SEW EURODRIVE

MOVIDRIVE® MDX60B/61B

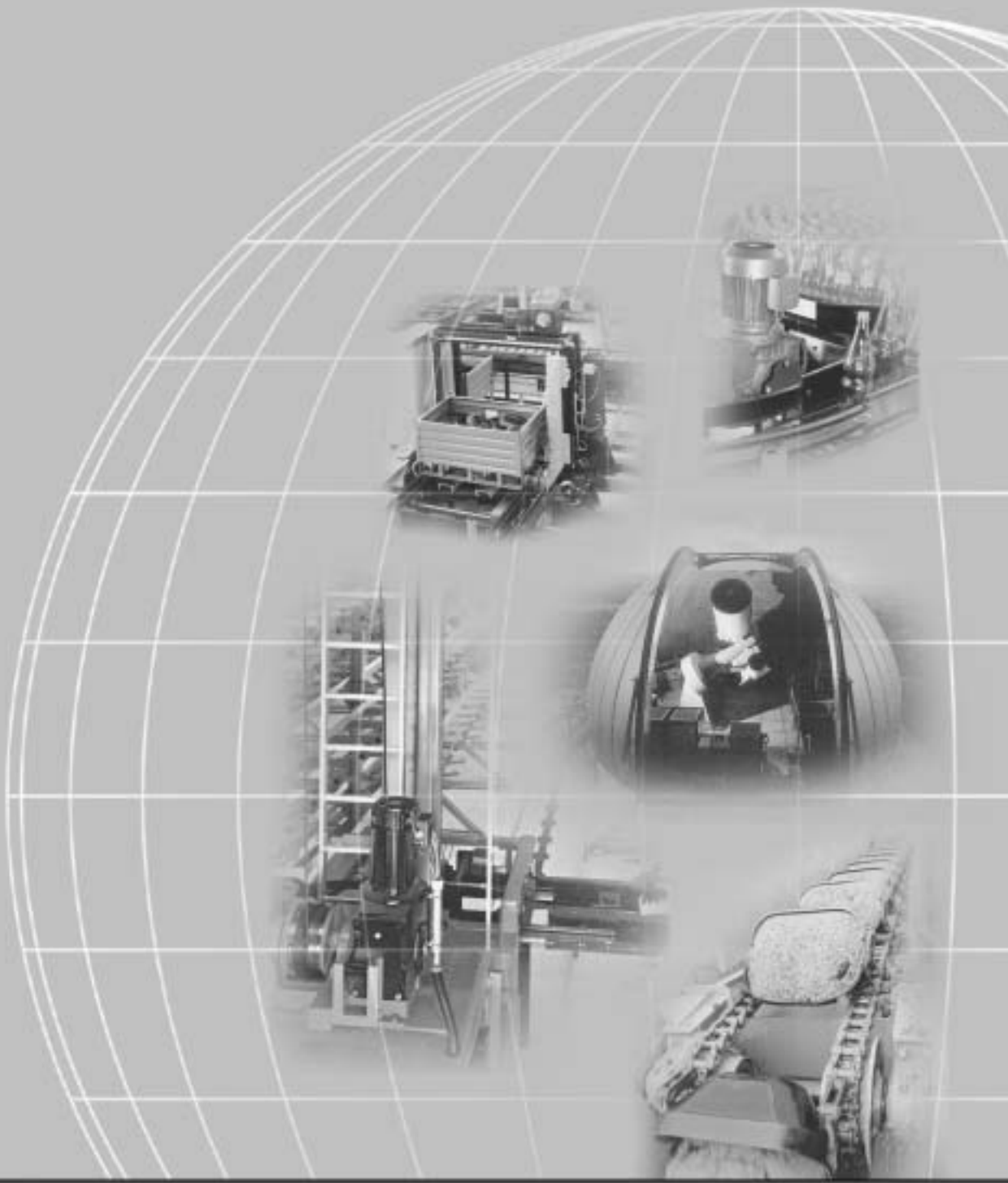
Edition

12/2003

Catalog

1125 2928 / EN

SEW
EURODRIVE



SEW-EURODRIVE

1 System Description

1.1 System overview

Power components

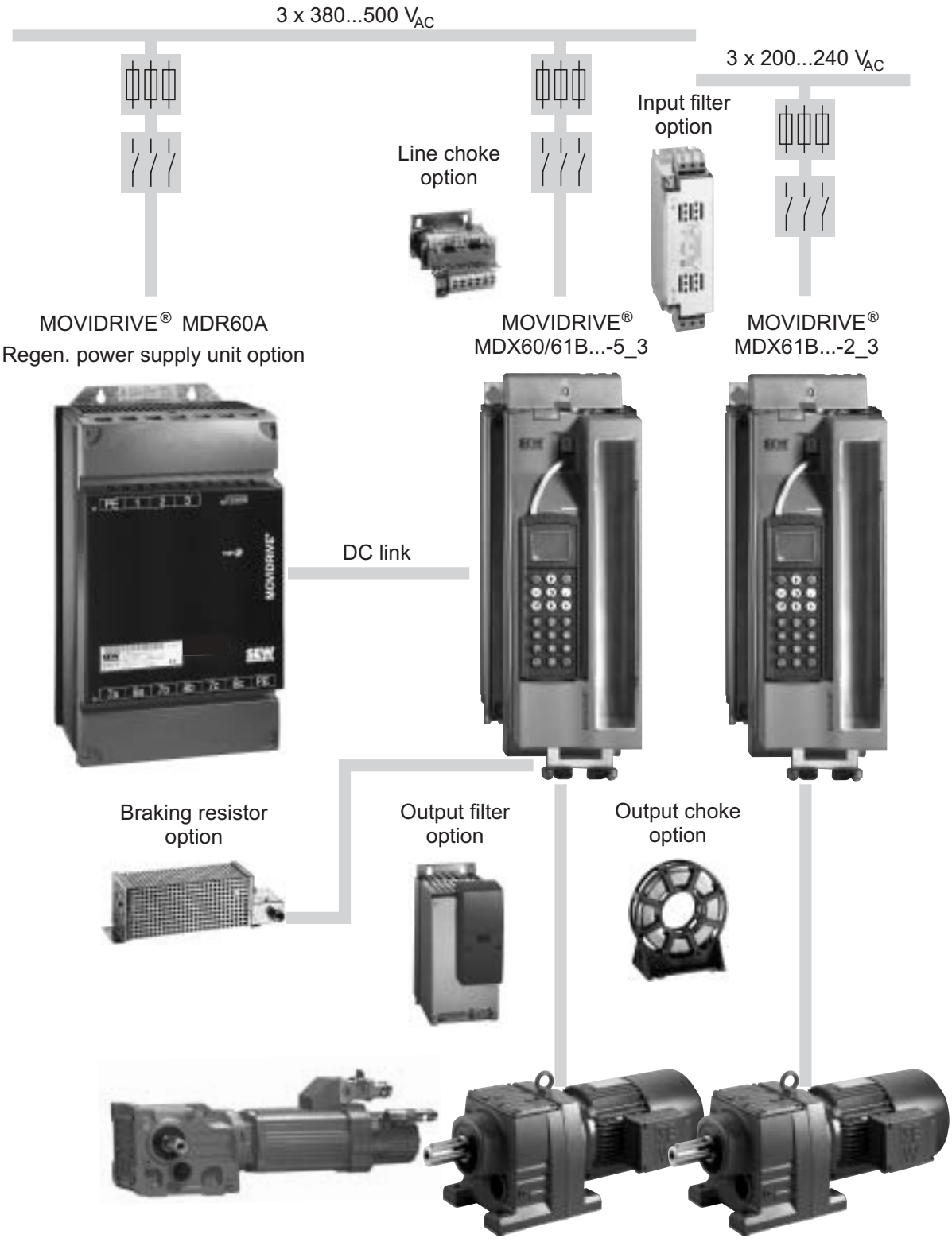


Figure 1: System overview of MOVIDRIVE® MDX60/61B power components

Encoder and communication options

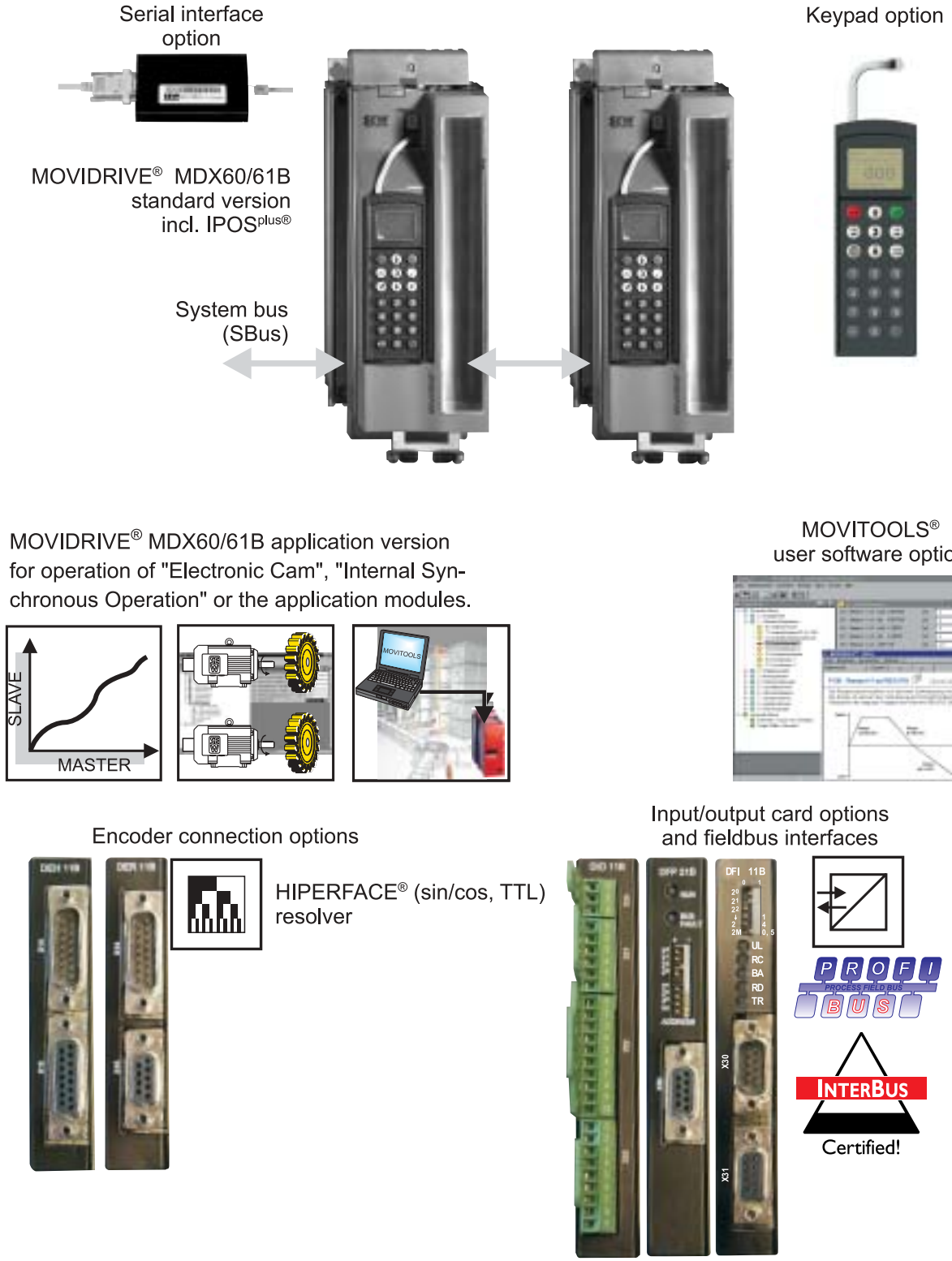


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Figure 2: System overview of MOVIDRIVE® MDX60/61B encoder and communication options

General description

MOVIDRIVE® **MDX60/61B** is the new generation of drive inverters from SEW. The new MOVIDRIVE® drive inverters of the B series convince with more basic functions, extended lower speed range, increased overload capacity and modular unit design.

As a result, AC drives with the latest digital inverter technology can now be used without restrictions in the power range from 0.55 to 160 kW (0.75 to 215 HP). The levels of dynamic performance and control quality that can now be achieved with MOVIDRIVE® for AC asynchronous motors as well were previously only possible using servo drives or DC motors. The integrated control functions and the possibility of expanding the system with technology and communication options is leading to drive systems that are designed for particularly high levels of efficiency in terms of their broad range of applications, project planning, startup and operation.

Range of units

The **MOVIDRIVE®** range of units includes three series:

- MOVIDRIVE® MDX60B: Drive inverter for asynchronous AC motors without encoder feedback. No options can be installed in these units.
- MOVIDRIVE® MDX61B: Drive inverter for asynchronous AC motors with or without encoder feedback, or for asynchronous and synchronous servomotors. Options can be installed in these units.
- MOVIDRIVE® MDR60A: Regenerative power supply unit, the energy from MOVIDRIVE® drive inverters (400/500 V units) operating in regenerative mode is fed back into the supply system.

Unit types

MOVIDRIVE® MDX60/61B drive inverters are each available in two versions: standard version and application version.

Standard version

As standard, the units are equipped with the IPOS$^{plus®}$ integrated positioning and sequence control system. They can also 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." Furthermore, you can use all the application modules available in the MOVITOOLS® software package.

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 come equipped with the following option slots:

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

- **Option cards can only be subsequently installed or removed with MDX61B sizes 1 to 6.**
- Subsequent **installing or removing option cards for MDX61B size 0 may be performed by SEW-EURODRIVE only**. Please bear this fact in mind when placing the order/during project planning.

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

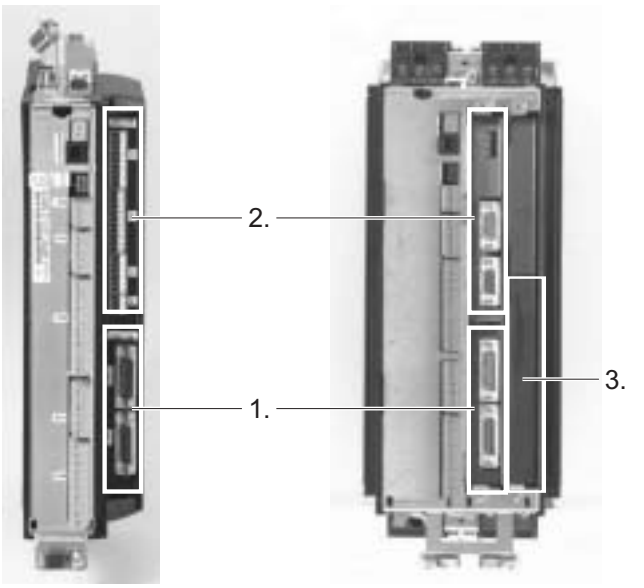


Figure 3: Option slots of MOVIDRIVE® MDX61B

1. Option slot 1 for encoder options
2. Option slot 2 for communication options
3. Option slot 3 for communication options

The modular unit concept enables you to use the option that is ideally suited for your application. For example, the HIPERFACE® encoder type DEH11B option if you use an asynchronous AC motor with encoder feedback (HIPERFACE®, sin/cos or TTL).

Application	Required option	Option slot
Encoder option		
Asynchronous AC motor with encoder feedback (HIPERFACE®, sin/cos, TTL)	HIPERFACE® encoder card type DEH11B	1
Asynchronous or synchronous servomotor with HIPERFACE® encoder		
Synchronous servomotor with resolver	Resolver card type DER11B	
Communication option		
Additional analog and binary inputs/outputs are required	Input/output card type DIO11B	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	

Control mode

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

VFC (Voltage Flux Control) control mode	CFC (Current Flux Control) 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 – Servo-like characteristics • 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 permits several MOVIDRIVE® drive inverters to be networked together. As a result, data can be exchanged rapidly between the units. The MOVILINK® unit profile is used for communication via the SBus. MOVILINK® is the uniform SEW-EURODRIVE standard for serial communication.

MOVILINK®

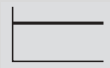
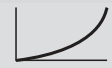
MOVILINK® means the same message structure is always used, disregarding the interface selected (SBus, RS-232, RS-485, fieldbus interfaces). As a result, the control software is independent of the selected interface.

IPOS$^{plus®}$

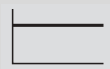
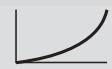
A significant feature of MOVIDRIVE® drive inverters is that the IPOS$^{plus®}$ positioning and sequence control system is integrated as standard. IPOS$^{plus®}$ enables you to control sequences of motion directly in the inverter, right on the plant floor. That way, load is taken off the master controller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

The units at a glance

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

Recommended motor power (VFC)		Contin. output current (CFC)	MOVIDRIVE® type		Size (Technical data)
			MDX60B not option capable	MDX61B option capable	
0.55 kW (0.75 HP)	0.75 kW (1.0 HP)	AC 2.0 A	0005-5A3-4-..	0005-5A3-4-..	0 (→ page 21)
0.75 kW (1.0 HP)	1.1 kW (1.5 HP)	AC 2.4 A	0008-5A3-4-..	0008-5A3-4-..	
1.1 kW (1.5 HP)	1.5 kW (2.0 HP)	AC 3.1 A	0011-5A3-4-..	0011-5A3-4-..	
1.5 kW (2.0 HP)	2.2 kW (3.0 HP)	AC 4.0 A	0014-5A3-4-..	0014-5A3-4-..	
1.5 kW (2.0 HP)	2.2 kW (3.0 HP)	AC 4.0 A	–	0015-5A3-4-..	1 (→ page 23)
2.2 kW (3.0 HP)	3.0 kW (4.0 HP)	AC 5.5 A	–	0022-5A3-4-..	
3.0 kW (4.0 HP)	4.0 kW (5.0 HP)	AC 7.0 A	–	0030-5A3-4-..	
4.0 kW (5.0 HP)	5.5 kW (7.5 HP)	AC 9.5 A	–	0040-5A3-4-..	
5.5 kW (7.5 HP)	7.5 kW (10 HP)	AC 12.5 A	–	0055-5A3-4-..	2 (→ page 25)
7.5 kW (10 HP)	11 kW (15 HP)	AC 16 A	–	0075-5A3-4-..	
11 kW (15 HP)	15 kW (20 HP)	AC 24 A	–	0110-5A3-4-..	
15 kW (20 HP)	22 kW (30 HP)	AC 32 A	–	0150-503-4-..	3 (→ page 27)
22 kW (30 HP)	30 kW (40 HP)	AC 46 A	–	0220-503-4-..	
30 kW (40 HP)	37 kW (50 HP)	AC 60 A	–	0300-503-4-..	
37 kW (50 HP)	45 kW (60 HP)	AC 73 A	–	0370-503-4-..	4 (→ page 29)
45 kW (60 HP)	55 kW (75 HP)	AC 89 A	–	0450-503-4-..	
55 kW (75 HP)	75 kW (100 HP)	AC 105 A	–	0550-503-4-..	5 (→ page 31)
75 kW (100 HP)	90 kW (120 HP)	AC 130 A	–	0750-503-4-..	
90 kW (120 HP)	110 kW (147 HP)	AC 170 A	–	0900-503-4-..	6 (→ page 33)
110 kW (147 HP)	132 kW (177 HP)	AC 200 A	–	1100-503-4-..	
132 kW (177 HP)	160 kW (215 HP)	AC 250 A	–	1320-503-4-..	

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

Recommended motor power (VFC)		Contin. output current (CFC)	MOVIDRIVE® type	Size (Technical data)
			MDX61B options can be installed	
1.5 kW (2.0 HP)	2.2 kW (3.0 HP)	AC 7.3 A	0015-2A3-4-..	1 (→ page 35)
2.2 kW (3.0 HP)	3.7 kW (5.0 HP)	AC 8.6 A	0022-2A3-4-..	
3.7 kW (5.0 HP)	5.0 kW (6.8 HP)	AC 14.5 A	0037-2A3-4-..	
5.5 kW (7.5 HP)	7.5 kW (10 HP)	AC 22 A	0055-2A3-4-..	2 (→ page 37)
7.5 kW (10 HP)	11 kW (15 HP)	AC 29 A	0075-2A3-4-..	
11 kW (15 HP)	15 kW (20 HP)	AC 42 A	0110-203-4-..	3 (→ page 39)
15 kW (20 HP)	22 kW (30 HP)	AC 54 A	0150-203-4-..	
22 kW (30 HP)	30 kW (40 HP)	AC 80 A	0220-203-4-..	4 (→ page 41)
30 kW (40 HP)	37 kW (50 HP)	AC 95 A	0300-203-4-..	

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

Regenerative power supply units		MOVIDRIVE® MDR60A	Size (technical data)
1.5 ... 37 kW (20 ... 50 HP)	I_{mains} = AC 66 A, $I_{DC\ link}$ = DC 70 A	0370-503-00	3 (→ page 58)
15 ... 75 kW (20 ... 100 HP)	I_{mains} = AC 117 A, I_{ZK} = DC 141 A	0750-503-00	4 (→ page 59)

Block circuit diagram

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

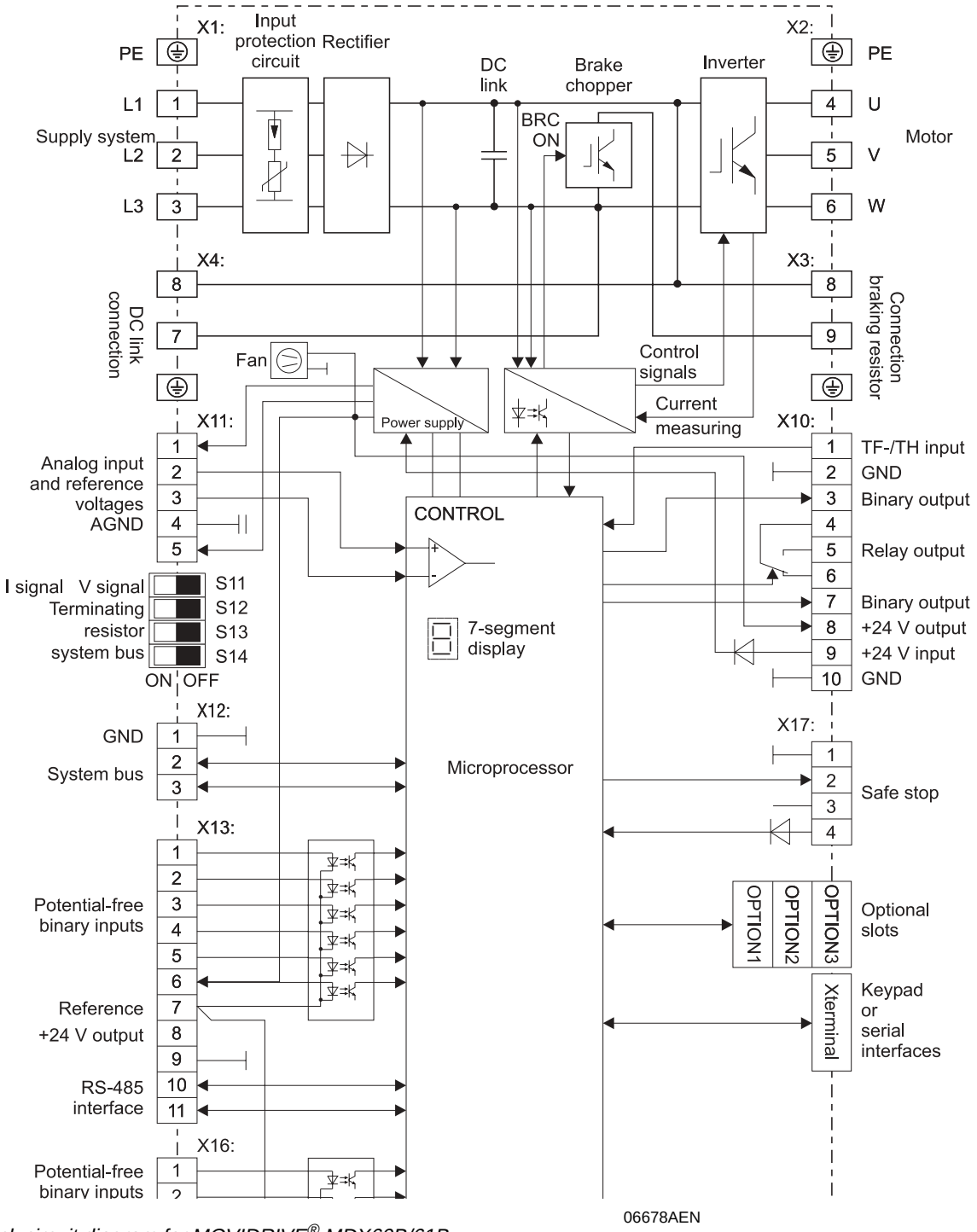


Figure 4: Block circuit diagram for MOVIDRIVE® MDX60B/61B

1.2 Functions / features

Unit properties

- 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: 2000 % I_N brief periods
  - Size 0 ... 6: 150 % I_N for at least 60 s
  - All sizes: 125 % I_N continuous for operation without overload (pumps, fans)
- In VFC mode and at I_N = 100 % permitted ambient temperature up to ϑ = 50° C
- 4Q capability due to integrated brake chopper installed as standard
- Compact unit mounting position for minimum switch cabinet space requirement and optimum utilization of switch cabinet volume
- Integrated line filter installed as standard in sizes 0, 1 and 2; class A limit is maintained on the input side without any additional measures
- Eight potential-free binary inputs and six binary outputs, one of which is a relay output, programmable inputs/outputs
- One TF/TH input for motor protection involving a PTC thermistor or thermocontact
- 7-segment display for operation and error states
- Separate DC 24 V voltage input for powering the inverter electronics (parameter setting, diagnosis and data storage even with the supply system switched off)
- Separable electronics terminals
- Power terminals of size 0 and 1 units can be disconnected

Control functions

- VFC or CFC control processes 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
- Slip compensation for high static accuracy of speed, even without encoder feedback
- Flying restart circuit for synchronizing the inverter to an already rotating motor
- Hoist capability with all motor systems that can be connected
- Motor stall prevention by sliding current limitation in the field weakening range
- Speed window masking to avoid mechanical resonance ranges
- Heating current to prevent condensation forming in the motor
- Factory settings can be reactivated
- Parameter lock to protect against parameter changes
- Speed controller and encoder input with DEH11B (encoder) and DER11B (resolver) option cards; user-friendly controller setting tool in the user interface
- Protective feature for complete protection of the inverter and motor (short-circuit, overload, overvoltage/undervoltage, ground fault, excess temperature in the inverter, motor stall prevention, excess temperature in the motor)
- Speed monitoring and monitoring of the motor and regenerative limit power
- Programmable signal range monitoring (speed, current, maximum current)
- Memory for storing x/t diagrams, which can be displayed using the SCOPE process

data visualization software (four channels, real-time capable)

- Fault memory (five memory locations) with all relevant operating data at the moment of the fault
- Elapsed-hour counter for ON-hours (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 switch mode (total of four ramps)
- Motor potentiometer, can be combined with analog setpoint and internal fixed setpoints
- External setpoint selections: 0 ... +10 V, ±10 V, 0 ... 20 mA, 4 ... 20 mA
- S pattern for jerk-free speed changes
- Programmable input characteristic for flexible setpoint processing
- Six bipolar fixed setpoints that can be combined 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
- RS-485 interface for communication between one PLC / IPC and up to 31 inverters
- Straightforward startup and parameter setting using keypad or PC
- Pluggable memory module for quick unit replacement

System expansion

- Extensive range of expansion options, for example:
  - Removable plain text keypad with parameter memory
  - Interface converter RS-232 → RS-485
  - Fieldbus interface PROFIBUS or INTERBUS
  - 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
  - As a result, the thermal load in the switch cabinet is reduced and costs are cut

Standards / certificates

- UL, cUL and C-Tick approved
- Safe separation of power and electronic connections according to EN 50178
- Compliance with all the requirements for CE certification of machines and plant equipped with MOVIDRIVE® on the basis of the EC Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC. Compliance with EMC product standard EN 61800-3
- Complies with the safety requirement "Safe stop" according to EN 954-1, category 3

1.3 New functions and improved features

MOVIDRIVE® MDX60B/61B units have the following new functions and improved features compared to MOVIDRIVE® MD_60A units:

- IPOS$^{plus®}$ program memory increased by factor 4
- IPOS$^{plus®}$ processing speed increased by factor 10
- Additional task 3 for IPOS$^{plus®}$
- Twice as many IPOS$^{plus®}$ variables
- Significantly increased speed for program download from PC to inverter
- Two additional binary inputs and three additional binary outputs in the basic unit
- Pluggable memory module for quick unit replacement
- Safe protection against restart according to EN954-1, category 3, stop category 0 or 1
- 200 % overload rating for at least 60 s with size 0 units (0005 .... 0014) if the following peripheral conditions are met:
  - 4 kHz or 8 kHz PWM frequency
  - Output frequency more than 2 Hz
  - At the beginning of the overload phase, the unit is in thermal steady state condition with max. 100 % I_N
- Units in application version: Expanded electronic cam functionality, six curves storage capacity
- Units in application version: Internal synchronous operation also possible in VFC mode and synchronous encoder
- Jerk-limited acceleration, avoids mechanical vibrations
- Synchronized CAN operation for external setpoints possible, for example for motion controller
- Expansion of the speed range to ± 6000 min^{-1}
- Master frequency possible as speed setpoint
- Simple positioning to initiator on motor fan possible
- With DER11B: Improved resolver evaluation, improved control response

1.4 Additional functions of the application version

SEW 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

Please refer to the "Electronic Cam" and "Internal Synchronous Operation" manuals for detailed information about the additional functions. These manuals are part of the "Application version" documentation package, which you can order from SEW.

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 and meets the needs of modern production and processing lines.

A user-friendly cam editor helps you during startup. You can also import existing cam data. You can also set application-specific parameters for the engagement and disengagement phases using the cam editor.

Example

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

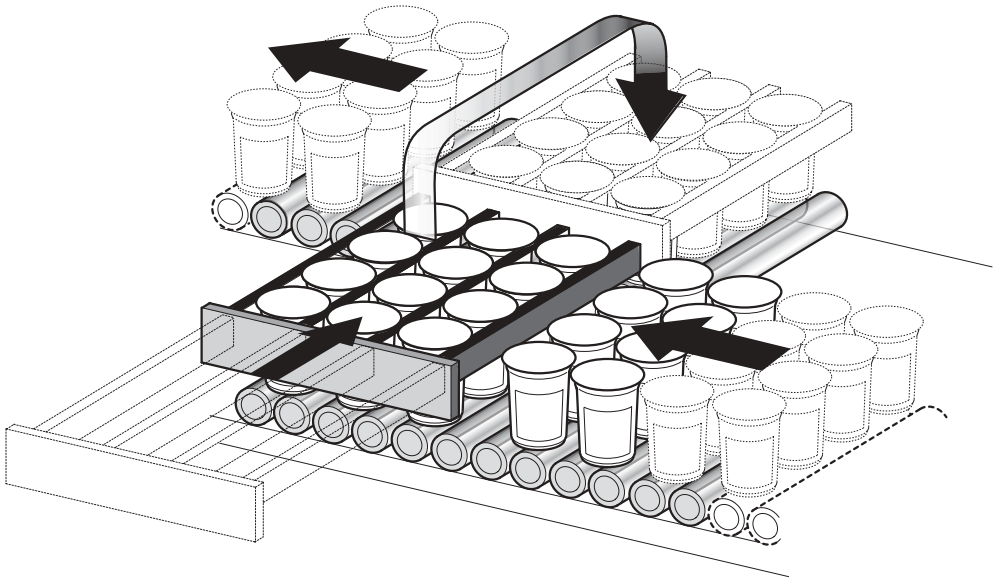


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Figure 5: Application example for the "electronic cam"

Internal synchronous operation

You can always 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 monitor helps you during startup.

Example

The figure below shows a typical application for the "internal synchronous operation." Extruded material has to be cut to length. The saw receives a start signal and synchronizes itself with the extruded material. The saw moves synchronously to the extruded material as it cuts. The saw returns to its starting position at the end of the sawing operation.

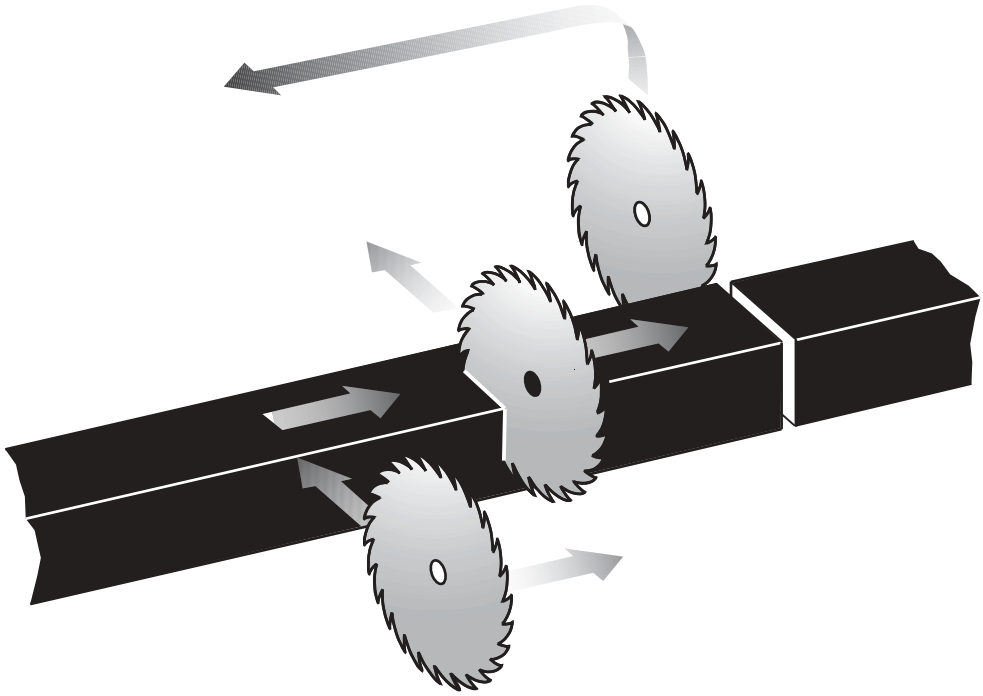

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Figure 6: Typical application for the "internal synchronous operation"

1.5 Application modules

The application

Usually, the application involves more than adjusting the speed of a motor. Often, the inverter is also required to control sequences of motion and perform typical PLC tasks. More and more complex drive applications have to be carried out without resulting in lengthy project planning and startup routines.

The solution with MOVIDRIVE®

SEW 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 modules uses this information to create the control program and loads it into the inverter. MOVIDRIVE® then takes over the entire motion control. This takes the load off the master controller and allows decentralized concepts to be implemented more easily.

The benefits at a glance

- Wide range of functions
- User-friendly user interface
- You only have to enter the parameters needed for the application
- User-friendly application programs guide you through the process of setting parameters, so there is no need for complicated programming
- No programming experience necessary
- No lengthy training, therefore quick project planning and startup
- Control of all movement functions is performed directly in MOVIDRIVE®
- Decentralized concepts can be implemented more easily

Available application modules

The currently available application modules are listed below. These application modules are explained in the "Technical Data and Dimensions" section.

Positioning

Linear movement; the motion tasks are managed in the inverter:

- Table positioning
- Table positioning with bus control

Linear movement, the motion sequences are managed in the PLC:

- Positioning via bus
- Extended positioning via bus
- Absolute value positioning

Rotational movement:

- Modulo positioning

Winding

- Constant tension central winder

Controlling

- Flying saw
- Absolute positioning (sensor positioning)

Application

The following figure shows an example for how the various SEW applications modules are used in a block warehouse.

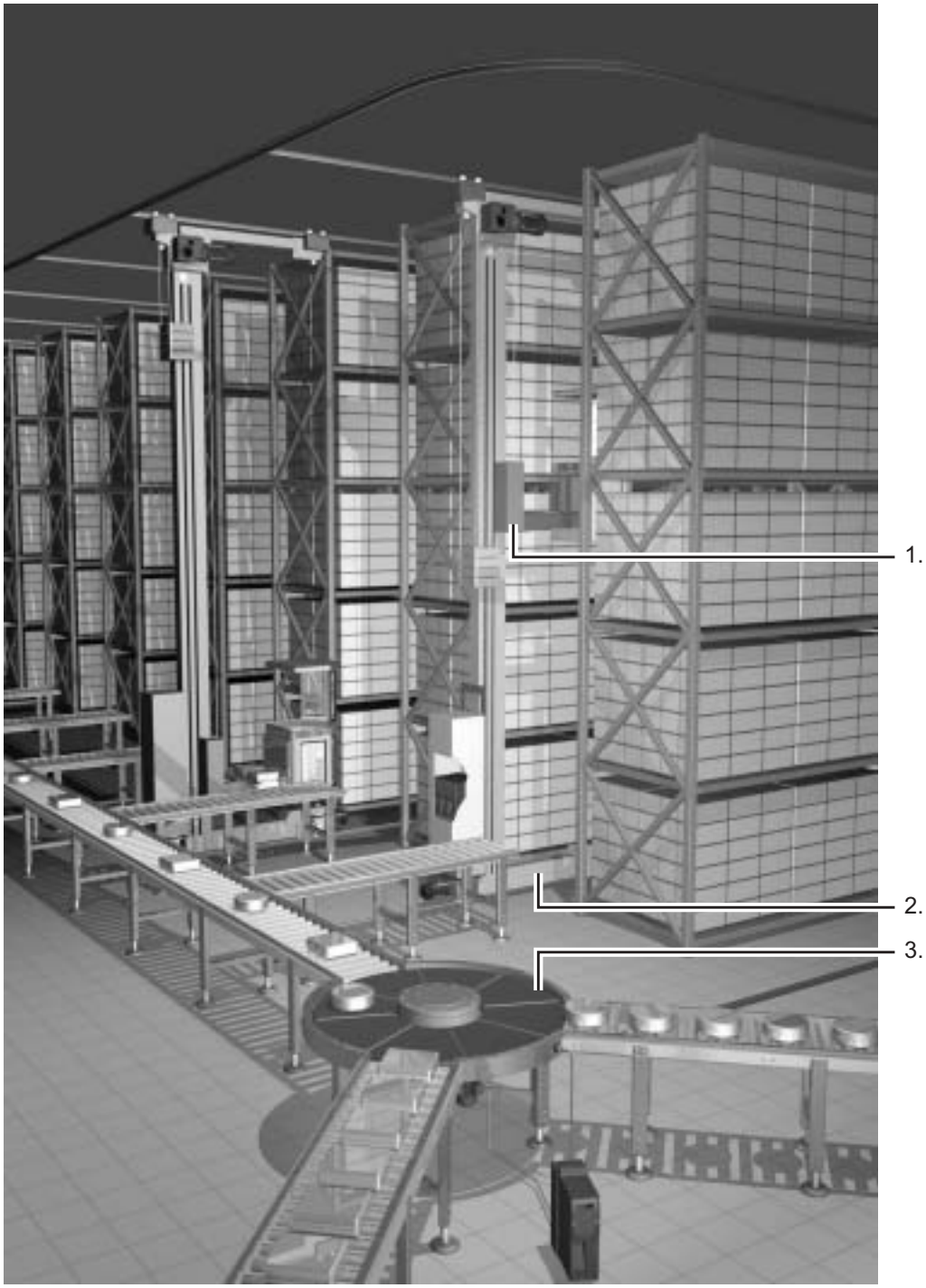

Figure 7: Application in a block warehouse

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

2 Technical Data and Dimension Sheets

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)

  The designated use of MOVIDRIVE® drive inverters and regenerative power supply units is 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 of class A or B limit was verified by a specified test setup. SEW-EURODRIVE provides 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 issue a declaration of conformity to this effect on request.

UL approval

c UL us

UL and cUL approval has been granted for the entire MOVIDRIVE® range of units. cUL is equivalent to CSA approval.

C-Tick

C-Tick approval has been granted for the entire MOVIDRIVE® range of units. C-Tick certifies conformity with the requirements of the ACA (Australian Communications Authority).

Example unit designation

MDX61 B 0055 - 5 A 3 - 4 00

Version	00 = Standard 0T = Application
Quadrants	4 = 4Q (with brake chopper)
Connection type	3 = 3-phase
Interference suppression on input side	B = Radio interference suppression B A = Radio interference suppression A 0 = No radio interference suppression
Supply voltage	5 = 380 ... AC 500 V 2 = 200 ... AC 240 V
Recommended motor power	0055 = 5.5 kW
Version B	
Series	60 = no options can be installed 61 = options can be installed

2.2 General technical data

The following table lists the technical data applicable to all MOVIDRIVE® MDX60B/61B drive inverters, regardless of their type, version, size and performance.

MOVIDRIVE® MDX60B/61B	All sizes
Interference immunity	meets EN 61800-3
Interference emission with EMC compliant installation	According to class B limit to EN 55011 and EN 55014 meets EN 61800-3 Sizes 0, 1, and 2 according to class A limit to EN 55011 and EN 55014 without additional measures
Ambient temperature ϑ_{amb} **Derating ambient temperature** **Climate class**	0 °C...+50 °C at I_D = 100 % I_N and f_{PWM} = 4 kHz (VFC mode) 0 °C...+40 °C at I_D = 125 % I_N and f_{PWM} = 4 kHz (VFC mode) 0 °C...+40 °C at I_D = 100 % I_N and f_{PWM} = 8 kHz (CFC mode) Derating: • 2.5 % I_N per K at 40 °C - 50 °C • 3.0 % I_N per K at 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
Enclosure **Sizes 0 to 3** **EN 60529** **Sizes 4 to 6** **(NEMA1)**	IP20 IP00 (power connections); IP10 with mounted Plexiglas cover supplied as standard
Operating mode	DB (EN 60149-1-1 and 1-3)
Overvoltage protection	III according to IEC 60664-1 (VDE 0110-1)
Pollution degree	2 according to IEC 60664-1 (VDE 0110-1)
Altitude **h**	Up to h ≤ 1000 m without restrictions. At h ≥ 1000 m (3300 ft), the following restrictions apply: • From 1000 m to max. 4000 m (3300 ft to max. 13 200 ft): – I_N reduction by 1 % per 100 m (330 ft) • From 1000 m to max. 4000 m (3300 ft to max. 13 200 ft): – I_N reduction by 3 V per 100 m (330 ft) Over 200 m (6600 ft) only overvoltage class 2, external measures are required for overvoltage class 3. Overvoltage classes to DIN VDE 0110-1.

1) For long-term storage, connect to power supply every two (2) years for at least 5 minutes, otherwise the unit's service life may be reduced.

MOVIDRIVE® MDX60B/61B series, size 0

51485AXX

Figure 8: MOVIDRIVE® MDX60/61B series, size 0

MOVIDRIVE® MDX61B series, sizes 1 to 6

52159AXX

Figure 9: MOVIDRIVE® MDX61B series, sizes 1 to 6

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

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

51485AXX

Figure 10: Size 0

MOVIDRIVE® MDX60/61B		0005-5A3-4-0_	0008-5A3-4-0_	0011-5A3-4-0_	0014-5A3-4-0_
INPUT					
Supply voltage	V_{mains}	3 × AC 380 V -10 % to 3 × AC 500 V +10 %			
Supply frequency	f_{mains}	50 Hz ... 60 Hz ±5 %			
Rated mains current[1] I_{mains} (at V_{mains} = 3 × AC 400 V)	**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					
Rated output power[2] (at V_{mains} = 3 × AC 380..500 V)	P_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 2.0 A	AC 2.4 A	AC 3.1 A	AC 4.0 A
Current limitation	I_{max}	Motor and regenerative 200 % I_N, duration depending on the capacity utilization			
Internal current limitation		I_{max} = 0...200 % can be set in menu (P303 / P313)			
Minimum permitted brake resistance value (4Q operation)	R_{BRmin}	68 Ω			
Output voltage	V_{out}	max. V_{mains}			
PWM frequency	f_{PWM}	Adjustable with VFC: 4/8/16 kHz (P860 / P861)			
Speed range / resolution	n_A / Δn_A	-6000 ... 0 ... +6000 min^{-1} / 0.2 min^{-1} across the entire range			
GENERAL					
Power loss at P_N	P_{Vmax}	42 W	48 W	58 W	74 W
Cooling air consumption		3 m^3/h (1.8 ft^3/min)		9 m^3/h (5.4 ft^3/min)	

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

2) In VFC operating modes: The performance data apply to f_{PWM} = 4 kHz (factory setting).

MDX60B Standard version (VFC)	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 (VFC)	**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 HP)	0.75 kW (1.0 HP)	1.1 kW (1.5 HP)	1.5 kW (2.0 HP)
Variable torque load or constant load without overload Recommended motor power P_{mot}	0.75 kW (1.0 HP)	1.1 kW (1.5 HP)	1.5 kW (2.0 HP)	2.2 kW (3.0 HP)
Continuous output current = 125 % I_N I_D (at V_{mains} = 3 × AC 400 V and f_{PWM} = 4 kHz)	AC 2.5 A	AC 3.0 A	AC 3.8 A	AC 5.0 A
Dimensions W × H × D	45 × 317 × 260 mm (1.78 × 12.48 × 10.24 in)		67.5 × 317 × 260 mm (2.66 × 12.48 × 10.24 in)	
Weight	2.0 kg (4.4 lb)		2.5 kg (5.5 lb)	

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
VFC operating mode	Recommended motor power → MDX60B			
CFC operating mode Continuous output current = 100 % I_N I_D	AC 2.0 A	AC 2.4 A	AC 3.1 A	AC 4.0 A
Dimensions W × H × D	72.5 × 317 × 260 mm (1.78 × 12.48 × 10.24 in)		95 × 317 × 260 mm (3.74 × 12.48 × 10.24 in)	
Weight	2.3 kg (5.1 lb)		2.8 kg (6.2 lb)	
Recommended motor power	→ Sec. Project Planning, CFC motor selection			

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

53071AXX

Figure 11: Size 1

MOVIDRIVE® MDX61B		0015-5A3-4-0_	0022-5A3-4-0_	0030-5A3-4-0_	0040-5A3-4-0_
INPUT					
Supply voltage	V_{mains}	3 × AC 380 V -10 % to 3 × AC 500 V +10 %			
Supply frequency	f_{mains}	50 Hz ... 60 Hz ±5 %			
Rated mains current[1] **I_{mains} (at V_{mains} = 3 × AC 400 V)**	**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					
Rated output power[2] **(at V_{mains} = 3 × AC 400..500 V)**	P_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 4.0 A	AC 5.5 A	AC 7.0 A	AC 9.5 A
Current limitation	I_{max}	Motor and regenerative 150 % I_N, duration depending on the capacity utilization			
Internal current limitation		I_{max} = 0...150 % can be set in menu (P303 / P313)			
Minimum permitted brake resistance value (4Q operation)	R_{BRmin}	68 Ω			
Output voltage	V_{out}	max. V_{mains}			
PWM frequency	f_{PWM}	Adjustable: 4/8/16 kHz (P860 / P861 / P864)			
Speed range / resolution	n_A / Δn_A	-6000 ... 0 ... +6000 min^{-1} / 0.2 min^{-1} across the entire range			
GENERAL					
Power loss at P_N	P_{Vmax}	85 W	105 W	130 W	180 W
Cooling air consumption		40 m^3/h (24 ft^3/min)			
Weight		3.5 kg (7.72 lb)			
Dimensions	**W × H × D**	105 × 314 × 234 mm (4.13 × 12.36 × 9.21 in)			

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 apply to f_{PWM} = 4 kHz (factory setting in VFC operating modes).

MDX61B Standard version (VFC)	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 (VFC)	**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 (2.0 HP)	2.2 kW (3.0 HP)	3.0 kW (4.0 HP)	4.0 kW (5.0 HP)
Variable torque load or constant load without overload Recommended motor power  **P_{mot}**	2.2 kW (3.0 HP)	3.0 kW (4.0 HP)	4.0 kW (5.0 HP)	5.5 kW (7.5 HP)
VFC operating mode (f_{PWM} = 4 kHz) Continuous output current = 125 % I_N I_D (at V_{mains} = 3 × AC 400 V)	AC 5.0 A	AC 6.9 A	AC 8.8 A	AC 11.9 A
CFC/SERVO operating mode (f_{PWM} = 8 kHz) Continuous output current = 100 % I_N I_D	AC 4.0 A	AC 5.5 A	AC 7.0 A	AC 9.5 A
Recommended motor power	→ Sec. Project Planning, CFC/SERVO motor selection			

Size 2S, 2 (400/ 500 V)

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

53072AXX

Figure 12: Size 2

MOVIDRIVE® MDX61B		0055-5A3-4-0_	0075-5A3-4-0_	0110-5A3-4-0_
Size		2S		2
INPUT				
Supply voltage	V_{mains}	3 × AC 380 V -10 % to 3 × AC 500 V +10 %		
Supply frequency	f_{mains}	50 Hz ... 60 Hz ±5 %		
Rated mains current[1] **I_{mains} (at V_{mains} = 3 × AC 400 V)**	**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				
Rated output power[2] **(at V_{mains} = 3 × AC 400..500 V)**	P_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
Current limitation	I_{max}	Motor and regenerative 150 % I_N, duration depending on the capacity utilization		
Internal current limitation		I_{max} = 0...150% can be set in menu (P303 / P313)		
Minimum permitted brake resistance value (4Q operation)	R_{BRmin}	47 Ω		22 Ω
Output voltage	V_{out}	max. V_{mains}		
PWM frequency	f_{PWM}	Adjustable: 4/8/16 kHz (P860 / P861 / P864)		
Speed range / resolution	n_A / Δn_A	-6000 ... 0 ... +6000 min^{-1} / 0.2 min^{-1} across the entire range		
GENERAL				
Power loss at P_N	P_{Vmax}	220 W	290 W	400 W
Cooling air consumption		80 m^3/h (48 ft^3/min)		
Weight		6.6 kg (14.55 lb)		
Dimensions	**W × H × D**	105 × 335 × 294 mm (4.13 × 13.19 × 11.57 in)		135 × 315 × 285 mm (5.12 × 12.40 × 11.22 in)

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 apply to f_{PWM} = 4 kHz (factory setting in VFC operating modes).

MDX61B Standard version (VFC)	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 (VFC)	**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 HP)	7.5 kW (10 HP)	11 kW (15 HP)
Variable torque load or constant  **load without overload Recommended motor power P_{mot}**	7.5 kW (10 HP)	11 kW (15 HP)	15 kW (20 HP)
VFC operating mode (f_{PWM} = 4 kHz) Continuous output current = 125 % I_N I_D (at V_{mains} = 3 × AC 400 V)	AC 15.6 A	AC 20.0 A	AC 30.0 A
CFC/SERVO operating mode (f_{PWM} = 8 kHz) Continuous output current = 100 % I_N I_D	AC 12.5 A	AC 16 A	AC 24 A
Recommended motor power	→ Sec. Project Planning, CFC/SERVO motor selection		

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

53073AXX

Figure 13: Size 3

MOVIDRIVE® MDX61B		0150-503-4-0_	0220-503-4-0_	0300-503-4-0_
INPUT				
Supply voltage	V_{mains}	3 × AC 380 V -10 % to 3 × AC 500 V +10 %		
Supply frequency	f_{mains}	50 Hz ... 60 Hz ±5 %		
Rated mains current[1] I_{mains} **(at V_{mains} = 3 × AC 400 V)**	**100 %** **125 %**	AC 28.8 A AC 36.0 A	AC 41.4 A AC 51.7 A	AC 54.0 A AC 67.5 A
OUTPUT				
Rated output power[2] **(at V_{mains} = 3 × AC 400..500 V)**	P_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
Current limitation	I_{max}	Motor and regenerative 150 % I_N, duration depending on the capacity utilization		
Internal current limitation		I_{max} = 0...150 % can be set in menu (P303 / P313)		
Minimum permitted brake resistance value (4Q operation)	R_{BRmin}	15 Ω		12 Ω
Output voltage	V_{out}	max. V_{mains}		
PWM frequency	f_{PWM}	Adjustable: 4/8/16 kHz (P860 / P861 / P864)		
Speed range / resolution	n_A / Δn_A	-6000 ... 0 ... +6000 min^{-1} / 0.2 min^{-1} across the entire range		
GENERAL				
Power loss at P_N	P_{Vmax}	550 W	750 W	950 W
Cooling air consumption		180 m^3/h (108 ft^3/min)		
Weight		15.0 kg (33.07 lb)		
Dimensions	**W × H × D**	200 × 465 × 308 mm (7.87 × 18.31× 12.13 in)		

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 apply to f_{PWM} = 4 kHz (factory setting in VFC operating modes).

MDX61B Standard version (VFC)	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 (VFC)	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 (20 HP)	22 kW (30 HP)	30 kW (40 HP)
Variable torque load or constant  load without overload Recommended motor power P_{mot}	22 kW (30 HP)	30 kW (40 HP)	37 kW (50 HP)
VFC operating mode (f_{PWM} = 4 kHz) Continuous output current = 125 % I_N I_D (at V_{mains} = 3 × AC 400 V)	AC 40.0 A	AC 57.5 A	AC 75.0 A
CFC/SERVO operating mode (f_{PWM} = 8 kHz) Continuous output current = 100 % I_N I_D	AC 32 A	AC 46 A	AC 60 A
Recommended motor power	→ Sec. Project Planning, CFC/SERVO motor selection		

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

53074AXX

Figure 14: Size 4

MOVIDRIVE® MDX61B		0370-503-4-0_	0450-503-4-0_
INPUT			
Supply voltage	V_{mains}	3 × AC 380 V -10 % to 3 × AC 500 V +10 %	
Supply frequency	f_{mains}	50 Hz ... 60 Hz ±5 %	
Rated mains current[1] I_{mains} (at V_{mains} = 3 × AC 400 V)	**100 %** **125 %**	AC 65.7 A AC 81.9 A	AC 80.1 A AC 100.1 A
OUTPUT			
Rated output power[2] (at V_{mains} = 3 × AC 400..500 V)	P_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
Current limitation	I_{max}	Motor and regenerative 150 % I_N, duration depending on the capacity utilization	
Internal current limitation		I_{max} = 0...150 % can be set in menu (P303 / P313)	
Minimum permitted brake resistance value (4Q operation)	R_{BRmin}	6 Ω	
Output voltage	V_{out}	max. V_{mains}	
PWM frequency	f_{PWM}	Adjustable: 4/8/16 kHz (P860 / P861 / P864)	
Speed range / resolution	n_A / Δn_A	-6000 ... 0 ... +6000 min^{-1} / 0.2 min^{-1} across the entire range	
GENERAL			
Power loss at P_N	P_{Vmax}	1200 W	1450 W
Cooling air consumption		180 m^3/h (108 ft^3/min)	
Weight		27 kg (59.53 lb)	
Dimensions	**W × H × D**	280 × 522 × 307 mm (11.02 × 20.55 × 12.09 in)	

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 apply to f_{PWM} = 4 kHz (factory setting in VFC operating modes).

MDX61B Standard version (VFC)	0370-503-4-00	0450-503-4-00
Part number	827 967 5	827 968 3
MDX61B Application version (VFC)	**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 (50 HP)	45 kW (60 HP)
Variable torque load or constant load without overload  Recommended motor power P_{mot}	45 kW (60 HP)	55 kW (75 HP)
VFC operating mode (f_{PWM} = 4 kHz) Continuous output current = 125 % I_N I_D (at V_{mains} = 3 × AC 400 V)	AC 91 A	AC 111 A
CFC/SERVO operating mode (f_{PWM} = 8 kHz) Continuous output current = 100 % I_N I_D	AC 73 A	AC 89 A
Recommended motor power	→ Sec. Project Planning, CFC/SERVO motor selection	

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

53075AXX

Figure 15: Size 5

MOVIDRIVE® MDX61B		0550-503-4-0_	0750-503-4-0_
INPUT			
Supply voltage	V_{mains}	3 × AC 380 V -10 % to 3 × AC 500 V +10 %	
Supply frequency	f_{mains}	50 Hz ... 60 Hz ±5 %	
Rated mains current[1] I_{mains} **(at V_{mains} = 3 × AC 400 V)**	**100 %** **125 %**	AC 94.5 A AC 118.1 A	AC 117.0 A AC 146.3 A
OUTPUT			
Rated output power[2] **(at V_{mains} = 3 × AC 400..500 V)**	P_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
Current limitation	I_{max}	Motor and regenerative 150 % I_N, duration depending on the capacity utilization	
Internal current limitation		I_{max} = 0...150 % can be set in menu (P303 / P313)	
Minimum permitted brake resistance value (4Q operation)	R_{BRmin}	6 Ω	4 Ω
Output voltage	V_{out}	max. V_{mains}	
PWM frequency	f_{PWM}	Adjustable: 4/8/16 kHz (P860 / P861 / P864)	
Speed range / resolution	n_A / Δn_A	-6000 ... 0 ... +6000 min^{-1} / 0.2 min^{-1} across the entire range	
GENERAL			
Power loss at P_N	P_{Vmax}	1700 W	2000 W
Cooling air consumption		360 m^3/h (216 ft^3/min)	
Weight		35 kg (77.18 lb)	
Dimensions	**W × H × D**	280 × 610 × 330 mm (11.02 × 24.02 × 12.99 in)	

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 apply to f_{PWM} = 4 kHz (factory setting in VFC operating modes).

MDX61B Standard version (VFC)	0550-503-4-00	0750-503-4-00
Part number	827 969 1	827 970 5
MDX61B Application version (VFC)	**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 HP)	75 kW (100 HP)
Variable torque load or constant load without overload  Recommended motor power P_{mot}	75 kW (100 HP)	90 kW (120 HP)
VFC operating mode (f_{PWM} = 4 kHz) Continuous output current = 125 % I_N I_D (at V_{mains} = 3 × AC 400 V)	AC 131 A	AC 162 A
CFC/SERVO operating mode (f_{PWM} = 8 kHz) Continuous output current = 100 % I_N I_D	AC 105 A	AC 130 A
Recommended motor power	→ Sec. Project Planning, CFC/SERVO motor selection	

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

53076AXX

Figure 16: Size 6

MOVIDRIVE® MDX61B		0900-503-4-0_	1100-503-4-0_	1320-503-4-0_
INPUT				
Supply voltage	V_{mains}	3 × AC 380 V -10 % to 3 × AC 500 V +10 %		
Supply frequency	f_{mains}	50 Hz ... 60 Hz ±5 %		
Rated mains current[1] I_{mains} (at V_{mains} = 3 × AC 400 V)	**100 %** **125 %**	AC 153 A AC 191 A	AC 180 A AC 225 A	AC 225 A AC 281 A
OUTPUT				
Rated output power[2] (at V_{mains} = 3 × AC 380..500 V)	P_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
Current limitation	I_{max}	Motor and regenerative 150 % I_N, duration depending on the capacity utilization		
Internal current limitation		I_{max} = 0...150 % can be set in menu (P303 / P313)		
Minimum permitted brake resistance value (4Q operation)	R_{BRmin}	2.7 Ω		
Output voltage	V_{out}	max. V_{mains}		
PWM frequency	f_{PWM}	Adjustable with VFC: 4 or 8 kHz (P860 / P861); with CFC/SERVO fixed at 8 kHz		
Speed range / resolution	n_A / Δn_A	–6000 ... 0 ... +6000 min^{-1} / 0.2 min^{-1} across the entire range		
GENERAL				
Power loss at P_N	P_{Vmax}	2300 W	2500 W	2700 W
Cooling air consumption		600 m^3/h (360 ft^3/min)		
Weight		60 kg (132 lb)		
Dimensions	**W × H × D**	280 × 1000 × 382 mm (11.02 × 39.37 × 15.04 in)		

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

2) MDF and MDV units in VFC operating modes: The performance data apply to f_{PWM} = 4 kHz (factory setting).

MDX61B Standard version (VFC)	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 (VFC)	**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 (120 HP)	110 kW (147 HP)	132 kW (177 HP)
Variable torque load or constant load without overload  Recommended motor power P_{mot}	110 kW (147 HP)	132 kW (177 HP)	160 kW (215 HP)
VFC operating mode (f_{PWM} = 4 kHz) Continuous output current = 125 % I_N I_D (at V_{mains} = 3 × AC 400 V)	AC 212 A	AC 250 A	AC 312 A
CFC operating mode Continuous output current = 100 % I_N I_D	AC 170 A	AC 200 A	AC 250 A
Recommended motor power	→ Sec. Project Planning, CFC motor selection		

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

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

53071AXX

Figure 17: Size 1

MOVIDRIVE® MDX61B		0015-2A3-4-0_	0022-2A3-4-0_	0037-2A3-4-0_
INPUT				
Supply voltage	V_{mains}	3 × AC 200 V -10 % to 3 × AC 240 V +10 %		
Supply frequency	f_{mains}	50 Hz ... 60 Hz ±5 %		
Rated mains current (at V_{mains} = 3 × AC 230 V)	I_{mains} **100 %** **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				
Rated output power[1] (at V_{mains} = 3 × AC 230...240 V)	P_N	2.7 kVA	3.4 kVA	5.8 kVA
Output rated current (at V_{mains} = 3 × AC 230 V)	I_N	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 the capacity utilization		
Internal current limitation		I_{max} = 0...150 % can be set in menu (P303 / P313)		
Minimum permitted brake resistance value (4Q operation)	R_{BRmin}	27 Ω		
Output voltage	V_{out}	max. V_{mains}		
PWM frequency	f_{PWM}	Adjustable: 4/8/16 kHz (P860 / P861 / P864)		
Speed range / resolution	n_A / Δn_A	-6000 ... 0 ... +6000 min^{-1} / 0.2 min^{-1} across the entire range		
GENERAL				
Power loss at P_N	P_{Vmax}	110 W	126 W	210 W
Cooling air consumption		40 m^3/h (24 ft^3/min)		
Weight		2.8 kg (6.16 lb)		
Dimensions	**W × H × D**	105 × 314 × 234 mm (4.13 × 12.36 × 9.21 in)		

1) The performance data apply to f_{PWM} = 4 kHz (factory setting in VFC operating modes).

MDX61B Standard version (VFC)	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 (VFC)	**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 (2.0 HP)	2.2 kW (3.0 HP)	3.7 kW (5.0 HP)
Variable torque load or constant load without overload Recommended motor power P_{mot}	2.2 kW (3.0 HP)	3.7 kW (5.0 HP)	5.0 kW (6.8 HP)
VFC operating mode (f_{PWM} = 4 kHz) Continuous output current = 125 % I_N I_D (at V_{mains} = 3 × AC 230 V)	AC 9.1 A	AC 10.8 A	AC 18.1 A
CFC/SERVO operating mode (f_{PWM} = 8 kHz) Continuous output current = 100 % I_N I_D	AC 7.3 A	AC 8.6 A	AC 14.5 A
Recommended motor power	→ Sec. Project Planning, CFC/SERVO motor selection		

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

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Figure 18: Size 2

MOVIDRIVE® MDX61B		0055-2A3-4-0_	0075-2A3-4-0_
INPUT			
Supply voltage	V_{mains}	3 × AC 200 V -10 % to 3 × AC 240 V +10 %	
Supply frequency	f_{mains}	50 Hz ... 60 Hz ±5 %	
Rated mains 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			
Rated output power[1] **(at V_{mains} = 3 × AC 230...240 V)**	P_N	8.8 kVA	11.6 kVA
Output rated current (at V_{mains} = 3 × AC 230 V)	I_N	AC 22 A	AC 29 A
Current limitation	I_{max}	Motor and regenerative 150 % I_N, duration depending on the capacity utilization	
Internal current limitation		I_{max} = 0...150 % can be set in menu (P303 / P313)	
Minimum permitted brake resistance value (4Q operation)	R_{BRmin}	12 Ω	
Output voltage	V_{out}	max. V_{mains}	
PWM frequency	f_{PWM}	Adjustable: 4/8/16 kHz (P860 / P861 / P864)	
Speed range / resolution	n_A / Δn_A	-6000 ... 0 ... +6000 min^{-1} / 0.2 min^{-1} across the entire range	
GENERAL			
Power loss at P_N	P_{Vmax}	300 W	380 W
Cooling air consumption		80 m^3/h (48 ft^3/min)	
Weight		5.9 kg (12.98 lb)	
Dimensions	**W × H × D**	135 × 315 × 285 mm (5.12 × 12.40 × 11.22 in)	

1) The performance data apply to f_{PWM} = 4 kHz (factory setting in VFC operating modes).

MDX61B Standard version (VFC)	0055-2A3-4-00	0075-2A3-4-00
Part number	827 997 7	827 998 5
MDX61B Application version (VFC)	**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 HP)	7.5 kW (10 HP)
Variable torque load or constant load without overload Recommended motor power P_{mot}	7.5 kW (10 HP)	11 kW (15 HP)
VFC operating mode (f_{PWM} = 4 kHz) Continuous output current = 125 % I_N I_D (at V_{mains} = 3 × AC 230 V)	AC 27.5 A	AC 36.3 A
CFC/SERVO operating mode (f_{PWM} = 8 kHz) Continuous output current = 100 % I_N I_D	AC 22 A	AC 29 A
Recommended motor power	→ Sec. Project Planning, CFC/SERVO motor selection	

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

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Figure 19: Size 3

MOVIDRIVE® MDX61B		**0110-203-4-0_**	**0150-203-4-0_**
INPUT			
Supply voltage	V_{mains}	3 × AC 200 V -10 % to 3 × AC 240 V +10 %	
Supply frequency	f_{mains}	50 Hz ... 60 Hz ±5 %	
Rated mains current (at V_{mains} = 3 × AC 230 V)	I_{mains} **100 %** **125 %**	AC 40.0 A AC 50.0 A	AC 49.0 A AC 61.0 A
OUTPUT			
Rated output power[1] (at V_{mains} = 3 × AC 230...240 V)	P_N	17.1 kVA	21.5 kVA
Output rated current (at V_{mains} = 3 × AC 230 V)	I_N	AC 42 A	AC 54 A
Current limitation	I_{max}	Motor and regenerative 150 % I_N, duration depending on the capacity utilization	
Internal current limitation		I_{max} = 0...150 % can be set in menu (P303 / P313)	
Minimum permitted brake resistance value (4Q operation)	R_{BRmin}	7.5 Ω	5.6 Ω
Output voltage	V_{out}	max. V_{mains}	
PWM frequency	f_{PWM}	Adjustable: 4/8/16 kHz (P860 / P861 / P864)	
Speed range / resolution	n_A / Δn_A	-6000 ... 0 ... +6000 min^{-1} / 0.2 min^{-1} across the entire range	
GENERAL			
Power loss at P_N	P_{Vmax}	580 W	720 W
Cooling air consumption		180 m^3/h (108 ft^3/min)	
Weight		14.3 kg (31.46 lb)	
Dimensions	**W × H × D**	200 × 465 × 308 mm (7.87 × 18.31× 12.13 in)	

1) The performance data apply to f_{PWM} = 4 kHz (factory setting in VFC operating modes).

MDX61B Standard version (VFC)	0110-203-4-00	0150-203-4-00
Part number	827 999 3	828 000 2
MDX61B Application version (VFC)	**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 HP)	15 kW (20 HP)
Variable torque load or constant load without overload  Recommended motor power P_{mot}	15 kW (20 HP)	22 kW (30 HP)
VFC operating mode (f_{PWM} = 4 kHz) Continuous output current = 125 % I_N I_D (at V_{mains} = 3 × AC 230 V)	AC 52.5 A	AC 67.5 A
CFC/SERVO operating mode (f_{PWM} = 8 kHz) Continuous output current = 100 % I_N I_D	AC 42 A	AC 54 A
Recommended motor power	→ Sec. Project Planning, CFC/SERVO motor selection	

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

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Figure 20: Size 4

MOVIDRIVE® MDX61B		0220-203-4-0_	0300-203-4-0_
INPUT			
Supply voltage	V_{mains}	3 × AC 200 V -10 % to 3 × AC 240 V +10 %	
Supply frequency	f_{mains}	50 Hz ... 60 Hz ±5 %	
Rated mains 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			
Rated output power[1] (at V_{mains} = 3 × AC 230...240 V)	P_N	31.8 kVA	37.8 kVA
Output rated current (at V_{mains} = 3 × AC 230 V)	I_N	AC 80 A	AC 95 A
Current limitation	I_{max}	Motor and regenerative 150 % I_N, duration depending on the capacity utilization	
Internal current limitation		I_{max} = 0...150 % can be set in menu (P303 / P313)	
Minimum permitted brake resistance value (4Q operation)	R_{BRmin}	3.0 Ω	
Output voltage	V_{out}	max. V_{mains}	
PWM frequency	f_{PWM}	Adjustable: 4/8/16 kHz (P860 / P861 / P864)	
Speed range / resolution	n_A / Δn_A	-6000 ... 0 ... +6000 min^{-1} / 0.2 min^{-1} across the entire range	
GENERAL			
Power loss at P_N	P_{Vmax}	1100 W	1300 W
Cooling air consumption		180 m^3/h (108 ft^3/min)	
Weight		26.3 kg (57.86 lb)	
Dimensions	W × H × D	280 × 522 × 307 mm (11.02 × 20.55 × 12.09 in)	

1) The performance data apply to f_{PWM} = 4 kHz (factory setting in VFC operating modes).

MDX61B Standard version (VFC)	0220-203-4-00	0300-203-4-00
Part number	828 001 0	828 002 9
MDX61B Application version (VFC)	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 HP)	30 kW (40 HP)
Variable torque load or constant load without overload  Recommended motor power P_{mot}	30 kW (40 HP)	37 kW (50 HP)
VFC operating mode (f_{PWM} = 4 kHz) Continuous output current = 125 % I_N I_D (at V_{mains} = 3 × AC 230 V)	AC 100 A	AC 118 A
CFC/SERVO operating mode (f_{PWM} = 8 kHz) Continuous output current = 100 % I_N I_D	AC 80 A	AC 95 A
Recommended motor power	→ Sec. Project Planning, CFC/SERVO motor selection	

2.5 Additional functions in the application version

Electronic cam

Refer to the "Electronic Cam" manual for detailed information. This manuals is part of the "Application version" documentation package, which you can order from SEW-EURODRIVE.

- The "electronic cam" can only be implemented with MOVIDRIVE® units in application version (...-0T).
- Encoder feedback is mandatory. That 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.
- The "electronic cam" is only available in parameter set 1.
- The "synchronous operation card type DRS11A" option cannot be used together with "internal synchronous operation."

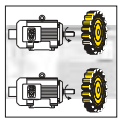
Motor and encoder

Use the following motor types:

- For operation with MOVIDRIVE® MDX61B...-5_3-4-0T:
  - Asynchronous servo motor CT/CV, high-resolution sin/cos encoder installed as standard or HIPERFACE® encoder
  - AC motor DT/DV/D with encoder option (incremental encoder), preferably high-resolution sin/cos encoder or HIPERFACE® encoder.
  - Synchronous servomotors DS/CM, resolver (installed as standard) or HIPERFACE® encoder

High-resolution speed measurement is required for optimum operation of the electronic cam. The encoders installed as standard on CT/CV and DS/CM motors fulfill these requirements. SEW-EURODRIVE recommends using high-resolution sin/cos encoders ES1S, ES2S or EV1S as incremental encoders when DT/DV/D motors are used.

Internal synchronous operation



Refer to the "Internal Synchronous Operation" manual for detailed information. This manual is part of the "Additional Functions and Application Modules" documentation package, which you can order from SEW-EURODRIVE.

Please note the following points:

- "Internal synchronous operation" can only be implemented with MOVIDRIVE® MDX61B units in application version (...-0T).
- Encoder feedback is mandatory. That 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.
- "Internal synchronous operation" is only available in parameter set 1.
- The "synchronous operation card type DRS11A" option cannot be used together with "internal synchronous operation."

Motor and encoder

Use the following motor types:

- For operation with MOVIDRIVE® MDX61B...-5_3-4-0T:
  - Asynchronous servo motor CT/CV, high-resolution sin/cos encoder installed as standard or HIPERFACE® encoder.
  - AC motor DT/DV/D with encoder option (incremental encoder), preferably high-resolution sin/cos encoder or HIPERFACE® encoder.
  - Synchronous servomotors DS/CM, resolver (installed as standard) or HIPERFACE® encoder

High-resolution speed measurement is required for optimum operation of internal synchronous operation. The encoders installed as standard on CT/CV and DS/CM motors fulfill these requirements. SEW-EURODRIVE recommends using high-resolution sin/cos encoders ES1S, ES2S or EV1S as incremental encoders when DT/DV/D motors are used.

2.6 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} = 3 mA REF2: DC -10 V +0 % / –5 %, I_{max} = 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 = 0...+10 V or –10 V...0...+10 V 12 bits R_i = 40 kΩ (external voltage supply) R_i = 20 kΩ (supply from REF1/REF2)	Current input: n1 = 0...20 mA or 4...20 mA 11 bits 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 speed ramps at Δn = 3000 min^{-1}		1st ramp t11/t21 Up: 0.0...2000 s Down: 0.0...2000 s 2nd ramp t12/t22 Up = down: 0.0...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} = 200 mA per output	
External voltage supply[1)] X10:9		VI24: V_{IN} = DC 24 V –15 % / +20 % 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 ≈ 3.0 kΩ, I_E ≈ 10 mA	
Signal level		+13 V...+30 V = "1" = contact closed –3 V...+5 V = "0" = contact open	To EN 61131
Function	X13:1 X13:2...X13:6, X16:1/X16:2	DIØØ: fixed assigned 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 1 ms DBØØ/DOØ2 and DOØ3...DOØ5	
Signal level		"0" = 0 V "1" = +24 V **Important:** Do not apply external voltage!	
Function	X10:3 X10:7, X16:3...X16:5	DBØØ: With fixed assignment "/Brake", I_{max} = 150 mA, short-circuit proof DOØ2, DOØ3...DOØ5: Selection option → Parameter menu P62_, I_{max} = 50 mA, short-circuit proof	
Relay output	X10:4...X10:6	DOØ1: Load capacity of the relay contacts V_{max} = DC 30 V, I_{max} = 800 mA	
Function	X10:4 X10:5 X10:6	DOØ1-C: Shared relay contact DOØ2-NO: NO contact DOØ2-NC: NC 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 to CAN specification 2.0, parts A and B, transmission technology to ISO 11898, max. 64 stations, terminating resistor (120 Ω) can be activated using DIP switches
RS-485 interface	X13:10 X13:11	ST11: RS-485 + ST12: RS-485-	EIA standard, 9.6 kBaud, max. 32 stations, max. cable length 200 m (660 ft) in total Dynamic terminating resistor with fixed installation
TF/TH input	X10:1	TF1: Response threshold at R_{TF} ≥ 2.9 kΩ ±10 %	
Safety contact Permitted line cross section Internal resistance	X17:1 X17:2 X17:3 X17:4	DGND: Reference potential for binary signals VO24: : V_{OUT} = DC 24 V, maximum current carrying capacity I_{max} = 200 mA SOV24: Reference potential for +24 V input "Safe stop" (safety contact) SVI24: +24 V input "Safe stop" (safety contact) One core per terminal: 0.08...1.5 mm^2 (AWG28...16) R_i ≈ 3.0 kΩ, I_E ≈ 10 mA	
Signal level		+13 V...+30 V = "1" = contact closed –3 V...+5 V = "0" = contact open	To EN 61131
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, RS-485 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 line cross section		One core per terminal: 0.20...2.5 mm^2 (AWG 24...12) Two cores per terminal: 0.25...1 mm^2 (AWG 22...17)	

1) The unit provides a current of I_{max} = 200 mA for the +24 V outputs (VO24, binary outputs, encoder supply). If this value is insufficient, a DC 24 V power supply unit must be connected to X10:9 (VI24).

2.7 MOVIDRIVE® MDX60B dimension sheets

Size 0S

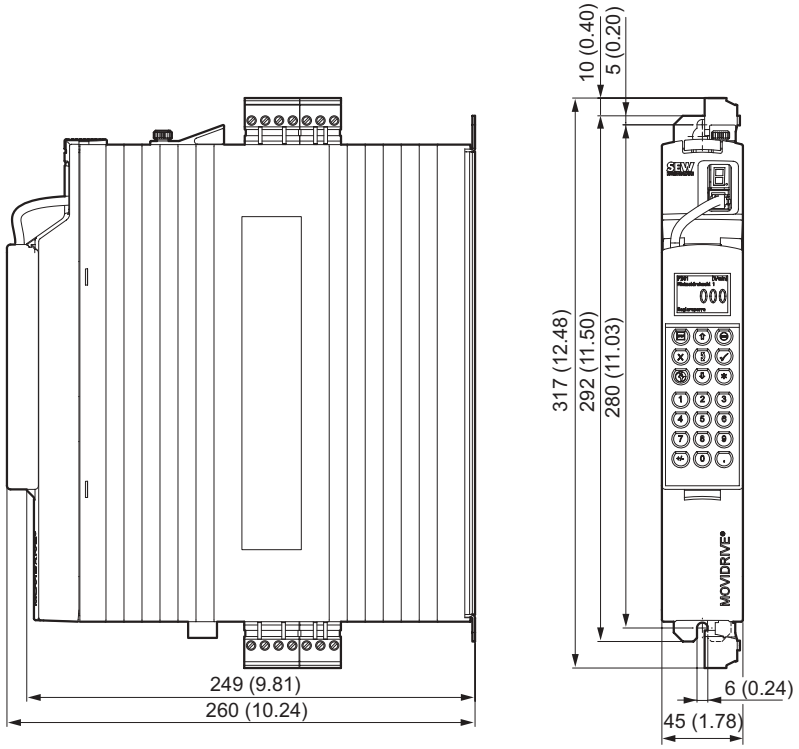


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Figure 21: Dimensions, MDX60B size 0S, in mm (in)

Size 0S with installed braking resistor

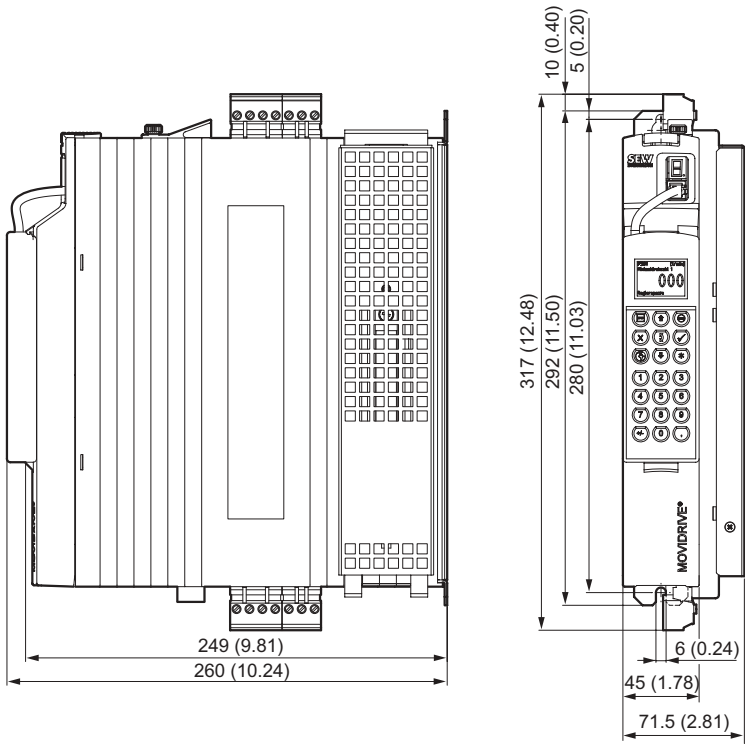

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Figure 22: Dimensions, MDX60B size 0S with braking resistor, in mm (in)

Size 0M

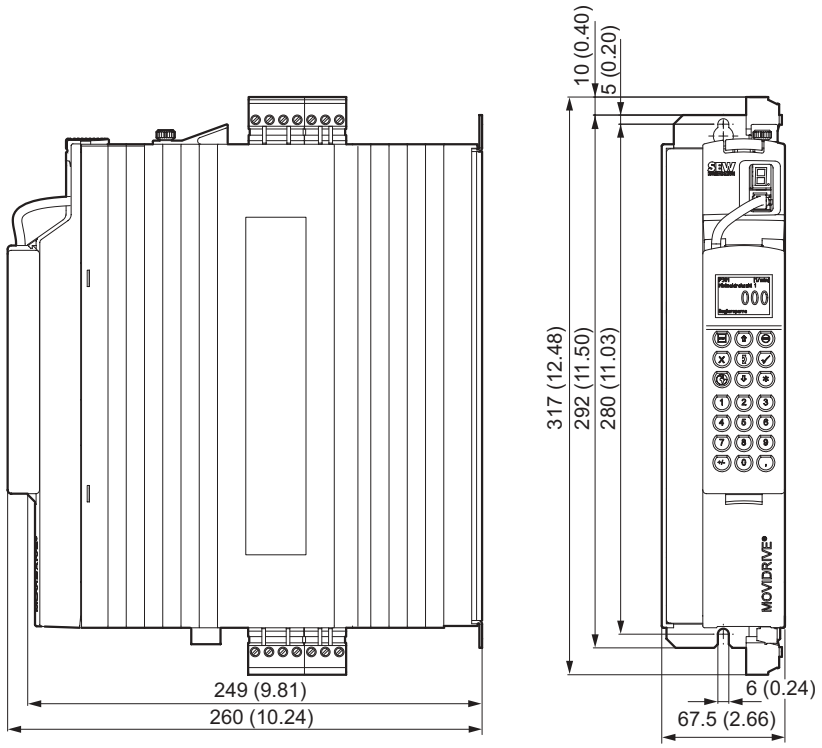

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Figure 23: Dimensions, MDX60B size 0M, in mm (in)

Size 0M with braking resistor

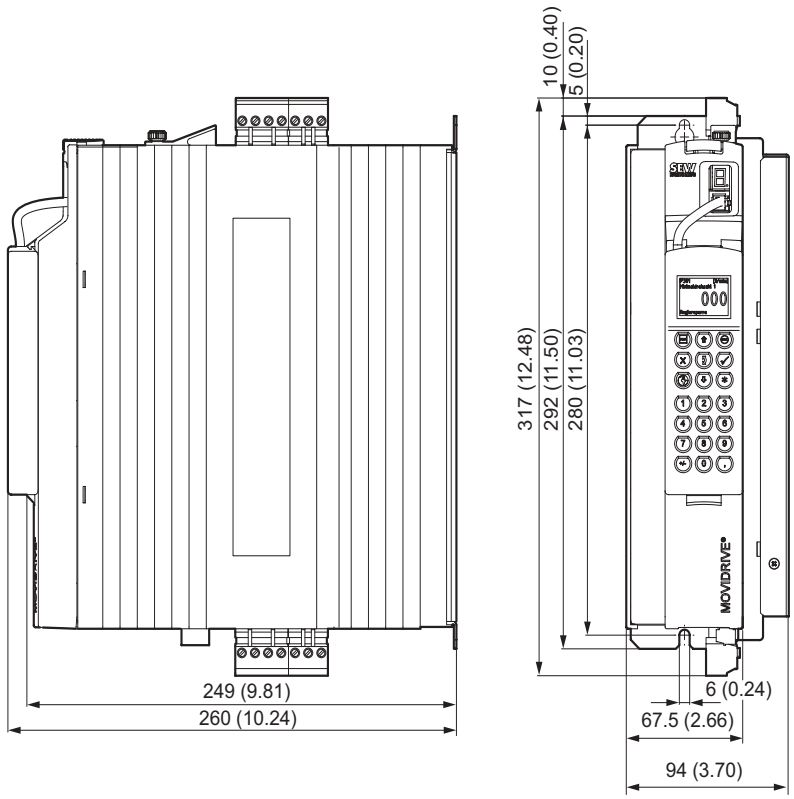

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Figure 24: Dimensions, MDX60B size 0M with braking resistor, in mm (in)

2.8 MOVIDRIVE® MDX61B dimension sheets

The braking resistor installed to MOVIDRIVE ® MDX61B sizes 0 to 6 does not influence the dimensions. The following dimension sheets therefore show the drive inverters without installed braking resistor.

Size 0S

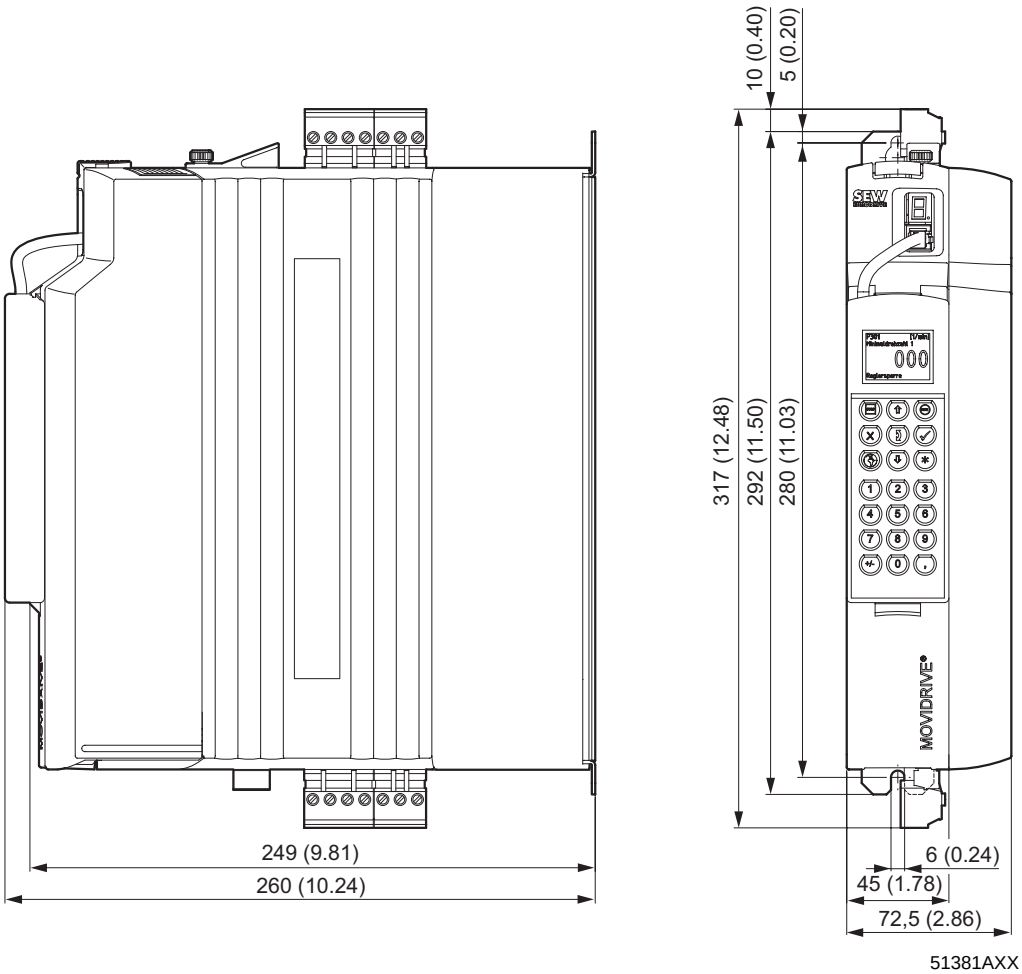

Figure 25: Dimensions, MDX61B size 0S, in mm (in)

Size 0M

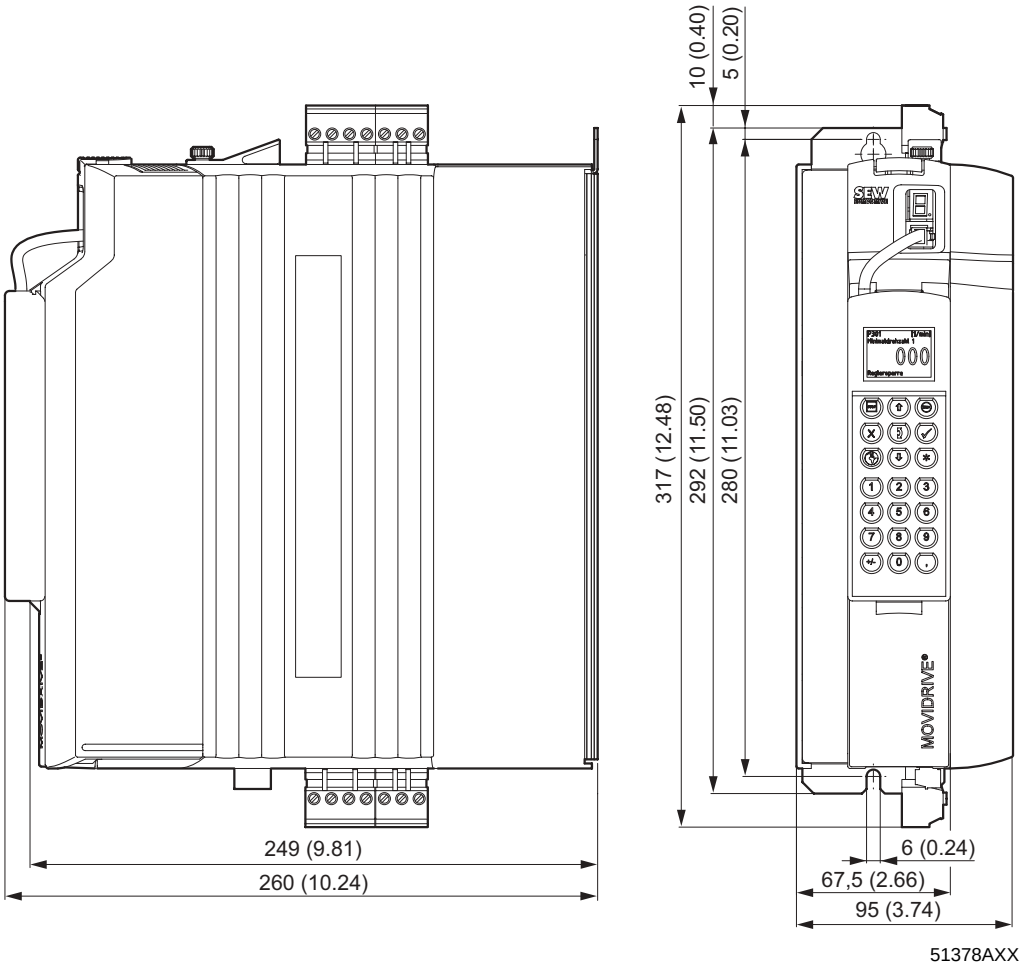

Figure 26: Dimensions, MDX61B size 0M, in mm (in)

Size 1

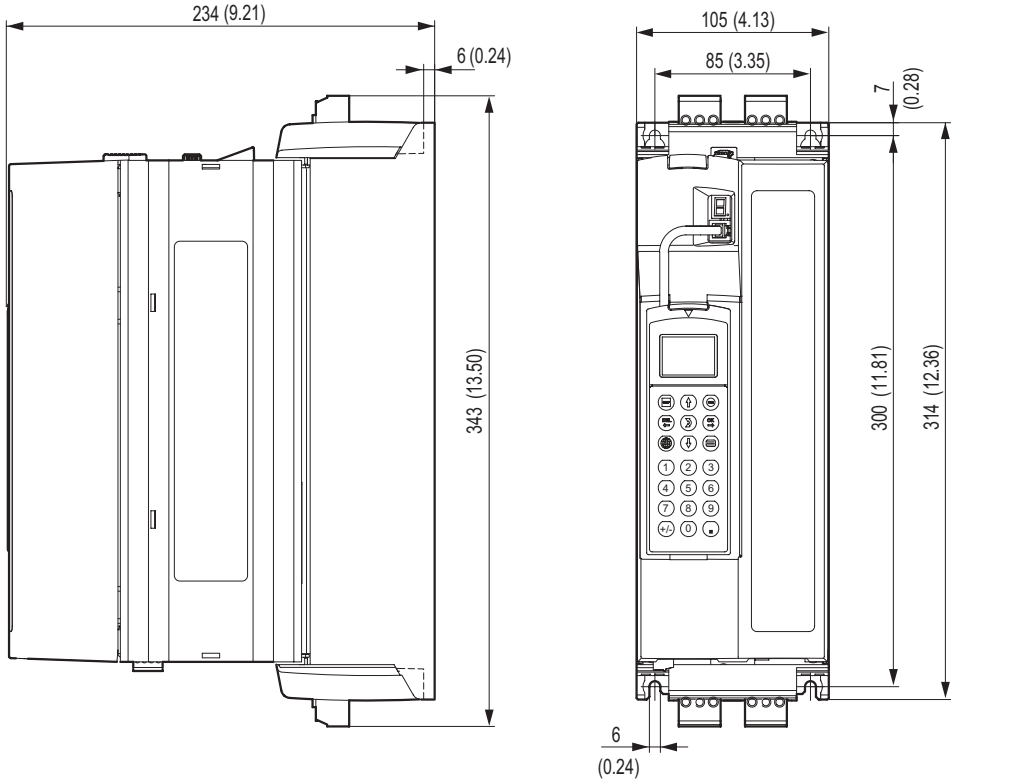

Figure 27: Dimensions, MDX61B size 1, in mm (in)

BSize 2S

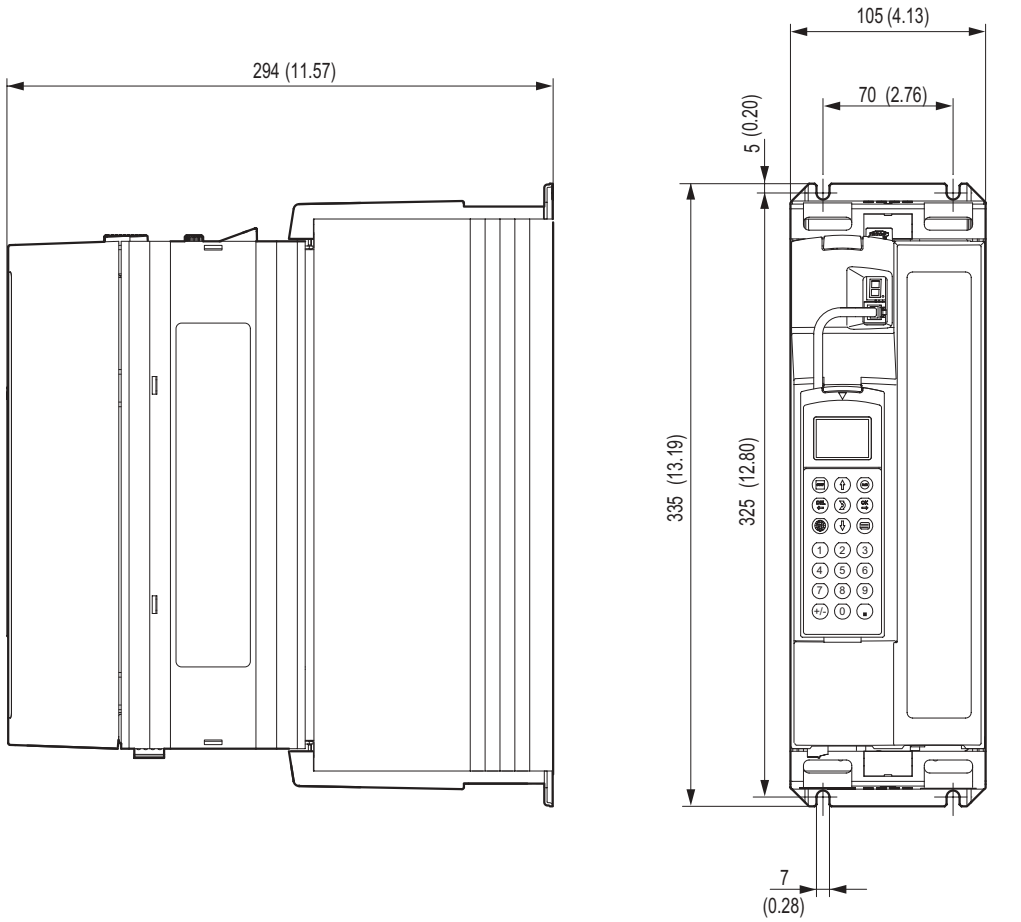

Figure 28: Dimensions, MDX61B size 2S, in mm (in)

BSize 2

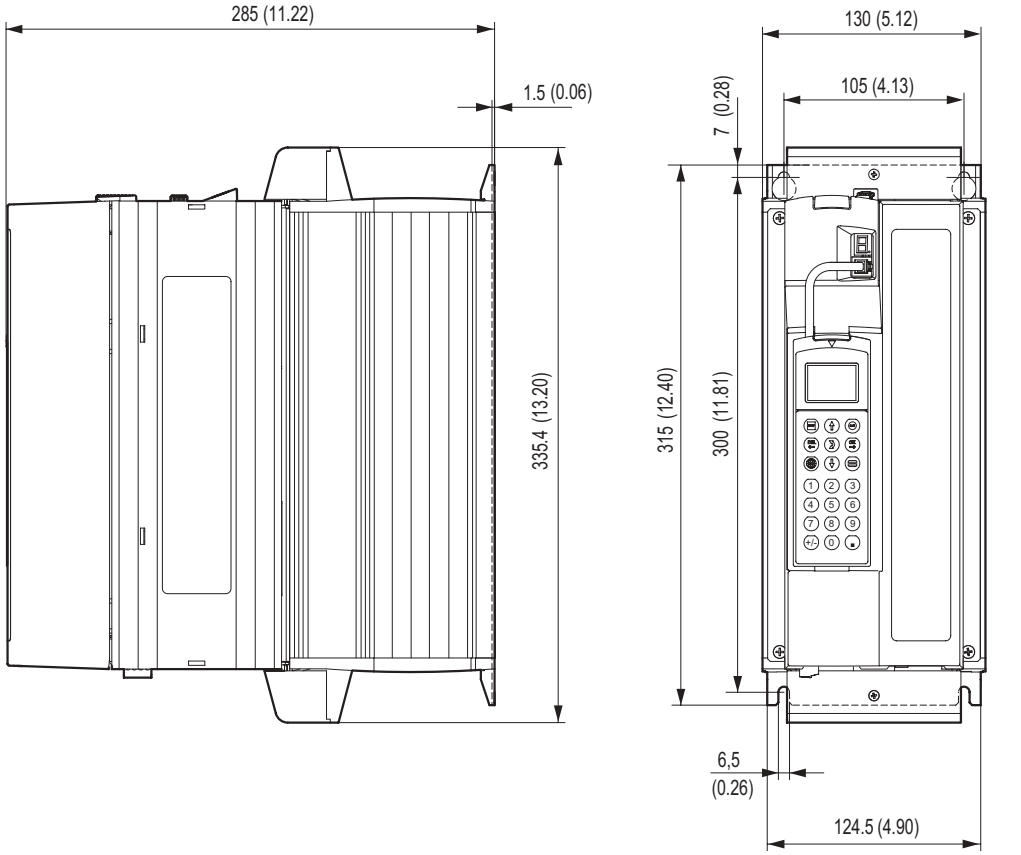

Figure 29: Dimensions, MDX61B size 2, in mm (in)

BSize 3

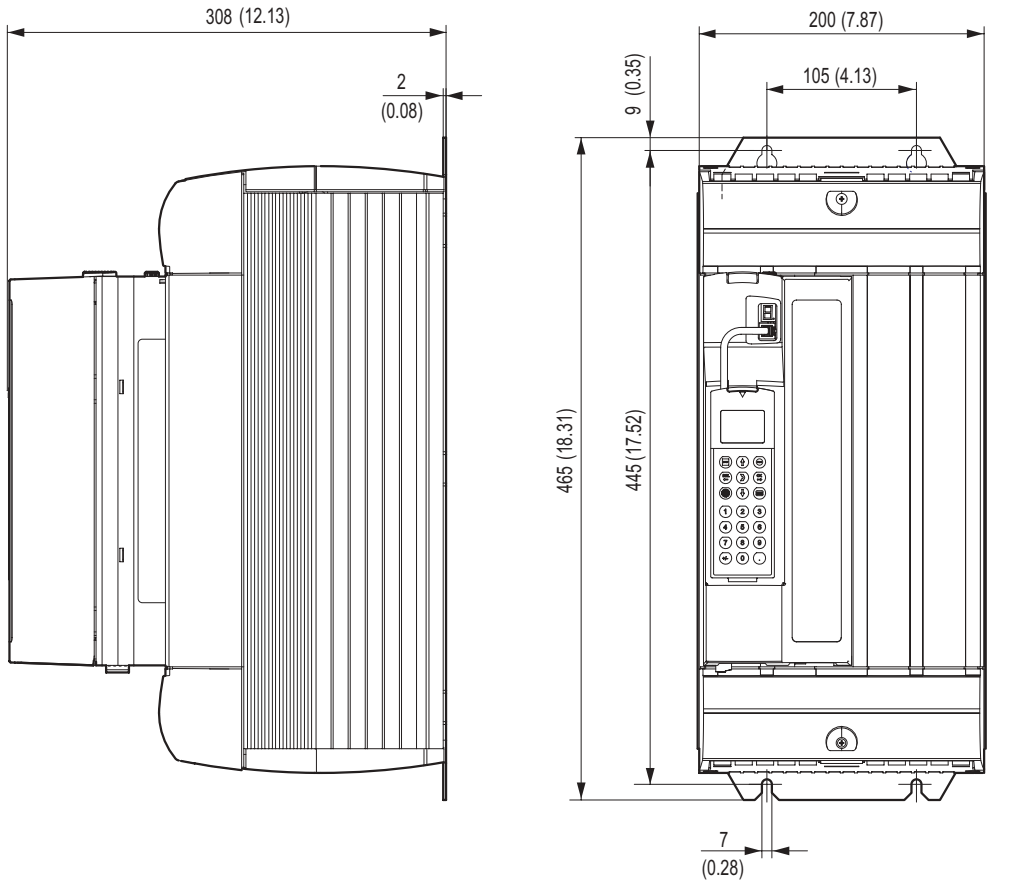

Figure 30: Dimensions, MDX61B size 3, in mm (in)

BSize 4

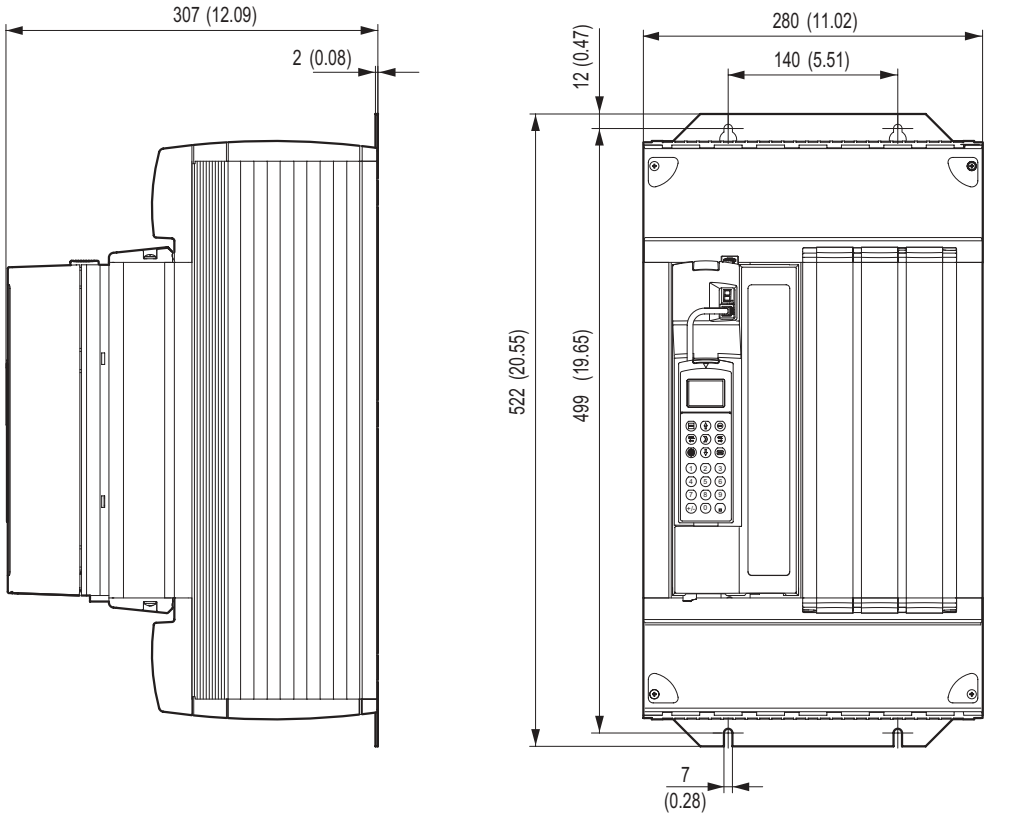

Figure 31: Dimensions, MDX61B size 4, in mm (in)

Size 5

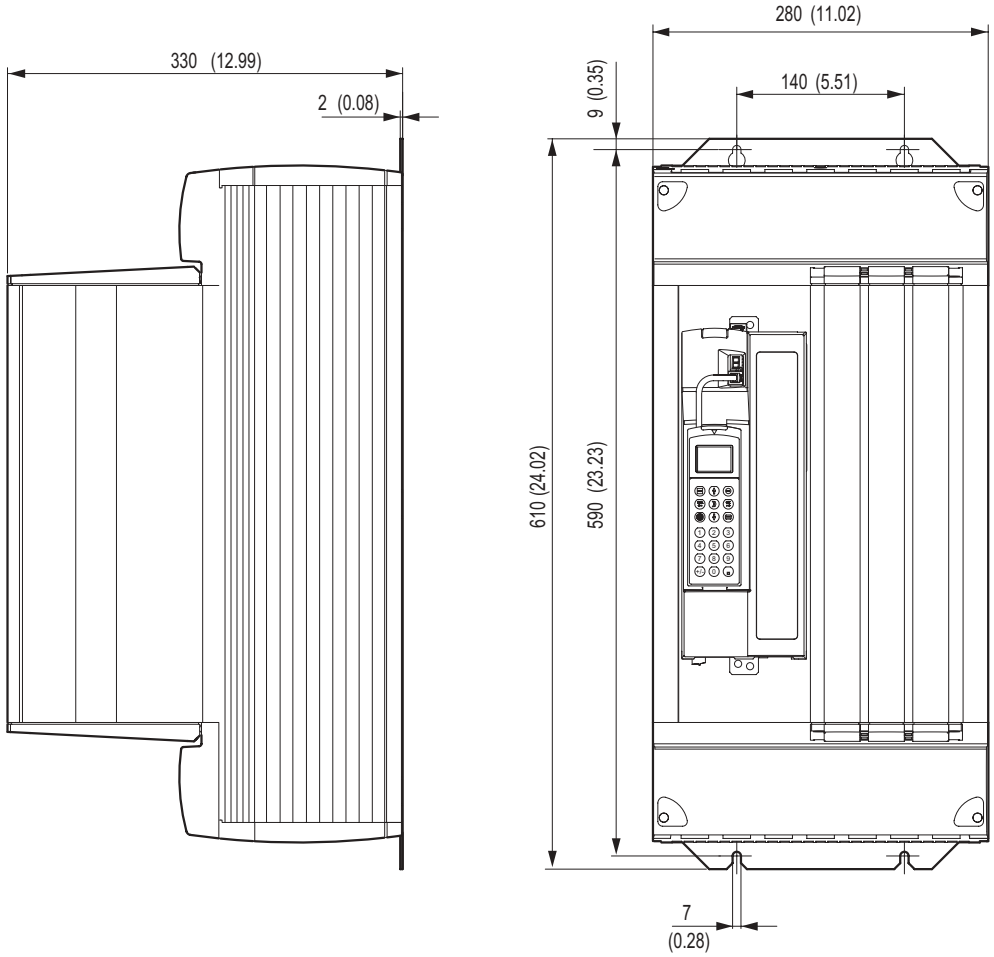

Figure 32: Dimensions, MDX61B size 5, in mm (in)

Size 6

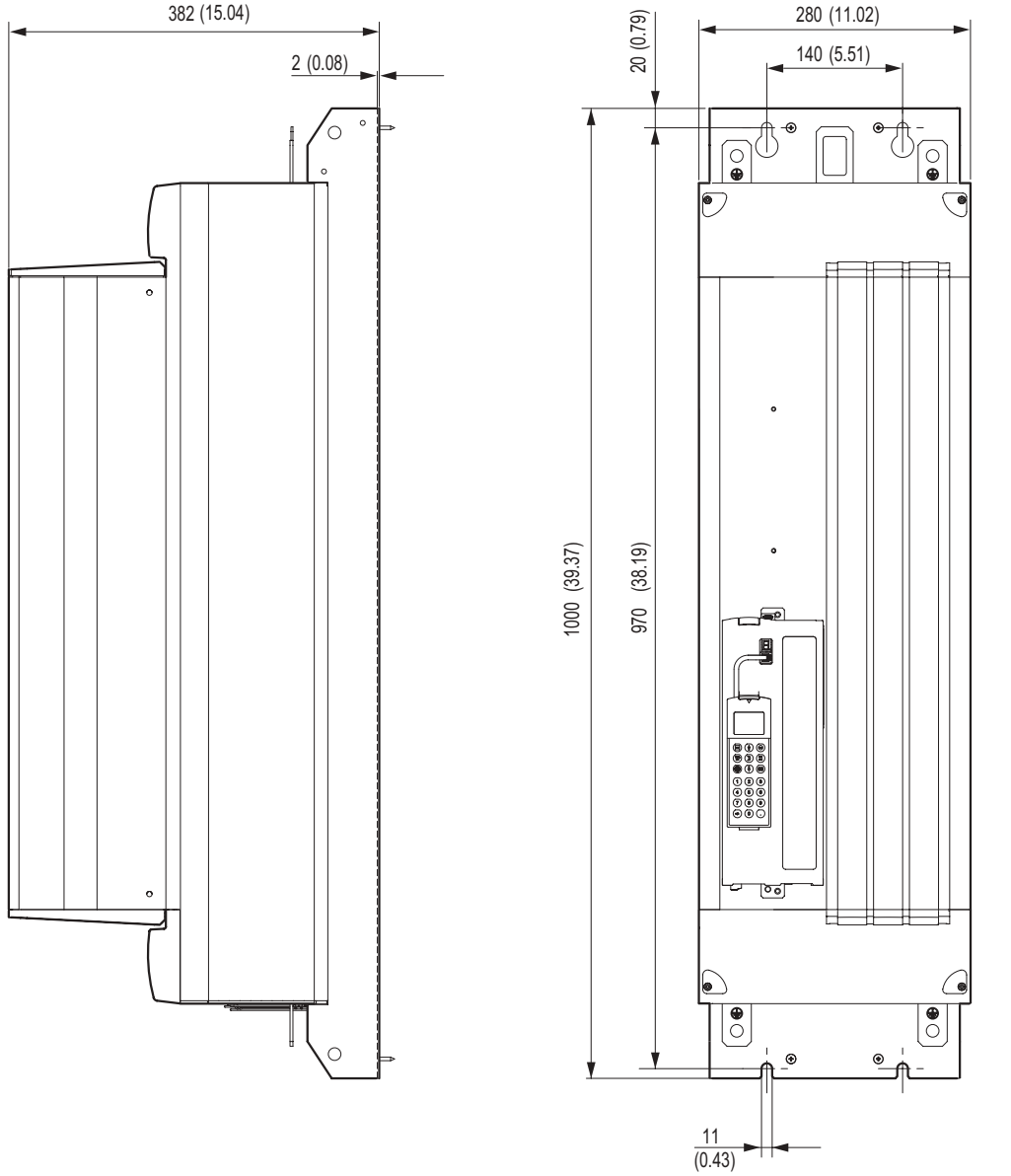

Figure 33: Dimensions, MDX61B size 6, in mm (in)

2.9 MOVIDRIVE® MDR60A regenerative power supply units

General technical data

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. The "MDR60A Regenerative Power Supply Unit" manual contains detailed information. This manual can be ordered from SEW.

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.

MOVIDRIVE® MDR60A does not require an auxiliary power supply or control signals. Readiness for operation is indicated by a DC 24 V signal output and a ready signal indicator.

MOVIDRIVE® MDR60A	**All sizes**
Interference immunity	meets EN 61800-3
Interference emission with EMC-compliant installation (with NF180-503)	According to class B limit to EN 55011 and EN 55014 meets EN 61800-3
Ambient temperature ϑ_{amb} **Derating ambient temperature** **Climate class**	0°C...+40 °C P_N reduction: 3.0 % I_N per K to max. 60 °C EN 60721-3-3, class 3K3
Storage temperature[1] ϑ_L	-2 5°C...+70 °C (EN 60721-3-3, class 3K3)
Cooling type (DIN 51751)	Forced cooling
Enclosure **Size 3** **EN 60529** **Size 4** **(NEMA1)**	IP20 IP00 (power connections); IP10 with mounted Plexiglas cover supplied as standard
Operating mode	DB (EN 60149-1-1 and 1-3)
Installation altitude	h ≤ 1000 m (3300 ft) I_N reduction: 1 % per 100 m (330 ft) from 1000 m (3300 ft) to max. 2000 m (6600 ft)

1) For long-term storage, connect to power supply every two (2) years for at least 5 minutes, otherwise the unit's service life may be reduced.

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Figure 34: MOVIDRIVE® MDR60A regenerative power supply units

MDR60A size 3

MOVIDRIVE® MDR60A		0370-503-00
Part number		826 658 1
INPUT		
Supply voltage	V_{mains}	3 × AC 380 V -10 % to 3 × AC 500 V +10 %
Supply frequency	f_{mains}	50 Hz ... 60 Hz ±5 %
Rated connected load	P_N	37 kW
Rated mains current (at V_{mains} = 3 × AC 400 V)	I_{mains}	AC 66 A
DC LINK		
Rated output power (at V_{mains} = 3 × AC 380...500 V)	P_A	51 kVA
DC link voltage	V_{DCL}	DC 560 V ... 780 V
Rated DC link current	I_{DCL}	DC 70 A
max. DC link current	I_{DCL_max}	DC 105 A
GENERAL		
Power loss at P_N	P_{Vmax}	950 W
Cooling air consumption		180 m^3/h (108 ft^3/min)
Weight		16 kg (35 lb)
Dimensions	W × H × D	200 × 465 × 221 mm (7.87 × 18.31 × 8.70 in)
Line choke (always necessary)		ND085-013, L_N = 0.13 mH, part number 826 014 1
for MOVIDRIVE®		0015...0370

Dimension sheet

Provide at least 100 mm (4 in) clearance above and below the unit. No clearance is required at the sides; the units can be lined up in rows.

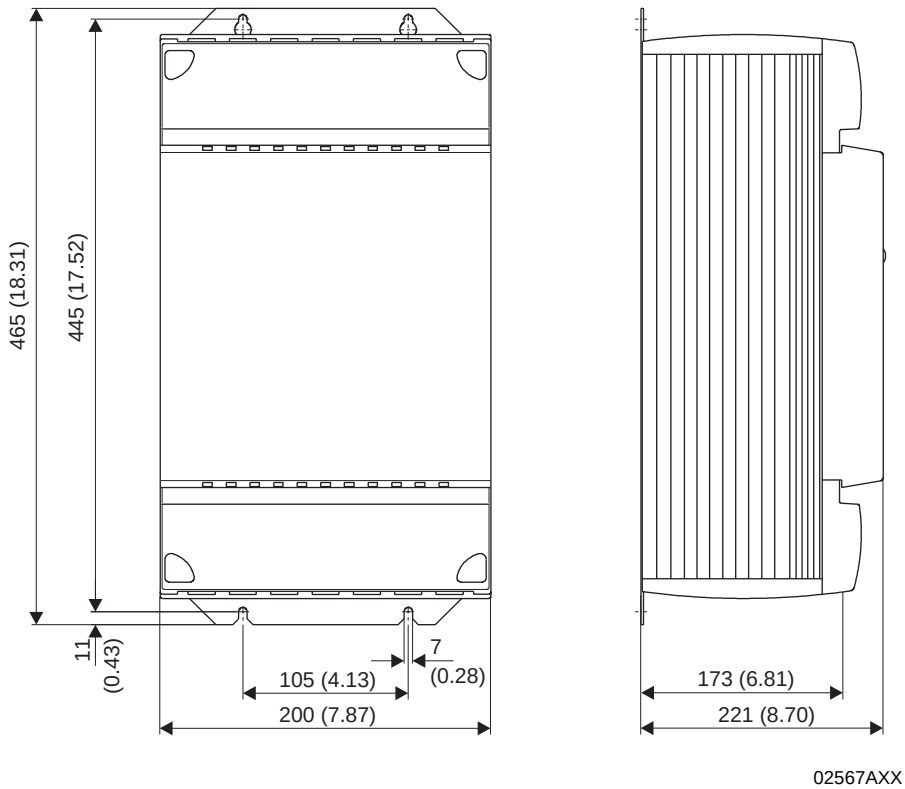


Figure 35: Dimensions, MDR60A size 3, in mm (in)

MDR60A size 4

MOVIDRIVE® MDR60A		0750-503-00
Part number		826 556 9
INPUT		
Supply voltage	V_{mains}	3 × AC 380 V -10 % to 3 × AC 500 V +10 %
Supply frequency	f_{mains}	50 Hz ... 60 Hz ±5 %
Rated connected load	P_N	75 kW
Rated mains current (at V_{mains} = 3 × AC 400 V)	I_{mains}	AC 117 A
DC LINK		
Rated output power (at V_{mains} = 3 × AC 380...500 V)	P_A	91 kVA
DC link voltage	V_{DCL}	DC 560 V ... 780 V
Rated DC link current	I_{DCL}	DC 141 A
max. DC link current	I_{DCL_max}	DC 212 A
GENERAL		
Power loss at P_N	P_{Vmax}	1700 W
Cooling air consumption		360 m^3/h (216 ft^3/min)
Weight		24 kg (53 lb)
Dimensions	**W × H × D**	280 × 522 × 205 mm (11.02 × 20.55 × 8.8.07 in)
Line choke (always necessary)		ND200-0033, L_N = 0.03 mH, part number 826 579 8
For MOVIDRIVE®		0015...0750

Dimension sheet

Provide at least 100 mm (4 in) clearance above and below the unit. No clearance is required at the sides; the units can be lined up in rows.

Do not install any components which are sensitive to high temperatures within 300 mm (11.81 in) of the top of the unit (e.g. contactors or fuses).

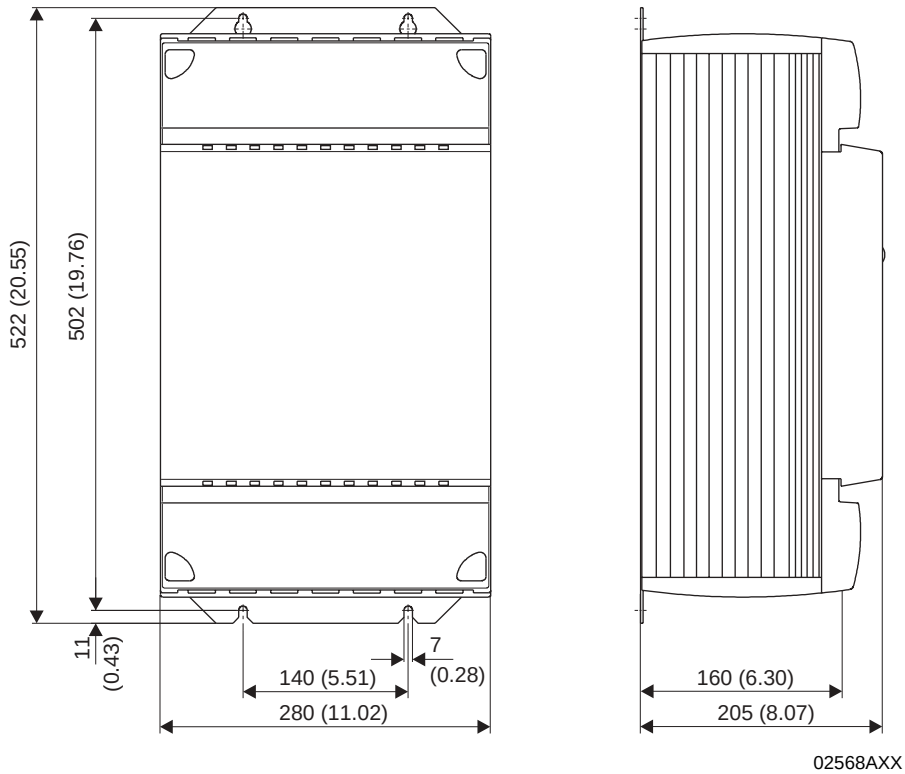


Figure 36: Dimensions, MDR60A size 4, in mm (in)

DC link circuit connection

SEW-EURODRIVE highly recommends the use of the following cable sets for the DC link connection of the regenerative power supply unit to the drive inverters. These cable sets offer the necessary dielectric strength. They are color-coded, which 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 circuit connection to the permitted 5 m (16.4 ft). 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 a star configuration. Use a busbar subdistributor if the DC link terminals of the regenerative power supply unit are not sufficient.

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...0300	0370...0750	0900.. 1320

STOP

Observe the information in the "DC Link Circuit Connection" manual with regard to the DC link circuit connection. This manual can be ordered from SEW-EURODRIVE.

DCD12A damping module

Part number of damping module type DCD12A: 826 903 3

If more than six MOVIDRIVE® drive inverters are connected via DC link, then a DCD12A damping module must be connected to X4:8 ($+U_Z$) of each size 1 (0015-5A3 ... 0040-5A3) and size 2 (0055-5A3 ... 0110-5A3) unit in the combination.

04810AXX

Figure 37: DCD12A damping module

STOP

The damping module may not be connected to MOVIDRIVE® drive inverters of sizes 3 to 5 (0150-503 ... 0750-503).

Technical data

Type	Rated through-put current	Electrical connection	Dimensions W × H × D	Weight
DCD12A	DC 30 A	Terminal screw 6 mm^2 (AWG10)	100 × 105 × 44 mm (3.94 × 4.13 × 1.73 in)	0.5 kg (1.1 lb)

2.10 IPOS$^{plus®}$

Description

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

The IPOS$^{plus®}$ sequence control system makes it possible to run a user program disregarding any encoder feedback or the selected control mode (VFC, CFC, SERVO). In conjunction with encoder feedback, the IPOS$^{plus®}$ positioning control provides a high-performance point-to-point positioning capability. The IPOS$^{plus®}$ program is written using the MOVITOOLS® software. Starting up the inverter, accessing parameters and editing variables are 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), RS-485, RS-232 and fieldbus (direct communication with MOVIMOT® is possible)
- Processing of digital and analog input/output signals

With encoder feedback only

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

Technical data

Max. program length of tasks 1 and 2	**approx. 3200 program lines in total (assembler programming)**
Command processing time per program line	100 µs ... 1 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 (0 ... 10 V, ±10 V, 0 ... 20 mA, 4 ... 20 mA) 1 input (0...10 V) 1 output (0...20 mA, 4...20 mA)

2.11 DBG60B keypad option

Description

06655AXX

Figure 38: DBG60B keypad

The keypad is used for startup and in case of service. The basic version of MOVIDRIVE® does not have a keypad and can be upgraded as an option.

Keypad	Language	Part number
DBG60B	DE/EN/FR/IT/ES/PT/FI/SV/DA (German/English/French/Italian/Spanish/Portuguese/Finnish/Swedish/Danish)	824 419 7
Extension cables	**Description**	**Part number**
DKG60B	• 5 m long (16.5 ft) • shielded 4-pole cable AWG26	817 583 7

Features

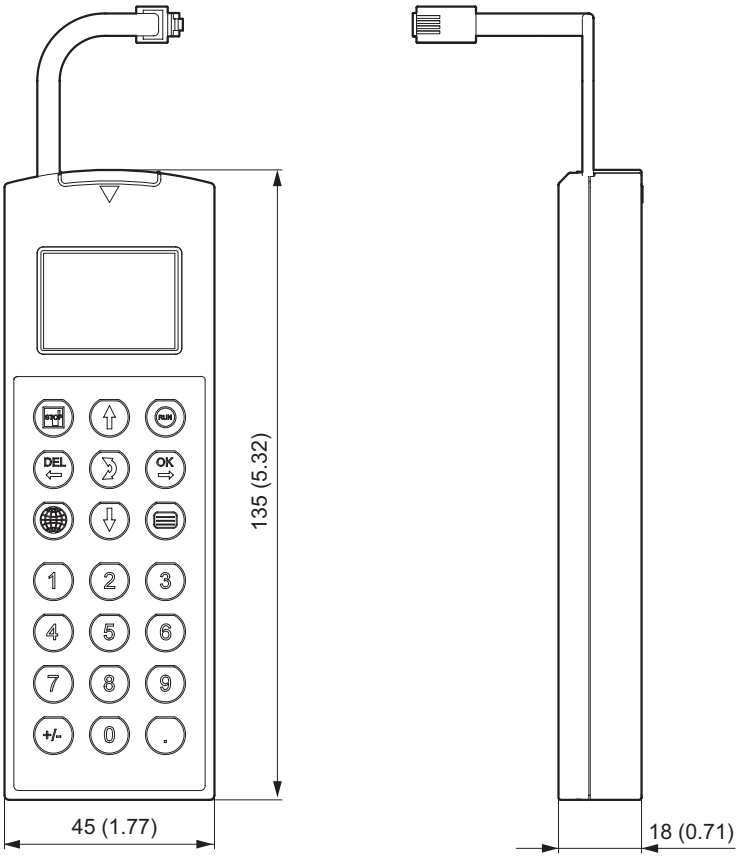
- Illuminated plain text display, nine languages can be set
- Keypad with 21 keys
- Selection between quick menu, detailed parameter menu and startup menu in VFC mode (CFC and SERVO startup is not possible with the DBG60B)
- Can be plugged onto the inverter (Xterminal slot)
- Can be connected via extension cable FKG60B
- Enclosure IP40 (EN 60529)

The DBG60B keypad option and the UWS21A serial interface option are plugged into the same inverter slot (Xterminal) and therefore cannot be used at the same time.

Functions

- Indication of process values and status displays
- Status displays of the binary inputs/outputs
- Fault memory inquiry and fault reset
- Displaying and setting of operating parameters and service parameters
- Data backup and transfer of parameter sets to other MOVIDRIVE® units
- User-friendly startup menu for VFC mode

Dimension sheet



53147AXX

Figure 39: Dimensions, DBG60B, in mm (in)

2.12 HIPERFACE® encoder card option type DEH11B

Part number 824 310 7

Description

53156AXX

Figure 40: HIPERFACE® encoder card type DEH11B

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 output for an encoder simulation.

Electronics data

DEH11B option		Electronics data	
Output encoder simulation or input external encoder[1)]	X14:	Output encoder simulation: Signal level to RS-422 (5 V TTL) The number of pulses is as follows: • 1024 pulses/revolution (Hiperface® encoder on X15) • as on X15: Motor encoder input (sin/cos encoder or TTL sensor on X15)	External encoder input (max. 200 kHz): Permitted encoder types: • Hiperface® encoder (AV1H) • sin/cos encoder 1 V_{SS} • TTL sensor Encoder power supply: +12 V, I_{max} = 180 mA
Motor encoder input[1)]	X15:	Permitted encoder types: • Hiperface® encoder (AV1H) • sin/cos encoder 1 V_{SS} • TTL sensor Encoder power supply: +12 V, I_{max} = 180 mA	

1) The unit provides a current of I_{max} = 400 mA for the +24 V outputs (VO24, binary outputs, encoder supply). If this value is insufficient, a DC 24 V power supply unit must be connected to X10:9 (VI24).

2.13 Resolver card option type DER11B

Part number 824 307 7

Description

53157AXX

Figure 41: Resolver card type DER11B

The option capable MOVIDRIVE® MDX61B units can be equipped with the 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 output for an encoder simulation.

Electronics data

DER11B option		Electronics data	
Encoder simulation output or external encoder input[1)]	X14:	Encoder simulation output: Signal level to RS-422 (5 V TTL) The number of pulses is 1024 pulses/ revolution	External encoder input (max. 200 kHz): Permitted encoder types: • Hiperface® encoder (AV1H) • sin/cos encoder 1 V_{SS} • TTL sensor Encoder power supply: +12 V, I_{max} = 180 mA
Motor encoder input[1)]	X15:	Resolver 2-pole, 3.5 $V_{AC\_r.m.s.}$, 4 kHz	

2.14 Interface converter option type UWS11A

Part number 822 689 X

Description The UWS11A option converts RS-232 signals, for example from the PC, into RS-485 signals. These RS-485 signals can then be routed to the RS-485 interface of the MOVIDRIVE® unit (ST11/ST12).

The UWS11A option requires a DC 24 V voltage supply (I_{max} = 100 mA).

RS-232 interface The connection between UWS11A and PC is made using a commercially available serial interface cable (shielded!).

RS-485 interface Max. 32 MOVIDRIVE® units can be networked for communications purposes (max. total cable length 200 m (660 ft)) via the RS-485 interface of the UWS11A. Dynamic terminating resistors are permanently installed, so do not connect any external terminating resistors!

Permitted line cross section: One core per terminal 0.20...2.5 mm² (AWG 24...12)
Two cores per terminal 0.20...1 mm² (AWG 24...17)

Dimension sheet

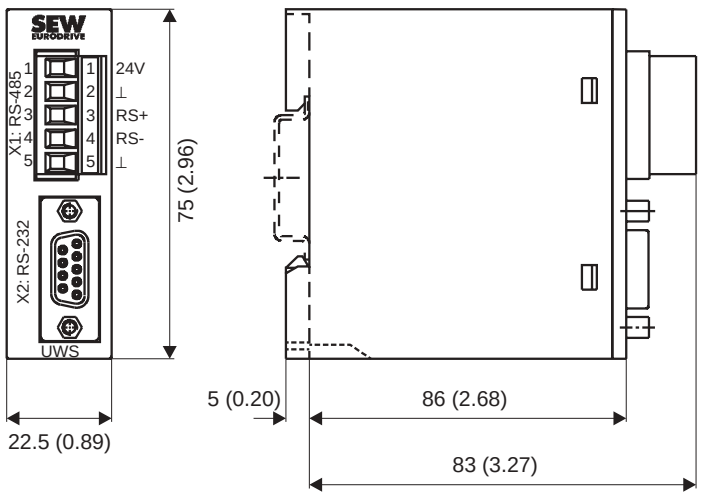


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Figure 42: Dimensions, UWS11A, in mm (in)

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

2.15 Interface converter option type UWS21A

Part number 823 077 3

Description The UWS21A option converts RS-232 signals, for example from the PC, into RS-485 signals. These RS-485 signals can then be routed to the Xterminal interface of the MOVIDRIVE® unit.

RS-232 interface The connection between UWS21A and PC is made using a commercially available serial interface cable (shielded!).

RS-485 interface UWS21A and MOVIDRIVE® are connected using a serial interface cable with RJ10 plugs.

Scope of delivery The scope of delivery for the UWS21A option includes:

- UWS21A interface adapter
- Serial interface cable with 9-pin sub-D socket and 9-pin sub-D plug to connect UWS21A with the PC.
- Serial interface cable with two RJ10 plugs to connect UWS21A and MOVIDRIVE®.

Dimension sheet

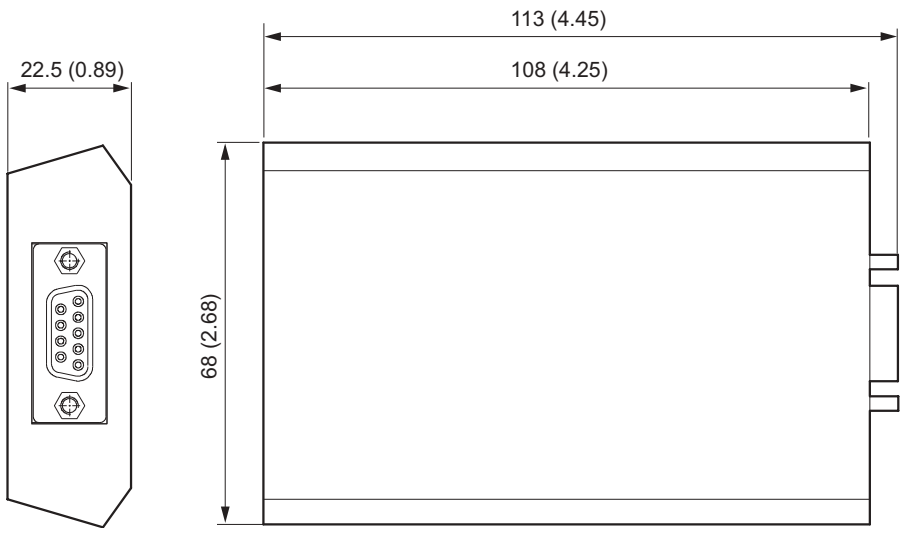


Figure 43: Dimensions, UWS21A, in mm (in)

2.16 5 V encoder power supply option 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 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 24 V power supply for the encoder inputs is converted to DC 5 V by means of a voltage controller. The supply voltage at the encoder is measured using a sensor line and the voltage drop along the encoder cable is compensated.

Incremental encoders with DC 5 V encoder power supply are not allowed to be connected directly to the encoder inputs X14: and X15: because this would result in irreparable damage to the encoders.

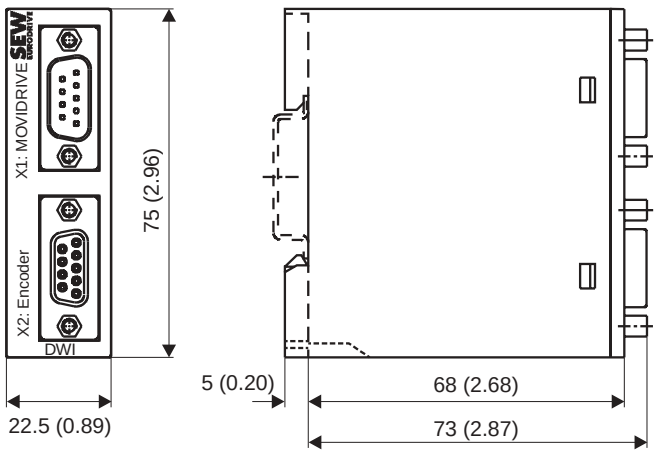
Note that in the event of a short circuit on the sensor line, the connected encoder may be subjected to a voltage in excess of its permitted voltage.

Technical data

Option	5 V encoder power supply type DWI11A
Part number	822 759 4
Voltage input	+24 V to EN 61131-2, DC 18 ... 30 V, I_{max} = 120 mA
Encoder power supply	+5 V (up to $V_{max} \approx$ +10 V), I_{max} = 300 mA
Max. line length which can be connected	100 m (330 ft) 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®.

Recommendation Use prefabricated cables from SEW-EURODRIVE for connecting the encoder.

Dimension sheet



01315BXX

Figure 44: Dimensions, DWI11A, in mm (in)

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

2.17 Input/output card option type DIO11B

Part number 824 308 5

Description

53159AXX

Figure 45: Input/output card type DIO11B

The inputs/outputs of the basic MOVIDRIVE® unit can be expanded with the DIO11B option. The DIO11B option is plugged into the expansion slot. The programmable signal types of the additional binary inputs/outputs are the same as the basic unit (→ parameter group P6__, Terminal assignment).

Functions

- Eight binary inputs
- Eight binary outputs
- One analog differential input (0 ... 10 V, ±10 V, 0 ... 20 mA with corresponding load)
- Two analog outputs (±10 V, 0 ... 20 mA, 4 ... 20 mA)

Electronics data

DIO11B option		Electronics data	
Setpoint input n2	X20:1/X20:2	AI21/AI22: Voltage input, sampling interval 1 ms Differential input or input with AGND reference potential	
AI21/AI22 operating mode		n2 = 0...+10 V or -10 V...0...+10 V	
Resolution		12 bits	
Internal resistance		R_i = 40 kΩ	
Analog outputs	X21:1/X21:4	AOV1/AOV2: Voltage outputs -10 V...0...+10 V, I_{max} = 10 mA, short-circuit proof and protected against external voltage, selection option → Parameter menu P64_	
	X21:2/X21:5	AOC1/AOC2: Voltage outputs 0(4)...20 mA, I_{max} = 10 mA, short-circuit proof and protected against external voltage, selection option → Parameter menu P64_	
Binary inputs X22:1...X22:8		Isolated (optocoupler), PLC compatible (EN 61131), sampling interval 1 ms DI1Ø...DI17	
Internal resistance		R_i ≈ 3.0 kΩ, I_E ≈ 10 mA	
Signal level		+13 V...+30 V = "1" = contact closed -3 V...+5 V = "0" = contact open	To EN 61131
Function	X22:1...X22:8	DI1Ø...DI17: Selection option → Parameter menu P61_	
Binary outputs[1]	X23:1...X23:8	DO1Ø...DO17: PLC compatible (EN 61131-2), response time 1 ms	
Signal level		"0" = 0 V "1" = +24 V **Important:** Do not apply external voltage!	
Function	X23:1...X23:8	DO1Ø...DO17: Selection option → Parameter menu P63_, I_{max} = 50 mA, short-circuit proof and protected against external voltage	
Reference terminals	X20:3/X21:3/X21:6 X22:9 X22:10	AGND: Reference potential for analog signals (AI21/AI22/AO_1/AO_2) DCOM: Reference potential for binary inputs X22:1...X22:8 (DI1Ø...DI17) DGND: Reference potential for binary signals, reference potential for 24 V power supply	
Voltage input	X23:9	24VIN: Supply voltage +24 V for binary outputs DO1Ø...DO17	
Permitted line cross section		One core per terminal: 0.08...1.5 mm^2 (AWG 28...16) Two cores per terminal: 0.25...1 mm^2 (AWG 22...17)	

1) The unit provides a current of I_{max} = 200 mA for the +24 V outputs (VO24, binary outputs, encoder supply). If this value is insufficient, a DC 24 V power supply unit must be connected to X23:9 (VI24).

2.18 PROFIBUS interface option type DFP21B

Part number 824 240 2

Description

53158AXX

Figure 46: PROFIBUS interface type DFP21B

MOVIDRIVE® can be equipped with a 12 Mbaud fieldbus interface for the PROFIBUS-DP serial bus system. The PROFIBUS documentation package contains detailed information. This package can be ordered from SEW. The documentation package contains the GSD files and type files for MOVIDRIVE® to help with project planning and to facilitate startup.

PROFIBUS-DP (Decentralized Periphery) is predominantly used at the sensor/actuator level where fast response times are required. The principal task of PROFIBUS-DP is to transmit 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. Consequently, MOVIDRIVE® can be controlled by a PLC and PROFIBUS-DP.

Electronics data

DFP21B option	Electronics data
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 connector, pin assignment to IEC 61158
Bus termination	not integrated, implement using suitable PROFIBUS plug with terminating resistors that can be switched on
Station address	0 ... 125, can be set using DIP switch
Name of the GSD file	SEWA6003.GSD
DP identity number	6003_{hex} (24579_{dec})
Max. number of process data	10 process data

2.19 INTERBUS interface option type DFI11B

Part number 824 309 3

Description

53160AXX

Figure 47: INTERBUS interface type DFI11B

MOVIDRIVE® can be equipped with a fieldbus interface for the non-proprietary and standardized INTERBUS sensor/actuator bus system. The INTERBUS documentation package contains detailed information. This package can be ordered from SEW.

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® drive inverter can be controlled and parameterized in a user-friendly way.

Electronics data

DFI11B option	Electronics data
Supported baud rates Connection technology	500 kbaud and 2 Mbaud, changeover via DIP switch Remote bus input: 9-pin sub D plug Remote bus output: 9-pin sub D socket RS-485 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) $38_{hex} = 56_{dec}$ (micro processor not ready) $03_{hex} = 3_{dec}$ (no PCP word)
Max. number of process data	6 process data

2.20 MOVITOOLS operating software

Part number 0918 5054

Description

MOVITOOLS is a program package comprising SHELL, SCOPE, IPOS$^{plus®}$ Compiler and LOGODrive. You can use MOVITOOLS® to address either of the four unit series MOVIDRIVE® MDX60B/61B, MOVIDRIVE® MD_60A, MOVIDRIVE® *compact* and MOVITRAC® 07.

- SHELL can be used for starting up the drive and setting its parameters in a convenient way.
- SCOPE provides extensive oscilloscope functions for diagnosis of the drive.
- 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.
- LOGODrive allows you to write applications with graphics support.
- 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-EURODRIVE homepage (http://www.sew-eurodrive.com). MOVITOOLS® can be used with the following operating systems:

- Windows® 95
- Windows® 98
- Windows NT® 4.0
- Windows® 2000 (from version 2.60)
- Windows® Me (from version 2.60)
- Windows® XP

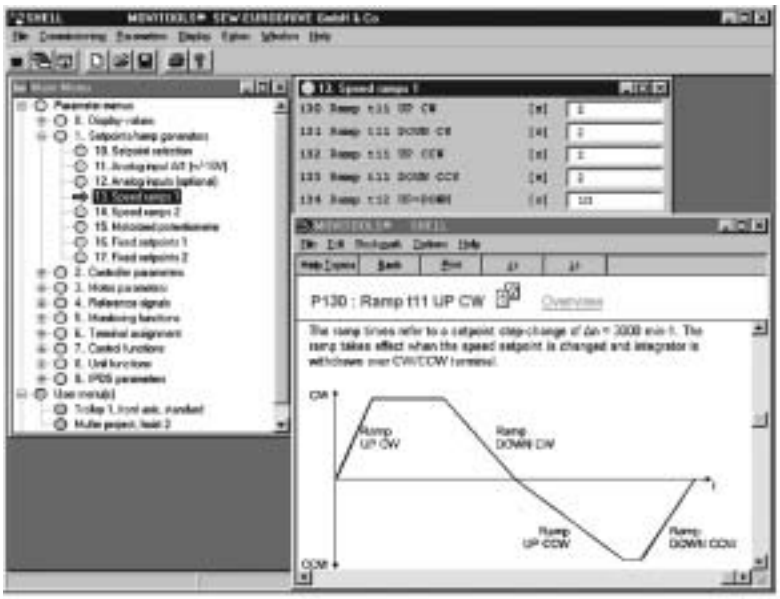


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Figure 48: MOVITOOLS® window

2.21 Application modules for MOVIDRIVE® MDX61B

In the past, it was necessary to write complicated control programs for the machine control to implement applications such as table positioning. All movements were controlled by the machine control.

IPOS$^{plus®}$

MOVIDRIVE® MDX61B drive inverters with integrated IPOS$^{plus®}$ positioning and sequence control are capable of controlling all the movements themselves. The control program runs in the inverter. Major advantages:

- Decentralized concepts can be implemented more easily.
- Movements are controlled closer to the machine, so response times are shorter.
- The machine control does not have to perform as many functions as before.

So you as the user do not have to go to the trouble of writing the IPOS$^{plus®}$ control program yourself, SEW-EURODRIVE offers application modules for MOVIDRIVE® MDX61B units in the application version. These application modules are part of the MOVITOOLS® software package.

Advantages

The application modules offer you the following benefits:

- Wide range of functions
- User-friendly operator interface
- You only have to enter the parameters needed for the application
- The application programs guide you through the process of setting parameters, so there is no need for complicated programming
- No programming experience necessary
- Quick familiarization

Scope of delivery and documentation

The application modules are part of the MOVITOOLS® operating software and can be used with units in application version (MOVIDRIVE® MDX61B...-0T). All manuals relating to the application modules are contained in the "Additional Functions and Application Modules" documentation package. You can order this documentation package from SEW-EURODRIVE.

The individual manuals can also be downloaded in PDF format from the SEW-EURODRIVE homepage (http://www.sew-eurodrive.com).

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. The sequence of motion can be linear or rotational.

Such sequences of motions include trolleys, hoists, gantries, rotary tables, swiveling devices and storage and retrieval units for high-bay warehouses.

Linear positioning

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

Motion sequences in the inverter

- **Table positioning**
- **Table positioning with bus control**

Up to 32 motion sequences 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). The application modules come with the following range of features:

- 32 table positions can be defined and selected.
- The travel speed can be selected as required for each positioning movement.
- The ramp can be set separately for each positioning movement.
- Software limit switches can be defined and evaluated.
- Either encoders or absolute encoders can be evaluated as encoders.
- Guided startup procedure and diagnosis
  - Freely definable user travel units
  - Calculation of position resolution during positioning via the motor encoder
  - Graphical position display

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.

There are four operating modes for controlling the machine:

- Jog mode: The machine can be moved manually.
- Reference travel: The machine zero is determined automatically with incremental position measurement.
- Teach-in: The stored position can be corrected without a programming unit.
- Automatic mode: Automatic sequence controlled by the master PLC.

Motion sequences in the PLC

- **Bus positioning**
- **Extended positioning via bus**

In these application modules, the motion sequences are managed in the PLC. The target position and travel speed are specified via the fieldbus or system bus. The application modules come with the following range of features:

- Any number of target positions can be defined and selected by means of a 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 encoders or absolute encoders can be evaluated as encoders.
- Straightforward connection to the master PLC.
- Guided startup procedure and diagnosis
  - Freely definable user travel units
  - Calculation of position resolution during positioning via the motor encoder
  - Jog mode with variable speed
  - Fieldbus monitor

These application modules are suited to applications in which movement has to take place to a large number of different target positions.

There are three operating modes for controlling the machine:

- Jog mode: The machine can be moved manually.
- Reference travel: The machine zero is determined automatically with incremental position measurement.
- Automatic mode: Automatic sequence controlled by the master PLC.

- **Absolute value positioning**

In this application module, the motion sequences are also managed in the PLC and specified via the fieldbus/system bus. No motor encoder is required for this application module. The absolute encoder mounted on the travel path is used for positioning. The application module comes with the following range of features:

- Any number of target positions can be defined and selected by means of a fieldbus/ system bus.
- A long travel distance is possible, for example 262,144 m in the "mm" travel unit.
- 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 master PLC.
- Guided startup procedure and diagnosis
  - Freely definable user travel units
  - Calculation of encoder resolution
  - Jog mode with two speeds
  - Fieldbus monitor

These application modules are 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.

There are two operating modes for controlling the machine:

- Jog mode: The machine can be moved manually.
- Automatic mode: Automatic sequence controlled by the master PLC.

Rotational positioning

- **Modulo positioning**

Up to 16 motion sequences can be managed in the inverter in this application module. 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). The position can only be measured by incremental encoders. The application module comes with the following range of features:

- 16 table positions can be defined and selected
- The travel speed can be selected as required for each positioning movement
- The ramp can be set separately for each positioning movement
- Flying referencing when using a non-whole number ratio
- Path-optimized positioning or positioning with a specified direction or rotation
- Pulse mode with 16 step widths
- External encoder for position detection possible
- Guided startup procedure and diagnosis
  - Calculation of position resolution during positioning via motor encoder
  - Graphical position display

This application module is suited to applications in which rotational movements or similar endless movements are required. These include rotary tables, circular indexing tables, swiveling devices or cyclic belts.

The following operating modes are available for controlling the machine:

- Jog mode: The machine can be moved manually.
- Reference travel: The machine zero is determined automatically.
- Teach-in: The stored position can be corrected without a programming unit.
- Positioning with position optimization
- Positioning with a fixed direction of rotation
- Cyclical operation

Winding

- **Constant tension central winder**

In this application module, the web tension is set for winding or unwinding using the setpoints, the mechanical friction values, the winding diameter and the winding characteristics. Control takes place either via the binary inputs of the inverter or the virtual terminals (fieldbus, system bus). The application module comes with the following range of features:

- Control either via fieldbus or terminals
- Calculation of the reel diameter and the tensile force
- Material tear monitoring
- Material length counter
- Straightforward connection to the master PLC
- Guided startup procedure and diagnosis
  - Adjustable winding curve
  - Display of web speed and current diameter

This application module is suitable for applications in which an endless material, for example paper, foil, foam, textiles or strip is wound for further processing.

There are four operating modes for controlling the machine:

- Jog mode: The machine can be moved manually
- Teach-in: The speed-dependent friction values are determined automatically
- Automatic mode with constant torque
- Automatic mode with constant web tension

Control

- **Flying saw**

In this application module, the sequence of motion is controlled according to specifications. The application module comes with the following range of features:

- Control either via fieldbus or terminals
- Cut edge protection or sorting using the "pulling a gap" function
- Immediate cut function by manual interrupt
- Material length counter
- Straightforward connection to the master PLC
- Guided startup procedure and diagnosis
  - Display of the current cut length and the material speed
  - Display of the saw drive speed

This 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.

There are two operating modes for controlling the machine:

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

- **Sensor based positioning**

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

- Materials handling technology
  - Trolleys
  - Hoists
  - Rail vehicles
- Logistics
  - Storage and retrieval systems
  - Transverse carriages
- Palletizing / handling
  - Multi-axis handling robots
  - Gantries

2.22 Braking resistor option type BW...

General information

The BW... braking resistor series is adapted to the technical characteristics of MOVIDRIVE® drive inverters.

PTC resistance BW090-P52B

- Direct installation on MOVIDRIVE® MDX60B/61B size 0 (0005 ... 0014).
- The MOVIDRIVE® units can be lined up even with mounted braking resistor BW090-P52B.
- The resistor is self-protecting (reversible) against regenerative overload. This is achieved by the resistor abruptly going to high resistance and no longer accepting any more energy. The inverter then switches off and signals an overvoltage fault (fault code 07).

Flat-type braking resistors

- Shockproof (IP54)
- Internal thermal overload protection (fuse which cannot be replaced)
- Touch guard and mounting rail mounting available from SEW-EURODRIVE as accessories

Wire and grid resistors

- Perforated sheet cover (IP20) open towards the mounting surface
- The short-time load capacity of the wire and grid resistors is greater than in the flat-type braking resistors (→ power diagrams)

SEW-EURODRIVE recommends also protecting the wire and grid resistors against overload using a bimetallic relay. Set the trip current to the value I_F in the table. Do not use any electronic or electromagnetic fuses since even the brief excess currents which are still permitted may cause them to trip.

The surfaces of the resistors get very hot if loaded with P_N. Bear this aspect in mind when selecting the installation location. Braking resistors are therefore mounted on the switch 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® drive inverters. SEW-EURODRIVE can issue a declaration of conformity to this effect on request.

Please note: UL/cUL approval for BW090-P52B in conjunction with MOVIDRIVE® is in preparation.

Parallel connection

Two braking resistors must be connected in parallel in the case of 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.

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

Braking resistor type		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
Load capacity at	**100 % cdf**	0.10 kW	0.45 kW	0.6 kW	0.23 kW	0.45 kW	0.8 kW	1.2 kW
	50 % cdf[1]		0.60 kW	1.1 kW	0.31 kW	0.60 kW	1.4 kW	2.2 kW
	25 % cdf		0.83 kW	1.9 kW	0.42 kW	0.83 kW	2.6 kW	3.8 kW
	12 % cdf		1.11 kW	3.5 kW	0.58 kW	1.11 kW	4.7 kW	6.7 kW
	6 % cdf		2.00 kW	5.7 kW	1.00 kW	2.00 kW	7.6 kW	10 kW[2]
		Note the **regenerative power limit** of the inverter! (= 150 % of the recommended motor power → Technical Data)						
Resistance value	R_{BW}	90 Ω ±35 %	100 Ω ±10 %		72 Ω ±10 %		68 Ω ±10 %	
Trip current (of F16)	I_F	-	0.8 A_{RMS}	1.8 A_{RMS}	0.6 A_{RMS}	1.0 A_{RMS}	2.5 A_{RMS}	3.4 A_{RMS}
Type		PTC	Flat type	Wire resistor on ceramic core	Flat type		Wire resistor on ceramic core	
Connections		Cable	Cable	Ceramic terminals 2.5 mm^2 (AWG12)	Cable		Ceramic terminals 2.5 mm^2 (AWG12)	
Enclosure		IP20	IP54	IP20 (when mounted)	IP54		IP20 (when mounted)	
Ambient temperature	ϑ_{amb}	-20 ... +45 °C						
Type of cooling		KS = Self-cooling						
for MOVIDRIVE®		0005 ... 0014	0005 ... 0022	0015 ... 0040	0005 ... 0014		0015 ... 0040	

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

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

Braking resistor type		BW147	BW247	BW347	BW039-012	BW039-026	BW039-050
Part number		820 713 5	820 714 3	820 798 4	821 689 4	821 690 8	821 691 6
Load capacity at	**100 % cdf**	1.2 kW	2.0 kW	4.0 kW	1.2 kW	2.6 kW	5.0 kW
	50 % cdf[1]	2.2 kW	3.8 kW	7.6 kW	2.1 kW	4.6 kW	8.5 kW
	25 % cdf	3.8 kW	6.4 kW	12.8 kW	3.8 kW	8.3 kW	15.0 kW
	12 % cdf	7.2 kW	12 kW	14.4 kW[2]	7.0 kW	15.3 kW	17.3 kW[2]
	6 % cdf	11 kW	14.4 kW[2]	14.4 kW[2]	11.4 kW	17.3 kW[2]	17.3 kW[2]
		Note the **regenerative power limit** of the inverter! (= 150 % of the recommended motor power → Technical Data)					
Resistance value	R_{BW}	47 Ω ±10 %			39 Ω ±10 %		
Trip current (of F16)	I_F	3.5 A_{RMS}	4.9 A_{RMS}	7.8 A_{RMS}	4.2 A_{RMS}	7.8 A_{RMS}	11 A_{RMS}
Type		Wire resistor on ceramic core					Grid resistor
Connections		Ceramic terminals 2.5 mm^2 (AWG12)					
Enclosure		IP20 (when mounted)					
Ambient temperature	ϑ_{amb}	-20 ... +45 °C					
Type of cooling		KS = Self-cooling					
for MOVIDRIVE®		0055/0075			0110		

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

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

Braking resistor type		BW018-015	BW018-035	BW018-075	BW915
Part number		821 684 3	821 685 1	821 686 X	821 260 0
Load capacity at	100 % cdf	1.5 kW	3.5 kW	7.5 kW	16 kW
	50 % cdf[1)]	2.5 kW	5.9 kW	12.7 kW	27 kW
	25 % cdf	4.5 kW	10.5 kW	22.5 kW	45 kW[2)]
	12 % cdf	6.7 kW	15.7 kW	33.7 kW	45 kW[2)]
	6 % cdf	11.4 kW	26.6 kW	37.5 kW[2)]	45 kW[2)]
		Note the **regenerative power limit** of the inverter! (= 150 % of the recommended motor power → Technical Data)			
Resistance value	R_{BW}	18 Ω ±10 %			15 Ω ±10 %
Trip current (of F16)	I_F	4.0 A_{RMS}	8.1 A_{RMS}	14 A_{RMS}	28 A_{RMS}
Type		Grid resistor			
Connections		Ceramic terminals 2.5 mm^2 (AWG12)			M8 stud
Enclosure		IP20 (when mounted)			
Ambient temperature	ϑ_{amb}	-20 ... +45 °C			
Type of cooling		KS = Self-cooling			
for MOVIDRIVE®		0150/0220 and 2 × parallel with 0370/0450			0220

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

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

Braking resistor type		BW012-025	BW012-050	BW012-100	BW106	BW206
Part number		821 680 0	821 681 9	821 682 7	821 050 0	821 051 9
Load capacity at	100 % cdf	2.5 kW	5.0 kW	10 kW	13 kW	18 kW
	50 % cdf[1)]	4.2 kW	8.5 kW	17 kW	24 kW	32 kW
	25 % cdf	7.5 kW	15.0 kW	30 kW	40 kW	54 kW
	12 % cdf	11.2 kW	22.5 kW	45 kW	66 kW	88 kW
	6 % cdf	19.0 kW	38.0 kW	56 kW[2)]	102 kW	112 kW[2)]
		Note the **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	6.1 A_{RMS}	12 A_{RMS}	22 A_{RMS}	38 A_{RMS}	42 A_{RMS}
Type		Grid resistor				
Connections		Ceramic terminals 2.5 mm^2 (AWG12)			M8 stud	
Enclosure		IP20 (when mounted)				
Ambient temperature	ϑ_{amb}	-20 ... +45 °C				
Type of cooling		KS = Self-cooling				
for MOVIDRIVE®		0300			0370...0750 and 2 × parallel with 0900/1100/1320	

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

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

Assignment to 230 V units (-2_3)

Braking resistor type		BW039-003	BW039-006	BW039-012	BW039-026	BW027-006	BW027-012	BW018-015	BW018-035
Part number		821 687 8	821 688 6	821 689 4	821 690 8	822 422 6	822 423 4	821 684 3	821 685 1
Load capacity at	**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
	50 % cdf[1]	0.5 kW	1.1 kW	2.1 kW	4.6 kW	1.2 kW	2.3 kW	2.5 kW	5.9 kW
	25 % cdf	1.0 kW	1.9 kW	3.8 kW	5.9 kW[2]	2.0 kW	5.0 kW	4.5 kW	10.5 kW
	12 % cdf	1.7 kW	3.5 kW	5.9 kW[2]	5.9 kW[2]	3.5 kW	7.5 kW	6.7 kW	15.7 kW
	6 % cdf	2.8 kW	5.7 kW	5.9 kW[2]	5.9 kW[2]	6.0 kW	8.5 kW[2]	11.4 kW	25.6 kW[2]
		Note the **regenerative power limit** of the inverter! (= 150 % of the recommended motor power → Technical Data)							
Resistance value	R_{BW}	39 Ω ±10 %				27 Ω ±10 %		18 Ω ±10 %	
Trip current (of F16)	I_F	2.0 A_{RMS}	3.2 A_{RMS}	4.2 A_{RMS}	7.8 A_{RMS}	2.5 A_{RMS}	4.4 A_{RMS}	4.0 A_{RMS}	8.1 A_{RMS}
Type		Wire resistor						Grid resistor	
Connections		Ceramic terminals 2.5 mm^2 (AWG12)							
Enclosure		IP20 (when mounted)							
Ambient temperature	ϑ_{amb}	-20 ... +45 °C							
Type of cooling		KS = Self-cooling							
For MOVIDRIVE®		0015/0022				0015...0037		2 × parallel with 0110	

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

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

Braking resistor type		BW018-075	BW915	BW012-025	BW012-050	BW012-100	BW106	BW206
Part number		821 686 X	821 260 0	821 680 0	821 681 9	821 682 7	821 050 0	821 051 9
Load capacity at	**100 % cdf**	7.5 kW	16.0 kW	2.5 kW	5.0 kW	10 kW	13 kW	18 kW
	50 % cdf[1]	12.7 kW	27.0 kW	4.2 kW	8.5 kW	17 kW	24 kW	32 kW
	25 % cdf	22.5 kW	30.7 kW[2]	7.5 kW	15.0 kW	19.2 kW[2]	38.4 kW[2]	38.4 kW[2]
	12 % cdf	25.6 kW[2]	30.7 kW[2]	11.2 kW	19.2 kW[2]	19.2 kW[2]	38.4 kW[2]	38.4 kW[2]
	6 % cdf	25.6 kW[2]	30.7 kW[2]	19.0 kW	19.2 kW[2]	19.2 kW[2]	38.4 kW[2]	38.4 kW[2]
		Note the **regenerative power limit** of the inverter! (= 150 % of the recommended motor power → Technical Data)						
Resistance value	R_{BW}	18 Ω ±10 %	15 Ω ±10 %	12 Ω ±10 %			6 Ω ±10 %	
Trip current (of F16)	I_F	14 A_{RMS}	28 A_{RMS}	10 A_{RMS}	19 A_{RMS}	27 A_{RMS}	38 A_{RMS}	42 A_{RMS}
Type		Grid resistor						
Connections		2.5 mm^2 (AWG12)	M8 stud	Ceramic terminals 2.5 mm^2 (AWG12)			M8 stud	
Enclosure		IP20 (when mounted)						
Ambient temperature	ϑ_{amb}	-20 ... +45 °C						
Type of cooling		KS = Self-cooling						
For MOVIDRIVE®		2 × parallel with 0110		0055/0075			0150 and 2 × parallel with 0220/0300	

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

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

Protection against contact

A touch guard is available for flat-type braking resistors.

Protection against contact	BS003	BS005
Part number	813 151 1	813 152 X
For braking resistor	BW1072-003	BW100-005 / BW072-005

Dimensions of BS touch guard

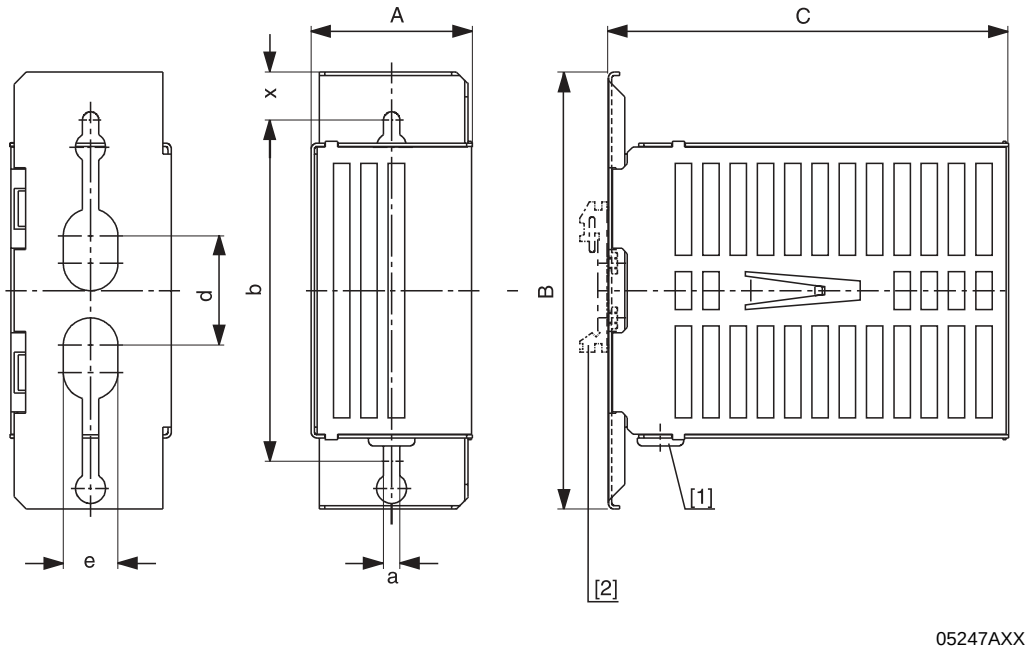

Figure 49: Dimensions, BS touch guard with grommet [1] and mounting rail [2]

Type	Main dimensions [mm (in)]			Fixing dimensions [mm (in)]					Weight [kg (lb)]
	A	B	C	b	d	e	a	x	
BS-003	60 (2.4)	160 (6.3)	146 (5.8)	125 (4.9)	40 (1.6)	20 (0.8)	6 (0.2)	17.5 (0.7)	0.35 (0.8)
BS-003	60 (2.4)	160 (6.3)	252 (9.9)	125 (4.9)	40 (1.6)	20 (0.8)	6 (0.2)	17.5 (0.7)	0.5 (1.1)

DIN-rail installation

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

DKB11A heat sink for brake resistors in flatpack design

Part number 814 345 5

Description The DKB11A heat sink for brake resistors in flatpack design provides a space-saving means of mounting braking resistors in flatpack design (BW100-005) below MOVIDRIVE® 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).

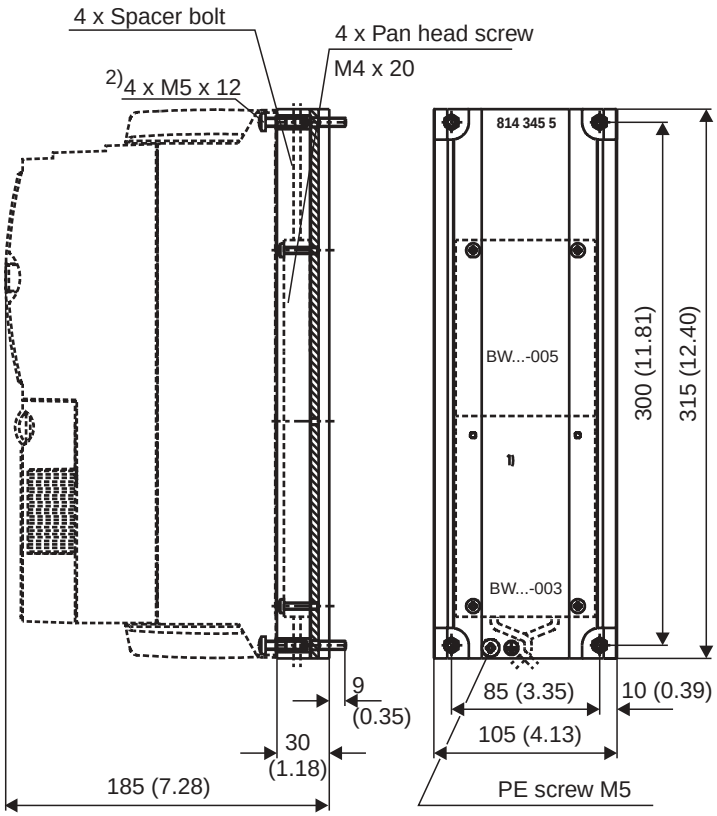

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Figure 50: Dimensions, DKB11A heat sink for brake resistors in flatpack design, all in mm (in)

1) Mounting surface for the braking resistor

2) Retaining screws, not included in scope of delivery

Dimensions BW...

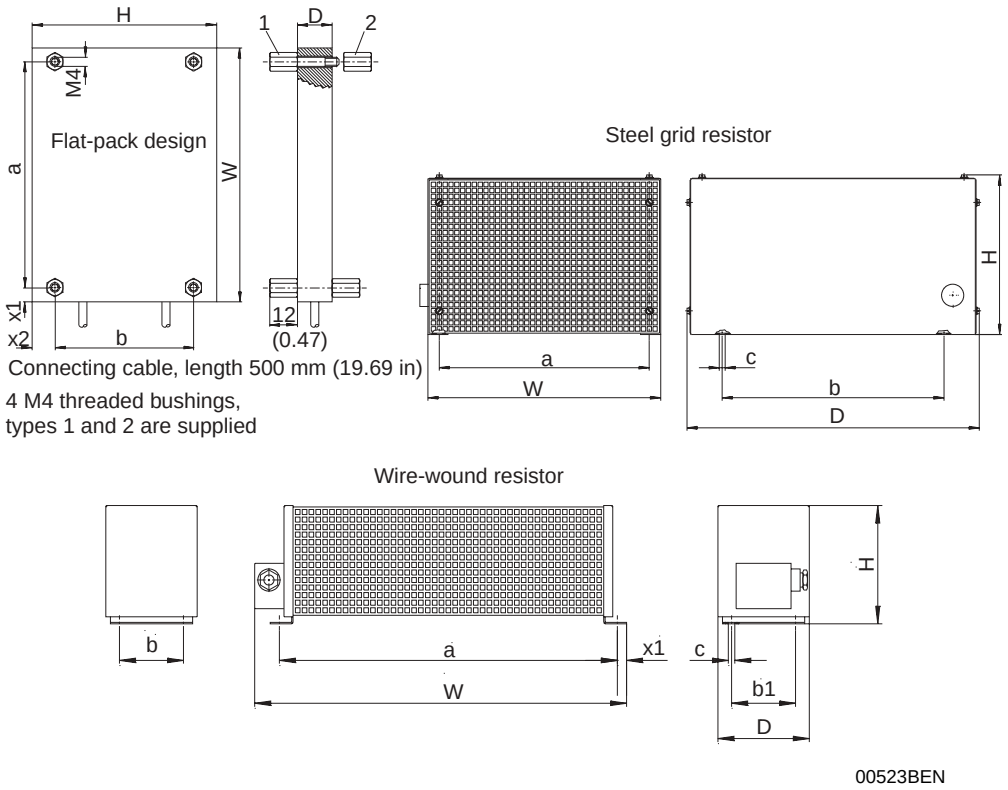

Figure 51: Dimensions, BW... braking resistors

Mounting position as required

All dimensions in mm (in):

BW...	Main dimensions			Fixing dimensions				Hole dimension	Weight
Type	W	H	D	a	b/b1	x1	x2	c	kg (lb)
BW100-005	216 (8.50)	80 (3.15)	15 (0.59)	204 (8.03)	60 (2.36)	6 (0.24)	10 (0.39)	4 hreaded bushings	0.6 (1.3)
BW100-006	486 (19.13)	120 (4.72)	92 (3.62)	426 (16.77)	64 (2.52)	10 (0.39)	-	5.8 (0.23)	2.2 (4.9)
BW168	365 (14.37)		185 (7.28)	326 (12.83)	150 (5.91)				3.6 (8.0)
BW268	465 (18.31)			426 (16.77)					4.3 (9.5)
BW147									4.3 (9.5)
BW247	665 (26.18)			626 (24.65)					6.1 (13.5)
BW347	670 (26.38)	145 (5.71)	340 (13.39)	630 (24.80)	300 (11.81)				13.2 (29.1)
BW039-003	286 (11.26)	120 (4.72)	92 (3.62)	226 (8.90)	64 (2.52)				1.5 (3.3)
BW039-006	486 (19.13)			426 (16.77)					2.2 (4.9)
BW039-012			185 (7.28)		150 (5.91)				4.3 (9.5)
BW039-026	586 (23.07)		275 (10.83)	530 (20.87)	240 (9.45)				7.5 (16.6)
BW039-050	395 (15.55)	260 (10.24)	490 (19.29)	370 (14.57)	380 (14.96)	-		10.5 (0.41)	12 (26.5)
BW027-006	486 (19.13)	120 (4.72)	92 (3.62)	426 (16.77)	64 (2.52)	10 (0.39)		5.8 (0.23)	2.2 (4.9)
BW027-012			185 (7.28)		150 (5.91)				4.3 (9.5)
BW018-015	600 (23.62)		92 (3.62)	540 (21.26)	64 (2.52)				4.0 (8.8)
BW018-035	295 (11.61)	260 (10.24)	490 (19.29)	270 (10.63)	380 (14.96)	-		10.5 (0.41)	9.0 (19.8)
BW018-075	595 (23.43)			570 (22.44)					21 (46.3)
BW915	795 (31.30)			770 (30.31)					26 (57.3)
BW012-025	295 (11.61)			270 (10.63)					9.0 (19.8)
BW012-050	395 (15.55)			370 (14.57)					12 (26.5)
BW012-100	595 (23.43)			570 (22.44)					21 (46.3)
BW106	795 (31.30)			770 (30.31)					32 (70.5)
BW206	995 (39.17)			970 (38.18)					43 (94.8)

2.23 Line chokes option type ND...

- To increase overvoltage protection
- To limit the charging current when several inverters are connected together in parallel on the input end with a shared supply system contactor (rated current of line choke = total of inverter rated currents)

Line choke type	ND020-013[1)]	ND045-013[1)]	ND085-013[1)]	ND1503[1)]	ND200-0033[1)]	ND300-005
Part number	826 012 5	826 013 3	826 014 1	825 548 2	826 579 8	827 721 4
Rated voltage V_N	3 × AC 380 V -10 % to 3 × AC 500 V +10 %, 50/60 Hz					
Rated current[2)] I_N	AC 20 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	15 W	25 W	65 W	100 W	280 W
Inductance L_N	0.1 mH				0.03 mH	0.05 mH
Ambient temperature ϑ_{amb}	-25 ... +45 °C					
Enclosure	IP 00 (EN 60529)					
Connections	Terminal strips 4 mm² (AWG10)	Terminal strips 10 mm² (AWG8)	Terminal strips 35 mm² (AWG2)	M10 stud PI: M8 stud		M12 stud PI: 2 × M10
Assignment to 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 (VFC, 125 %)	0005...0075	0110/0150	0220...0370	0450...0750		
Assignment to 230 V units (MDX61B...-2_3)						
Rated operation (100 %)	0015...0055	0075/0110	0150/0220	0300	-	-
Increased power (VFC, 125 %)	0015...0037	0055/0075	0110/0150	0220/0300	-	-

1) UL/cUL approved in conjunction with the MOVIDRIVE® drive inverters. SEW-EURODRIVE can issue a declaration of conformity to this effect on request.

2) If more than one MOVIDRIVE® 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**!

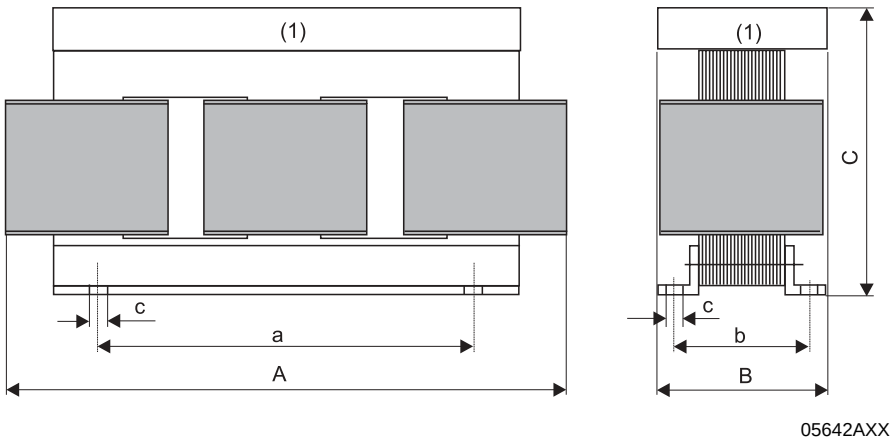

Figure 52: Dimensions, ND... line choke

(1) Space for terminal strips (protected against contact)
Mounting position as required

All dimensions in mm (in):

Line choke type	Main dimensions			Fixing dimensions		Hole dimension	Weight
	A	B	C	a	b	c	kg (lb)
ND020-013	85 (3.35)	60 (2.36)	120 (4.72)	50 (1.97)	31 (1.22)	5-10 (0.20-0.39)	0.5 (1.1)
ND045-013	125 (4.92)	95 (3.74)	170 (6.69)	84 (3.31)	55-75 (2.17-2.95)	6 (0.24)	2.5 (5.5)
ND085-013	185 (7.28)	115 (4.53)	235 (9.25)	136 (5.35)	56 (2.20)	7 (0.28)	8 (17.6)
ND1503	255 (10.04)	140 (5.51)	230 (9.06)	170 (6.69)	77 (3.03)	8 (0.31)	17 (37.5)
ND200-0033	250 (9.84)	160 (6.30)	230 (9.06)	180 (7.09)	98 (3.86)	8 (0.31)	15 (33.1)
ND300-005	300 (11.81)	190 (7.48)	295 (11.61)	255 (10.04)	145 (5.71)	11 (0.43)	35 (77.1)

2.24 NF...-... line filter option

- To suppress interference emission on the line side of inverters.

Line filter type	NF009-503[1)]	NF014-503[1)]	NF018-503[1)]	NF035-503[1)]	NF048-503[1)]
Part number	827 412 6	827 116 X	827 413 4	827 128 3	827 117 8
Rated voltage V_N	3 × 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_{amb}					
Enclosure	IP 20 (EN 60529)				
Connections L1-L3/L1'-L3'	4 mm² (AWG 10)			10 mm² (AWG 8)	
PE	M5 stud			M5/M6 stud	
Assignment to 400/500 V units (MDX60/61B...-5_3)					
Rated operation (100 %)	0005...0040	0055/0075	-	0110/0150	0220
Increased power (VFC, 125 %)	0005...0030	0040/0055	0075	0110	0150
Assignment to 230 V units (MDX61B...-2_3)					
Rated operation (100 %)	0015/0022	0037	-	0055/0075	0110
Increased power (VFC, 125 %)	0015	0022	0037	0055/0075	-

1) The NF... type line filters are cRUus certified independent of the MOVIDRIVE® drive inverters. SEW-EURODRIVE can issue a declaration of conformity to this effect on request.

Line filter type	NF063-503[1)]	NF085-503[1)]	NF115-503[1)]	NF150-503[1)]	NF210-503[1)]	NF300-503[1)]
Part number	827 414 2	827 415 0	827 416 9	827 417 7	827 418 5	827 419 3
Rated voltage V_N	3 × 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_{amb}	-25 ... +40°C					
Enclosure	IP 20 (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
Assignment to 400/500 V units (MDX60/61B...-5_3)						
Rated operation (100 %)	0300	0370/0450	0550	0750	0900/1100	1320
With increased power (VFC, 125 %)	0220	0300/0370	0450	0550/0750	0900	1100/1320
Assignment to 230 V units (MDX61B...-2_3)						
Rated operation (100 %)	0150	0220	0300	-	-	-
With increased power (VFC, 125 %)	0110/0150	-	0220/0300	-	-	-

1) The type NF... line filters are cRUus certified independent of the MOVIDRIVE® drive inverters. SEW-EURODRIVE can issue a declaration of conformity to this effect on request.

The effectiveness of line filters is restricted in IT systems.

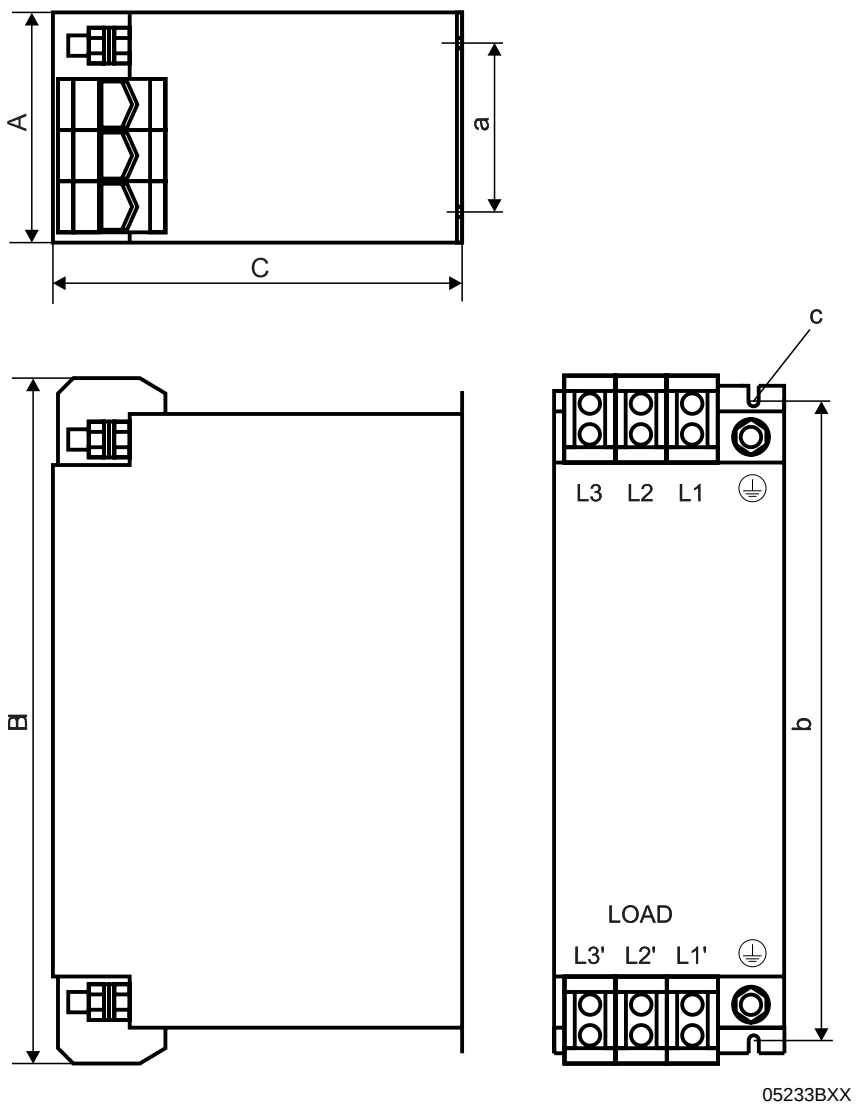

Figure 53: Dimensions, NF line filter

Mounting position as required

All dimensions in mm (in):

Line filter type	Main dimensions			Fixing dimensions		Hole dim.	PE connection	Weight
	A	B	C	a	b	c		kg (lb)
NF009-503	55 (2.16)	195 (7.67)	80 (3.15)	20 (0.79)	180 (7.09)	5.5 (0.22)	M5	0.8 (1.8)
NF014-503		225 (8.85)			210 (8.27)			0.9 (2.0)
NF018-503	50 (1.96)	255 (10.04)			240 (9.45)			1.1 (2.4)
NF035-503	60 (2.36)	275 (10.83)	100 (3.93)	30 (1.18)	255 (10.04)			1.7 (3.7)
NF048-503		315 (12.40)			295 (11.61)		M6	2.1 (4.6)
NF063-503	90 (3.54)	260 (10.24)		60 (2.36)	235 (9.25)	6.5 (0.26)		2.4 (5.3)
NF085-503		320 (12.60)	140 (5.51)		255 (10.04)		M8	3.5 (7.7)
NF115-503	100 (3.93)	330 (13.00)	155 (6.10)	65 (2.56)			M10	4.8 (10.6)
NF150-503								5.6 (12.3)
NF210-503	140 (5.51)	450 (17.72)	190 (7.48)	102 (4.02)	365 (14.37)			8.9 (19.6)
NF300-503	170 (6.69)	540 (21.26)	230 (9.06)	125 (4.92)	435 (17.13)		M12	12.2 (26.9)

2.25 Output choke option type HD...

- To suppress radiated interference from the unshielded motor cable. With HD001 to HD003, we recommend routing the motor cable through the output choke with 5 turns. Less than 5 turns are possible if the cable has a large diameter. To make up for this, two or three output chokes should be connected in series. Two output chokes should be connected in series if there are four turns, and three output chokes in series if there are three turns. With HD004, the number of turns is specified.
- Output chokes HD001 to HD003 are allocated on the basis of the cable cross sections of the motor leads. Consequently, there is no separate allocation table for the 230 V units.
- The HD004 output choke is allocated to size 6 units (0900...1320).

Output choke type	HD001[1)]	HD002[1)]	HD003[1)]	HD004[1)]
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	1.5...16 mm² (AWG 16...6)	≤ 1.5 mm² (AWG 16)	≥ 16 mm² (AWG 6)	M12 connection studs

1) The output choke type HD... is no UL/cUL relevant component.

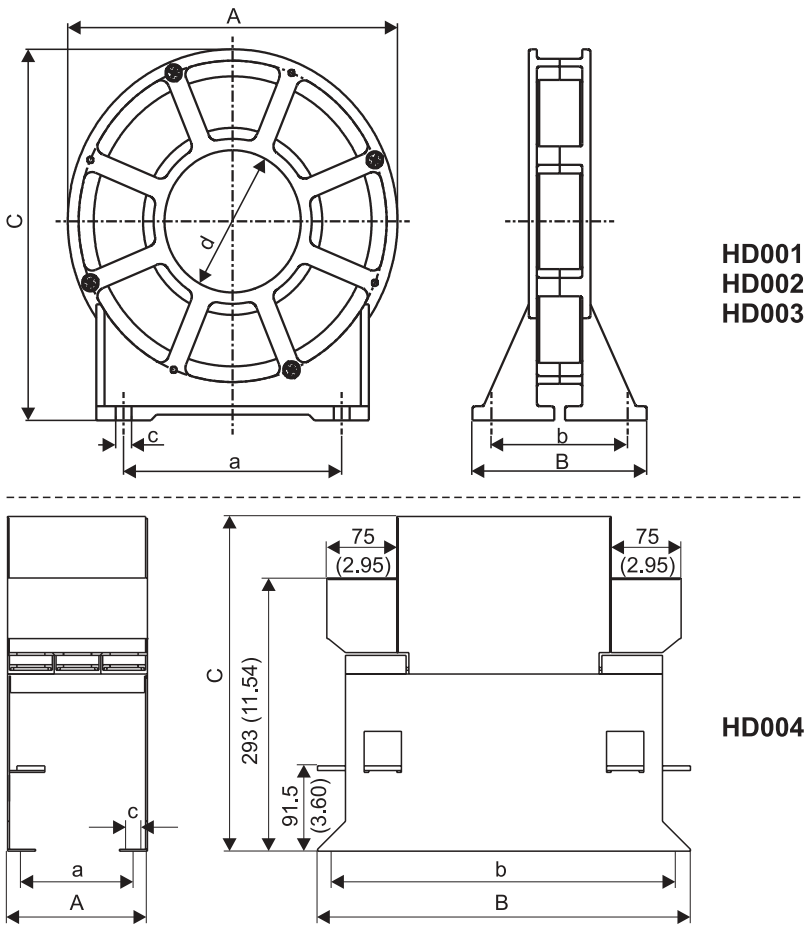

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Figure 54: Dimensions, HD001...HD003 and HD004 output chokes

Mounting position as required

All dimensions in mm (in):

Output choke type	Main dimensions			Fixing dimensions		Inside ∅	Hole dim.	Dimensions
	A	B	C	a	b	d	c	kg (lb)
HD001	121 (4.76)	64 (2.52)	131 (5.16)	80 (3.15)	50 (1.97)	50 (1.97)	5.8 (0.23)	0.5 (1.1)
HD002	66 (2.60)	49 (1.93)	73 (2.87)	44 (1.73)	38 (1.50)	23 (0.91)		0.2 (0.44)
HD003	170 (6.69)	64 (2.52)	185 (7.28)	120 (4.72)	50 (1.97)	88 (3.46)	7.0 (0.28)	1.1 (2.42)
HD004	150 (5.91)	400 (15.75)	360 (14.17)	120 (4.72)	370 (14.57)	-	9.0 (0.35)	12.5 (27.5)

2.26 Output filter option type HF...

Sine filter for smoothing the output voltage of inverters. They are used

- in group drives (several motor leads in parallel); the discharge currents in the motor cables are suppressed
- for protecting the motor winding insulation of non-SEW motors which are not suitable for PWM inverters
- for protection against overvoltage spikes in long motor cables (> 100 m)

- Output filters may be used in VFC operating modes only. Do not use output filters in CFC and SERVO operating modes.
- Output filters are not allowed to be used in hoists
- During project planning of the drive, take into account the voltage drop in the output filter and consequently the reduced motor torque available. This point applies especially to 230 V units with output filter.

Output filter type	**HF008-503**[1]	**HF015-503**[2]	**HF022-503**[2]	**HF030-503**[2]	**HF040-503**[2]	**HF055-503**[2]
Part number	826 029 X	826 030 3	826 031 1	826 032 X	826 311 6	826 312 4
Rated voltage V_N	3 × AC 380 V -10 % to 3 × AC 500 V +10 %, 50/60 Hz[3]					
Voltage drop at I_N ΔV	< 6.5 % (7.5 %) at 400 V / < 4 % (5 %) at 500 V and f_{Amax} = 50 Hz (60 Hz)					
Rated throughput current[4] **$I_{N\ 400\ V}$ (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 throughput 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
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
Emitted interference via unshielded motor lead	According to class B limit to EN 55011 and EN 55014 Meets EN 50081, parts 1 and 2					
Ambient temperature ϑ_{amb}	0 ... +45 °C (reduction: 3.0 % I_N per K to max. 60 °C)					
Enclosure (EN 60529)	IP 20					
Connections	M4 connection studs: 0.5 ... 6 mm² (AWG 20 ... 10)					10 mm² (AWG 8)
Weight	3.1 kg (6.84 lb)	4.4 kg (9.68 lb)			10.8 kg (23.76 lb)	
Assignment to 400/500 V units (MDX60/61B...-5_3)						
Rated operation (100 %)	0008	0015	0022	0030	0040	0055
With increased power (125 %)		0008	0015	0022	0030	0040
Assignment to 230 V units (MDX61B...-2_3)						
Voltage drop at I_N ΔV	-	< 6.5 % (7.5 %) at 230 V at f_{Amax} = 50 Hz (60 Hz)				
Rated throughput current[3] **$I_{N\ 230\ V}$ (at V_{mains} = 3 × AC 230 V)**	-	AC 6.5 A	AC 10.8 A	AC 13 A	AC 17.3 A	AC 22 A
Rated operation (100 %)	-	-	0015/0022	-	0037	0055
With increased power (125 %)	-	0055	0015/0022	-	-	0037

1) Approved according to UL/cUL in conjunction with the MOVIDRIVE® drive inverters. SEW-EURODRIVE can issue a declaration of conformity to this effect on request.

2) Approved according to UL/cUL in conjunction with the MOVIDRIVE®. SEW-EURODRIVE can issue a declaration of conformity to this effect on request.

3) A reduction of 6 % I_N per 10 Hz applies above f_{AN} = 60 Hz for the rated throughput current I_N.

4) Only applies to operation without V_{DClink} connection. For operation with V_{DClink} connection, observe the project planning instructions in the MOVIDRIVE® MDX60/61B system manual, section "Project Planning/Connecting the optional power components."

Output filter type	HF075-503[1]	HF450-503	HF023-403[1]	HF033-403[1]	HF047-403[1]
Part number	826 313 2	826 948 3	825 784 1	825 785 X	825 786 8
Rated voltage V_N	3 × AC 380 V -10 % to 3 × AC 500 V +10 %, 50/60 Hz[2]				
Voltage drop at I_N ΔV	< 6.5 % (7.5 %) at 400 V / < 4 % (5 %) at 500 V and f_{Amax} = 50 Hz (60 Hz)				
Rated throughput current[3] $I_{N\ 400\ V}$ (at V_{mains} = 3 × AC 400 V)	AC 16 A	AC 90 A	AC 23 A	AC 33 A	AC 47 A
Rated throughput current[3] $I_{N\ 500\ V}$ (at V_{mains} = 3 × AC 500 V)	AC 13 A	AC 72 A	AC 19 A	AC 26 A	AC 38 A
Earth-leakage current at V_N ΔI	0 mA				
Power loss at I_N P_V	135 W	400 W	90 W	120 W	200 W
Emitted interference via unshielded motor lead	According to class B limit to EN 55011 and EN 55014 Meets EN 50081, parts 1 and 2				
Ambient temperature ϑ_{amb}	0 ... +45 °C (reduction: 3.0 % I_N per K to max. 60 °C)				
Enclosure (EN 60529)	IP 20	IP 10	IP 20		
Connections	10 mm² (AWG 8)	35 mm² (AWG 2)	25 mm² (AWG 4)		
Weight	10.8 kg (23.76 lb)	32 kg (70.58 lb)	15.9 kg (35.0 lb)	16.5 kg (36.3 lb)	23 kg (50.6 lb)
Assignment to 400/500 V units (MDX60/61B...-5_3)					
Rated operation (100 %)	0075	0370/0450/ 0550[4]/0750[4]	0110	0150/0300[4]	0220
With increased power (125 %)	0055	0300/0370/0450/ 0550/0750	0075	0110/0220[4]	0150
Assignment to 230 V units (MDX61B...-2_3)					
Voltage drop at I_N ΔV	< 6.5 % (7.5 %) at 230 V at f_{Amax} = 50 Hz (60 Hz)				
Rated throughput current[3] $I_{N\ 230\ V}$ (at V_{mains} = 3 × AC 230 V)	AC 29 A	AC 156 A	AC 42 A	AC 56.5 A	AC 82.6 A
Rated operation (100 %)	0075	0300	0110	0150/0300[4]	0220
With increased power (125 %)	0055	0220/0300	0075	0110/0220[4]	0150

1) Approved according to UL/cUL in conjunction with the MOVIDRIVE® drive inverters. SEW-EURODRIVE can issue a declaration of conformity to this effect on request.

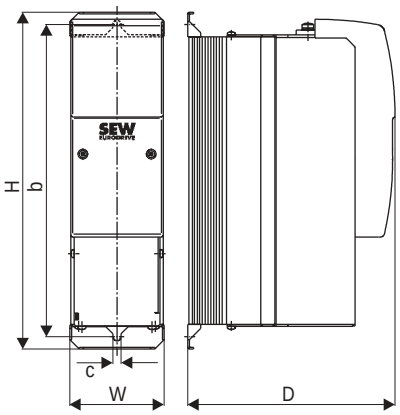
2) A reduction of 6 % I_N per 10 Hz applies above f_{AN} = 60 Hz for the rated throughput current I_N.

3) Only applies to operation without V_{DClink} connection. For operation with V_{DClink} connection, observe the project planning instructions in the MOVIDRIVE® MDX60/61B system manual, section "Project Planning/Connecting the optional power components."

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

Dimensions, HF...-503 output filter, in mm (in)

HF015/022/030-503



HF040/055/075-503

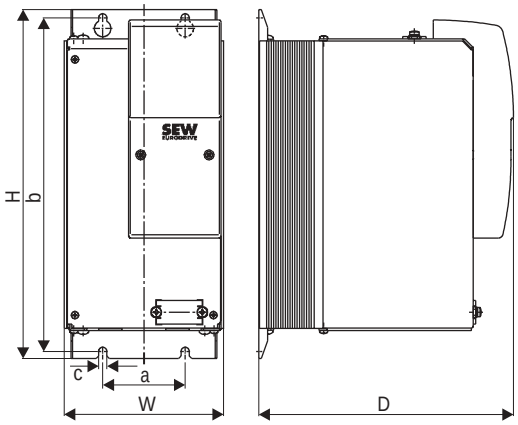


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Figure 55: Dimensions, output filter HF015...075-503

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

Output filter type	Main dimensions			Fixing dimensions		Hole dimension	Ventilation clearance[1)]	
	W	H	D	a	b	c	Top	Bottom
HF015/022/030-503	80 (3.15)	286 (11.26)	176 (6.93)	-	265 (10.43)	7 (0.28)	100 (3.94)	100 (3.94)
HF040/055/075-503	135 (5.31)	296 (11.65)	216 (8.50)	70 (2.76)	283 (11.14)			

1) No clearance is required at the sides; the units can be lined up in rows.

HF450-503

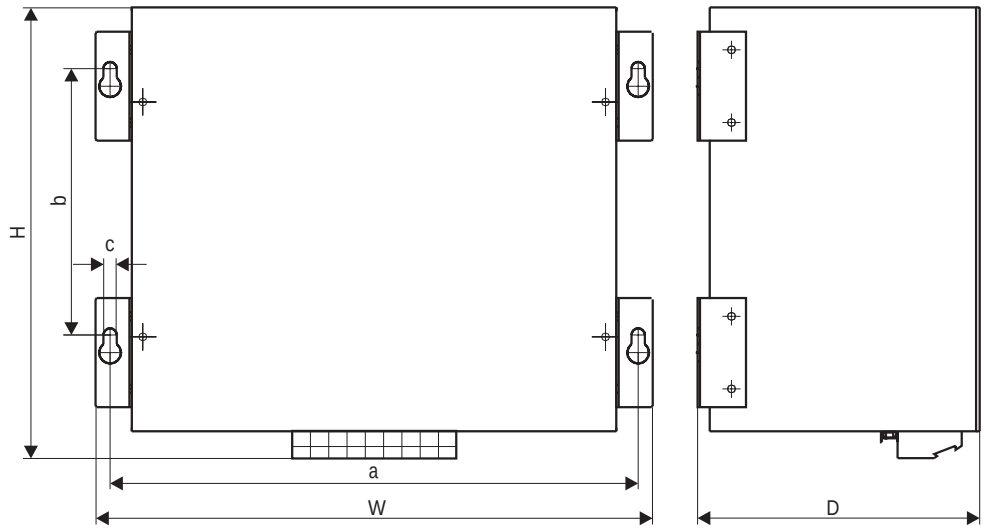

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Figure 56: Dimensions, output filter HF450-503

Only the mounting position shown in the dimension diagram is permitted

Output filter type	Main dimensions			Fixing dimensions		Hole dim.	Ventilation clearance	
	W	H	D	a	b	c	Top	Bottom
HF450-503	465 (18.31)	385 (15.16)	240 (9.45)	436 (17.17)	220 (8.66)	8.5 (0.33)	100 (3.94)	100 (3.94)

Dimensions, output filter HF...-403, in mm (in)

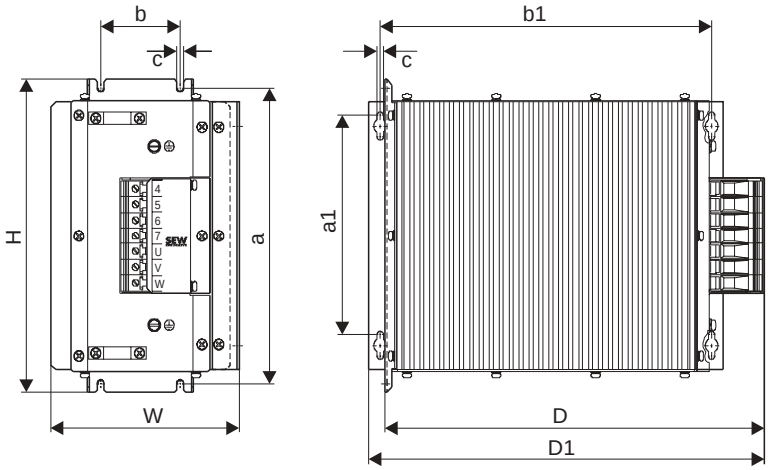

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Figure 57: Dimensions, output filter HF...-403

Type	Main dimensions			Fixing dimensions				Hole dimension	Ventilation clearance		
				Standard installation		Horizontal mounting position					
	W	H	D/D1	a	b	a1	a2	c	Lateral	Top	Bottom
HF023-403	145 (5.71)	284 (11.18)	365/390 (14.37/15.35)	268 (10.55)	60 (2.36)	210 (8.27)	334 (13.15)	6.5 (0.26)	30 each (1.18 ea)	150 (5.91)	150 (5.91)
HF033-403											
HF047-403	190 (7.48)	300 (11.82)	385/400 (15.16/15.57)	284 (11.18)	80 (3.15)						

2.27 Pre-fabricated cables

Overview

SEW-EURODRIVE offers cable sets and prefabricated cables for straightforward and error-free connection of various system components to MOVIDRIVE®. The cables are pre-fabricated in 1 m steps for 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. Encoder cables for connecting the motor encoder to encoder input X15 of the MDX unit with DEH11B option, or to "X2: encoder" of the 5 V encoder power supply type DWI11A
3. Motor cables and extension cables for connecting CM motors
4. Motor cables for connecting DS/DY motors
5. Hiperface® cables, resolver cables and extension cables in plug and terminal box version for CM/DS/DY motors, connection to encoder/resolver input X15 of the MDX unit with DEH11B or DER11B option
6. VR forced cooling fan cables and extension cables
7. Connection of the brake rectifier
8. Encoder connection "X1: MOVIDRIVE" of the DWI11A and X15 MDX unit with DEH11B option

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Figure 58: Pre-fabricated cables for DC link connection, connection of the motor encoder and encoder connection via 5 V encoder power supply type DWI11A

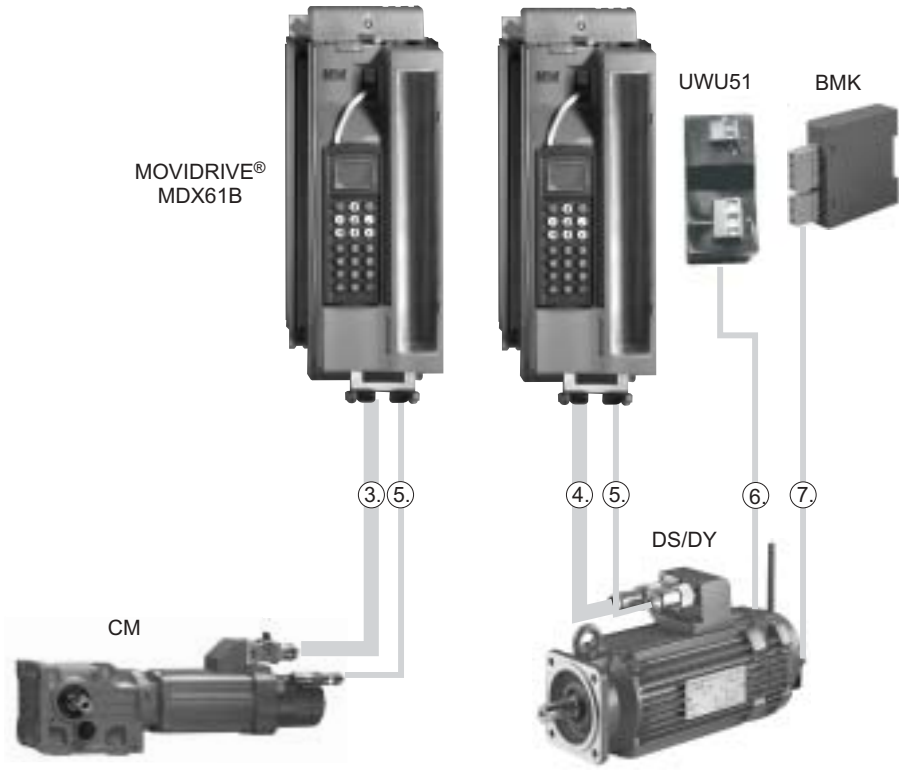

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Figure 59: Pre-fabricated cables for connecting CM/DS/DY motors and encoders/resolvers

1) Cable sets for DC link connection MDR → MDX

Description

SEW-EURODRIVE strongly recommends to use the cable sets named below because they possess the relevant 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 circuit connection to the permitted 5 m (16.4 ft). They can also be cut to length by the customer for connecting several units. The cable lugs for connection to the regenerative power supply unit and an inverter are supplied with the cable set. Use commercially available cable lugs for connecting additional inverters. The inverters must then be connected to the regenerative power supply unit in a star configuration. Use a busbar subdistributor if the DC link terminals of the regenerative power supply unit are not sufficient.

Type of routing

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...0300	0370...0750	0900...1320

2) Pre-fabricated cables for encoder connection, connection to MDX61B with DEH11B option, X15

Cables for TTL sensors and sin/cos motor encoders (TTL sensors and sin/cos encoders) with DC 24 V power supply

Part number	**1332 459 4**	**1332 458 6**
Routing	Fixed routing	Cat track routing
For encoder	ES1S, ES2S, EV1S, ES1R, ES2R and EV1R	
Line cross section	$4 \times 2 \times 0.25$ mm^2 (AWG 23) + 1×0.25 mm^2 (AWG 23)	
Conductor colors	$\underline{A}$: Yellow (YE) $\overline{A}$: Green (GN) $\underline{B}$: Red (RD) $\overline{B}$: Blue (BU) $\underline{C}$: Pink (PK) $\overline{C}$: Gray (GY) UB: White (WH) ⊥: Brown (BN) Sensor line: Violet (VT)	
Manufacturer and type	Lapp, Unitronic Li2YCY (TP) Helukabel, Paar-Tronic-CY	Lapp, Unitronic FD CP (TP) Helukabel, Super-Paar-Tronic-C-PUR
Connection to encoder/motor	With conductor end sleeves cut off the violet conductor (VT) at the encoder end	
to MDX61B with DEH11B, X15	With 15-pin sub D plug	

Cables for TTL encoder with DC 5 V supply

Part number	**198 829 8**	**198 828 X**
Routing	Fixed routing	Cat track routing
For encoder	ES1T, ES2T and EV1T via DWI11A option and cable 817 957 3 (→ 8.)	
Line cross section	$4 \times 2 \times 0.25$ mm^2 (AWG 23) + 1×0.25 mm^2 (AWG 23)	
Conductor colors	$\underline{A}$: Yellow (YE) $\overline{A}$: Green (GN) $\underline{B}$: Red (RD) $\overline{B}$: Blue (BU) $\underline{C}$: Pink (PK) $\overline{C}$: Gray (GY) UB: White (WH) ⊥: Brown (BN) Sensor line: Violet (VT)	
Manufacturer and type	Lapp, Unitronic Li2YCY (TP) Helukabel, Paar-Tronic-CY	Lapp, Unitronic FD CP (TP) Helukabel, Super-Paar-Tronic-C-PUR
Connection to encoder/motor	With conductor end sleeves connect the violet conductor (VT) to the encoder on UB	
to DWI11A, X2	with 9-pin sub D plug	

3) Pre-fabricated cables for connecting CM motors to MDX, and extension cables

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

Number of cores and line cross section	Part number	Type of routing	For motor
4×1.5 mm² (AWG 16)	199 179 5	Fixed routing	CM..SM51
4×1.5 mm² (AWG 16) + 3×1.0 mm² (AWG 17)	199 189 2		CM..BR SB51
4×2.5 mm² (AWG 12)	199 181 7		CM..SM52
4×2.5 mm² (AWG 12) + 3×1.0 mm² (AWG 17)	199 191 4		CM..BR SB52
4×4 mm² (AWG 10)	199 183 3		CM..SM54
4×4 mm² (AWG 10) + 3×1.0 mm² (AWG 17)	199 193 0		CM..BR SB54
4×6 mm² (AWG 10)	199 185 X		CM..SM56
4×6 mm² (AWG 10) + 3×1.5 mm² (AWG 16)	199 195 7		CM..BR SB56
4×10 mm² (AWG 8)	199 187 6		CM..SM59
4×10 mm² (AWG 8) + 3×1.5 mm² (AWG 16)	199 197 3		CM..BR SB59

Number of cores and line cross section	Part number	Type of routing	For motor
4×1.5 mm² (AWG 16)	199 180 9	Cat track routing	CM..SM51
4×1.5 mm² (AWG 16) + 3×1.0 mm² (AWG 17)	199 190 6		CM..BR SB51
4×2.5 mm² (AWG 12)	199 182 5		CM..SM52
4×2.5 mm² (AWG 12) + 3×1.0 mm² (AWG 17)	199 192 2		CM..BR SB52
4×4 mm² (AWG 10)	199 184 1		CM..SM54
4×4 mm² (AWG 10) + 3×1.0 mm² (AWG 17)	199 194 9		CM..BR SB54
4×6 mm² (AWG 10)	199 186 8		CM..SM56
4×6 mm² (AWG 10) + 3×1.5 mm² (AWG 16)	199 196 5		CM..BR SB56
4×10 mm² (AWG 8)	199 188 4		CM..SM59
4×10 mm² (AWG 8) + 3×1.5 mm² (AWG 16)	199 198 1		CM..BR SB59

Extension cables The cables are equipped with a plug and coupling for extending the CM motor cable.

Number of cores and line cross section	Part number	Type of routing	For motor
4×1.5 mm² (AWG 16)	199 549 9	Fixed routing	CM..SM51
4×1.5 mm² (AWG 16) + 3×1.0 mm² (AWG 17)	199 199 X		CM..BR SB51
4×2.5 mm² (AWG 12)	199 551 0		CM..SM52
4×2.5 mm² (AWG 12) + 3×1.0 mm² (AWG 17)	199 201 5		CM..BR SB52
4×4 mm² (AWG 10)	199 553 7		CM..SM54
4×4 mm² (AWG 10) + 3×1.0 mm² (AWG 17)	199 203 1		CM..BR SB54
4×6 mm² (AWG 10)	199 555 3		CM..SM56
4×6 mm² (AWG 10) + 3×1.5 mm² (AWG 16)	199 205 8		CM..BR SB56
4×10 mm² (AWG 8)	199 557 X		CM..SM59
4×10 mm² (AWG 8) + 3×1.5 mm² (AWG 16)	199 207 4		CM..BR SB59

Number of cores and line cross section	Part number	Type of routing	For motor
4×1.5 mm² (AWG 16)	199 550 2	Cat track routing	CM..SM51
4×1.5 mm² (AWG 16) + 3×1.0 mm² (AWG 17)	199 200 7		CM..BR SB51
4×2.5 mm² (AWG 12)	199 552 9		CM..SM52
4×2.5 mm² (AWG 12) + 3×1.0 mm² (AWG 17)	199 202 3		CM..BR SB52
4×4 mm² (AWG 10)	199 554 5		CM..SM54
4×4 mm² (AWG 10) + 3×1.0 mm² (AWG 17)	199 204 X		CM..BR SB54
4×6 mm² (AWG 10)	199 556 1		CM..SM56
4×6 mm² (AWG 10) + 3×1.5 mm² (AWG 16)	199 206 6		CM..BR SB56
4×10 mm² (AWG 8)	199 558 8		CM..SM59
4×10 mm² (AWG 8) + 3×1.5 mm² (AWG 16)	199 208 2		CM..BR SB59

4) Pre-fabricated cables for connecting DS/DY motors to MDX

Description The cables are equipped with a plug for the motor connection and conductor end sleeves for the inverter connection.

Number of cores and line cross section	Part number	Type of routing	For motor
4×1.5 mm² (AWG 16)	199 093 4	Fixed routing	DS56 / SM11
4×1.5 mm² (AWG 16) + 2×0.75 mm² (AWG 18)	199 094 2		DS56..B / SM11
4×1.5 mm² (AWG 16)	198 683 X		DY71 / SM21
4×2.5 mm² (AWG 12)	198 684 8		DS71 / SM22
4×2.5 mm² (AWG 12)	198 685 6		DY90/112 / SM32
4×4 mm² (AWG 10)	198 686 4		DY90/112 / SM34
4×6 mm² (AWG 10)	198 687 2		DY90/112 / SM36
4×6 mm² (AWG 10)	198 688 0		DY112 / SM46
4×10 mm² (AWG 8)	198 689 9		DY112 / SM41

Number of cores and line cross section	Part number	Type of routing	For motor
4×1.5 mm² (AWG 16)	199 095 0	Cat track routing	DS56 / SM11
4×1.5 mm² (AWG 16) + 2×0.75 mm² (AWG 18)	199 096 9		DS56..B / SM11
4×1.5 mm² (AWG 16)	198 734 8		DY71 / SM21
4×2.5 mm² (AWG 12)	198 735 6		DS71 / SM22
4×2.5 mm² (AWG 12)	198 736 4		DY90/112 / SM32
4×4 mm² (AWG 10)	198 737 2		DY90/112 / SM34
4×6 mm² (AWG 10)	198 738 0		DY90/112 / SM36
4×6 mm² (AWG 10)	198 739 9		DY112 / SM46
4×10 mm² (AWG 8)	198 740 2		DY112 / SM41

5) Pre-fabricated cables for connecting Hiperface® encoders/resolvers, and extension cables

Hiperface® cables for DS56/CM/DT/DV/CT/CV motors with plug connector:

Part number	1332 453 5	1332 455 1
Routing	Fixed routing	Cat track routing
for Hiperface® encoder AV1H/AS1H/ES1H in the motor	DS56, CM, DT/DV, CT/CV	
Line cross section	$6 \times 2 \times 0.25$ mm^2 (AWG 23)	
Conductor colors	cos+: Red (RD) cos-: Blue (BU) sin+: Yellow (YE) sin-: Green (GN) D+: Black (BK) D-: Violet (VT) TF/TH/KTY+: Brown (BN) TF/TH/KTY-: White (WH) GND: Grey/pink + pink (GY-PK + PK) U_S: Red/blue + gray (RD-BU + GY)	
Manufacturer and type	Lapp, PVC/C/PP 303 028 1	Nexans, 493 290 70
Connection to encoder / motor MDX61B with DEH11B, X15	with 12-pin round connector plug (Intercontec, type ASTA021NN00 10 000 5 000) with 15-pin sub D plug	

Extension cables for Hiperface® cable (DS56/CM/DT/DV/CT/CV motors with plug connector):

Part number	199 539 1	199 540 5
Routing	Fixed routing	Cat track routing
for Hiperface® encoder AV1H/AS1H/ES1H in the motor	DS56, CM, DT/DV, CT/CV	
Line cross section	$6 \times 2 \times 0.25$ mm^2 (AWG 23)	
Conductor colors	cos+: Red (RD) cos-: Blue (BU) sin+: Yellow (YE) sin-: Green (GN) D+: Black (BK) D-: Violet (VT) TF/TH/KTY+: Brown (BN) TF/TH/KTY-: White (WH) GND: Grey/pink + pink (GY-PK + PK) U_S: Red/blue + gray (RD-BU + GY)	
Manufacturer and type	Lapp, PVC/C/PP 303 028 1	Nexans, 493 290 70
Connection to encoder/motor Hiperface® cable	with 12-pin round connector plug (Intercontec, type ASTA021NN00 10 000 5 000) with 12-pin round connector plug (Intercontec, type AKUA20)	

Hiperface® cables for CM motors with terminal box:

Part number	1332 457 8	1332 454 3
Routing	Fixed routing	Cat track routing
for Hiperface® encoder AS1H/ES1H in the motor	CM	
Line cross section	$6 \times 2 \times 0.25$ mm^2 (AWG 23)	
Conductor colors	cos+: Red (RD) cos-: Blue (BU) sin+: Yellow (YE) sin-: Green (GN) D+: Black (BK) D-: Violet (VT) TF/TH/KTY+: Brown (BN) TF/TH/KTY-: White (WH) GND: Grey/pink + pink (GY-PK + PK) U_S: Red/blue + gray (RD-BU + GY)	
Manufacturer and type	Lapp, PVC/C/PP 303 028 1	Nexans, 493 290 70
Connection to encoder / motor MDX61B with DEH11B, X15	with conductor end sleeves with 15-pin sub D plug	

Resolver cables for DS56/CM/DY motors with plug connector:

Part number	199 487 5	199 319 4
Routing	Fixed routing	Cat track routing
For RH1M resolver in motor	DS56, CM, DY	
Line cross section	$5 \times 2 \times 0.25$ mm^2 (AWG 23)	
Conductor colors	Ref.+: Pink (PK) Ref.-: Gray (GY) cos+: Red (RD) cos-: Blue (BU) sin+: Yellow (YE) sin-: Green (GN) TF/TH/KTY+: Brown + pink (BN + PK) TF/TH/KTY-: White + black (WH + BK)	
Manufacturer and type	Lapp, PVC/C/PP	Nexans
Connection to resolver/motor MDX61B with DER11B, X15	with 12-pin round connector plug (Intercontec, type ASTA021NN00 10 000 5 000) with 9-pin sub D plug	

Extension cables for resolver cable (DS56/CM/DY motors with plug connector):

Part number	199 542 1	199 541 3
Routing	Fixed routing	Cat track routing
For RH1M resolver in motor	DS56, CM71...112, DY	
Line cross section	$5 \times 2 \times 0.25$ mm^2 (AWG 23)	
Conductor colors	Ref.+: Pink (PK) Ref.-: Gray (GY) cos+: Red (RD) cos-: Blue (BU) sin+: Yellow (YE) sin-: Green (GN) TF/TH/KTY+: Brown + pink (BN + PK) TF/TH/KTY-: White + black (WH + BK)	
Manufacturer and type	Lapp, PVC/C/PP	Nexans
Connection to resolver/motor Resolver cable	with 12-pin round connector plug (Intercontec, type ASTA021NN00 10 000 5 000) with 12-pin round connector plug (Intercontec, type AKUA20)	

Resolver cables for DS56/DY/CM motors with terminal box:

Part number	199 589 8	199 590 1
Routing	Fixed routing	Cat track routing
For RH1M resolver in motor	DS56, DY, CM	
Line cross section	$5 \times 2 \times 0.25$ mm^2 (AWG 23)	
Conductor colors	Ref.+: Pink (PK) Ref.-: Gray (GY) cos+: Red (RD) cos-: Blue (BU) sin+: Yellow (YE) sin-: Green (GN) TF/TH/KTY+: Brown + pink (BN + PK) TF/TH/KTY-: White + black (WH + BK)	
Manufacturer and type	Lapp, PVC/C/PP	Nexans
Connection to resolver/motor **MDX61B with DER11B, X15**	with conductor end sleeves with 9-pin sub D plug	

6) Pre-fabricated cables for connecting forced cooling fans VR, and extension cables

VR forced cooling fan cable:

Part number	199 559 6	199 560 X
Routing	Fixed routing	Cat track routing
Line cross section	3×1 mm^2 (AWG 17)	
Connection VR forced cooling fan **Switch cabinet**	with STAK 200 plug with conductor end sleeves	

Extension cable for VR forced cooling fan cable:

Part number	199 561 8	199 562 6
Routing	Fixed routing	Cat track routing
Line cross section	3×1 mm^2 (AWG 17)	
Connection VR forced cooling fan **VR forced cooling fan cable**	with STAK 200 plug with plug connector	

7) Pre-fabricated cables for connecting the brake rectifier

Part number	198 633 3	198 745 3
Routing	Fixed routing	Cat track routing
Line cross section	4×1.5 mm^2 (AWG 16)	
Connection to DY motor **Brake rectifier**	with plug with conductor end sleeves	

8) Pre-fabricated cables for connecting DWI11A to MDX61B with DEH11B option

This cable is intended for the following connections:

- MOVIDRIVE® MDX61B with DEH11B option "Encoder In" (X15) → 5 V encoder power supply option type DWI11A

Part number	**817 967 3**
Routing	Fixed routing
For encoder with 5 V encoder power supply	ES1T, ES2T and EV1T via DWI11A option
Line cross section	$4 \times 2 \times 0.25$ mm^2 (AWG 23) + 1×0.25 mm^2 (AWG 23)
Conductor colors	$\underline{A}$: Yellow (YE) $\overline{A}$: Green (GN) $\underline{B}$: Red (RD) $\overline{B}$: Blue (BU) $\underline{C}$: Pink (PK) $\overline{C}$: Gray (GY) UB: White (WH) ⊥: Brown (BN) Sensor line: Violet (VT)
Manufacturer and type	Lapp, Unitronic Li2YCY (TP) Helukabel, Paar-Tronic-CY
Connection to DWI11A, X1 **MDX61B with DEH11B, X15**	with 9-pin sub D socket with 15-pin sub D plug

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 a thermal classification of F at least.
- Use TF thermistor sensors or TH winding thermostats. TH should be preferred in the case of group drives on one inverter. The series connection of TH contacts (NC contacts) is not subject to any restriction if joint monitoring is provided.
- For group drives, we recommend that the motors should not differ from one another by more than three types.
- 4-pole motors should be preferred. This recommendation particularly applies to gear-motors 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.
- Avoid selecting a motor which is too large, especially in case of a delta connection. Otherwise, the inverter may trigger short circuit detection due to the small winding resistance of the motor (1/3 that of a star connection).
- A MOVIDRIVE® MDX61B with HIPERFACE® encoder card option type DEH11B is required for speed control. In this case, the motor must be equipped with an encoder (HIPERFACE®, sin/cos or TTL).

Voltage/ frequency characteristic

The asynchronous motor follows a load-dependent voltage/frequency characteristic in VFC operating mode. It is possible to achieve full motor torque down to minimum speeds because the motor model is continuously calculated. This characteristic curve is set by entering the rated motor voltage and the rated frequency of the motor in the startup function. The setting determines the speed-dependent torque and power characteristics of the asynchronous motor.

The following figure shows an example of the voltage/frequency characteristic curves of an asynchronous AC motor 230/400 V, 50 Hz.

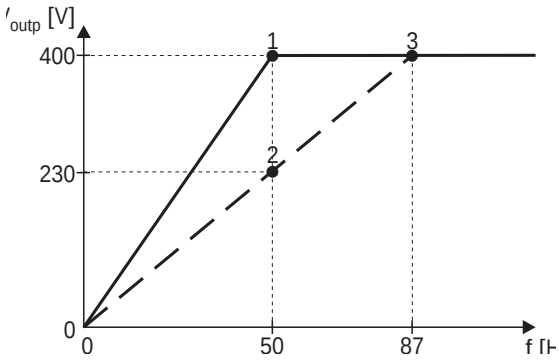

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Figure 60: Voltage/frequency characteristic curve of the asynchronous motor

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 supply voltage that is connected. 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. The maximum permitted motor voltage should be entered. 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

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 = 1500 rpm) decreases 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.

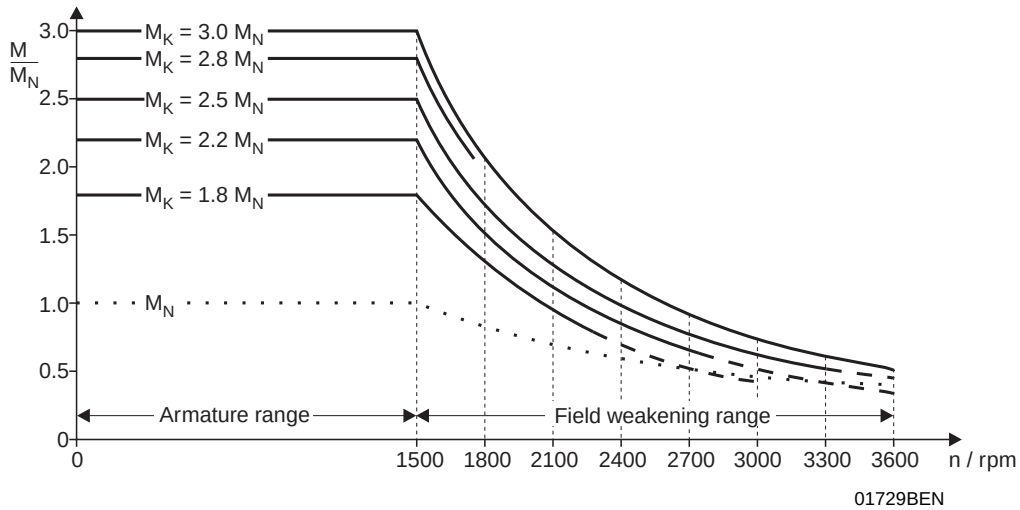


Figure 61: Quadratically decreasing breakdown torque

With gearmotors, the maximum motor speed depends on the size and mounting position of the gear unit. The speed should not exceed 3000 rpm due to the resulting noise and oil churning losses.

Dynamic applications ($P_{inverter}$ greater 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 refers to 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 manually set 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. The slip compensation parameter (P324) must be increased accordingly for greater torques.

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

Combinations with $P_{inverter}$ greater 4 × P_{motor}

Special measures must be taken during project planning and startup in the case of inverter/motor combinations where the inverter power is greater than the fourfold motor power. The reason is the great difference between rated inverter current and rated motor current.

Take the following measures:

- Project planning for connecting the motor in a delta connection. This means the motor current is increased by a factor $\sqrt{3}$ and the unfavorable ratio is reduced.
- If this measure does not suffice, start up the motor in VFC & GROUP operating mode. In this operating mode, the inverter operates without slip compensation and simulates a constant-voltage constant-frequency system (system with a constant V/f ratio).

Motor selection with delta/star connection type (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 (HP)] for operation on MOVIDRIVE® MDX60/61B...-5_3 (400/500 V units)												
Connection			⅄ / AC 400 V[1]						Δ / 230 V_{AC}[2]			
Cooling			Self-cooling			Forced			Self-cooling		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} [rpm]			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 (HP)]**		**$P = P_{reduced}$ [kW (HP)]**		**MDX[6] 60/61B...-5_3**	**$P = P_n$ [kW (HP)]**		**MDX[6] 60/61B...-5_3**	**$P = P_{increased}$[5] [kW (HP)]**		**MDX[6] 60/61B...-5_3**	
DR63S4	**0.12**	**(0.16)**							0.18	(0.25)	**0005**	
DR63M4	**0.18**	**(0.25)**				0.18	(0.25)	**0005**	0.25	(0.33)		
DR63L4	**0.25**	**(0.33)**	0.18	(0.25)	**0005**	0.25	(0.33)		0.37	(0.5)		
DT71D4	**0.37**	**(0.5)**	0.25	(0.33)	**0005/0015**	0.37	(0.5)	**0005/0015**	0.55	(0.75)	**0005/0015**	
DT80K4	**0.55**	**(0.75)**	0.37	(0.5)		0.55	(0.75)		0.75	(1.0)	**0008/0015**	
DT80N4	**0.75**	**(1.0)**	0.55	(0.75)		0.75	(1.0)	**0008/0015**	1.1	(1.5)	**0011/0015**	
DT90S4	**1.1**	**(1.5)**	0.75	(1.0)	**0008/0015**	1.1	(1.5)	**0011/0015**	1.5	(2.0)	**0014/0015**	
DT90L4	**1.5**	**(2.0)**	1.1	(1.5)	**0011/0015**	1.5	(2.0)	**0014/0015**	2.2	(3.0)	**0022**	
DV100M4	**2.2**	**(3.0)**	1.5	(2.0)	**0014/0015**	2.2	(3.0)	**0022**	3.0	(4.0)	**0030**	
DV100L4	**3.0**	**(4.0)**	2.2	(3.0)	**0022**	3.0	(4.0)	**0030**	4.0	(5.4)	**0040**	
DV112M4	**4.0**	**(5.4)**	3.0	(4.0)	**0030**	4.0	(5.4)	**0040**	5.5	(7.5)	**0055**	
DV132S4	**5.5**	**(7.5)**	4.0	(5.4)	**0040**	5.5	(7.5)	**0055**	7.5	(10)	**0075**	
DV132M4	**7.5**	**(10)**	5.5	(7.5)	**0055**	7.5	(10)	**0075**	9.2	(12.5)	**0110**	
DV132ML4	**9.2**	**(12.5)**	7.5	(10)	**0075**	9.2	(12.5)	**0110**	11	(15)		
DV160M4	**11**	**(15)**	9.2	(12.5)	**0110**	11	(15)		15	(20)	**0150**	
DV160L4	**15**	**(20)**	11	(15)		15	(20)	**0150**	18.5	(25)	**0220**	
DV180M4	**18.5**	**(25)**	15	(20)	**0150**	18.5	(25)	**0220**	22	(30)	**0300**	
DV180L4	**22**	**(30)**	18.5	(25)	**0220**	22	(30)		30	(40)	**0370**	
DV200L4	**30**	**(40)**	22	(30)		30	(40)	**0300**	37	(50)		
DV225S4	**37**	**(50)**	30	(40)	**0300**	37	(50)	**0370**	45	(60)	**0450**	
DV225M4	**45**	**(60)**	37	(50)	**0370**	45	(60)	**0450**	55	(75)	**0550**	
DV250M4	**55**	**(75)**	45	(60)	**0450**	55	(75)	**0550**	75	(100)	**0750**	
DV280S4	**75**	**(100)**	55	(75)	**0550**	75	(100)	**0750**	90	(120)	**0900**	
D280M4	**90**	**(120)**	75	(100)	**0750**	90	(120)	**0900**	110	(150)	**1100**	
D315S4	**110**	**(150)**	90	(120)	**0900**	110	(150)	**1100**	132	(180)	**1320**	
D315M4	**132**	**(180)**	110	(150)	**1100**	132	(180)	**1320**				
D315M4a	**160**	**(220)**	132	(180)	**1320**							

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

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

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 (1 frame size), rather than with the $\sqrt{3}$-fold power.

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

Examples for motor selection delta/star 230/400 V

Trolley drive

Constant load with overload (acceleration) and low load when in motion:

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

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

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

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

According to the selection table (→ page 108a MOVIDRIVE® MDX61B0110 ($P = P_n$) is selected.

Hoist drive

High constant load with intermittent overload (acceleration):

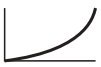
- P_{max} = 26 kW
- $P_{sustained}$ = 20 kW
- Speed range 1:15, low speed only for positioning
- Brake applied when stationary
- Load type S3 (40 % c.d.f.)

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

In view of the load type (S3, 40 % c.d.f.), the selection table allocates motor type DV180L4 (P_n = 22 kW) with star connection.

For more information, see → Sec. Project planning for hoists

Fan/ pump



Variable torque load with the following power values:

- P_{max} = 4.8 kW
- n_{max} = 1400 rpm, 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 decreasing torque. This means the DV132S4 motor type with star connection (P_n = 5.5 kW) is adequate.

The selection table allocates a MOVIDRIVE® MDX61B0055 ($P = P_n$). However, the inverter can be operated with an increased output power because this case involves a variable torque load without overload. Consequently, a MOVIDRIVE® MDX61B0040 is sufficient.

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

P_{max} [kW (HP)] for operation on MOVIDRIVE® MDX60/61B...-5_3 (400/500 V units)												
Connection			⅄ / AC 460 V						⅄⅄ / AC 230 V			
Cooling			Self-cooling			Self-cooling		Forced	Self-cooling		Forced	
f_{min} - f_{max} [Hz]			6 - 90			10 - 60		0 - 60[1]	10 - 120		0 - 120[1]	
n_{min} - n_{max} [rpm]			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 (HP)]**		**$P = P_{reduced}$**			**$P = P_n$**			**$P = P_{increased}$[2]**			
			[kW (HP)]		**With MDX[3] 60/61B...-5_3**	**[kW (HP)]**		**With MDX[3] 60/61B...-5_3**	**[kW (HP)]**		**With MDX[3] 60/61B...-5_3**	
DR63S4	**0.12**	**(0.16)**							0.18	(0.25)	**0005**	
DR63M4	**0.18**	**(0.25)**				0.18	(0.25)	**0005**	0.25	(0.33)		
DR63L4	**0.25**	**(0.33)**	0.18	(0.25)	**0005**	0.25	(0.33)		0.37	(0.5)		
DT71D4	**0.37**	**(0.5)**	0.25	(0.33)	**0005/0015**	0.37	(0.5)	**0005/0015**	0.75	(1.0)	**0008/0015**	
DT80K4	**0.55**	**(0.75)**	0.37	(0.5)		0.55	(0.75)		1.1	(1.5)	**0011/0015**	
DT80N4	**0.75**	**(1.0)**	0.55	(0.75)		0.75	(1.0)	**0008/0015**	1.5	(2.0)	**0014/0015**	
DT90S4	**1.1**	**(1.5)**	0.75	(1.0)	**0008/0015**	1.1	(1.5)	**0011/0015**	2.2	(3.0)	**0022**	
DT90L4	**1.5**	**(2.0)**	1.1	(1.5)	**0011/0015**	1.5	(2.0)	**0014/0015**	3.0	(4.0)	**0030**	
DV100M4	**2.2**	**(3.0)**	1.5	(2.0)	**0014/0015**	2.2	(3.0)	**0022**	4.0	(5.4)	**0040**	
DV100L4	**3.7**	**(5.0)**	2.2	(3.0)	**0022**	3.0	(4.0)	**0030**	5.5	(7.5)	**0055**	
DV112M4	**4.0**	**(5.4)**	3.0	(4.0)	**0030**	4.0	(5.4)	**0040**	7.5	(10)	**0075**	
DV132S4	**5.5**	**(7.5)**	4.0	(5.4)	**0040**	5.5	(7.5)	**0055**	9.2	(12.5)	**0110**	
DV132M4	**7.5**	**(10)**	5.5	(7.5)	**0055**	7.5	(10)	**0075**	11	(15)		
DV132ML4	**9.2**	**(12.5)**	7.5	(10)	**0075**	9.2	(12.5)	**0110**	15	(20)	**0150**	
DV160M4	**11**	**(15)**	9.2	(12.5)	**0110**	11	(15)		18.5	(25)	**0220**	
DV160L4	**15**	**(20)**	11	(15)		15	(20)	**0150**	22	(30)		
DV180M4	**18.5**	**(25)**	15	(20)	**0150**	18.5	(25)	**0220**	30	(40)	**0300**	
DV180L4	**22**	**(30)**	18.5	(25)	**0220**	22	(30)		37	(50)	**0370**	
DV200L4	**30**	**(40)**	22	(30)		30	(40)	**0300**	45	(60)	**0450**	
DV225S4	**37**	**(50)**	30	(40)	**0300**	37	(50)	**0370**	55	(75)	**0550**	
DV225M4	**45**	**(60)**	37	(50)	**0370**	45	(60)	**0450**	75	(100)	**0750**	
DV250M4	**55**	**(75)**	45	(60)	**0450**	55	(75)	**0550**	90	(120)	**0900**	
DV280S4	**75**	**(100)**	55	(75)	**0550**	75	(100)	**0750**	110	(150)	**1100**	
D280M4	**90**	**(120)**	75	(100)	**0750**	90	(120)	**0900**	132	(180)	**1320**	
D315S4	**110**	**(150)**	90	(120)	**0900**	110	(150)	**1100**				
D315M4	**132**	**(180)**	110	(150)	**1100**	132	(180)	**1320**				
D315M4a	**160**	**(220)**	132	(180)	**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 (1 frame size), rather than with the $\sqrt{3}$-fold power.

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

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

P_{max} [kW (HP)] for operation on MOVIDRIVE® MDX61B...-2_3 (230 V units)									
Connection			Δ / AC 230 V						
Cooling			Self-cooling			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} [rpm]			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 (HP)]**		**P = $P_{reduced}$ [kW (HP)]**		**With MDX[3] 61B...-2_3**	**P = P_n [kW (HP)]**		**With MDX[3] 61B...-2_3**
DT71D4	**0.37**	**(0.5)**	0.25	(0.33)	**0015**	0.37	(0.5)	**0015**
DT80K4	**0.55**	**(0.75)**	0.37	(0.5)		0.55	(0.75)	
DT80N4	**0.75**	**(1.0)**	0.55	(0.75)		0.75	(1.0)	
DT90S4	**1.1**	**(1.5)**	0.75	(1.0)		1.1	(1.5)	
DT90L4	**1.5**	**(2.0)**	1.1	(1.5)		1.5	(2.0)	
DV100M4	**2.2**	**(3.0)**	1.5	(2.0)		2.2	(3.0)	**0022**
DV100L4	**3.0**	**(4.0)**	2.2	(3.0)	**0022**	3.0	(4.0)	**0030**
DV112M4	**4.0**	**(5.4)**	3.0	(4.0)	**0030**	4.0	(5.4)	**0040**
DV132S4	**5.5**	**(7.5)**	4.0	(5.4)	**0040**	5.5	(7.5)	**0055**
DV132M4	**7.5**	**(10)**	5.5	(7.5)	**0055**	7.5	(10)	**0075**
DV132ML4	**9.2**	**(12.5)**	7.5	(10)	**0075**	9.2	(12.5)	**0110**
DV160M4	**11**	**(15)**	9.2	(12.5)	**0110**	11	(15)	
DV160L4	**15**	**(20)**	11	(15)		15	(20)	**0150**
DV180M4	**18.5**	**(25)**	15	(20)	**0150**	18.5	(25)	**0220**
DV180L4	**22**	**(30)**	18.5	(25)	**0220**	22	(30)	**0300**
DV200L4	**30**	**(40)**	22	(30)		30	(40)	
DV225S4	**37**	**(50)**	30	(40)	**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 an increased continuous output power (→ Sec. Technical Data). The continuous output current of 125 % of the rated unit current is only available in the VFC operating modes at f_{PWM} = 4 kHz.

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

P_{max} [kW (HP)] for operation on MOVIDRIVE® MDX61B...-2_3 (230 V units)								
Connection			⅄⅄ / AC 230 V					
Cooling			Self-cooling			Self-cooling	Forced	
f_{min} - f_{max} [Hz]			6 - 90			10 - 60	0 - 60[1]	
n_{min} - n_{max} [rpm]			180 - 2700			300 - 1800	0 - 1800	
Setting range			1:15			1:6	≥ 1:15	
Motor type	**Rated power P_n [kW (HP)]**		**$P = P_{reduced}$ [kW (HP)]**		**With MDX[2] 61B...-2_3**	**$P = P_n$ [kW (HP)]**		**With MDX[2] 61B...-2_3**
DT71D4	**0.37**	**(0.5)**	0.25	(0.33)	**0015**	0.37	(0.5)	**0015**
DT80K4	**0.55**	**(0.75)**	0.37	(0.5)		0.55	(0.75)	
DT80N4	**0.75**	**(1.0)**	0.55	(0.75)		0.75	(1.0)	
DT90S4	**1.1**	**(1.5)**	0.75	(1.0)		1.1	(1.5)	
DT90L4	**1.5**	**(2.0)**	1.1	(1.5)		1.5	(2.0)	
DV100M4	**2.2**	**(3.0)**	1.5	(2.0)		2.2	(3.0)	**0022**
DV100L4	**3.7**	**(5.0)**	2.2	(3.0)	**0022**	3.0	(4.0)	**0030**
DV112M4	**4.0**	**(5.4)**	3.0	(4.0)	**0030**	4.0	(5.4)	**0040**
DV132S4	**5.5**	**(7.5)**	4.0	(5.4)	**0040**	5.5	(7.5)	**0055**
DV132M4	**7.5**	**(10)**	5.5	(7.5)	**0055**	7.5	(10)	**0075**
DV132ML4	**9.2**	**(12.5)**	7.5	(10)	**0075**	9.2	(12.5)	**0110**
DV160M4	**11**	**(15)**	9.2	(12.5)	**0110**	11	(15)	
DV160L4	**15**	**(20)**	11	(15)		15	(20)	**0150**
DV180M4	**18.5**	**(25)**	15	(20)	**0150**	18.5	(25)	**0300**
DV180L4	**22**	**(30)**	18.5	(25)	**0220**	22	(30)	**0370**
DV200L4	**30**	**(40)**	22	(30)		30	(40)	
DV225S4	**37**	**(50)**	30	(40)	**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 an increased continuous output power (→ Sec. Technical Data). The continuous output current of 125 % of the rated unit current is only available in the VFC operating modes at f_{PWM} = 4 kHz.

3.2 Motor selection for asynchronous servomotors (CFC)

The torque limit (M limit) is set automatically by the startup function of the MOVITOOLS® software package. Do not alter this automatically set value!

We recommend to always use the latest version of MOVITOOLS® (4.00 or later) for startup. The latest MOVITOOLS® version can be downloaded from our homepage (www.sew-eurodrive.de).

Motor characteristics

The drive in CFC operating modes is characterized by its ability to control torque directly and rapidly. This means it achieves a high level of dynamic overload capacity (up to 3 × M_N) and a very high speed and control range (up to 1:5000). Smooth running at speed and positioning accuracy fulfill the exacting requirements of servo systems. This behavior is achieved by the field-oriented control function. The current components for magnetization (I_d) and torque generation (I_q) are controlled separately. A feature of the CFC operating modes is that there must always be an encoder on the motor.

The inverter needs to know exact data about the motor connected to calculate the motor model. These data are made available by the MOVITOOLS® 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 are stored in MOVIDRIVE® for the 4-pole SEW motors.

Typical speed/ torque characteristics

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

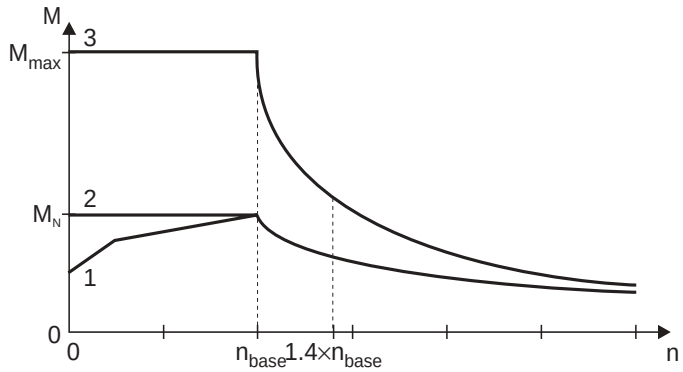


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Figure 62: Speed/torque characteristics in CFC operating mode

1 With integrated cooling
2 With forced cooling
3 Maximum torque

Magnetization current

Dynamic drives which are supposed to accelerate without a time lag are also energized when at a standstill without load. This means the magnetization current I_d is flowing. The inverter must be able to supply this current constantly in applications in which the output stage is permanently enabled, e.g. in CFC & M-CONTROL mode. In particular in the case of large motors with a slip frequency ≤ 2 Hz, you must 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 for this application (forced cooling fan). For the magnetization current I_d, refer to the motor tables (CT/CV → page 117, DT/DV/D → page 122).

Basic recommendations

CFC operating modes are only possible with SEW-motors (CT/CV or DT/DV/D series), not with non-SEW motors. The necessary motor data for the CFC operating modes are stored in MOVIDRIVE® for the SEW motors.

Speed is the correcting variable in the CFC modes with speed control. Torque is the correcting variable in the CFC modes with torque control (CFC & M-CONTROL).

CFC mode with speed control

There is no reason to differentiate between quadratic, dynamic and static load types when configuring a system for CFC mode. Project planning for an asynchronous motor in CFC mode is carried out in accordance with the following requirements:

1. Effective torque demand at the average speed of the application.

   $M_{r.m.s.} < M_{n\_mot}$

   The point must lie below the characteristic curve for the continuous torque (Figure 62, curve 2). If this operating point lies below the characteristic curve for forced cooling (Figure 62, curve 1), then no forced cooling is required.

2. Maximum torque required across the speed characteristic.

   $M_{max} < M_{dyn\_mot}$

   This operating point must lie below the characteristic curve for the maximum torque of the motor/MOVIDRIVE® combination (Figure 62, curve 3).

3. Maximum speed

   The maximum speed of the motor should not be configured higher than 1.4 times the transition speed. The maximum torque available will then still be approx. 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 3000 rpm with delta connection.

   $n_{max} < 1.4 \times n_{transition} < 3000$ rpm

Motor cooling

Self-cooling of asynchronous motors is based on the integrated fan, and consequently depends on the speed. The integrated fan does not provide any cooling at low speeds and when the motor is stopped. Forced cooling may be required 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 ($n \leq n_{transition}$). The setpoint sources of the speed controlled CFC mode can also be used for torque control. All speed setpoint sources are interpreted as current setpoint sources. The settings for evaluating the analog input (→ P11_, parameter description) also remain in effect. The fixed setpoints (P16_, P17_) can be entered either in the unit [rpm] or [% $I_{N\_inverter}$] (→ MOVITOOLS®).

The following relationship applies between the units:

3000 rpm = 150 % rated inverter current

The torque on the output shaft can then be calculated for the basic speed range ($n \leq n_{transition}$) 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 rpm:

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

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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 parameters. For the values of the torque constants k_T and the motor-specific parameters M_n and I_{q_n}, refer to the motor tables (DT/DV/D → page 122, CT/CV → page 117).

In addition to the current I_q for creating the torque, the inverter also needs to supply the magnetization current I_d. The inverter output current I_{tot} that actually flows 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 rpm:

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

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I_{q_n} = Nominal value for the current, which generates the torque, according to motor table

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

CT/CV asynchronous servomotors

SEW offers series 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.

Classification into speed classes

CT/CV motors are available in four speed classes, which ensures optimum utilization of torque and speed.

With sin/cos encoder as standard

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

With TF or TH motor protection as standard

The winding temperature of the three motor phases is monitored using temperature sensors (TF). The temperature sensor 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 temperature sensors. The bimetallic switches are also connected to the TF/TH input.

Thermal classification F as standard

As standard, CT/CV motors are built using thermal classification F materials. The maximum permitted temperature rise is therefore 105 K.

Reinforced pinion spigot

CT/CV motors can generate up to three times their rated motor torque during 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 recommends using CT/CV motors to achieve optimum benefit from the advantages of CFC mode.

	Advantage	Disadvantage
CFC mode with DT/DV/D motor **Motor selection → page 124**	Motor in standard 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 moment of inertia is greater than of the CT/CV motors.
		In some inverter/motor combinations, the maximum torque is limited by the mechanical strength.
CFC mode with CT/CV motor **Motor selection → page 118**	Faster transition speed than DT/DV/D motor.	Not an IEC standard motor
	Usually with a power yield as next higher motor type.	
	Lower mass inertia in relation to the power yield.	Higher current consumption due to the higher power yield, therefore a larger inverter must be assigned.
	Motor is designed for dynamic operation.	

Motor table CT/CV

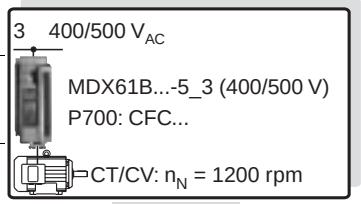
n_N [rpm]	Motor	M_N [Nm]	I_N [A]	I_{q_n} [A]	I_{d_n} [A]	k_T [Nm/A]	V_N [V]	J_{Mot} [10^{-4} kgm^2]	J_{Bmot} [10^{-4} kgm^2]
	CT71D4	2.5	1.24	1.03	0.69	2.42	340	4.6	5.5
	CT80N4	5	2.0	1.52	1.30	3.29	350	8.7	9.6
	CT90L4	10	3.5	2.95	1.89	3.39	345	34	39.5
	CV100M4	15	4.7	4.13	2.25	3.63	345	53	59
	CV100L4	26	8.9	8.30	3.21	3.13	310	65	71
	CV132S4	37	11.1	9.99	4.83	3.70	340	146	158
1200	CV132M4	50	15.5	14.2	6.18	3.52	340	280	324
	CV132ML4	61	17.6	16.0	7.43	3.81	345	330	374
	CV160M4	73	22.5	20.3	9.73	3.60	335	400	440
	CV160L4	95	29	25.3	14.2	3.75	330	925	1030
	CV180M4	110	34	27.7	19.7	3.97	330	1120	1226
	CV180L4	125	35	28.4	20.5	4.40	345	1290	1396
	CV200L4	200	58	52.9	23.7	3.78	330	2340	2475
	CT71D4	2.5	1.7	1.42	0.95	1.76	340	4.6	5.5
	CT80N4	5	2.8	2.15	1.79	2.33	350	8.7	9.6
	CT90L4	10	4.8	4.03	2.61	2.48	345	34	39.5
	CV100M4	15	6.5	5.71	3.10	2.63	345	53	59
	CV100L4	26	13.6	12.9	4.41	2.02	315	65	71
	CV132S4	37	15.2	13.7	6.67	2.70	340	146	158
1700	CV132M4	48	20.8	18.9	8.70	2.54	335	280	324
	CV132ML4	58	24.4	21.7	11.2	2.67	320	330	374
	CV160M4	71	29.8	26.6	13.4	2.67	340	400	440
	CV160L4	89	37.5	32.0	19.5	2.78	330	925	1030
	CV180M4	105	44.5	35.2	27.2	2.98	335	1120	1226
	CV180L4	115	48.5	37.5	30.7	3.07	325	1290	1396
	CV200L4	190	77	69.4	33.4	2.74	330	2340	2475
	CT71D4	2.5	2.0	1.60	1.20	1.56	340	4.6	5.5
	CT80N4	5	3.5	2.67	2.26	1.87	340	8.7	9.6
	CT90L4	10	6.1	5.14	3.29	1.95	335	34	39.5
	CV100M4	15	8.1	7.09	3.91	2.12	335	53	59
	CV100L4	25	14.8	13.7	5.56	1.82	305	65	71
	CV132S4	37	19.2	17.3	8.41	2.14	335	146	158
2100	CV132M4	48	26	23.7	10.7	2.03	335	280	324
	CV132ML4	58	29	26.0	12.9	2.23	340	330	374
	CV160M4	70	37	33.9	16.9	2.13	330	400	440
	CV160L4	88	46	38.9	24.6	2.26	330	925	1030
	CV180M4	100	53	40.5	34.2	2.47	330	1120	1226
	CV180L4	115	56	43.4	35.4	2.65	345	1290	1396
	CV200L4	175	88	77.8	41.2	2.25	325	2340	2475
	CT71D4	2.4	2.6	2.01	1.65	1.19	345	4.6	5.5
	CT80N4	4.5	4.3	2.97	3.11	1.52	350	8.7	9.6
	CT90L4	9.5	7.9	6.47	4.54	1.47	345	34	39.5
	CV100M4	15	11.3	9.93	5.39	1.51	345	53	59
	CV100L4	21	17.0	15.2	7.65	1.38	310	65	71
	CV132S4	35	25.0	22.1	11.6	1.58	340	146	158
3000	CV132M4	45	34	30.5	15.1	1.48	335	280	324
	CV132ML4	52	38	32.7	19.3	1.59	320	330	374
	CV160M4	64	47	40.8	23.3	1.57	345	400	440
	CV160L4	85	62	51.9	33.9	1.64	335	925	1030
	CV180M4	93	68	49.0	47.2	1.90	340	1120	1226
	CV180L4	110	81	61.2	53.1	1.80	325	1290	1396
	CV200L4	145	102	84.0	57.8	1.73	330	2340	2475

CT/CV motor selection

1) Rated speed n_N = 1200 rpm:

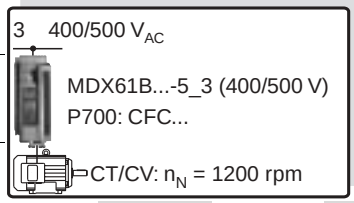
Assignment of MOVIDRIVE® MDX61B0005-5A3 ... MDX61B0040-503 (sizes 0 and 1):

Motor		MOVIDRIVE® MDX61B...-5_3 (400/500 V units) in CFC operating modes (P700)							
		0005	0008	0011	0014	0015	0022	0030	0040
CT71D4	M_{max} [Nm] ([lb.in])	7.3 (64)							
	$n_{transition}$ [rpm]	486							
CT80N4	M_{max} [Nm] ([lb.in])		10.2 (89)	13.5 (118)		15.6 (138)			
	$n_{transition}$ [rpm]		627	550		540			
CT90L4	M_{max} [Nm] ([lb.in])				18.2 (160)	18.2 (160)	25.7 (227)	30.5 (270)	
	$n_{transition}$ [rpm]				794	928	781	685	
CV100M4	M_{max} [Nm] ([lb.in])						29.0 (256)	37.0 (327)	45.0 (398)
	$n_{transition}$ [rpm]						883	781	680
CV100L4	M_{max} [Nm] ([lb.in])							32.6 (288)	45.3 (400)
	$n_{transition}$ [rpm]							1062	947



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

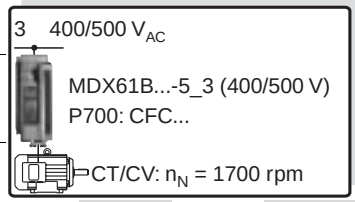
Motor		MOVIDRIVE® MDX61B...-5_3 (400/500 V units) in CFC operating modes (P700)								
		0055	0075	0110	0150	0220	0300	0370	0450	0550
CV100L4	M_{max} [Nm] ([lb.in])	60.0 (530)	75.0 (663)							
	$n_{transition}$ [rpm]	813	675							
CV132S4	M_{max} [Nm] ([lb.in])	64.0 (565)	84.0 (743)	110 (972)						
	$n_{transition}$ [rpm]	992	915	825						
CV132M4	M_{max} [Nm] ([lb.in])		82.0 (725)	125 (1105)	150 (1326)					
	$n_{transition}$ [rpm]		1011	877	806					
CV132ML4	M_{max} [Nm] ([lb.in])			126 (1114)	169 (1495)	183 (1617)				
	$n_{transition}$ [rpm]			922	819	725				
CV160M4	M_{max} [Nm] ([lb.in])			125 (1105)	169 (1495)	219 (1935)				
	$n_{transition}$ [rpm]				909	840				
CV160L4	M_{max} [Nm] ([lb.in])				163 (1440)	240 (2121)	294 (2600)			
	$n_{transition}$ [rpm]				1043	954	921			
CV180M4	M_{max} [Nm] ([lb.in])					241 (2130)	320 (2828)	360 (3183)		
	$n_{transition}$ [rpm]					1050	986	1005		
CV180L4	M_{max} [Nm] ([lb.in])					244 (2156)	324 (2863)	360 (3183)		
	$n_{transition}$ [rpm]					960	959	947		
CV200L4	M_{max} [Nm] ([lb.in])						326 (2882)	402 (3554)	494 (4367)	567 (5013)
	$n_{transition}$ [rpm]						1011	986	947	940



2) Rated speed n_N = 1700 rpm:

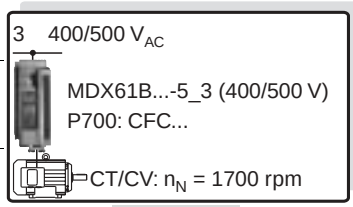
Assignment of MOVIDRIVE® MDX61B0005-5A3 ... MDX61B0110-503 (sizes 0 ... 2):

Motor		MOVIDRIVE® MDV60A...-5_3 (400/500 V units) in CFC operating modes (P700)										
		0005	0008	0011	0014	0015	0022	0030	0040	0055	0075	0110
CT71D4	M_{max} [Nm] ([lb.in])	5.1 (44)	6.3 (55)									
	$n_{transition}$[rpm]	986	896									
CT80N4	M_{max} [Nm] ([lb.in])			9.4 (82)	12.6 (110)	12.6 (110)	15.6 (137)					
	$n_{transition}$[rpm]			1126	992	1150	992					
CT90L4	M_{max} [Nm] ([lb.in])						18.1 (160)	23.6 (208)	30.5 (270)			
	$n_{transition}$[rpm]						1400	1280	1150			
CV100M4	M_{max} [Nm] ([lb.in])							26.3 (230)	36.4 (320)	45.0 (397)		
	$n_{transition}$[rpm]							1363	1229	1145		
CV100L4	M_{max} [Nm] ([lb.in])								32.4 (285)	43.6 (385)	56.5 (500)	75.0 (663)
	$n_{transition}$[rpm]								1536	1427	1299	1113
CV132S4	M_{max} [Nm] ([lb.in])										59.0 (520)	91.0 (805)
	$n_{transition}$[rpm]										1470	1330
CV132M4	M_{max} [Nm] ([lb.in])											87.4 (770)
	$n_{transition}$[rpm]											1484



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

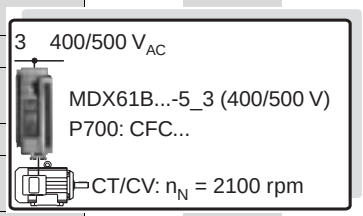
Motor		MOVIDRIVE® MDV60A...-5_3 (400/500 V units) in CFC operating modes (P700)							
		0150	0220	0300	0370	0450	0550	0750	0900
CV132S4	M_{max} [Nm] ([lb.in])	110 (970)							
	$n_{transition}$[rpm]	1280							
CV132M4	M_{max} [Nm] ([lb.in])	118 (1045)	150 (1325)						
	$n_{transition}$[rpm]	1369	1292						
CV132ML4	M_{max} [Nm] ([lb.in])	114 (1007)	166 (1467)	183 (1618)					
	$n_{transition}$[rpm]	1485	1331	1345					
CV160M4	M_{max} [Nm] ([lb.in])	120 (1060)	176 (1555)	219 (1935)					
	$n_{transition}$[rpm]	1420	1312	1254					
CV160L4	M_{max} [Nm] ([lb.in])		170 (1503)	226 (2000)	278 (2457)	294 (2600)			
	$n_{transition}$[rpm]		1470	1400	1330	1395			
CV180M4	M_{max} [Nm] ([lb.in])			226 (2000)	280 (2475)	345 (3050)	360 (3182)		
	$n_{transition}$[rpm]			1510	1460	1400	1504		
CV180L4	M_{max} [Nm] ([lb.in])				259 (2290)	321 (2838)	360 (3182)	360 (3182)	
	$n_{transition}$[rpm]				1480	1434	1472	1664	
CV200L4	M_{max} [Nm] ([lb.in])					345 (3050)	411 (3633)	513 (4535)	567 (5013)
	$n_{transition}$[rpm]					1460	1428	1382	1446



3) Rated speed n_N = 2100 rpm:

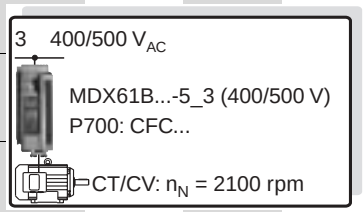
Assignment of MOVIDRIVE® MDX61B0008-5A3 ... MDX61B0110-503 (sizes 0 ... 2):

Motor		MOVIDRIVE® MDX61B...-5_3 (400/500 V units) in CFC operating modes (P700)									
		0008	0011	0014	0015	0022	0030	0040	0055	0075	0110
CT71D4	M_{max} [Nm] ([lb.in])	4.8 (42)	6.4 (56)		7.7 (68)						
	$n_{transition}$[rpm]	1472	1324		1318						
CT80N4	M_{max} [Nm] ([lb.in])			9.7 (85)	9.7 (85)	13.5 (120)	15.6 (137)				
	$n_{transition}$[rpm]			1536	1754	1510	1420				
CT90L4	M_{max} [Nm] ([lb.in])						18.3 (160)	25.5 (225)	30.5 (270)		
	$n_{transition}$[rpm]						1843	1676	1619		
CV100M4	M_{max} [Nm] ([lb.in])							28.4 (250)	38.1 (335)	45.0 (397)	
	$n_{transition}$[rpm]							1760	1626	1580	
CV100L4	M_{max} [Nm] ([lb.in])								34.0 (300)	44.4 (392)	67.6 (597)
	$n_{transition}$[rpm]								1978	1869	1613
CV132S4	M_{max} [Nm] ([lb.in])										71.6 (633)
	$n_{transition}$[rpm]										1850



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

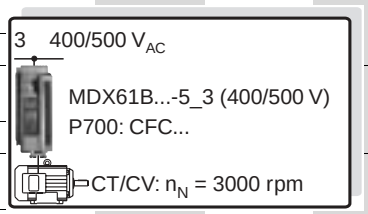
Motor		MOVIDRIVE® MDX61B...-5_3 (400/500 V units) in CFC operating modes (P700)									
		0150	0220	0300	0370	0450	0550	0750	0900	1100	1320
CV100L4	M_{max} [Nm] ([lb.in])	75.0 (663)									
	$n_{transition}$[rpm]	1555									
CV132S4	M_{max} [Nm] ([lb.in])	96.7 (855)	110 (970)								
	$n_{transition}$[rpm]	1722	1786								
CV132M4	M_{max} [Nm] ([lb.in])	94.8 (838)	138 (1220)	150 (1325)							
	$n_{transition}$[rpm]	1850	1670	1696							
CV132ML4	M_{max} [Nm] ([lb.in])		143 (1264)	183 (1618)							
	$n_{transition}$[rpm]		1658	1549							
CV160M4	M_{max} [Nm] ([lb.in])		138 (1220)	183 (1618)	219 (1935)						
	$n_{transition}$[rpm]		1792	1690	1625						
CV160L4	M_{max} [Nm] ([lb.in])			177 (1565)	218 (1927)	268 (2370)	294 (2600)				
	$n_{transition}$[rpm]			1882	1824	1740	1779				
CV180M4	M_{max} [Nm] ([lb.in])				218 (1927)	270 (2387)	322 (2847)	360 (3182)			
	$n_{transition}$[rpm]				1939	1894	1836	1932			
CV180L4	M_{max} [Nm] ([lb.in])					275 (2430)	328 (2900)	360 (3182)			
	$n_{transition}$[rpm]					1709	1670	1805			
CV200L4	M_{max} [Nm] ([lb.in])						329 (2910)	412 (3640)	498 (4400)	567 (5013)	
	$n_{transition}$[rpm]						1830	1792	1747	1869	



4) Rated speed n_N = 3000 rpm:

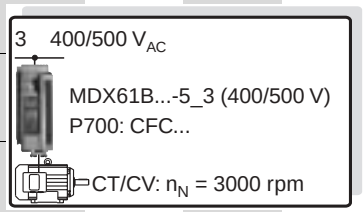
Assignment of MOVIDRIVE® MDX61B0011-5A3 ... MDX61B0110-503 (sizes 0 ... 2):

Motor		MOVIDRIVE® MDX61B...-5_3 (400/500 V units) in CFC operating modes (P700)								
		0011	0014	0015	0022	0030	0040	0055	0075	0110
CT71D4	M_{max} [Nm] ([lb.in])	4.5 (40)	6.0 (53)	6.0 (53)	7.7 (68)					
	$n_{transition}$[rpm]	2348	2099	2380	2092					
CT80N4	M_{max} [Nm] ([lb.in])				9.7 (85)	12.7 (112)	15.6 (137)			
	$n_{transition}$[rpm]				2566	2362	2200			
CT90L4	M_{max} [Nm] ([lb.in])						18.0 (159)	24.3 (214)	30.5 (270)	
	$n_{transition}$[rpm]						2662	2496	2368	
CV100M4	M_{max} [Nm] ([lb.in])							27.1 (240)	35.2 (310)	45.0 (397)
	$n_{transition}$[rpm]							2554	2432	2458
CV100L4	M_{max} [Nm] ([lb.in])								31.4 (277)	48.5 (428)
	$n_{transition}$[rpm]								2848	2643
CV132S4	M_{max} [Nm] ([lb.in])									51.0 (450)
	$n_{transition}$[rpm]									2740



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

Motor		MOVIDRIVE® MDX61B...-5_3 (400/500 V units) in CFC operating modes (P700)									
		0150	0220	0300	0370	0450	0550	0750	0900	1100	1320
CV100L4	M_{max} [Nm] ([lb.in])	65.4 (578)	75.0 (663)								
	$n_{transition}$[rpm]	2425	2368								
CV132S4	M_{max} [Nm] ([lb.in])	69.2 (610)	101 (893)	110 (970)							
	$n_{transition}$[rpm]	2650	2458	2611							
CV132M4	M_{max} [Nm] ([lb.in])	65.8 (580)	97.3 (860)	128 (1130)	150 (1325)						
	$n_{transition}$[rpm]	2809	2669	2512	2451						
CV132ML4	M_{max} [Nm] ([lb.in])		93.5 (825)	124 (1095)	152 (1343)	183 (1618)					
	$n_{transition}$[rpm]		2765	2656	2547	2444					
CV160M4	M_{max} [Nm] ([lb.in])			131 (1158)	161 (1423)	198 (1750)	219 (1935)				
	$n_{transition}$[rpm]			2550	2470	2368	2387				
CV160L4	M_{max} [Nm] ([lb.in])				155 (1370)	192 (1697)	228 (2015)	285 (2520)	294 (2600)		
	$n_{transition}$[rpm]				2682	2618	2554	2438	2630		
CV180M4	M_{max} [Nm] ([lb.in])					191 (1688)	228 (2015)	288 (2545)	348 (3075)	360 (3182)	
	$n_{transition}$[rpm]					2752	2707	2637	2560	2914	
CV180L4	M_{max} [Nm] ([lb.in])						212 (1875)	268 (2370)	325 (2873)	360 (3182)	360 (3182)
	$n_{transition}$[rpm]						2682	2630	2572	2854	3168
CV200L4	M_{max} [Nm] ([lb.in])							293 (2590)	350 (3095)	454 (4015)	567 (5013)
	$n_{transition}$[rpm]							2573	2592	2534	2477



DT/DV/D motor tables

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

Motor	M_N	Mass moment of inertia J_M		Star ⅄ (400 V)				Delta Δ (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 (lb.in)]	[10^{-4} kgm^2 (10^{-3} lb.ft^2)]		[A]	[A]	[A]	[Nm/A]	[A]	[A]	[A]	[Nm/A]
DT71D4	2.6 (23)	4.6 (10.4)	5.5 (12.5)	1.24	1.03	0.69	2.52	2.15	1.82	1.14	1.43
DT80K4	3.9 (34)	6.6 (15.6)	7.5 (17.7)	1.56	1.44	1.00	2.70	3.03	2.53	1.67	1.54
DT80N4	5.2 (46)	8.7 (20.7)	9.6 (22.8)	2.15	1.72	1.29	3.02	3.72	2.99	2.21	1.74
DT90S4	7.5 (66)	25 (59.4)	31 (72.2)	2.80	2.39	1.46	3.13	4.85	4.17	2.48	1.80
DT90L4	10.2 (90)	34 (78.9)	40 (93.6)	3.7	3.18	1.89	3.21	6.41	5.51	3.28	1.85
DV100M4	15.0 (133)	42 (101)	48 (114)	4.95	4.37	2.32	3.43	8.57	7.57	4.02	1.98
DV100L4	20.5 (181)	53 (126)	59 (139)	6.7	5.89	3.19	3.48	11.6	10.2	5.52	2.01
DV112M4	26.9 (238)	98 (233)	110 (262)	8.7	7.85	3.75	3.43	15.2	13.6	6.79	1.98
DV132S4	36.7 (324)	146 (416)	158 (445)	11.4	10.3	4.89	3.56	19.8	17.9	8.46	2.05
DV132M4	50.1 (443)	280 (655)	330 (769)	15.5	14.2	6.21	3.53	27.0	24.6	11.1	2.04
DV132ML4	61.0 (539)	330 (769)	380 (887)	18.7	17.1	7.57	3.57	32.5	29.6	13.4	2.06
DV160M4	72.9 (644)	398 (945)	448 (1049)	22.5	20.3	9.70	3.59	39.0	35.1	17.0	2.08
DV160L4	98.1 (867)	925 (2197)	1060 (2449)	31.0	27.6	14.1	3.55	54.0	47.8	25.1	2.05
DV180M4	121 (1070)	1120 (2660)	1255/1520 [2)] (2912/3164 [2)])	38.5	33.1	19.7	3.66	67.0	57.3	34.7	2.11
DV180L4	143 (1264)	1290 (3064)	1425/1520 [2)] (3316/3567 [2)])	46.0	40.7	21.4	3.51	80.0	70.4	38.0	2.03
DV200L4	195 (1724)	2340 (5558)	2475/2570 [2)] (5809/6061 [2)])	57.0	51.8	23.8	3.76	99.0	89.8	41.7	2.17
DV225S4	240 (2122)	3010 (7149)	3145/3240 [2)] (7400/7652 [2)])	70.0	64.5	27.2	3.72	122	112	48.4	2.14
DV225M4	292 (2581)	3570 (8479)	3705/3800 [2)] (8730/8982 [2)])	86.0	77.6	37.1	3.76	149	134	65.2	2.18
DV250M4	356 (3147)	6300 (14950)	6600/6730 [2)] (15550/15908 [2)])	102	91.7	44.7	3.88	172	159	77.7	2.24
DV280S4	483 (4270)	8925 (21180)	9225/9355 [2)] (21737/22112 [2)])	142	124	68.9	3.90	226	216	120	2.24
D280M4	580 (5127)	14500 (34409)	[3)]	155	147	49.2	3.95	270	255	86.1	2.27
D315S4	707 (6249)	20000 (47460)	[3)]	192	180	67.0	3.93	-	-	-	-
D315M4	849 (7505)	24000 (56952)	[3)]	235	209	106	4.06	-	-	-	-
D315M4a	1028 (9087)	31000 (73564)	[3)]	295	259	140	3.97	-	-	-	-

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

2) Double disc brake

3) On request

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

(according to MG1, NEMA design B up to DT80K4, NEMA design C up to DT80N4)

Motor	Mass moment of inertia J_M		Star ⅄ (460 V)					Double-star ⅄⅄ (230 V)				
	Without brake	With brake	M_N at 1000 rpm	I_n	I_{q_n} [1)]	I_{d_n} [1)]	k_T [1)]	M_N at 2400 rpm	I_n	I_{q_n} [1)]	I_{d_n} [1)]	k_T [1)]
	[10^{-4} kgm^2 (10^{-3} lb.ft^2)]		[Nm (lb.in)]	[A]	[A]	[A]	[Nm/A (lb.in/A)]	[Nm (lb.in)]	[A]	[A]	[A]	[Nm/A (lb.in/A)]
DT71D4	4.6 (10.4)	5.5 (12.5)	2.60 (23.0)	1.15	0.95	0.65	2.74 (24.2)	2.60 (23.0)	2.30	1.90	1.30	1.37 (12.1)
DT80K4	6.6 (15.6)	7.5 (17.7)	3.90 (34.5)	1.67	1.35	0.98	2.89 (27.3)	3.90 (34.5)	3.34	2.70	1.96	1.44 (12.8)
DT80N4	8.7 (20.7)	9.6 (22.8)	5.20 (46.0)	2.11	1.72	1.22	3.03 (26.8)	5.20 (46.0)	4.21	3.44	2.44	1.51 (13.4)
DT90S4	25 (59.4)	31 (72.2)	7.50 (66.3)	2.94	2.33	1.80	3.21 (28.4)	7.50 (66.3)	5.89	4.66	3.60	1.61 (14.2)
DT90L4	34 (78.9)	40 (93.6)	10.2 (90.2)	3.57	3.06	1.84	3.35 (29.6)	10.2 (90.2)	7.13	6.11	3.68	1.67 (14.8)
DT100LS4	42 (101)	48 (114)	15.0 (133)	5.00	4.47	2.25	3.34 (29.5)	15.0 (133)	10.1	9.00	4.50	1.66 (14.7)
DT100L4	53 (126)	59 (139)	20.5 (181)	7.92	7.32	3.02	3.45 (30.5)	20.5 (181)	15.8	14.6	6.05	1.72 (15.2)
DV112M4	98 (233)	110 (262)	26.9 (238)	8.20	7.47	3.37	3.60 (31.8)	26.9 (238)	16.4	14.9	6.74	1.80 (15.9)
DV132S4	146 (416)	158 (375)	36.7 (324)	11.0	10.3	3.77	3.55 (31.4)	36.7 (324)	22.0	20.7	7.54	1.78 (15.7)
DV132M4	280 (655)	330 (769)	50.0 (442)	15.9	14.3	6.87	3.46 (30.5)	50.1 (443)	31.8	28.7	13.7	1.77 (15.3)
DV132ML4	330 (769)	380 (887)	61.0 (539)	18.6	16.9	7.69	3.61 (31.7)	61.0 (539)	37.2	33.9	15.4	1.80 (15.8)
DV160M4	398 (945)	448 (1049)	71.0 (628)	22.7	20.4	9.93	3.47 (30.7)	71.0 (628)	45.4	40.8	19.9	1.74 (15.4)
DV160L4	925 (2197)	1060 (2449)	96.0 (849)	30.7	27.4	13.7	3.51 (31.0)	96.0 (849)	61.3	54.8	27.5	1.75 (15.5)
DV180M4	1120 (2660)	1255/1520 [2)] (2912/3164 [2)])	120 (1060)	36.5	33.6	14.3	3.57 (31.6)	120 (1060)	72.9	67.1	28.6	1.79 (15.8)
DV180L4	1290 (3064)	1425/1520 [2)] (3316/3567 [2)])	130 (1150)	42.7	37.6	20.2	3.46 (30.6)	130 (1150)	85.4	75.1	40.5	1.73 (15.3)
DV200L4	2340 (5558)	2475/2570 [2)] (5809/6061 [2)])	190 (1680)	54.6	52.1	16.2	3.65 (32.3)	190 (1680)	109	104	32.5	1.82 (16.2)
DV225S4	3010 (7149)	3145/3240 [2)] (7400/7652 [2)])	235 (2078)	67.9	64.5	21.0	3.64 (32.3)	235 (2078)	136	129	42.0	1.83 (16.2)
DV225M4	3570 (8479)	3705/3800 [2)] (8730/8982 [2)])	280 (2475)	78.8	74.1	27.0	3.78 (33.5)	260 (2300)	148	138	54.0	1.89 (16.8)
D250M4	7300 (17323)	[3)]	356 (3147)	102	95.6	36.4	3.73 (33.0)	356 (3150)	204	191	72.8	1.86 (16.5)
D280S4	12000 (28476)	[3)]	483 (4270)	135	128	45.2	3.77 (33.3)	483 (4270)	270	256	90.4	1.89 (16.8)
D280M4	14500 (34409)	[3)]	580 (5128)	162	153	51.7	3.79 (33.5)	580 (5130)	324	306	103.4	1.89 (16.8)
D315S4	20000 (47460)	[3)]	702 (6249)	201	188	69.8	3.76 (33.2)	-	-	-	-	-
D315M4	24000 (56952)	[3)]	849 (7505)	246	219	111	3.87 (34.2)	-	-	-	-	-
D315M4a	31000 (73564)	[3)]	1028 (9087)	308	271	147	3.79 (33.5)	-	-	-	-	-

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

2) Double disc brake

3) On request

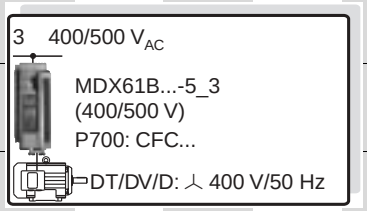
DT/DV/D motor selection in delta/star connection type (AC 230/400 V / 50 Hz)

1) Star connection ⅄ 400 V / 50 Hz or 400/690 V / 50 Hz motors in Δ connection

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

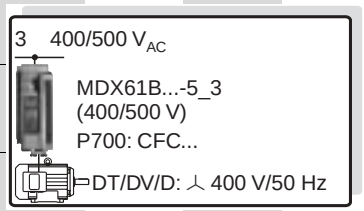
Motor		MOVIDRIVE® MDX61B...-5_3 (400/500 V units) in CFC operating modes (P700)										
⅄ 400 V / 50 Hz		0005	0008	0011	0014	0015	0022	0030	0040	0055	0075	0110
DT71D4	M_{max} [Nm] ([lb.in])	4.6 (40)										
	$n_{transition}$[rpm]	826										
DT80K4	M_{max} [Nm] ([lb.in])	6.9 (60)	6.9 (60)									
	$n_{transition}$[rpm]	710	812									
DT80N4	M_{max} [Nm] ([lb.in])		9.3 (82)	9.3 (82)		9.3 (82)						
	$n_{transition}$[rpm]		672	909		908						
DT90S4	M_{max} [Nm] ([lb.in])			13.5 (120)	13.5 (120)	13.5 (120)	13.5 (120)					
	$n_{transition}$[rpm]			774	960	1011	1011					
DT90L4	M_{max} [Nm] ([lb.in])				18.2 (161)	18.2 (161)	18.3 (162)	18.3 (162)				
	$n_{transition}$[rpm]				794	928	1049	1056				
DV100M4	M_{max} [Nm] ([lb.in])						26.8 (236)	26.8 (236)	26.8 (236)			
	$n_{transition}$[rpm]						940	1043	1056			
DV100L4	M_{max} [Nm] ([lb.in])							36.8 (325)	36.8 (325)	36.8 (325)		
	$n_{transition}$[rpm]							889	1004	1011		
DV112M4	M_{max} [Nm] ([lb.in])								47.1 (416)	48.4 (427)	48.4 (427)	
	$n_{transition}$[rpm]								915	1030	1062	
DV132S4	M_{max} [Nm] ([lb.in])									64.4 (569)	66.1 (584)	66.1 (584)
	$n_{transition}$[rpm]									992	1132	1196
DV132M4	M_{max} [Nm] ([lb.in])										81.7 (722)	90.2 (797)
	$n_{transition}$[rpm]										1011	1145
DV132ML4	M_{max} [Nm] ([lb.in])											110 (972)
	$n_{transition}$[rpm]											1043
DV160M4	M_{max} [Nm] ([lb.in])											124 (1096)
	$n_{transition}$[rpm]											986

Note: The maximum torque M_{max} is limited to 180 % of the rated motor torque M_N.



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

Motor		MOVIDRIVE® MDX61B...-5_3 (400/500 V units) in CFC operating modes (P700)									
⅄ 400 V / 50 Hz		0150	0220	0300	0370	0450	0550	0750	0900	1100	1320
DV132M4	M_{max} [Nm] ([lb.in])	90.2 (797)									
	$n_{transition}$[rpm]	1152									
DV132ML4	M_{max} [Nm] ([lb.in])	110 (972)									
	$n_{transition}$[rpm]	1132									
DV160M4	M_{max} [Nm] ([lb.in])	131 (1157)	131 (1157)								
	$n_{transition}$[rpm]	1132	1196								
DV160L4	M_{max} [Nm] ([lb.in])	163 (1440)	177 (1565)	177 (1565)							
	$n_{transition}$[rpm]	1043	1248	1312							
DV180M4	M_{max} [Nm] ([lb.in])		217 (1917)	217 (1917)	217 (1917)						
	$n_{transition}$[rpm]		1164	1395	1465						
DV180L4	M_{max} [Nm] ([lb.in])		230 (2033)	258 (2280)	258 (2280)	258 (2280)					
	$n_{transition}$[rpm]		1017	1152	1299	1369					
DV200L4	M_{max} [Nm] ([lb.in])			325 (2873)	351 (3100)	351 (3100)	351 (3100)				
	$n_{transition}$[rpm]			1011	1126	1299	1420				
DV225S4	M_{max} [Nm] ([lb.in])				395 (3490)	433 (3826)	433 (3826)	433 (3826)			
	$n_{transition}$[rpm]				947	1030	1164	1312			
DV225M4	M_{max} [Nm] ([lb.in])					482 (4260)	526 (4648)	526 (4648)			
	$n_{transition}$[rpm]					1030	1100	1299			
DV250M4	M_{max} [Nm] ([lb.in])						587 (5188)	641 (5665)	641 (5665)		
	$n_{transition}$[rpm]						1017	1133	1133		
DV280S4	M_{max} [Nm] ([lb.in])							711 (6283)	871 (7698)	871 (7698)	
	$n_{transition}$ [rpm]							1075	1056	1306	
D280M4	M_{max} [Nm] ([lb.in])							745 (6583)	904 (7990)	1045 (9235)	1045 (9235)
	$n_{transition}$ [rpm]							1107	1094	1184	1382
D315S4	M_{max} [Nm] ([lb.in])									1150 (10163)	1273 (11250)
	$n_{transition}$ [rpm]									1088	1203
D315M4	M_{max} [Nm] ([lb.in])										1453 (12840)
	$n_{transition}$ [rpm]										1024
D315M4a	M_{max} [Nm] ([lb.in])										1374 (12143)
	$n_{transition}$ [rpm]										1107

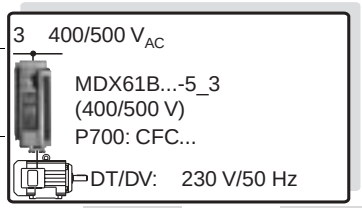


Note: The maximum torque M_{max} is limited to 180 % of the rated motor torque M_N.

2. Delta connection Δ 230 V / 50 Hz:

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

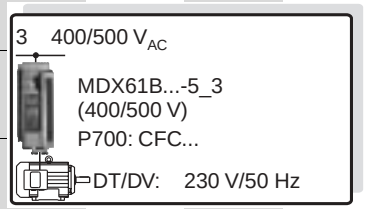
Motor		MOVIDRIVE® MDX61B...-5_3 (400/500 V units) in CFC operating modes (P700)									
Δ 230 V / 50 Hz		**0008**	**0011**	**0014**	**0015**	**0022**	**0030**	**0040**	**0055**	**0075**	**0110**
DT71D4	M_{max}[Nm] ([lb.in])	4.6 (40)	4.6 (40)		4.6 (40)						
	$n_{transition}$ [rpm]	1536	1958		1958						
DT80K4	M_{max} [Nm] ([lb.in])		6.7 (59)	6.9 (61)	6.9 (61)	6.9 (61)					
	$n_{transition}$ [rpm]		1491	1849	1849	1868					
DT80N4	M_{max} [Nm] ([lb.in])			9.3 (82)	9.3 (82)	9.3 (82)	9.3 (82)				
	$n_{transition}$ [rpm]			1587	1817	2054	2054				
DT90S4	M_{max} [Nm] ([lb.in])					13.5 (120)	13.5 (120)	13.5 (120)			
	$n_{transition}$ [rpm]					1971	2246	2304			
DT90L4	M_{max} [Nm] ([lb.in])						18.3 (162)	18.3 (162)	18.3 (162)		
	$n_{transition}$ [rpm]						1843	2240	2329		
DV100M4	M_{max} [Nm] ([lb.in])							26.8 (236)	26.8 (236)	26.8 (236)	
	$n_{transition}$ [rpm]							1862	2214	2297	
DV100L4	M_{max} [Nm] ([lb.in])								36.8 (325)	36.8 (325)	36.8 (325)
	$n_{transition}$ [rpm]								1779	2080	2188
DV112M4	M_{max} [Nm] ([lb.in])									45.5 (402)	48.4 (427)
	$n_{transition}$ [rpm]									1779	2163
DV132S4	M_{max} [Nm] ([lb.in])										66.1 (584)
	$n_{transition}$ [rpm]										1996



Note: The maximum torque M_{max} is limited to 180 % of the rated motor torque M_N.

Assignment of MOVIDRIVE® MDX661B0150-503 ... MDX61B1320-503 (sizes 3 ... 6):

Motor		MOVIDRIVE® MDX61B...-5_3 (400/500 V units) in CFC operating modes (P700)									
Δ 230 V / 50 Hz		0150	0220	0300	0370	0450	0550	0750	0900	1100	1320
DV112M4	M_{max} [Nm] ([lb.in])	48.4 (427)									
	$n_{transition}$ [rpm]	2195									
DV132S4	M_{max} [Nm] ([lb.in])	66.1 (584)	66.1 (584)								
	$n_{transition}$ [rpm]	2374	2444								
DV132M4	M_{max} [Nm] ([lb.in])	90.2 (797)	90.2 (797)								
	$n_{transition}$ [rpm]	1939	2310								
DV132ML4	M_{max} [Nm] ([lb.in])		110 (972)	110 (972)							
	$n_{transition}$ [rpm]		2105	2246							
DV160M4	M_{max} [Nm] ([lb.in])		131 (1157)	131 (1157)	131 (1157)						
	$n_{transition}$ [rpm]		1894	2246	2348						
DV160L4	M_{max} [Nm] ([lb.in])			177 (1565)	177 (1565)	177 (1565)					
	$n_{transition}$ [rpm]			1881	2208	2451					
DV180M4	M_{max} [Nm] ([lb.in])				217 (1917)	217 (1917)	217 (1917)				
	$n_{transition}$ [rpm]				1952	2336	2611				
DV180L4	M_{max} [Nm] ([lb.in])					258 (2280)	258 (2280)	258 (2280)			
	$n_{transition}$ [rpm]					1836	2131	2457			
DV200L4	M_{max} [Nm] ([lb.in])						329 (2908)	351 (3100)	351 (3100)		
	$n_{transition}$ [rpm]						1830	2092	2413		
DV225S4	M_{max} [Nm] ([lb.in])							405 (3580)	433 (3827)	433 (3827)	
	$n_{transition}$ [rpm]							1708	1895	2290	
DV225M4	M_{max} [Nm] ([lb.in])		**Note:** The maximum torque M_{max} is limited to 180 % of the rated motor torque M_N.						487 (4304)	526 (4649)	526 (4649)
	$n_{transition}$ [rpm]								1856	2163	2541
DV250M4	M_{max} [Nm] ([lb.in])								492 (4348)	641 (5665)	641 (5665)
	$n_{transition}$ [rpm]								1856	1837	2227
DV280S4	M_{max} [Nm] ([lb.in])									616 (5444)	796 (7035)
	$n_{transition}$ [rpm]									1933	1907

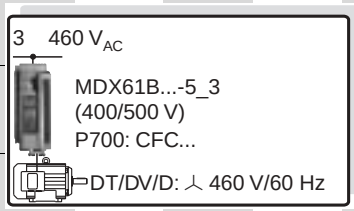


DT/DV/D motor selection in double-star/star connection type (AC 230/460 V / 60 Hz)

1) Star connection ⅄ 460 V / 60 Hz:

Assignment of MOVIDRIVE® MDX61B0005-5A3 ... MDX60A0110-503 (sizes 0 ... 2):

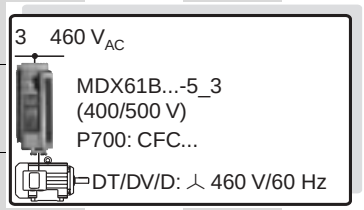
Motor		MOVIDRIVE® MDX61B...-5_3 (400/500 V units) in CFC operating modes (P700)										
⅄ 460 V / 60 Hz		0005	0008	0011	0014	0015	0022	0030	0040	0055	0075	0110
DT80K4	M_{max} [Nm] ([lb.in])	7.0 (62)										
	$n_{transition}$ [rpm]	1005										
DT80N4	M_{max} [Nm] ([lb.in])	8.3 (73)	9.3 (82)			9.3 (82)						
	$n_{transition}$ [rpm]	947	921			1145						
DT90S4	M_{max} [Nm] ([lb.in])			13.5 (120)		13.5 (120)						
	$n_{transition}$ [rpm]			992		1312						
DT90L4	M_{max} [Nm] ([lb.in])				18.3 (162)	18.3 (162)	18.3 (162)					
	$n_{transition}$ [rpm]				1005	1152	1318					
DT100LS4	M_{max} [Nm] ([lb.in])						26.5 (234)	27.0 (238)				
	$n_{transition}$ [rpm]						1100	1222				
DT100L4	M_{max} [Nm] ([lb.in])							28.2 (250)	36.8 (325)	36.8 (325)		
	$n_{transition}$ [rpm]							1171	1075	1120		
DV112M4	M_{max} [Nm] ([lb.in])							35.8 (316)	48.4 (427)	48.4 (427)		
	$n_{transition}$ [rpm]							1196	1139	1312		
DV132S4	M_{max} [Nm] ([lb.in])								48.7 (430)	65.1 (575)	66.1 (584)	
	$n_{transition}$ [rpm-rpm]								1068	992	1100	
DV132M4	M_{max} [Nm] ([lb.in])		**Note:** The maximum torque M_{max} is limited to 180 % of the rated motor torque M_N.								80.0 (705)	90.2 (797)
	$n_{transition}$ [rpm]										1088	1222
DV132ML4	M_{max} [Nm] ([lb.in])											110 (972)
	$n_{transition}$ [rpm]											1196
DV160M4	M_{max} [Nm] ([lb.in])											120.3 (1062)
	$n_{transition}$ [rpm]											1132



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

Motor		MOVIDRIVE® MDX61B...-5_3 (400/500 V units) in CFC operating modes (P700)									
⅄ 460 V / 60 Hz		0150	0220	0300	0370	0450	0550	0750	0900	1100	1320
DV132ML4	M_{max} [Nm] ([lb.in])	110 (972)									
	$n_{transition}$ [rpm]	1299									
DV160M4	M_{max} [Nm] ([lb.in])	131 (1157)	131 (1157)								
	$n_{transition}$ [rpm]	1260	1318								
DV160L4	M_{max} [Nm] ([lb.in])	161 (1422)	177 (1565)								
	$n_{transition}$ [rpm]	1158	1370								
DV180M4	M_{max} [Nm] ([lb.in])	164 (1448)	217 (1917)	217 (1917)							
	$n_{transition}$ [rpm]	1140	1177	1350							
DV180L4	M_{max} [Nm] ([lb.in])		228 (2015)	258 (2280)	258 (2280)						
	$n_{transition}$ [rpm]		1081	1196	1324						
DV200L4	M_{max} [Nm] ([lb.in])			323 (2845)	351 (3100)	351 (3100)					
	$n_{transition}$ [rpm]			1024	1107	1248					
DV225S4	M_{max} [Nm] ([lb.in])			318 (2815)	391 (3456)	433 (3826)	433 (3826)				
	$n_{transition}$ [rpm]			1100	1075	1145	1286				
DV225M4	M_{max} [Nm] ([lb.in])				401 (3542)	494 (4364)	526 (4648)	526 (4648)			
	$n_{transition}$ [rpm]				1081	1056	1139	1324			
D250M4	M_{max} [Nm] ([lb.in])						570 (5040)	640 (5656)			
	$n_{transition}$ [rpm]						1300	1395			
D280S4	M_{max} [Nm] ([lb.in])							717 (6335)	869 (7678)	871 (7695)	
	$n_{transition}$ [rpm]							1345	1318	1594	
D280M4	M_{max} [Nm] ([lb.in])							712 (6290)	864 (7634)	1045 (9233)	
	$n_{transition}$ [rpm]							1337	1325	1382	
D315S4	M_{max} [Nm] ([lb.in])									1099 (9710)	1273 (11247)
	$n_{transition}$ [rpm]									1325	1408
D315M4	M_{max} [Nm] ([lb.in])										1387 (12255)
	$n_{transition}$ [rpm]										1242
D315M4a	M_{max} [Nm] ([lb.in])										1307 (11548)
	$n_{transition}$ [rpm]										1344

Note: The maximum torque M_{max} is limited to 180 % of the rated motor torque M_N.

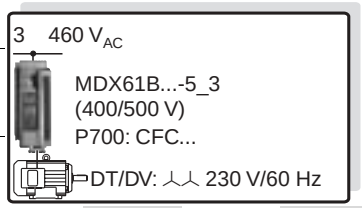


2) Double-star connection ⅄⅄ 230 V / 60 Hz:

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

Motor		MOVIDRIVE® MDX61B...-5_3 (400/500 V units) in CFC operating modes (P700)									
⅄⅄ 230 V / 60 Hz		0008	0011	0014	0015	0022	0030	0040	0055	0075	0110
DT71D4	M_{max} [Nm] ([lb.in])	4.6 (40)			4.6 (40)						
	$n_{transition}$ [rpm]	2310			2988						
DT80K4	M_{max} [Nm] ([lb.in])		6.1 (53)	7.0 (62)	7.0 (62)	7.0 (62)					
	$n_{transition}$ [rpm]		2297	2413	2688	2822					
DT80N4	M_{max} [Nm] ([lb.in])			8.3 (73)	8.3 (73)	9.3 (82)	9.3 (82)				
	$n_{transition}$ [rpm]			2368	2585	2873	2969				
DT90S4	M_{max} [Nm] ([lb.in])					11.9 (105)	13.5 (120)	13.5 (120)			
	$n_{transition}$ [rpm]					2636	2931	3462			
DT90L4	M_{max} [Nm] ([lb.in])						16.4 (145)	18.3 (162)	18.3 (162)		
	$n_{transition}$ [rpm]						2604	3014	3353		
DT100LS4	M_{max} [Nm] ([lb.in])							22.5 (200)	27.0 (238)	27.0 (238)	
	$n_{transition}$ [rpm]							2592	2732	3104	
DT100L4	M_{max} [Nm] ([lb.in])									32.5 (287)	36.8 (325)
	$n_{transition}$ [rpm]									2592	2912
DV112M4	M_{max} [Nm] ([lb.in])									41.4 (365)	48.4 (427)
	$n_{transition}$ [rpm]									2534	2988
DV132S4	M_{max} [Nm] ([lb.in])										62.4 (550)
	$n_{transition}$ [rpm]										2233

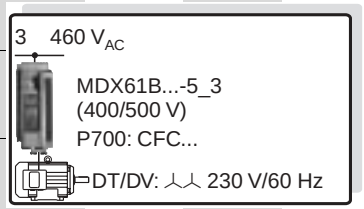
Note: The maximum torque M_{max} is limited to 180 % of the rated motor torque M_N.



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

Motor		MOVIDRIVE® MDX61B...-5_3 (400/500 V units) in CFC operating modes (P700)									
⅄⅄ 230 V / 60 Hz		0150	0220	0300	0370	0450	0550	0750	0900	1100	1320
DV132S4	M_{max} [Nm] ([lb.in])	66.1 (585)									
	$n_{transition}$ [rpm]	2572									
DV132M4	M_{max} [Nm] ([lb.in])	80.0 (705)	90.2 (797)								
	$n_{transition}$ [rpm]	2348	2707								
DV132ML4	M_{max} [Nm] ([lb.in])		110 (972)	110 (972)							
	$n_{transition}$ [rpm]		2566	2944							
DV160M4	M_{max} [Nm] ([lb.in])		115 (1015)	131 (1157)	131 (1157)						
	$n_{transition}$ [rpm]		2451	2688	2963						
DV160L4	M_{max} [Nm] ([lb.in])			150 (1325)	177 (1565)	177 (1565)					
	$n_{transition}$ [rpm]			2457	2512	2918					
DV180M4	M_{max} [Nm] ([lb.in])				189 (1670)	217 (1917)	217 (1917)				
	$n_{transition}$ [rpm]				2355	2457	2771				
DV180L4	M_{max} [Nm] ([lb.in])					220 (1943)	258 (2280)	258 (2280)			
	$n_{transition}$ [rpm]					2284	2291	2720			
DV200L4	M_{max} [Nm] ([lb.in])						281 (2482)	350 (3092)	351 (3100)		
	$n_{transition}$ [rpm]						2208	2163	2509		
DV225S4	M_{max} [Nm] ([lb.in])							346 (3056)	419 (3700)	433 (3825)	
	$n_{transition}$ [rpm]							2291	2253	2694	
DV225M4	M_{max} [Nm] ([lb.in])							354 (3127)	430 (3798)	526 (4646)	526 (4646)
	$n_{transition}$ [rpm]							2278	2252	2336	2803

Note: The maximum torque M_{max} is limited to 180 % of the rated motor torque M_N.



DT/DV/D motor selection with double-star or double-delta connection type (AC 200 V / 50 Hz)

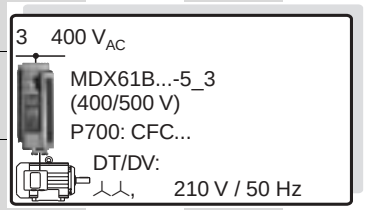
Assignment of MOVIDRIVE® MDX61B0005-5A3 ... MDX61B0110-503 (sizes 0 ... 2):

Motor		MOVIDRIVE® MDX61B...-5_3 (400/500 V units) in CFC operating modes (P700)							
⅄⅄, ΔΔ 200 V / 50 Hz[1]		0014	0015	0022	0030	0040	0055	0075	0110
DT80K4	M_{max} [Nm] ([lb.in])	6.9 (61)	6.9 (61)	6.9 (61)					
	$n_{transition}$ [rpm]	1804	2035	2112					
DT80N4	M_{max} [Nm] ([lb.in])			9.3 (82)	9.3 (82)	9.3 (82)			
	$n_{transition}$ [rpm]			2483	2624	2624			
DT90L4	M_{max} [Nm] ([lb.in])					18.3 (162)	18.3 (162)	18.3 (162)	
	$n_{transition}$ [rpm]					2521	2924	2963	
DV100M4	M_{max} [Nm] ([lb.in])					24.4 (215)	26.8 (236)	26.8 (236)	
	$n_{transition}$ [rpm]					2124	2419	2732	
DV112M4	M_{max} [Nm] ([lb.in])								48.4 (427)
	$n_{transition}$ [rpm]	**Note:** The maximum torque M_{max} is limited to 180 % of the rated motor torque M_N.							2457
DV132S4	M_{max} [Nm] ([lb.in])								58.3 (515)
	$n_{transition}$ [rpm]								2355

1) The values also apply to 200 V / 60 Hz and 220 V / 60 Hz.

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

Motor		MOVIDRIVE® MDX61B...-5_3 (400/500 V units) in CFC operating modes (P700)									
⅄⅄, ΔΔ 200 V / 50 Hz[1]		0150	0220	0300	0370	0450	0550	0750	0900	1100	1320
DV112M4	M_{max} [Nm] ([lb.in])	48.4 (427)									
	$n_{transition}$ [rpm]	2796									
DV132S4	M_{max} [Nm] ([lb.in])	66.1 (585)	66.1 (585)								
	$n_{transition}$ [rpm]	2656	3052								
DV132M4	M_{max} [Nm] ([lb.in])	77.3 (683)	90.2 (797)	90.2 (797)							
	$n_{transition}$ [rpm]	2361	2688	2886							
DV160M4	M_{max} [Nm] ([lb.in])		112 (995)	131 (1157)	131 (1157)	131 (1157)					
	$n_{transition}$ [rpm]		2265	2470	2784	2918					
DV160L4	M_{max} [Nm] ([lb.in])				177 (1565)	177 (1565)	177 (1565)	177 (1565)			
	$n_{transition}$ [rpm]				2316	2726	2995	3084			
DV180M4	M_{max} [Nm] ([lb.in])					217 (1917)	217 (1917)	217 (1917)			
	$n_{transition}$ [rpm]					2406	2803	3251			
DV180L4	M_{max} [Nm] ([lb.in])						252 (2233)	258 (2280)	258 (2280)		
	$n_{transition}$ [rpm]						2240	2662	3008		
DV200L4	M_{max} [Nm] ([lb.in])							336 (2975)	351 (3110)	351 (3110)	
	$n_{transition}$ [rpm]							2233	2541	3072	
DV225S4	M_{max} [Nm] ([lb.in])							330 (2917)	401 (3553)	433 (3836)	433 (3836)
	$n_{transition}$ [rpm]	**Note:** The maximum torque M_{max} is limited to 180 % of the rated motor torque M_N.						2112	2086	2438	2867
DV225M4	M_{max} [Nm] ([lb.in])								395 (3500)	518 (4590)	526 (4660)
	$n_{transition}$ [rpm]								2291	2253	2720

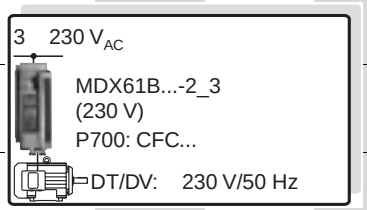


1) The values also apply to 200 V / 60 Hz and 220 V / 60 Hz.

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

Motor			MOVIDRIVE® MDX61B...-2_3 (230 V units) in CFC operating modes (P700)								
Δ 230 V / 50 Hz			0015	0022	0037	0055	0075	0110	0150	0220	0300
DT80K4	M_{max}[Nm]	([lb.in])	6.9 (61)								
	$n_{transition}$	[rpm]	812								
DT80N4	M_{max}	[Nm] ([lb.in])	9.3 (82)								
	$n_{transition}$	[rpm]	908								
DT90S4	M_{max}	[Nm] ([lb.in])	13.5 (120)	13.5 (120)							
	$n_{transition}$	[rpm]	1011	1011							
DT90L4	M_{max}	[Nm] ([lb.in])	18.3 (162)	18.3 (162)	18.3 (162)						
	$n_{transition}$	[rpm]	953	1024	1056						
DV100M4	M_{max}	[Nm] ([lb.in])		25.5 (225)	26.8 (236)						
	$n_{transition}$	[rpm]		921	1056						
DV100L4	M_{max}	[Nm] ([lb.in])			36.8 (325)	36.8 (325)					
	$n_{transition}$	[rpm]			972	1011					
DV112M4	M_{max}	[Nm] ([lb.in])				48.4 (427)	48.4 (427)				
	$n_{transition}$	[rpm]				1036	1062				
DV132S4	M_{max}	[Nm] ([lb.in])				65.3 (577)	66.1 (584)	66.1 (584)			
	$n_{transition}$	[rpm]				992	1152	1196			
DV132M4	M_{max}	[Nm] ([lb.in])					85.4 (755)	90.2 (797)	90.2 (797)		
	$n_{transition}$	[rpm-rpm]					998	1152	1152		
DV132ML4	M_{max}	[Nm] ([lb.in])						110 (972)	110 (972)	110 (972)	
	$n_{transition}$	[rpm]						1050	1132	1132	
DV160M4	M_{max}	[Nm] ([lb.in])						126 (1110)	131 (1157)	131 (1157)	
	$n_{transition}$	[rpm]						980	1120	1196	
DV160L4	M_{max}	[Nm] ([lb.in])							158 (1395)	177 (1565)	177 (1565)
	$n_{transition}$	[rpm]							1050	1248	1312
DV180M4	M_{max}	[Nm] ([lb.in])								217 (1917)	217 (1917)
	$n_{transition}$	[rpm]								1165	1325
DV180L4	M_{max}	[Nm] ([lb.in])								231 (2042)	258 (2280)
	$n_{transition}$	[rpm]								1017	1068
DV200L4	M_{max}	[Nm] ([lb.in])									295 (2605)
	$n_{transition}$	[rpm]									1025

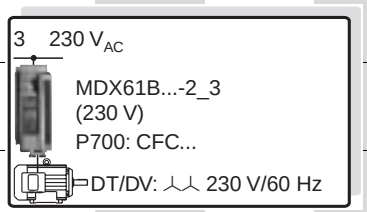
Note: The maximum torque M_{max} is limited to 180 % of the rated motor torque M_N.



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

Motor			MOVIDRIVE® MDX61B...-2_3 (230 V units) in CFC operating modes (P700)								
⅄⅄ 230 V / 60 Hz			0015	0022	0037	0055	0075	0110	0150	0220	0300
DT80K4	M_{max}[Nm] ([lb.in])		7.0 (62)								
	$n_{transition}$	[rpm]	1100								
DT80N4	M_{max}	[Nm] ([lb.in])	9.3 (82)								
	$n_{transition}$	[rpm]	1145								
DT90S4	M_{max}	[Nm] ([lb.in])	13.5 (120)	13.5 (120)							
	$n_{transition}$	[rpm]	1267	1337							
DT90L4	M_{max}	[Nm] ([lb.in])	17.2 (152)	18.3 (162)	18.3 (162)						
	$n_{transition}$	[rpm]	1145	1210	1325						
DT100LS4	M_{max}	[Nm] ([lb.in])		20.1 (178)	27.0 (238)						
	$n_{transition}$	[rpm]		1190	1228						
DT100L4	M_{max}	[Nm] ([lb.in])			29.2 (258)	36.8 (325)	36.8 (325)				
	$n_{transition}$	[rpm]			1158	1113	1120				
DV112M4	M_{max}	[Nm] ([lb.in])			37.2 (328)	48.4 (427)	48.4 (427)				
	$n_{transition}$	[rpm]			1190	1248	1337				
DV132S4	M_{max}	[Nm] ([lb.in])				57.0 (504)	66.1 (585)	66.1 (585)			
	$n_{transition}$	[rpm]				1030	1062	1120			
DV132M4	M_{max}	[Nm] ([lb.in])					71.7 (633)	90.2 (797)	90.2 (797)		
	$n_{transition}$	[rpm]					1113	1165	1222		
DV132ML4	M_{max}	[Nm] ([lb.in])						109 (970)	110 (972)		
	$n_{transition}$	[rpm]						1100	1260		
DV160M4	M_{max}	[Nm] ([lb.in])						104 (920)	131 (1157)	131 (1157)	
	$n_{transition}$	[rpm]						1165	1145	1318	
DV160L4	M_{max}	[Nm] ([lb.in])							133 (1178)	177 (1565)	177 (1565)
	$n_{transition}$	[rpm]							1190	1267	1395
DV180M4	M_{max}	[Nm] ([lb.in])								208 (1840)	217 (1917)
	$n_{transition}$	[rpm]								1100	1203
DV180L4	M_{max}	[Nm] ([lb.in])									236 (2087)
	$n_{transition}$	[rpm]									1075
DV200L4	M_{max}	[Nm] ([lb.in])								210 (1860)	253 (2235)
	$n_{transition}$	[rpm]								1080	1062

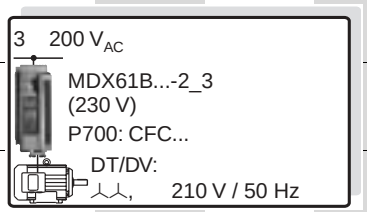
Note: The maximum torque M_{max} is limited to 180 % of the rated motor torque M_N.



DT/DV motor selection with double-star of double-delta connection type (AC 200 V / 50 Hz)

Motor			MOVIDRIVE® MDX61B...-2_3 (230 V units) in CFC operating modes (P700)								
⅄⅄, ΔΔ 200 V / 50 Hz[1]			0015	0022	0037	0055	0075	0110	0150	0220	0300
DT80K4	M_{max}	[Nm] ([lb.in])	6.9 (61)								
	$n_{transition}$	[rpm]	748								
DT80N4	M_{max}	[Nm] ([lb.in])	9.3 (82)								
	$n_{transition}$	[rpm]	985								
DT90L4	M_{max}	[Nm] ([lb.in])	15.5 (137)	18.3 (162)	18.3 (162)						
	$n_{transition}$	[rpm]	1049	998	1145						
DV100M4	M_{max}	[Nm] ([lb.in])			26.8 (236)	26.8 (236)					
	$n_{transition}$	[rpm]			1050	1056					
DV112M4	M_{max}	[Nm] ([lb.in])				48.4 (427)	48.4 (427)	48.4 (427)			
	$n_{transition}$	[rpm]				1017	1132	1145			
DV132S4	M_{max}	[Nm] ([lb.in])					66.1 (585)	66.1 (585)			
	$n_{transition}$	[rpm]					1107	1280			
DV132M4	M_{max}	[Nm] ([lb.in])						90.2 (797)	90.2 (797)	90.2 (797)	
	$n_{transition}$	[rpm]						1139	1228	1228	
DV160M4	M_{max}	[Nm] ([lb.in])							131 (1157)	131 (1157)	
	$n_{transition}$	[rpm]							1050	1273	
DV160L4	M_{max}	[Nm] ([lb.in])								177 (1565)	177 (1565)
	$n_{transition}$	[rpm]								1177	1312
DV180M4	M_{max}	[Nm] ([lb.in])								195 (1723)	217 (1917)
	$n_{transition}$	[rpm]								1145	1216
DV180L4	M_{max}	[Nm] ([lb.in])									226 (2000)
	$n_{transition}$	[rpm]									1080

Note: The maximum torque M_{max} is limited to 180 % of the rated motor torque M_N.



1) The values also apply to 200 V / 60 Hz and 220 V / 60 Hz.

3.3 Motor selection for synchronous servomotors (SERVO)

The torque limit (M limit) is set automatically by the startup function of the MOVITOOLS software package. Do not alter this automatically set value!

We recommend to always use the latest version of MOVITOOLS (4.00 or later) for startup. The latest MOVITOOLS version can be downloaded from our homepage (www.sew-eurodrive.de).

Motor characteristics

The requirements on a servo drive include speed dynamics, stable speed and positioning accuracy. CM/DFS/DFY motors with MOVIDRIVE® meet these requirements.

Technically speaking, these motors are synchronous motors with permanent magnets on the rotor and an integrated resolver. The required characteristics, namely a constant torque over a wide speed range (up to 4500 rpm), a high speed and control range (up to 1:3000) and a high overload capacity ($3 \times M_0$), are achieved using control by MOVIDRIVE®. The servomotor has a lower mass moment of inertia than the asynchronous motor. This means it is optimally suited to applications requiring dynamic speeds.

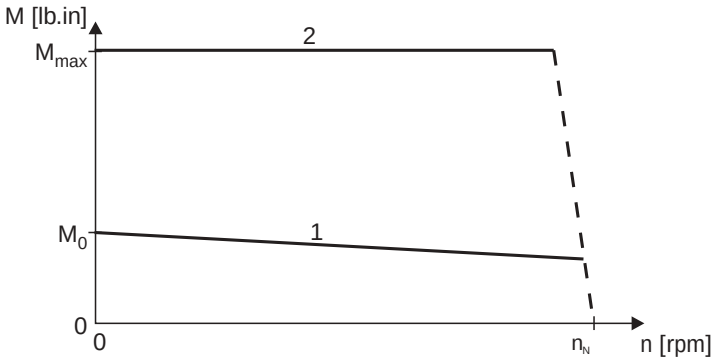


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Figure 63: Speed-torque characteristics of the DFY servomotor

1 Continuous torque
2 Maximum torque

M_0 is determined by the motor. M_{max} is $3 \times M_0$ of the motor. The attainable M_{max} may also be less, depending on the inverter.

For values for M_0, refer to the motor table (DS/CM → page 138).

For values for M_{max}, refer to the motor selection tables (DS/CM → page 139).

Basic recommendations

SERVO operating modes are only possible with SEW motors (CM/DFS/DFY), not with non-SEW motors. The necessary motor data for the SERVO operating modes are stored in MOVIDRIVE® for the SEW motors.

Speed is the correcting variable in the SERVO modes with speed control. Torque is the correcting variable in the SERVO modes with torque control (SERVO & M-CONTROL).

SERVO mode with speed control

There is no reason to differentiate between quadratic, dynamic and static load types when configuring a system for SERVO mode. Project planning for a synchronous motor is carried out in accordance with the following requirements:

1. Effective torque demand at the average speed of the application.

   $M_{r.m.s.} < M_{n\_mot}$

   The point must lie below the characteristic curve for the continuous torque (Figure 63, curve 1). The continuous torque of the DFY series can be increased by 60 % by forced cooling if this operating point lies above the characteristic curve for self-cooling.

2. Maximum torque required across the speed characteristic.

   $M_{max} < M_{dyn\_mot}$

   This operating point must lie below the characteristic curve for the maximum torque of the motor/MOVIDRIVE® combination (Figure 63, 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 rpm due to the high input speed.

   $n_{max} \leq n_N$

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

This operating mode allows the torque of the servomotor to be controlled directly. The setpoint sources of the speed controlled SERVO mode can also be used for torque control. All speed setpoint sources are interpreted as current setpoint sources. The settings for evaluating the analog input (→ P11_, parameter description) also remain in effect. The fixed setpoints (P16_, P17_) can be entered either in the unit [rpm] or [%$I_{N\_inverter}$] (→ MOVITOOLS).

The following relationship applies between the units:

3000 rpm = 150 % inverter rated current

You can calculate the torque at the output shaft of the servomotor using the following formula:

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

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M_0 Continuous static torque according to the motor table DS/CM (→ page 138)

I_0 Continuous static current according to the motor table DS/CM (→ page 138)

Motor table DS/CM

Additional project planning notes and information about the type DS/CM synchronous servomotors can be found in the "Geared Servomotors" catalog, which can be ordered from SEW.

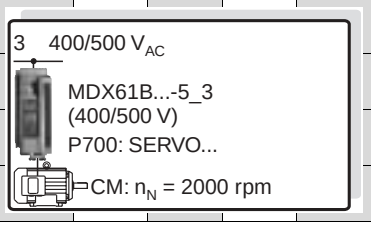
Characteristic values at V_{max} = AC 400 V

n_N	Motor	without forced cooling fan		with forced cooling fan VR		I_{max}	Moment of inertia J_M	
		M_0	I_0	M_{0_VR}	I_{0_VR}		without brake	with brake
[rpm]		[Nm (lb.in)]	[A]	[Nm (lb.in)]	[A]	[A]	[10^{-4} kgm^2 (10^{-3} lb.ft^2)]	
2000	**CM71S**	5.0 (44)	2.2	7.3 (64)	3.2	8.8	4.85 (11.4)	6.89 (16.2)
	CM71M	6.5 (57)	2.9	9.4 (83)	4.2	11.6	6.27 (14.7)	8.31 (19.5)
	CM71L	9.5 (84)	4.2	13.8 (122)	6.1	16.8	9.1 (21.4)	11.1 (26.1)
	CM90S	11.0 (97)	4.9	16.0 (141)	7.1	20.0	14.3 (33.6)	19.8 (46.5)
	CM90M	14.5 (128)	6.9	21.0 (185)	10.0	28.0	18.6 (43.7)	24.1 (56.7)
	CM90L	21.0 (185)	9.9	30.5 (270)	14.4	40.0	27.1 (63.7)	32.6 (76.7)
	CM112S	23.5 (207)	10.0	34.0 (300)	14.5	40.0	67.4 (159)	87.5 (206)
	CM112M	31.0 (274)	13.5	45.0 (397)	19.6	54.0	87.4 (206)	108 (254)
	CM112L	45.0 (397)	19.1	65.0 (574)	29.0	80.0	128 (301)	148 (348)
3000	**DS56M**	1.0 (8.8)	1.65	-	-	4.65	0.47 (1.12)	0.85 (2.02)
	DS56L	2.0 (18)	2.4	-	-	6.66	0.82 (1.95)	1.2 (2.85)
	DS56H	4.0 (36)	2.8					
	CM71S	5.0 (44)	3.3	7.3 (64)	4.8	13.2	4.85 (11.4)	6.89 (16.2)
	CM71M	6.5 (57)	4.3	9.4 (83)	6.2	17.2	6.27 (14.7)	8.31 (19.5)
	CM71L	9.5 (84)	6.2	13.8 (122)	9.0	25.0	9.1 (21.4)	11.1 (26.1)
	CM90S	11.0 (97)	7.3	16.0 (141)	10.6	30.0	14.3 (33.6)	19.8 (46.5)
	CM90M	14.5 (128)	10.1	21.0 (185)	14.6	40.0	18.6 (43.7)	24.1 (56.7)
	CM90L	21.0 (185)	14.4	30.5 (270)	21.0	58.0	27.1 (63.7)	32.6 (76.7)
	CM112S	23.5 (207)	15.0	34.0 (300)	22.0	60.0	67.4 (159)	87.5 (206)
	CM112M	31.0 (274)	20.5	45.0 (397)	30.0	82.0	87.4 (206)	108 (254)
	CM112L	45.0 (397)	30.0	65.0 (574)	44.0	120	128 (301)	148 (348)
4500	**DS56M**	1.0 (8.8)	1.65	-	-	4.65	0.47 (1.12)	0.85 (2.02)
	DS56L	2.0 (18)	2.4	-	-	6.66	0.82 (1.95)	1.2 (2.85)
	DS56H	4.0 (36)	4.0					
	CM71S	5.0 (44)	4.9	7.3 (64)	7.2	20.0	4.85 (11.4)	6.89 (16.2)
	CM71M	6.5 (57)	6.6	9.4 (83)	9.6	27.0	6.27 (14.7)	8.31 (19.5)
	CM71L	9.5 (84)	9.6	13.8 (122)	14.0	39.0	9.1 (21.4)	11.1 (26.1)
	CM90S	11.0 (97)	11.1	16.0 (141)	16.2	45.0	14.3 (33.6)	19.8 (46.5)
	CM90M	14.5 (128)	14.7	21.0 (185)	21.5	59.0	18.6 (43.7)	24.1 (56.7)
	CM90L	21.0 (185)	21.6	30.5 (270)	31.5	86.0	27.1 (63.7)	32.6 (76.7)
	CM112S	23.5 (207)	22.5	34.0 (300)	32.5	90.0	67.4 (159)	87.5 (206)
	CM112M	31.0 (274)	30.0	45.0 (397)	44.0	120	87.4 (206)	108 (254)
	CM112L	45.0 (397)	46.0	65.0 (574)	67.0	184	128 (301)	148 (348)
6000	**DS56M**	1.0 (8.8)	1.65	-	-	4.65	0.47 (1.12)	0.85 (2.02)
	DS56L	2.0 (18)	2.75	-	-	6.66	0.82 (1.95)	1.2 (2.85)
	DS56H	4.0 (36)	5.3					
	CM71S	5.0 (44)	6.5	7.3 (64)	7.2	20.0	4.85 (11.4)	6.89 (16.2)
	CM71M	6.5 (57)	8.6	9.4 (83)	9.6	27.0	6.27 (14.7)	8.31 (19.5)
	CM71L	9.5 (84)	12.5	13.8 (122)	14.0	39.0	9.1 (21.4)	11.1 (26.1)
	CM90S	11.0 (97)	14.5	16.0 (141)	16.2	45.0	14.3 (33.6)	19.8 (46.5)
	CM90M	14.5 (128)	19.8	21.0 (185)	21.5	59.0	18.6 (43.7)	24.1 (56.7)
	CM90L	21.0 (185)	29.5	30.5 (270)	31.5	86.0	27.1 (63.7)	32.6 (76.7)

DS/CM motor selection

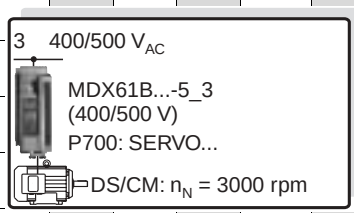
1) Rated speed n_N = 2000 rpm:

Motor		MOVIDRIVE® MDX61B...-5_3 (400/500 V units) in SERVO operating modes (P700)													
		0005	0008	0011	0014	0015	0022	0030	0040	0055	0075	0110	0150	0220	0300
CM71S	M_{max} [Nm] ([lb.in])	8.9 (78.4)	10.5 (92.5)	13.1 (115)	15.6 (137)	12.7 (111)	15.9 (140)	16.5 (145)							
CM71M	M_{max} [Nm] ([lb.in])	8.6 (75.7)	10.3 (90.7)	13.1 (115)	16.2 (142)	12.7 (111)	16.7 (147)	19.8 (175)	21.1 (185)						
CM71L	M_{max} [Nm] ([lb.in])		10.8 (95.1)	13.9 (122)	17.7 (155)	13.5 (118)	18.2 (160)	22.5 (198)	28.4 (250)	31.4 (278)					
CM90S	M_{max} [Nm] ([lb.in])			13.9 (122)	17.8 (156)	13.4 (118)	18.4 (162)	23.2 (204)	30.6 (269)	38.2 (336)	40.0 (352)				
CM90M	M_{max} [Nm] ([lb.in])				16.8 (148)	12.6 (111)	17.3 (152)	21.9 (192)	29.5 (259)	38.0 (334)	46.9 (413)	52.5 (462)			
CM90L	M_{max} [Nm] ([lb.in])						17.5 (154)	22.2 (195)	30.1 (265)	39.3 (346)	49.6 (437)	70.3 (619)	75.8 (667)		
CM112S	M_{max} [Nm] ([lb.in])						19.3 (170)	24.6 (216)	33.4 (294)	43.6 (384)	54.8 (482)	76.2 (671)	81.9 (721)		
CM112M	M_{max} [Nm] ([lb.in])							23.9 (210)	32.6 (287)	42.9 (378)	54.7 (482)	79.3 (698)	99.6 (877)	108.0 (951)	
CM112L	M_{max} [Nm] ([lb.in])									42.0 (370)	53.9 (474)	80.3 (707)	104.9 (924)	141.5 (1246)	156.8 (1381)



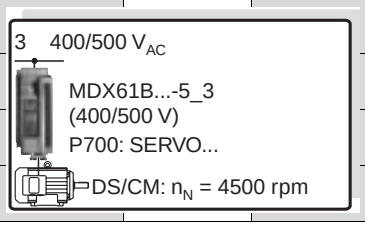
2) Rated speed n_N = 3000 rpm:

Motor		MOVIDRIVE® MDX61B...-5_3 (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] ([lb.in])	2.4 (21.1)	2.8 (24.6)	3.6 (31.7)	3.8 (33.4)	3.5 (30.8)	3.8 (33.4)										
DS56L	M_{max} [Nm] ([lb.in])	3.3 (29.0)	4.0 (35.2)	5.1 (44.9)	6.4 (56.4)	4.9 (43.1)	6.6 (58.1)	7.6 (66.9)									
DS56H	M_{max} [Nm] ([lb.in])	5.7 (50.2)	6.8 (59.9)	8.8 (77.5)	11.2 (98.7)	8.5 (74.9)	11.5 (101)	14.3 (126)	15.2 (133)								
CM71S	M_{max} [Nm] ([lb.in])	6.0 (52.8)	7.2 (63.4)	9.2 (81.0)	11.6 (102)	8.9 (78.4)	11.9 (104)	14.3 (126)	16.5 (145)								
CM71M	M_{max} [Nm] ([lb.in])		7.2 (63.4)	9.3 (81.9)	11.9 (104)	9.0 (79.3)	12.2 (107)	15.1 (133)	19.1 (168)	21.5 (189)							
CM71L	M_{max} [Nm] ([lb.in])			9.5 (83.7)	12.2 (107)	9.2 (81.0)	12.6 (111)	15.9 (140)	21.0 (185)	26.2 (230)	30.8 (271)	31.5 (277)					
CM90S	M_{max} [Nm] ([lb.in])				12.0 (105)	9.0 (79.3)	12.4 (109)	15.7 (138)	21.2 (186)	27.4 (241)	34.0 (299)	40.1 (353)					
CM90M	M_{max} [Nm] ([lb.in])						11.8 (103)	15.0 (132)	20.4 (179)	26.6 (234)	33.7 (296)	47.8 (421)	51.6 (454)				
CM90L	M_{max} [Nm] ([lb.in])								20.7 (182)	27.3 (240)	34.7 (305)	51.1 (450)	65.6 (578)	75.6 (666)			
CM112S	M_{max} [Nm] ([lb.in])								22.2 (195)	29.3 (258)	37.4 (329)	54.8 (482)	69.8 (615)	81.9 (721)			
CM112M	M_{max} [Nm] ([lb.in])									28.2 (248)	36.2 (319)	54.0 (475)	70.7 (623)	95.7 (843)	108.0 (951)		
CM112L	M_{max} [Nm] ([lb.in])										35.8 (345)	53.9 (474)	71.6 (630)	101.0 (890)	126.9 (1118)	147.4 (1298)	156.8 (1381)

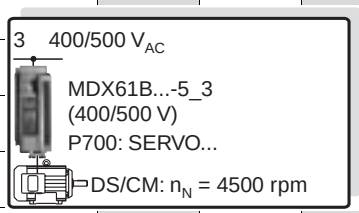


3) Rated speed n_N = 4500 rpm:

Motor		MOVIDRIVE® MDX61B...-5_3 (400/500 V units) in SERVO operating modes (P700)							
		0005	0008	0011	0014	0015	0022	0030	0040
DS56M	M_{max} [Nm] ([lb.in])	2.4 (21.1)	2.8 (24.6)	3.6 (31.7)	3.8 (33.4)	3.5 (30.8)	3.8 (33.4)		
DS56L	M_{max} [Nm] ([lb.in])	3.3 (29.0)	4.0 (35.2)	5.1 (44.9)	6.4 (56.4)	4.9 (43.1)	6.6 (58.1)	7.6 (66.9)	
DS56H	M_{max} [Nm] ([lb.in])	4.0 (35.2)	4.8 (42.3)	6.2 (54.6)	7.9 (69.6)	6.0 (52.8)	8.2 (72.2)	10.3 (90.7)	13.7 (120)
CM71S	M_{max} [Nm] ([lb.in])			6.3 (55.5)	8.1 (71.3)	6.1 (53.7)	8.3 (73.1)	10.4 (91.6)	13.4 (118)
CM71M	M_{max} [Nm] ([lb.in])				7.9 (69.6)	5.9 (51.9)	8.1 (71.3)	10.2 (89.8)	13.6 (119)
CM71L	M_{max} [Nm] ([lb.in])						8.2 (72.2)	10.4 (91.6)	14.0 (123)
CM90S	M_{max} [Nm] ([lb.in])							10.4 (91.6)	14.1 (124)
CM90M	M_{max} [Nm] ([lb.in])								14.0 (123)

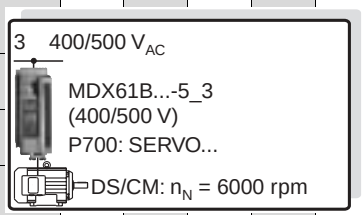


Motor		MOVIDRIVE® MDX61B...-5_3 (400/500 V units) in the SERVO operating modes (P700)									
		0055	0075	0110	0150	0220	0300	0370	0450	0550	0750
DS56H	M_{max} [Nm] ([lb.in])	15.2 (133)									
CM71S	M_{max} [Nm] ([lb.in])	16.1 (141)	16.7 (147)								
CM71M	M_{max} [Nm] ([lb.in])	17.1 (150)	20.3 (178)	21.8 (192)							
CM71L	M_{max} [Nm] ([lb.in])	18.1 (159)	22.5 (198)	30.3 (267)	31.7 (279)						
CM90S	M_{max} [Nm] ([lb.in])	18.4 (162)	23.4 (206)	33.6 (296)	39.8 (350)						
CM90M	M_{max} [Nm] ([lb.in])	18.4 (162)	23.5 (207)	34.6 (304)	44.5 (392)	52.1 (459)					
CM90L	M_{max} [Nm] ([lb.in])	18.2 (160)	23.3 (205)	34.7 (305)	45.8 (403)	63.4 (558)	75.0 (660)				
CM112S	M_{max} [Nm] ([lb.in])	19.5 (171)	25.0 (220)	37.4 (329)	49.2 (433)	67.5 (594)	81.9 (721)				
CM112M	M_{max} [Nm] ([lb.in])		24.6 (216)	37.1 (326)	49.4 (435)	69.6 (613)	87.4 (770)	101.5 (894)	108.0 (951)		
CM112L	M_{max} [Nm] ([lb.in])			35.0 (308)	46.8 (412)	67.2 (592)	86.9 (765)	104.1 (917)	123.5 (1088)	140.7 (1239)	156.8 (1381)



4) Rated speed n_N = 6000 rpm:

Motor		MOVIDRIVE® MDX61B...-5_3 (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] ([lb.in])	2.4 (21.1)	2.8 (24.6)	3.6 (31.7)	3.8 (33.4)	3.5 (30.8)	3.8 (33.4)										
DS56L	M_{max} [Nm] ([lb.in])	2.9 (25.5)	3.5 (30.8)	4.5 (39.6)	5.7 (50.2)	4.3 (37.8)	5.8 (51.1)	7.3 (64.3)	7.6 (66.9)								
DS56H	M_{max} [Nm] ([lb.in])			4.7 (41.4)	6.0 (52.8)	4.5 (39.6)	6.2 (54.6)	7.9 (69.6)	10.5 (92.5)	13.6 (119)	15.1 (133)						
CM71S	M_{max} [Nm] ([lb.in])				6.1 (53.7)	4.6 (40.5)	6.3 (55.5)	8.0 (70.5)	10.6 (93.4)	13.3 (117)	15.8 (139)	16.5 (145)					
CM71M	M_{max} [Nm] ([lb.in])						6.2 (54.6)	7.9 (69.6)	10.6 (93.4)	13.7 (120)	16.8 (148)	21.3 (187)					
CM71L	M_{max} [Nm] ([lb.in])							8.0 (70.5)	10.8 (95.1)	14.1 (124)	17.9 (157)	25.2 (222)	30.7 (270)	31.4 (276)			
CM90S	M_{max} [Nm] ([lb.in])								10.8 (95.1)	14.2 (125)	18.1 (159)	26.6 (234)	34.2 (301)	39.4 (347)			
CM90M	M_{max} [Nm] ([lb.in])									13.7 (120)	17.5 (154)	26.1 (230)	34.3 (302)	46.9 (413)	51.9 (457)		
CM90L	M_{max} [Nm] ([lb.in])										17.1 (150)	25.6 (225)	33.9 (298)	48.0 (423)	60.9 (536)	71.3 (628)	75.2 (662)



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	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 15, rue de Mambourg F-68240 Sigolsheim	Tel. +33 3 89 78 45 11 Fax +33 3 89 78 45 12
	Alsace Nord	SEW-USOCOME 35, rue Jeanne d'Arc F-67250 Surbourg	Tel. +33 3 88 54 74 44 Fax +33 3 88 80 47 62
	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 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
	Centre Auvergne	SEW-USOCOME 27, avenue du Colobier F-19150 Laguenne	Tel. +33 5 55 20 12 10 Fax +33 5 55 20 12 11
	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 4, Montée du Pavé F-26750 Génissieux	Tel. +33 4 75 05 65 95 Fax +33 4 75 05 65 96
	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

France			
	Normandie	SEW-USOCOME Les Courtillages Hameau de Coupigny F-14370 Airan	Tel. +33 2 31 78 99 70 Fax +33 2 31 78 99 72
	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 1, rue Matisse F-78960 Voisins le Bretonneux	Tel. +33 1 30 64 46 33 Fax +33 1 30 57 54 86
	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
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
	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

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

Austria			
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 sew@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 sew@graz.sew-eurodrive.at

Bangladesh			
	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**	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**	CARON-VECTOR S.A. Industrieweg 112-114 B-9032 Gent (Wondelgem)	Tel. +32 92 273-452 Fax +32 92 274-155

Bolivia			
	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 9532565 Fax +359 2 9549345 bever@mbox.infotel.bg

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
	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 sewsales@entelchile.net

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 http://www.sew.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

China			
Technical Offices	**Beijing**	SEW-EURODRIVE (Tianjin) Co., LTD Room 1205/1206, Golden Corner Building, No. 129 Xuanwumen Xidajie, Xicheng District Beijing 100031	Tel. +86 10 66412026 Fax +86 10 66411017 beijing@sew.com.cn
	Chengdu	SEW-Eurodrive (Tianjin) Co. Ltd. Room 715, Sichuan International Building No. 206, Shun Cheng Avenue Chengdu 610015	Tel. +86 28 6521560 Fax +86 28 6521563 chengdu@sew.com.cn
	Fuzhou	SEW-Eurodrive (Tianjin) Co. Ltd. Unit D, 15/F, Oriental Hotel Fujian Fuzhou 350001	Tel. +86 591 7507596 Fax +86 591 7507285 fuzhou@sew.com.cn
	Jinan	SEW-Eurodrive (Tianjin) Co.Ltd. Room 2008-2009, Liang You Fu Lin Hotel No. 5, Luo Yuan Avenue Jinan 250063	Tel. +86 531 6412622 Fax +86 531 6412430 jinan@sew.com.cn
	Kunming	SEW-EURODRIVE (Tianjin) Co., Ltd Room 1401 Dong Yuan Business Building No. 464 Tuodong Road, Kunming Yunnan Province 650011	Tel. +86 871 3113677 Fax +86 871 3154454 kunming@sew.com.cn
	Nanjing	SEW-Eurodrive (Tianjing) Co.Ltd. Room 710, Jianda Plaza No. 223, North Zhongshan Road Nanjing 210009	Tel. +86 25 3346768 Fax +86 25 3346871 nanjing@sew.com.cn
	Shanghai	SEW-EURODRIVE (TIANJIN) CO., Ltd 16/F, E Block, Jinxuan Building No. 238 South Dandong Road Xuhui District Shanghai 200030	Tel. +86 21 64693534 Fax +86 21 64695532 shanghai@sew.com.cn
	Shenyang	SEW-EURODRIVE (Tianjin) Co., Ltd Shenyang OfficeRoom 0605 Koh Brother Building No. 21 Beijing Street Shenhe District Shenyang City, 110013	Tel. +86 24 22521596 Fax +86 24 22521579 shenyang@sew.com.cn
	Wuhan	SEW-Eurodrive (Tianjin) Co.Ltd. Room 911, Tai He Plaza Wusheng Road Wuhan 430033	Tel. +86 27 85712293 Fax +86 27 85712282 wuhan@sew.com.cn
	Xian	SEW-EURODRIVE (TIANJIN) Co., Ltd Rm 611, Fan Mei Building No. 1 Nan Guan Main Street Xian 710068, Shanxi Province	Tel. +86 29 7811327 Fax +86 29 7811327 xian@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 sewcol@andinet.com

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 Luná 591 CZ-16000 Praha 6 - Vokovice	Tel. +420 220121234 + 220121236 Fax +420 220121237 http://www.sew-eurodrive.cz sew@sew-eurodrive.cz

Czech Republic			
Technical Offices	**Brno**	SEW-EURODRIVE CZ S.R.O. Zvonarka 16 CZ-61700 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
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			
	Cairo	Copam Egypt for Engineering & Agencies 33 El Hegaz ST, Heliopolis, Cairo	Tel. +20 2 2566-299 + 1 23143088 Fax +20 2 2594-757 copam@datum.com.eg

Estonia			
Sales	**Tallin**	ALAS-KUUL AS Paldiski mnt.125 EE 0006 Tallin	Tel. +372 6593230 Fax +372 6593231

Finland			
Assembly **Sales** **Service**	**Lahti**	SEW-EURODRIVE OY Vesimäentie 4 FIN-15860 Hollola 2	Tel. +358 3 589-300 Fax +358 3 7806-211 http://www.sew-eurodrive.fi sew@sew-eurodrive.fi
Technical Offices	**Helsinki**	SEW-EURODRIVE OY Luutnantinaukio 5C LT2 FIN-00410 Helsinki	Tel. +358 3 589-300 Fax + 358 9 5666-311
	Vaasa	SEW-EURODRIVE OY Kauppapuistikko 15 A 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

Great Britain			
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 Boznos@otenet.gr
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

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 sew-eurodrive.voros@matarnet.hu

Iceland			
	Hafnarfirdi	VARMAVERK ehf Dalshrauni 5 IS - 220 Hafnarfirdi	Tel. +354 5 6517-50 Fax +354 5 6519-51 varmaverk@varmaverk.is

India			
Assembly **Sales** **Service**	**Baroda**	SEW-EURODRIVE India Pvt. Ltd. Plot No. 4, Gidc Por Ramangamdi · Baroda - 391 243 Gujarat	Tel. +91 265 2831021 Fax +91 265 2831087 sew.baroda@gecsl.com

India			
Technical Offices	**Bangalore**	SEW-EURODRIVE India Private Limited 308, Prestige Centre Point 7, Edward Road Bangalore	Tel. +91 80 22266565 Fax +91 80 22266569 sewbangalore@sify.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 2nd Floor, Hariram Building 16, College Road Chennai - 600 006, Tamil Nadu	Tel. +91 44 28214471 Fax +91 44 28214473
	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 sewmumbai@vsnl.net
	New Delhi	SEW-EURODRIVE India Private Limited 303 Kirti Deep, 2-Nangal Raya Business Centre New Delhi 110 046	Tel. +91 11 25611566 Fax +91 11 25513494
	Pune	SEW-EURODRIVE India Private Limited 206, Metro House 7 Mangaldas Road Pune 411001, Maharashtra	Tel. +91 20 26111054 Fax +91 20 26132337 sewpun@pn2.vsnl.net.in

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			
	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 2 96 9801 Fax +39 2 96 799781 sewit@sew-eurodrive.it

Italy			
Technical Offices	**Bologna**	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Via Emilia,172 I-40064 Ozzano dell'Emilia (Bo)	Tel. +39 51 796-660 Fax +39 51 796-595
	Caserta	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Viale Carlo III-Parco Matilde A I-81020 S. Nicola la Strada (Caserta)	Tel. +39 823 450611 Fax +39 823 421414
	Firenze	RIMA Via Einstein, 14 I-50013 Campi Bisenzio (Firenze)	Tel. +39 55 898 58-21 Fax +39 55 898 58-30
	Roma	Elettromec Via Castel Rosso, 10 I-00144 Roma	Tel. +39 6 592 45-30 Fax +39 6 592 45-30
	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 11 3473780 Fax +39 11 3473783
	Verona	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Via P. Sgulmero, 27/A I-37132 Verona	Tel. +39 45 97-7722 Fax +39 45 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, Toyoda-cho, Iwata gun Shizuoka prefecture, 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 master@sew-korea.co.kr
	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

Korea			
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

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 Merkines g. 2A LT-4580 Alytus	Tel. +370 315 79204 Fax +370 315 79688 irmantas.irseva@one.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 kchtan@pd.jaring.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
	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			
	Queretaro	SEW-EURODRIVE, Sales and Distribution, S. A. de C. V. Privada Tequisquiapan No. 102 Parque Ind. Queretaro C. P. 76220 Queretaro, Mexico	Tel. +52 442 1030-300 Fax +52 442 1030-301 scmexico@seweurodrive.com.mx

Morocco			
Sales	**Casablanca**	S. R. M. Société de Réalisations Mécaniques 5, rue Emir Abdelkader 05 Casablanca	Tel. +212 2 6186-69 + 6186-70 + 6186-71 Fax +212 2 6215-88 srm@marocnet.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 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 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

Paraguay			
	Asunción	EQUIS S. R. L. Avda. Madame Lynchy y Sucre Asunción	Tel. +595 21 6721-48 Fax +595 21 6721-50 equisa@uninet.com.py

Peru			
Assembly **Sales** **Service**	**Lima**	SEW DEL PERU MOTORES REDUCTORES S.A.C. Los Calderos <FmSdata>[Idot] 120-124 Urbanizacion Industrial Vulcano, ATE, Lima	Tel. +51 1 3495280 Fax +51 1 3493002 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			
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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 Edificio 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, 1196-9° Sala 909 - Edificio Acia P- 4450 Matosinhos	Tel. +351 22 935038-3 Fax +351 22 935038-4 MobilTel. +351 9 332559110 esc.porto@sew-eurodrive.pt

Romania			
Sales **Service**	**Bucuresti**	Sialco Trading SRL str. Madrid nr.4 71222 Bucuresti	Tel. +40 21 230-1328 Fax +40 21 230-7170 sialco@sialco.ro

Russia			
Sales	**St. Petersburg**	ZAO SEW-EURODRIVE P.O. Box 263 RUS-195220 St. Petersburg	Tel. +7 812 5357142 +812 5350430 Fax +7 812 5352287 sew@sew-eurodrive.ru
Technical Office	**Moskau**	ZAO SEW-EURODRIVE RUS-119180 Moskau	Tel. +7 95 9337090 Fax +7 95 9337094

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. Kajmakcalanska 54 SCG-11000 Beograd	Tel. +381 11 3046677 Fax +381 11 3809380 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 ... 1705 Fax +65 68612827 Telex 38 659 sales@sew-eurodrive.com.sg

Slovakia			
Sales	**Sered**	SEW-Eurodrive SK s.r.o. Trnavska 920 SK-926 01 Sered	Tel. +421 31 7891311 Fax +421 31 7891312 sew@sew-eurodrive.sk

Slovenia			
Sales **Service**	**Celje**	Pakman - Pogonska Tehnika d.o.o. UI. 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 11 494-2311 ljansen@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
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	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 sew.spain@sew-eurodrive.es
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Sri Lanka			
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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

Sweden			
Technical Offices	**Göteborg**	SEW-EURODRIVE AB Gustaf Werners gata 8 S-42131 Västra Frölunda	Tel. +46 31 70968-80 Fax +46 31 70968-93
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Switzerland			
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	Bern	Rudolf Bühler Allerheiligenstraße 97d 2540 Grenchen	Tel. +41 3 265223-39 Fax +41 3 265223-31
	Luzern	Beat Lütolf Baumacher 11 6244 Nebikon	Tel. +41 6 275647-80 Fax +41 6 275647-86
	Zürich	René Rothenbühler Nörgelbach 7 8493 Saland	Tel. +41 5 238631-50 Fax +41 5 238632-13

Taiwan (R.O.C.)			
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	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 nestnet@ms6.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.co.th
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	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.co.th

Tunisia			
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Turkey			
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Technical Offices	**Ankara**	SEW-EURODRIVE Hareket Sistemleri Ticaret Ltd. Sirketi Özcelik Is Merkezi, 14. Sok, No. 4/42 TR-06370 Ostim/Ankara	Tel. +90 312 2868014 Fax +90 312 2868015
	Izmir	SEW-EURODRIVE Hareket Sistemleri Ticaret Ltd. Sirketi 1203/11 Sok. No. 4/613 Hasan Atli Is Merkezi TR-35110 Yenisehir-Izmir	Tel. +90 232 4696264 Fax +90 232 4336105

Uruguay			
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USA			
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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 +1 856 467-3792 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 sewventas@cantv.net sewfinanzas@cantv.net

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