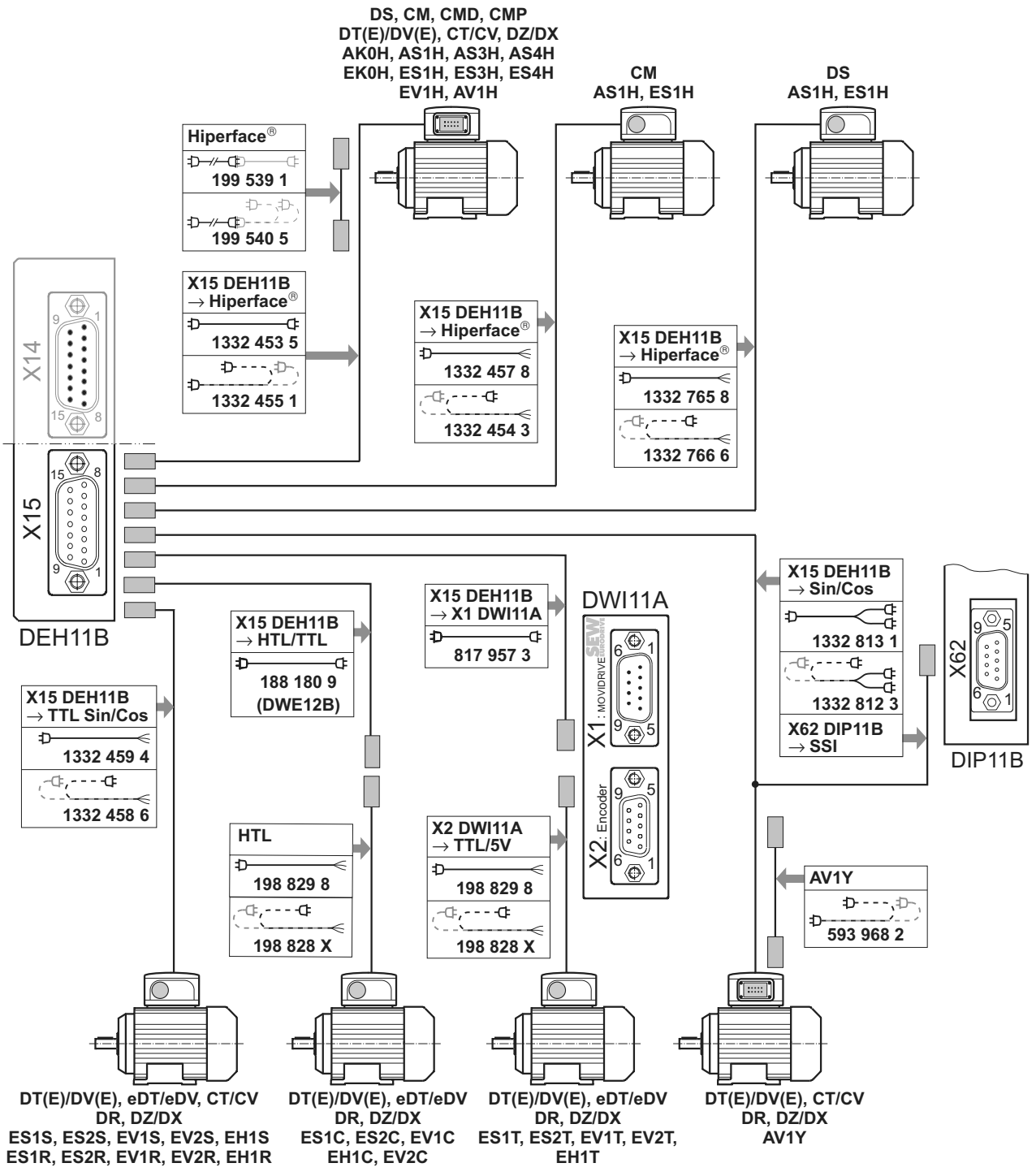
The following overviews show the possible connections for the DEH11B and DER11B options.

Meaning of the icons

The connection cables are assigned a part number and a symbol. The symbols have the following meaning:

Symbol	Meaning
 56047AXX	Connection cable connector → connector for fixed installation
 56051AXX	Extension connection cable connector → connector for fixed installation
 56048AXX	Connection cable connector → connector for cable carrier installation
 56052AXX	Extension connection cable connector → connector for cable carrier installation
 56049AXX	Connection cable connector → terminal box for fixed installation
 56050AXX	Connection cable connector → terminal box for cable carrier installation
 56053AXX	Connection cable connector → Y connector for fixed installation
 56054AXX	Connection cable connector → Y connector for cable carrier installation
 56489AXX	Connection cable connector → connector with crossed A/B track for reversing the direction of rotation (for fixed installation)
 56112AXX	Encoder connection via plug connector
 56113AXX	Encoder connection via encoder terminal strip
 56114AXX	Connection via plug connector on the motor side
 56115AXX	Connection via terminal box on the motor side

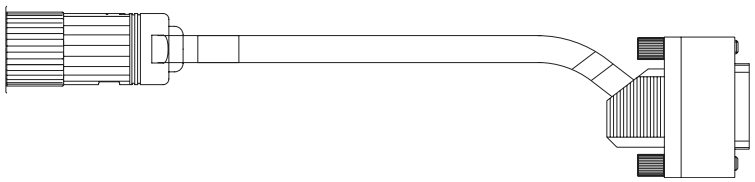
Connection options for X15 DEH11B



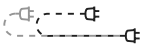
59103AXX

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

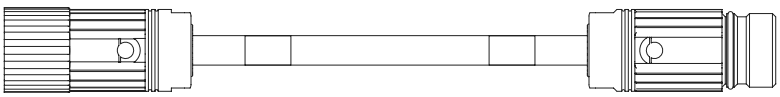
- Cable to connect HIPERFACE® encoders AK0H, AS1H, AS3H, AS4H, EK0H, ES1H, ES3H, ES4H, EV1H, AV1H with plug connector connection on the motor side to DS, CM, CMD, CMP, DT, DV, DT(E), DV(E), CT, CV, DZ or DX motors.



56135AXX

Type	Installation	Part number
DEH11B X15 → DS-/CM-/CMD-/CMP-/DT-/DV-/DT(E)-/DV(E)-/CT-/CV-/DZ/DX motors with AK0H, AS1H, AS3H, AS4H, EK0H, ES1H, ES3H, ES4H, EV1H, AV1H	 56047AXX	1332 453 5
	 56048AXX	1332 455 1

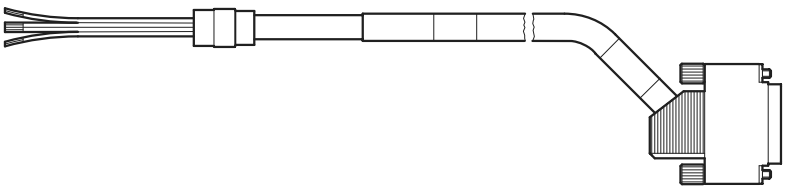
- Extension cable to connect HIPERFACE® encoders AK0H, AS1H, AS3H, AS4H, EK0H, ES1H, ES3H, ES4H, EV1H, AV1H with plug connector connection on the motor side to DS, CM, CMD, CMP, DT, DV, DT(E), DV(E), CT, CV, DZ or DX motors.



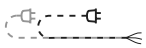
56136AXX

Type	Installation	Part number
DEH11B X15 → DS-/CM-/CMD-/CMP-/DT-/DV-/DT(E)-/DV(E)-/CT-/CV-/DZ/DX motors with AK0H, AS1H, AS3H, AS4H, EK0H, ES1H, ES3H, ES4H, EV1H, AV1H	 56051AXX	199 539 1
	 56052AXX	199 540 5

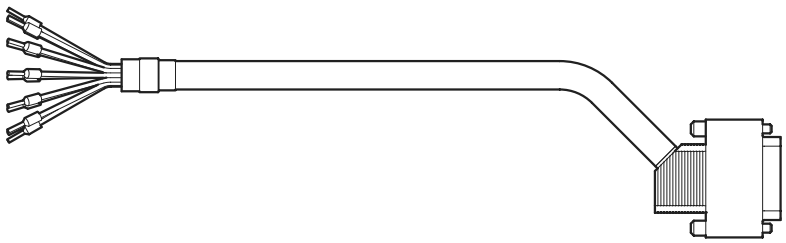
- Cable to connect HIPERFACE® encoders AS1H, ES1H with terminal box connection on the motor side to CM motors.



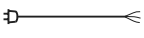
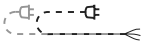
56137AXX

Type	Installation	Part number
DEH11B X15 → CM motors with AS1H, ES1H	 56049AXX	1332 457 8
	 56050AXX	1332 454 3

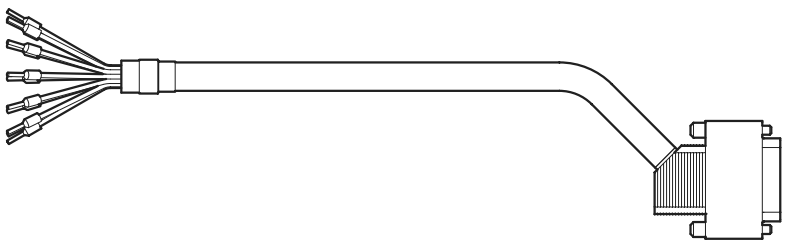
- Cable to connect HIPERFACE® encoders AS1H, ES1H with terminal box connection on the motor side to DS motors.



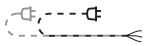
56132AXX

Type	Installation	Part number
DEH11B X15 → DS motors with AS1H, ES1H	 56049AXX	1332 765 8
	 56050AXX	1332 766 6

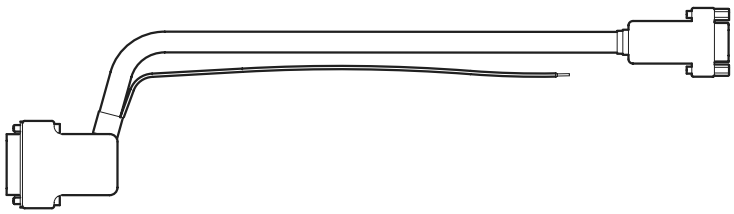
- Cable to connect sin/cos encoders ES1S, ES2S, EV1S, EV2S, EH1S, ES1R, ES2R, EV1R, EV2R, EH1R with terminal box connection on the motor side to CT, CV, DT(E), DV(E), eDT, eDV, DR, DZ and DX motors.



56132AXX

Type	Installation	Part number
DEH11B X15 → DT(E)/DV(E)/eDT/eDV/CT/CV/DR/DZ/DX motors with sin/cos encoders ES1S, ES2S, EV1S, EV2S, EH1S, ES1R, ES2R, EV1R, EV2R, EH1R	 56049AXX	1332 459 4
	 56050AXX	1332 458 6

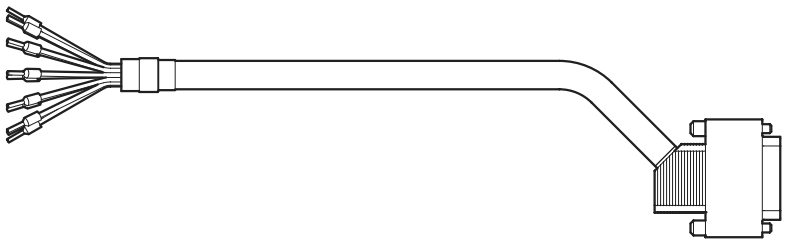
- Cable (option DWE12B, interface adapter HTL→TTL) to connect push-pull HTL encoders at X15 of option (→ section "Interface adapter DWE11B/12B").



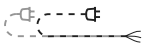
59109AXX

Type	Installation	Part number
DEH11B X15 → Option DWE12B (connection for push-pull HTL encoders)	56047AXX	188 180 9

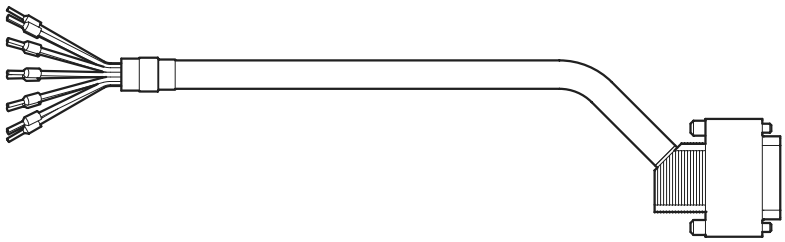
- Cable to connect push-pull HTL encoders ES1C, ES2C, EV1C, EV2C, EH1C with terminal box connection on the motor side to DT(E), DV(E), eDT, eDV, DR, DZ and DX motors.



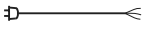
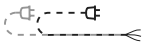
56132AXX

Type	Installation	Part number
Push-pull HTL encoders ES1C, ES2C, EV1C, EV2C, EH1C → DT(E)/DV(E)/eDT/eDV/DR/DZ/DX motors	56049AXX	198 829 8
	 56050AXX	198,828 X

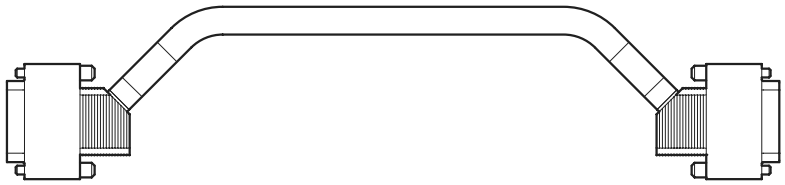
- Cable to connect DC 5 V TTL sensors ES1T, ES2T, EV1T, EV2T, EH1T with terminal box connection on the motor side (DT(E), DV(E), eDT, eDV, DR, DZ or DX motors) to DC 5 V encoder power supply type DWI11A.



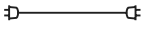
56132AXX

Type	Installation	Part number
DC 5 V TTL sensors ES1T, ES2T, EV1T, EV2T, EH1T→ DWI11A X2	 56049AXX	198 829 8
	 56050AXX	198,828 X

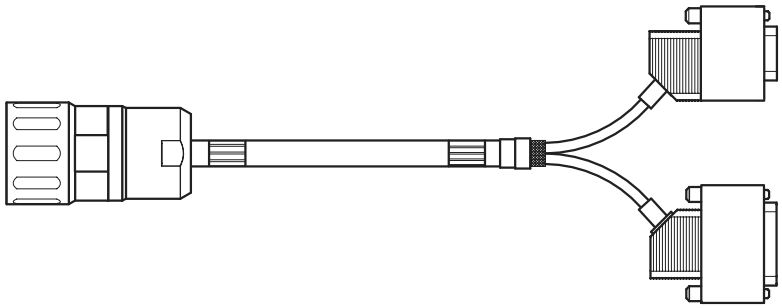
- Cable to connect the DC 5 V encoder power supply type DWI11A via plug connector.



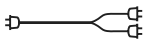
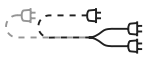
56109AXX

Type	Installation	Part number
DEH11B X15 → DWI11A X1	 56047AXX	817 957 3

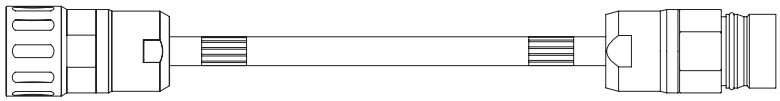
- Y cable to connect the AV1Y absolute encoder with plug connector on the motor side to DT(E), DV(E), CT, CV, DR, DZ and DX motors. The following encoder tracks are evaluated with the Y cable:
  - SSI track of the AV1Y absolute encoder and at DIP11B X62
  - sin/cos track of the AV1Y absolute encoder at DEH11B X15



59321AXX

Type	Installation	Part number
DEH11B X15 → AV1Y and DIP11B X62	 56053AXX	1332 813 1
	 56054AXX	1332 812 3

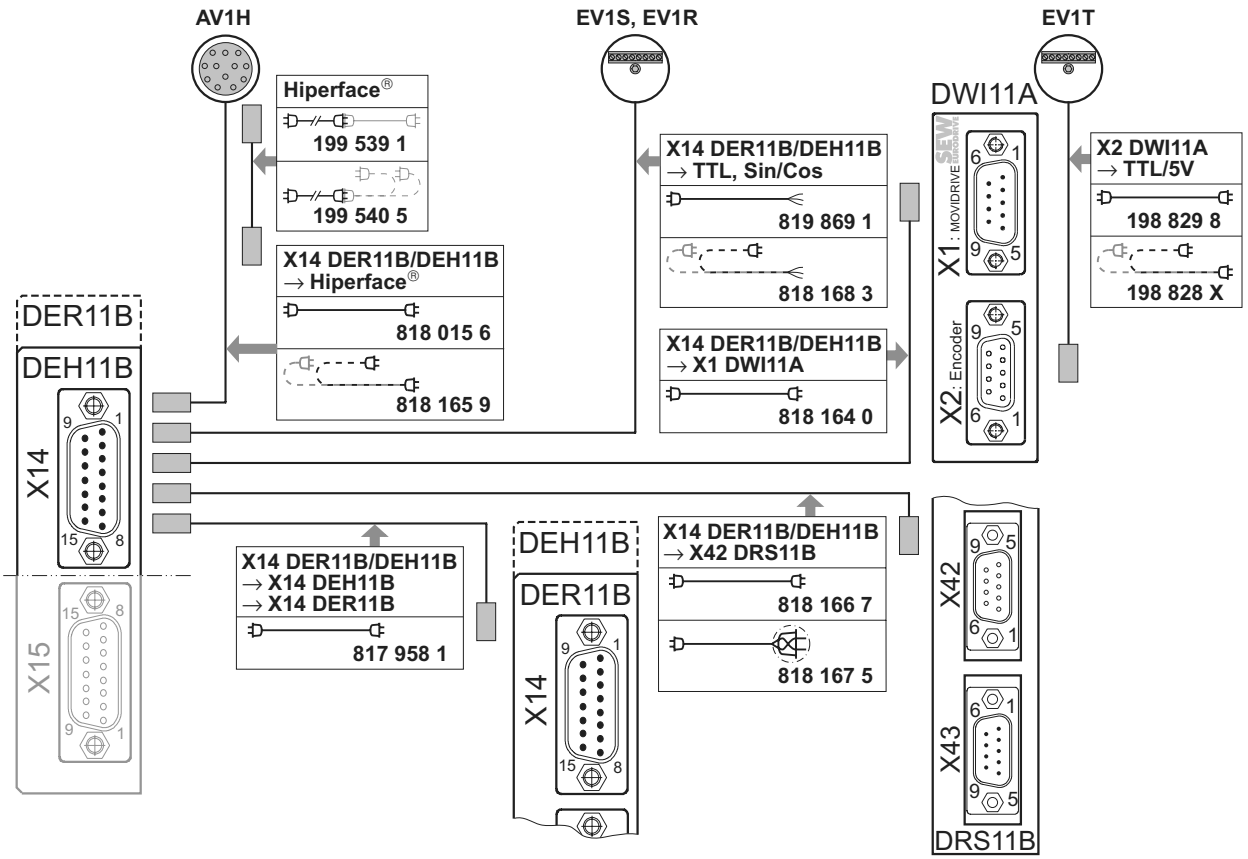
- Extension cable to connect the AV1Y absolute encoder with plug connector on the motor side to DT(E), DV(E), CT, CV, DR, DZ und DX motors.



56131AXX

Type	Installation	Part number
DT(E)/DV(E)/CT/CV/DR/DZ/DX motors → AV1Y	 56052AXX	593 968 2

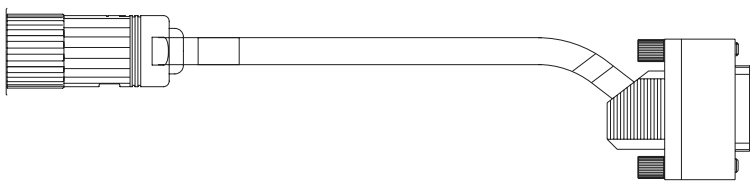
Connection options for X14, DEH11B / DER11B



56479BXX

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

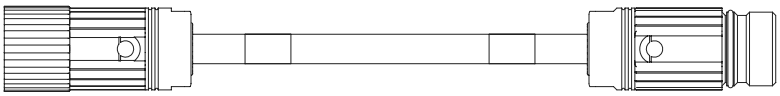
- Cable to connect external HIPERFACE® encoders AV1H, AS1H, ES1H via plug connector.



56130AXX

Type	Installation	Part number
DEH11B / DER11B X14 → AV1H, AS1H, ES1H	56047AXX	818 015 6
	56048AXX	818 165 9

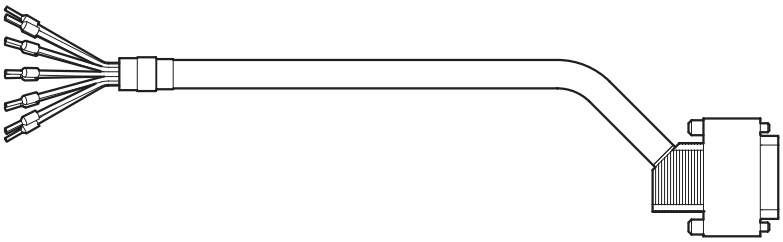
- Extension cable to connect external HIPERFACE® encoders AV1H, AS1H, ES1H via plug connector.



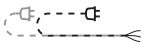
56131AXX

Type	Installation	Part number
DEH11B / DER11B X14 → AV1H, AS1H, ES1H	 56051AXX	199 539 1
	 56052AXX	199 540 5

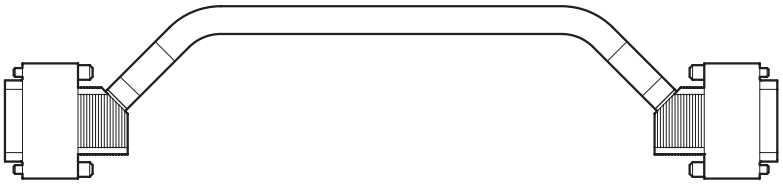
- Cable to connect external sin/cos encoders via encoder terminal strip.



56132AXX

Type	Installation	Part number
DEH11B / DER11B X14 → sin/cos encoders	 56049AXX	819 869 1
	 56050AXX	818 168 3

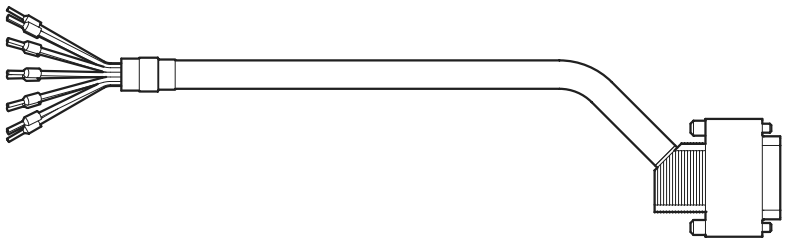
- Cable to connect the DC 5 V encoder power supply type DWI11A via plug connector.



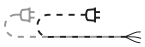
56109AXX

Type	Installation	Part number
DEH11B / DER11B X14 → DWI11A X1	 56047AXX	818 164 0

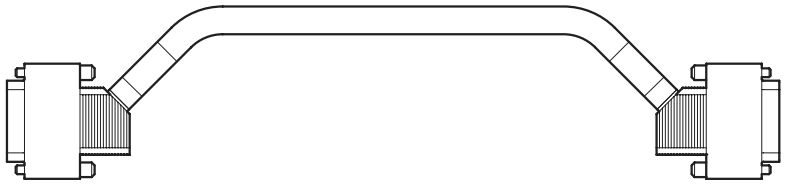
- Cable to connect an external DC 5 V TTL sensor to the DC 5 V encoder power supply type DWI11A via encoder terminal strip.



56132AXX

Type	Installation	Part number
DC 5 V TTL sensor → DWI11A X2	 56049AXX	198 829 8
	 56050AXX	198,828 X

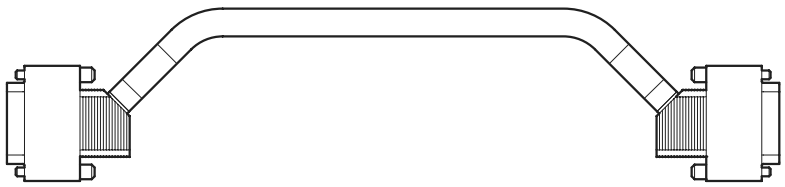
- Cable to connect a master/slave connection.



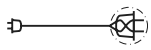
56109AXX

Type	Installation	Part number
DEH11B/DER11B X14 → DER11B/DEH11B X14	 56047AXX	817 958 1

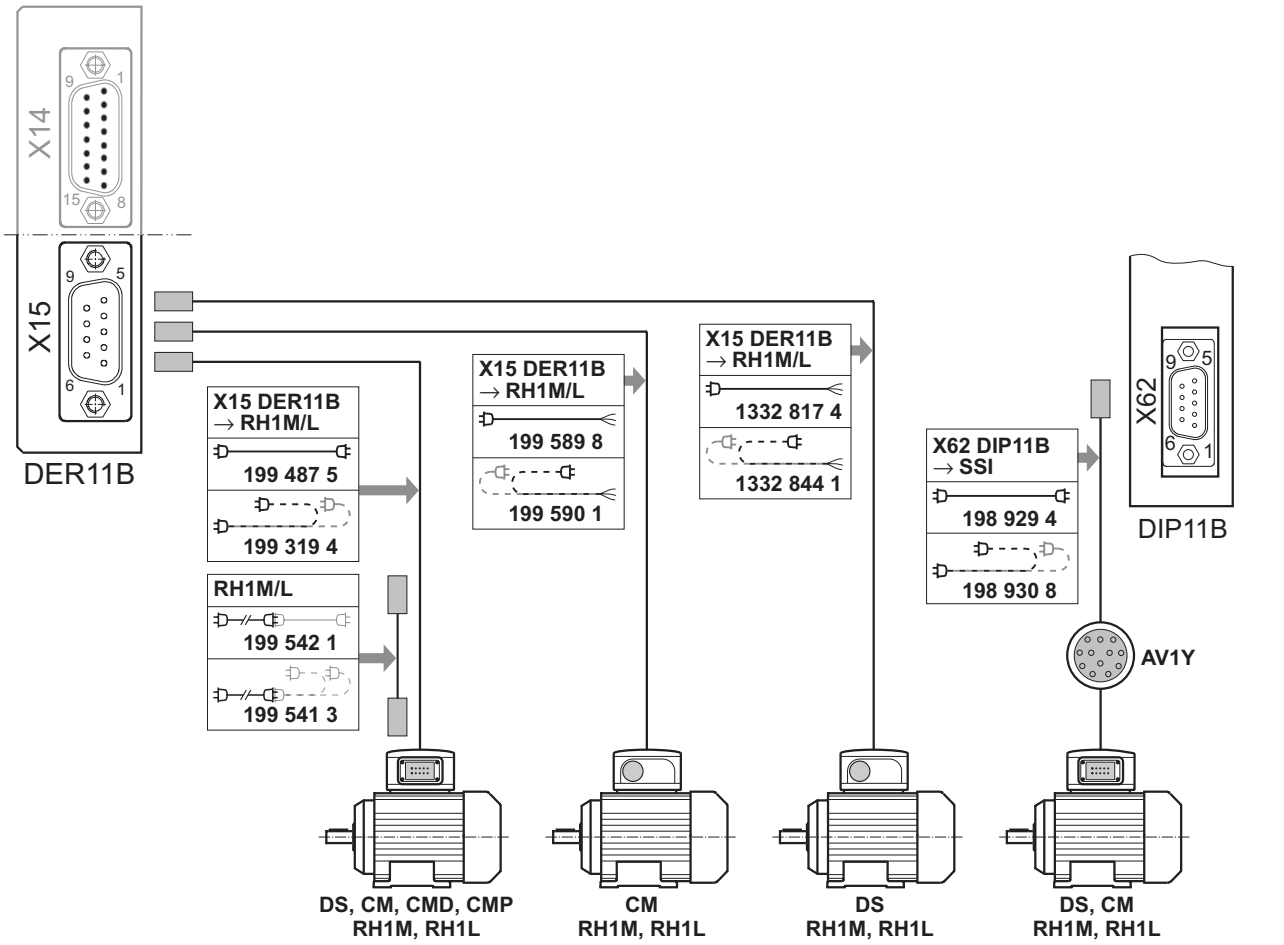
- Cable to connect the encoder simulation (DEH11B/DER11B:X14) of the master to terminal X42 of option DRS11B.



56109AXX

Type	Installation	Part number
DEH11B/DER11B X14 → DRS11B X42 (master and slave turn in the same direction)	 56047AXX	0818 166 7
DEH11B/DER11B X14 → DRS11B X42 (master and slave turn in opposite directions)	 56489AXX	0818 167 5

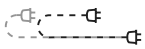
Connection options for X15 DER11B



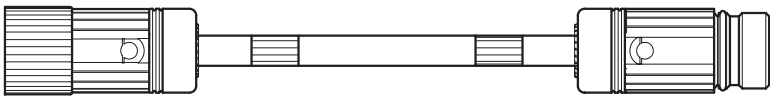
	NOTE
	For the individual wiring diagrams, refer to the section "Installation" in the MOVIDRIVE® MDX60B/61B operating instructions.

- Cable to connect resolvers RH1M / RH1L with plug connector connection on the motor side to DS, CM, CMD or CMP motors.

56138AXX

Type	Installation	Part number
DER11B X15 → DS/CM/CMD/CMP motors with RH1M/RH1L	 56047AXX	199 487 5
	 56048AXX	199 319 4

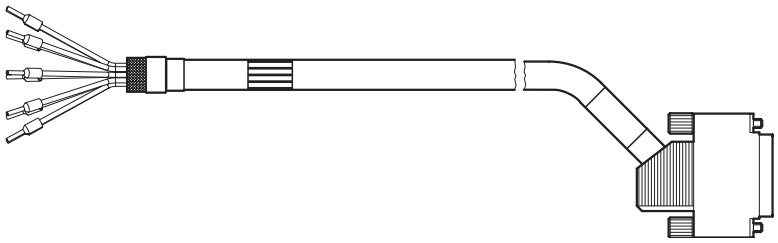
- Extension cable to connect resolvers RH1M / RH1L with plug connector connection on the motor side to DS, CM, CMD or CMP motors.



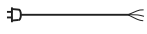
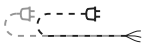
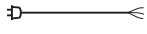
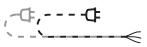
56139AXX

Type	Installation	Part number
DER11B X15 → DS/CM/CMD/CMP motors with RH1M/RH1L	 56051AXX	199 542 1
	 56052AXX	199 541 3

- Cable to connect resolvers RH1M / RH1L with terminal box connection on the motor side to CM and DS motors.

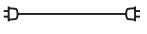
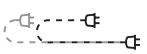


56142AXX

Type	Installation	Part number
DER11B X15 → CM motors with RH1M/RH1L	 56049AXX	199 589 8
	 56050AXX	199 590 1
DER11B X15 → DS motors with RH1M/RH1L	 56049AXX	1332 817 4
	 56050AXX	1332 844 1

- CM and DS motors with integrated resolver: Additional cable to connect the AV1Y absolute encoder with plug connector connection on the motor side to DIP11B X62.

56143AXX

Type	Installation	Part number
DS/CM motors with AV1Y→ DIP11B X62	 56047AXX	198 929 4
	 56048AXX	198 930 8

3 Motor Selection

3.1 Motor selection for asynchronous AC motors (VFC)

Basic recommendations

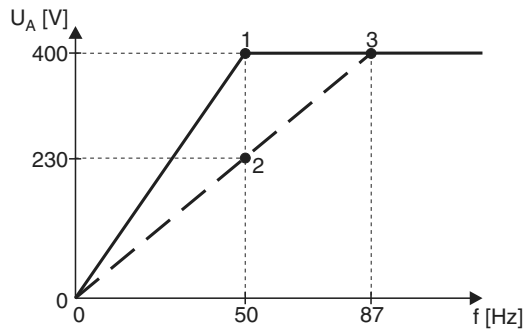
Observe the following recommendations for selecting the motor:

- Only use motors with at least thermal class 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 recommendation particularly applies to gearmotors that are operated with a high oil filling level due to their vertical mounting position.
- Generally speaking, the motor can be operated at its listed power without forced cooling if the operating conditions differ from S1 operation, e.g. positioning drive with 1:20 speed 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 unit with HIPERFACE® encoder card type DEH11B option is required for speed control. The motor must then be equipped with an encoder (HIPERFACE®, sin/cos or TTL).

Voltage/frequency characteristic curve

The operating mode VFC runs the asynchronous motor on a load-dependent voltage/frequency curve. 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 rated motor voltage and the rated 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 curve of an asynchronous AC motor 230/400 V, 50 Hz.



01650BEN

Figure 39: Voltage/frequency characteristics of the asynchronous motor

1 Star connection; 400 V, 50 Hz

2 Delta connection: 230 V, 50 Hz

3 Delta connection: 400 V, 87 Hz

The inverter output voltage V_{out} is limited by the connected supply voltage. The "rated supply voltage" input value in the startup function limits the effective 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 "rated supply voltage" input value is less than or equal to the supply voltage of the inverter.

Speed/torque characteristic curve

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 speed in the field weakening range, note that the rated torque M_N (in relation to the rated speed, e.g. n_N = 1,500 1/min) 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.

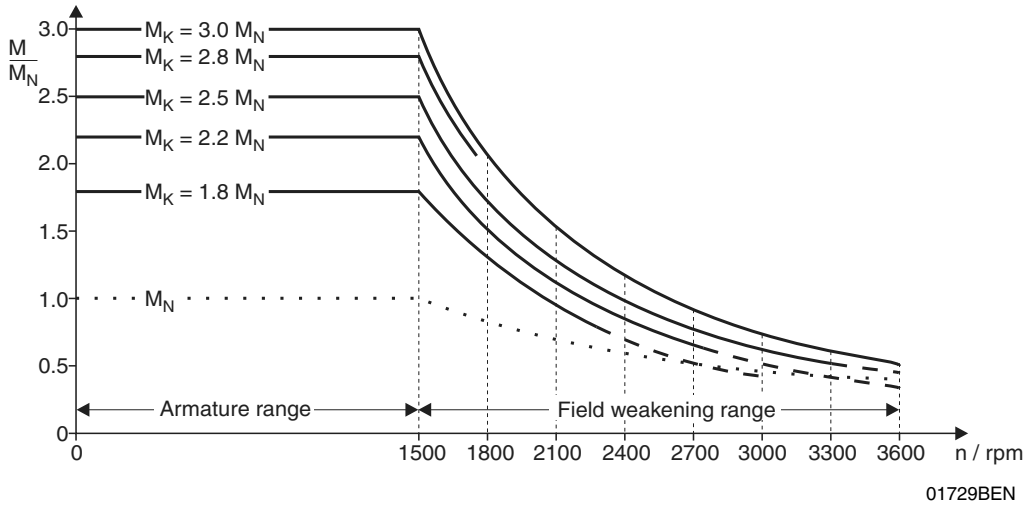


Figure 40: Quadratically falling breakdown torque

With gearmotors, the maximum motor speed depends on the size and mounting position of the gear unit. The speed should not exceed 3,000 1/min due to the resulting noise and oil churning losses.

Dynamic applications ($P_{inverter}$ greater than 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 rated motor current. The value of the current limit is based on the rated inverter current. As a result, 150 % of the rated motor current is less than 150 % of the rated 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 rated 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 at most 150 % of the rated motor torque. For higher torque ratings, the slip compensation parameter (P324) must be increased accordingly.

	NOTE
	Set parameter P324 "Slip compensation" to **max. 130 % of the rated slip of the motor** for **stable operation**.

Combinations with $P_{inverter}$ greater than $4 \times P_{motor}$

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 $\sqrt{3}$ 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.

Motor selection in connection type delta/star (AC 230/400 V / 50 Hz)

Motors for AC 380 V / 60 Hz can also be allocated on the basis of this selection table.

P_{max} [kW] for operation on MOVIDRIVE® MDX60/61B...-5_3 (AC 400/500 V units)							
Connection		⅄ / AC 400 V[1]				Δ / AC 230 V[2]	
Cooling		Own		Forced		Own	Forced
f_{min} - f_{max} [Hz]		10 - 50 / 6 - 60 5 - 70 / 5.5 - 80		≤ 2.5 - 50 / ≤ 3 - 60[3]		9 - 87	≤ 2.5 - 87[3]
n_{min} - n_{max} [1/min]		300 - 1500 / 180 - 1800 150 - 2100 / 165 - 2400		≤ 75 - 1500 / ≤ 90 - 1800		270 - 2610	≤ 75 - 2610
Setting range		1:5 / 1:10 / 1:15		≥ 1:20		1:10	≥ 1:20
Motor type[4]	**Rated power P_n [kW]**	**$P = P_{reduced}$** [kW]	**MDX[6] 60/61B...-5_3**	**$P = P_n$** [kW]	**MDX[6] 60/61B...-5_3**	**$P = P_{increased}$[5]** [kW]	**MDX[6] 60/61B...-5_3**
DR63S4	**0.12**					0.18	**0005**
DR63M4	**0.18**			0.18	**0005**	0.25	
DR63L4	**0.25**	0.18	**0005**	0.25		0.37	
DT71D4	**0.37**	0.25	**0005/0015**	0.37	**0005/0015**	0.55	**0005/0015**
DT80K4	**0.55**	0.37		0.55		0.75	**0008/0015**
DT80N4	**0.75**	0.55		0.75	**0008/0015**	1.1	**0011/0015**
DT90S4	**1.1**	0.75	**0008/0015**	1.1	**0011/0015**	1.5	**0014/0015**
DT90L4	**1.5**	1.1	**0011/0015**	1.5	**0014/0015**	2.2	**0022**
DV100M4	**2.2**	1.5	**0014/0015**	2.2	**0022**	3.0	**0030**
DV100L4	**3.0**	2.2	**0022**	3.0	**0030**	4.0	**0040**
DV112M4	**4.0**	3.0	**0030**	4.0	**0040**	5.5	**0055**
DV132S4	**5.5**	4.0	**0040**	5.5	**0055**	7.5	**0075**
DV132M4	**7.5**	5.5	**0055**	7.5	**0075**	9.2	**0110**
DV132ML4	**9.2**	7.5	**0075**	9.2	**0110**	11	
DV160M4	**11**	9.2	**0110**	11		15	**0150**
DV160L4	**15**	11		15	**0150**	18.5	**0220**
DV180M4	**18.5**	15	**0150**	18.5	**0220**	22	**0300**
DV180L4	**22**	18.5	**0220**	22		30	**0370**
DV200L4	**30**	22		30	**0300**	37	
DV225S4	**37**	30	**0300**	37	**0370**	45	**0450**
DV225M4	**45**	37	**0370**	45	**0450**	55	**0550**
DV250M4	**55**	45	**0450**	55	**0550**	75	**0750**
DV280S4	**75**	55	**0550**	75	**0750**	90	**0900**
D280M4	**90**	75	**0750**	90	**0900**	110	**1100**
D315S4	**110**	90	**0900**	110	**1100**	132	**1320**
D315M4	**132**	110	**1100**	132	**1320**		
D315M4a	**160**	132	**1320**				

1) Also applies to motors with AC 460 V or AC 500 V rated voltage and for AC 400/690 V motors in Δ connection.

2) Also applies to motors with AC 266 V or AC 290 V rated voltage.

3) Without speed control: f_{min} = 0.5 Hz

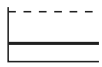
4) In load type S3 (40 % c.d.f.), the motor may be operated at its listed power ($P = P_n$) even without forced cooling. Example: P_{stat} = 2 kW, P_{dyn} = 2.5 kW → selected motor DV100M4 (P_n = 2.2 kW).

5) $P_{increased}$ means that the motor is operated at the power of the next larger motor (one frame size), rather than with the $\sqrt{3}$-fold power.

6) In each application, the units listed here permit intermittent loads of up to two times the rated load with size 0 (0005 ... 0014) and up to 1.5 times the rated load with sizes 1 ... 6 (0015 ... 1320). With variable torque load and constant load without overload, each inverter can also be operated with increased continuous output power (→ Sec. Technical Data). The continuous output current of 125 % of the rated unit current is only available at f_{PWM} = 4 kHz.

Examples for motor selection delta/star AC 230/400 V

Trolley drive



Constant load with overload (acceleration) and low load during travel:

- P_{travel} = 1.3 kW
- P_{max} = 13 kW
- n_{min} = 270 1/min, setting range 1:10
- n_{max} = 2610 1/min

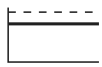
In inverter mode with adapted power (P = P_n), the motor can output 150 % of its listed power during the acceleration phase. The following applies:

$P_{Mot} = P_{max} : 1.5 = 13 kW : 1.5 = 8.67 kW$

A DV132M4 motor with delta connection (P_n = 9.2 kW) is selected.

According to the selection table (→ page 132) a MOVIDRIVE® MDX61B0110 (P = P_n) should be selected.

Hoist drive



High constant load with short-term overload (acceleration):

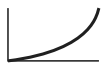
- P_{max} = 26 kW
- $P_{const.}$ = 20 kW
- Setting range 1:15, low speed only for positioning
- Brake applied when the drive is at a standstill
- Load type S3 (40 % c.d.f.)

The inverter can yield 150 % of its rated current during acceleration. Consequently, a MOVIDRIVE® MDX61B0220 is selected.

In view of the load type (S3, 40 % cdf), the selection table allocates motor type DV180L4 (P_n = 22 kW) in a star connection.

For more information, → Sec. Project planning for hoists

Fan/pump



Variable torque load with the following power values:

- P_{max} = 4.8 kW
- n_{max} = 1400 1/min, continuous duty with n_{max}

The motor can be operated at its listed power (P = P_n) even without forced cooling due to the quadratically falling torque. Therefore, the motor type DV132S4 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.

Motor selection in connection type double-star/star (AC 230/460 V / 60 Hz)

P_{max} [kW] for operation on MOVIDRIVE® MDX60/61B...-5_3 (AC 400/500 V units)							
Connection		⅄ / AC 460 V				⅄⅄ / AC 230 V	
Cooling		Own		Own	Forced	Own	Forced
f_{min} - f_{max} [Hz]		6 - 90		10 - 60	0 - 60[1]	10 - 120	0 - 120[1]
n_{min} - n_{max} [1/min]		180 - 2700		300 - 1800	0 - 1800	300 - 3600	0 - 3600
Setting range		1:15		1:6	≥ 1:15	1:12	≥ 1:20
Motor type	**Rated power P_n [kW]**	**$P = P_{reduced}$**		**$P = P_n$**		**$P = P_{increased}$[2]**	
		[kW]	**Clicking on MDX60/61B...-5_3[3]**	**[kW]**	**Clicking on MDX60/61B...-5_3[3]**	**[kW]**	**Clicking on MDX60/61B...-5_3[3]**
DR63S4	**0.12**					0.18	**0005**
DR63M4	**0.18**			0.18	**0005**	0.25	
DR63L4	**0.25**	0.18	**0005**	0.25		0.37	
DT71D4	**0.37**	0.25	**0005/0015**	0.37	**0005/0015**	0.75	**0008/0015**
DT80K4	**0.55**	0.37		0.55		1.1	**0011/0015**
DT80N4	**0.75**	0.55		0.75	**0008/0015**	1.5	**0014/0015**
DT90S4	**1.1**	0.75	**0008/0015**	1.1	**0011/0015**	2.2	**0022**
DT90L4	**1.5**	1.1	**0011/0015**	1.5	**0014/0015**	3.0	**0030**
DV100M4	**2.2**	1.5	**0014/0015**	2.2	**0022**	4.0	**0040**
DV100L4	**3.7**	2.2	**0022**	3.0	**0030**	5.5	**0055**
DV112M4	**4.0**	3.0	**0030**	4.0	**0040**	7.5	**0075**
DV132S4	**5.5**	4.0	**0040**	5.5	**0055**	9.2	**0110**
DV132M4	**7.5**	5.5	**0055**	7.5	**0075**	11	
DV132ML4	**9.2**	7.5	**0075**	9.2	**0110**	15	**0150**
DV160M4	**11**	9.2	**0110**	11		18.5	**0220**
DV160L4	**15**	11		15	**0150**	22	
DV180M4	**18.5**	15	**0150**	18.5	**0220**	30	**0300**
DV180L4	**22**	18.5	**0220**	22		37	**0370**
DV200L4[4]	**30**	22		30	**0300**	45	**0450**
DV225S4[4]	**37**	30	**0300**	37	**0370**	55	**0550**
DV225M4[4]	**45**	37	**0370**	45	**0450**	75	**0750**
DV250M4[5]	**55**	45	**0450**	55	**0550**	90	**0900**
DV280S4[5]	**75**	55	**0550**	75	**0750**	110	**1100**
D280M4[5]	**90**	75	**0750**	90	**0900**	132	**1320**
D315S4	**110**	90	**0900**	110	**1100**		
D315M4	**132**	110	**1100**	132	**1320**		
D315M4a	**160**	132	**1320**				

1) Without speed control: f_{min} = 0.5 Hz

2) $P_{increased}$ means that the motor is operated at the power of the next larger motor (one frame size), rather than with the $\sqrt{3}$-fold power.

3) In each application, the units listed here permit intermittent loads of up to two times the rated load with size 0 (0005 ... 0014) and up to 1.5 times the rated load with sizes 1 ... 6 (0015 ... 1320). With variable torque load and constant load without overload, each inverter can also be operated with increased continuous output power (→ Sec. Technical Data). The continuous output current of 125 % of the rated unit current is only available at f_{PWM} = 4 kHz.

4) Maximum permitted motor speed n_{max} = 3000 1/min

5) Maximum permitted motor speed n_{max} = 2600 1/min

Motor selection in connection type delta (AC 230 V / 50 Hz)

P_{max} [kW] for operation on MOVIDRIVE® MDX61B...-2_3 (AC 230 V units)					
Connection		Δ / AC 230 V			
Cooling		Own		Forced	
f_{min} - f_{max} [Hz]		10 - 50 6 - 60 5 - 70 / 5.5 - 80		≤ 2.5 - 50 / ≤ 3 - 60[1]	
n_{min} - n_{max} [1/min]		300 - 1500 180 - 1800 150 - 2100 / 165 - 2400		≤ 75 - 1500 / ≤ 90 - 1800	
Setting range		1:5 1:10 1:15		≥ 1:20	
Motor type[2]	**Rated power P_n [kW]**	**$P = P_{reduced}$**		**$P = P_n$**	
		[kW]	**With MDX61B...-2_3[3]**	**[kW]**	**With MDX61B...-2_3[3]**
DT71D4	**0.37**	0.25	**0015**	0.37	**0015**
DT80K4	**0.55**	0.37		0.55	
DT80N4	**0.75**	0.55		0.75	
DT90S4	**1.1**	0.75		1.1	
DT90L4	**1.5**	1.1		1.5	
DV100M4	**2.2**	1.5		2.2	**0022**
DV100L4	**3.0**	2.2	**0022**	3.0	**0030**
DV112M4	**4.0**	3.0	**0030**	4.0	**0040**
DV132S4	**5.5**	4.0	**0040**	5.5	**0055**
DV132M4	**7.5**	5.5	**0055**	7.5	**0075**
DV132ML4	**9.2**	7.5	**0075**	9.2	**0110**
DV160M4	**11**	9.2	**0110**	11	
DV160L4	**15**	11		15	**0150**
DV180M4	**18.5**	15	**0150**	18.5	**0220**
DV180L4	**22**	18.5	**0220**	22	**0300**
DV200L4	**30**	22		30	
DV225S4	**37**	30	**0300**	-	

1) Without speed control: f_{min} = 0.5 Hz

2) In load type S3 (40 % c.d.f.), the motor may be operated at its listed power (P = P_n) even without forced cooling. Example: P_{stat} = 2 kW, P_{dyn} = 2.5 kW → selected motor DV100M4 (P_n = 2.2 kW).

3) The units listed here permit intermittent loads of up to 1.5 times the rated load in the specific application. With variable torque load and constant load without overload, each inverter can also be operated with increased continuous output power (→ Sec. Technical Data). The continuous output current of 125 % of the rated unit current is only available at f_{PWM} = 4 kHz.

Motor selection in connection type double-star (AC 230 V / 60 Hz)

P_{max} [kW] for operation on MOVIDRIVE® MDX61B...-2_3 (AC 230 V units)					
Connection		人人 / AC 230 V			
Cooling		Own		Own	Forced
f_{min} - f_{max} [Hz]		6 - 90		10 - 60	0 - 60[1]
n_{min} - n_{max} [1/min]		180 - 2700		300 - 1800	0 - 1800
Setting range		1:15		1:6	≥ 1:15
Motor type	**Rated power P_n [kW]**	**$P = P_{reduced}$**		**$P = P_n$**	
		[kW]	**With MDX61B...-2_3[2]**	**[kW]**	**With MDX61B...-2_3[2]**
DT71D4	**0.37**	0.25	**0015**	0.37	**0015**
DT80K4	**0.55**	0.37		0.55	
DT80N4	**0.75**	0.55		0.75	
DT90S4	**1.1**	0.75		1.1	
DT90L4	**1.5**	1.1		1.5	
DV100M4	**2.2**	1.5		2.2	**0022**
DV100L4	**3.7**	2.2	**0022**	3.0	**0030**
DV112M4	**4.0**	3.0	**0030**	4.0	**0040**
DV132S4	**5.5**	4.0	**0040**	5.5	**0055**
DV132M4	**7.5**	5.5	**0055**	7.5	**0075**
DV132ML4	**9.2**	7.5	**0075**	9.2	**0110**
DV160M4	**11**	9.2	**0110**	11	
DV160L4	**15**	11		15	**0150**
DV180M4	**18.5**	15	**0150**	18.5	**0300**
DV180L4	**22**	18.5	**0220**	22	**0370**
DV200L4	**30**	22		30	
DV225S4	**37**	30	**0300**	-	

1) Without speed control: f_{min} = 0.5 Hz

2) The units listed here permit intermittent loads of up to 1.5 times the rated load in the specific application. With variable torque load and constant load without overload, each inverter can also be operated with increased continuous output power (→ Sec. Technical Data). The continuous output current of 125 % of the rated unit current is only available at f_{PWM} = 4 kHz.

3.2 Motor selection for asynchronous servomotors (CFC)

Basic recommendations

Observe the following recommendations for selecting the motor:

- Only use motors with at least thermal class F.
- Use TF thermistors or TH winding thermostats.

	NOTE
	The torque limit (M limit) is set automatically by the startup function of the MOVITOOLS® operating software. Do not increase this automatically set value! SEW-EURODRIVE recommends always using the latest version of MOVITOOLS® for startup. The latest MOVITOOLS® version can be downloaded from our homepage (www.sew-eurodrive.com).

Motor characteristics

Drives in CFC modes are characterized by their ability to control torque directly and quickly. This means they achieve a highly dynamic overload capacity (up to $3 \times M_N$) and a very high speed and control range (up to 1:5000). Stable speed and positioning accuracy meet the high requirements of servo technology. This behavior is implemented using field-oriented control. The current components for magnetization (I_d) and torque generation (I_q) are controlled separately. One prerequisite for the CFC operating modes is that the motor must always be equipped with an encoder.

The inverter needs to know exact data about the connected motor to calculate the motor model. This data is made available by the MOVITOOLS® operating software with the startup function. CFC operating modes are only possible with 4-pole SEW-motors (CT/CV or DT/DV/D), not with the other SEW motors or non-SEW motors. The necessary motor data for the CFC operating modes is stored in MOVIDRIVE® for 4-pole SEW motors.

Typical speed/torque characteristic curves

M_N is determined by the motor. M_{max} and n_{trans} depend on the motor/inverter combination. You can refer to the motor selection tables for CFC mode for the values of n_{trans}, M_N and M_{max}.

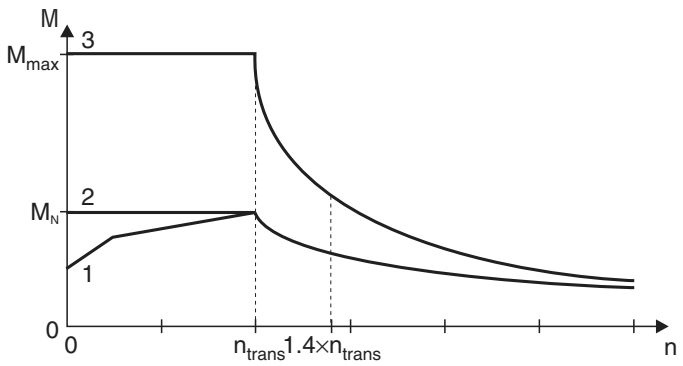


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Figure 41: Speed/torque characteristic curve in CFC operating mode

1 With integrated cooling
2 With forced cooling
3 Maximum torque

Magnetization current

Dynamic drives that have to accelerate without 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 & M-CONTROL mode. In particular in the case of large motors with a slip frequency ≤ 2 Hz, you have to refer to the diagrams in Sec. "Load capacity of the units at low output frequencies" to check whether the inverter can supply the current. Also check whether the thermal characteristics of the motor are suitable (forced cooling fan) for this. For the magnetization current I_d, refer to the motor tables (CT/CV → page 141, DT/DV/D → page 146).

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:

1. Effective torque requirement at average application speed.

   $M_{eff} < M_{N\_Mot}$

   The operating point must lie below the characteristic curve for the continuous torque (Figure 41, curve 2). If this operating point lies below the characteristic curve for forced cooling (Figure 41, curve 1), then no forced cooling is required.

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 41, curve 3).

3. Maximum speed

   Do not configure the maximum speed of the motor higher than 1.4 times the transition speed. The maximum torque available will then still be approximately 110 % of the continuous rated torque of the motor; also, the input speed for the gear unit connected to the motor output will still be less than 3,000 1//min with delta connection.

   $n_{max} < 1.4 \times n_{trans} < 3000$ 1/min

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. Forced cooling may be necessary in case of a high static load or a high effective torque.

CFC mode with torque control (CFC & M-CONTROL)

This operating mode permits direct torque control of the asynchronous motor in the basic speed range ($n \leq n_{trans}$). 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 in the units [1/min] or [%$I_{N\_inverter}$] as required (→ MOVITOOLS®).

The following relationship exists between the units:

3000 1/min = 150 % rated inverter current

The torque on the output shaft of the motor can then be calculated for the basic speed range ($n \leq n_{trans}$) using the following formulae:

Specification of a setpoint for the motor torque in %$I_{N\_inverter}$:

$$M = k_T \times I_{n\_inverter} \times Setpoint$$

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Specification of a setpoint for the motor torque in 1/min:

$$M = k_T \times 1.5 \times I_{n\_inverter} \times \frac{Setpoint}{3000\ rpm}$$

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$I_{N\_inverter}$ = Rated output current of the inverter

k_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 values M_n and I_{q_n}, refer to the motor tables (DT/DV/D → page 146, CT/CV → page 140).

In addition to the current I_q for creating the torque, the inverter also needs to supply the magnetization 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 %$I_{N\_inverter}$:

$$I_{tot} = \sqrt{\left(Setpoint \times I_{n\_inverter}\right)^2 + I_{d\_N}^2}$$

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Specification of a setpoint for the motor torque in 1/min:

$$I_{tot} = \sqrt{\left(Setpoint \times 1.5 \times I_{n\_inverter} \times \frac{1}{3000\ rpm}\right)^2 + I_{d\_N}^2}$$

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I_{q_n} = Nominal value of the torque-generating current according to the motor table

I_{d_n} = Nominal value of the magnetization current according to the motor table

CT/CV asynchronous servomotors

SEW-EURODRIVE offers CT/CV asynchronous servomotors especially for operation with MOVIDRIVE® in the CFC operating modes. These motors have the following characteristics:

High power yield

The optimum winding of CT/CV motors permits a high power yield.

Division into speed classes

CT/CV motors are available in four speed classes. The division into speed classes ensures optimum utilization of torque and speed.

Sin/cos encoder as standard

CT/CV motors are equipped as standard with a high-resolution sin/cos encoder (ES1S, ES2S, EV1S).

TF or TH motor protection as standard

The winding temperature of the three 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 classification F as standard

CT/CV motors are designed with thermal classification F materials.

Reinforced pinion shaft ends

CT/CV motors can generate up to three times their rated motor torque in dynamic operation. For this reason, these motors are equipped with reinforced pinion spigots for direct mounting to gear units to enable them to transmit the high torque levels reliably.

Either DT/DV/D motors or CT/CV motors can be used in CFC mode. SEW-EURODRIVE recommends using CT/CV motors to achieve optimum benefit from the CFC mode.

	Advantage	Disadvantage
CFC mode with DT/DV/D motor **Motor selection → page 148**	Standard motor version	Slower transition speed than the CT/CV 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 CT/CV motors.
		The maximum torque is limited for some of the inverter/motor combinations due to mechanical rigidity.
CFC mode with CT/CV motor **Motor selection → page 142**	Higher transition speed than DT/DV/D 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.	

CT/CV motor table

n_N [1/min]	Motor	M_N [Nm]	I_N [A]	I_{q_n} [A]	I_{d_n} [A]	k_T [Nm/A]	U_N [V]	J_{Mot} [10^{-4} kgm^2]	J_{BMot} [10^{-4} kgm^2]
	CT71D4	3	1.4	1.21	0.69	2.48	360	4.6	5.5
	CT80N4	5	2.1	1.65	1.30	3.0	350	8.7	9.6
	CT90L4	10	3.65	3.13	1.89	3.2	345	34	39.5
	CV100M4	15	4.7	4.15	2.25	3.61	345	53	59
	CV100L4	26	8.5	7.9	3.21	3.29	320	65	71
	CV132S4	37	11.5	10.4	4.83	3.56	340	146	158
1200	CV132M4	50	15.5	14.2	6.18	3.52	340	280	324
	CV132ML4	61	18.2	16.7	7.43	3.66	345	330	374
	CV160M4	73	22.5	20.3	9.73	3.60	335	400	440
	CV160L4	95	30	26.7	14.2	3.56	330	925	1030
	CV180M4	110	36	30.2	19.7	3.65	330	1120	1226
	CV180L4	125	39.5	33.8	20.5	3.7	345	1290	1396
	CV200L4	200	58	53.2	23.7	3.76	330	2340	2475
	CT71D4	3	1.9	1.67	0.95	2.48	355	4.6	5.5
	CT80N4	5	2.9	2.28	1.79	3.03	350	8.7	9.6
	CT90L4	10	5	4.32	2.61	3.2	345	34	39.5
	CV100M4	15	6.5	5.73	3.10	3.61	345	53	59
	CV100L4	26	11.7	10.86	4.41	3.29	320	65	71
	CV132S4	37	15.8	14.35	6.67	3.56	340	146	158
1700	CV132M4	48	21	19.2	8.7	3.52	335	280	324
	CV132ML4	58	26.5	23.8	11.2	3.66	320	330	374
	CV160M4	71	30.5	27.2	13.4	3.6	340	400	440
	CV160L4	89	39.5	34.5	19.53	3.56	335	925	1030
	CV180M4	105	48	39.7	27.2	3.65	335	1120	1226
	CV180L4	115	56	46.6	30.7	3.7	325	1290	1396
	CV200L4	190	79	71.2	33.4	3.76	325	2340	2475
	CT71D4	3	2.4	2.1	1.20	1.43	345	4.6	5.5
	CT80N4	5	3.65	2.87	2.26	1.74	340	8.7	9.6
	CT90L4	10	6.4	5.44	3.29	1.84	335	34	39.5
	CV100M4	15	8.2	7.23	3.91	2.07	335	53	59
	CV100L4	25	14.3	13.2	5.56	1.9	310	65	71
	CV132S4	37	19.9	18.1	8.41	2.05	335	146	158
2100	CV132M4	48	26	23.7	10.75	2.03	330	280	324
	CV132ML4	58	30.5	27.5	12.9	2.1	340	330	374
	CV160M4	70	38	33.9	16.9	2.07	330	400	440
	CV160L4	88	49.5	43	24.6	2.05	330	925	1030
	CV180M4	100	59	47.7	34.2	2.1	325	1120	1226
	CV180L4	115	64	53.7	35.4	2.14	345	1290	1396
	CV200L4	175	91	80.1	41.2	2.16	325	2340	2475
	CT71D4	3	3.35	2.9	1.65	1.04	350	4.6	5.5
	CT80N4	4.5	4.75	3.6	3.11	1.26	345	8.7	9.6
	CT90L4	9.5	8.4	7.12	4.54	1.33	345	34	39.5
	CV100M4	15	11.3	9.95	5.39	1.51	345	53	59
	CV100L4	21	17	15.2	7.65	1.38	310	65	71
	CV132S4	35	26.5	23.6	11.6	1.49	340	146	158
3000	CV132M4	45	34.5	31.2	15.1	1.44	335	280	324
	CV132ML4	52	41.5	36.9	19.3	1.41	320	330	374
	CV160M4	64	48.5	42.6	23.3	1.50	340	400	440
	CV160L4	85	67	57.2	33.9	1.49	340	925	1030
	CV180M4	93	77	61.1	47.2	1.52	335	1120	1226
	CV180L4	110	94	77	53.1	1.43	325	1290	1396
	CV200L4	145	110	94.1	57.8	1.54	330	2340	2475

CT/CV motor selection

1. Rated speed n_N = 1200 1/min:

Assignment of MOVIDRIVE® MDX61B0005-5A3 ... MDX61B0040-503 (sizes 0 and 1):

Motor		MOVIDRIVE® MDX61B...-5_3 (AC 400/500 V units) in CFC operating modes (P700)							
		0005	0008	0011	0014	0015	0022	0030	0040
CT71D4	M_{max} [Nm]	7.7	7.7						
	n_{trans} [1/min]	429	429						
CT80N4	M_{max} [Nm]		14.0	16.0	16.0	16.0			
	n_{trans} [1/min]		627	550	550	550			
CT90L4	M_{max} [Nm]				25.0	18.0	26.0	31.0	
	n_{trans} [1/min]				794	928	781	678	
CV100M4	M_{max} [Nm]						29.0	37.0	45.0
	n_{trans} [1/min]						883	781	678
CV100L4	M_{max} [Nm]							33.0	46.0
	n_{trans} [1/min]							1050	934

Assignment of MOVIDRIVE® MDX61B0055-503 ... MDX61B0550-503 (sizes 2 ... 5):

Motor		MOVIDRIVE® MDX61B...-5_3 (AC 400/500 V units) in CFC operating modes (P700)								
		0055	0075	0110	0150	0220	0300	0370	0450	0550
CV100L4	M_{max} [Nm]	61.0	75.0							
	n_{trans} [1/min]	800	666							
CV132S4	M_{max} [Nm]	64.0	84.0	110						
	n_{trans} [1/min]	992	915	826						
CV132M4	M_{max} [Nm]		82.0	125	150					
	n_{trans} [1/min]		1010	877	806					
CV132ML4	M_{max} [Nm]			129	174	183				
	n_{trans} [1/min]			890	781	774				
CV160M4	M_{max} [Nm]			125	169	220				
	n_{trans} [1/min]			986	909	838				
CV160L4	M_{max} [Nm]				163	240	295			
	n_{trans} [1/min]				1045	954	922			
CV180M4	M_{max} [Nm]					240	320	360		
	n_{trans} [1/min]					1050	986	1005		
CV180L4	M_{max} [Nm]					245	325	360	360	
	n_{trans} [1/min]					960	909	947	1035	
CV200L4	M_{max} [Nm]						325	400	495	565
	n_{trans} [1/min]						1010	986	947	941

2. Rated speed n_N = 1700 1/min:

Assignment of MOVIDRIVE® MDX61B0005-5A3 ... MDX61B0110-503 (sizes 0 ... 2):

Motor		MOVIDRIVE® MDV60A...-5_3 (AC 400/500 V units) in CFC operating modes (P700)										
		0005	0008	0011	0014	0015	0022	0030	0040	0055	0075	0110
CT71D4	M_{max} [Nm]	7.0	7.7	7.7								
	n_{trans} [1/min]	986	890	890								
CT80N4	M_{max} [Nm]			13.0	16.0	13.0	16.0					
	n_{trans} [1/min]			1125	992	1150	992					
CT90L4	M_{max} [Nm]						18.0	24.0	31.0			
	n_{trans} [1/min]						1400	1285	1150			
CV100M4	M_{max} [Nm]							26.0	36.0	45.0		
	n_{trans} [1/min]							1365	1230	1145		
CV100L4	M_{max} [Nm]								32.0	44.0	57.0	75.0
	n_{trans} [1/min]								1535	1425	1300	1115
CV132S4	M_{max} [Nm]										60.0	91.0
	n_{trans} [1/min]										1470	1330
CV132M4	M_{max} [Nm]											87.4
	n_{trans} [1/min]											1484
CV132ML4	M_{max} [Nm]											83.0
	n_{trans} [1/min]											1560

Assignment of MOVIDRIVE® MDX61B0150-503 ... MDX61B0900-503 (sizes 3 ... 6):

Motor		MOVIDRIVE® MDV60A...-5_3 (AC 400/500 V units) in CFC operating modes (P700)							
		0150	0220	0300	0370	0450	0550	0750	0900
CV132S4	M_{max} [Nm]	110							
	n_{trans} [1/min]	1295							
CV132M4	M_{max} [Nm]	118	150						
	n_{trans} [1/min]	1370	1295						
CV132ML4	M_{max} [Nm]	114	166	183					
	n_{trans} [1/min]	1485	1330	1345					
CV160M4	M_{max} [Nm]	120	176	220					
	n_{trans} [1/min]	1420	1310	1255					
CV160L4	M_{max} [Nm]		171	225	280	295			
	n_{trans} [1/min]		1470	1400	1330	1395			
CV180M4	M_{max} [Nm]		168	225	280	345	360		
	n_{trans} [1/min]		1555	1510	1460	1400	1505		
CV180L4	M_{max} [Nm]			210	260	320	360	360	
	n_{trans} [1/min]			1510	1480	1435	1470	1665	
CV200L4	M_{max} [Nm]					345	410	515	565
	n_{trans} [1/min]					1460	1425	1380	1445

3. Rated speed n_N = 2100 1/min:

Assignment of MOVIDRIVE® MDX61B0008-5A3 ... MDX61B0110-503 (sizes 0 ... 2):

Motor		MOVIDRIVE® MDX61B...-5_3 (AC 400/500 V units) in CFC operating modes (P700)									
		0008	0011	0014	0015	0022	0030	0040	0055	0075	0110
CT71D4	M_{max} [Nm]	6.6	7.7	7.7	7.7						
	n_{trans} [1/min]	1470	1320	1320	1320						
CT80N4	M_{max} [Nm]			13	9.7	14	16				
	n_{trans} [1/min]			1535	1755	1510	1420				
CT90L4	M_{max} [Nm]						18	26	31		
	n_{trans} [1/min]						1845	1675	1620		
CV100M4	M_{max} [Nm]							28	38	45	
	n_{trans} [1/min]							1760	1625	1580	
CV100L4	M_{max} [Nm]								34	44	68
	75								1980	1870	1615
CV132S4	M_{max} [Nm]										72
	n_{trans} [1/min]										1850

Assignment of MOVIDRIVE® MDX61B0150-503 ... MDX61B1320-503 (sizes 3 ... 6):

Motor		MOVIDRIVE® MDX61B...-5_3 (AC 400/500 V units) in CFC operating modes (P700)									
		0150	0220	0300	0370	0450	0550	0750	0900	1100	1320
CV100L4	M_{max} [Nm]	75.0									
	n_{trans} [1/min]	1555									
CV132S4	M_{max} [Nm]	97	110								
	n_{trans} [1/min]	1720	1785								
CV132M4	M_{max} [Nm]	95	138	150							
	n_{trans} [1/min]	1850	1670	1695							
CV132ML4	M_{max} [Nm]	97	143	183							
	n_{trans} [1/min]	1790	1660	1550							
CV160M4	M_{max} [Nm]		138	183	220						
	n_{trans} [1/min]		1790	1690	1625						
CV160L4	M_{max} [Nm]			177	220	270	295				
	n_{trans} [1/min]			1880	1825	1740	1780				
CV180M4	M_{max} [Nm]				220	270	320	360			
	n_{trans} [1/min]				1940	1895	1835	1935			
CV180L4	M_{max} [Nm]					275	330	360	360		
	n_{trans} [1/min]					1710	1670	1805	1985		
CV200L4	M_{max} [Nm]						330	410	500	565	
	n_{trans} [1/min]						1830	1790	1745	1870	

4. Rated speed n_N = 3000 1/min:

Assignment of MOVIDRIVE® MDX61B0011-5A3 ... MDX61B0110-503 (sizes 0 ... 2):

Motor		MOVIDRIVE® MDX61B...-5_3 (AC 400/500 V units) in CFC operating modes (P700)								
		0011	0014	0015	0022	0030	0040	0055	0075	0110
CT71D4	M_{max} [Nm]	6	7.7	6	7.7					
	n_{trans} [1/min]	2380	2095	2380	2095					
CT80N4	M_{max} [Nm]				9.7	13	16			
	n_{trans} [1/min]				2565	2360	2200			
CT90L4	M_{max} [Nm]						18	24	31	
	n_{trans} [1/min]						2660	2495	2370	
CV100M4	M_{max} [Nm]							27	35	45
	n_{trans} [1/min]							2555	2430	2460
CV100L4	M_{max} [Nm]								31	49
	n_{trans} [1/min]								2850	2645
CV132S4	M_{max} [Nm]									51
	n_{trans} [1/min]									2745

Assignment of MOVIDRIVE® MDX61B0150-503 ... MDX61B1320-503 (sizes 3 ... 6):

Motor		MOVIDRIVE® MDX61B...-5_3 (AC 400/500 V units) in CFC operating modes (P700)									
		0150	0220	0300	0370	0450	0550	0750	0900	1100	1320
CV100L4	M_{max} [Nm]	65	75								
	n_{trans} [1/min]	2425	2370								
CV132S4	M_{max} [Nm]	69	101	110							
	n_{trans} [1/min]	2650	2460	2610							
CV132M4	M_{max} [Nm]	66	97	101	110						
	n_{trans} [1/min]	2810	2670	2515	2450						
CV132ML4	M_{max} [Nm]		94	124	152	183					
	n_{trans} [1/min]		2765	2655	2545	2445					
CV160M4	M_{max} [Nm]		98	131	161	197	220				
	n_{trans} [1/min]		2630	2555	2470	2370	2385				
CV160L4	M_{max} [Nm]				155	192	230	285	295		
	n_{trans} [1/min]				2680	2620	2555	2440	2630		
CV180M4	M_{max} [Nm]					190	230	290	350	360	
	n_{trans} [1/min]					2750	2705	2635	2560	2920	
CV180L4	M_{max} [Nm]						210	270	325	360	360
	n_{trans} [1/min]						2680	2630	2575	2855	3170
CV200L4	M_{max} [Nm]							285	350	455	565
	n_{trans} [1/min]							2625	2590	2535	2475

DT/DV/D motor tables

Characteristic values for delta/star AC 230/400 V / 50 Hz

Motor	M_N	Mass moment of inertia J_M		Star ⅄ (AC 400 V)				Delta Δ (AC 230 V)			
		without brake	with brake	I_n	I_{q_n} [1]	I_{d_n} [1]	k_T [1]	I_n	I_{q_n} [1]	I_{d_n} [1]	k_T [1]
	[Nm]	[10^{-4} kgm^2]		[A]	[A]	[A]	[Nm/A]	[A]	[A]	[A]	[Nm/A]
DT71D4	2.6	4.6	5.5	1.15	0.95	0.65	2.69	1.99	1.64	1.13	1.56
DT80K4	3.9	6.6	7.5	1.75	1.44	1	2.68	3.03	2.49	1.73	1.55
DT80N4	5.2	8.7	9.6	2.1	1.67	1.27	3.11	3.64	2.89	2.2	1.79
DT90S4	7.5	25	31	2.80	2.39	1.46	3.13	4.85	4.14	2.53	1.81
DT90L4	10.2	34	40	3.55	2.93	2	3.48	6.15	5.07	3.46	2.01
DV100M4	15.0	53	59	4.7	4.12	2.24	3.61	8.14	7.14	3.88	2.09
DV100L4	20.5	65	71	6.3	5.6	2.98	3.66	10.91	9.70	5	2.11
DV112M4	26.9	98	110	8.7	7.85	3.75	3.43	15.1	13.6	6.5	1.98
DV132S4	36.7	146	158	11	9.9	4.7	3.69	19.1	17.2	8.14	2.13
DV132M4	50.1	280	330	15.5	14.2	6.15	3.53	26.9	24.6	10.65	2.04
DV132ML4	61.0	330	380	18.1	16.5	7.46	3.7	31.35	28.6	12.9	2.13
DV160M4	72.9	398	448	22.5	20.3	9.70	3.59	39.0	35.2	16.8	2.07
DV160L4	98.1	925	1060	29.5	26.1	13.7	3.75	51.1	45.28	23.7	2.17
DV180M4	121	1120	1255/1350 [2]	37	21.7	19.1	3.82	64.1	54.9	33.1	2.2
DV180L4	143	1290	1425/1520 [1]	42.5	37.4	20.3	3.83	73.6	64.71	35.1	2.21
DV200L4	195	2340	2475/2570 [2]	55	49.9	23.1	3.91	95.3	86.5	39.9	2.25
DV225S4	240	3010	3145/3240 [2]	67	61.6	26.4	3.9	116	106.7	45.7	2.25
DV225M4	292	3570	3705/3800 [2]	83	74.8	36.1	3.9	143.8	129.5	62.4	2.26
DV250M4	356	6300	6600/6730 [2]	102	91.7	44.7	3.88	176.7	158.8	77.4	2.24
DV280S4	484	8925	9225/9355 [2]	138	120.4	67.5	4.02	239	208.5	116.8	2.32
DV280M4	581	8925	9225/9355 [2]	170	148.9	68.9	3.9	294.5	257.9	119.3	2.25
D315S4	707	20000	[3]	192	180	67.0	3.93	-	-	-	-
D315M4	849	24000		235	209	106	4.06	-	-	-	-
D315M4a	1028	31000		295	259	140	3.97	-	-	-	-

1) Applies in the basic speed range up to n_{Eck}.

2) Double disc brake

3) On request

Characteristic values for double-star/star AC 230/460 V / 60 Hz

(according to MG1, NEMA Design B to DT80K4, NEMA Design C from DT80N4)

Motor	M_N [Nm]	Mass moment of inertia J_M [10^{-4} kgm^2] without brake	with brake	Star ⅄ (AC 460 V) I_n [A]	I_{q_n} [A] 1)	I_{d_n} [A] 1)	k_T [Nm/A] 1)	Double-star ⅄⅄ (AC 230 V) I_n [A]	I_{q_n} [A] 1)	I_{d_n} [A] 1)	k_T [Nm/A] 1)
DT71D4	2.1	4.6	5.5	1	0.76	0.65	2.74	2	1.52	1.30	1.37
DT80K4	3.1	6.6	7.5	1.45	1.06	0.98	2.92	2.9	2.12	1.96	1.46
DT80N4	4.2	8.7	9.6	1.85	1.39	1.21	3.03	3.7	2.78	2.42	1.51
DT90S4	6.1	25	31	2.6	1.87	1.79	3.25	5.2	3.74	3.58	1.62
DT90L4	8.3	34	40	3.1	2.49	1.84	3.34	6.2	4.98	3.68	1.67
DT100M4	12.1	53	59	4.1	3.59	1.97	3.37	8.2	7.18	3.94	1.69
DT100L4	21	65	71	6.6	5.98	2.78	3.51	13.2	11.96	5.56	1.76
DV112M4	22.1	98	110	7	6.13	3.37	3.61	14	12.26	6.74	1.80
DV132S4	30.5	146	158	9.4	8.61	3.76	3.54	18.8	17.22	7.52	1.77
DV132M4	41.2	280	330	13.7	11.85	6.87	3.48	27.4	23.7	13.74	1.74
DV132ML4	50.5	330	380	16.4	14.41	7.83	3.50	32.8	28.82	15.66	1.75
DV160M4	60.4	398	448	20	17.36	9.92	3.48	40	34.72	19.84	1.74
DV160L4	81.4	925	1060	27	23.24	13.73	3.50	54	46.48	27.46	1.75
DV180M4	100	1120	1255/1350 2)	31.5	28.06	14.29	3.56	63	56.1	28.58	1.78
DV180L4	119	1290	1425/1520 2)	40	34.5	20.22	3.45	80	69	40.44	1.72
DV200L4	163	2340	2475/2570 2)	47.5	44.63	16.25	3.65	95	89.26	32.5	1.83
DV225S4	201	3010	3145/3240 2)	59	55.14	21	3.65	118	110.3	42	1.82
DV225M4	244	3570	3705/3800 2)	70	64.6	27	3.78	140	129.2	54	1.89
DV250M4	296	6300	6600/6730 2)	87	78.45	37.6	3.77	174	156.9	75.2	1.89
DV280S4	402	8925	9225/9355 2)	118	106.5	50.8	3.77	236	213	101.6	1.89
D280M4	580	14500	3)	162	153	51.7	3.79	324	306	103.4	1.89
D315S4	707	20000	3)	201	188	69.8	3.76	-	-	-	-
D315M4	849	24000	3)	246	219	111	3.87	-	-	-	-
D315M4a	1028	31000	3)	308	271	147	3.79	-	-	-	-

1) Applies in the basic speed range up to n_{Eck}.

2) Double disc brake

3) On request

DT/DV/D motor selection in connection type delta/star (AC 230/400 V / 50 Hz)

1. Motors AC 230/400 V / 50 Hz in ⅄ connection or motors AC 400/690 V / 50 Hz in Δ connection

Assignment of MOVIDRIVE® MDX61B0005-5A3 ... MDX61B0110-503 (sizes 0 ... 2):

Motor		MOVIDRIVE® MDX61B...-5_3 (AC 400/500 V units) in CFC operating modes (P700)										
⅄ AC 400 V / 50 Hz		0005	0008	0011	0014	0015	0022	0030	0040	0055	0075	0110
DT71D4	M_{max} [Nm]	4.6										
	n_{trans} [1/min]	883										
DT80K4	M_{max} [Nm]	6.9	6.9									
	n_{trans} [1/min]	813	813									
DT80N4	M_{max} [Nm]	9.3	9.3	9.3	9.3	9.3						
	n_{trans} [1/min]	915	922	922	922	922						
DT90S4	M_{max} [Nm]		13.5	13.5	13.5	13.5						
	n_{trans} [1/min]		960	1011	1011	1011						
DT90L4	M_{max} [Nm]				18.3	18.3	18.3					
	n_{trans} [1/min]				1082	973	1088					
DV100M4	M_{max} [Nm]						26.8	26.8	26.8			
	n_{trans} [1/min]						941	1043	1056			
DV100L4	M_{max} [Nm]							36.8	36.8	36.8		
	n_{trans} [1/min]							890	1005	1011		
DV112M4	M_{max} [Nm]								47.1	48.4	48.4	
	n_{trans} [1/min]								915	1030	1062	
DV132S4	M_{max} [Nm]									66.1	66.1	66.1
	n_{trans} [1/min]									1011	1171	1222
DV132M4	M_{max} [Nm]		**Note:** The maximum torque M_{max} is limited to 180 % of the rated motor torque M_N. The data is based on a supply voltage of AC 400 V.								81.7	90.2
	n_{trans} [1/min]										1011	1145
DV132ML4	M_{max} [Nm]											110
	n_{trans} [1/min]											1082
DV160M4	M_{max} [Nm]											125
	n_{trans} [1/min]											986

Assignment of MOVIDRIVE® MDX61B0150-503 ... MDX61B1320-503 (sizes 3 ... 6):

Motor		MOVIDRIVE® MDX61B...-5_3 (AC 400/500 V units) in CFC operating modes (P700)									
⅄ AC 400 V / 50 Hz		0150	0220	0300	0370	0450	0550	0750	0900	1100	1320
DV132M4	M_{max} [Nm]	90.2									
	n_{trans} [1/min]	1152									
DV132ML4	M_{max} [Nm]	110									
	n_{trans} [1/min]	1165									
DV160M4	M_{max} [Nm]	131	131								
	n_{trans} [1/min]	1133	1197								
DV160L4	M_{max} [Nm]	172	177	177							
	n_{trans} [1/min]	1050	1306	1350							
DV180M4	M_{max} [Nm]		217	217	217						
	n_{trans} [1/min]		1222	1453	1517						
DV180L4	M_{max} [Nm]		231.2	258	258	258					
	n_{trans} [1/min]		1018	1152	1299	1370					
DV200L4	M_{max} [Nm]			339.5	351	351	351				
	n_{trans} [1/min]			1018	1171	1350	1466				
DV225S4	M_{max} [Nm]				414.7	433	433	433			
	n_{trans} [1/min]				954	1082	1222	1363			
DV225M4	M_{max} [Nm]					502.6	526	526			
	n_{trans} [1/min]					1037	1146	1344			
DV250M4	M_{max} [Nm]						586.5	641	641		
	n_{trans} [1/min]						1018	1133	1357		
DV280S4	M_{max} [Nm]							735.4	871	871	
	n_{trans} [1/min]							1082	1184	1344	
DV280M4	M_{max} [Nm]								860.6	1000	1000
	n_{trans} [1/min]								1171	1178	1402
D315S4	M_{max} [Nm]									1150	1273
	n_{trans} [1/min]									1088	1203
D315M4	M_{max} [Nm]										1453
	n_{trans} [1/min]										1024
D315M4a	M_{max} [Nm]										1374
	n_{trans} [1/min]										1107

Note: The maximum torque M_{max} is limited to 180 % of the rated motor torque M_N. The data is based on a supply voltage of AC 400 V.

2. Motor AC 230/400 V / 50 Hz in delta connection:

Assignment of MOVIDRIVE® MDX61B0008-5A3 ... MDX61B0110-503 (sizes 0 ... 2):

Motor		MOVIDRIVE® MDX61B...-5_3 (AC 400/500 V units) in CFC operating modes (P700)									
Δ AC 230 V / 50 Hz		0008	0011	0014	0015	0022	0030	0040	0055	0075	0110
DT71D4	M_{max} [Nm]	4.6	4.6	4.6	4.6						
	n_{trans} [1/min]	2054	2054	2054	2054						
DT80K4	M_{max} [Nm]		6.9	6.9	6.9	6.9					
	n_{trans} [1/min]		1869	1869	1850	1869					
DT80N4	M_{max} [Nm]			9.3	9.3	9.3					
	n_{trans} [1/min]			2080	1869	2080					
DT90S4	M_{max} [Nm]					13.5	13.5	13.5			
	n_{trans} [1/min]					1971	2246	2304			
DT90L4	M_{max} [Nm]						18.3	18.3	18.3		
	n_{trans} [1/min]						1946	2342	2387		
DV100M4	M_{max} [Nm]							26.8	26.8	26.8	
	n_{trans} [1/min]							1862	2214	2298	
DV100L4	M_{max} [Nm]	**Note:** The maximum torque M_{max} is limited to 180 % of the rated motor torque M_N. The data is based on a supply voltage of AC 400 V.							36.8	36.8	36.8
	n_{trans} [1/min]								1779	2080	2188
DV112M4	M_{max} [Nm]									45.5	48.4
	n_{trans} [1/min]									1779	2163
DV132S4	M_{max} [Nm]										66.1
	n_{trans} [1/min]										2086

Assignment of MOVIDRIVE® MDX61B0150-503 ... MDX61B1320-503 (sizes 3 ... 6):

Motor		MOVIDRIVE® MDX61B...-5_3 (AC 400/500 V units) in CFC operating modes (P700)									
Δ AC 230 V / 50 Hz		0150	0220	0300	0370	0450	0550	0750	0900	1100	1320
DV112M4	M_{max} [Nm]	48.4									
	n_{trans} [1/min]	2195									
DV132S4	M_{max} [Nm]	66.1	66.1								
	n_{trans} [1/min]	2458	2496								
DV132M4	M_{max} [Nm]	90.2	90.2								
	n_{trans} [1/min]	1939	2310								
DV132ML4	M_{max} [Nm]		110	110							
	n_{trans} [1/min]		2176	2291							
DV160M4	M_{max} [Nm]		131	131	131						
	n_{trans} [1/min]		1894	2246	2348						
DV160L4	M_{max} [Nm]			177	177	177					
	n_{trans} [1/min]			2010	2336	2560					
DV180M4	M_{max} [Nm]				217	217	217				
	n_{trans} [1/min]				2061	2445	2720				
DV180L4	M_{max} [Nm]					258	258	258			
	n_{trans} [1/min]					1837	2131	2458			
DV200L4	M_{max} [Nm]						341.8	351	351		
	n_{trans} [1/min]						1843	2182	2643		
DV225S4	M_{max} [Nm]							425	433	433	
	n_{trans} [1/min]							1715	2138	2394	
DV225M4	M_{max} [Nm]	**Note:** The maximum torque M_{max} is limited to 180 % of the rated motor torque M_N. The data is based on a supply voltage of AC 400 V.							526	526	526
	n_{trans} [1/min]								1952	2253	2630
DV250M4	M_{max} [Nm]								542	641	641
	n_{trans} [1/min]								1843	1837	2227
DV280S4	M_{max} [Nm]									638.2	823.2
	n_{trans} [1/min]									1946	1920

DT/DV/D motor selection in connection type double-star/star (AC 230/460 V / 60 Hz)

1. Motors AC 230/460 V / 60 Hz in star connection:

Assignment of MOVIDRIVE® MDX61B0005-5A3 ... MDX61A0110-503 (size 0 ... 2):

Motor		**MOVIDRIVE® MDX61B...-5_3 (AC 400/500 V units) in CFC operating modes (P700)**										
⅄ AC 460 V / 60 Hz		**0005**	**0008**	**0011**	**0014**	**0015**	**0022**	**0030**	**0040**	**0055**	**0075**	**0110**
DT80K4	M_{max} [Nm]	7.0										
	n_{trans} [1/min]	1101										
DT80N4	M_{max} [Nm]	9.3	9.3	9.3	9.3	9.3						
	n_{trans} [1/min]	1133	1146	1146	1146	1146						
DT90S4	M_{max} [Nm]			13.5	13.5	13.5						
	n_{trans} [1/min]			1325	1350	1312						
DT90L4	M_{max} [Nm]				18.3	18.3	18.3					
	n_{trans} [1/min]				1312	1152	1318					
DV100M4	M_{max} [Nm]						26.8	26.8				
	n_{trans} [1/min]						1363	1510				
DV100L4	M_{max} [Nm]							35.6	36.8	36.8		
	n_{trans} [1/min]							1069	1197	1210		
DV112M4	M_{max} [Nm]							35.8	48.4	48.4		
	n_{trans} [1/min]							1197	1139	1312		
DV132S4	M_{max} [Nm]								48.7	65	66	
	n_{trans} [1/min]								1069	992	1101	
DV132M4	M_{max} [Nm]		**Note:** The maximum torque M_{max} is limited to 180 % of the rated motor torque M_N. The data is based on a supply voltage of AC 460 V.							60.8	80	90
	n_{trans} [1/min]									1152	1088	1222
DV132ML4	M_{max} [Nm]											110
	n_{trans} [1/min]											1171
DV160M4	M_{max} [Nm]											120
	n_{trans} [1/min]											1133

Assignment of MOVIDRIVE® MDX61B0150-503 ... MDX61B1320-503 (sizes 3 ... 6):

Motor		MOVIDRIVE® MDX61B...-5_3 (AC 400/500 V units) in CFC operating modes (P700)									
⅄ AC 460 V / 60 Hz		0150	0220	0300	0370	0450	0550	0750	0900	1100	1320
DV132ML4	M_{max} [Nm]	110									
	n_{trans} [1/min]	1267									
DV160M4	M_{max} [Nm]	131	131								
	n_{trans} [1/min]	1261	1319								
DV160L4	M_{max} [Nm]	161	177								
	n_{trans} [1/min]	1158	1370								
DV180M4	M_{max} [Nm]	164	217	217							
	n_{trans} [1/min]	1139	1177	1350							
DV180L4	M_{max} [Nm]		228	258	258						
	n_{trans} [1/min]		1082	1197	1325						
DV200L4	M_{max} [Nm]			323	351	351					
	n_{trans} [1/min]			1024	1107	1248					
DV225S4	M_{max} [Nm]			318	391	433	433				
	n_{trans} [1/min]			1101	1075	1146	1286				
DV225M4	M_{max} [Nm]				401	494	526	526			
	n_{trans} [1/min]				1082	1056	1139	1325			
DV250M4	M_{max} [Nm]						576	641			
	n_{trans} [1/min]						1261	1370			
DV280S4	M_{max} [Nm]							711	871	871	
	n_{trans} [1/min]							1421	1478	1664	
D280M4	M_{max} [Nm]							712	946	1045	
	n_{trans} [1/min]							1338	1318	1382	
D315S4	M_{max} [Nm]									1099	1273
	n_{trans} [1/min]									1325	1408
D315M4	M_{max} [Nm]										1387
	n_{trans} [1/min]										1242
D315M4a	M_{max} [Nm]										1308
	n_{trans} [1/min]										1344

Note: The maximum torque M_{max} is limited to 180 % of the rated motor torque M_N. The data is based on a supply voltage of AC 460 V.

2. Motors AC 230/460 V / 60 Hz in double-star connection:

Assignment of MOVIDRIVE® MDX61B0008-5A3 ... MDX61B0110-503 (sizes 0 ... 2):

Motor		MOVIDRIVE® MDX61B...-5_3 (AC 400/500 V units) in CFC operating modes (P700)									
⅄⅄ AC 230 V / 60 Hz		0008	0011	0014	0015	0022	0030	0040	0055	0075	0110
DT71D4	M_{max} [Nm]	4.6	4.6	4.6	4.6						
	n_{trans} [1/min]	2771	2989	2989	2989						
DT80K4	M_{max} [Nm]		7	7	7	7					
	n_{trans} [1/min]		2733	2822	2688	2822					
DT80N4	M_{max} [Nm]			9.3	8.3	9.3	9.3				
	n_{trans} [1/min]			2835	2586	2874	2970				
DT90S4	M_{max} [Nm]					11.9	13.5	13.5			
	n_{trans} [1/min]					2637	2931	3462			
DT90L4	M_{max} [Nm]						16.4	18.3	18.3		
	n_{trans} [1/min]						2605	3014	3354		
DV100M4	M_{max} [Nm]							23.1	26	26.8	
	n_{trans} [1/min]							3142	3360	3680	
DV100L4	M_{max} [Nm]								31.5	36.8	36.8
	n_{trans} [1/min]								2470	2605	3014
DV112M4	M_{max} [Nm]									41.4	48.4
	n_{trans} [1/min]									2534	2989
DV132S4	M_{max} [Nm]										62.4
	n_{trans} [1/min]										2234

Note: The maximum torque M_{max} is limited to 180 % of the rated motor torque M_N. The data is based on a supply voltage of AC 460 V.

Assignment of MOVIDRIVE® MDX61B0150-503 ... MDX61B1320-503 (sizes 3 ... 6):

Motor		MOVIDRIVE® MDX61B...-5_3 (AC 400/500 V units) in CFC operating modes (P700)									
AC 230 V / 60 Hz		0150	0220	0300	0370	0450	0550	0750	0900	1100	1320
DV132S4	M_{max} [Nm]	66									
	n_{trans} [1/min]	2573									
DV132M4	M_{max} [Nm]	80	90.2								
	n_{trans} [1/min]	2349	2707								
DV132ML4	M_{max} [Nm]		110	110							
	n_{trans} [1/min]		2496	2880							
DV160M4	M_{max} [Nm]		115	131	131						
	n_{trans} [1/min]		2451	2688	2963						
DV160L4	M_{max} [Nm]			150	177	177					
	n_{trans} [1/min]			2458	2515	2918					
DV180M4	M_{max} [Nm]				189	217	217				
	n_{trans} [1/min]				2355	2458	2771				
DV180L4	M_{max} [Nm]					220	258	258			
	n_{trans} [1/min]					2285	2291	2720			
DV200L4	M_{max} [Nm]						281	350	351		
	n_{trans} [1/min]						2208	2163	2662		
DV225S4	M_{max} [Nm]							346	433	433	
	n_{trans} [1/min]							2291	2362	2694	
DV225M4	M_{max} [Nm]							354	471	526	526
	n_{trans} [1/min]							2278	2240	2336	2803
DV250M4	M_{max} [Nm]								459	547	641
	n_{trans} [1/min]								2656	2630	2771
DV280S4	M_{max} [Nm]									533	681
	n_{trans} [1/min]									2963	2925

Note: The maximum torque M_{max} is limited to 180 % of the rated motor torque M_N. The data is based on a supply voltage of AC 460 V.

DT/DV motor selection in connection type delta (AC 230 V / 50 Hz)

Motors AC 230/400 V / 50 Hz in delta connection:

Motor		MOVIDRIVE® MDX61B...-2_3 (AC 230 V units) in CFC operating modes (P700)								
Δ AC 230 V / 50 Hz		0015	0022	0037	0055	0075	0110	0150	0220	0300
DT80K4	M_{max} [Nm]	6.9								
	n_{trans} [1/min]	813								
DT80N4	M_{max} [Nm]	9.3								
	n_{trans} [1/min]	922								
DT90S4	M_{max} [Nm]	13.5	13.5							
	n_{trans} [1/min]	1011	1011							
DT90L4	M_{max} [Nm]	18.3	18.3	18.3						
	n_{trans} [1/min]	998	1068	1088						
DV100M4	M_{max} [Nm]		25.5	26.8						
	n_{trans} [1/min]		922	1056						
DV100L4	M_{max} [Nm]			36.8	36.8					
	n_{trans} [1/min]			973	1011					
DV112M4	M_{max} [Nm]				48.4	48.4				
	n_{trans} [1/min]				1037	1062				
DV132S4	M_{max} [Nm]				66.1	66.1	66.1			
	n_{trans} [1/min]				1024	1190	1222			
DV132M4	M_{max} [Nm]					85.4	90.2	90.2		
	n_{trans} [1/min]					998	1152	1152		
DV132ML4	M_{max} [Nm]						110	110	110	
	n_{trans} [1/min]						1082	1165	1165	
DV160M4	M_{max} [Nm]						126	131	131	
	n_{trans} [1/min]						979	1120	1197	
DV160L4	M_{max} [Nm]							167	177	177
	n_{trans} [1/min]							1056	1306	1350
DV180M4	M_{max} [Nm]		**Note:** The maximum torque M_{max} is limited to 180 % of the rated motor torque M_N. The data is based on a supply voltage of AC 230 V.						217	217
	n_{trans} [1/min]								1222	1382
DV180L4	M_{max} [Nm]								231	258
	n_{trans} [1/min]								1017	1069
DV200L4	M_{max} [Nm]									307
	n_{trans} [1/min]									1030

DT/DV motor selection in connection type double-star (AC 230 V / 60 Hz)

Motors AC 230/460 V / 60 Hz in double-star connection:

Motor		MOVIDRIVE® MDX61B...-2_3 (AC 230 V units) in CFC operating modes (P700)								
⅄⅄ AC 230 V / 60 Hz		0015	0022	0037	0055	0075	0110	0150	0220	0300
DT80N4	M_{max} [Nm]	9.3								
	n_{trans} [1/min]	1146								
DT90S4	M_{max} [Nm]	13.5	13.5							
	n_{trans} [1/min]	1267	1338							
DT90L4	M_{max} [Nm]	17.2	18.3	18.3						
	n_{trans} [1/min]	1146	1210	1325						
DV100M4	M_{max} [Nm]		20.7	26.8						
	n_{trans} [1/min]		1459	1517						
DV100L4	M_{max} [Nm]			36.8	36.8					
	n_{trans} [1/min]			1056	1210					
DV112M4	M_{max} [Nm]			37.2	48.4	48.4				
	n_{trans} [1/min]			1190	1248	1338				
DV132S4	M_{max} [Nm]				57	66.1	66.1			
	n_{trans} [1/min]				1030	1062	1120			
DV132M4	M_{max} [Nm]					71.7	90.2	90.2		
	n_{trans} [1/min]					1114	1165	1222		
DV132ML4	M_{max} [Nm]						106	110		
	n_{trans} [1/min]						1101	1235		
DV160M4	M_{max} [Nm]						104	131	131	
	n_{trans} [1/min]						1165	1146	1318	
DV160L4	M_{max} [Nm]							133	177	177
	n_{trans} [1/min]							1190	1267	1395
DV180M4	M_{max} [Nm]								208	217
	n_{trans} [1/min]								1101	1203
DV180L4	M_{max} [Nm]								195	236
	n_{trans} [1/min]								1107	1075
DV200L4	M_{max} [Nm]								210	253
	n_{trans} [1/min]								1082	1062
DV225S4	M_{max} [Nm]									247
	n_{trans} [1/min]									1133

Note: The maximum torque M_{max} is limited to 180 % of the rated motor torque M_N. The data is based on a supply voltage of AC 230 V.

3.3 Motor Selection for Synchronous Servomotors (SERVO)

	NOTE
	The torque limit (M limit) is set automatically by the startup function of the MOVITOOLS® operating software. Do not increase this automatically set value! We recommend always using the latest version of MOVITOOLS® for startup. The latest MOVITOOLS® version can be downloaded from our homepage (www.sew-eurodrive.com).

Motor characteristics

The requirements on a servo drive include speed dynamics, stable speed and positioning accuracy. DS/CM/CMD/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 constant torque over a wide speed range (up to 6000 1/min), a high speed and control range and a high overload capacity, are achieved using control by 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.

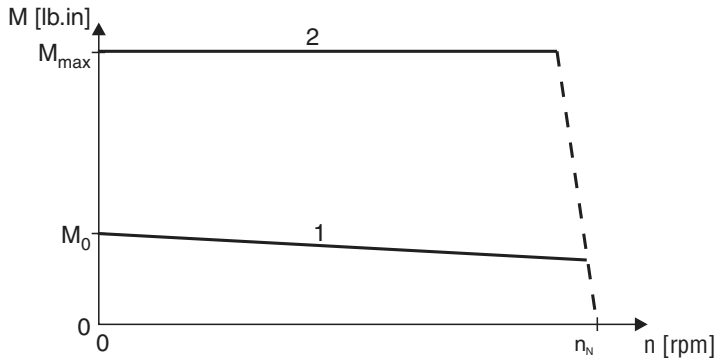

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Figure 42: Speed/torque characteristic curve of the DS/CM/CMD/CMP servomotors

1 Continuous torque
2 Maximum torque

M_0 and M_{max} are determined by the motor. The attainable M_{max} can also be less, depending on the inverter.

Refer to the motor tables (DS/CM/CMD/CMP) for the values for M_0.

Refer to the motor selection tables (DS/CM/CMD/CMP) for the values for M_{max}.

Basic recommendations

The necessary motor data for the SERVO operating modes is stored in MOVIDRIVE® for the SEW motors.

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 & M-CONTROL).

SERVO mode 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 operating point must lie below the characteristic curve for the continuous torque (Figure 42, curve 1). The continuous torque of the CM series can be increased by 40 % by forced 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 42, curve 2).

3. Maximum speed

   The maximum speed must not be configured higher than the rated speed of the motor. Planetary gear units should be used for speeds greater than 3000 1/min as a result of the high input speed.

   $n_{max} \leq n_N$

SERVO mode with torque control (SERVO & M-CTRL.)

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 in the units [1/min] or [$\%I_{N\_inverter}$] as required (→ MOVITOOLS®).

The following relationship exists between the units:

3000 1/min = 150 % rated inverter current

The torque at the output shaft of the servomotor can be calculated using the following formula:

$$M = \frac{M_0}{I_0} \times \frac{150\% \times I_{n\_inverter} \times n_{set}}{3000\ rpm}$$

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M_0 Continuous static torque according to motor tables DS/CM/CMD/CMP

I_0 Continuous static current according to motor tables DS/CM/CMD/CMP

Motor table DS/CM

Characteristic values at V_{max} = AC 230 V / AC 400 V

n_N [1/min]	Motor	Without forced cooling fan M_0 [Nm]	I_0 [1] [A]	I_0 [2] [A]	With forced cooling fan VR M_{0_VR} [Nm]	I_{0_VR} [1] [A]	I_{0_VR} [2] [A]	I_{max} [1] [A]	I_{max} [2] [A]	Mass moment of inertia J_M without brake [10^{-4} kgm^2]	Mass moment of inertia J_M with brake [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	DS56M	1.0	1.65	1.65	-	-	-	6.6	6.6	0.47	0.85
	DS56L	2.0	2.4	2.4	-	-	-	9.6	9.6	0.82	1.2
	DS56H	4.0	2.8	4.7	-	-	-	11.2	19	1.53	1.88
	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	DS56M	1.0	1.65	1.65	-	-	-	6.6	6.6	0.47	0.85
	DS56L	2.0	2.4	-	-	-	-	9.6	-	0.82	1.2
	DS56H	4.0	4.0	-	-	-	-	16.0	-	1.53	1.88
	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	DS56M	1.0	1.65	-	-	-	-	6.6	-	0.47	0.85
	DS56L	2.0	2.75	-	-	-	-	11.0	-	0.82	1.2
	DS56H	4.0	5.3	-	-	-	-	21.0	-	1.53	1.88
	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) For DS/CM synchronous servomotors with AC 230 V system voltage

NOTE

Additional project planning instructions and information on the DS/CM synchronous servomotors can be found in the "Servo Gearmotors" catalog, which can be ordered from SEW-EURODRIVE.

DS/CM motor selection (AC 400 V system voltage)

1. Rated speed n_N = 2000 1/min:

Motor		MOVIDRIVE® MDX61B...-5_3 (AC 400/500 V units) in SERVO operating modes (P700)															
		0005	0008	0011	0014	0015	0022	0030	0040	0055	0075	0110	0150	0220	0300	0370	0450
CM71S	M_{max} [Nm]	8.9	10.5	13.1	15.6	12.7	15.9	16.5									
CM71M	M_{max} [Nm]	8.6	10.3	13.1	16.2	12.7	16.7	19.8	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	17.8	13.4	18.4	23.2	30.6	38.2	39.4						
CM90M	M_{max} [Nm]				16.8	12.6	17.3	21.9	29.5	38.0	46.9	52.5					
CM90L	M_{max} [Nm]						17.5	22.2	30.1	39.3	49.6	70.3	75.8				
CM112S	M_{max} [Nm]						19.3	24.6	33.4	43.6	54.8	76.2	81.9				
CM112M	M_{max} [Nm]							23.9	32.6	42.9	54.7	79.3	99.6	108.0			
CM112L	M_{max} [Nm]									42.0	53.9	80.3	104.9	141.5	156.8		
CM112H	M_{max} [Nm]										53.2	80.1	106.5	150.3	189.2	220.1	237.0

2. Rated speed n_N = 3000 1/min:

Motor		MOVIDRIVE® MDX61B...-5_3 (AC 400/500 V units) in SERVO operating modes (P700)								
		0005	0008	0011	0014	0015	0022	0030	0040	0055
DS56M	M_{max} [Nm]	2.4	2.8	3.6	3.8	3.5	3.8			
DS56L	M_{max} [Nm]	3.3	4.0	5.1	6.4	4.9	6.6	7.6		
DS56H	M_{max} [Nm]	5.7	6.8	8.8	11.2	8.5	11.5	14.3	15.0	
CM71S	M_{max} [Nm]	6.0	7.2	9.2	11.6	8.9	11.9	14.3	16.5	
CM71M	M_{max} [Nm]		7.2	9.3	11.9	9.0	12.2	15.1	19.1	21.5
CM71L	M_{max} [Nm]			9.5	12.2	9.2	12.6	15.9	21.0	26.2
CM90S	M_{max} [Nm]				12.0	9.0	12.4	15.7	21.2	27.4
CM90M	M_{max} [Nm]						11.8	15.0	20.4	26.6
CM90L	M_{max} [Nm]								20.7	27.3
CM112S	M_{max} [Nm]								22.2	29.3
CM112M	M_{max} [Nm]									28.2

Motor		MOVIDRIVE® MDX61B...-5_3 (AC 400/500 V units) in SERVO operating modes (P700)								
		0075	0110	0150	0220	0300	0370	0450	0550	0750
CM71L	M_{max} [Nm]	30.8	31.5							
CM90S	M_{max} [Nm]	34.0	39.2							
CM90M	M_{max} [Nm]	33.7	47.8	51.6						
CM90L	M_{max} [Nm]	34.7	51.1	65.6	75.6					
CM112S	M_{max} [Nm]	37.4	54.8	69.8	81.9					
CM112M	M_{max} [Nm]	36.2	54.0	70.7	95.7	108.0				
CM112L	M_{max} [Nm]	35.8	53.9	71.6	101.0	126.9	147.4	156.8		
CM112H	M_{max} [Nm]		56.6	75.7	108.6	139.9	167.0	197.1	223.2	237.0

3. Rated speed n_N = 4500 1/min:

Motor		MOVIDRIVE® MDX61B...-5_3 (AC 400/500 V units) in SERVO operating modes (P700)							
		0005	0008	0011	0014	0015	0022	0030	0040
DS56M	M_{max} [Nm]	2.4	2.8	3.6	3.8	3.5	3.8		
DS56L	M_{max} [Nm]	3.3	4.0	5.1	6.4	4.9	6.6	7.6	
DS56H	M_{max} [Nm]	4.0	4.8	6.2	7.9	6.0	8.2	10.3	13.7
CM71S	M_{max} [Nm]			6.3	8.1	6.1	8.3	10.4	13.4
CM71M	M_{max} [Nm]				7.9	5.9	8.1	10.2	13.6
CM71L	M_{max} [Nm]						8.2	10.4	14.0
CM90S	M_{max} [Nm]							10.4	14.1
CM90M	M_{max} [Nm]								14.0

Motor		MOVIDRIVE® MDX61B...-5_3 (AC 400/500 V units) in SERVO operating modes (P700)											
		0055	0075	0110	0150	0220	0300	0370	0450	0550	0750	0900	1100
DS56H	M_{max} [Nm]	15.2											
CM71S	M_{max} [Nm]	16.1	16.5										
CM71M	M_{max} [Nm]	17.1	20.3	21.3									
CM71L	M_{max} [Nm]	18.1	22.5	30.3	31.2								
CM90S	M_{max} [Nm]	18.4	23.4	33.6	39.2								
CM90M	M_{max} [Nm]	18.4	23.5	34.6	44.5	52.1							
CM90L	M_{max} [Nm]	18.2	23.3	34.7	45.8	63.4	75.0						
CM112S	M_{max} [Nm]	19.5	25.0	37.4	49.2	67.5	81.9						
CM112M	M_{max} [Nm]		24.6	37.1	49.4	69.6	87.4	101.5	108.0				
CM112L	M_{max} [Nm]			35	46.8	67.2	86.9	104.1	123.5	140.7	156.8		
CM112H	M_{max} [Nm]					70.9	92.5	112.1	135.5	157.7	189.4	231.6	237.0

4. Rated speed n_N = 6000 1/min:

Motor		MOVIDRIVE® MDX61B...-5_3 (AC 400/500 V units) in SERVO operating modes (P700)															
		0005	0008	0011	0014	0015	0022	0030	0040	0055	0075	0110	0150	0220	0300	0370	0450
DS56M	M_{max} [Nm]	2.4	2.8	3.6	3.8	3.5	3.8										
DS56L	M_{max} [Nm]	2.9	3.5	4.5	5.7	4.3	5.8	7.3	7.6								
DS56H	M_{max} [Nm]			4.7	6.0	4.5	6.2	7.9	10.5	13.6	15.1						
CM71S	M_{max} [Nm]				6.1	4.6	6.3	8.0	10.6	13.3	15.8	16.5					
CM71M	M_{max} [Nm]						6.2	7.9	10.6	13.7	16.8	21.3					
CM71L	M_{max} [Nm]							8.0	10.8	14.1	17.9	25.2	30.7	31.4			
CM90S	M_{max} [Nm]								10.8	14.2	18.1	26.6	34.2	39.4			
CM90M	M_{max} [Nm]									13.7	17.5	26.1	34.3	46.9	51.9		
CM90L	M_{max} [Nm]										17.1	25.6	33.9	48.0	60.9	71.3	75.2

DS/CM motor selection (AC 230 V system voltage)

1. Rated speed n_N = 2000 1/min:

Motor		MOVIDRIVE® MDX61B...-2_3 (AC 230 V units) in 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]	13.1	15.1	21.4						
CM71L	M_{max} [Nm]	14.0	16.3	25.6	31.3					
CM90S	M_{max} [Nm]	13.8	16.2	26.8	38.0	39.6				
CM90M	M_{max} [Nm]	13.1	15.4	25.8	38.2	48.1	52.0			
CM90L	M_{max} [Nm]		15.8	26.6	40.0	51.9	70.9	74.9		
CM112S	M_{max} [Nm]			28.3	42.7	55.1	74.7	81.9		
CM112M	M_{max} [Nm]			27.4	41.6	54.6	76.8	94.4	108.0	
CM112L	M_{max} [Nm]				41.7	55.0	79.2	100.2	139.3	156.8
CM112H	M_{max} [Nm]					56.6	82.2	105.5	153	177.9

2. Rated speed n_N = 3000 1/min:

Motor		MOVIDRIVE® MDX61B...-2_3 (AC 230 V units) in SERVO operating modes (P700)								
		0015	0022	0037	0055	0075	0110	0150	0220	0300
DS56M	M_{max} [Nm]	3.8								
DS56L	M_{max} [Nm]	7.6								
DS56H	M_{max} [Nm]	9.2	10.7	15.3						
CM71S	M_{max} [Nm]	9.1	10.6	15.8	16.5					
CM71M	M_{max} [Nm]	9.3	10.9	17.2	21.5					
CM71L	M_{max} [Nm]	9.4	11.0	18.2	25.8	31.0	31.4			
CM90S	M_{max} [Nm]	9.5	11.2	18.7	27.7	35.1	39.5			
CM90M	M_{max} [Nm]			18.1	27.2	35.3	48.4	52.2		
CM90L	M_{max} [Nm]			17.9	27.1	35.5	50.5	63.1	75.2	
CM112S	M_{max} [Nm]			18.8	28.7	37.7	53.4	66.3	81.9	
CM112M	M_{max} [Nm]				29.1	38.4	55.3	69.9	97.0	108.0
CM112L	M_{max} [Nm]					40.6	58.9	75.4	108.8	125.9
CM112H	M_{max} [Nm]						58.4	75.3	111.1	131.1

3. Rated speed n_N = 4500 1/min:

Motor		MOVIDRIVE® MDX61B...-2_3 (AC 230 V units) in SERVO operating modes (P700)								
		0015	0022	0037	0055	0075	0110	0150	0220	0300
DS56M	M_{max} [Nm]	3.8								
CM71S	M_{max} [Nm]	6.4	7.5	12.1	16.3	16.5				
CM71M	M_{max} [Nm]	6.3	7.4	12.2	17.4	21.0	21.4			
CM71L	M_{max} [Nm]		7.2	12.1	17.9	22.8	29.9	31.3		
CM90S	M_{max} [Nm]			12.6	19.0	24.8	34.4	39.6		
CM90M	M_{max} [Nm]			12.1	18.3	24.1	34.3	42.8	52.0	
CM90L	M_{max} [Nm]				17.7	23.4	33.7	42.9	61.4	70.5
CM112S	M_{max} [Nm]				20.0	26.5	38.2	48.6	68.3	77.7
CM112M	M_{max} [Nm]					24.8	36.1	46.3	67.4	78.5

4. Rated speed n_N = 6000 1/min:

Motor		MOVIDRIVE® MDX61B...-2_3 (AC 230 V units) in SERVO operating modes (P700)								
		0015	0022	0037	0055	0075	0110	0150	0220	0300
CM71S	M_{max} [Nm]	4.7	5.6	9.2	13.2	15.9	16.6			
CM71M	M_{max} [Nm]	5.0	5.9	9.9	14.6	18.2	21.4			
CM71L	M_{max} [Nm]			9.6	14.5	18.7	25.6	30.3	31.4	
CM90S	M_{max} [Nm]			10.2	15.4	20.1	28.5	35.3	39.4	
CM90M	M_{max} [Nm]				12.9	17.0	24.5	31.2	44.3	50.6
CM90L	M_{max} [Nm]					17.9	25.9	33.1	48.3	56.5

CMD motor table

Characteristic values at V_{max} = AC 400 V

n_N [1/min]	Motor	M_0 [Nm]	I_0 [A]	I_{max} [A]	Mass moment of inertia J_M [10^{-4} kgm^2]
1200	**CMD93S**	2.4	1.55	8.1	1.16
	CMD93M	4.2	2.5	16.2	2.25
	CMD93L	6.0	3.5	22.9	3.35
	CMD138S	6.7	3.9	13.2	6.5
	CMD138M	12.1	5.5	25.5	12.4
	CMD138L	16.5	8	40.2	18.1
2000	**CMD138S**	6.7	7.4	24.9	6.5
	CMD138M	12.1	11.4	53.0	12.4
	CMD138L	16.5	15.1	75.7	18.1
3000	**CMD70S**	0.7	1.04	5.8	0.21
	CMD70M	1.1	1.36	7.9	0.4
	CMD70L	1.9	1.96	17.7	0.76
	CMD93S	2.4	2.32	12.2	1.16
	CMD93M	4.2	3.6	23.2	2.25
	CMD93L	6.0	6	39.7	3.35
4500	**CMD55S**	0.25	0.7	4.1	0.076
	CMD56M	0.45	0.95	6.1	0.15
	CMD56L	0.9	1.5	12.2	0.3

CMD motor selection (AC 400 V system voltage)

1. Rated speed n_N = 1200 1/min:

Motor		MOVIDRIVE® MDX61B...-5_3 (AC 400 V units) in SERVO operating modes (P700)											
		0005	0008	0011	0014	0015	0022	0030	0040	0055	0075	0110	0150
CMD93S	M_{max} [Nm]	5.8	6.7	8.1	10	7.9	10						
CMD93M	M_{max} [Nm]		8.2	10.5	13.3	10.2	13.6	16.6	20.6	22			
CMD93L	M_{max} [Nm]			10.5	13.5	10.1	14.0	17.6	23.1	28.6	33		
CMD138S	M_{max} [Nm]				12.5	9.8	12.8	15.2	17				
CMD138M	M_{max} [Nm]							21.9	27.9	33.3	37.8	39	
CMD138L	M_{max} [Nm]									36.8	45.0	59	62

2. Rated speed n_N = 2000 1/min:

Motor		MOVIDRIVE® MDX61B...-5_3 (AC 400 V units) in SERVO operating modes (P700)						
		0040	0055	0075	0110	0150	0220	0300
CMD138S	M_{max} [Nm]	11.9	14.7	17				
CMD138M	M_{max} [Nm]			23.7	31.8	37.2	38.8	
CMD138L	M_{max} [Nm]				37.4	47.1	59.6	62

3. Rated speed n_N = 3000 1/min:

Motor		MOVIDRIVE® MDX61B...-5_3 (AC 400 V units) in SERVO operating modes (P700)											
		0005	0008	0011	0014	0015	0022	0030	0040	0055	0075	0110	0150
CMD70S	M_{max} [Nm]	2.2	2.5	3									
CMD70M	M_{max} [Nm]	3.2	3.7	4.5	5.2	4.4	5						
CMD70L	M_{max} [Nm]	3.8	4.5	5.8	7.4	5.7	7.6	9.1	10.6	11			
CMD93S	M_{max} [Nm]		4.8	6.0	7.3	5.8	7.5	8.8	10				
CMD93M	M_{max} [Nm]				9.5	7.2	9.8	12.3	15.9	19.5	22		
CMD93L	M_{max} [Nm]								13.9	18.1	22.5	30.7	33

4 Rated speed n_N = 4500 1/min:

Motor		MOVIDRIVE® MDX61B...-5_3 (AC 400 V units) in SERVO operating modes (P700)							
		0005	0008	0011	0014	0015	0022	0030	0040
CMD55S	M_{max} [Nm]	1.2							
CMD55M	M_{max} [Nm]	1.8	2	2.3					
CMD55L	M_{max} [Nm]	2.5	2.9	3.7	4.5	3.6	4.6	5.4	6

CMP motor table

Characteristic values at V_{max} = AC 400 V

n_N [1/min]	Motor	Without forced cooling fan		With forced cooling fan		I_{max} [A]	Mass moment of inertia J_M	
		M_0 [Nm]	I_0 [A]	M_{0_VR} [Nm]	I_{0_VR} [A]		without brake [10^{-4} kgm^2]	with brake
3000	**CMP40S**	0.5	1.2	-	-	6.1	0.104	0.132
	CMP40M	0.8	0.95	-	-	6.0	0.148	0.176
	CMP50S	1.3	0.96	1.7	1.25	5.1	0.415	0.481
	CMP50M	2.4	1.68	3.5	2.45	9.6	0.667	0.733
	CMP50L	3.3	2.2	4.8	3.2	13.6	0.919	0.985
	CMP63S	2.9	2.15	4	3	12.9	1.148	1.489
	CMP63M	5.3	3.6	7.5	5.1	21.6	1.919	2.260
	CMP63L	7.1	4.95	10.3	7.2	29.7	2.689	3.030
4500	**CMP40S**	0.5	1.2	-	-	6.1	0.104	0.132
	CMP40M	0.8	0.95	-	-	6	0.148	0.176
	CMP50S	1.3	1.32	1.7	1.7	7	0.415	0.481
	CMP50M	2.4	2.3	3.5	3.35	13.1	0.667	0.733
	CMP50L	3.3	3.15	4.8	4.6	19.5	0.919	0.985
	CMP63S	2.9	3.05	4	4.2	18.3	1.148	1.489
	CMP63M	5.3	5.4	7.5	7.6	32.4	1.919	2.260
	CMP63L	7.1	6.9	10.3	10	41.4	2.689	3.030
6000	**CMP40S**	0.5	1.2	-	-	6.1	0.104	0.132
	CMP40M	0.8	1.1	-	-	6.9	0.148	0.176
	CMP50S	1.3	1.7	1.7	2.2	9	0.415	0.481
	CMP50M	2.4	3	3.5	4.4	17.1	0.667	0.733
	CMP50L	3.3	4.2	4.8	6.1	26	0.919	0.985
	CMP63S	2.9	3.9	4	5.4	23.4	1.148	1.489
	CMP63M	5.3	6.9	7.5	9.8	41.4	1.919	2.260
	CMP63L	7.1	9.3	10.3	13.5	55.8	2.689	3.030

CMP motor selection (AC 400 V system voltage)

1. Rated speed n_N = 3000 1/min:

Motor		MOVIDRIVE® MDX61B...-5_3 (AC 400 V units) in SERVO operating modes (P700)										
		0005	0008	0011	0014	0015	0022	0030	0040	0055	0075	0110
CMP40S	M_{max} [Nm]	1.5	1.7	1.9		1.9	1.9					
CMP40M	M_{max} [Nm]	3.0	3.3	3.8		3.8						
CMP50S	M_{max} [Nm]	4.5	5.0	5.2		5.2						
CMP50M	M_{max} [Nm]	5.4	6.3	7.7	9.3	7.6	9.4	10.3				
CMP50L	M_{max} [Nm]	5.9	6.9	8.7	10.7	8.4	11.0	13.1	15.4			
CMP63S	M_{max} [Nm]	5.2	6.0	7.3	8.7	7.1	8.8	10.1	11.1			
CMP63M	M_{max} [Nm]	6.0	7.1	8.9	11.1	8.7	11.3	13.7	17.0	20.0	21.4	
CMP63L	M_{max} [Nm]			9.0	11.3	8.7	11.6	14.4	18.6	23.0	27.0	30.4

2. Rated speed n_N = 4500 1/min:

Motor		MOVIDRIVE® MDX61B...-5_3 (AC 400 V units) in SERVO operating modes (P700)											
		0005	0008	0011	0014	0015	0022	0030	0040	0055	0075	0110	0150
CMP40S	M_{max} [Nm]	1.5	1.7	1.9		1.9	1.9						
CMP40M	M_{max} [Nm]	3.0	3.3	3.8		3.8							
CMP50S	M_{max} [Nm]	3.5	4.1	4.8	5.2	4.7	5.2						
CMP50M	M_{max} [Nm]	4.1	4.8	6.0	7.4	5.9	7.6	9.0	10.3				
CMP50L	M_{max} [Nm]	4.2	5.0	6.3	7.9	6.1	8.2	10.0	12.7	15.1	15.4		
CMP63S	M_{max} [Nm]	3.8	4.5	5.6	6.8	5.4	7.0	8.2	9.9	11.1			
CMP63M	M_{max} [Nm]			6.2	7.8	6.0	8.0	9.9	12.7	15.6	18.3	21.4	
CMP63L	M_{max} [Nm]				8.3	6.4	8.6	10.7	14.1	17.8	21.6	28.2	30.4

3. Rated speed n_N = 6000 1/min:

Motor		MOVIDRIVE® MDX61B...-5_3 (AC 400 V units) in SERVO operating modes (P700)												
		0005	0008	0011	0014	0015	0022	0030	0040	0055	0075	0110	0150	0220
CMP40S	M_{max} [Nm]	1.5	1.7	1.9		1.9	1.9							
CMP40M	M_{max} [Nm]	2.6	3.0	3.6	3.8	3.5	3.8							
CMP50S	M_{max} [Nm]	2.9	3.3	4.1	4.8	4.0	4.9	5.2						
CMP50M	M_{max} [Nm]		3.8	4.8	6.0	4.6	6.1	7.4	9.2	10.3				
CMP50L	M_{max} [Nm]		3.8	4.8	6.1	4.7	6.3	7.8	10.2	12.5	14.7	15.4		
CMP63S	M_{max} [Nm]		3.6	4.5	5.6	4.4	5.8	6.9	8.6	10.0	11.1			
CMP63M	M_{max} [Nm]				6.3	4.8	6.5	8.0	10.4	13.0	15.6	20.0	21.4	
CMP63L	M_{max} [Nm]						6.5	8.1	10.8	13.8	17.0	23.3	28.1	30.4

4 Index of Changes

4.1 Changes compared to the previous version

The following section lists the changes made to the individual sections from edition 06/2005, publication number 11324015.

System description

- New options have been included in the subsection "System overview."

Technical data and dimension drawings

- All the tightening torques according to EN 61800-5-1 have been included in the catalog.
- The following subsections have been included in this section:
  - "DWE11B/12B interface adapter option"
  - "PROFINET IO RT type DFE12B fieldbus interface option"
  - "EtherNet/IP DFE13B fieldbus interface option"
  - "MOVI-PLC® basic DHP11B controller option"
  - "Option OST11B"
- The subsection "MOVIDRIVE® MDR60A regenerative power supply units" has been completely revised.
- The DBG60B-04 design has been included in the subsection "DBG60B keypad option."
- The trip currents I_F have been updated in the subsection "BW.. braking resistors" The braking resistors BW...-P have been included.
- Type ND030-023 has been included in the subsection "ND.. line chokes." The dimension drawing for the line choke types ND150..., ND200... and ND300... has been included.
- The dimension drawing for the HD004 output choke has been revised in the subsection "HD... output chokes."
- The dimension drawings have been revised in the subsection "HF.. output filters."
- The motor connection cable for CMP motors has been included in the subsection "Prefabricated cables."

Motor selection

- The motor tables have been revised in the subsection "Motor selection for asynchronous servomotors (CFC)." The motor/inverter assignments have been updated.
- The motor data for the CMP motors and the accompanying motor/inverter assignments have been included.

5 Index

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Service Competence Center	**Central** Gear units / Motors	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 D-76676 Graben-Neudorf	Tel. +49 7251 75-1710 Fax +49 7251 75-1711 sc-mitte-gm@sew-eurodrive.de
	Central Electronics	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 D-76646 Bruchsal	Tel. +49 7251 75-1780 Fax +49 7251 75-1769 sc-mitte-e@sew-eurodrive.de
	North	SEW-EURODRIVE GmbH & Co KG Alte Ricklinger Straße 40-42 D-30823 Garbsen (near Hannover)	Tel. +49 5137 8798-30 Fax +49 5137 8798-55 sc-nord@sew-eurodrive.de
	East	SEW-EURODRIVE GmbH & Co KG Dänkritzer Weg 1 D-08393 Meerane (near Zwickau)	Tel. +49 3764 7606-0 Fax +49 3764 7606-30 sc-ost@sew-eurodrive.de
	South	SEW-EURODRIVE GmbH & Co KG Domagkstraße 5 D-85551 Kirchheim (near München)	Tel. +49 89 909552-10 Fax +49 89 909552-50 sc-sued@sew-eurodrive.de
	West	SEW-EURODRIVE GmbH & Co KG Siemensstraße 1 D-40764 Langenfeld (near Düsseldorf)	Tel. +49 2173 8507-30 Fax +49 2173 8507-55 sc-west@sew-eurodrive.de
	Drive Service Hotline / 24 Hour Service		+49 180 5 SEWHELP +49 180 5 7394357
Technical Offices	**Augsburg**	SEW-EURODRIVE GmbH & Co KG August-Wessels-Straße 29 D-86156 Augsburg	Tel. +49 821 22779-10 Fax +49 821 22779-50 tb-augsburg@sew-eurodrive.de
	Berlin	SEW-EURODRIVE GmbH & Co KG Lilienthalstraße 3a D-12529 Schönefeld	Tel. +49 33762 2266-30 Fax +49 33762 2266-36 tb-berlin@sew-eurodrive.de
	Bodensee	SEW-EURODRIVE GmbH & Co KG Burgbergring 91 D-88662 Überlingen	Tel. +49 7551 9226-30 Fax +49 7551 9226-56 tb-bodensee@sew-eurodrive.de
	Bremen	SEW-EURODRIVE GmbH & Co KG Kohlhökerstr.48 D-28203 Bremen	Tel. +49 421 33918-0 Fax +49 421 33918-22 tb-bremen@sew-eurodrive.de
	Dortmund	SEW-EURODRIVE GmbH & Co KG Hildastraße 10 D-44145 Dortmund	Tel. +49 231 912050-10 Fax +49 231 912050-20 tb-dortmund@sew-eurodrive.de
	Dresden	SEW-EURODRIVE GmbH & Co KG Hauptstraße 32 D-01445 Radebeul	Tel. +49 351 26338-0 Fax +49 351 26338-38 tb-dresden@sew-eurodrive.de
	Erfurt	SEW-EURODRIVE GmbH & Co KG Blumenstraße 70 D-99092 Erfurt	Tel. +49 361 21709-70 Fax +49 361 21709-79 tb-erfurt@sew-eurodrive.de
	Güstrow	SEW-EURODRIVE GmbH & Co KG Thünenweg 19 D-18273 Güstrow P.O. Box Postfach 1216 • D-18262 Güstrow	Tel. +49 3843 8557-80 Fax +49 3843 8557-88 tb-guestrow@sew-eurodrive.de

Germany			
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	Hannover/ Garbsen	SEW-EURODRIVE GmbH & Co KG Alte Ricklinger Str.40-42 D-30823 Garbsen P.O. Box Postfach 1104 53 • D-30804 Garbsen	Tel. +49 5137 8798-10 Fax +49 5137 8798-50 tb-hannover@sew-eurodrive.de
	Heilbronn	SEW-EURODRIVE GmbH & Co KG Zeppelinstraße 7 D-74357 Bönnigheim P.O. Box Postfach 68 • D-74355 Bönnigheim	Tel. +49 7143 8738-0 Fax +49 7143 8738-25 tb-heilbronn@sew-eurodrive.de
	Herford	SEW-EURODRIVE GmbH & Co KG Radewiger Straße 21 D-32052 Herford P.O. Box Postfach 4108 • D-32025 Herford	Tel. +49 5221 9141-0 Fax +49 5221 9141-20 tb-herford@sew-eurodrive.de
	Karlsruhe	SEW-EURODRIVE GmbH & Co KG Ettlinger Weg 2 D-76467 Bietigheim P.O. Box Postfach 43 • D-76463 Bietigheim	Tel. +49 7245 9190-10 Fax +49 7245 9190-20 tb-karlsruhe@sew-eurodrive.de
	Kassel	SEW-EURODRIVE GmbH & Co KG Lange Straße 14 D-34253 Lohfelden	Tel. +49 561 95144-80 Fax +49 561 95144-90 tb-kassel@sew-eurodrive.de
	Koblenz	SEW-EURODRIVE GmbH & Co KG Bahnstraße 17a D-56743 Mendig	Tel. +49 2652 9713-30 Fax +49 2652 9713-40 tb-koblenz@sew-eurodrive.de
	Lahr	SEW-EURODRIVE GmbH & Co KG Europastraße 3 D-77933 Lahr / Schwarzwald	Tel. +49 7821 90999-60 Fax +49 7821 90999-79 tb-lahr@sew-eurodrive.de
	Langenfeld	SEW-EURODRIVE GmbH & Co KG Siemensstraße 1 D-40764 Langenfeld	Tel. +49 2173 8507-10 Fax +49 2173 8507-50 tb-langenfeld@sew-eurodrive.de
	Magdeburg	SEW-EURODRIVE GmbH & Co KG Burgstraße 7 D-39326 Wolmirstedt	Tel. +49 39201 7004-1 Fax +49 39201 7004-9 tb-magdeburg@sew-eurodrive.de
	Mannheim	SEW-EURODRIVE GmbH & Co KG Radeberger Straße 2 D-68309 Mannheim	Tel. +49 621 71683-10 Fax +49 621 71683-22 tb-mannheim@sew-eurodrive.de
	München	SEW-EURODRIVE GmbH & Co KG Domagkstraße 5 D-85551 Kirchheim	Tel. +49 89 909551-10 Fax +49 89 909551-50 tb-muenchen@sew-eurodrive.de
	Münster	SEW-EURODRIVE GmbH & Co KG Von-Vincke-Straße 14 D-48143 Münster	Tel. +49 251 41475-11 Fax +49 251 41475-50 tb-muenster@sew-eurodrive.de
	Nürnberg	SEW-EURODRIVE GmbH & Co KG Plattenäckerweg 6 D-90455 Nürnberg	Tel. +49 911 98884-50 Fax +49 911 98884-60 tb-nuernberg@sew-eurodrive.de
	Regensburg	SEW-EURODRIVE GmbH & Co KG Im Gewerbepark A15 D-93059 Regensburg	Tel. +49 941 46668-68 Fax +49 941 46668-66 tb-regensburg@sew-eurodrive.de
	Rhein-Main	SEW-EURODRIVE GmbH & Co KG Niederstedter Weg 5 D-61348 Bad Homburg	Tel. +49 6172 9617-0 Fax +49 6172 9617-50 tb-rheinmain@sew-eurodrive.de
	Stuttgart	SEW-EURODRIVE GmbH & Co KG Friedrich-List-Straße 46 D-70771 Leinfelden-Echterdingen	Tel. +49 711 16072-0 Fax +49 711 16072-72 tb-stuttgart@sew-eurodrive.de
	Ulm	SEW-EURODRIVE GmbH & Co KG Dieselstraße 14 D-89160 Dornstadt	Tel. +49 7348 9885-0 Fax +49 7348 9885-90 tb-ulm@sew-eurodrive.de

Germany			
	Würzburg	SEW-EURODRIVE GmbH & Co KG Nürnbergerstraße 118 D-97076 Würzburg-Lengfeld	Tel. +49 931 27886-60 Fax +49 931 27886-66 tb-wuerzburg@sew-eurodrive.de
	Zwickau / Meerane	SEW-EURODRIVE GmbH & Co KG Dänkritzer Weg1 D-08393 Meerane	Tel. +49 3764 7606-0 Fax +49 3764 7606-20 tb-zwickau@sew-eurodrive.de

France			
Production Sales Service	**Haguenau**	SEW-USOCOME 48-54, route de Soufflenheim B. P. 20185 F-67506 Haguenau Cedex	Tel. +33 3 88 73 67 00 Fax +33 3 88 73 66 00 http://www.usocome.com sew@usocome.com
Assembly Sales Service	**Bordeaux**	SEW-USOCOME Parc d'activités de Magellan 62, avenue de Magellan - B. P. 182 F-33607 Pessac Cedex	Tel. +33 5 57 26 39 00 Fax +33 5 57 26 39 09
	Lyon	SEW-USOCOME Parc d'Affaires Roosevelt Rue Jacques Tati F-69120 Vaulx en Velin	Tel. +33 4 72 15 37 00 Fax +33 4 72 15 37 15
	Paris	SEW-USOCOME Zone industrielle 2, rue Denis Papin F-77390 Verneuil l'Etang	Tel. +33 1 64 42 40 80 Fax +33 1 64 42 40 88
Technical Offices	**Alsace Franche-Comté**	SEW-USOCOME 1, rue Auguste Gasser F-68360 Soultz	Tel. +33 3 89 74 51 62 Fax +33 3 89 76 58 71
	Alsace Nord	SEW-USOCOME 15, rue Mambourg F-68240 Sigolsheim	Tel. +33 3 89 78 45 11 Fax +33 3 89 78 45 12
	Aquitaine	SEW-USOCOME Parc d'activités de Magellan 62, avenue de Magellan B.P.182 F-33607 Pessac Cedex	Tel. +33 5 57 26 39 00 Fax +33 5 57 26 39 09
	Ardennes Lorraine	SEW-USOCOME 7, rue de Prény F-54000 Nancy	Tel. +33 3 83 96 28 04 Fax +33 3 83 96 28 07
	Bourgogne	SEW-USOCOME 10, rue de la Poste F-71350 Saint Loup Géanges	Tel. +33 3 85 49 92 18 Fax +33 3 85 49 92 19
	Bretagne Ouest	SEW-USOCOME 4, rue des Châtaigniers F-44830 Brains	Tel. +33 2 51 70 54 04 Fax +33 2 51 70 54 05
	Centre Auvergne	SEW-USOCOME 27, avenue du Colombier F-19150 Laguenne	Tel. +33 5 55 20 12 10 Fax +33 5 55 20 12 11
	Centre Pays de Loire	SEW-USOCOME 9, rue des Erables F-37540 Saint Cyr sur Loire	Tel. +33 2 47 41 33 23 Fax +33 2 47 41 34 03
	Champagne	SEW-USOCOME 2, chemin des Suivots F-10120 Saint André les Vergers	Tel. +33 3 25 79 63 24 Fax +33 3 25 79 63 25
	Lyon Nord-Est	SEW-USOCOME Parc d'Affaires Roosevelt Rue Jacques Tati F-69120 Vaulx en Velin	Tel. +33 4 72 15 37 03 Fax +33 4 72 15 37 15
	Lyon Ouest	SEW-USOCOME Parc d'Affaires Roosevelt Rue Jacques Tati F-69120 Vaulx en Velin	Tel. +33 4 72 15 37 04 Fax +33 4 72 15 37 15
	Lyon Sud-Est	SEW-USOCOME Montée de la Garenne F-26750 Génissieux	Tel. +33 4 75 05 65 95 Fax +33 4 75 05 65 96

France			
	Nord	SEW-USOCOME 348, rue du Calvaire F-59213 Bermerain Cidex 102	Tel. +33 3 27 27 07 88 Fax +33 3 27 27 24 41
	Normandie	SEW-USOCOME 5 rue de la Limare F-14250 Brouay	Tel. +33 2 31 37 92 86 Fax +33 2 31 74 68 15
	Paris Est	SEW-USOCOME Résidence Le Bois de Grâce 2, allée des Souches Vertes F-77420 Champs sur Marne	Tel. +33 1 64 68 40 50 Fax +33 1 64 68 45 00
	Paris Ouest	SEW-USOCOME 42 avenue Jean Jaurès F-78580 Maule	Tel. +33 1 30 90 89 86 Fax +33 1 30 90 93 15
	Paris Picardie	SEW-USOCOME 25 bis, rue Kléber F-92300 Levallois Perret	Tel. +33 1 41 05 92 74 Fax +33 1 41 05 92 75
	Paris Sud	SEW-USOCOME 6. chemin des Bergers Lieu-dit Marchais F-91410 Roinville sous Dourdan	Tel. +33 1 60 81 10 56 Fax +33 1 60 81 10 57
	Provence	SEW-USOCOME Résidence Les Hespérides Bât. B2 67, boulevard des Alpes F-13012 Marseille	Tel. +33 4 91 18 00 11 Fax +33 4 91 18 00 12
	Pyrénées	SEW-USOCOME 271, Lieu-dit Ninaut F-31190 Caujac	Tel. +33 5 61 08 15 85 Fax +33 5 61 08 16 44
	Sud-Atlantique	SEW-USOCOME 12, rue des Pinsons F-44120 Vertou	Tel. +33 2 40 80 32 23 Fax +33 2 40 80 32 13

Algeria			
Sales	**Alger**	Réducom 16, rue des Frères Zaghnoun Bellevue El-Harrach 16200 Alger	Tel. +213 21 8222-84 Fax +213 21 8222-84

Argentina			
Assembly **Sales** **Service**	**Buenos Aires**	SEW EURODRIVE ARGENTINA S.A. Centro Industrial Garin, Lote 35 Ruta Panamericana Km 37,5 1619 Garin	Tel. +54 3327 4572-84 Fax +54 3327 4572-21 sewar@sew-eurodrive.com.ar

Australia			
Assembly **Sales** **Service**	**Melbourne**	SEW-EURODRIVE PTY. LTD. 27 Beverage Drive Tullamarine, Victoria 3043	Tel. +61 3 9933-1000 Fax +61 3 9933-1003 http://www.sew-eurodrive.com.au enquires@sew-eurodrive.com.au
	Sydney	SEW-EURODRIVE PTY. LTD. 9, Sleigh Place, Wetherill Park New South Wales, 2164	Tel. +61 2 9725-9900 Fax +61 2 9725-9905 enquires@sew-eurodrive.com.au
	Perth	SEW-EURODRIVE PTY. LTD. 105 Robinson Avenue Belmont, W.A. 6104	Tel. +61 8 9478-2688 Fax +61 8 9277-7572 enquires@sew-eurodrive.com.au
	Brisbane	SEW-EURODRIVE PTY.LTD. 1 /34 Collinsvale St Rocklea, Queensland, 4106	Tel. +61 7 3272-7900 Fax +61 7 3272-7901 enquires@sew-eurodrive.com.au
Technical Offices	**Adelaide**	SEW-EURODRIVE PTY. LTD. Unit 1/601 Anzac Highway Glenelg, S.A. 5045	Tel. +61 8 8294-8277 Fax +61 8 8294-2893 enquires@sew-eurodrive.com.au
	Townsville	SEW-EURODRIVE PTY. LTD. 12 Leyland Street Garbutt, QLD 4814	Tel. +61 7 4779 4333 Fax +61 7 4779 5333 enquires@sew-eurodrive.com.au

Austria			
Assembly **Sales** **Service**	**Wien**	SEW-EURODRIVE Ges.m.b.H. Richard-Strauss-Strasse 24 A-1230 Wien	Tel. +43 1 617 55 00-0 Fax +43 1 617 55 00-30 http://sew-eurodrive.at sew@sew-eurodrive.at
Technical Offices	**Linz**	SEW-EURODRIVE Ges.m.b.H. Reuchlinstr. 6/3 A-4020 Linz	Tel. +43 732 655 109-0 Fax +43 732 655 109-20 tb-linz@sew-eurodrive.at
	Graz	SEW-EURODRIVE Ges.m.b.H. Grabenstraße 231 A-8045 Graz	Tel. +43 316 685 756-0 Fax +43 316 685 755 tb-graz@sew-eurodrive.at
	Dornbirn	SEW-EURODRIVE Ges.m.b.H. Lustenauerstraße 27/1 A-6850 Dornbirn	Tel. +43 5572 3725 99-0 Fax +43 5572 3725 99-20 tb-dornbirn@sew-eurodrive.at

Bangladesh			
Sales	**Dhaka**	Triangle Trade International Bldg-5, Road-2, Sec-3, Uttara Model Town Dhaka-1230 Bangladesh	Tel. +880 2 8912246 Fax +880 2 8913344

Belgium			
Assembly **Sales** **Service**	**Brüssel**	SEW Caron-Vector S.A. Avenue Eiffel 5 B-1300 Wavre	Tel. +32 10 231-311 Fax +32 10 231-336 http://www.caron-vector.be info@caron-vector.be
Technical Office	**Vlaanderen**	SEW Caron-Vector S.A. Industrieweg 112-114 B-9032 Gent (Wondelgem)	Tel. +32 92 273-452 Fax +32 92 274-155

Bolivia			
Sales	**La Paz**	GRUPO LARCOS LTDA. Av. Jose Carrasco Not. 1398 Entre Hugo Estrada Y Av. Busch La Paz	Tel. +591 2 221808 Fax +591 2 220085 larcos@ceibo.entelnet.bo

Brazil			
Production **Sales** **Service**	**Sao Paulo**	SEW-EURODRIVE Brasil Ltda. Avenida Amâncio Gaiolli, 50 Caixa Postal: 201-07111-970 Guarulhos/SP - Cep.: 07251-250	Tel. +55 11 6489-9133 Fax +55 11 6480-3328 http://www.sew.com.br sew@sew.com.br
	Additional addresses for service in Brazil provided on request!		

Bulgaria			
Sales	**Sofia**	BEVER-DRIVE GmbH Bogdanovetz Str.1 BG-1606 Sofia	Tel. +359 2 9151160 Fax +359 2 9151166 bever@fastbg.net

Cameroon			
Sales	**Douala**	Electro-Services Rue Drouot Akwa B.P. 2024 Douala	Tel. +237 4322-99 Fax +237 4277-03

Canada			
Assembly **Sales** **Service**	**Toronto**	SEW-EURODRIVE CO. OF CANADA LTD. 210 Walker Drive Bramalea, Ontario L6T3W1	Tel. +1 905 791-1553 Fax +1 905 791-2999 http://www.sew-eurodrive.ca l.reynolds@sew-eurodrive.ca
	Vancouver	SEW-EURODRIVE CO. OF CANADA LTD. 7188 Honeyman Street Delta. B.C. V4G 1 E2	Tel. +1 604 946-5535 Fax +1 604 946-2513 b.wake@sew-eurodrive.ca
	Montreal	SEW-EURODRIVE CO. OF CANADA LTD. 2555 Rue Leger Street LaSalle, Quebec H8N 2V9	Tel. +1 514 367-1124 Fax +1 514 367-3677 a.peluso@sew-eurodrive.ca

Canada			
	Additional addresses for service in Canada provided on request!		

Chile			
Assembly **Sales** **Service**	**Santiago de Chile**	SEW-EURODRIVE CHILE LTDA. Las Encinas 1295 Parque Industrial Valle Grande LAMPA RCH-Santiago de Chile P.O. Box Casilla 23 Correo Quilicura - Santiago - Chile	Tel. +56 2 75770-00 Fax +56 2 75770-01 www.sew-eurodrive.cl ventas@sew-eurodrive.cl

China			
Production **Assembly** **Sales** **Service**	**Tianjin**	SEW-EURODRIVE (Tianjin) Co., Ltd. No. 46, 7th Avenue, TEDA Tianjin 300457	Tel. +86 22 25322612 Fax +86 22 25322611 gm-tianjin@sew-eurodrive.cn http://www.sew-eurodrive.com.cn
Assembly **Sales** **Service**	**Suzhou**	SEW-EURODRIVE (Suzhou) Co., Ltd. 333, Suhong Middle Road Suzhou Industrial Park Jiangsu Province, 215021 P. R. China	Tel. +86 512 62581781 Fax +86 512 62581783 suzhou@sew.com.cn
	Guangzhou	SEW-EURODRIVE (Guangzhou) Co., Ltd. No. 9, JunDa Road East Section of GETDD Guangzhou 510530 P. R. China	Tel. +86 20 82267890 Fax +86 20 82267891 sewguangzhou@sew.com.cn
	Shenyang	SEW-EURODRIVE (Shenyang) Co., Ltd. 10A-2, 6th Road Shenyang Economic Technological ¬Development Area Shenyang, 110141 P. R. China	Tel. +86 24 22521596 Fax +86 24 22521579 shenyang@sew.com.cn

Colombia			
Assembly **Sales** **Service**	**Bogotá**	SEW-EURODRIVE COLOMBIA LTDA. Calle 22 No. 132-60 Bodega 6, Manzana B Santafé de Bogotá	Tel. +57 1 54750-50 Fax +57 1 54750-44 http://www.sew-eurodrive.com.co sewcol@sew-eurodrive.com.co

Croatia			
Sales **Service**	**Zagreb**	KOMPEKS d. o. o. PIT Erdödy 4 II HR 10 000 Zagreb	Tel. +385 1 4613-158 Fax +385 1 4613-158 kompeks@net.hr

Czech Republic			
Sales	**Praha**	SEW-EURODRIVE CZ S.R.O. Business Centrum Praha Luzna 591 CZ-16000 Praha 6 - Vokovice	Tel. +420 220121234 Fax +420 220121237 http://www.sew-eurodrive.cz sew@sew-eurodrive.cz
Technical Offices	**Brno**	SEW-EURODRIVE CZ S.R.O. Krenova 52 CZ -60200 Brno	Tel. +420 543256151 + 543256163 Fax +420 543256845
	Hradec Kralove	SEW-EURODRIVE CZ S.R.O. Technicka Kancelar - vychodni Cechy Svermova CZ-53374 Horni Jeleni	Tel. +420 466673711 Fax +420 466673634
	Klatovy	SEW-EURODRIVE CZ S.R.O. Technical Office Klatovy Kollarova 528 CZ-33901 Klatovy 3	Tel. +420 376310729 Fax +420 376310725

Denmark			
Assembly **Sales** **Service**	**Kopenhagen**	SEW-EURODRIVEA/S Geminivej 28-30, P.O. Box 100 DK-2670 Greve	Tel. +45 43 9585-00 Fax +45 43 9585-09 http://www.sew-eurodrive.dk sew@sew-eurodrive.dk

Denmark			
Technical Offices	**Aarhus**	SEW-EURODRIVEA/S Birkenhaven 45 DK-8520 Lystrup	Tel. +45 86 2283-44 Fax +45 86 2284-90
	Helsingør	SEW-EURODRIVEA/S Rømøvej 2 DK-3140 Ålsgårde	Tel. +45 49 7557-00 Fax +45 49 7558-00
	Odense	SEW-EURODRIVEA/S Lindelyvei 29, Nr. Søby DK-5792 Arslev	Tel. +45 65 9020-70 Fax +45 65 9023-09

Egypt			
Sales **Service**	**Cairo**	Copam Egypt for Engineering & Agencies 33 El Hegaz ST, Heliopolis, Cairo	Tel. +20 2 2566-299 + 1 23143088 Fax +20 2 2594-757 http://www.copam-egypt.com/ copam@datum.com.eg

Estonia			
Sales	**Tallin**	ALAS-KUUL AS Mustamäe tee 24 EE-10620Tallin	Tel. +372 6593230 Fax +372 6593231 veiko.soots@alas-kuul.ee

Finland			
Assembly **Sales** **Service**	**Lahti**	SEW-EURODRIVE OY Vesimäentie 4 FIN-15860 Hollola 2	Tel. +358 201 589-300 Fax +358 3 780-6211 sew@sew.fi http://www.sew-eurodrive.fi
Technical Offices	**Helsinki**	SEW-EURODRIVE OY Luutnantinaukio 5C LT2 FIN-00410 Helsinki	Tel. +358 201 589-300 Fax + 358 9 5666-311 sew@sew.fi
	Vaasa	SEW-EURODRIVE OY Kauppapuistikko 11 E FIN-65100 Vaasa	Tel. +358 3 589-300 Fax +358 6 3127-470

Gabon			
Sales	**Libreville**	Electro-Services B.P. 1889 Libreville	Tel. +241 7340-11 Fax +241 7340-12

Great Britain			
Assembly **Sales** **Service**	**Normanton**	SEW-EURODRIVE Ltd. Beckbridge Industrial Estate P.O. Box No.1 GB-Normanton, West- Yorkshire WF6 1QR	Tel. +44 1924 893-855 Fax +44 1924 893-702 http://www.sew-eurodrive.co.uk info@sew-eurodrive.co.uk
Technical Offices	**London**	SEW-EURODRIVE Ltd. 764 Finchely Road, Temple Fortune GB-London N.W.11 7TH	Tel. +44 20 8458-8949 Fax +44 20 8458-7417
	Midlands	SEW-EURODRIVE Ltd. 5 Sugar Brook court, Aston Road, Bromsgrove, Worcs B60 3EX	Tel. +44 1527 877-319 Fax +44 1527 575-245
	Scotland	SEW-EURODRIVE Ltd. Scottish Office No 37 Enterprise House Springkerse Business Park GB-Stirling FK7 7UF Scotland	Tel. +44 17 8647-8730 Fax +44 17 8645-0223

Greece			
Sales **Service**	**Athen**	Christ. Boznos & Son S.A. 12, Mavromichali Street P.O. Box 80136, GR-18545 Piraeus	Tel. +30 2 1042 251-34 Fax +30 2 1042 251-59 http://www.boznos.gr info@boznos.gr

Greece			
Technical Office	**Thessaloniki**	Christ. Boznos & Son S.A. Maiandrou 15 562 24 Evosmos, Thessaloniki	Tel. +30 2 310 7054-00 Fax +30 2 310 7055-15 info@boznos.gr

Hong Kong			
Assembly **Sales** **Service**	**Hong Kong**	SEW-EURODRIVE LTD. Unit No. 801-806, 8th Floor Hong Leong Industrial Complex No. 4, Wang Kwong Road Kowloon, Hong Kong	Tel. +852 2 7960477 + 79604654 Fax +852 2 7959129 sew@sewhk.com

Hungary			
Sales **Service**	**Budapest**	SEW-EURODRIVE Kft. H-1037 Budapest Kunigunda u. 18	Tel. +36 1 437 06-58 Fax +36 1 437 06-50 office@sew-eurodrive.hu

Iceland			
Sales	**Reykjavik**	Vélaverk ehf. Bolholti 8, 3h. IS - 105 Reykjavik	Tel. +354 568 3536 Fax +354 568 3537 info@velaverk.is

India			
Assembly **Sales** **Service**	**Baroda**	SEW-EURODRIVE India Pvt. Ltd. Plot No. 4, Gidc Por Ramangamdi • Baroda - 391 243 Gujarat	Tel. +91 265 2831086 Fax +91 265 2831087 http://www.seweurodriveindia.com mdoffice@seweurodriveindia.com
Technical Offices	**Bangalore**	SEW-EURODRIVE India Private Limited 308, Prestige Centre Point 7, Edward Road Bangalore	Tel. +91 80 22266565 Fax +91 80 22266569 salesbang@seweurodriveinindia.com
	Calcutta	SEW EURODRIVE INDIA PVT. LTD. Juthika Apartment, Flat No. B1 11/1, Sunny Park Calcutta - 700 019	Tel. +91 33 24615820 Fax +91 33 24615826 sewcal@cal.vsnl.net.in
	Chennai	SEW-EURODRIVE India Private Limited F2, 1st Floor, Sarvamangala Indira New No. 67, Bazullah Road Chennai - 600 017	Tel. +91 44 28144461 Fax +91 44 28144463 saleschen@seweurodriveindia.com
	Hyderabad	SEW-EURODRIVE India Pvt. Limited 408, 4th Floor, Meridian Place Green Park Road Amerpeet Hyderabad	Tel. +91 40 23414698 Fax +91 40 23413884 saleshyd@seweurodriveindia.com
	Mumbai	SEW-EURODRIVE India Private Limited 312 A, 3rd Floor, Acme Plaza Andheri Kurla Road, Andheri (E) Mumbai	Tel. +91 22 28348440 Fax +91 22 28217858 salesmumbai@seweurodriveindia.com
	New Delhi	SEW-EURODRIVE India Private Limited 303 Kirti Deep, 2-Nangal Raya Business Centre New Delhi 110 046	Tel. +91 11 28521566 Fax +91 11 28521577 salesdelhi@seweurodriveindia.com
	Pune	SEW-EURODRIVE India Private Limited 206, Metro House 7 Mangaldas Road Pune 411001, Maharashtra	Tel. +91 20 26111054 Fax +91 20 26132337 salespune@seweurodriveindia.com

Indonesia			
Technical Office	**Jakarta**	SEW-EURODRIVE Pte Ltd. Jakarta Liaison Office, Menara Graha Kencana Jl. Perjuangan No. 88, LT 3 B, Kebun Jeruk, Jakarta 11530	Tel. +62 21 5359066 Fax +62 21 5363686

Ireland			
Sales **Service**	**Dublin**	Alperton Engineering Ltd. 48 Moyle Road Dublin Industrial Estate Glasnevin, Dublin 11	Tel. +353 1 830-6277 Fax +353 1 830-6458

Israel			
Sales	**Tel-Aviv**	Liraz Handasa Ltd. Ahofer Str 34B / 228 58858 Holon	Tel. +972 3 5599511 Fax +972 3 5599512 lirazhandasa@barak-online.net

Italy			
Assembly **Sales** **Service**	**Milano**	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Via Bernini,14 I-20020 Solaro (Milano)	Tel. +39 02 96 9801 Fax +39 02 96 799781 http://www.sew-eurodrive.it sewit@sew-eurodrive.it
Technical Offices	**Bologna**	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Via Emilia,172 I-40064 Ozzano dell'Emilia (Bo)	Tel. +39 051 796-660 Fax +39 051 796-595
	Caserta	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Viale Carlo III Km. 23,300 I-81020 S. Nicola la Strada (Caserta)	Tel. +39 0823 450611 Fax +39 0823 421414
	Firenze	RIMA Via Einstein, 14 I-50013 Campi Bisenzio (Firenze)	Tel. +39 055 898 58-21 Fax +39 055 898 58-30
	Pescara	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Via Emilia,172 I-40064 Ozzano dell'Emilia (Bo)	Tel. +39 051 796-660 Fax +39 051 796-595
	Torino	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Filiale Torino c.so Unione Sovietica 612/15 - int. C I-11035 Torino	Tel. +39 011 3473780 Fax +39 011 3473783
	Verona	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Via P. Sgulmero, 27/A I-37132 Verona	Tel. +39 045 97-7722 Fax +39 045 97-6079

Ivory Coast			
Sales	**Abidjan**	SICA Ste industrielle et commerciale pour l'Afrique 165, Bld de Marseille B.P. 2323, Abidjan 08	Tel. +225 2579-44 Fax +225 2584-36

Japan			
Assembly **Sales** **Service**	**Toyoda-cho**	SEW-EURODRIVE JAPAN CO., LTD 250-1, Shimoman-no, Iwata Shizuoka 438-0818	Tel. +81 538 373811 Fax +81 538 373814 sewjapan@sew-eurodrive.co.jp
Technical Offices	**Fukuoka**	SEW-EURODRIVE JAPAN CO., LTD. C-go, 5th-floor, Yakuin-Hiruzu-Bldg. 1-5-11, Yakuin, Chuo-ku Fukuoka, 810-0022	Tel. +81 92 713-6955 Fax +81 92 713-6860 sewkyushu@jasmine.ocn.ne.jp
	Osaka	SEW-EURODRIVE JAPAN CO., LTD. B-Space EIRAI Bldg., 3rd Floor 1-6-9 Kyoumachibori, Nishi-ku, Osaka, 550-0003	Tel. +81 6 6444--8330 Fax +81 6 6444--8338 sewosaka@crocus.ocn.ne.jp
	Tokyo	SEW-EURODRIVE JAPAN CO., LTD. Izumi-Bldg. 5 F 3-2-15 Misaki-cho Chiyoda-ku, Tokyo 101-0061	Tel. +81 3 3239-0469 Fax +81 3 3239-0943 sewtokyo@basil.ocn.ne.jp

Korea			
Assembly **Sales** **Service**	**Ansan-City**	SEW-EURODRIVE KOREA CO., LTD. B 601-4, Banweol Industrial Estate Unit 1048-4, Shingil-Dong Ansan 425-120	Tel. +82 31 492-8051 Fax +82 31 492-8056 http://www.sew-korea.co.kr master@sew-korea.co.kr

Korea			
	Busan	SEW-EURODRIVE KOREA Co., Ltd. No. 1720 - 11, Songjeong - dong Gangseo-ku Busan 618-270	Tel. +82 51 832-0204 Fax +82 51 832-0230 master@sew-korea.co.kr
Technical Offices	**Daegu**	SEW-EURODRIVE KOREA Co., Ltd. No.1108 Sungan officete l 87-36, Duryu 2-dong, Dalseo-ku Daegu 704-712	Tel. +82 53 650-7111 Fax +82 53 650-7112 sewdaegu@netsgo.com
	DaeJeon	SEW-EURODRIVE KOREA Co., Ltd. No. 2017, Hongin offictel 536-9, Bongmyung-dong, Yusung-ku Daejeon 305-301	Tel. +82 42 828-6461 Fax +82 42 828-6463 sewdaejeon@netsgo.com
	Kwangju	SEW-EURODRIVE KOREA Co., Ltd. 4fl., Shinhyun B/D 96-16 Unam-dong, Buk-ku Kwangju 500-170	Tel. +82 62 511-9172 Fax +82 62 511-9174 sewkwangju@netsgo.com
	Seoul	SEW-EURODRIVE KOREA Co., Ltd. No.1104 Sunkyung officetel 106-4 Kuro 6-dong, Kuro-ku Seoul 152-054	Tel. +82 2 862-8051 Fax +82 2 862-8199 sewseoul@netsgo.com

Latvia			
Sales	**Riga**	SIA Alas-Kuul Katlakalna 11C LV-1073 Riga	Tel. +371 7139253 Fax +371 7139386 http://www.alas-kuul.com info@alas-kuul.com

Lebanon			
Sales	**Beirut**	Gabriel Acar & Fils sarl B. P. 80484 Bourj Hammoud, Beirut	Tel. +961 1 4947-86 +961 1 4982-72 +961 3 2745-39 Fax +961 1 4949-71 gacar@beirut.com

Lithuania			
Sales	**Alytus**	UAB Irseva Naujoji 19 LT-62175 Alytus	Tel. +370 315 79204 Fax +370 315 56175 info@irseva.lt http://www.sew-eurodrive.lt

Luxembourg			
Assembly **Sales** **Service**	**Brüssel**	CARON-VECTOR S.A. Avenue Eiffel 5 B-1300 Wavre	Tel. +32 10 231-311 Fax +32 10 231-336 http://www.caron-vector.be info@caron-vector.be

Malaysia			
Assembly **Sales** **Service**	**Johore**	SEW-EURODRIVE SDN BHD No. 95, Jalan Seroja 39, Taman Johor Jaya 81000 Johor Bahru, Johor West Malaysia	Tel. +60 7 3549409 Fax +60 7 3541404 sales@sew-eurodrive.com.my
Technical Offices	**Kota Kinabalu**	SEW-EURODRIVE Sdn Bhd (Kota Kinabalu Branch) Lot No. 2,1st Floor, Inanam Baru Phase III, Miles 5.1 /2, Jalan Tuaran, Inanam 89350 Kota Kinabalu Sabah, Malaysia	Tel. +60 88 424792 Fax +60 88 424807
	Kuala Lumpur	SEW-EURODRIVE Sdn. Bhd. No. 2, Jalan Anggerik Mokara 31/46 Kota Kemuning Seksyen 31 40460 Shah Alam Selangor Darul Ehsan	Tel. +60 3 5229633 Fax +60 3 5229622 sewpjy@po.jaring.my

Malaysia			
	Kuching	SEW-EURODRIVE Sdn. Bhd. Lot 268, Section 9 KTLD Lorong 9, Jalan Satok 93400 Kuching, Sarawak East Malaysia	Tel. +60 82 232380 Fax +60 82 242380
	Penang	SEW-EURODRIVE Sdn. Bhd. No. 38, Jalan Bawal Kimsar Garden 13700 Prai, Penang	Tel. +60 4 3999349 Fax +60 4 3999348 seweurodrive@po.jaring.my

Mexico			
Assembly **Sales** **Service**	**Queretaro**	SEW-EURODRIVE MEXIKO SA DE CV SEM-981118-M93 Tequisquiapan No. 102 Parque Industrail Queretaro C.P. 76220 Queretaro, Mexico	Tel. +52 442 1030-300 Fax +52 442 1030-301 http://www.sew-eurodrive.com.mx scmexico@seweurodrive.com.mx

Morocco			
Sales	**Casablanca**	Afit 5, rue Emir Abdelkader MA 20300 Casablanca	Tel. +212 22618372 Fax +212 22618351 richard.miekisiak@premium.net.ma

Netherlands			
Assembly **Sales** **Service**	**Rotterdam**	VECTOR Aandrijftechniek B.V. Industrieweg 175 NL-3044 AS Rotterdam Postbus 10085 NL-3004 AB Rotterdam	Tel. +31 10 4463-700 Fax +31 10 4155-552 http://www.vector.nu info@vector.nu

New Zealand			
Assembly **Sales** **Service**	**Auckland**	SEW-EURODRIVE NEW ZEALAND LTD. P.O. Box 58-428 82 Greenmount drive East Tamaki Auckland	Tel. +64 9 2745627 Fax +64 9 2740165 http://www.sew-eurodrive.co.nz sales@sew-eurodrive.co.nz
	Christchurch	SEW-EURODRIVE NEW ZEALAND LTD. 10 Settlers Crescent, Ferrymead Christchurch	Tel. +64 3 384-6251 Fax +64 3 384-6455 sales@sew-eurodrive.co.nz
Technical Office	**Palmerston North**	SEW-EURODRIVE NEW ZEALAND LTD. C/-Grant Shearman, RD 5, Aronui Road Palmerston North	Tel. +64 6 355-2165 Fax +64 6 355-2316 sales@sew-eurodrive.co.nz

Norway			
Assembly **Sales** **Service**	**Moss**	SEW-EURODRIVE A/S Solgaard skog 71 N-1599 Moss	Tel. +47 69 241-020 Fax +47 69 241-040 http://www.sew-eurodrive.no sew@sew-eurodrive.no

Pakistan			
Technical Office	**Karachi**	SEW-EURODRIVE Pte. Ltd. Karachi Liaison Office A/3, 1st Floor, Central Commercial Area Sultan Ahmed Shah Road Block 7/8, K.C.H.S. Union Ltd., Karachi	Tel. +92 21 4529369 Fax +92 21 4547365 seweurodrive@cyber.net.pk

Peru			
Assembly **Sales** **Service**	**Lima**	SEW DEL PERU MOTORES REDUCTORES S.A.C. Los Calderos, 120-124 Urbanizacion Industrial Vulcano, ATE, Lima	Tel. +51 1 3495280 Fax +51 1 3493002 http://www.sew-eurodrive.com.pe sewperu@sew-eurodrive.com.pe

Philippines			
Technical Office	**Manila**	SEW-EURODRIVE Pte Ltd Manila Liaison Office Suite 110, Ground Floor Comfoods Building Senator Gil Puyat Avenue 1200 Makati City	Tel. +63 2 894275254 Fax +63 2 8942744 sewmla@i-next.net

Poland			
Assembly **Sales** **Service**	**Lodz**	SEW-EURODRIVE Polska Sp.z.o.o. ul. Techniczna 5 PL-92-518 Lodz	Tel. +48 42 67710-90 Fax +48 42 67710-99 http://www.sew-eurodrive.pl sew@sew-eurodrive.pl
Technical Office	**Katowice**	SEW-EURODRIVE Polska Sp.z.o.o. ul. Nad Jeziorem 87 PL-43-100 Tychy	Tel. +48 32 2175026 + 32 2175027 Fax +48 32 2277910
	Bydgoszcz	SEW-EURODRIVE Polska Sp.z.o.o. ul. Fordonska 246 PL-85-959 Bydgoszcz	Tel. +48 52 3606590 Fax +48 52 3606591
	Szczecinek	SEW-EURODRIVE Polska Sp.z.o.o. ul. Mickiewicza 2 pok. 36 PL-78-400 Szczecinek	Tel. +48 94 3728820 Fax +48 94 3728821

Portugal			
Assembly **Sales** **Service**	**Coimbra**	SEW-EURODRIVE, LDA. Apartado 15 P-3050-901 Mealhada	Tel. +351 231 20 9670 Fax +351 231 20 3685 http://www.sew-eurodrive.pt infosew@sew-eurodrive.pt
Technical Offices	**Lisboa**	Tertir Edifício Lisboa Gabinete 119 P-2615 Alverca do Ribatejo	Tel. +351 21 958-0198 Fax +351 21 958-0245 esc.lisboa@sew-eurodrive.pt
	Porto	Av. D. Afonso Henriques, 1196 - 1° - sala 102 Edifício ACIA P- 4450-016 Matosinhos	Tel. +351 229 350 383 Fax +351 229 350 384 MobilTel. +351 9 332559110 esc.porto@sew-eurodrive.pt

Romania			
Sales **Service**	**Bucuresti**	Sialco Trading SRL str. Madrid nr.4 011785 Bucuresti	Tel. +40 21 230-1328 Fax +40 21 230-7170 sialco@sialco.ro

Russia			
Assembly **Sales** **Service**	**St. Petersburg**	ZAO SEW-EURODRIVE P.O. Box 36 195220 St. Petersburg Russia	Tel. +7 812 3332522 +7 812 5357142 Fax +7 812 3332523 http://www.sew-eurodrive.ru sew@sew-eurodrive.ru
Technical Office	**Moskau**	ZAO SEW-EURODRIVE RUS-107023 Moskau	Tel. +7 495 9337090 Fax +7 495 9337094 mso@sew-eurodrive.ru
	Novosibirsk	ZAO SEW-EURODRIVE pr. K Marksa, d.30 RUS-630087 Novosibirsk	Tel. +7 383 3350200 Fax +7 383 3462544 nso@sew-eurodrive.ru

Senegal			
Sales	**Dakar**	SENEMECA Mécanique Générale Km 8, Route de Rufisque B.P. 3251, Dakar	Tel. +221 849 47-70 Fax +221 849 47-71 senemeca@sentoo.sn

Serbia and Montenegro			
Sales	**Beograd**	DIPAR d.o.o. Ustanicka 128a PC Košum, IV floor SCG-11000 Beograd	Tel. +381 11 347 3244 / +381 11 288 0393 Fax +381 11 347 1337 dipar@yubc.net

Singapore			
Assembly **Sales** **Service**	**Singapore**	SEW-EURODRIVE PTE. LTD. No 9, Tuas Drive 2 Jurong Industrial Estate Singapore 638644	Tel. +65 68621701 Fax +65 68612827 http://www.sew-eurodrive.com.sg sewsingapore@sew-eurodrive.com

Slovakia			
Sales	**Bratislava**	SEW-Eurodrive SK s.r.o. Rybnicna 40 SK-83107 Bratislava	Tel. +421 2 49595201 Fax +421 2 49595200 http://www.sew.sk sew@sew-eurodrive.sk
	Zilina	SEW-Eurodrive SK s.r.o. ul. Vojtecha Spanyola 33 SK-010 01 Zilina	Tel. +421 41 700 2513 Fax +421 41 700 2514 sew@sew-eurodrive.sk
	Banská Bystrica	SEW-Eurodrive SK s.r.o. Rudlovská cesta 85 SK-97411 Banská Bystrica	Tel. +421 48 414 6564 Fax +421 48 414 6566 sew@sew-eurodrive.sk

Slovenia			
Sales **Service**	**Celje**	Pakman - Pogonska Tehnika d.o.o. Ul. XIV. divizije 14 SLO - 3000 Celje	Tel. +386 3 490 83-20 Fax +386 3 490 83-21 pakman@siol.net

South Africa			
Assembly **Sales** **Service**	**Johannesburg**	SEW-EURODRIVE (PROPRIETARY) LIMITED Eurodrive House Cnr. Adcock Ingram and Aerodrome Roads Aeroton Ext. 2 Johannesburg 2013 P.O.Box 90004 Bertsham 2013	Tel. +27 11 248-7000 Fax +27 11 494-3104 http://www.sew.co.za dross@sew.co.za
	Capetown	SEW-EURODRIVE (PROPRIETARY) LIMITED Rainbow Park Cnr. Racecourse & Omuramba Road Montague Gardens Cape Town P.O.Box 36556 Chempet 7442 Cape Town	Tel. +27 21 552-9820 Fax +27 21 552-9830 Telex 576 062 dswanepoel@sew.co.za
	Durban	SEW-EURODRIVE (PROPRIETARY) LIMITED 2 Monaceo Place Pinetown Durban P.O. Box 10433, Ashwood 3605	Tel. +27 31 700-3451 Fax +27 31 700-3847 dtait@sew.co.za
	Nelspruit	SEW-EURODRIVE (PTY) LTD. 7 Christie Crescent Vintonia P.O.Box 1942 Nelspruit 1200	Tel. +27 13 752-8007 Fax +27 13 752-8008 robermeyer@sew.co.za
Technical Offices	**Port Elizabeth**	SEW-EURODRIVE PTY LTD. 5 b Linsay Road Neave Township 6000 Port Elizabeth	Tel. +27 41 453-0303 Fax +27 41 453-0305 dswanepoel@sew.co.za
	Richards Bay	SEW-EURODRIVE PTY LTD. 25 Eagle Industrial Park Alton Richards Bay P.O. Box 458 Richards Bay 3900	Tel. +27 35 797-3805 Fax +27 35 797-3819 dtait@sew.co.za

Spain			
Assembly **Sales** **Service**	**Bilbao**	SEW-EURODRIVE ESPAÑA, S.L. Parque Tecnológico, Edificio, 302 E-48170 Zamudio (Vizcaya)	Tel. +34 9 4431 84-70 Fax +34 9 4431 84-71 http://www.sew-eurodrive.es sew.spain@sew-eurodrive.es
Technical Offices	**Barcelona**	Delegación Barcelona Avenida Francesc Maciá 40-44 Oficina 3.1 E-08206 Sabadell (Barcelona)	Tel. +34 9 37 162200 Fax +34 9 37 233007

Spain			
	Lugo	Delegación Noroeste Apartado, 1003 E-27080 Lugo	Tel. +34 6 3940 3348 Fax +34 9 8220 2934
	Madrid	Delegación Madrid Gran Via. 48-2° A-D E-28220 Majadahonda (Madrid)	Tel. +34 9 1634 2250 Fax +34 9 1634 0899

Sri Lanka			
Sales	**Colombo**	SM International (Pte) Ltd 254, Galle Raod Colombo 4, Sri Lanka	Tel. +94 1 2584887 Fax +94 1 2582981

Sweden			
Assembly **Sales** **Service**	**Jönköping**	SEW-EURODRIVE AB Gnejsvägen 6-8 S-55303 Jönköping Box 3100 S-55003 Jönköping	Tel. +46 36 3442-00 Fax +46 36 3442-80 http://www.sew-eurodrive.se info@sew-eurodrive.se
Technical Offices	**Göteborg**	SEW-EURODRIVE AB Gustaf Werners gata 8 S-42131 Västra Frölunda	Tel. +46 31 70968-80 Fax +46 31 70968-93
	Malmö	SEW-EURODRIVE AB Borrgatan 5 S-21124 Malmö	Tel. +46 40 68064-80 Fax +46 40 68064-93
	Stockholm	SEW-EURODRIVE AB Björkholmsvägen 10 S-14125 Huddinge	Tel. +46 8 44986-80 Fax +46 8 44986-93
	Skellefteå	SEW-EURODRIVE AB Trädgårdsgatan 8 S-93131 Skellefteå	Tel. +46 910 7153-80 Fax +46 910 7153-93

Switzerland			
Assembly **Sales** **Service**	**Basel**	Alfred Imhof A.G. Jurastrasse 10 CH-4142 Münchenstein bei Basel	Tel. +41 61 417 1717 Fax +41 61 417 1700 http://www.imhof-sew.ch info@imhof-sew.ch
Technical Offices	**Rhaetian Switzerland**	André Gerber Es Perreyres CH-1436 Chamblon	Tel. +41 24 445 3850 Fax +41 24 445 4887
	Bern / Solothurn	Rudolf Bühler Muntersweg 5 CH-2540 Grenchen	Tel. +41 32 652 2339 Fax +41 32 652 2331
	Central Switzerland and Ticino	Beat Lütolf Baumacher 11 CH-6244 Nebikon	Tel. +41 62 756 4780 Fax +41 62 756 4786
	Zürich	René Rothenbühler Nörgelbach 7 CH-8493 Saland	Tel. +41 52 386 3150 Fax +41 52 386 3213
	Bodensee and East Switzerland	Markus Künzle Eichweg 4 CH-9403 Goldbach	Tel. +41 71 845 2808 Fax +41 71 845 2809

Taiwan (R.O.C.)			
Sales	**Nan Tou**	Ting Shou Trading Co., Ltd. No. 55 Kung Yeh N. Road Industrial District Nan Tou 540	Tel. +886 49 255353 Fax +886 49 257878
	Taipei	Ting Shou Trading Co., Ltd. 6F-3, No. 267, Sec. 2 Tung Hwa South Road, Taipei	Tel. +886 2 27383535 Fax +886 2 27368268 Telex 27 245 sewtwn@ms63.hinet.net

Thailand			
Assembly **Sales** **Service**	**Chon Buri**	SEW-EURODRIVE (Thailand) Ltd. Bangpakong Industrial Park 2 700/456, Moo.7, Tambol Donhuaroh Muang District Chon Buri 20000	Tel. +66 38 454281 Fax +66 38 454288 sewthailand@sew-eurodrive.com
Technical Offices	**Bangkok**	SEW-EURODRIVE PTE LTD Bangkok Liaison Office 6th floor, TPS Building 1023, Phattanakarn Road Klongtan, Phrakanong, Bangkok,10110	Tel. +66 2 7178149 Fax +66 2 7178152 sewthailand@sew-eurodrive.com
	Hadyai	SEW-EURODRIVE (Thailand) Ltd. Hadyai Country Home Condominium 59/101 Soi.17/1 Rachas-Utid Road. Hadyai, Songkhla 90110	Tel. +66 74 359441 Fax +66 74 359442 sewhdy@ksc.th.com
	Khonkaen	SEW-EURODRIVE (Thailand) Ltd. 4th Floor, Kaow-U-HA MOTOR Bldg, 359/2, Mitraphab Road. Muang District Khonkaen 40000	Tel. +66 43 225745 Fax +66 43 324871 sewkk@cscoms.com
	Lampang	SEW-EURODRIVE (Thailand) Ltd. 264 Chatchai Road, sob-tuy, Muang, Lampang 52100	Tel. +66 54 310241 Fax +66 54 310242 sewthailand@sew-eurodrive.com

Tunisia			
Sales	**Tunis**	T. M.S. Technic Marketing Service 7, rue Ibn El Heithem Z.I. SMMT 2014 Mégrine Erriadh	Tel. +216 1 4340-64 + 1 4320-29 Fax +216 1 4329-76 tms@tms.com.tn

Turkey			
Assembly **Sales** **Service**	**Istanbul**	SEW-EURODRIVE Hareket Sistemleri San. ve Tic. Ltd. Sti. Bagdat Cad. Koruma Cikmazi No. 3 TR-34846 Maltepe ISTANBUL	Tel. +90 216 4419163 / 164 3838014/15 Fax +90 216 3055867 sew@sew-eurodrive.com.tr
Technical Offices	**Ankara**	SEW-EURODRIVE Hareket Sistemleri San. ve Tic. Ltd. Sti. Özcelik Is Merkezi, 14. Sok, No. 4/42 TR-06370 Ostim/Ankara	Tel. +90 312 3853390 Fax +90 312 3853258
	Bursa	SEW-EURODRIVE Hareket Sistemleri San. ve Tic. Ltd. Sti. Besevler Küçük Sanayi Parkoop Parçacilar Sitesi 48. Sokak No. 47 TR Nilüfer/Bursa	Tel. +90 224 443 4556 Fax +90 224 443 4558
	Izmir	SEW-EURODRIVE Hareket Sistemleri San. ve Tic. Ltd. Sti. 1203/11 Sok. No. 4/613 Hasan Atli Is Merkezi TR-35110 Yenisehir-Izmir	Tel. +90 232 4696264 Fax +90 232 4336105

Ukraine			
Sales **Service**	**Dnepropetrovsk**	SEW-EURODRIVE Str. Rabochaja 23-B, Office 409 49008 Dnepropetrovsk	Tel. +380 56 370 3211 Fax +380 56 372 2078 http://www.sew-eurodrive.ua sew@sew-eurodrive.ua

Uruguay			
Sales	**Montevideo**	SEW-EURODRIVE Argentina S. A. Sucursal Uruguay German Barbato 1526 CP 11200 Montevideo	Tel. +598 2 90181-89 Fax +598 2 90181-88 sewuy@sew-eurodrive.com.uy

USA			
Production **Assembly** **Sales** **Service**	**Greenville**	SEW-EURODRIVE INC. 1295 Old Spartanburg Highway P.O. Box 518 Lyman, S.C. 29365	Tel. +1 864 439-7537 Fax Sales +1 864 439-7830 Fax Manuf. +1 864 439-9948 Fax Ass. +1 864 439-0566 Telex 805 550 http://www.seweurodrive.com cslyman@seweurodrive.com
Assembly **Sales** **Service**	**San Francisco**	SEW-EURODRIVE INC. 30599 San Antonio St. Hayward, California 94544-7101	Tel. +1 510 487-3560 Fax +1 510 487-6381 cshayward@seweurodrive.com
	Philadelphia/PA	SEW-EURODRIVE INC. Pureland Ind. Complex 2107 High Hill Road, P.O. Box 481 Bridgeport, New Jersey 08014	Tel. +1 856 467-2277 Fax +1 856 845-3179 csbridgeport@seweurodrive.com
	Dayton	SEW-EURODRIVE INC. 2001 West Main Street Troy, Ohio 45373	Tel. +1 937 335-0036 Fax +1 937 440-3799 cstroy@seweurodrive.com
	Dallas	SEW-EURODRIVE INC. 3950 Platinum Way Dallas, Texas 75237	Tel. +1 214 330-4824 Fax +1 214 330-4724 csdallas@seweurodrive.com
	Additional addresses for service in the USA provided on request!		

Venezuela			
Assembly **Sales** **Service**	**Valencia**	SEW-EURODRIVE Venezuela S.A. Av. Norte Sur No. 3, Galpon 84-319 Zona Industrial Municipal Norte Valencia, Estado Carabobo	Tel. +58 241 832-9804 Fax +58 241 838-6275 http://www.sew-eurodrive.com.ve sewventas@cantv.net sewfinanzas@cantv.net

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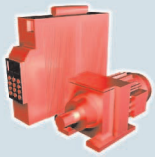

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With a worldwide service network that is always close at hand.

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With comprehensive knowledge in virtually every branch of industry today.

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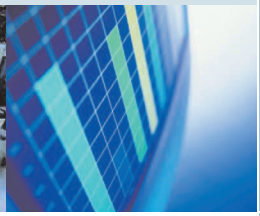



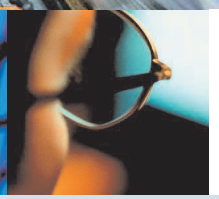

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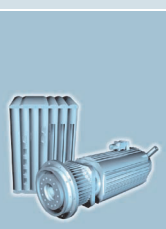

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With innovative technology that solves tomorrow's problems today.

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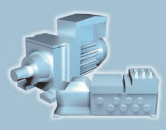

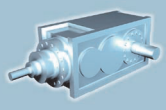

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