SEW EURODRIVE

MOVIDRIVE® *compact*

Edition

08/2002

Catalog

1053 8313 / EN

SEW
EURODRIVE

SEW-EURODRIVE

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1 System Description

1.1 Overview of the system

Power components

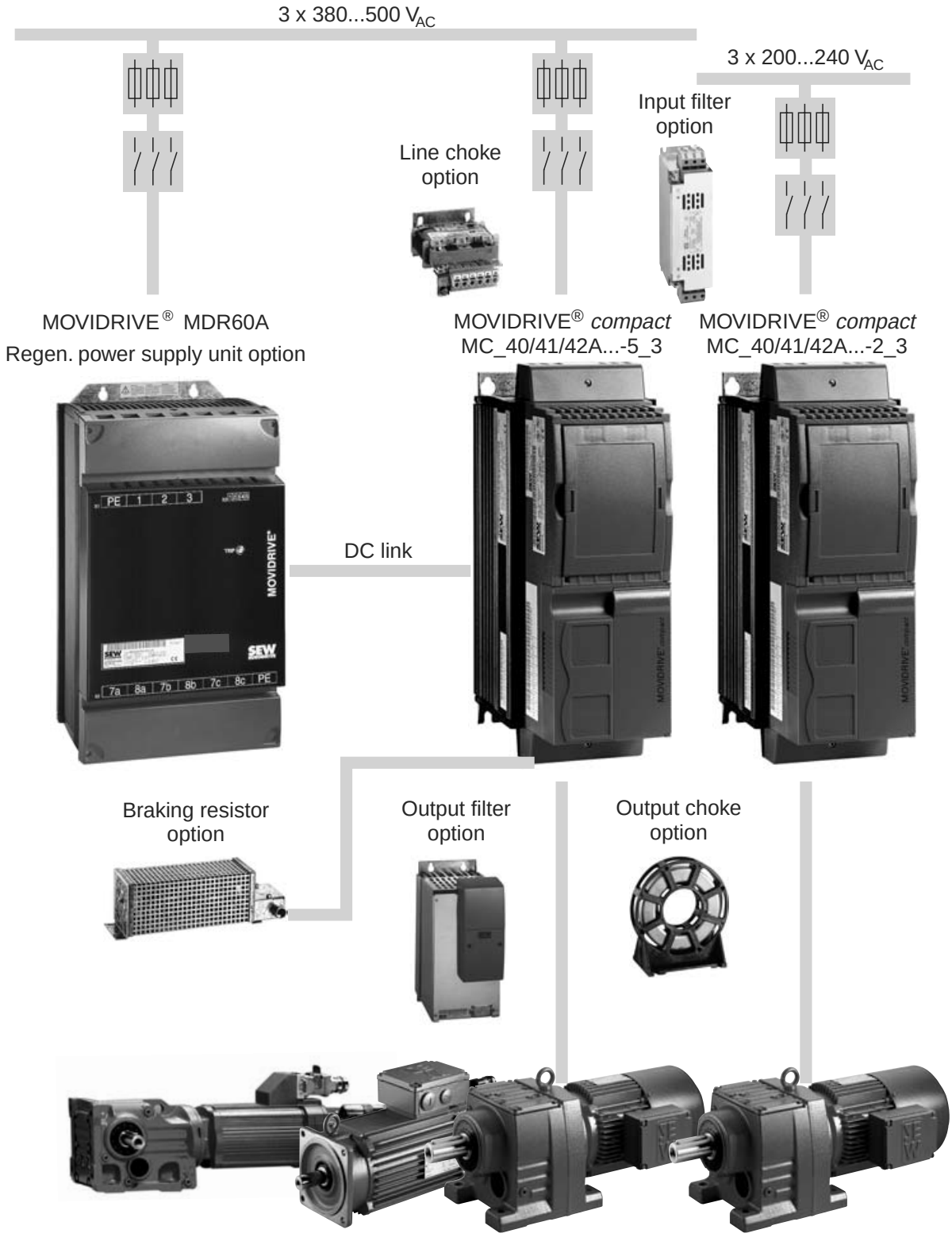

Figure 1: Overview of the system, MOVIDRIVE® compact MC_4_A power components

Communications components

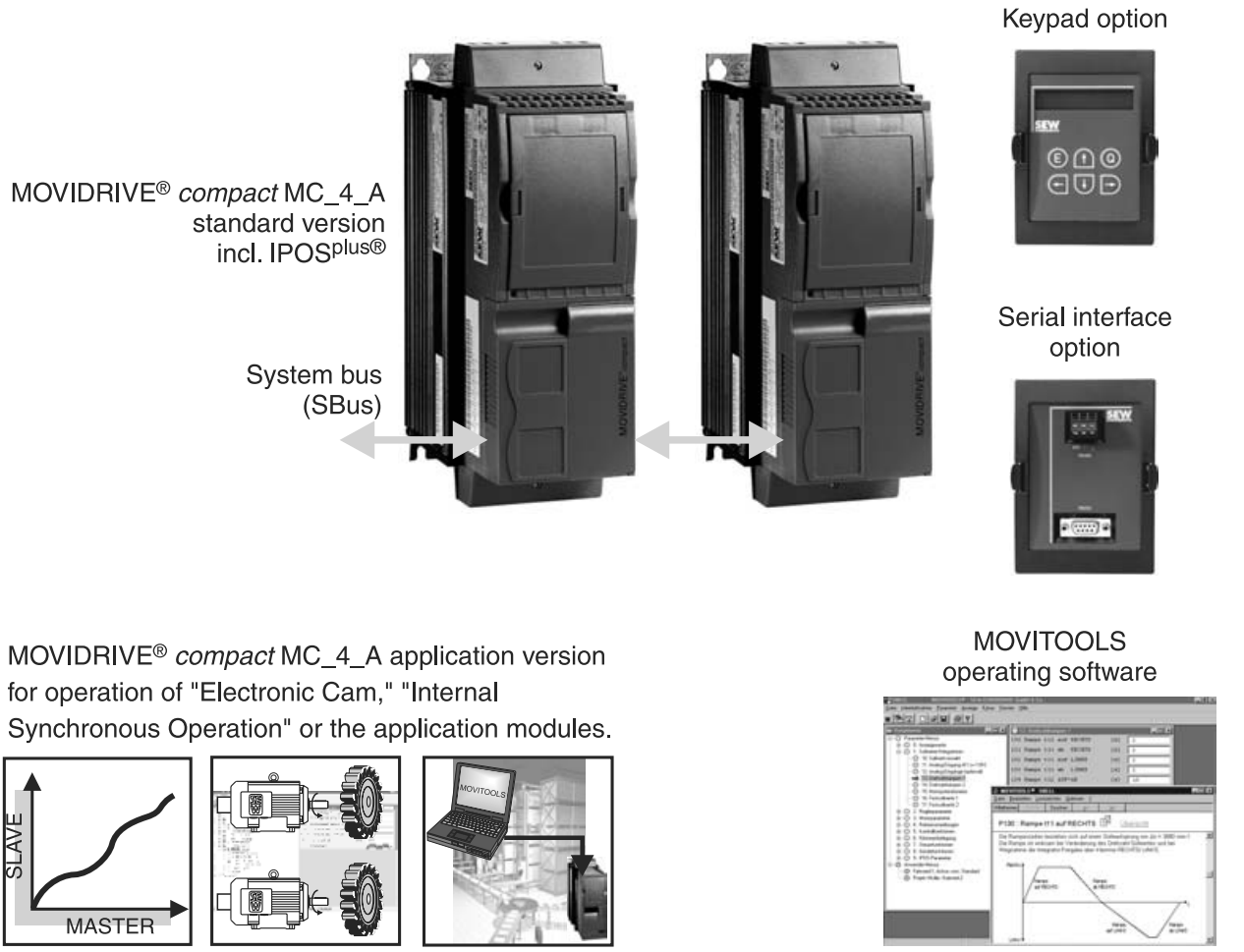

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Figure 2: Overview of the system, MOVIDRIVE® compact MC_4_A communications components

General description

MOVIDRIVE® ***compact*** is the term for compact and high-performance drive inverters from SEW. MOVIDRIVE® *compact* units are precisely tailored to your requirements. You can use them for AC drives in the power range from 1.5 to 90 kW (2.0 to 120 HP). They satisfy the most exacting requirements for dynamic properties and control quality thanks to the most modern inverter technology combined with tried-and-tested SEW control processes.

Range of units

The **MOVIDRIVE® *compact*** range of units includes four series:

- MOVIDRIVE® *compact* MCF: Drive inverter for asynchronous AC motors without encoder feedback, VFC control mode
- MOVIDRIVE® *compact* MCV: Drive inverter for asynchronous AC motors with encoder feedback, either VFC or CFC control mode.
- MOVIDRIVE® *compact* MCS: Drive inverter for synchronous servo motors with resolver, CFC control mode.
- MOVIDRIVE® *compact* MCH: Drive inverter for asynchronous AC motors, asynchronous servo motors or synchronous servo motors. Encoder feedback with Hiperface encoder, sin/cos encoder or TTL sensor.

Unit variants

The MCF, MCV and MCS series are available in two variants:

- **MCF/MCV/MCS40A:** Control via binary inputs and setpoint selection via analog setpoint input.
- **MCF/MCV/MCS41A:** Control either via PROFIBUS interface or binary inputs. Setpoint selection via PROFIBUS-DP interface.

The MCH series is available in three variants:

- **MCH40A:** Control via binary inputs and setpoint selection via analog setpoint input.
- **MCH41A:** Control either via PROFIBUS interface or binary inputs. Setpoint selection via PROFIBUS-DP interface.
- **MCH42A:** Control either via INTERBUS FO interface or binary inputs. Setpoint selection via INTERBUS FO interface.

Unit versions

MOVIDRIVE® *compact* drive inverters are each available in two versions, namely the standard version and the technology 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.

Technology version

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

The technology version is indicated by the '0T' characters at the end of the unit designation.

Overview of the series and versions

The following table presents an overview of the series and versions:

	Without encoder input	With encoder input for sin/cos and incremental encoders	With resolver input	With encoder input for Hiperface, sin/cos and incremental encoders
Without fieldbus	MCF40A	MCV40A	MCS40A	MCH40A
With PROFIBUS-DP	MCF41A	MCV41A	MCS41A	MCH41A
With INTERBUS FO	-	-	-	MCH42A

Control mode

VFC (Voltage Flux Control) and CFC (Current Flux Control) control modes are features of MOVIDRIVE® *compact* 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 AC asynchronous 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 AC asynchronous motors and permanent-field AC 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. MOVILINK® is the uniform SEW unit profile used for communication via the SBus.

MOVILINK®

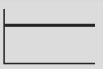
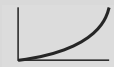
MOVILINK® means the same message structure is always used, regardless of the interface selected (SBus, RS-232, RS-485, fieldbus interfaces). As a result, the control software is independent of the selected interface.

IPOS^{plus}®

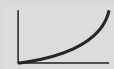
A significant feature of MOVIDRIVE® drive inverters is that the IPOS^{plus}® positioning and sequence control system is integrated as standard. IPOS^{plus}® enables you to control sequences of motion directly in the inverter, right on the plant floor. This concept takes the load off the master controller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

The units at a glance

MOVIDRIVE® compact for 3 × 380 500 V_{AC} supply voltage (400/500 V units):

Recommended motor power (VFC) (at V_{in} = 3 × 400 V_{AC})		Continuous output current	MOVIDRIVE® *compact* type				Size
		(CFC)	MCF4_A Asynchronous without encoder	MCV4_A Asynchronous with encoder	MCS4_A Synchronous with resolver	MCH42A Asynchronous/ synchronous with encoder	(Techn. data)
1.5 kW (2.0 HP)	2.2 kW (3.0 HP)	4.0 A_{AC}	0015-5A3-4-..	0015-5A3-4-..	0015-5A3-4-..	0015-5A3-4-..	1 (→ page 22)
2.2 kW (3.0 HP)	3.0 kW (4.0 HP)	5.5 A_{AC}	0022-5A3-4-..	0022-5A3-4-..	0022-5A3-4-..	0022-5A3-4-..	
3.0 kW (4.0 HP)	4.0 kW (5.0 HP)	7.0 A_{AC}	0030-5A3-4-..	0030-5A3-4-..	0030-5A3-4-..	0030-5A3-4-..	
4.0 kW (5.0 HP)	5.5 kW (7.5 HP)	9.5 A_{AC}	0040-5A3-4-..	0040-5A3-4-..	0040-5A3-4-..	0040-5A3-4-..	
5.5 kW (7.5 HP)	7.5 kW (10 HP)	12.5 A_{AC}	0055-5A3-4-..	0055-5A3-4-..	0055-5A3-4-..	0055-5A3-4-..	2 (→ page 24)
7.5 kW (10 HP)	11 kW (15 HP)	16 A_{AC}	0075-5A3-4-..	0075-5A3-4-..	0075-5A3-4-..	0075-5A3-4-..	
11 kW (15 HP)	15 kW (20 HP)	24 A_{AC}	0110-5A3-4-..	0110-5A3-4-..	0110-5A3-4-..	0110-5A3-4-..	
15 kW (20 HP)	22 kW (30 HP)	32 A_{AC}	0150-503-4-..	0150-503-4-..	0150-503-4-..	0150-503-4-..	3 (→ page 26)
22 kW (30 HP)	30 kW (40 HP)	46 A_{AC}	0220-503-4-..	0220-503-4-..	0220-503-4-..	0220-503-4-..	
30 kW (40 HP)	37 kW (50 HP)	60 A_{AC}	0300-503-4-..	0300-503-4-..	0300-503-4-..	0300-503-4-..	
37 kW (50 HP)	45 kW (60 HP)	73 A_{AC}	0370-503-4-..	0370-503-4-..	0370-503-4-..	0370-503-4-..	4 (→ page 28)
45 kW (60 HP)	55 kW (75 HP)	89 A_{AC}	0450-503-4-..	0450-503-4-..	0450-503-4-..	0450-503-4-..	
55 kW (75 HP)	75 kW (100 HP)	105 A_{AC}	0550-503-4-..	0550-503-4-..	0550-503-4-..	0550-503-4-..	5 (→ page 30)
75 kW (100 HP)	90 kW (120 HP)	130 A_{AC}	0750-503-4-..	0750-503-4-..	0750-503-4-..	0750-503-4-..	

MOVIDRIVE® compact for 3 × 200 240 V_{AC} supply voltage (230 V units):

Recommended motor power (VFC) (at V_{in} = 3 × 230 V_{AC})		Continuous output current	MOVIDRIVE® *compact* type				Size
		(CFC)	MCF4_A Asynchronous without encoder	MCV4_A Asynchronous with encoder	MCS4_A Synchronous with resolver	MCH42A Asynchronous/ synchronous with encoder	(Technical data)
1.5 kW (2.0 HP)	2.2 kW (3.0 HP)	7.3 A_{AC}	0015-2A3-4-..	0015-2A3-4-..	0015-2A3-4-..	0015-2A3-4-..	1 (→ page 32)
2.2 kW (3.0 HP)	3.7 kW (5.0 HP)	8.6 A_{AC}	0022-2A3-4-..	0022-2A3-4-..	0022-2A3-4-..	0022-2A3-4-..	
3.7 kW (5.0 HP)	5.0 kW (6.8 HP)	14.5 A_{AC}	0037-2A3-4-..	0037-2A3-4-..	0037-2A3-4-..	0037-2A3-4-..	
5.5 kW (7.5 HP)	7.5 kW (10 HP)	22 A_{AC}	0055-2A3-4-..	0055-2A3-4-..	0055-2A3-4-..	0055-2A3-4-..	2 (→ page 34)
7.5 kW (10 HP)	11 kW (15 HP)	29 A_{AC}	0075-2A3-4-..	0075-2A3-4-..	0075-2A3-4-..	0075-2A3-4-..	
11 kW (15 HP)	15 kW (20 HP)	42 A_{AC}	0110-203-4-..	0110-203-4-..	0110-203-4-..	0110-203-4-..	3 (→ page 36)
15 kW (20 HP)	22 kW (30 HP)	54 A_{AC}	0150-203-4-..	0150-203-4-..	0150-203-4-..	0150-203-4-..	
22 kW (30 HP)	30 kW (40 HP)	80 A_{AC}	0220-203-4-..	0220-203-4-..	0220-203-4-..	0220-203-4-..	4 (→ page 38)
30 kW (40 HP)	37 kW (50 HP)	95 A_{AC}	0300-203-4-..	0300-203-4-..	0300-203-4-..	0300-203-4-..	

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

Regenerative power supply units[1)]		MOVIDRIVE® MDR60A	Size
1.5 ... 37 kW (20 ... 50 HP)	I_{in} = 66 A_{AC}, I_{DCL} = 70 A_{DC}	0370-503-00	3
15 ... 75 kW (20 ... 100 HP)	I_{in} = 117 A_{AC}, I_{DCL} = 141 A_{DC}	0750-503-00	4

1) Technical data → 'MDR60A Regenerative Power Supply Unit' manual

Block wiring diagram

The following block wiring diagram shows the configuration principles and theory of operation of MOVIDRIVE® *compact* drive inverters taking the example of the MOVIDRIVE® *compact* MCV41A.

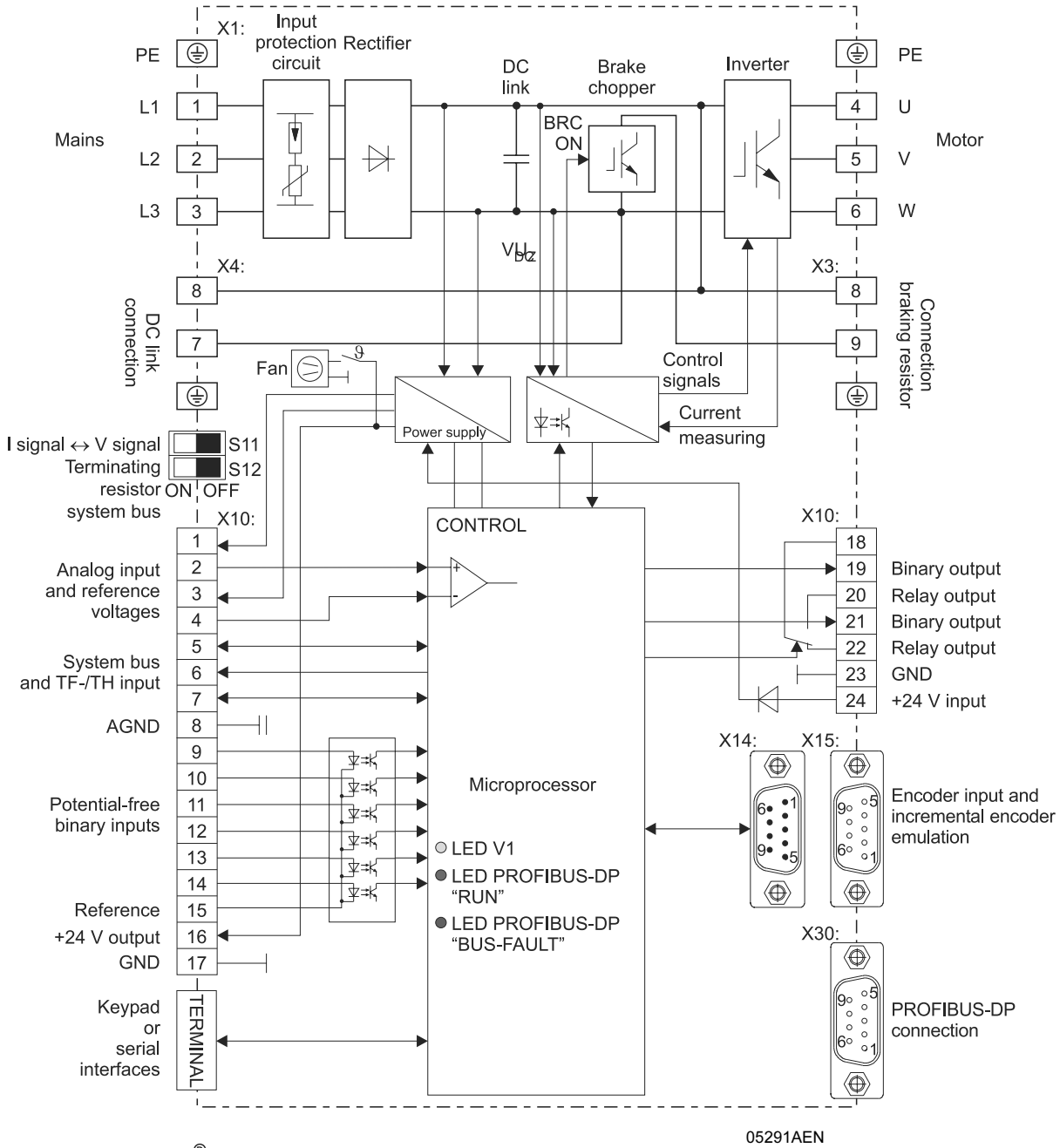


Figure 3: MOVIDRIVE® compact MCV41A block circuit diagram

1.2 Functions / features

Unit properties

- Wide voltage range
  - 400/500 V units for the voltage range 3 × 380 ... 500 V_{AC}
  - 230 V units for the voltage range 3 × 200 ... 240 V_{AC}
- High overload capacity
  - 150 % I_N short-term operation
  - 125 % I_N sustained for operation without overload (pumps, fans)
- In VFC mode and at I_N = 100 % permitted ambient temperature up to ϑ = 50° C
- 4Q capability thanks to integrated brake chopper fitted as standard
- Compact unit mounting position for minimum switch cabinet space requirement and optimum utilization of switch cabinet volume
- Integrated input filter fitted as standard in sizes 1 and 2, adherence to class A limit on the input side without any additional measures
- Six isolated binary inputs and three binary outputs, one of which is a relay output, programmable inputs/outputs
- One TF/TH input for the motor protection involving a PTC thermistor or thermocontact
- 3-color LED to display operating and fault states.
- Separate 24 V_{DC} voltage input for powering the inverter electronics (parameter setting, diagnostics and data storage even with the supply system switched off)
- Removable connection unit and, in addition with MOVIDRIVE® *compact* MCH4_A, separable electronics terminals
- Power terminals of size 1 units can be disconnected

Control functions

- VFC or CFC control processes for field-oriented operation (asynchronous servo)
- With MCH4_A: Either asynchronous or synchronous AC motors can be operated.
- 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 flying restart of the inverter
- Hoist capability with all motor systems which can be connected
- Motor pull-out protection 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 in types MCV (optionally sin/cos encoder, TTL sensor or HTL sensor), MCS (resolver) and MCH (optionally Hiperface encoder, sin/cos encoder or TTL sensor), 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 pull-out protection, excess temperature in the motor)
- Temperature-controlled power unit fan, i.e. no disruptive fan noise in most cases.
- 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 24 V_{DC}) and enable hours (output stage energized)
- 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 or fieldbus
- S-pattern for jerk-free speed changes
- Programmable input characteristics for flexible setpoint processing
- Six bipolar fixed setpoints which can be mixed with external setpoints and motor potentiometer function

Communication / operation

- System bus for networking up to 64 MOVIDRIVE® units to one another
- PROFIBUS-DP interface (max. 12 Mbaud) in MC_41A and INTERBUS FO interface in MCH42A
- Straightforward startup and parameter setting using keypad or PC

System expansion

- Extensive range of expansion options, for example:
  - Removable plain text keypad with parameter memory
  - RS-232 and RS-485 serial interfaces
  - Braking resistors, input filters, line chokes, output chokes, output filters
- MOVITOOLS software package with SCOPE process data visualization
- Technology version with access to technology functions and application modules for user-friendly application solutions
- MOVIDRIVE® MDR60A regenerative power supply unit
  - Regenerative energy is fed back into the supply system
  - This reduces the thermal load in the switch cabinet and helps to cut costs

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

1.3 Additional functions of the application version

SEW offers additional functions for special applications. You can use these additional functions with MOVIDRIVE® units in technology 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 form part of the 'Technology Version' documentation package available from SEW.

Electronic cam

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

A user-friendly cam editor 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 displays a typical application for the 'electronic cam'. Freshly filled yogurt jars are transported for further processing. The 'electronic cam' makes it possible for movement to take place smoothly, which is an important requirement for this application.

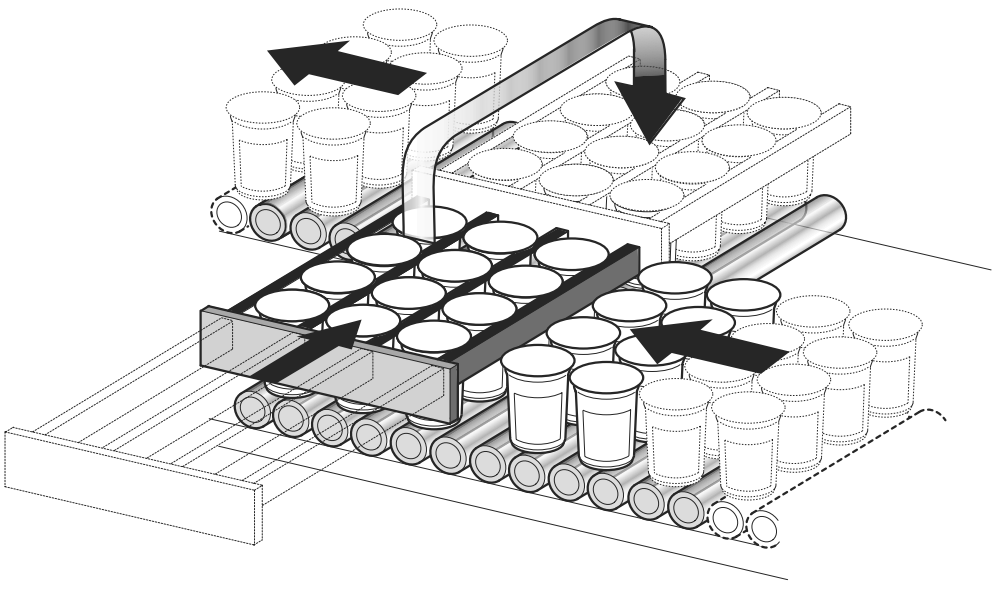


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Figure 4: Typical application for the 'electronic cam'

Internal synchronous operation

You can always use the MOVIDRIVE® range of units with 'internal synchronous operation' whenever a group of motors have 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 displays 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.

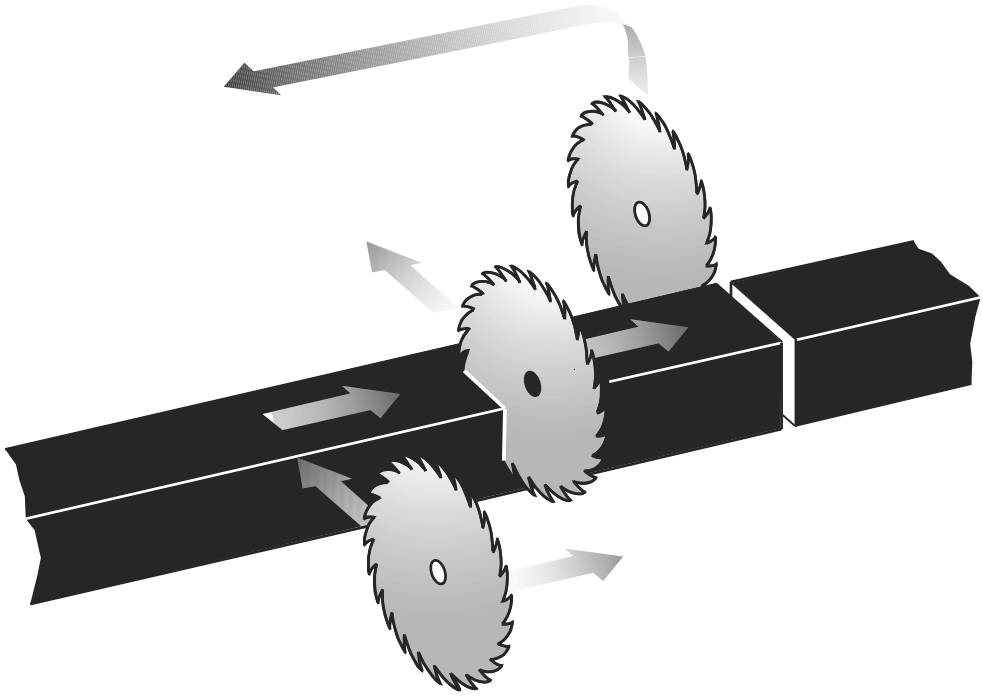

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Figure 5: Typical application for the 'internal synchronous operation'

1.4 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 undertake typical PLC tasks. More and more complex drive applications have to be carried out without this 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 form part of the MOVITOOLS software package and can be used with units in technology version.

A user-friendly user interface leads 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 turns this information into the control program and loads it into the inverter. MOVIDRIVE® then undertakes all the movement control functions. 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 learning curve, 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 application modules currently available for MOVIDRIVE® *compact* are listed below. These application modules are explained in the 'Technical Data and Dimensions' chapter.

Positioning

Linear movement, the movement records are administered in the inverter:

- Table positioning with bus control

Linear movement, the movement records are administered in the PLC:

- Positioning via bus
- Extended positioning via bus

Rotational movement:

- Rotary axis

Winding

- Constant tension center winder
- Winder with jockey roll control

Controlling

- Flying saw

Application

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

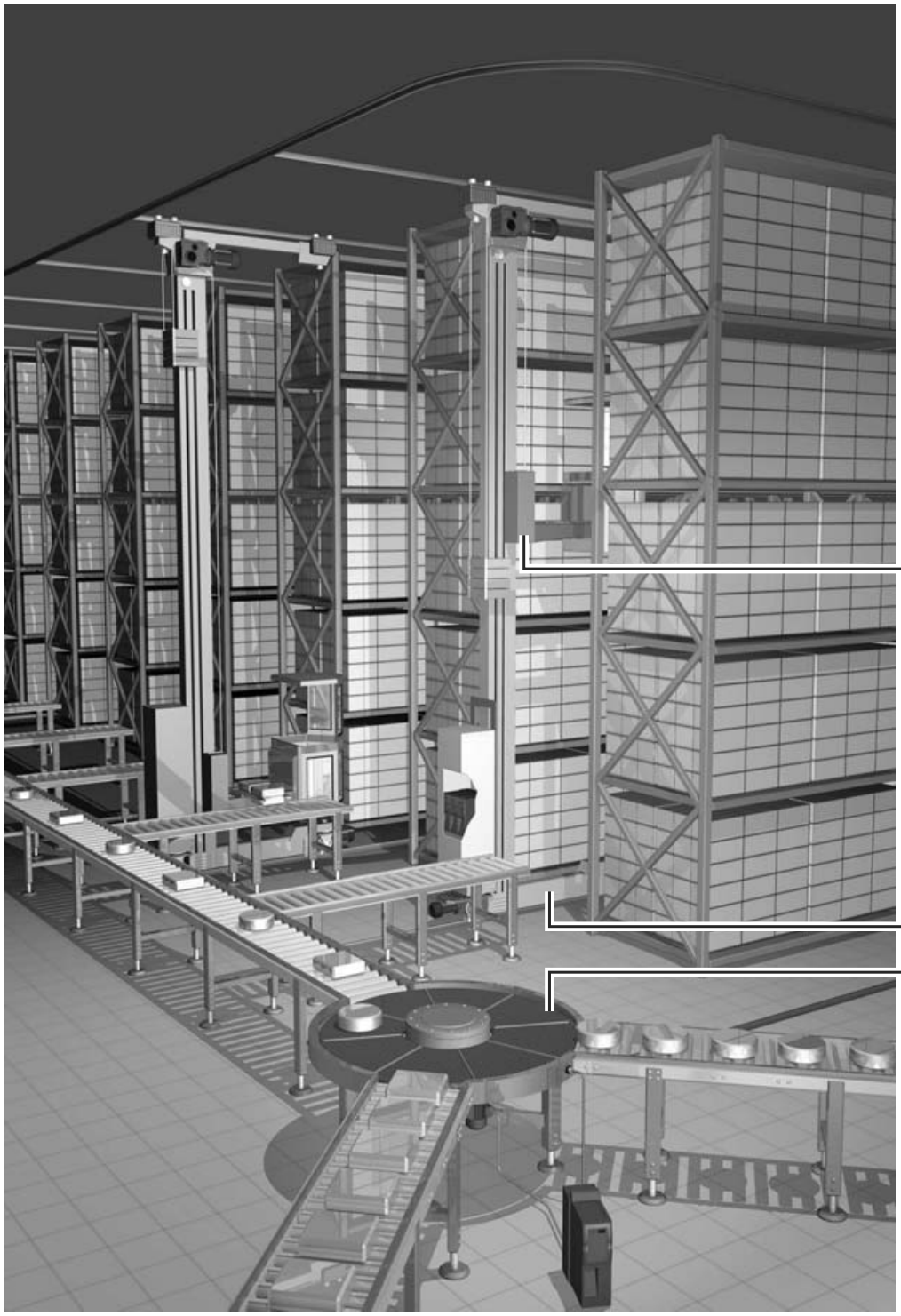

Figure 6: Application in a block warehouse

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

2 Technical Data and Dimensions

2.1 CE-marking, UL approval and unit designation

CE-marking

- Low Voltage Directive

  MOVIDRIVE® *compact* drive inverters comply with the regulations of the Low Voltage Directive 73/23/EEC.

- Electromagnetic compatibility (EMC)

  MOVIDRIVE® *compact* drive inverters are designed as components for installation in machinery and plant. 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 fitted, on the basis of the EMC Directive 89/336/EEC.

  MOVIDRIVE® *compact* drive inverters of size 1 and 2 are fitted with an input filter as standard. These units comply with limit value class A to EN 55011 and EN 55014 on the line side without further measures.

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® *compact* range of units. C-Tick certifies conformity with the requirements of the ACA (Australian Communications Authority).

Unit designation

The following example illustrates the unit designation of MOVIDRIVE® *compact*:

MOVIDRIVE® *compact* MCV 41 A 0055-5A3-4-00

Version	00 = Standard / 0T = Technology
Quadrants	4 = 4Q (with brake chopper)
Type of supply	3 = 3-phase
Input filter	A = installed / 0 = not installed
Rated supply voltage	5 = 380...500 V_{AC} / 2 = 200...240 V_{AC}
Recommended motor power	0055 = 5.5 kW
Version A	
Type series and generation	
Type: MCF	= flux control mode without encoder for asynchronous motors VFC operating modes (VFC = Voltage Flux Control) only
MCV	= flux control mode without and with encoder for asynchronous motors VFC and CFC operating modes (CFC = Current Flux Control)
MCS	= flux control mode with resolver for synchronous motors SERVO operating modes
MCH	= flux control mode with encoder (Hiperface, sin/cos or TTL) for asynchronous or synchronous motors

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2.2 General technical data

The following table lists the technical data applicable to all MOVIDRIVE® *compact* drive inverters, irrespective of their type, version, size and performance.

MOVIDRIVE® *compact*	All sizes
Interference immunity	To EN 61800-3
Interference emission with EMC-compliant installation	According to class B limit to EN 55011 and EN 55014 To EN 61800-3 Sizes 1 and 2 on line side according to class A limit to EN 55011 and EN 55014 without further 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 0 °C...+40 °C at I_D = 125 % I_N and f_{PWM} = 4 kHz 0 °C...+40 °C at I_D = 100 % I_N and f_{PWM} = 8 kHz P_N reduction: 3.0 % I_N per K to max. 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
Type of cooling (DIN 51751)	Forced cooling Temperature-controlled fan, response threshold at ϑ = 45 °C
Enclosure **Sizes 1 to 3** **EN 60529** **Size 4 and 5** **(NEMA1)**	IP20 IP00 (power connections); IP10 with Plexiglas cover mounted (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) Connect to supply voltage for min. 5 minutes every 2 years if stored for long periods, otherwise the unit service life may be reduced.

MOVIDRIVE® compact unit series

02531AXX

Figure 7: MOVIDRIVE® compact unit series

2.3 MOVIDRIVE® compact MC_4_A...-5_3 (400/500 V units)

Size 1

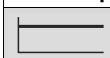
02570AXX

Figure 8: Size 1

MOVIDRIVE® *compact*		0015-5A3-4-0_	0022-5A3-4-0_	0030-5A3-4-0_	0040-5A3-4-0_
INPUT					
Supply voltage	V_{mains}	3×380 V_{AC} -10 %...3×500 V_{AC} +10 %			
Supply frequency	f_{mains}	50 Hz...60 Hz ±5 %			
Rated system current[1] I_{mains} (at V_{mains} = 3 × 400 V_{AC})	**100 %** **125 %**	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_{AC}
OUTPUT					
Rated output power[2] (at V_{mains} = 3 × 400...500 V_{AC})	P_N	2.8 kVA	3.8 kVA	4.9 kVA	6.6 kVA
Rated output current[1] (at V_{mains} = 3 × 400 V_{AC})	I_N	4.0 A_{AC}	5.5 A_{AC}	7.0 A_{AC}	9.5 A_{AC}
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_{BWmin}	68 Ω			
Output voltage	V_{out}	max. V_{in}			
PWM frequency	f_{PWM}	Adjustable: 4/8/16 kHz (P860 / P861)			
Speed range / resolution	n_A / Δn_A	-5000...0...+5000 rpm / 0.2 rpm 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		2.8 kg (6.16 lb)			
Dimensions	**W × H × D**	MCF/MCV/MCS: 105 × 315 × 155 mm (4.13 × 12.40 × 6.10 in) MCH: 105 × 315 × 161 mm (4.13 × 12.40 × 6.34 in)			

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

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

MCF4_A standard type (VFC)	0015-5A3-4-00	0022-5A3-4-00	0030-5A3-4-00	0040-5A3-4-00
MCF40A part numbers (without fieldbus)	826 738 3	826 739 1	826 740 5	826 741 3
MCF41A part numbers (with PROFIBUS-DP)	826 835 5	826 836 3	826 837 1	826 838 X
MCF4_A application type (VFC)	**0015-5A3-4-0T**	**0022-5A3-4-0T**	**0030-5A3-4-0T**	**0040-5A3-4-0T**
MCF40A part numbers (without fieldbus)	827 426 6	827 427 4	827 428 2	827 429 0
MCF41A part numbers (with PROFIBUS-DP)	827 449 5	827 450 9	827 451 7	827 452 5
 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)
Continuous output current = 125 % I_N I_D (at V_{mains} = 3 × 400 V_{AC} and f_{PWM} = 4 kHz)	5.0 A_{AC}	6.9 A_{AC}	8.8 A_{AC}	11.9 A_{AC}

MCV4_A standard type (VFC/CFC)	0015-5A3-4-00	0022-5A3-4-00	0030-5A3-4-00	0040-5A3-4-00
MCV40A part numbers (without fieldbus)	826 908 4	826 909 2	826 910 6	826 911 4
MCV41A part numbers (with PROFIBUS-DP)	826 928 9	826 929 7	826 930 0	826 931 9
MCV4_A application type (VFC/CFC)	**0015-5A3-4-0T**	**0022-5A3-4-0T**	**0030-5A3-4-0T**	**0040-5A3-4-0T**
MCV40A part numbers (without fieldbus)	827 472 X	827 473 8	827 474 6	827 475 4
MCV41A part numbers (with PROFIBUS-DP)	827 495 9	827 496 7	827 497 5	827 498 3
VFC operating mode	Recommended motor power → MCF4_A			
CFC operating mode (f_{PWM} = 8 kHz) Continuous output current = 100 % I_N I_D	4.0 A_{AC}	5.5 A_{AC}	7.0 A_{AC}	9.5 A_{AC}
Recommended motor power	→ Sec. Project Planning, CFC motor selection			

MCS4_A standard type (SERVO)	0015-5A3-4-00	0022-5A3-4-00	0030-5A3-4-00	0040-5A3-4-00
MCS40A part numbers (without fieldbus)	827 060 0	827 061 9	827 062 7	827 063 5
MCS41A part numbers (with PROFIBUS-DP)	827 077 5	827 078 3	827 079 1	827 080 5
MCS4_A application type (SERVO)	**0015-5A3-4-0T**	**0022-5A3-4-0T**	**0030-5A3-4-0T**	**0040-5A3-4-0T**
MCS40A part numbers (without fieldbus)	827 518 1	827 519 X	827 520 3	827 521 1
MCS41A part numbers (with PROFIBUS-DP)	827 541 6	827 542 4	827 543 2	827 544 0
SERVO operating mode (f_{PWM} = 8 kHz) Continuous output current = 100 % I_N I_D	4.0 A_{AC}	5.5 A_{AC}	7.0 A_{AC}	9.5 A_{AC}
Recommended motor power	→ Sec. Project Planning, SERVO motor selection			

MCH4_A standard type (VFC/CFC/SERVO)	0015-5A3-4-00	0022-5A3-4-00	0030-5A3-4-00	0040-5A3-4-00
MCH40A part numbers (without fieldbus)	827 603 X	827 604 8	827 605 6	827 606 4
MCH41A part numbers (with PROFIBUS-DP)	827 649 8	827 650 1	827 651 X	827 652 8
MCH42A part numbers (with INTERBUS FO)	827 565 3	827 566 1	827 567 X	827 568 8
MCH4_A application type (VFC/CFC/SERVO)	**0015-5A3-4-0T**	**0022-5A3-4-0T**	**0030-5A3-4-0T**	**0040-5A3-4-0T**
MCH40A part numbers (without fieldbus)	827 626 9	827 627 7	827 628 5	827 629 3
MCH41A part numbers (with PROFIBUS-DP)	827 672 2	827 673 0	827 674 9	827 675 7
MCH42A part numbers (with INTERBUS FO)	827 158 5	827 159 3	827 160 7	827 161 5
VFC operating mode	Recommended motor power → MCF4_A			
CFC/SERVO operating mode (f_{PWM} = 8 kHz) Continuous output current = 100 % I_N I_D	4.0 A_{AC}	5.5 A_{AC}	7.0 A_{AC}	9.5 A_{AC}
Recommended motor power	→ Sec. Project Planning, CFC/SERVO motor selection			

Size 2

02571AXX

Figure 9: Size 2

MOVIDRIVE® *compact*		0055-5A3-4-0_	0075-5A3-4-0_	0110-5A3-4-0_
INPUT				
Supply voltage	V_{mains}	3 × 380 V_{AC} -10 %...3 × 500 V_{AC} +10 %		
Supply frequency	f_{mains}	50 Hz...60 Hz ±5 %		
Rated system current[1] I_{mains} (at V_{mains} = 3 × 400 V_{AC})	**100 %** **125 %**	11.3 A_{AC} 14.1 A_{AC}	14.4 A_{AC} 18.0 A_{AC}	21.6 A_{AC} 27.0 A_{AC}
OUTPUT				
Rated output power[2] (at V_{mains} = 3 × 400...500 V_{AC})	P_N	8.7 kVA	11.2 kVA	16.8 kVA
Rated output current[1] (at V_{mains} = 3 × 400 V_{AC})	I_N	12.5 A_{AC}	16 A_{AC}	24 A_{AC}
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_{BWmin}	47 Ω		22 Ω
Output voltage	V_{out}	max. V_{in}		
PWM frequency	f_{PWM}	Adjustable: 4/8/16 kHz (P860 / P861)		
Speed range / resolution	n_A / Δn_A	-5000...0...+5000 rpm / 0.2 rpm 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		5.9 kg (12.98 lb)		
Dimensions	**W × H × D**	MCF/MCV/MCS: 130 × 335 × 207 mm (5.12 × 13.19 × 8.15 in) MCH: 130 × 335 × 213 mm (5.12 × 13.19 × 8.39 in)		

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

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

MCF4_A standard type (VFC)	0055-5A3-4-00	0075-5A3-4-00	0110-5A3-4-00
MCF40A part numbers (without fieldbus)	826 742 1	826 743 X	826 744 8
MCF41A part numbers (with PROFIBUS-DP)	826 839 8	826 840 1	826 841 X
MCF4_A application type (VFC)	**0055-5A3-4-0T**	**0075-5A3-4-0T**	**0110-5A3-4-0T**
MCF40A part numbers (without fieldbus)	827 430 4	827 431 2	827 432 0
MCF41A part numbers (with PROFIBUS-DP)	827 453 3	827 454 1	827 455 X
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)
Continuous output current = 125 % I_N I_D (at V_{mains} = 3 × 400 V_{AC} and f_{PWM} = 4 kHz)	15.6 A_{AC}	20.0 A_{AC}	30.0 A_{AC}

MCV4_A standard type (VFC/CFC)	0055-5A3-4-00	0075-5A3-4-00	0110-5A3-4-00
MCV40A part numbers (without fieldbus)	826 912 2	826 913 0	826 914 9
MCV41A part numbers (with PROFIBUS-DP)	826 932 7	826 933 5	826 934 3
MCV4_A application type (VFC/CFC)	**0055-5A3-4-0T**	**0075-5A3-4-0T**	**0110-5A3-4-0T**
MCV40A part numbers (without fieldbus)	827 476 2	827 477 0	827 478 9
MCV41A part numbers (with PROFIBUS-DP)	827 499 1	827 500 9	827 501 7
VFC operating mode	Recommended motor power → MCF4_A		
CFC operating mode (f_{PWM} = 8 kHz) Continuous output current = 100 % I_N I_D	12.5 A_{AC}	16 A_{AC}	24 A_{AC}
Recommended motor power	→ Sec. Project Planning, CFC motor selection		

MCS4_A standard type (SERVO)	0055-5A3-4-00	0075-5A3-4-00	0110-5A3-4-00
MCS40A part numbers (without fieldbus)	827 064 3	827 065 1	827 066 X
MCS41A part numbers (with PROFIBUS-DP)	827 081 3	827 082 1	827 083 X
MCS4_A application type (SERVO)	**0055-5A3-4-0T**	**0075-5A3-4-0T**	**0110-5A3-4-0T**
MCS40A part numbers (without fieldbus)	827 522 X	827 523 8	827 524 6
MCS41A part numbers (with PROFIBUS-DP)	827 545 9	827 546 7	827 547 5
SERVO operating mode (f_{PWM} = 8 kHz) Continuous output current = 100 % I_N I_D	12.5 A_{AC}	16 A_{AC}	24 A_{AC}
Recommended motor power	→ Sec. Project Planning, SERVO motor selection		

MCH4_A standard type (VFC/CFC/SERVO)	0055-5A3-4-00	0075-5A3-4-00	0110-5A3-4-00
MCH40A part numbers (without fieldbus)	827 607 2	827 608 0	827 609 9
MCH41A part numbers (with PROFIBUS-DP)	827 653 6	827 654 4	827 655 2
MCH42A part numbers (with INTERBUS FO)	827 569 6	827 570 X	827 571 8
MCH4_A application type (VFC/CFC/SERVO)	**0055-5A3-4-0T**	**0075-5A3-4-0T**	**0110-5A3-4-0T**
Part numbers (without fieldbus)	827 630 7	827 631 5	827 632 3
Part numbers (with PROFIBUS-DP)	827 676 5	827 677 3	827 678 1
Part numbers (with INTERBUS FO)	827 162 3	827 163 1	827 164 X
VFC operating mode	Recommended motor power → MCF4_A		
CFC/SERVO operating mode (f_{PWM} = 8 kHz) Continuous output current = 100 % I_N I_D	12.5 A_{AC}	16 A_{AC}	24 A_{AC}
Recommended motor power	→ Sec. Project Planning, CFC/SERVO motor selection		

Size 3

02572AXX

Figure 10: Size 3

MOVIDRIVE® *compact*		0150-503-4-0_	0220-503-4-0_	0300-503-4-0_
INPUT				
Supply voltage	V_{mains}	3 × 380 V_{AC} -10 %...3 × 500 V_{AC} +10 %		
Supply frequency	f_{mains}	50 Hz...60 Hz ±5 %		
Rated system current[1] I_{mains} (at V_{mains} = 3 × 400 V_{AC})	**100 %** **125 %**	28.8 A_{AC} 36.0 A_{AC}	41.4 A_{AC} 51.7 A_{AC}	54.0 A_{AC} 67.5 A_{AC}
OUTPUT				
Rated output power[2] (at V_{mains} = 3 × 400...500 V_{AC})	P_N	22.2 kVA	31.9 kVA	41.6 kVA
Rated output current[1] (at V_{mains} = 3 × 400 V_{AC})	I_N	32 A_{AC}	46 A_{AC}	60 A_{AC}
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_{BWmin}	15 Ω		12 Ω
Output voltage	V_{out}	max. V_{in}		
PWM frequency	f_{PWM}	Adjustable: 4/8/16 kHz (P860 / P861)		
Speed range / resolution	n_A / Δn_A	-5000...0...+5000 rpm / 0.2 rpm 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		14.3 kg (31.46 lb)		
Dimensions	**W × H × D**	MCF/MCV/MCS: 200 × 465 × 227 mm (7.87 × 18.31 × 8.94 in) MCH: 200 × 465 × 233 mm (7.87 × 18.31 × 9.17 in)		

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

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

MCF4_A standard type (VFC)	0150-503-4-00	0220-503-4-00	0300-503-4-00
MCF40A part numbers (without fieldbus)	826 745 6	826 746 4	826 747 2
MCF41A part numbers (with PROFIBUS-DP)	826 842 8	826 843 6	826 844 4
MCF4_A application type (VFC)	**0150-503-4-0T**	**0220-503-4-0T**	**0300-503-4-0T**
MCF40A part numbers (without fieldbus)	827 433 9	827 434 7	827 435 5
MCF41A part numbers (with PROFIBUS-DP)	827 456 8	827 457 6	827 458 4
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)
Continuous output current = 125 % I_N I_D (at V_{mains} = 3 × 400 V_{AC} and f_{PWM} = 4 kHz)	40.0 A_{AC}	57.5 A_{AC}	75.0 A_{AC}

MCV4_A standard type (VFC/CFC)	0150-503-4-00	0220-503-4-00	0300-503-4-00
MCV40A part numbers (without fieldbus)	826 915 7	826 916 5	826 917 3
MCV41A part numbers (with PROFIBUS-DP)	826 935 1	826 936 X	826 937 8
MCV4_A application type (VFC/CFC)	**0150-503-4-0T**	**0220-503-4-0T**	**0300-503-4-0T**
MCV40A part numbers (without fieldbus)	827 479 7	827 480 0	827 481 9
MCV41A part numbers (with PROFIBUS-DP)	827 502 5	827 503 3	827 504 1
VFC operating mode	Recommended motor power → MCF4_A		
CFC operating mode (f_{PWM} = 8 kHz) Continuous output current = 100 % I_N I_D	32 A_{AC}	46 A_{AC}	60 A_{AC}
Recommended motor power	→ Sec. Project Planning, CFC motor selection		

MCS4_A standard type (SERVO)	0150-503-4-00	0220-503-4-00	0300-503-4-00
MCS40A part numbers (without fieldbus)	827 067 8	827 068 6	827 069 4
MCS41A part numbers (with PROFIBUS-DP)	827 084 8	827 085 6	827 086 4
MCS4_A application type (SERVO)	**0150-503-4-0T**	**0220-503-4-0T**	**0300-503-4-0T**
MCS40A part numbers (without fieldbus)	827 525 4	827 526 2	827 527 0
MCS41A part numbers (with PROFIBUS-DP)	827 548 3	827 549 1	827 550 5
SERVO operating mode (f_{PWM} = 8 kHz) Continuous output current = 100 % I_N I_D	32 A_{AC}	46 A_{AC}	60 A_{AC}
Recommended motor power	→ Sec. Project Planning, SERVO motor selection		

MCH4_A standard type (VFC/CFC/SERVO)	0150-503-4-00	0220-503-4-00	0300-503-4-00
MCH40A part numbers (without fieldbus)	827 610 2	827 611 0	827 612 9
MCH41A part numbers (with PROFIBUS-DP)	827 656 0	827 657 9	827 658 7
MCH42A part numbers (with INTERBUS FO)	827 572 6	827 573 4	827 574 2
MCH4_A application type (VFC/CFC/SERVO)	**0150-503-4-0T**	**0220-503-4-0T**	**0300-503-4-0T**
MCH40A part numbers (without fieldbus)	827 633 1	827 634 X	827 635 8
MCH41A part numbers (with PROFIBUS-DP)	827 679 X	827 680 3	827 681 1
MCH42A part numbers (with INTERBUS FO)	827 165 8	827 166 6	827 167 4
VFC operating mode	Recommended motor power → MCF4_A		
CFC/SERVO operating mode (f_{PWM} = 8 kHz) Continuous output current = 100 % I_N I_D	32 A_{AC}	46 A_{AC}	60 A_{AC}
Recommended motor power	→ Sec. Project Planning, CFC/SERVO motor selection		

Size 4

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Figure 11: Size 4

MOVIDRIVE® *compact*		0370-503-4-0_	0450-503-4-0_
INPUT			
Supply voltage	V_{mains}	3 × 380 V_{AC} -10 %...3 × 500 V_{AC} +10 %	
Supply frequency	f_{mains}	50 Hz...60 Hz ±5 %	
Rated system current[1] I_{mains} (at V_{mains} = 3 × 400 V_{AC})	**100 %** **125 %**	65.7 A_{AC} 81.9 A_{AC}	80.1 A_{AC} 100.1 A_{AC}
OUTPUT			
Rated output power[2] (at V_{mains} = 3 × 400...500 V_{AC})	P_N	51.1 kVA	62.3 kVA
Rated output current[1] (at V_{mains} = 3 × 400 V_{AC})	I_N	73 A_{AC}	89 A_{AC}
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_{BWmin}	6 Ω	
Output voltage	V_{out}	max. V_{in}	
PWM frequency	f_{PWM}	Adjustable: 4/8/16 kHz (P860 / P861)	
Speed range / resolution	n_A / Δn_A	-5000...0...+5000 rpm / 0.2 rpm 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		26.3 kg (57.86 lb)	
Dimensions	**W × H × D**	MCF/MCV/MCS: 280 × 522 × 227 mm (11.02 × 20.55 × 8.94 in) MCH: 280 × 522 × 233 mm (11.02 × 20.55 × 9.17 in)	

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

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

MCF4_A standard type (VFC)	0370-503-4-00	0450-503-4-00
MCF40A part numbers (without fieldbus)	826 748 0	826 749 9
MCF41A part numbers (with PROFIBUS-DP)	826 845 2	826 846 0
MCF4_A application type (VFC)	**0370-503-4-0T**	**0450-503-4-0T**
MCF40A part numbers (without fieldbus)	827 436 3	827 437 1
MCF41A part numbers (with PROFIBUS-DP)	827 459 2	827 460 6
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)
Continuous output current = 125 % I_N I_D (at V_{mains} = 3 × 400 V_{AC} and f_{PWM} = 4 kHz)	91 A_{AC}	111 A_{AC}

MCV4_A standard type (VFC/CFC)	0370-503-4-00	0450-503-4-00
MCV40A part numbers (without fieldbus)	826 918 1	826 919 X
MCV41A part numbers (with PROFIBUS-DP)	826 938 6	826 939 4
MCV4_A application type (VFC/CFC)	**0370-503-4-0T**	**0450-503-4-0T**
MCV40A part numbers (without fieldbus)	827 482 7	827 483 5
MCV41A part numbers (with PROFIBUS-DP)	827 505 X	827 506 8
VFC operating mode	Recommended motor power → MCF4_A	
CFC operating mode (f_{PWM} = 8 kHz) Continuous output current = 100 % I_N I_D	73 A_{AC}	89 A_{AC}
Recommended motor power	→ Sec. Project Planning, CFC motor selection	

MCS4_A standard type (SERVO)	0370-503-4-00	0450-503-4-00
MCS40A part numbers (without fieldbus)	827 070 8	
MCS41A part numbers (with PROFIBUS-DP)	827 087 2	
MCS4_A application type (SERVO)	**0370-503-4-0T**	**0450-503-4-0T**
MCS40A part numbers (without fieldbus)	827 528 9	827 529 7
MCS41A part numbers (with PROFIBUS-DP)	827 551 3	827 552 1
SERVO operating mode (f_{PWM} = 8 kHz) Continuous output current = 100 % I_N I_D	73 A_{AC}	89 A_{AC}
Recommended motor power	→ Sec. Project Planning, SERVO motor selection	

MCH4_A standard type (VFC/CFC/SERVO)	0370-503-4-00	0450-503-4-00
MCH40A part numbers (without fieldbus)	827 613 7	827 614 5
MCH41A part numbers (with PROFIBUS-DP)	827 659 5	827 660 9
MCH42A part numbers (with INTERBUS FO)	827 575 0	827 576 9
MCH4_A application type (VFC/CFC/SERVO)	**0370-503-4-0T**	**0450-503-4-0T**
MCH40A part numbers (without fieldbus)	827 636 6	827 637 4
MCH41A part numbers (with PROFIBUS-DP)	827 682 X	827 683 8
MCH42A part numbers (with INTERBUS FO)	827 168 2	827 169 0
VFC operating mode	Recommended motor power → MCF4_A	
CFC/SERVO operating mode (f_{PWM} = 8 kHz) Continuous output current = 100 % I_N I_D	73 A_{AC}	89 A_{AC}
Recommended motor power	→ Sec. Project Planning, CFC/SERVO motor selection	

Size 5

02574AXX

Figure 12: Size 5

MOVIDRIVE® *compact*		0550-503-4-0_	0750-503-4-0_
INPUT			
Supply voltage	V_{mains}	3 × 380 V_{AC} -10 %...3 × 500 V_{AC} +10 %	
Supply frequency	f_{mains}	50 Hz...60 Hz ±5 %	
Rated system current[1] I_{mains} (at V_{mains} = 3 × 400 V_{AC})	**100 %** **125 %**	94.5 A_{AC} 118.1 A_{AC}	117.0 A_{AC} 146.3 A_{AC}
OUTPUT			
Rated output power[2] (at V_{mains} = 3 × 400...500 V_{AC})	P_N	73.5 kVA	91.0 kVA
Rated output current[1] (at V_{mains} = 3 × 400 V_{AC})	I_N	105 A_{AC}	130 A_{AC}
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_{BWmin}	6 Ω	4 Ω
Output voltage	V_{out}	max. V_{in}	
PWM frequency	f_{PWM}	Adjustable: 4/8/16 kHz (P860 / P861)	
Speed range / resolution	n_A / Δn_A	-5000...0...+5000 rpm / 0.2 rpm 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		34.3 kg (75.46 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_{in} = 3 × 500 V_{AC}.

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

MCF4_A standard type (VFC)	0550-503-4-00	0750-503-4-00
MCF40A part numbers (without fieldbus)	826 750 2	826 751 0
MCF41A part numbers (with PROFIBUS-DP)	826 847 9	826 848 7
MCF4_A application type (VFC)	**0550-503-4-0T**	**0750-503-4-0T**
MCF40A part numbers (without fieldbus)	827 438 X	827 439 8
MCF41A part numbers (with PROFIBUS-DP)	827 461 4	827 462 2
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)
Continuous output current = 125 % I_N I_D (at V_{mains} = 3 × 400 V_{AC} and f_{PWM} = 4 kHz)	131 A_{AC}	162 A_{AC}

MCV4_A standard type (VFC/CFC)	0550-503-4-00	0750-503-4-00
MCV40A part numbers (without fieldbus)	826 920 3	826 921 1
MCV41A part numbers (with PROFIBUS-DP)	826 940 8	826 941 6
MCV4_A application type (VFC/CFC)	**0550-503-4-0T**	**0750-503-4-0T**
MCV40A part numbers (without fieldbus)	827 484 3	827 485 1
MCV41A part numbers (with PROFIBUS-DP)	827 507 6	827 508 4
VFC operating mode	Recommended motor power → MCF4_A	
CFC operating mode (f_{PWM} = 8 kHz) Continuous output current = 100 % I_N I_D	105 A_{AC}	130 A_{AC}
Recommended motor power	→ Sec. Project Planning, CFC motor selection	

MCS4_A standard type (SERVO)	0550-503-4-00	0750-503-4-00
MCS40A part numbers (without fieldbus)		
MCS41A part numbers (with PROFIBUS-DP)		
MCS4_A application type (SERVO)	**0550-503-4-0T**	**0750-503-4-0T**
MCS40A part numbers (without fieldbus)	827 530 0	827 531 9
MCS41A part numbers (with PROFIBUS-DP)	827 553 X	827 554 8
SERVO operating mode (f_{PWM} = 8 kHz) Continuous output current = 100 % I_N I_D	105 A_{AC}	130 A_{AC}
Recommended motor power	→ Sec. Project Planning, SERVO motor selection	

MCH4_A standard type (VFC/CFC/SERVO)	0550-503-4-00	0750-503-4-00
MCH40A part numbers (without fieldbus)	827 615 3	827 616 1
MCH41A part numbers (with PROFIBUS-DP)	827 661 7	827 662 5
MCH42A part numbers (with INTERBUS FO)	827 577 7	827 578 5
MCH4_A application type (VFC/CFC/SERVO)	**0550-503-4-0T**	**0750-503-4-0T**
MCH40A part numbers (without fieldbus)	827 638 2	827 639 0
MCH41A part numbers (with PROFIBUS-DP)	827 684 6	827 685 4
MCH42A part numbers (with INTERBUS FO)	827 170 4	827 171 2
VFC operating mode	Recommended motor power → MCF4_A	
CFC/SERVO operating mode (f_{PWM} = 8 kHz) Continuous output current = 100 % I_N I_D	105 A_{AC}	130 A_{AC}
Recommended motor power	→ Sec. Project Planning, CFC/SERVO motor selection	

2.4 MOVIDRIVE® compact MC_4_A...-2_3 (230 V units)

Size 1

02570AXX

Figure 13: Size 1

MOVIDRIVE® *compact*		0015-2A3-4-0_	0022-2A3-4-0_	0037-2A3-4-0_
INPUT				
Supply voltage	V_{mains}	3×200 V_{AC} -10 %...3×240 V_{AC} +10 %		
Supply frequency	f_{mains}	50 Hz...60 Hz ±5 %		
Rated system current I_{mains} (at $V_{mains} = 3 \times 230$ V_{AC})	**100 %** **125 %**	6.7 A_{AC} 8.4 A_{AC}	7.8 A_{AC} 9.8 A_{AC}	12.9 A_{AC} 16.1 A_{AC}
OUTPUT				
Rated output power[1] (at $V_{mains} = 3 \times 230...240$ V_{AC})	P_N	2.7 kVA	3.4 kVA	5.8 kVA
Rated output current (at $V_{mains} = 3 \times 230$ V_{AC})	I_N	7.3 A_{AC}	8.6 A_{AC}	14.5 A_{AC}
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_{BWmin}	27 Ω		
Output voltage	V_{out}	max. V_{in}		
PWM frequency	f_{PWM}	Adjustable: 4/8/16 kHz (P860 / P861)		
Speed range / resolution	n_A / Δn_A	-5000...0...+5000 rpm / 0.2 rpm 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**	MCF/MCV: 105 × 315 × 155 mm (4.13 × 12.40 × 6.10 in) MCH: 105 × 315 × 161 mm (4.13 × 12.40 × 6.34 in)		

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

MCF4_A standard type (VFC)	0015-2A3-4-00	0022-2A3-4-00	0037-2A3-4-00
MCF40A part numbers (without fieldbus)	826 752 9	826 753 7	826 754 5
MCF41A part numbers (with PROFIBUS-DP)	826 853 3	826 854 1	826 855 X
MCF4_A application type (VFC)	**0015-2A3-4-0T**	**0022-2A3-4-0T**	**0037-2A3-4-0T**
MCF40A part numbers (without fieldbus)	827 440 1	827 441 X	827 442 8
MCF41A part numbers (with PROFIBUS-DP)	827 463 0	827 464 9	827 465 7
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)
Continuous output current = 125 % I_N I_D (at V_{mains} = 3 × 230 V_{AC} and f_{PWM} = 4 kHz)	9.1 A_{AC}	10.8 A_{AC}	18.1 A_{AC}

MCV4_A standard type (VFC/CFC)	0015-2A3-4-00	0022-2A3-4-00	0037-2A3-4-00
MCV40A part numbers (without fieldbus)	826 922 X	826 923 8	826 924 6
MCV41A part numbers (with PROFIBUS-DP)	826 942 4	826 943 2	826 944 0
MCV4_A application type (VFC/CFC)	**0015-2A3-4-0T**	**0022-2A3-4-0T**	**0037-2A3-4-0T**
MCV40A part numbers (without fieldbus)	827 486 X	827 487 8	827 488 6
MCV41A part numbers (with PROFIBUS-DP)	827 509 2	827 510 6	827 511 4
VFC operating mode	Recommended motor power → MDF60A		
CFC operating mode (f_{PWM} = 8 kHz) Continuous output current = 100 % I_N I_D	7.3 A_{AC}	8.6 A_{AC}	14.5 A_{AC}
Recommended motor power	→ Sec. Project Planning, CFC motor selection		

MCH4_A standard type (VFC/CFC)	0015-2A3-4-00	0022-2A3-4-00	0037-2A3-4-00
MCH40A part numbers (without fieldbus)	827 617 X	827 618 8	827 619 6
MCH41A part numbers (with PROFIBUS-DP)	827 663 3	827 664 1	827 665 X
MCH42A part numbers (with INTERBUS FO)	827 588 2	827 589 0	827 590 4
MCH4_A application type (VFC/CFC)	**0015-2A3-4-0T**	**0022-2A3-4-0T**	**0037-2A3-4-0T**
MCH40A part numbers (without fieldbus)	827 640 4	827 641 2	827 642 0
MCH41A part numbers (with PROFIBUS-DP)	827 686 2	827 687 0	827 688 9
MCH42A part numbers (with INTERBUS FO)	827 579 3	827 580 7	827 581 5
VFC operating mode	Recommended motor power → MCF4_A		
CFC/SERVO operating mode (f_{PWM} = 8 kHz) Continuous output current = 100 % I_N I_D	7.3 A_{AC}	8.6 A_{AC}	14.5 A_{AC}
Recommended motor power	→ Sec. Project Planning, CFC/SERVO motor selection		

Size 2

02571AXX

Figure 14: Size 2

MOVIDRIVE® *compact*		0055-2A3-4-0_	0075-2A3-4-0_
INPUT			
Supply voltage	V_{mains}	3 × 200 V_{AC} -10 %...3 × 240 V_{AC} +10 %	
Supply frequency	f_{mains}	50 Hz...60 Hz ±5 %	
Rated system current I_{mains} (at V_{mains} = 3 × 230 V_{AC})	**100 %** **125 %**	19.5 A_{AC} 24.4 A_{AC}	27.4 A_{AC} 34.3 A_{AC}
OUTPUT			
Output rated power[1] (at V_{mains} = 3 × 230...240 V_{AC})	P_N	8.8 kVA	11.6 kVA
Output rated current (at V_{mains} = 3 × 230 V_{AC})	I_N	22 A_{AC}	29 A_{AC}
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_{BWmin}	12 Ω	
Output voltage	V_{out}	max. V_{in}	
PWM frequency	f_{PWM}	Adjustable: 4/8/16 kHz (P860 / P861)	
Speed range / resolution	n_A / Δn_A	-5000...0...+5000 rpm / 0.2 rpm 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**	MCF/MCV: 130 × 335 × 207 mm (5.12 × 13.19 × 8.15 in) MCH: 130 × 335 × 213 mm (5.12 × 13.19 × 8.39 in)	

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

MCF4_A standard type (VFC)	0055-2A3-4-00	0075-2A3-4-00
MCF40A part numbers (without fieldbus)	826 755 3	826 756 1
MCF41A part numbers (with PROFIBUS-DP)	826 856 8	826 857 6
MCF4_A application type (VFC)	**0055-2A3-4-0T**	**0075-2A3-4-0T**
MCF40A part numbers (without fieldbus)	827 443 6	827 444 4
MCF41A part numbers (with PROFIBUS-DP)	827 466 5	827 467 3
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)
Continuous output current = 125 % I_N I_D (at V_{mains} = 3 × 230 V_{AC} and f_{PWM} = 4 kHz)	27.5 A_{AC}	36.3 A_{AC}

MCV4_A standard type (VFC/CFC)	0055-2A3-4-00	0075-2A3-4-00
MCV40A part numbers (without fieldbus)	826 925 4	826 926 2
MCV41A part numbers (with PROFIBUS-DP)	826 945 9	826 946 7
MCV4_A application type (VFC/CFC)	**0055-2A3-4-0T**	**0075-2A3-4-0T**
MCV40A part numbers (without fieldbus)	827 489 4	827 490 8
MCV41A part numbers (with PROFIBUS-DP)	827 512 2	827 513 0
VFC operating mode	Recommended motor power → MCF4_A	
CFC operating mode (f_{PWM} = 8 kHz) Continuous output current = 100 % I_N I_D	22 A_{AC}	29 A_{AC}
Recommended motor power	→ Sec. Project Planning, CFC motor selection	

MCH4_A standard type (VFC/CFC)	0055-2A3-4-00	0075-2A3-4-00
MCH40A part numbers (without fieldbus)	827 620 X	827 621 8
MCH41A part numbers (with PROFIBUS-DP)	827 666 8	827 667 6
MCH42A part numbers (with INTERBUS FO)	827 591 2	827 592 0
MCH4_A application type (VFC/CFC)	**0055-2A3-4-0T**	**0075-2A3-4-0T**
MCH40A part numbers (without fieldbus)	827 643 9	827 644 7
MCH41A part numbers (with PROFIBUS-DP)	827 689 7	827 690 0
MCH42A part numbers (with INTERBUS FO)	827 582 3	827 583 1
VFC operating mode	Recommended motor power → MCF4_A	
CFC/SERVO operating mode (f_{PWM} = 8 kHz) Continuous output current = 100 % I_N I_D	22 A_{AC}	29 A_{AC}
Recommended motor power	→ Sec. Project Planning, CFC/SERVO motor selection	

Size 3

02572AXX

Figure 15: Size 3

MOVIDRIVE® *compact*		0110-203-4-0_	0150-203-4-0_
INPUT			
Supply voltage	V_{mains}	3 × 200 V_{AC} -10 %...3 × 240 V_{AC} +10 %	
Supply frequency	f_{mains}	50 Hz...60 Hz ±5 %	
Rated system current I_{mains} (at V_{mains} = 3 × 230 V_{AC})	**100 %** **125 %**	40.0 A_{AC} 50.0 A_{AC}	49.0 A_{AC} 61.0 A_{AC}
OUTPUT			
Output rated power[1] (at V_{mains} = 3 × 230...240 V_{AC})	P_N	17.1 kVA	21.5 kVA
Output rated current (at V_{mains} = 3 × 230 V_{AC})	I_N	42 A_{AC}	54 A_{AC}
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_{BWmin}	7.5 Ω	5.6 Ω
Output voltage	V_{out}	max. V_{in}	
PWM frequency	f_{PWM}	Adjustable: 4/8/16 kHz (P860 / P861)	
Speed range / resolution	n_A / Δn_A	-5000...0...+5000 rpm / 0.2 rpm 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**	MCF/MCV/MCS: 200 × 465 × 227 mm (7.87 × 18.31 × 8.94 in) MCH: 200 × 465 × 233 mm (7.87 × 18.31 × 9.17 in)	

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

MCF4_A standard type (VFC)	0110-203-4-00	0150-203-4-00
MCF40A part numbers (without fieldbus)	826 757 X	827 263 8
MCF41A part numbers (with PROFIBUS-DP)	826 858 4	827 266 2
MCF4_A application type (VFC)	**0110-203-4-0T**	**0150-203-4-0T**
MCF40A part numbers (without fieldbus)	827 445 2	827 446 0
MCF41A part numbers (with PROFIBUS-DP)	827 468 1	827 469 X
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)
Continuous output current = 125 % I_N I_D (at V_{mains} = 3 × 230 V_{AC} and f_{PWM} = 4 kHz)	52.5 A_{AC}	67.5 A_{AC}

MCV4_A standard type (VFC/CFC)	0110-203-4-00	0150-203-4-00
MCV40A part numbers (without fieldbus)	826 927 0	827 269 7
MCV41A part numbers (with PROFIBUS-DP)	826 947 5	827 272 7
MCV4_A application type (VFC/CFC)	**0110-203-4-0T**	**0150-203-4-0T**
MCV40A part numbers (without fieldbus)	827 491 6	827 492 4
MCV41A part numbers (with PROFIBUS-DP)	827 514 9	827 515 7
VFC operating mode	Recommended motor power → MCF4_A	
CFC operating mode (f_{PWM} = 8 kHz) Continuous output current = 100 % I_N I_D	42 A_{AC}	54 A_{AC}
Recommended motor power	→ Sec. Project Planning, CFC motor selection	

MCH4_A standard type (VFC/CFC)	0110-203-4-00	0150-203-4-00
MCH40A part numbers (without fieldbus)	827 622 6	827 623 4
MCH41A part numbers (with PROFIBUS-DP)	827 668 4	827 669 2
MCH42A part numbers (with INTERBUS FO)	827 593 9	827 594 7
MCH4_A application type (VFC/CFC)	**0110-203-4-0T**	**0150-203-4-0T**
MCH40A part numbers (without fieldbus)	827 645 5	827 646 3
MCH41A part numbers (with PROFIBUS-DP)	827 691 9	827 692 7
MCH42A part numbers (with INTERBUS FO)	827 584 X	827 585 8
VFC operating mode	Recommended motor power → MCF4_A	
CFC/SERVO operating mode (f_{PWM} = 8 kHz) Continuous output current = 100 % I_N I_D	42 A_{AC}	54 A_{AC}
Recommended motor power	→ Sec. Project Planning, CFC/SERVO motor selection	

Size 4

02573AXX

Figure 16: Size 4

MOVIDRIVE® *compact*		0220-203-4-0_	0300-203-4-0_
INPUT			
Supply voltage	V_{mains}	3 × 200 V_{AC} -10 %...3 × 240 V_{AC} +10 %	
Supply frequency	f_{mains}	50 Hz...60 Hz ±5 %	
Rated system current I_{mains} (at V_{mains} = 3 × 230 V_{AC})	**100 %** **125 %**	72 A_{AC} 90 A_{AC}	86 A_{AC} 107 A_{AC}
OUTPUT			
Output rated power[1] (at V_{mains} = 3 × 230...240 V_{AC})	P_N	31.8 kVA	37.8 kVA
Output rated current (at V_{mains} = 3 × 230 V_{AC})	I_N	80 A_{AC}	95 A_{AC}
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_{BWmin}	3.0 Ω	
Output voltage	V_{out}	max. V_{in}	
PWM frequency	f_{PWM}	Adjustable: 4/8/16 kHz (P860 / P861)	
Speed range / resolution	n_A / Δn_A	-5000...0...+5000 rpm / 0.2 rpm 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**	MCF/MCV/MCS: 280 × 522 × 227 mm (11.02 × 20.55 × 8.94 in) MCH: 280 × 522 × 233 mm (11.02 × 20.55 × 9.17 in)	

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

MCF4_A standard type (VFC)	0220-203-4-00	0300-203-4-00
MCF40A part numbers (without fieldbus)	827 264 6	827 265 4
MCF41A part numbers (with PROFIBUS-DP)	827 267 0	827 268 9
MCF4_A application type (VFC)	**0220-203-4-0T**	**0300-203-4-0T**
MCF40A part numbers (without fieldbus)	827 447 9	827 448 7
MCF41A part numbers (with PROFIBUS-DP)	827 470 3	827 471 1
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)
Continuous output current = 125 % I_N I_D (at V_{mains} = 3 × 230 V_{AC} and f_{PWM} = 4 kHz)	100 A_{AC}	118 A_{AC}

MCV4_A standard type (VFC/CFC)	0220-203-4-00	0300-203-4-00
MCV40A part numbers (without fieldbus)	827 270 0	827 271 9
MCV41A part numbers (with PROFIBUS-DP)	827 273 5	827 274 3
MCV4_A application type (VFC/CFC)	**0220-203-4-0T**	**0300-203-4-0T**
MCV40A part numbers (without fieldbus)	827 493 2	827 494 0
MCV41A part numbers (with PROFIBUS-DP)	827 516 5	827 517 3
VFC operating mode	Recommended motor power → MCF4_A	
CFC operating mode (f_{PWM} = 8 kHz) Continuous output current = 100 % I_N I_D	80 A_{AC}	95 A_{AC}
Recommended motor power	→ Sec. Project Planning, CFC motor selection	

MCH4_A standard type (VFC/CFC)	0220-203-4-00	0300-203-4-00
MCH40A part numbers (without fieldbus)	827 624 2	827 625 0
MCH41A part numbers (with PROFIBUS-DP)	827 670 6	827 671 4
MCH42A part numbers (with INTERBUS FO)	827 595 5	827 596 3
MCH4_A application type (VFC/CFC)	**0220-203-4-0T**	**0300-203-4-0T**
MCH40A part numbers (without fieldbus)	827 647 1	827 648 X
MCH41A part numbers (with PROFIBUS-DP)	827 693 5	827 694 3
MCH42A part numbers (with INTERBUS FO)	827 586 6	827 587 4
VFC operating mode	Recommended motor power → MCF4_A	
CFC/SERVO operating mode (f_{PWM} = 8 kHz) Continuous output current = 100 % I_N I_D	80 A_{AC}	95 A_{AC}
Recommended motor power	→ Sec. Project Planning, CFC/SERVO motor selection	

2.5 Additional functions in the application type

Electronic cam

Refer to the 'Electronic cam' manual for detailed information. This manual forms part of the 'application version' documentation package which you can order from SEW.

Please note the following points:

- The 'electronic cam' can only be implemented on MOVIDRIVE® units in application version (...-0T).
- It is essential for the 'electronic cam' to have the current-controlled control mode and, therefore, encoder feedback. As a result, the 'electronic cam' can only be implemented with type MCV in CFC operating modes, with type MCS in SERVO operating modes and with type MCH in CFC or SERVO operating modes. The 'electronic cam' cannot be implemented with type MCV/MCH in VFC and VFC-n-CONTROL operating modes or with type MCF.
- The 'electronic cam' is available in parameter set 1 only.

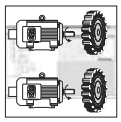
Motor and encoder

Use the following motor types:

- For operation with MOVIDRIVE® *compact* MCV4_A...-5_3-4-0T:
  - Asynchronous servomotor CT/CV with high-resolution sin/cos encoder.
  - AC motor DT/DV/D with incremental encoder option, preferably high-resolution sin/cos encoder.
- For operation with MOVIDRIVE® *compact* MCS4_A...-5_3-4-0T:
  - Synchronous servomotor CM with AS1H (Hiperface encoder).
  - Synchronous servomotor DS/DY with resolver.
- For operation with MOVIDRIVE® *compact* MCH4_A...-5_3-4-0T:
  - Asynchronous servomotor CT/CV with AV1H option (Hiperface encoder).
  - AC motor DT/DV/D with AV1H option (Hiperface encoder).
  - Synchronous servomotor CM with AS1H/ES1H (Hiperface encoder).

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

Internal synchronous operation



Refer to the 'Internal Synchronous Operation' manual for detailed information. This manual forms part of the 'Additional Functions and Application Modules' documentation package which you can order from SEW.

Please note the following points:

- 'Internal synchronous operation' can only be implemented on MOVIDRIVE® units in application version (...-0T).
- It is essential for 'internal synchronous operation' to have the current-controlled control mode and, therefore, encoder feedback. As a result, 'internal synchronous operation' can only be implemented with type MCV in CFC operating modes, with type MCS in SERVO operating modes and with type MCH in CFC or SERVO operating modes. 'Internal synchronous operation' cannot be implemented with type MCV/ MCH in VFC and VFC-n-CONTROL operating modes or with type MCF.
- 'Internal synchronous operation' is available in parameter set 1 only.

Motor and encoder

Use the following motor types:

- For operation with MOVIDRIVE® *compact* MCV4_A...-5_3-4-0T:
  - Asynchronous servomotor CT/CV with high-resolution sin/cos encoder.
  - AC motor DT/DV/D with incremental encoder option, preferably high-resolution sin/cos encoder.
- For operation with MOVIDRIVE® *compact* MCS4_A...-5_3-4-0T:
  - Synchronous servomotor CM with AS1H (Hiperface encoder).
  - Synchronous servomotor DS/DY with resolver.
- For operation with MOVIDRIVE® *compact* MCH4_A...-5_3-4-0T:
  - Asynchronous servomotor CT/CV with AV1H option (Hiperface encoder).
  - AC motor DT/DV/D with AV1H option (Hiperface encoder).
  - Synchronous servomotor CM with AS1H/ES1H (Hiperface encoder).

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

2.6 MOVIDRIVE® compact MCF/MCV/MCS electronics data

MOVIDRIVE® *compact*		**Setpoint processing and speed ramps**	
MCF/MCV/MCS40A and MCV/MCS41A		**Version with analog setpoint input**	
Voltage supply for setpoint input	X10:1 X10:3	REF1: +10 V_{DC} +5 % / -0 %, I_{max} = 3 mA REF2: -10 V_{DC} +0 % / -5 %, I_{max} = 3 mA	Reference voltages for setpoint potentiometer
Setpoint input n1	X10:2/X10:4	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
MCF/MCV/MCS41A (X10:2 and X10:4 ineffective with MCF41A)		**Version with PROFIBUS-DP interface. There is no analog setpoint input n1 (AI11/AI12) in MCF41A, setpoint specification only via PROFIBUS-DP interface.**	
Protocol option Baud rate Connection system Bus termination Station address Name of the GSD file DP identity number		PROFIBUS-DP acc. to IEC 61158 Automatic detection of baud rate from 9.6 kbaud to 12 Mbaud 9-pin sub D connector, pin assignment to IEC 61158 Can be activated for cable type A to IEC 61158 0...125, can be set using DIP switch SEW_6002.GSD 6002_{hex} (24578_{dec})	
Applies to all versions			
Setpoint input n2 TF/TH input	X10:6	Analog input 0...10 V or optionally (→ P120) TF/TH input with response threshold at $R_{TF} \geq 2.9$ kΩ ±10 %	
Internal setpoints		Parameter set 1: n11/n12/n13 = -5000...0...+5000 rpm Parameter set 2: n21/n22/n23 = -5000...0...+5000 rpm	
Time ranges of speed ramps at Δn = 3000 rpm		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 Motorized potentiometer t3 Up: 0.2...50 s Down: 0.2...50 s	

MOVIDRIVE® *compact*		Other electronics data	
Auxiliary voltage output[1]	X10:16	VO24: V_{OUT} = 24 V_{DC}, maximum current carrying capacity I_{max} = 200 mA	
Ext. voltage supply[1]	X10:24	VI24: V_{IN} = 24 V_{DC} -15 % / +20 % (range: 19.2...30 V_{DC}) to EN 61131-2	
Binary inputs Internal resistance	X10:9...X10:14	DIØØ...DIØ5: Isolated (optocoupler), PLC-compatible (EN 61131), sampling interval 5 ms $R_i \approx 3.0$ kΩ, $I_E \approx 10$ mA	
Signal level		+13 V...+30 V = '1' = Contact closed -3 V...+5 V = '0' = Contact open	To EN 61131
Function	X10:9 X10:10...X10:14	DIØØ: With fixed assignment '/Controller inhibit' DIØ1...DIØ5: Selection option → Parameter menu P60_	
Binary outputs[1]	X10:21/X10:19	DBØØ/DOØ2: PLC compatible (EN 61131-2), response time 5 ms	
Signal level		'0' = 0 V '1' = +24 V **Important:** Do not apply external voltage!	
Function	X10:21 X10:19	DBØØ: With fixed assignment '/Brake', I_{max} = 150 mA, short-circuit proof DOØ2: Selection option → Parameter menu P62_, I_{max} = 50 mA, short-circuit proof	
Only in MCF/MCV/MCS40A Analog output	X10:19	AOØ1: → Menu P64_, resolution 8-bit, I_{max} = 20 mA (short-circuit proof)	
Relay output	X10:18/20/22	DOØ1: Load capacity of the relay contacts V_{max} = 30 V_{DC}, I_{max} = 800 mA	
Function	X10:18 X10:20 X10:22	DOØ1-C: Shared relay contact DOØ2-NO: NO contact DOØ2-NC: NC contact	Selection option → Parameter menu P62_
System bus (SBus)	X10:5 X10:7	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
Motor encoder input[1] not with type MCF4_A	X15:	Encoder with type MCV4_A Permitted encoder types: • sin/cos encoder 1 V_{SS} • 5 V TTL sensors • 24 V HTL sensors Encoder power supply: +24 V, I_{max} = 180 mA	Resolver with type MCS4_A 2-pole, 7 $V_{AC\_r.m.s.}$, 7 kHz
Output encoder simulation or input external encoder[1] not with type MCF4_A	X14:	Output encoder simulation: Signal level to RS-422 (5 V TTL) Number of pulses as on X15: (MCV4_A) or fixed 1024 pulses/revolution (MCS4_A)	Input external encoder (max. 200 kHz): Only encoder with signal level to RS-422 (5 V TTL) should be connected! Encoder power supply: +24 V, I_{max} = 180 mA
Reference terminals	X10:8 X10:17/X10:23 X10:15	AGND: Reference potential for analog signals n1 and n2 and terminals X10:1 and X10:3 DGND: Reference potential for binary signals, system bus (SBus), encoder and resolver. DCOM: Reference potential for binary inputs X10:9...X10:14 (DIØØ...DIØ5).	
Permitted line cross section		one core per terminal: 0.20...2.5 mm^2 (AWG 24...12) two cores per terminal: 0.20...1 mm^2 (AWG 24...17)	

1) **MCF/MCV/MCS40A (without fieldbus):** The unit provides a current of I_{max} = 400 mA for the +24 V outputs (VO24, DBØØ, DBØ2, encoder supply). If this value is insufficient, a 24 V_{DC} power supply unit must be connected to X10:24 (VI24). This external 24 V_{DC} power supply must be capable of supplying a continuous power of 50 W and a peak power (1 s) of 100 W.

MCF/MCV/MCS41A (with PROFIBUS-DP): SEW recommends always supplying these units with 24 V_{DC} at terminal X10:24 (VI24). This external 24 V_{DC} power supply must be capable of supplying a continuous power of 50 W and a peak power (1 s) of 100 W.
The maximum total current which may be applied to the 24 V_{DC} outputs X10:16 (VO24), X10:21 (DBØØ) and X10:19 (DOØ2) is I_{max} = 400 mA.

Front view of MCF40A, MCF41A control unit

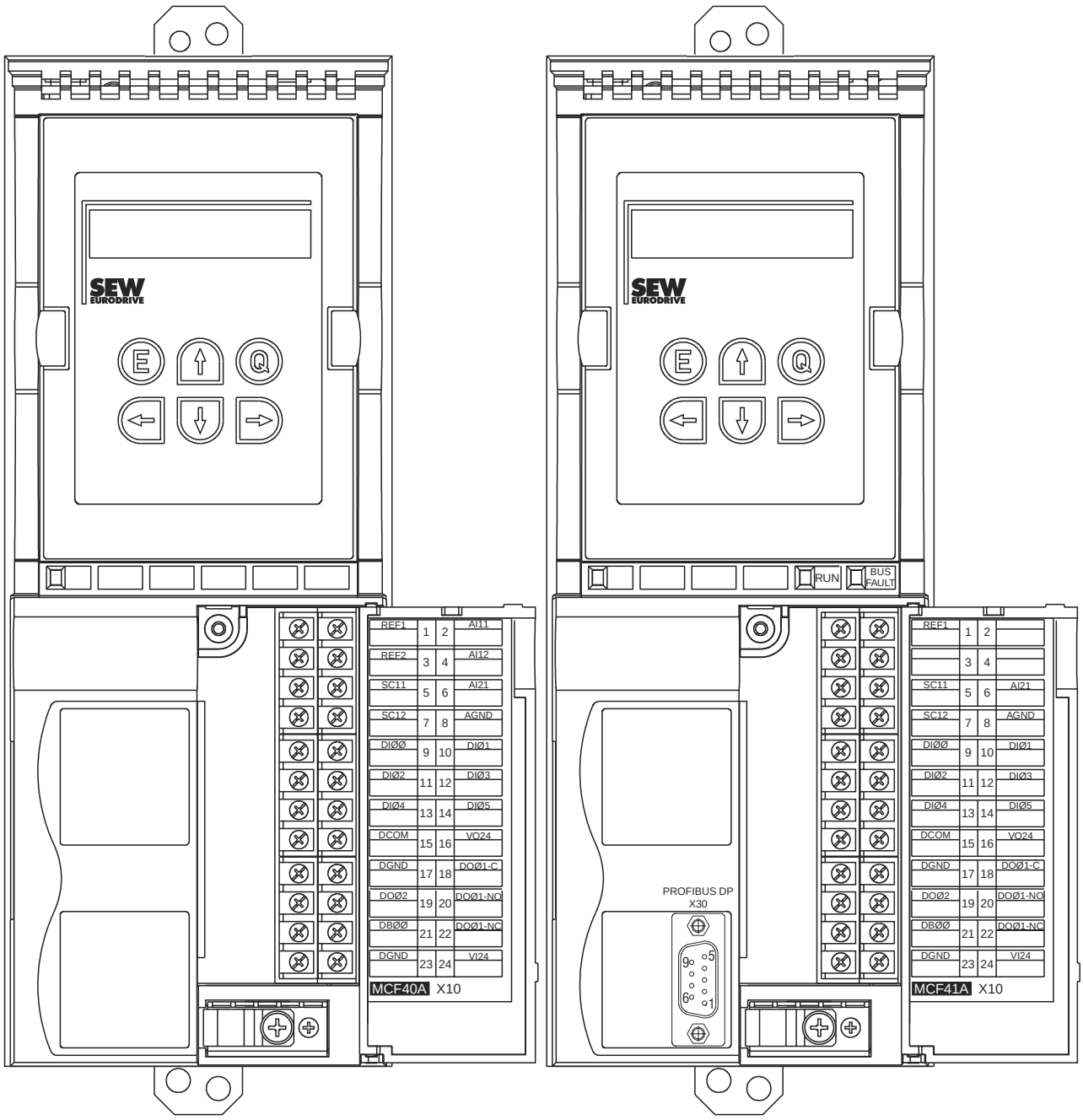


Figure 17: Front view of MCF40A, MCF41A control unit

Front view of MCV/MCS40A, MCV/MCS41A control unit

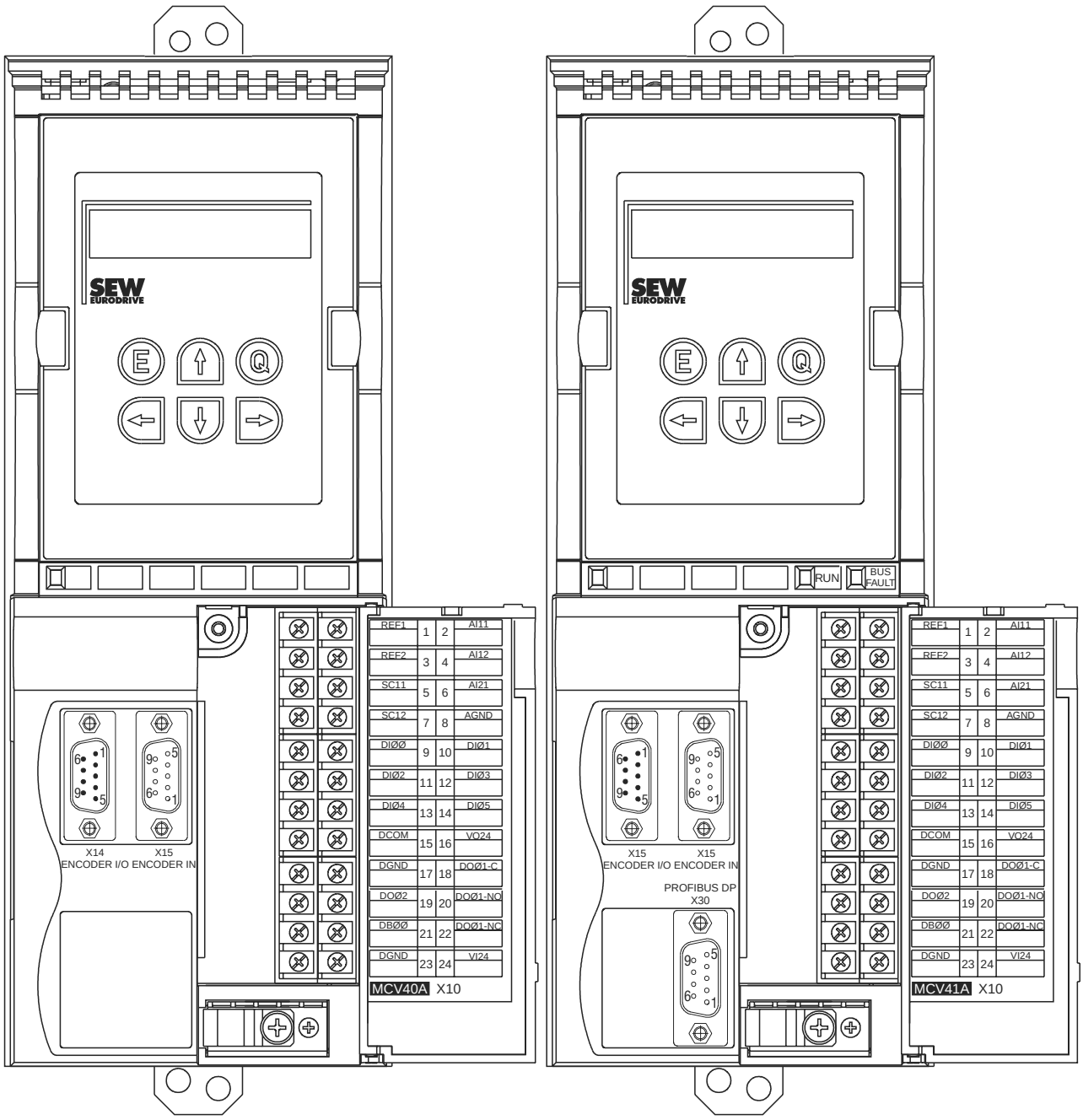


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Figure 18: Front view of MCV/MCS40A, MCV/MCS41A control unit

2.7 MOVIDRIVE® compact MCH electronics data

MOVIDRIVE® *compact*	Setpoint processing and speed ramps	
MCH40A	**Version without fieldbus interface.**	
MCH41A	**Version with PROFIBUS-DP interface.**	
Protocol option Baud rate Connection system Bus termination Station address Name of the GSD file DP identity number	PROFIBUS-DP acc. to IEC 61158 Automatic detection of baud rate from 9.6 kbaud to 12 Mbaud 9-pin sub D connector, pin assignment to IEC 61158 not integrated, implement using suitable PROFIBUS plug with terminating resistors that can be switched on 0...125, can be set using DIP switch SEW_6003.GSD 6003_{hex} (24579_{dec})	
MCH42A	**Version with INTERBUS fiber optic (FO) interface.**	
Protocol option Baud rate Connection system	INTERBUS to prEN 50254 (DIN 19258) with optically controlled FO interface 500 kbaud and 2 Mbaud, changeover via DIP switch 4 F-SMA plugs (2 × remote bus input and 2 × remote bus output)	
Applies to all versions		
Voltage supply X10:1 for setpoint input X10:6	REF1: +10 V_{DC} +5 % / -0 %, I_{max} = 3 mA REF2: -10 V_{DC} +0 % / -5 %, I_{max} = 3 mA	Reference voltages for setpoint potentiometer
Setpoint input n1 X10:2/X10:3 (Differential input) Operating mode AI11/AI12 Resolution Internal resistance	AI11/AI12: Voltage or current input, can be set with S11 and P11_, sampling interval 1 ms 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
Setpoint input n2 X10:4 TF/TH input	Analog input 0...10 V or optionally (→ P120) TF/TH input with response threshold at $R_{TF} \geq$ 2.9 kΩ ±10 %	
Internal setpoints	Parameter set 1: n11/n12/n13 = -5000...0...+5000 rpm Parameter set 2: n21/n22/n23 = -5000...0...+5000 rpm	
Time ranges of speed ramps at Δn = 3000 rpm	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 Motorized potentiometer t3 Up: 0.2...50 s Down: 0.2...50 s	

The PROFIBUS-DP interface of the MOVIDRIVE® MCH41A unit corresponds to the state-of-the-art in PROFIBUS technology. The new, ground-breaking PROFIBUS-ASIC technology has been used for these units.

The concept of the MCH41A PROFIBUS-DP interface is the same as the MOVIDRIVE® MD_60A option 'PROFIBUS fieldbus interface type DFP21A'. As a result, both PROFIBUS interfaces can be used with the same PROFIBUS project planning.

MOVIDRIVE® *compact*		Other electronics data	
Auxiliary voltage output[1]	X11:8	VO24: V_{OUT} = 24 V_{DC}, maximum current carrying capacity I_{max} = 200 mA	
Ext. voltage supply[1]	X12:6	VI24: V_{IN} = 24 V_{DC} -15 % / +20 % (range: 19.2...30 V_{DC}) to EN 61131-2	
Binary inputs Internal resistance	X11:1...X11:6	DIØØ...DIØ5: Isolated (optocoupler), PLC-compatible (EN 61131), sampling interval 5 ms $R_i \approx 3.0$ kΩ, $I_E \approx 10$ mA	
Signal level		+13 V...+30 V = '1' = Contact closed -3 V...+5 V = '0' = Contact open	To EN 61131
Function	X11:1 X11:2...X11:6	DIØØ: With fixed assignment '/Controller inhibit' DIØ1...DIØ5: Selection option → Parameter menu P60_	
Binary outputs[1]	X12:1/X12:5	DBØØ/DOØ2: PLC compatible (EN 61131-2), response time 5 ms	
Signal level		'0' = 0 V '1' = +24 V **Important:** Do not apply external voltage!	
Function	X12:1 X12:5	DBØØ: With fixed assignment '/Brake', I_{max} = 150 mA, short-circuit proof DOØ2: Selection option → Parameter menu P62_, I_{max} = 50 mA, short-circuit proof	
Analog output	X12:5	AOØ1: → Menu P64_, resolution 8-bit, I_{max} = 20 mA (short-circuit proof)	
Relay output	X12:2/3/4	DOØ1: Load capacity of the relay contacts V_{max} = 30 V_{DC}, I_{max} = 800 mA	
Function	X12:2 X12:3 X12:4	DOØ1-C: Shared relay contact DOØ2-NO: NO contact DOØ2-NC: NC contact	Selection option → Parameter menu P62_
System bus (SBus)	X10:7/10 X10:8/11	SC11/21: SBus high SC12/22: 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
Motor encoder input[1]	X15:	Permitted encoder types: • Hiperface encoders • sin/cos encoder 1 V_{SS} • TTL sensor Encoder power supply: +12 V, I_{max} = 180 mA	
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)	Input external encoder (max. 200 kHz): Permitted encoder types: • Hiperface encoders • sin/cos encoder 1 V_{SS} • TTL sensor Encoder power supply: +12 V, I_{max} = 180 mA
Reference terminals	X10:5 X10:9/X11:9/X12:7 X11:7	AGND: Reference potential for analog signals n1 and n2 and terminals X10:1 and X10:6 DGND: Reference potential for binary signals, system bus (SBus), encoder and resolver. DCOM: Reference potential for binary inputs X10:9...X10:14 (DIØØ...DIØ5).	
Permitted line cross section		only one core per terminal: 0.20...1.5 mm^2 (AWG 24...16) Use right-angled crimping pliers with 1.5 mm^2 (AWG16)	

1) **MCH40A (without fieldbus):** The unit provides a current of I_{max} = 400 mA for the +24 V outputs (VO24, DBØØ, DBØ2, encoder supply). If this value is insufficient, a 24 V_{DC} power supply unit must be connected to X10:24 (VI24). This external 24V_{DC} power supply must be capable of supplying a continuous power of 50 W and a peak power (1 s) of 100 W.

MCH41A (with PROFIBUS-DP) or MCH42A (with INTERBUS FO): SEW recommends always supplying these units with 24V_{DC} at terminal X10:24 (VI24). This external 24 V_{DC} power supply must be capable of supplying a continuous power of 50 W and a peak power (1 s) of 100 W.
The maximum total current which may be applied to the 24 V_{DC} outputs X10:16 (VO24), X10:21 (DBØØ) and X10:19 (DOØ2) is I_{max} = 400 mA.

Front view of MCH42A control unit

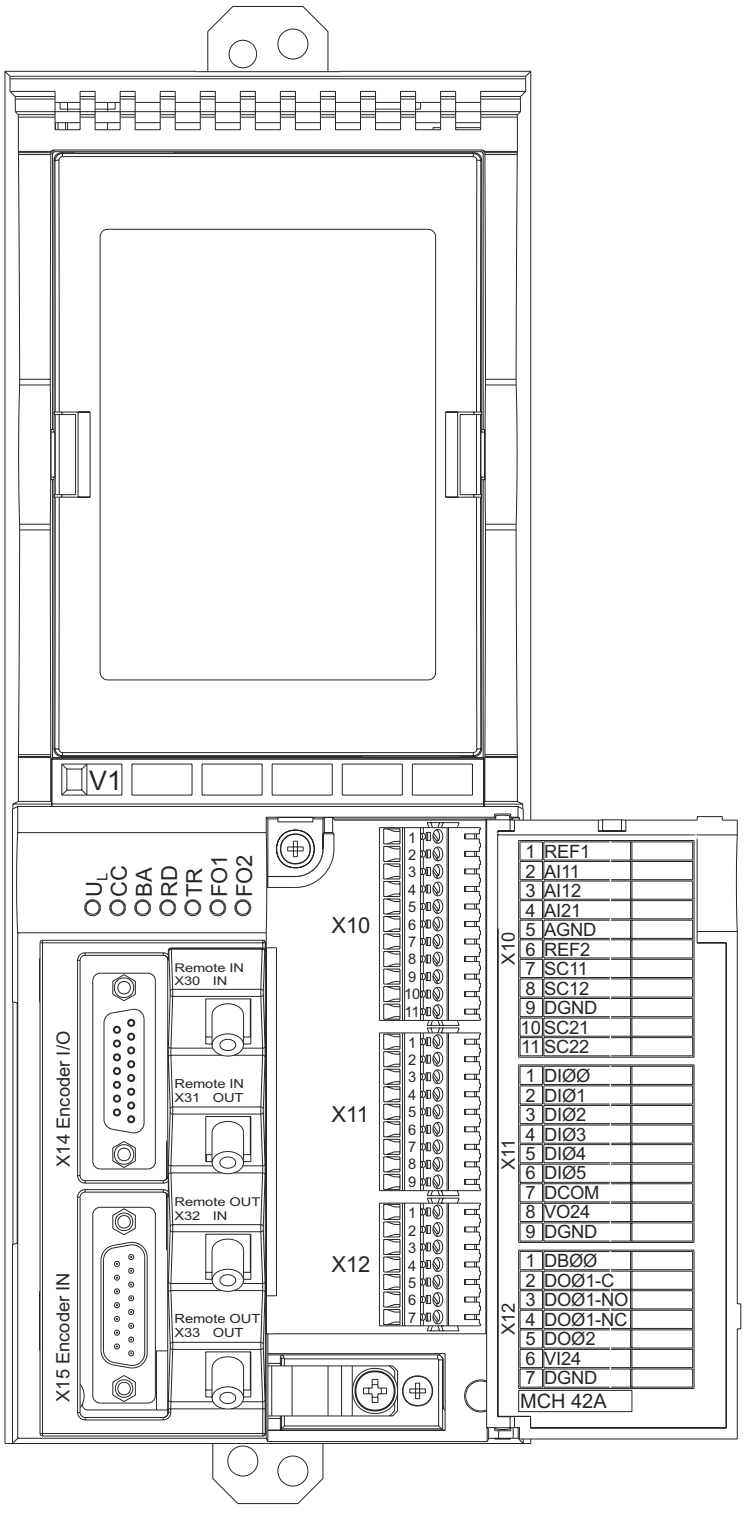

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Figure 19: Front view of MCH42A control unit

2.8 MOVIDRIVE® compact dimensions

Dimensions, size 1 (0015...0040-5A3 and 0015...0037-2A3)

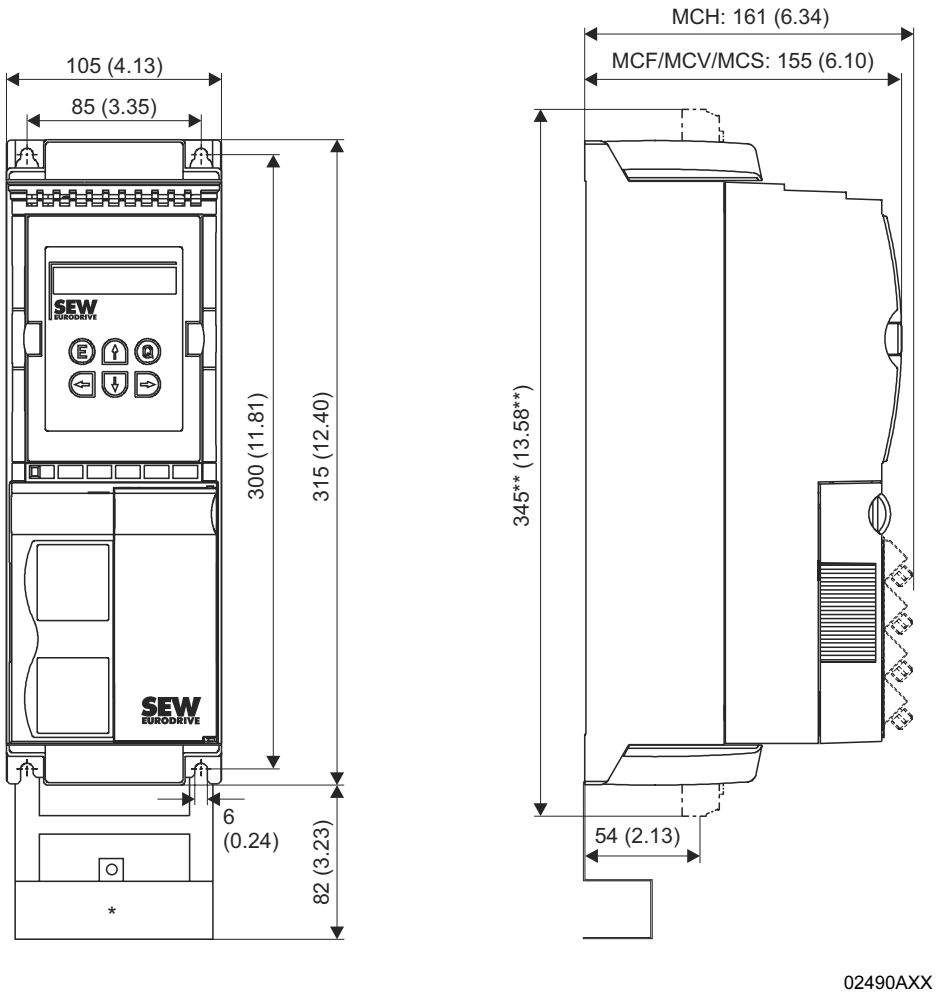

Figure 20: Dimensions, size 1, in mm (in)

* Power shield clamp

** Unit dimension with power terminals attached

Provide at least 100 mm (4 in) clearance above and below the unit to ensure adequate cooling! No lateral clearance required; the units can be lined up side-by-side.

Dimensions, size 2 (0055...0110-5A3 and 0055 / 0075-2A3)

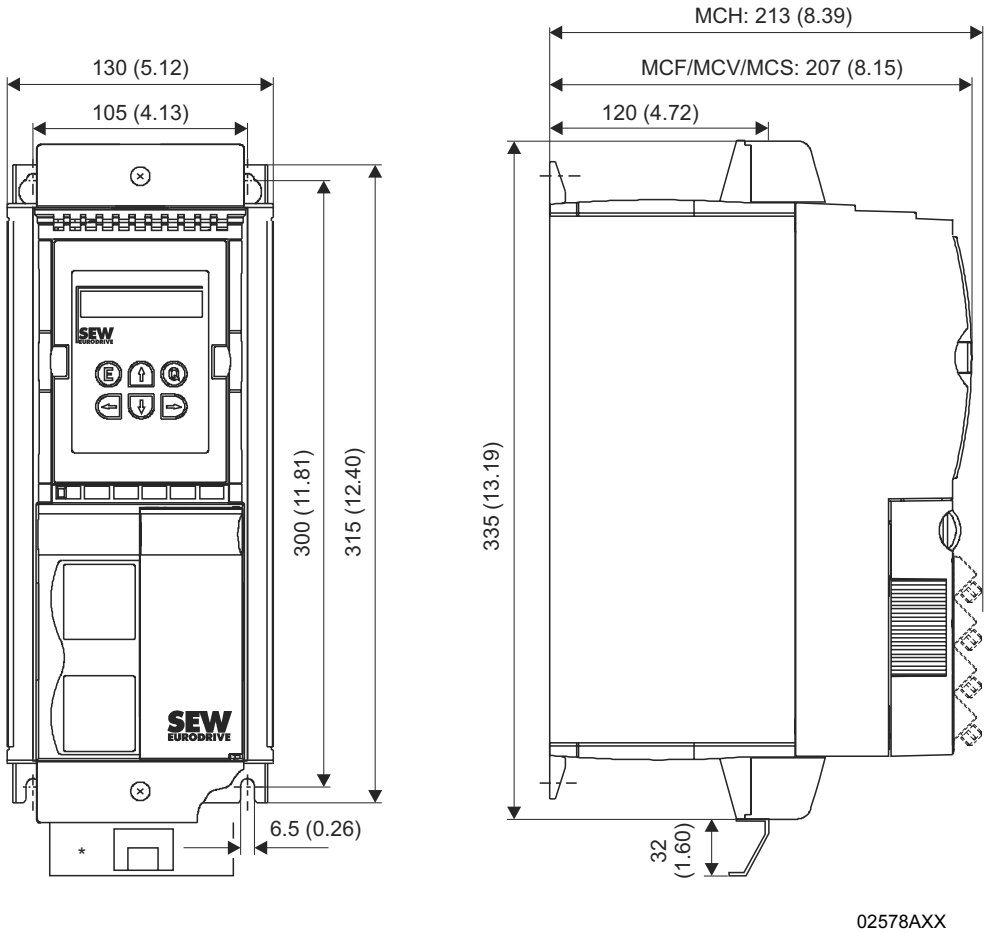

Figure 21: Dimensions, size 2, in mm (in)

* Power shield clamp

Provide at least 100 mm (4 in) clearance above and below the unit to ensure adequate cooling! No lateral clearance required; the units can be lined up side-by-side.

Dimensions, size 3 (0150...0300-503 and 0110 / 0150-203)

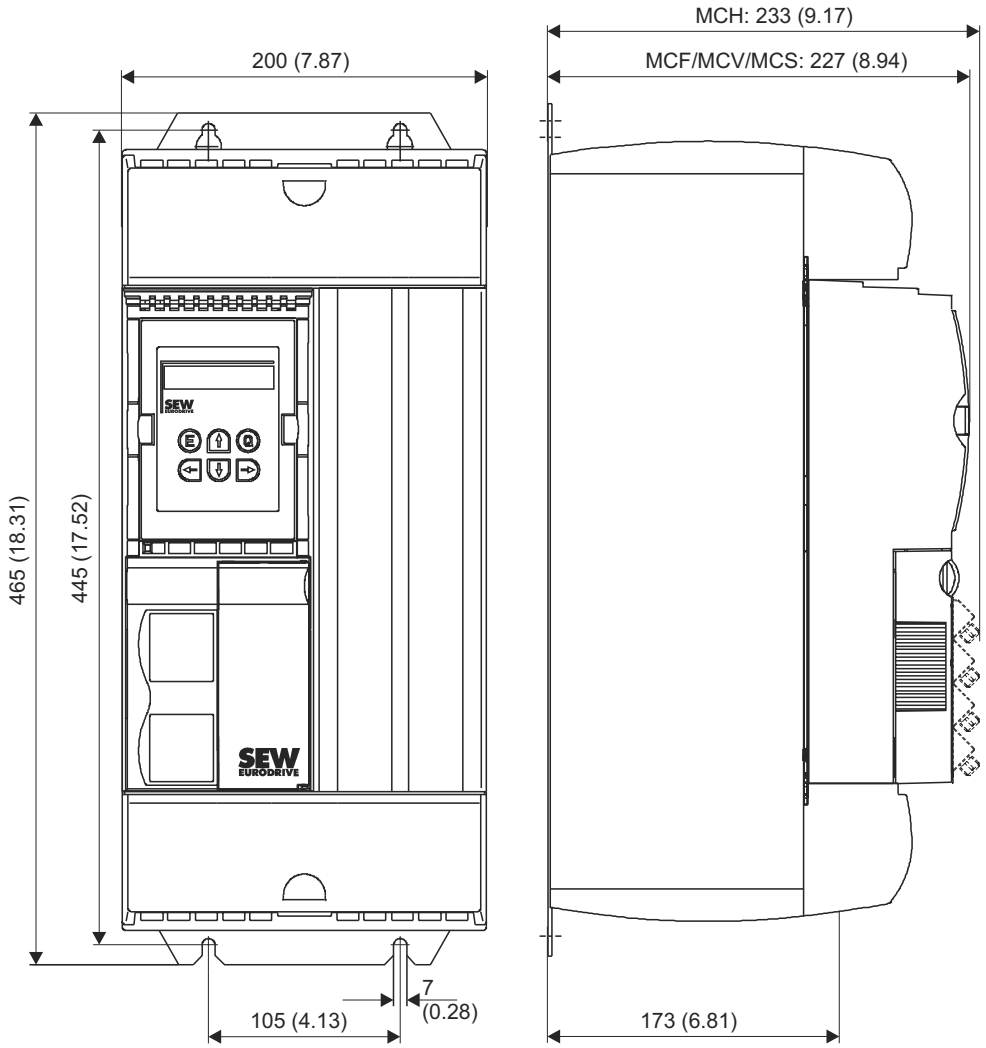

Figure 22: Dimensions, size 3, in mm (in)

Provide at least 100 mm (4 in) clearance above and below the unit to ensure adequate cooling! No lateral clearance required; the units can be lined up side-by-side.

Dimensions, size 4 (0370 / 0450-503 and 0220 / 0300-203)

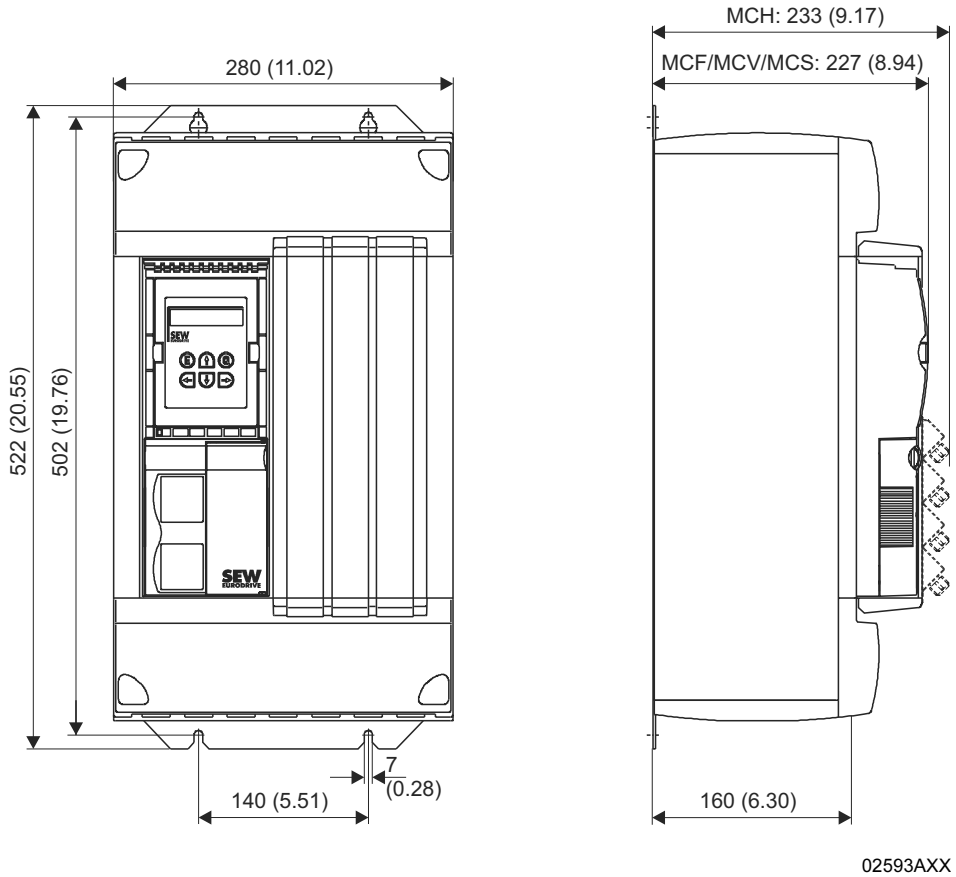

Figure 23: Dimensions, size 4, in mm (in)

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 side-by-side.

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).

Dimensions, size 5 (0550 / 0750-503)

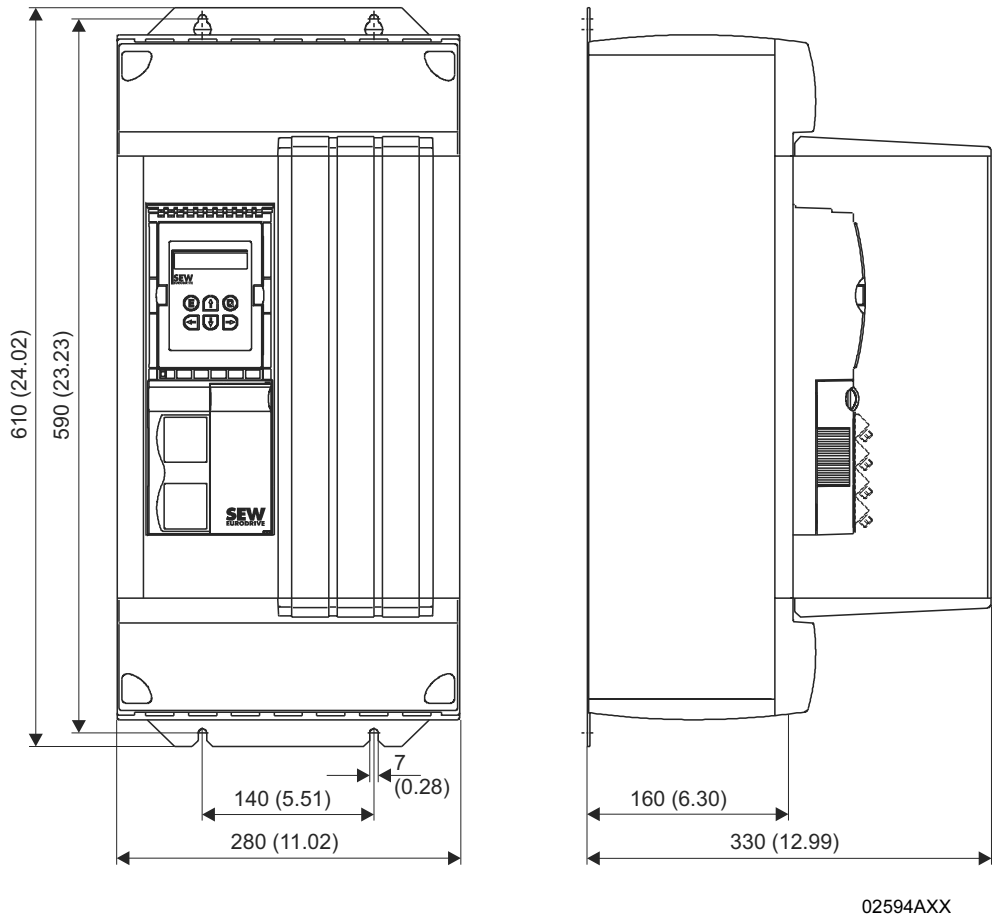

Figure 24: Dimensions, size 5, in mm (in)

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 side-by-side.

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).

2.9 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, regardless of any encoder feedback or the selected control mode (VFC, CFC, SERVO). In conjunction with encoder feedback (MCV, MCS, MCH), the IPOS$^{plus®}$ positioning control provides a high-performance point-to-point positioning capability. The IPOS$^{plus®}$ program is written using the MOVITOOLS software. Startup of the inverter, accessing parameters and editing variables are possible either with the software or the DBG11B keypad. (Note: The DBG11B can only be used for startup in VFC mode.)

Properties

- Program execution independent of encoder feedback and operating mode.
- The user program is continued even if the unit develops a malfunction (troubleshooting is possible in the user program).
- Two user programs can be run in parallel and independently of one another (task 1, interrupt-capable, and task 2).
- The user programs programmed in assembler can contain up to 800 program lines.
- User-friendly and comprehensive control options for the inverter.
- 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 MCV/MCS/ MCH only

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

Technical data

Max. program length of task 1 and task 2	**approx. 800 program lines in total (assembler programming)**
Command processing time per program line	Task 1: 1.0 ms; Task 2: 0.5 ms
Variables	512, 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...5 ms
Digital inputs/outputs	6 inputs / 3 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)

2.10 DBG11B keypad option

Description

The keypad is used for startup and for service. The basic version of MOVIDRIVE® does not have a keypad but can be upgraded.

Keypad	Language	Part number
DBG11B-08	DE/EN/FR/ES/PT (German/English/French/Spanish/Portuguese)	824 154 6
DBG11B-09	EN/IT/SV/DA/FI (English/Italian/Swedish/Danish/Finnish)	824 155 4
DBG11B-11	ES/DE/EN/FR/PT (Spanish/German/English/French/Portuguese)	824 156 2
DBG11B-12	SV/EN/IT/DA/FI (Swedish/English/Italian/Danish/Finnish)	824 157 0
DBG11B-13	EN/ES/DE/FR/PT (English/Spanish/German/French/Portuguese)	824 158 9
DBG11B-14	FR/IT/ES/PT/EN (French/Italian/Spanish/Portuguese/English)	824 248 8

Equipment

- Illuminated plain text display, five languages can be set.
- Membrane keypad with 6 keys.
- Selection between the quick menu, detailed parameter menu and startup menu in VFC mode (CFC and SERVO startup is not possible with the DBG11B).
- Can be plugged onto the inverter (TERMINAL option slot).
- Connection possible via FKG11A extension cable (part number 822 101 4).
- Enclosure IP40 (EN 60529)

Note

The DBG11B keypad option and the USS21A serial interface option are connected to the same inverter slot (TERMINAL) and cannot therefore be used at the same time.

Functions

- Displays of process values and status displays.
- Status displays of the binary inputs/outputs.
- Fault memory inquiry and fault reset.
- Displaying and setting the operating parameters and service parameters.
- Saving data and transferring parameter sets to other MOVIDRIVE® units.
- User-friendly startup menu for VFC mode.
- Storing a curve for the electronic cam.

Dimensions

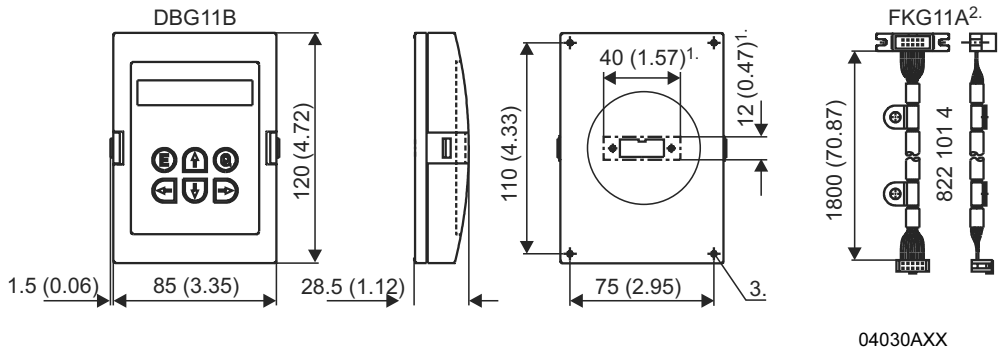

Figure 25: Dimensions, DBG11B and FKG11A, in mm (in)

1. Cut-out for the plug in the mounting plate
2. DBG11B-MOVIDRIVE® communications cable
3. Holes for tapping screws 3.5 × 9.5 mm (0.14 × 0.37 in)

2.11 Serial interface option type USS21A (RS-232 and RS-485)

Part number 822 914 7

Description MOVIDRIVE® can be equipped with isolated RS-232 and RS-485 interfaces. The RS-232 interface is configured as a 9-pin sub D female connector (EIA standard) and the RS-485 interface as a terminal connection. The interfaces are accommodated in a housing for plugging onto the inverter (TERMINAL option slot). The option can be plugged on during operation. The transmission rate of both interfaces is 9600 baud.

Startup, operation and service are possible from the PC via the serial interface. The SEW MOVITOOLS software is used for this. It is also possible to transfer parameter settings to several MOVIDRIVE® drive inverters via PC.

Note DBG11B and USS21A are connected to the same inverter slot (TERMINAL) and cannot be used at the same time.

RS-232 interface To connect a PC to the MOVIDRIVE® USS21A option, use a commercial shielded serial interface cable with a 1:1 connection assignment.

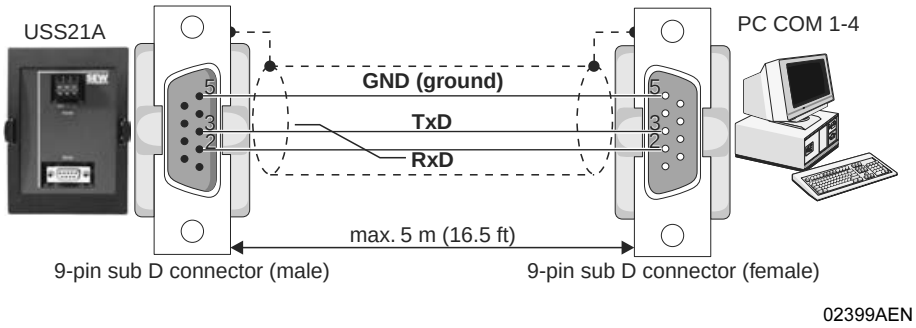

Figure 26: USS21A-PC connection cable (1:1 connection assignment)

RS-485 interface You can network up to 16 MOVIDRIVE® units for communications purposes (max. total cable length 200 m (660 ft)) via the RS-485 interface of the USS21A. Dynamic terminating resistors are permanently installed, so do not connect any external terminating resistors.

Unit addresses 0...99 are permitted with multipoint connections. In this case, the 'point to point connection' must not be selected in MOVITOOLS. The communications address in MOVITOOLS and the RS-485 address of the MOVIDRIVE® unit (P810) must be the same.

Dimensions

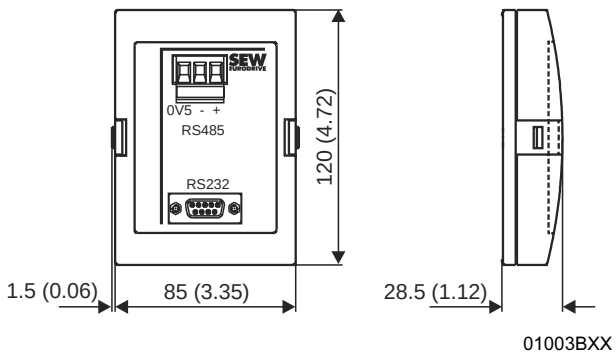

Figure 27: Dimensions, USS21A, in mm (in)

2.12 5 V encoder power supply option type DWI11A

Part number 822 759 4

Description If you are using an incremental encoder with a 5 V_{DC} 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 5 V_{DC} power supply for the encoder. This involves converting the 24 V_{DC} power supply for the encoder inputs to 5 V_{DC} 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.

Do not connect incremental encoders with 5 V_{DC} encoder power supply directly to the encoder inputs X14: and X15:. Such a connection 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, 18...30 V_{DC}, 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 for connection of the encoder.

Dimensions

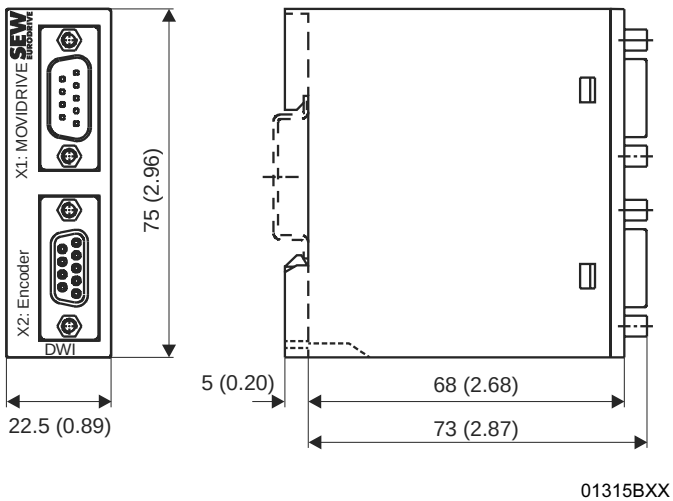

Figure 28: Dimensions, DWI11A, in mm (in)

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

2.13 MOVITOOLS 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 three ranges of units MOVIDRIVE® MD_60A, MOVIDRIVE® *compact* and MOVITRAC® 07.

- SHELL can be used for starting up the drive and setting its parameters in a convenient fashion.
- SCOPE provides extensive oscilloscope functions for diagnostics 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 displays the status of the connected unit.

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

MOVITOOLS is supplied on a CD-ROM and can also be downloaded from the SEW 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)

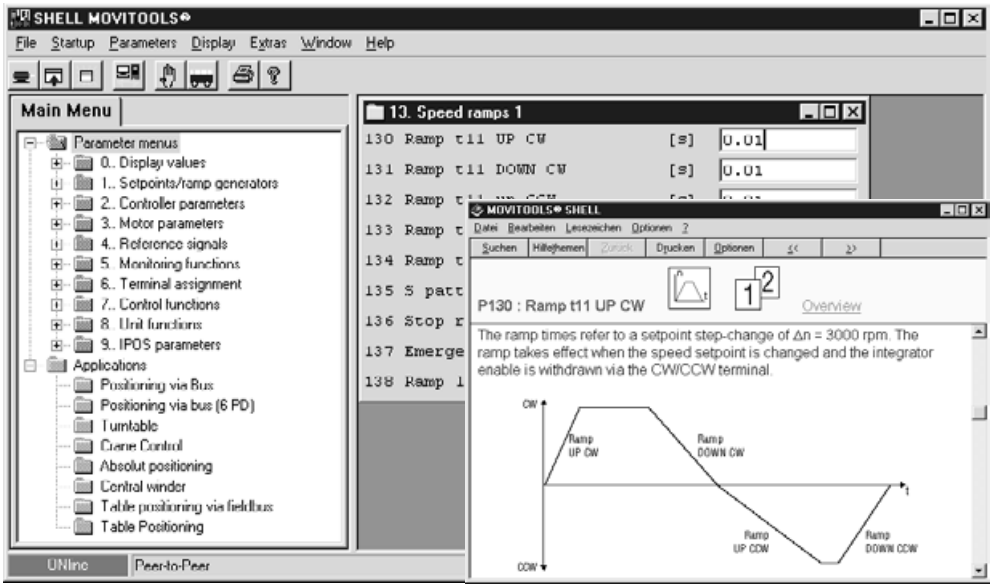

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Figure 29: MOVITOOLS window

2.14 Application modules for MOVIDRIVE® compact

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

IPOS$^{plus®}$

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

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

Users do not have to go to the trouble of writing the IPOS$^{plus®}$ control program themselves. SEW offers application modules for MOVIDRIVE® *compact* units in application version. The application modules form part of the MOVITOOLS software package.

Advantages

The application modules offer the following benefits:

- 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, i.e. there is no need for complicated programming
- No programming experience necessary
- Steep learning curve

Scope of supply and documentation

The application modules form part of the MOVITOOLS software package and can be used with units in application version (MOVIDRIVE® *compact*...-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.

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

Positioning

The application modules for the 'Positioning' application are suited to all applications which involve target positions being specified and then movement taking place to those positions. The sequence of motion can be linear or rotational.

These 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 distinguishes between whether the movement records are managed in the inverter or in the master PLC.

Movement records in the inverter

- **Table positioning with bus control**

You can manage up to 32 movement records in the inverter with this application module. A movement record is made up of the destination, speed and ramp. The destination to which movement is to take place is selected using binary code, by means of virtual terminals (fieldbus, system bus). The application module comes 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.
- Menu system for startup and diagnostics
  - Freely definable user travel units
  - Calculation of position resolution during positioning via the motor encoder
  - Graphical position display

This application module is suited to applications in which movement has to take place to a limited number of different destinations only and that require the highest possible degree of independence from the machine control.

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.

Movement records in the PLC

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

In these application modules, the movement records are managed in the PLC. The destination 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.
- Straightforward connection to the machine control.

- Menu system for startup and diagnostics
  - 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 for 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.

Rotational positioning

- **Rotary axis**

You can manage up to 16 movement records in the inverter with this application module. A movement record is made up of the destination, speed and ramp. The destination to which movement is to take place is selected using binary code, by means of the binary inputs of the inverter or via virtual terminals (fieldbus, system bus). The position measurement can only take place with 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.
- Positioning with position optimization or positioning with a predefined direction of rotation.
- Pulse mode with 16 step widths.
- External encoder for position detection possible.
- Menu system for startup and diagnostics
  - Calculation of position resolution during positioning via the motor encoder
  - Graphical position display

This application module is suited for 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** (short: central winder)

In this application, 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:

- Calculation of the reel diameter and the tensile force.
- Material tear monitoring.
- Material length counter.
- Straightforward connection to the machine control.
- Menu system for startup and diagnostics
  - Adjustable winding curve
  - Display of web speed and current diameter

This application module is suited for applications in which an endless material, e.g. paper, film, foam, textiles or sheet metal 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.

Controlling

- **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:

- Cut edge protection or singling using the 'Draw gap' function.
- Immediate cut function by manual interrupt.
- Material length counter.
- Straightforward connection to the machine control.
- Menu system for startup and diagnostics
  - Display of the current cut length and the material speed
  - Display of the saw drive speed

This application module is suited for applications in which endless material has to be cut, sawn or pressed, e.g. 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

2.15 Braking resistor option type BW...

General information

The braking resistors in the BW... series are adapted to the technical characteristics of MOVIDRIVE® drive inverters.

Flat-type braking resistor

- Shockproof (IP54)
- Internal thermal overload protection (fuse which cannot be replaced)
- Touch guard and mounting rail mounting available from SEW 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 recommends 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. As a rule, braking resistors are 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).

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		BW100-005	BW100-006	BW168	BW268	BW147	BW247	BW347
Part number		826 269 1	821 701 7	820 604 X	820 715 1	820 713 5	820 714 3	820 798 4
Load capacity at	**100 % cdf**	0.45 kW	0.6 kW	0.8 kW	1.2 kW	1.2 kW	2.0 kW	4.0 kW
	50 % cdf[1)]	0.60 kW	1.1 kW	1.4 kW	2.2 kW	2.2 kW	3.8 kW	7.6 kW
	25 % cdf	0.83 kW	1.9 kW	2.6 kW	3.8 kW	3.8 kW	6.4 kW	12.8 kW
	12 % cdf	1.11 kW	3.5 kW	4.7 kW	6.7 kW	7.2 kW	12 kW	14.4 kW[2)]
	6 % cdf	2.00 kW	5.7 kW	7.6 kW	10 kW[2)]	11 kW	14.4 kW[2)]	14.4 kW[2)]
		Note the **regenerative power limit** of the inverter! (= 150 % of the recommended motor power → Technical Data)						
Resistance value	R_{BW}	100 Ω ±10 %		68 Ω ±10 %		47 Ω ±10 %		
Trip current (of F16)	I_F	0.8 A_{RMS}	1.8 A_{RMS}	2.5 A_{RMS}	3.4 A_{RMS}	3.5 A_{RMS}	4.9 A_{RMS}	7.8 A_{RMS}
Type		Flat type	Wire resistor on ceramic core					
Connections		Cable	Ceramic terminals 2.5 mm^2 (AWG12)					
Enclosure		IP54	IP20 (when mounted)					
Ambient temperature	ϑ_{amb}	-20...+45 °C						
Type of cooling		KS = Self-cooling						
for MOVIDRIVE®		0015/0022	0015...0040			0055/0075		

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

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

Braking resistor type		BW039-012	BW039-026	BW039-050	BW018-015	BW018-035	BW018-075
Part number		821 689 4	821 690 8	821 691 6	821 684 3	821 685 1	821 686 X
Load capacity at	100 % cdf	1.2 kW	2.6 kW	5.0 kW	1.5 kW	3.5 kW	7.5 kW
	50 % cdf[1)]	2.1 kW	4.6 kW	8.5 kW	2.5 kW	5.9 kW	12.7 kW
	25 % cdf	3.8 kW	8.3 kW	15.0 kW	4.5 kW	10.5 kW	22.5 kW
	12 % cdf	7.0 kW	15.3 kW	17.3 kW[2)]	6.7 kW	15.7 kW	33.7 kW
	6 % cdf	11.4 kW	17.3 kW[2)]	17.3 kW[2)]	11.4 kW	26.6 kW	37.5 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 %			18 Ω ±10 %		
Trip current (of F16)	I_F	4.2 A_{RMS}	7.8 A_{RMS}	11 A_{RMS}	4.0 A_{RMS}	8.1 A_{RMS}	14 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®		0110			0150/0220 and 2 × parallel with 0370/0450		

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		BW915	BW012-025	BW012-050	BW012-100	BW106	BW206
Part number		821 260 0	821 680 0	821 681 9	821 682 7	821 050 0	821 051 9
Load capacity at	100 % cdf	16 kW	2.5 kW	5.0 kW	10 kW	13 kW	18 kW
	50 % cdf[1)]	27 kW	4.2 kW	8.5 kW	17 kW	24 kW	32 kW
	25 % cdf	45 kW[2)]	7.5 kW	15.0 kW	30 kW	40 kW	54 kW
	12 % cdf	45 kW[2)]	11.2 kW	22.5 kW	45 kW	66 kW	88 kW
	6 % cdf	45 kW[2)]	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}	15 Ω ±10 %	12 Ω ±10 %			6 Ω ±10 %	
Trip current (of F16)	I_F	28 A_{RMS}	6.1 A_{RMS}	12 A_{RMS}	22 A_{RMS}	38 A_{RMS}	42 A_{RMS}
Type		Grid resistor					
Connections		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®		0220	0300			0370...0750	

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[3]
		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.

3) 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.

Touch guard

Touch guard is available for braking resistors in flat-pack design.

Touch guard	BS005
Part number	813 152 X
For braking resistor	BW100-005

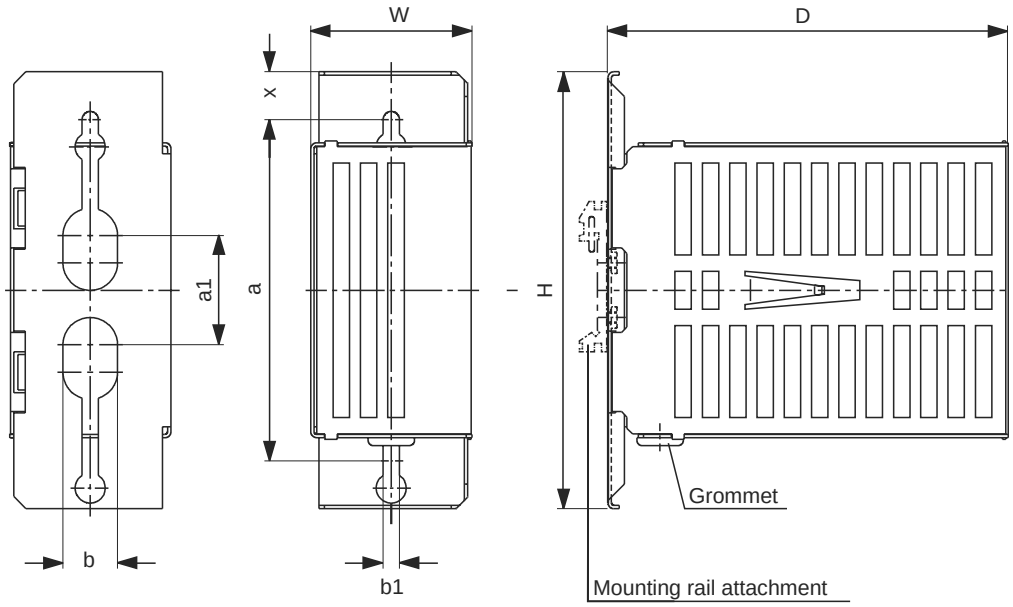

Figure 30: Dimensions, touch guard

All dimensions in mm (in):

Touch guard	Main dimensions			Fixing dimensions					Weight
	W	H	D	a	a1	b	b1	x	kg (lb)
BS005	60 (2.36)	160 (6.30)	252 (9.92)	125 (4.92)	40 (1.57)	20 (0.79)	6 (0.24)	17.5 (0.69)	0.5 (1.1)

Mounting rail installation

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

DKB11A heat sink for brake resistors in flat-pack design

Part number 814 345 5

Description The DKB11A heat sink for brake resistors in flat-pack 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).

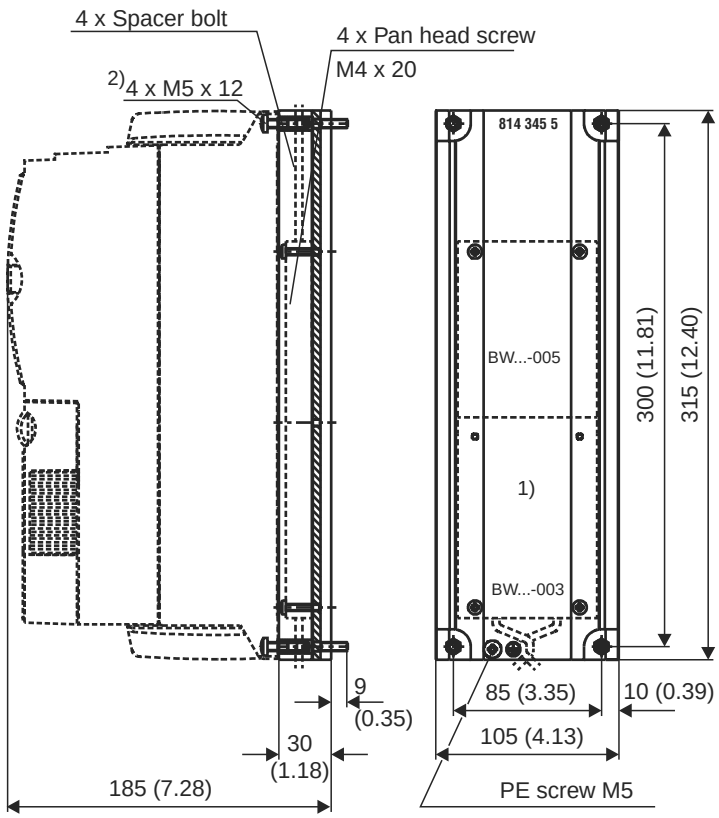

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Figure 31: Dimensions, DKB11A heat sink for brake resistors in flatpack design in mm (in)

1) Mounting surface for the braking resistor

2) Retaining screws, not included in scope of delivery

Dimensions, BW...

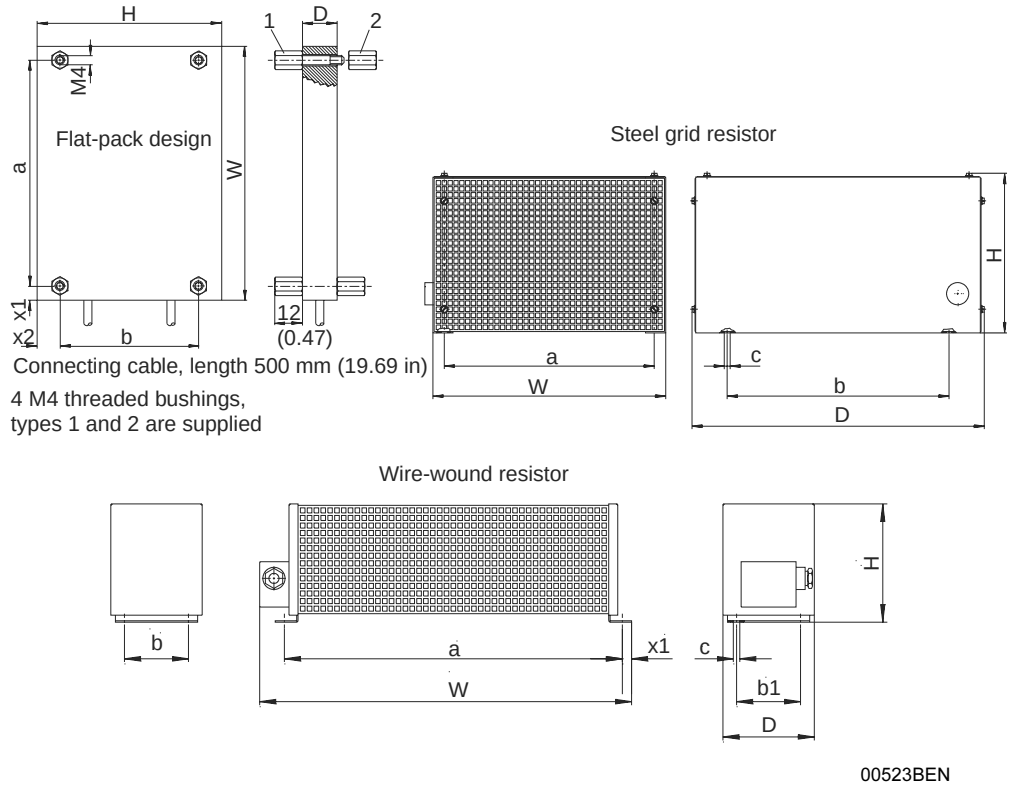


Figure 32: Dimensions, BW... braking resistors

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 threaded bushes	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)

2.16 Line chokes option type ND...

- To increase the 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	ND045-013	ND085-013	ND1503	ND200-0033
Part number		826 012 5	826 013 3	826 014 1	825 548 2	826 579 8
Rated voltage	V_N	$3 \times 380\ V_{AC}$ -10 %...$3 \times 500\ V_{AC}$ +10 %, 50/60 Hz				
Rated current[1]	I_N	20 A_{AC}	45 A_{AC}	85 A_{AC}	150 A_{AC}	200 A_{AC}
Power loss at I_N	P_V	10 W	15 W	25 W	65 W	100 W
Inductance	L_N	0.1 mH				0.03 mH
Ambient temperature	ϑ_{amb}	-25...+45 °C				
Enclosure		IP 00 (EN 60529)				
Connections		Modular terminal blocks 4 mm^2 (AWG 10)	Modular terminal blocks 10 mm^2 (AWG 8)	Modular terminal blocks 35 mm^2 (AWG 2)	M10 stud / PE: M8 stud	
Assignment to 400/500 V units (...-5_3)						
In rated operation (100 %)		0015...0075	0110...0220	0300...0450 and MDR60A0370	0550/0750	MDR60A0750
With increased power (VFC, 125 %)		0015...0075	0110/0150	0220...0370	0450...0750	
Assignment to 230 V units (...-2_3)						
In rated operation (100 %)		0015...0055	0075/0110	0150/0220	0300	-
With increased power (VFC, 125 %)		0015...0037	0055/0075	0110/0150	0220/0300	-

1) 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**!

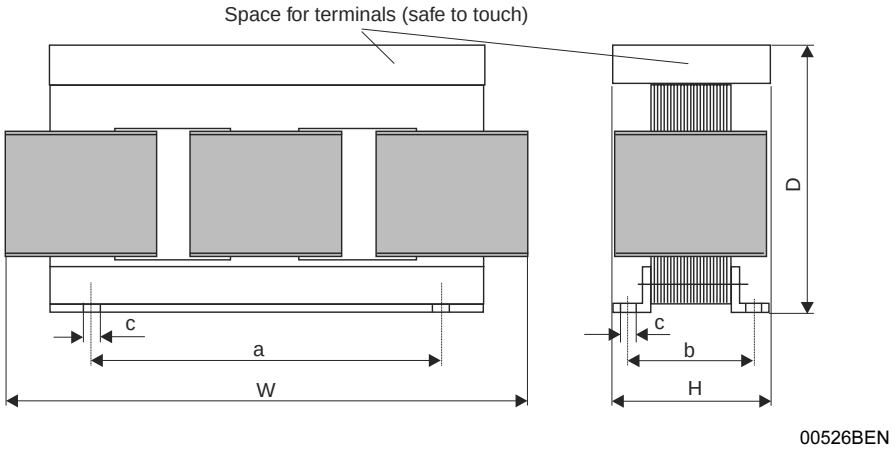


Figure 33: Dimensions, ND... line chokes

Mounting position as required

All dimensions in mm (in):

Line choke type	Main dimensions			Fixing dimensions		Hole dim.	Weight
	W	H	D	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)

2.17 NF...-... line filter option

- To suppress interference emissions on the line side of inverters

Input filter type	NF009-503	NF014-503	NF018-503	NF035-503	NF048-503	NF063-503	NF085-503	NF115-503	NF150-503
Part number	827 412 6	827 116 X	827 413 4	827 128 3	827 117 8	827 414 2	827 415 0	827 416 9	827 417 7
Rated voltage V_N	3×380 V_{AC} -10 %...3×500 V_{AC} +10 %, 50/60 Hz								
Rated current I_N	9 A_{AC}	14 A_{AC}	18 A_{AC}	35 A_{AC}	48 A_{AC}	63 A_{AC}	85 A_{AC}	115 A_{AC}	150 A_{AC}
Power loss at $I_N P_V$	6 W	9 W	12 W	15 W	22 W	30 W	35 W	60 W	90 W
Earth-leakage current at V_N	< 25 mA	< 25 mA	< 25 mA	< 25 mA	< 40 mA	< 30 mA	< 30 mA	< 30 mA	< 30 mA
Ambient temperature ϑ_{amb}	-25...+40 °C								
Enclosure	IP 20 (EN 60529)								
Connections L1-L3/L1'-L3'	4 mm^2 (AWG 10)			10 mm^2 (AWG 8)		16 mm^2 (AWG 6)	35 mm^2 (AWG 2)	50 mm^2 (AWG1/0)	95 mm^2 (AWG4/0)
PE	M5 stud			M5 stud	M6 stud	M6 stud	M8 stud	M10 stud	M10 stud
Assignment to 400/500 V units (...-5_3)									
In rated operation (100 %)	0015... 0040	0055/ 0075	-	0110/ 0150	0220	0300	0370/ 0450	0550	0750
With increased power (VFC, 125 %)	0015... 0030	0040/ 0055	0075	0110	0150	0220	0300/ 0370	0450	0550/ 0750
Assignment to 230 V units (...-2_3)									
In rated operation (100 %)	0015/ 0022	0037	-	0055/ 0075	0110	0150	0220	0300	-
With increased power (VFC, 125 %)	0015	0022	0037	0055/ 0075	-	0110/ 0150	-	0220/ 0300	-

The effectiveness of input filters is restricted in IT systems.

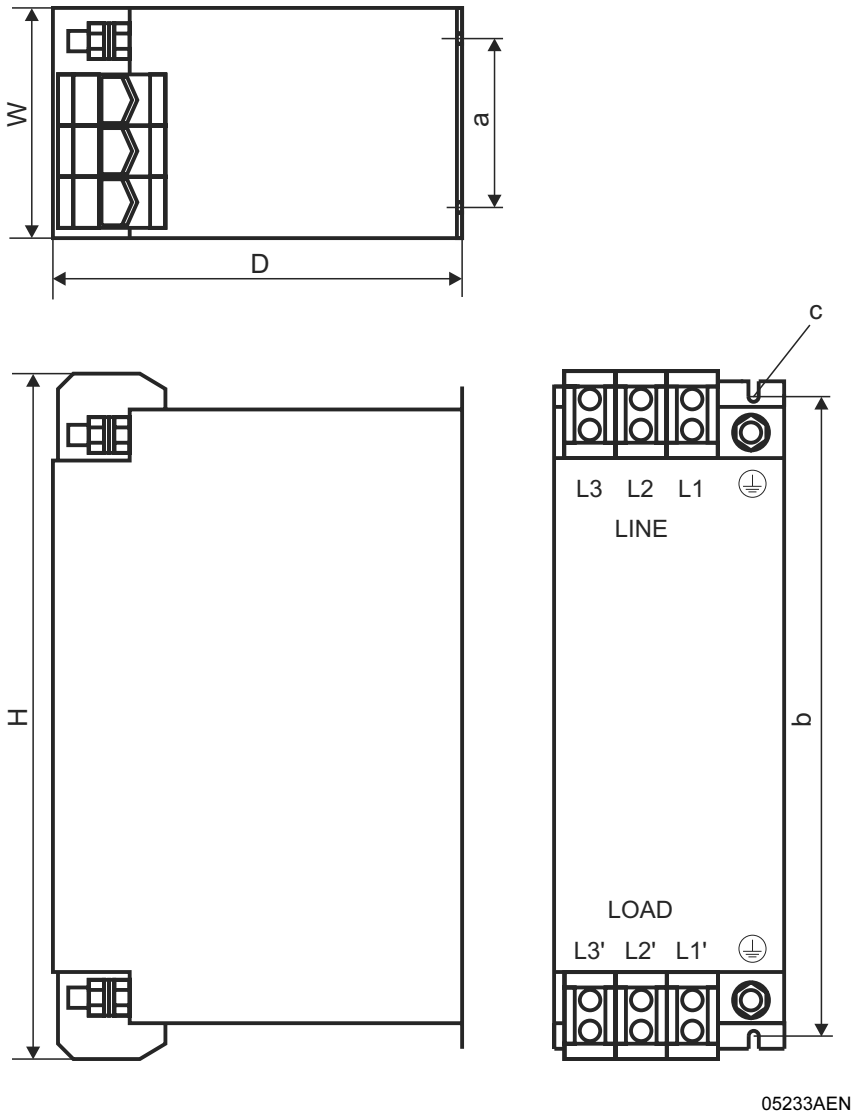


Figure 34: Dimensions, NF input filters

Mounting position as required

All dimensions in mm (in):

Input filter type	Main dimensions			Fixing dimensions		Hole dimension	PE connection	Weight
	W	H	D	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)

2.18 Output choke option type HD...

- To suppress radiated interference from the unshielded motor cable. We recommend routing the motor cable through the output choke with five loops. Less than five loops 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 loops, and three output chokes in series if there are three loops.

Output chokes are allocated on the basis of the cable cross sections of the motor feeders. Consequently, there is no separate allocation table for the 230 V units.

Output choke type	HD001	HD002	HD003
Part number	813 325 5	813 557 6	813 558 4
Dimensions W × H × D	121 × 64 × 131 mm (4.76 × 2.52 × 5.16 in)	66 × 49 × 73 mm (2.60 × 1.93 × 2.87 in)	170 × 64 × 185 mm (6.69 × 2.52 × 7.28 in)
Inside diameter d	50 mm (1.97 in)	23 mm (0.91 in)	88 mm (4.46 in)
Max. power loss P_{Vmax}	15 W	8 W	30 W
Weight	0.5 kg (1.1 lb)	0.2 kg (0.44 lb)	1.1 kg (2.42 lb)
For cable cross sections	1.5...16 mm^2 (AWG 16...6)	≤ 1.5 mm^2 (AWG 16)	≥ 16 mm^2 (AWG 6)

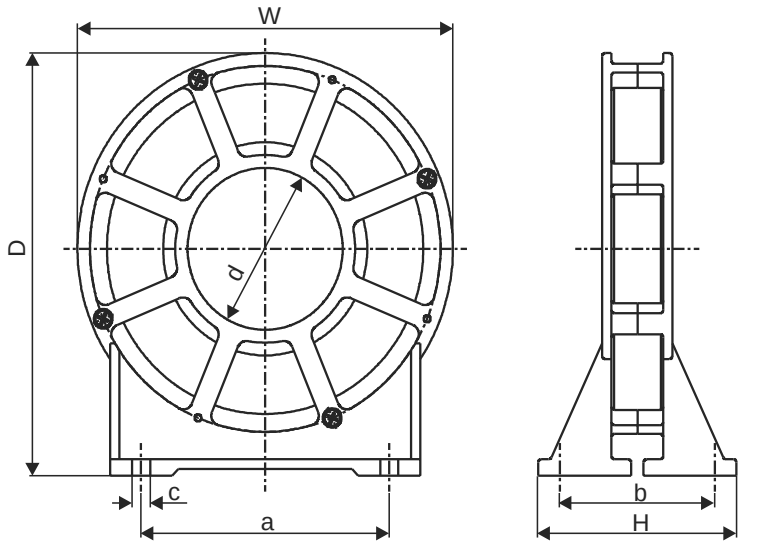


Figure 35: Dimensions, HD... output chokes

Mounting position as required

All dimensions in mm (in):

Output choke type	Main dimensions			Fixing dimensions		Inside ∅	Hole dimension
	W	H	D	a	b	d	c
HD001	121 (4.76)	64 (2.52)	131 (5.16)	80 (3.15)	50 (1.97)	50 (1.97)	5.8 (0.23)
HD002	66 (2.60)	49 (1.93)	73 (2.87)	44 (1.73)	38 (1.50)	23 (0.91)	
HD003	170 (6.69)	64 (2.52)	185 (7.28)	120 (4.72)	50 (1.97)	88 (3.46)	7.0 (0.28)

2.19 Output filter option type HF...

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

- In group drives (several motor feeders in parallel); the discharge currents in the motor cables are suppressed.
- To protect the motor winding insulation of non-SEW motors which are not suitable for use with PWM inverters and could be damaged by voltage spikes in long motor feeders (> 100 m).

- Output filters are only allowed to be used with 400/500 V units type MCF, MCV and MCH in VFC operating modes. Do not use with 230 V units, do not use with type MDV in CFC operating modes, do not use with type MCH in CFC or SERVO operating modes and do not use with type MDS.
- Output filters are not allowed to be used in hoists.

Output filter type		HF015-503	HF022-503	HF030-503	HF040-503	HF055-503
Part number		826 030 3	826 031 1	826 032 X	826 311 6	826 312 4
Rated voltage	V_N	$3 \times 380\ V_{AC}$ -10 %...$3 \times 500\ V_{AC}$ +10 %, 50/60 Hz[1]				
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[2] $I_{N\ 400\ V}$ (at $V_{mains} = 3 \times 400\ V_{AC}$)		4 A_{AC}	6 A_{AC}	8 A_{AC}	10 A_{AC}	12 A_{AC}
Rated throughput current[2] $I_{N\ 500\ V}$ (at $V_{mains} = 3 \times 500\ V_{AC}$)		3 A_{AC}	5 A_{AC}	6 A_{AC}	8 A_{AC}	10 A_{AC}
Earth-leakage current at V_N	ΔI	0 mA				
Power loss at I_N	P_V	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 Complies with 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 mm^2 (AWG 20...10)				10 mm^2 (AWG 8)
Weight		4.4 kg (9.68 lb)			10.8 kg (23.76 lb)	
For MOVIDRIVE® MD_60A...-5_3 In rated operation (100 %)		0015	0022	0030	0040	0055
With increased power (125 %)		-	0015	0022	0030	0040

Output filter type		HF075-503	HF450-503	HF023-403	HF033-403	HF047-403
Part number		826 313 2	826 948 3	825 784 1	825 785 X	825 786 8
Rated voltage	V_N	$3 \times 380\ V_{AC}$ -10 %...$3 \times 500\ V_{AC}$ +10 %, 50/60 Hz[1]				
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[2] $I_{N\ 400\ V}$ (at $V_{mains} = 3 \times 400\ V_{AC}$)		16 A_{AC}	90 A_{AC}	23 A_{AC}	33 A_{AC}	47 A_{AC}
Rated throughput current[2] $I_{N\ 500\ V}$ (at $V_{mains} = 3 \times 500\ V_{AC}$)		13 A_{AC}	72 A_{AC}	19 A_{AC}	26 A_{AC}	38 A_{AC}
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 Complies with 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 mm^2 (AWG 8)	35 mm^2 (AWG 2)	25 mm^2 (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)
For MOVIDRIVE® MD_60A...-5_3 In rated operation (100 %)		0075	0370/0450/ 0550[3]/0750[3]	0110	0150/0300[3]	0220
With increased power (125 %)		0055	0300/0370/0450/ 0550/0750	0075	0110/0220[3]	0150

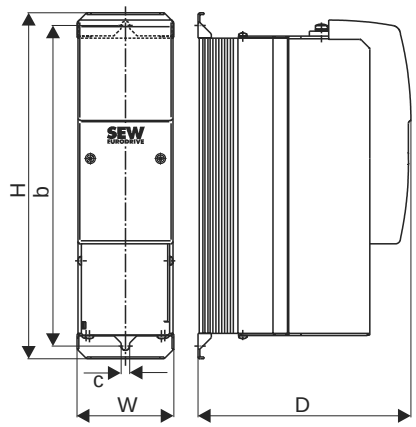
1) A reduction of 6 % I_N per 10 Hz applies above f_{AN} = 60 Hz for the rated throughput current I_N.

2) Only applies to operation without U_Z connection. For operation with U_Z connection, observe the project planning instructions in the MOVIDRIVE® *compact* System Manual, Sec. 'Project Planning/Connecting the optional power components'.

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

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

HF015/022/030-503



HF040/055/075-503

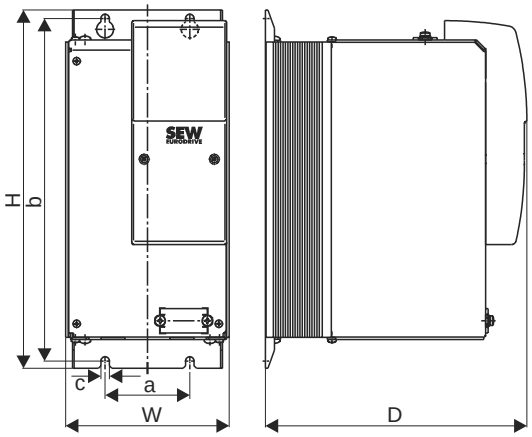


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Figure 36: Dimensions, output filter HF015...075-503

Only the mounting position shown in the dimensions diagram 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 side-by-side.

HF450-503

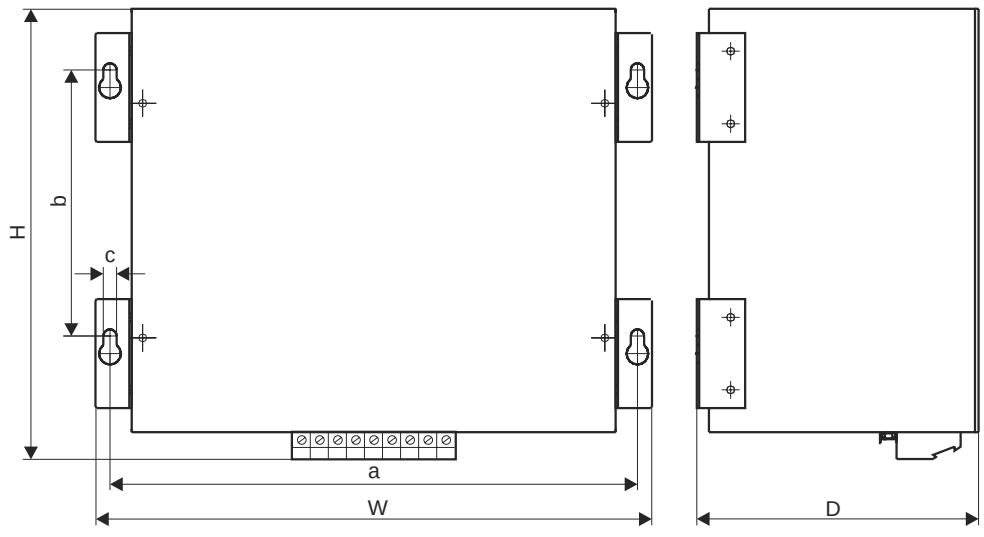

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Figure 37: Dimensions, output filter HF450-503

Only the mounting position shown in the dimensions diagram is permitted

Output filter type	Main dimensions			Fixing dimensions		Hole dimension	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)

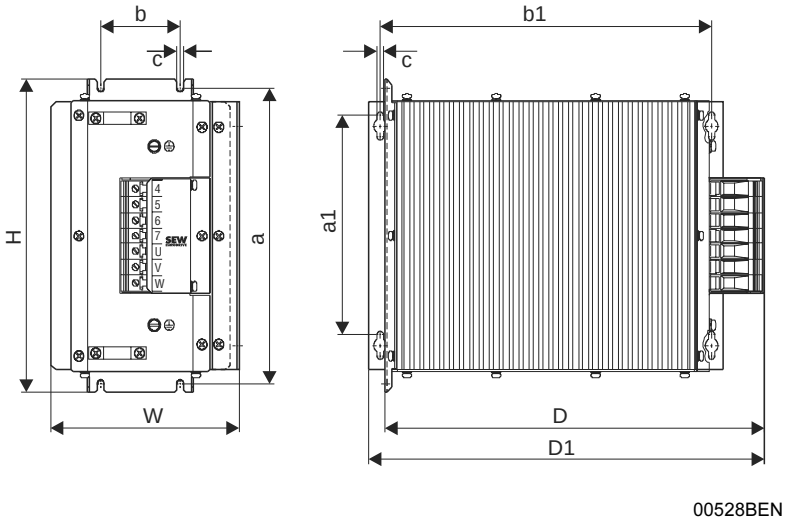

Figure 38: Dimensions, output filter HF...-403

Type	Main dimensions			Fixing dimensions				Hole dimension	Ventilation clearance		
				Standard installation		Crossways mounting position					
	W	H	D/D1	a	b	a1	a2	c	At side	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)						

2.20 Pre-fabricated cables

Overview

SEW offers cable sets and prefabricated cables for straightforward and error-free connection of various system components to MOVIDRIVE®. Specifically, these are:

1. Cable sets for DC link connection MDR → MCF/MCV/MCS/MCH
2. Motor cables and extension cables for connecting CM motors to MCS and MCH
3. Motor cables for connecting DS/DY motors to MCS
4. Hiperface cables, resolver cables and extension cables (plug and terminal box versions) for CM/DS/DY motors
5. VR forced cooling fan cables and extension cables
6. Brake cables
7. Encoder cables for connecting the motor encoder to encoder input X15 of the MCV basic unit or to 'X2: Encoder' of the 5 V encoder power supply type DWI11A
8. Encoder connection 'X1: MOVIDRIVE' of the DWI11A and X15 MCV basic unit
9. Encoder cables for connecting an external encoder or a control (encoder simulation output) to X14 of the MCV/MCS basic unit
10. Encoder connection (MCV/MCS: master X14 → slave X14)

It is necessary to differentiate between whether the cables are intended for fixed routing or for use in cat tracks. The cables are pre-fabricated in 1 m steps for the required length.

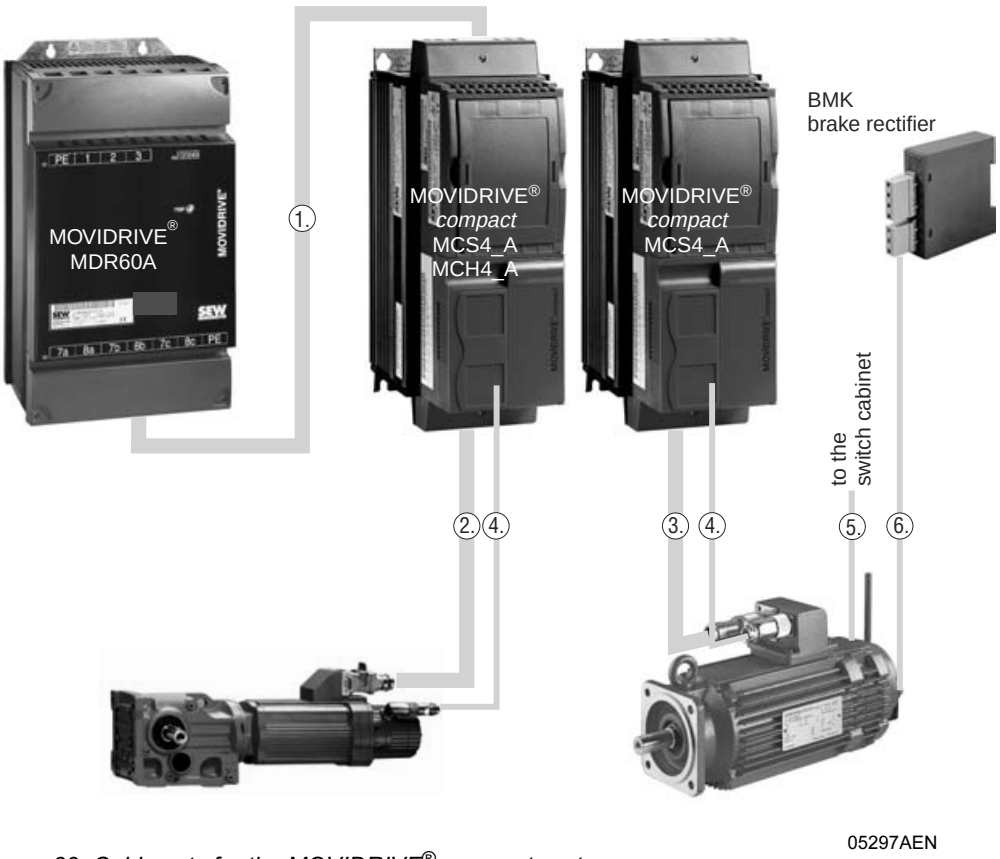

Figure 39: Cable sets for the MOVIDRIVE® compact system

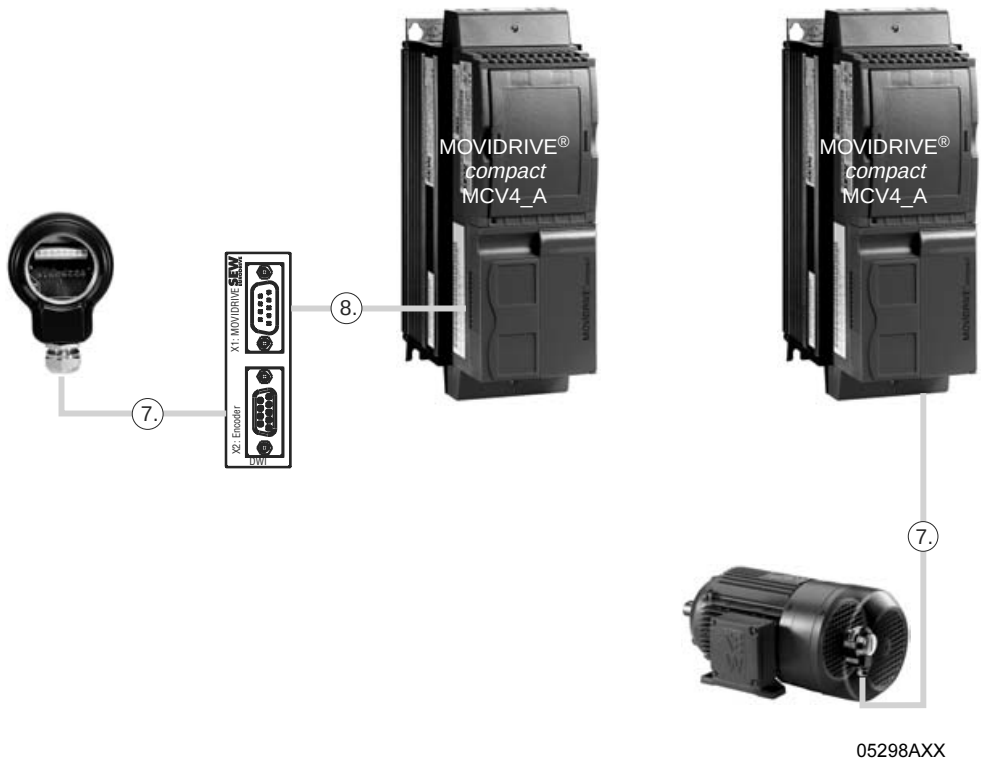

Figure 40: Motor encoder connection

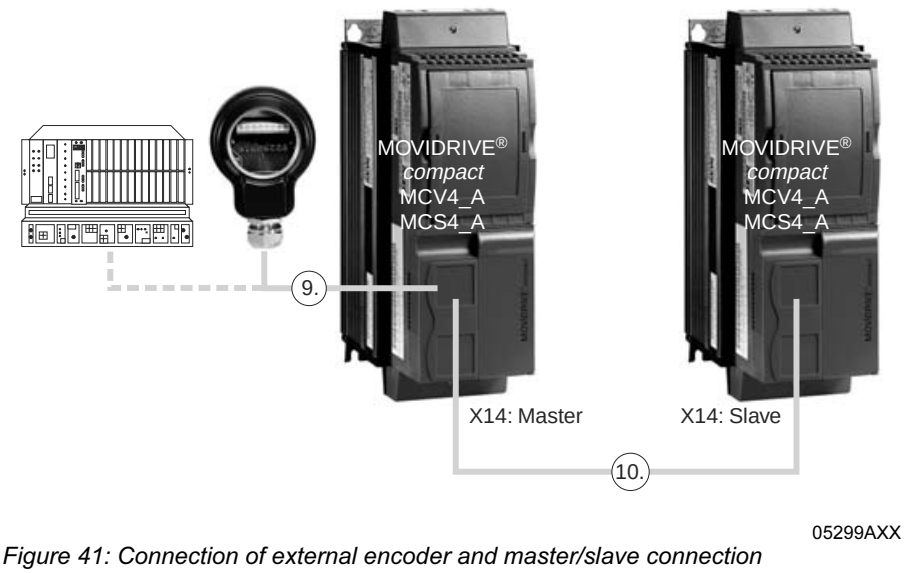

Figure 41: Connection of external encoder and master/slave connection

1. Cable sets for DC link connection MDR → MCF/MCV/MCS/MCH

Description

SEW strongly recommends that the cable sets named below are used, because they possess the relevant dielectric strength and are also color-coded. This 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 five meters (16.4 ft), whilst they can also be cut to length by the customer for connecting several units. The lugs for connecting to the regenerative power supply unit and an inverter are supplied with the cable set. Use commercial 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
Part number	814 567 9	814 250 5	814 251 3
For connecting MOVIDRIVE®	0015...0110	0150...0300	0370...0750

2. Motor cables for connecting CM motors to MCS or MCH 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

3. Motor cables for connecting DS/DY motors to MCS

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)	198 669 4	Fixed routing	DS56 / SM11
4×1.5 mm² (AWG 16) + 2×0.75 mm² (AWG 18)	198 670 8		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)	198 741 0	Cat track routing	DS56 / SM11
4×1.5 mm² (AWG 16) + 2×0.75 mm² (AWG 18)	198 742 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

4. Hiperface cables, resolver cables and extension cables

Hiperface cables for CM motors with plug connection:

Part number	**199 488 3**	**199 320 8**
Routing	Fixed routing	Cat track routing
For Hiperface encoder AS1H/ES1H in motor	CM71...112	
Line cross section	$6 \times 2 \times 0.25$ mm² (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 **MOVIDRIVE® *compact* MCH4_A**	With 12-pin round connector plug (Intercontec, type ASTA021NN00 10 000 5 000) With 15-pin sub D plug	

Extension cables for Hiperface cables (CM motors with plug connection):

Part number	**199 539 1**	**199 540 5**
Routing	Fixed routing	Cat track routing
For Hiperface encoder AS1H/ES1H in motor	CM71...112	
Line cross section	$6 \times 2 \times 0.25$ mm² (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	199 591 X	199 592 8
Routing	Fixed routing	Cat track routing
For Hiperface encoder AS1H/ES1H in motor	CM71...112	
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 MOVIDRIVE® *compact* MCH4_A	With conductor end sleeves With 15-pin sub D plug	

Resolver cables for DS56 and CM motors with plug connection:

Part number	199 487 5	199 319 4
Routing	Fixed routing	Cat track routing
For RH1M resolver in motor	DS56, CM71...112	
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 MOVIDRIVE® *compact* MCS4_A	With 12-pin round connector plug (Intercontec, type ASTA021NN00 10 000 5 000) With 9-pin sub D plug	

Extension cables for resolver cables (DS56 and CM motors with plug connection):

Part number	199 542 1	199 541 3
Routing	Fixed routing	Cat track routing
For RH1M resolver in motor	DS56, CM71...112	
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 cables	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 DY71...112 motors with plug connection:

Part number	198 827 1	198 812 3
Routing	Fixed routing	Cat track routing
For RH1M resolver in motor	DY71...112	
Line cross section	$4 \times 2 \times 0.25$ 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: Brown (BN) TF/TH: White (WH)	
Manufacturer and type	Lapp, Unitronic Li2YCY (TP) Helukabel, Paar-Tronic-CY	Lapp, Unitronic FD CP (TP) Helukabel, Super-Paar-Tronic-C-PUR
Connection to resolver/motor MOVIDRIVE® *compact* MCS4_A	With 12-pin round connector plug (Framatome Souriou, type GN-DMS2-12S) With 9-pin sub D plug	

Resolver cables for DS56 and DY71...112 motors with terminal box:

Part number	199 589 8	199 590 1
Routing	Fixed routing	Cat track routing
For RH1M resolver in motor	DS56, DY71...112	
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 MOVIDRIVE® *compact* MCS4_A	With conductor end sleeves With 9-pin sub D plug	

5. VR forced cooling fan cables and extension cables

VR forced cooling fan cables:

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 plug STAK 200 With conductor end sleeves	

Extension cables for VR forced cooling fan cables:

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 cables	With plug STAK 200 with plug connection	

6. Brake cables

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	

7. Motor encoder cables, connection to MCV4_A, X15

Cables for TTL sensors and sin/cos motor encoders (TTL sensors and sin/cos encoders)

Part number		198 829 8	198 828 X
Routing		Fixed routing	Cat track routing
For encoder		ES1T, ES2T and EV1T via option DWI11A and cable 814 344 7 ES1S, ES2S, EV1S, ES1R, ES2R and EV1R directly to X15 (MCV)	
Line cross section		$4 \times 2 \times 0.25$ mm^2 (AWG 23) + 1×0.25 mm^2 (AWG 23)	
Conductor colors		A: Yellow (YE) $\overline{A}$: Green (GN) B: Red (RD) $\overline{B}$: Blue (BU) 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 On ES1T, ES2T and EV1T, connect the violet conductor (VT) on the encoder to UB On ES1S, ES2S, EV1S, ES1R, ES2R and EV1R, cut off the violet conductor (VT) at the encoder end	
	To MCV4_A, X15 or DWI11A	With 9-pin sub D plug	

Cables for HTL motor encoders (HTL encoders)

Part number		198 932 4	198 931 6
Routing		Fixed routing	Cat track routing
For encoder		ES1C, ES2C and EV1C	
Line cross section		5×0.25 mm^2 (AWG 23) + 1×0.25 mm^2 (AWG 23)	
Conductor colors		A: Yellow (YE) B: Green (GN) C: Gray (GY) UB: White (WH) ⊥: Brown (BN)	
Manufacturer and type		Lapp, Unitronic LiYCY Helukabel, Tronic-CY	Lapp, Unitronic FD CP Helukabel, Super-Tronic-C-PURö
Connection	**To encoder/motor** **To MCV4_A, X15**	With conductor end sleeves With 9-pin sub D plug	

8. Encoder connection

This cable is intended for the following connections:

- MOVIDRIVE® *compact* MCV 'Encoder In' (X15) → 5 V encoder power supply option type DWI11A

Part number		814 344 7
Routing		Fixed routing
For encoder with 5 V encoder power supply		ES1T, ES2T and EV1T via option DWI11A
Line cross section		$4 \times 2 \times 0.25$ mm^2 (AWG 23) + 1×0.25 mm^2 (AWG 23)
Conductor colors		A: Yellow (YE) $\overline{A}$: Green (GN) B: Red (RD) $\overline{B}$: Blue (BU) 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	**To DWI11A X15**	With 9-pin sub D socket With 9-pin sub D plug

9. Cable for external encoder (TTL encoder) or encoder simulation, connection on X14

This cable is provided for connecting an external encoder or evaluation of encoder simulation on MCV/MCS4_A.

Part number		815 354 X	-
Routing		Fixed routing	-
For encoder		ES1R, ES2R and EV1R or evaluation of encoder simulation	
Line cross section		$4 \times 2 \times 0.25$ mm^2 (AWG 23) + 1×0.25 mm^2 (AWG 23)	
Conductor colors		A: Yellow (YE) $\overline{A}$: Green (GN) B: Red (RD) $\overline{B}$: Blue (BU) C: Pink (PK) $\overline{C}$: Gray (GY) UB: White (WH) ⊥: Brown (BN) Switch mode: Violet (VT)	
Manufacturer and type		Lapp, Unitronic Li2YCY (TP) Helukabel, Paar-Tronic-CY	-
Connection	**To encoder/to the Evaluation unit**	With conductor end sleeves External encoder: cut off the violet conductor (VT) at the encoder end Evaluation unit: jumper the violet conductor (VT) with the brown conductor (BN)	
	To MCV/MCS4_A, X14	With 9-pin sub D socket	

10. Encoder connection MCV/MCS4_A X14: Master → MCV/MCS4_A X14: Slave

This cable is provided for the master/slave connection of two MCV/MCS4_A units.

Part number		**815 355 8**
Routing		Fixed routing
For master/slave connection		X14: Master → X14: Slave
Line cross section		$4 \times 2 \times 0.25$ mm^2 (AWG 23) + 1×0.25 mm^2 (AWG 23)
Conductor colors		A: Yellow (YE) A: Green (GN) B: Red (RD) B: Blue (BU) C: Pink (PK) 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	**X14: Master**[1)] **X14: Slave**[1)]	With 9-pin sub D socket With 9-pin sub D socket

1) **Important:** Connect the socket marked 'Master' to X14: Master and the socket marked 'Slave' to X14: Slave!

3 Project Planning

3.1 Motor selection for asynchronous AC motors (VFC)

Basic recommendations

- 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 multi-motor drives on one inverter. The series connection of TH contacts (NC contacts) is not subject to any restriction if joint monitoring is provided.
- For multi-motor drives, we recommend that the motors should not differ from one another by more than 3 type levels.
- 4-pole motors should be preferred. This particularly applies to geared motors which are operated with a high oil filling level as a result of their vertical mounting position.
- Generally speaking, the motor can be operated at its listed power without forced cooling if the operating conditions differ from S1-mode, e.g. positioning drive with 1:20 speed range in S3-mode.
- Avoid selecting a motor which is too large, especially in case of a delta connection. Otherwise, the inverter may trigger a short circuit detection function due to the small winding resistance of the motor (1/3 that of a star connection).
- A MOVIDRIVE® *compact* MCV4_A (with encoder connection) is required for speed control. The motor must then be equipped with an incremental encoder, preferably with 1024 increments/revolution.

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.

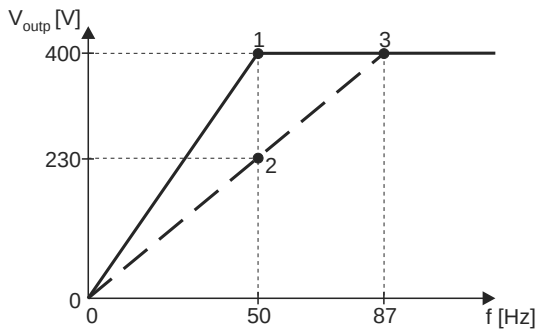

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Figure 42: Voltage/frequency characteristics of the asynchronous motor

Sample asynchronous motor 230/ 400 V, 50 Hz

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_A is limited by the supply voltage which is connected. The 'nominal system 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 design voltage than the power supply of the inverter. The maximum permitted motor voltage should be entered. Furthermore, make sure that the 'nominal system voltage' input value is less than or equal to the supply voltage of the inverter.

Speed/torque characteristics

The field weakening range starts when the set maximum output voltage of the inverter is reached. As the speed increases, the motor generates:

- constant torque with increasing power in the basic speed range,
- constant power with an inversely proportionate decrease in torque in the field weakening range.

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) falls in inverse proportion and the breakdown torque M_K is reduced in an inverse quadratic relationship. The M_K/M_N ratio is a motor-specific parameter. The MOVIDRIVE® pull-out protection limits the speed when the maximum possible torque is reached.

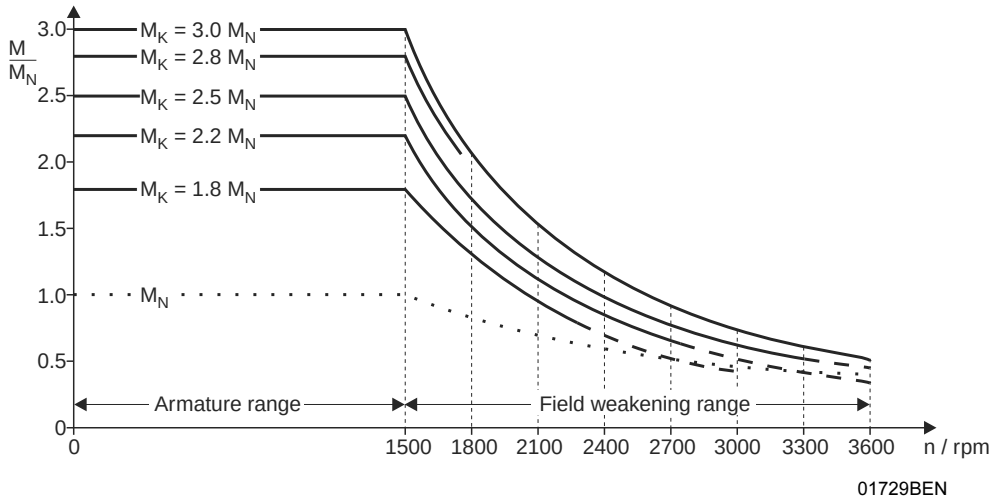


Figure 43: Quadratically falling breakdown torque

With geared motors, the maximum motor speed is dependent 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 than P_{motor})

- 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). This parameter must be set to a higher value manually for dynamic applications.
- The startup function sets the slip compensation parameter (P324/P334) to the nominal slip of the motor. In the case of VFC-n-CONTROL, the internal slip limiting function allows the slip to reach max. 150 % of this setting. Consequently, the motor develops at most 150 % of the nominal motor torque. The slip compensation parameter (P324) must be increased accordingly for greater torques.

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

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

The large difference between the rated inverter current and the rated motor current means that these combinations cannot be started up without taking special 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.
- The motor must be started up in VFC & GROUP operating mode if this measure does not suffice. In this operating mode, the inverter operates without slip compensation and simulates a constant-voltage constant-frequency system (system with a constant U/f ratio).

Motor selection in delta/star topology (230/400 V_{AC} / 50 Hz)

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

P_{max} [kW (HP)] for operation on MOVIDRIVE® *compact* MCF/MCV/MCH 4_A...-5_3 (400/500 V units)												
Connection			⅄ / 400 V_{AC}[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	**Rated power P_n [kW (HP)]**		**$P = P_{reduced}$ [kW (HP)]**		**With MCF/ MCV/MCH[5] 4_A...-5_3**	**$P = P_n$ [kW (HP)]**		**With MCF/ MCV/MCH[5] 4_A...-5_3**	**$P = P_{increased}$[4] [kW (HP)]**		**With MCF/ MCV/MCH[5] 4_A...-5_3**	
DT71D4	**0.37**	**(0.5)**	0.25	(0.33)	**0015**	0.37	(0.5)	**0015**	0.55	(0.75)	**0015**	
DT80K4	**0.55**	**(0.75)**	0.37	(0.5)		0.55	(0.75)		0.75	(1.0)		
DT80N4	**0.75**	**(1.0)**	0.55	(0.75)		0.75	(1.0)		1.1	(1.5)		
DT90S4	**1.1**	**(1.5)**	0.75	(1.0)		1.1	(1.5)		1.5	(2.0)		
DT90L4	**1.5**	**(2.0)**	1.1	(1.5)		1.5	(2.0)		2.2	(3.0)	**0022**	
DV100M4	**2.2**	**(3.0)**	1.5	(2.0)		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**	-			
D280M4	**90**	**(120)**	75	(100)	**0750**	-						

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) The following applies to MCF, MCV and MCH without speed control: f_{min} = 0.5 Hz

4) $P_{increased}$ 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.

5) The devices listed here permit intermittent loads of up to 1.5 times the nominal 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 at f_{PWM} = 4 kHz in the VFC operating modes.

Examples for motor selection delta/star topology 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 output can be 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 with delta connection (P_n = 9.2 kW) is selected.

The selection table (→ page 84) allocates a MOVIDRIVE® *compact* MCF60A0110 ($P = P_n$).

Hoist drive

High constant load with intermittent overload (acceleration):

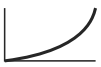
- P_{max} = 26 kW
- $P_{sustained}$ = 20 kW
- Speed range 1:15, low speed only for positioning
- Brake applied when stationary
- Load type S3 (40 % c.d.f.)

The inverter output can be 150 % of its rated current during acceleration. Consequently, a MOVIDRIVE® *compact* MCF60A0220 is selected.

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

→ Sec. Project planning for hoists for more information.

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 falling torque. This means the DV132S4 motor type with star connection (P_n = 5.5 kW) is adequate.

The selection table allocates a MOVIDRIVE® *compact* MCF60A0055 ($P = P_n$). However, the inverter can be operated with an increased output power because this case involves a variable torque load without overload. Consequently, a MOVIDRIVE® *compact* MCF60A0040 is sufficient.

Motor selection in double-star/star topology (230/460 V_{AC} / 60 Hz)

P_{max} [kW (HP)] for operation on MOVIDRIVE® *compact* MCF/MCV/MCH 4_A...-5_3 (400/500 V units)												
Connection			Δ / 460 V_{AC}						Δ Δ / 230 V_{AC}			
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			200 - 1800		0 - 1800	200 - 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 MCF/ MCV/MCH[3] 4_A...-5_3**	**[kW (HP)]**		**With MCF/ MCV/MCH[3] 4_A...-5_3**	**[kW (HP)]**		**With MCF/ MCV/MCH[3] 4_A...-5_3**	
DT71D4	**0.37**	**(0.5)**	0.25	(0.33)	**0015**	0.37	(0.5)	**0015**	0.75	(1.0)	**0015**	
DT80K4	**0.55**	**(0.75)**	0.37	(0.5)		0.55	(0.75)		1.1	(1.5)		
DT80N4	**0.75**	**(1.0)**	0.55	(0.75)		0.75	(1.0)		1.5	(2.0)		
DT90S4	**1.1**	**(1.5)**	0.75	(1.0)		1.1	(1.5)		2.2	(3.0)	**0022**	
DT90L4	**1.5**	**(2.0)**	1.1	(1.5)		1.5	(2.0)		3.0	(4.0)	**0030**	
DV100M4	**2.2**	**(3.0)**	1.5	(2.0)		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**				
DV280S4	**75**	**(100)**	55	(75)	**0550**	75	(100)	**0750**		-		
D280M4	**90**	**(120)**	75	(100)	**0750**		-					

1) The following applies to MCF, MCV and MCH 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 devices listed here permit intermittent loads of up to 1.5 times the nominal 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 at f_{PWM} = 4 kHz in the VFC operating modes.

Motor selection with the delta topology (230 V_{AC} / 50 Hz)

P_{max} [kW (HP)] for operation on MOVIDRIVE® *compact* MCF/MCV/MCH 4_A...-2_3 (230 V units)									
Connection			Δ / 230 V_{AC}						
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 MCF/ MCV/MCH[3] 4_A...-2_3**	**$P = P_n$ [kW (HP)]**		**With MCF/ MCV/MCH[3] 4_A...-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) The following applies to MCF, MCV and MCH without speed control: f_{min} = 0.5 Hz

2) In load type S3 (40 % c.d.f.), the motor must not 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 devices listed here permit intermittent loads of up to 1.5 times the nominal 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 at f_{PWM} = 4 kHz in the VFC operating modes.

Motor selection with the double-star topology (230 V_{AC} / 60 Hz)

P_{max} [kW (HP)] for operation on MOVIDRIVE® *compact* MCF/MCV/MCH 4_A...-2_3 (230 V units)									
Connection			⅄⅄ / 230 V_{AC}						
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			200 - 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 MCF/ MCV/MCH[2] 4_A...-2_3**	**$P = P_n$ [kW (HP)]**		**With MCF/ MCV/MCH[3] 4_A...-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) The following applies to MCF, MCV and MCH without speed control: f_{min} = 0.5 Hz

2) The devices listed here permit intermittent loads of up to 1.5 times the nominal 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 at f_{PWM} = 4 kHz in the VFC operating modes.

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 always using the latest version of MOVITOOLS (2.70 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 exact data about the connected motor in order 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 characteristic

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}.

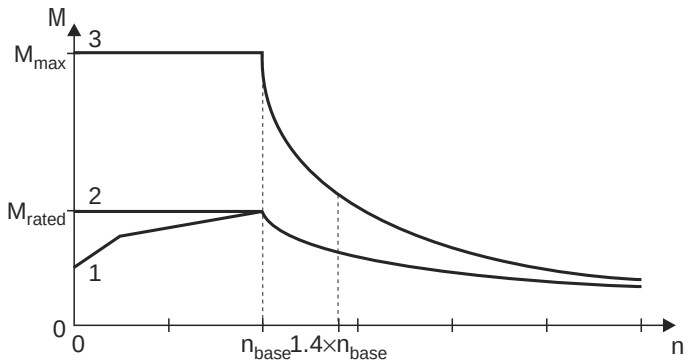


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Figure 44: Speed/torque characteristic curve in CFC operating mode

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 mode of operation (forced cooling fan). Refer to the motor tables (CT/CV → page 93, DT/DV/D → page 98) for the magnetization current I_d.

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 undertaken 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 44, curve 2). No forced cooling is required if this operating point lies below the characteristic curve for forced cooling (Figure 44, curve 1).

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 44, 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. 100 % of the rated continuous torque of the motor; 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. Refer to the motor tables (DT/DV/D → page 98, CT/CV → page 93) for the values of the torque constants k_T and the motor-specific parameters M_n and I_{q_n}.

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} which 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 the 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® *compact* 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.

Organization into speed categories

CT/CV motors are supplied in four speed categories. This 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).

As standard, with TF or TH motor protection

The winding temperature of the three motor phases is monitored using thermistor sensors (TF). The thermistor sensor can be connected to the TF/TH input of MOVIDRIVE® *compact*. Thermal monitoring is then undertaken by MOVIDRIVE® *compact*; no additional monitoring unit is required.

Bimetallic switches (TH) can also be used instead of thermistor 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 fitted with reinforced pinion spigots for direct mounting to gear units. These spigots enable these motors 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 in order to achieve optimum benefit from the advantages of CFC mode.

	Advantage	Disadvantage
CFC mode with DT/DV/D motor **Motor selection → page 101**	Standard version of motor	Slower transition speed than the CT/CV motor.
		The power yield of the motor is less than the rated motor power.
		In terms of the power yield, the mass inertia is greater than 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 94**	Faster transition speed than DT/DV/D motor.	Not an IEC standard motor
	Usually with a power yield one level higher.	
	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

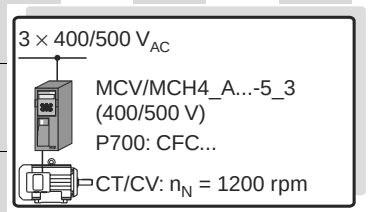
n_N [rpm]	Motor	M_N [Nm]	I_N [A]	I_{q_n} [A]	I_{d_n} [A]	k_T [A]	U_N [V]	J_{mot} [10^{-4} kgm^2]	J_{Bmot} [10^{-4} kgm^2]
1200	CT80N4	5	2.0	1.52	1.30	2.50	350	8.7	9.6
	CT90L4	10	3.5	2.95	1.89	2.86	345	34	39.5
	CV100M4	15	4.7	4.13	2.25	3.19	345	53	59
	CV100L4	26	8.9	8.30	3.21	2.92	310	65	71
	CV132S4	37	11.1	9.99	4.83	3.33	340	146	158
	CV132M4	50	15.5	14.2	6.18	3.23	340	280	324
	CV132ML4	61	17.6	16.0	7.43	3.47	345	330	374
	CV160M4	73	22.5	20.3	9.73	3.24	335	400	440
	CV160L4	95	29	25.3	14.2	3.28	330	925	1030
	CV180M4	110	34	27.7	19.7	3.24	330	1120	1226
	CV180L4	125	35	28.4	20.5	3.57	345	1290	1396
	CV200L4	200	58	52.9	23.7	3.45	330	2340	2475
1700	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
	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
2100	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
	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
3000	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
	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

CT/CV motors in the four speed categories are designed for operation with 400/500 V units. Please contact SEW concerning operation with 230 V units.

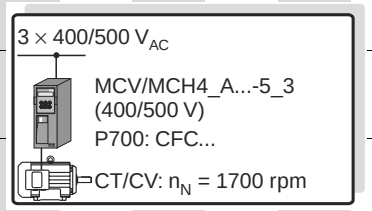
1. Rated speed n_N = 1200 rpm:

Motor		MOVIDRIVE® *compact* MCV/MCH4_A...-5_3 (400/500 V units) in CFC operating modes (P700)												
		0015	0022	0030	0040	0055	0075	0110	0150	0220	0300	0370	0450	0550	0750
CT80N4	M_{max}[Nm] ([lb.in])	15.6 (138)													
	$n_{transition}$[rpm]	540													
CT90L4	M_{max} [Nm] ([lb.in])	18.2 (160)	25.7 (227)	30.5 (270)											
	$n_{transition}$[rpm]	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)	60.0 (530)	75.0 (663)								
	$n_{transition}$[rpm]			1062	947	813	675								
CV132S4	M_{max} [Nm] ([lb.in])					64.0 (565)	84.0 (743)	110 (972)							
	$n_{transition}$[rpm]					992	915	1175							
CV132M4	M_{max} [Nm] ([lb.in])						82.0 (725)	125 (1105)	150 (1326)						
	$n_{transition}$[rpm]						1011	877	770						
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 (1936)					
	$n_{transition}$[rpm]							986	909	840					
CV160L4	M_{max} [Nm] ([lb.in])								163 (1440)	240 (2121)	294 (2600)				
	$n_{transition}$[rpm]								1043	954	1240				
CV180M4	M_{max} [Nm] ([lb.in])									241 (2130)	320 (2828)	360 (3183)			
	$n_{transition}$[rpm]									1050	986	1005			
CV180L4	M_{max} [Nm] ([lb.in])									231 (2042)	308 (2723)	360 (3183)			
	$n_{transition}$[rpm]									1018	973	980			
CV200L4	M_{max} [Nm] ([lb.in])										326 (2882)	402 (3554)	494 (4367)	567 (5013)	
	$n_{transition}$[rpm]										1011	986	947	940	



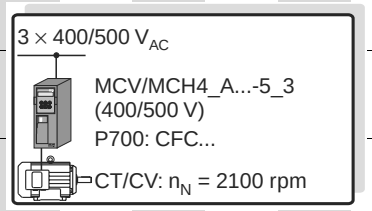
2. Rated speed n_N = 1700 rpm:

Motor		MOVIDRIVE® *compact* MCV/MCH4_A...-5_3 (400/500 V units) in CFC operating modes (P700)												
		0015	0022	0030	0040	0055	0075	0110	0150	0220	0300	0370	0450	0550	0750
CT80N4	M_{max} [Nm] ([lb.in])	12.6 (111)	15.6 (138)												
	$n_{transition}$[rpm]	1150	980												
CT90L4	M_{max} [Nm] ([lb.in])		18.0 (159)	23.5 (208)	30.5 (270)										
	$n_{transition}$[rpm]		1400	1280	1150										
CV100M4	M_{max} [Nm] ([lb.in])			25.7 (227)	36.0 (318)	45.0 (398)									
	$n_{transition}$[rpm]			1402	1274	1150									
CV100L4	M_{max} [Nm] ([lb.in])				32.9 (290)	44.2 (390)	57.0 (504)	75.0 (663)							
	$n_{transition}$[rpm]				1510	1402	1274	1090							
CV132S4	M_{max} [Nm] ([lb.in])						59.0 (522)	91.0 (805)	110 (972)						
	$n_{transition}$[rpm]						1470	1330	1280						
CV132M4	M_{max} [Nm] ([lb.in])							89.0 (787)	121 (1070)	150 (1326)					
	$n_{transition}$[rpm]							1440	1330	1250					
CV132ML4	M_{max} [Nm] ([lb.in])							83.0 (734)	114 (1008)	166 (1468)	183 (1618)				
	$n_{transition}$[rpm]							1562	1485	1331	1325				
CV160M4	M_{max} [Nm] ([lb.in])								120 (1060)	176 (1555)	219 (1936)				
	$n_{transition}$[rpm]								1420	1310	1250				
CV160L4	M_{max} [Nm] ([lb.in])									170 (1503)	226 (2000)	277 (2450)	294 (2600)		
	$n_{transition}$[rpm]									1470	1400	1330	1380		
CV180M4	M_{max} [Nm] ([lb.in])									168 (1485)	226 (2000)	280 (2475)	345 (3050)	360 (3183)	
	$n_{transition}$[rpm]									1550	1510	1460	1400	1490	
CV180L4	M_{max} [Nm] ([lb.in])										217 (1918)	269 (2378)	332 (2935)	360 (3183)	
	$n_{transition}$[rpm]										1450	1420	1370	1420	
CV200L4	M_{max} [Nm] ([lb.in])												353 (3120)	420 (3713)	524 (4632)
	$n_{transition}$[rpm]												1421	1395	1344



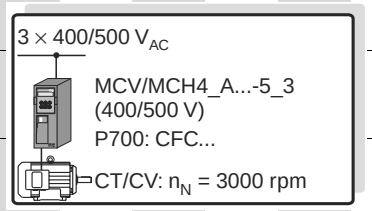
3. Rated speed n_N = 2100 rpm:

Motor		MOVIDRIVE® *compact* MCV/MCH4_A...-5_3 (400/500 V units) in CFC operating modes (P700)													
		0015	0022	0030	0040	0055	0075	0110	0150	0220	0300	0370	0450	0550	0750
CT71D4	M_{max} [Nm] ([lb.in])	7.7 (68)													
	$n_{transition}$[rpm]	1280													
CT80N4	M_{max} [Nm] ([lb.in])	9.7 (86)	13.8 (122)	15.6 (138)											
	$n_{transition}$[rpm]	1754	1510	1400											
CT90L4	M_{max} [Nm] ([lb.in])			18.3 (162)	25.5 (225)	30.5 (270)									
	$n_{transition}$[rpm]			1843	1677	1625									
CV100M4	M_{max} [Nm] ([lb.in])				28.0 (248)	38.1 (337)	45.0 (398)								
	$n_{transition}$[rpm]				1760	1626	1550								
CV100L4	M_{max} [Nm] ([lb.in])					33.7 (298)	44.0 (390)	67.0 (592)	75.0 (663)						
	$n_{transition}$[rpm]					2003	1894	1645	1550						
CV132S4	M_{max} [Nm] ([lb.in])							72.0 (637)	97.0 (858)	110 (972)					
	$n_{transition}$[rpm]							1850	1722	1730					
CV132M4	M_{max} [Nm] ([lb.in])								95.0 (840)	138 (1220)	150 (1326)				
	$n_{transition}$[rpm]								1850	1670	1670				
CV132ML4	M_{max} [Nm] ([lb.in])									139 (1230)	183 (1618)				
	$n_{transition}$[rpm]									1715	1574				
CV160M4	M_{max} [Nm] ([lb.in])									138 (1220)	183 (1618)	219 (1936)			
	$n_{transition}$[rpm]									1792	1690	1625			
CV160L4	M_{max} [Nm] ([lb.in])										177 (1565)	218 (1927)	268 (2370)	294 (2600)	
	$n_{transition}$[rpm]										1882	1824	1740	1760	
CV180M4	M_{max} [Nm] ([lb.in])											218 (1927)	270 (2387)	322 (2847)	360 (3183)
	$n_{transition}$[rpm]											1939	1894	1836	1930
CV180L4	M_{max} [Nm] ([lb.in])												260 (2300)	310 (2740)	360 (3183)
	$n_{transition}$[rpm]												1824	1786	1840
CV200L4	M_{max} [Nm] ([lb.in])													329 (2910)	412 (3642)
	$n_{transition}$[rpm]													1830	1792



4. Rated speed n_N = 3000 rpm:

Motor		MOVIDRIVE® *compact* MCV/MCH4_A...-5_3 (400/500 V units) in CFC operating modes (P700)													
		0015	0022	0030	0040	0055	0075	0110	0150	0220	0300	0370	0450	0550	0750
CT71D4	M_{max} [Nm] ([lb.in])	6.6 (58)	7.7 (68)												
	$n_{transition}$[rpm]	2280	2080												
CT80N4	M_{max} [Nm] ([lb.in])		9.7 (86)	12.7 (112)	15.5 (137)										
	$n_{transition}$[rpm]		2560	2350	2200										
CT90L4	M_{max} [Nm] ([lb.in])			12.7 (112)	18.0 (160)	24.0 (212)	30.5 (270)								
	$n_{transition}$[rpm]			2790	2650	2490	2360								
CV100M4	M_{max} [Nm] ([lb.in])					26.5 (235)	34.6 (305)	45.0 (398)							
	$n_{transition}$[rpm]					2620	2490	2425							
CV100L4	M_{max} [Nm] ([lb.in])						31.8 (281)	49.0 (433)	66.0 (583)	75.0 (663)					
	$n_{transition}$[rpm]						2800	2600	2380	2290					
CV132S4	M_{max} [Nm] ([lb.in])							51.0 (450)	69.0 (610)	101 (893)	110 (972)				
	$n_{transition}$[rpm]							2740	2650	2455	2580				
CV132M4	M_{max} [Nm] ([lb.in])								67.0 (592)	99.0 (875)	131 (1158)	150 (1326)			
	$n_{transition}$[rpm]								2750	2600	2450	2400			
CV132ML4	M_{max} [Nm] ([lb.in])									94.0 (830)	124 (1096)	152 (1343)	183 (1618)		
	$n_{transition}$[rpm]									2765	2656	2547	2400		
CV160M4	M_{max} [Nm] ([lb.in])									98.0 (866)	131 (1158)	161 (1423)	198 (1750)	219 (1936)	
	$n_{transition}$[rpm]									2630	2550	2470	2370	2380	
CV160L4	M_{max} [Nm] ([lb.in])										124 (1096)	155 (1370)	192 (1697)	228 (2015)	286 (2528)
	$n_{transition}$[rpm]										2720	2680	2620	2545	2440
CV180M4	M_{max} [Nm] ([lb.in])											150 (1326)	191 (1690)	228 (2015)	289 (2555)
	$n_{transition}$[rpm]											2790	2745	2700	2635
CV180L4	M_{max} [Nm] ([lb.in])												182 (1610)	220 (1945)	276 (2440)
	$n_{transition}$[rpm]												2620	2580	2540
CV200L4	M_{max} [Nm] ([lb.in])														293 (2590)
	$n_{transition}$[rpm]														2573



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)	-	-	-	-	2.15	1.82	1.14	1.43
DT80K4	3.9 (34)	6.6 (15.6)	7.5 (17.7)	-	-	-	-	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	-	-	-	-
DV280S4	483 (4270)	8925 (21180)	9225/9355 [2)] (21737/ 22112 [2)])	142	124	68.9	3.90	-	-	-	-
D280M4	580 (5127)	14500 (34409)	[3)]	155	147	49.2	3.95	-	-	-	-

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

2) Double disk 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 (445)	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)	-	-	-	-	-
D280S4	12000 (28476)	[3)]	483 (4270)	135	128	45.2	3.77 (33.3)	-	-	-	-	-
D280M4	14500 (34409)	[3)]	580 (5128)	162	153	51.7	3.79 (33.5)	-	-	-	-	-

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

2) Double disk brake

3) On request

Characteristic values for JEC motors

Motor	M_N	Mass moment of inertia J_M		400 V / 60 Hz 440 V / 60 Hz 400 V / 50 Hz				200 V / 60 Hz 220 V / 60 Hz 200 V / 50 Hz			
		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 (lb.in/A)]	[A]	[A]	[A]	[Nm/A (lb.in/A)]
DT80K4	2.71 (24)	6.55 (15.5)	7.45 (17.7)	1.35 (人)	0.96	0.95	2.82 (24.9)	2.70 (人人)	1.92	1.90	1.41 (12.5)
DT80N4	4.97 (44)	8.7 (20.6)	9.6 (22.8)	2.20 (人)	1.72	1.37	2.88 (25.5)	4.40 (人人)	3.45	2.73	1.44 (12.7)
DT90L4	10.0 (88)	34 (80.7)	39.4 (93.5)	3.85 (人)	3.29	2.00	3.04 (26.9)	7.70 (人人)	6.58	3.99	1.52 (13.4)
DV100M4	14.9 (131)	53 (126)	58.4 (139)	4.70 (人)	4.13	2.25	3.60 (31.8)	9.40 (人人)	8.25	4.50	1.80 (15.9)
DV112M4	24.4 (215)	98 (233)	110.2 (262)	8.50 (人)	7.55	3.93	3.24 (28.6)	17.0 (人人)	15.1	7.85	1.62 (14.3)
DV132S4	36.7 (324)	146 (346)	158.0 (375)	12.0 (Δ)	10.9	5.10	3.38 (29.9)	24.0 (ΔΔ)	21.7	10.2	1.69 (14.9)
DV132M4	48.8 (431)	280 (664)	323.7 (768)	16.0 (Δ)	14.6	6.50	3.34 (29.5)	32.0 (ΔΔ)	29.2	13.0	1.67 (14.8)
DV160M4	70.4 (622)	398 (944)	441.7 (1048)	23.0 (Δ)	20.6	10.3	3.42 (30.2)	46.0 (ΔΔ)	41.2	20.5	1.71 (15.1)
DV160L4	96.6 (854)	925 (2195)	1031 (2447)	32.3 (Δ)	28.6	14.9	3.38 (29.9)	64.5 (ΔΔ)	57.2	29.8	1.69 (14.9)
DV180M4	120 (1060)	1120 (2658)	1226/1332 [2)] (2909/3160 [2)])	40.5 (Δ)	34.8	20.7	3.46 (30.6)	81.0 (ΔΔ)	69.6	41.4	1.73 (15.3)
DV180L4	140 (1237)	1290 (3060)	1396/1502 [2)] (3313/3564 [2)])	47.8 (Δ)	42.0	22.7	3.34 (29.5)	95.5 (ΔΔ)	84.1	45.3	1.67 (14.8)
DV200L4	194 (1714)	2340 (5553)	2446/2552 [2)] (5804/6056 [2)])	60.0 (Δ)	54.5	24.9	3.56 (31.5)	120 (ΔΔ)	109	49.9	1.78 (15.7)
DV225S4	234 (2068)	3010 (7143)	3116/3222 [2)] (7394/7645 [2)])	72.0 (Δ)	66.0	28.7	3.54 (31.3)	144 (ΔΔ)	132	57.3	1.77 (15.6)
DV225M4	284 (2510)	3570 (8472)	3676/3782 [2)] (8723/8975 [2)])	88.5 (Δ)	79.5	38.9	3.58 (31.6)	177 (ΔΔ)	159	77.9	1.79 (15.8)

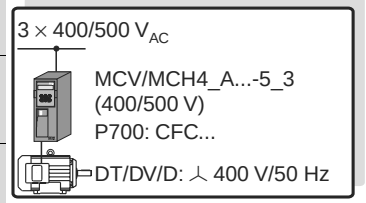
1) Applies in the basic speed range up to $n_{transition}$.

2) Double disk brake

DT/DV/D motor selection with the delta/star topology (230/400 V_{AC} / 50 Hz)

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

Motor		MOVIDRIVE® *compact* MCV/MCH4_A...-5_3 (400/500 V units) in CFC operating modes (P700)													
⅄ 400 V / 50 Hz		0015	0022	0030	0040	0055	0075	0110	0150	0220	0300	0370	0450	0550	0750
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])	18.2 (161)	18.3 (162)	18.3 (162)											
	$n_{transition}$ [rpm]	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)	90.2 (797)						
	$n_{transition}$ [rpm]						1011	1145	1152						
DV132ML4	M_{max} [Nm] ([lb.in])							110 (972)	110 (972)						
	$n_{transition}$ [rpm]							1043	1132						
DV160M4	M_{max} [Nm] ([lb.in])							124 (1096)	131 (1157)	131 (1157)					
	$n_{transition}$ [rpm]							986	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)
	$n_{transition}$ [rpm]													1017	1133
DV280S4	M_{max} [Nm] ([lb.in])														711 (6283)
	$n_{transition}$ [rpm]														1075
D280M4	M_{max} [Nm] ([lb.in])														745 (6583)
	$n_{transition}$ [rpm]														1107

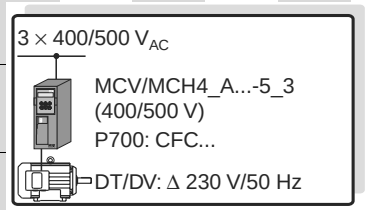


Please note: The maximum torque M_{max} is limited to 180 % of the rated motor torque M_N.

2. Delta connection Δ 230 V / 50 Hz:

Motor		MOVIDRIVE® *compact* MCV/MCH4_A...-5_3 (400/500 V units) in CFC operating modes (P700)													
Δ 230 V / 50 Hz		0015	0022	0030	0040	0055	0075	0110	0150	0220	0300	0370	0450	0550	0750
DT71D4	M_{max} [Nm] ([lb.in])	4.6 (40.5)													
	$n_{transition}$ [rpm]	1958													
DT80K4	M_{max} [Nm] ([lb.in])	6.9 (61)	6.9 (61)												
	$n_{transition}$ [rpm]	1849	1868												
DT80N4	M_{max} [Nm] ([lb.in])	9.3 (82)	9.3 (82)	9.3 (82)											
	$n_{transition}$ [rpm]	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)	48.4 (427)						
	$n_{transition}$ [rpm]						1779	2163	2195						
DV132S4	M_{max} [Nm] ([lb.in])							66.1 (584)	66.1 (584)	66.1 (584)					
	$n_{transition}$ [rpm]							1996	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)	177 (2496)	
	$n_{transition}$ [rpm]										1881	2208	2451	2496	
DV180M4	M_{max} [Nm] ([lb.in])											217 (1917)	217 (1917)	217 (1917)	217 (1917)
	$n_{transition}$ [rpm]											1952	2336	2611	2809
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)
	$n_{transition}$ [rpm]													1830	2092
DV225S4	M_{max} [Nm] ([lb.in])														405 (3580)
	$n_{transition}$ [rpm]														1708

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

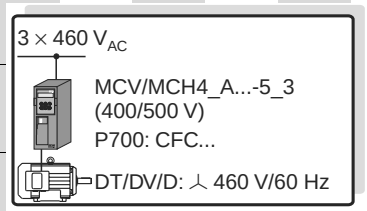


DT/DV/D motor selection with the double-star/star topology (230/460 V_{AC} / 60 Hz)

1. Star connection ⅄ 460 V / 60 Hz:

Motor		MOVIDRIVE® *compact* MCV/MCH4_A...-5_3 (400/500 V units) in CFC operating modes (P700)													
⅄ 460 V / 60 Hz		0015	0022	0030	0040	0055	0075	0110	0150	0220	0300	0370	0450	0550	0750
DT80N4	M_{max} [Nm] ([lb.in])	9.3 (82)													
	$n_{transition}$ [rpm]	1145													
DT90S4	M_{max} [Nm] ([lb.in])	13.5 (120)													
	$n_{transition}$ [rpm]	1312													
DT90L4	M_{max} [Nm] ([lb.in])	18.3 (162)	18.3 (162)												
	$n_{transition}$ [rpm]	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]				1068	992	1100								
DV132M4	M_{max} [Nm] ([lb.in])						80.0 (705)	90.2 (797)							
	$n_{transition}$ [rpm]						1088	1222							
DV132ML4	M_{max} [Nm] ([lb.in])							110 (972)	110 (972)						
	$n_{transition}$ [rpm]							1196	1299						
DV160M4	M_{max} [Nm] ([lb.in])							120.3 (1062)	131 (1157)	131 (1157)					
	$n_{transition}$ [rpm]							1132	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)
	$n_{transition}$ [rpm]														1345
D280M4	M_{max} [Nm] ([lb.in])														712 (6290)
	$n_{transition}$ [rpm]														1337

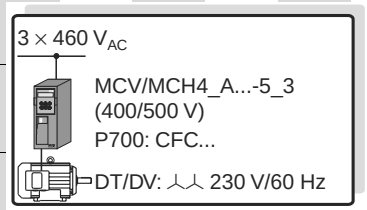
Please note: The maximum torque M_{max} is limited to 180 % of the rated motor torque M_N.



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

Motor		MOVIDRIVE® *compact* MCV/MCH4_A...-5_3 (400/500 V units) in CFC operating modes (P700)													
⅄⅄ 230 V / 60 Hz		0015	0022	0030	0040	0055	0075	0110	0150	0220	0300	0370	0450	0550	0750
DT71D4	M_{max} [Nm] ([lb.in])	4.6 (40.5)													
	$n_{transition}$ [rpm]	2988													
DT80K4	M_{max} [Nm] ([lb.in])	7.0 (62)	7.0 (62)												
	$n_{transition}$ [rpm]	2688	2822												
DT80N4	M_{max} [Nm] ([lb.in])	8.3 (73)	9.3 (82)	9.3 (82)											
	$n_{transition}$ [rpm]	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)	66.1 (585)						
	$n_{transition}$ [rpm]							2233	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)	217 (1917)
	$n_{transition}$ [rpm]											2355	2457	2771	3040
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)
	$n_{transition}$ [rpm]													2208	2163
DV225S4	M_{max} [Nm] ([lb.in])														346 (3056)
	$n_{transition}$ [rpm]														2291
DV225M4	M_{max} [Nm] ([lb.in])														354 (3127)
	$n_{transition}$ [rpm]														2278

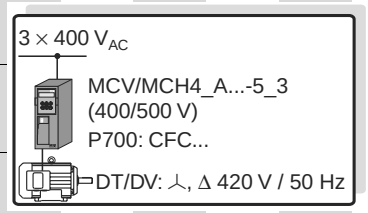
Please note: The maximum torque M_{max} is limited to 180 % of the rated motor torque M_N.



DT/DV/D motor selection with the double-star/star or double-delta/delta topology (200/400 V_{AC} / 50 Hz)

1. Star connection ⅄ or delta connection Δ 400 V / 50 Hz:

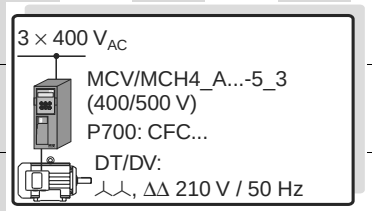
Motor		MOVIDRIVE® *compact* MCV/MCH4_A...-5_3 (400/500 V units) in CFC operating modes (P700)													
⅄, Δ 400 V / 50 Hz[1]		0015	0022	0030	0040	0055	0075	0110	0150	0220	0300	0370	0450	0550	0750
DT80K4	M_{max} [Nm] ([lb.in])	6.9 (61)													
	$n_{transition}$ [rpm]	748													
DT80N4	M_{max} [Nm] ([lb.in])	9.3 (82)													
	$n_{transition}$ [rpm]	985													
DT90L4	M_{max} [Nm] ([lb.in])	17.2 (152)	18.3 (162)	18.3 (162)											
	$n_{transition}$ [rpm]	1011	1120	1145											
DV100M4	M_{max} [Nm] ([lb.in])		26.8 (236)	26.8 (236)	26.8 (236)										
	$n_{transition}$ [rpm]		940	1043	1056										
DV112M4	M_{max} [Nm] ([lb.in])				44.5 (393)	48.4 (427)	48.4 (427)								
	$n_{transition}$ [rpm]				992	1088	1145								
DV132S4	M_{max} [Nm] ([lb.in])					61.0 (540)	66.1 (584)	66.1 (584)							
	$n_{transition}$ [rpm]					1068	1177	1280							
DV132M4	M_{max} [Nm] ([lb.in])						77.3 (683)	90.2 (797)	90.2 (797)						
	$n_{transition}$ [rpm]						1088	1210	1228						
DV160M4	M_{max} [Nm] ([lb.in])							118 (1042)	131 (1157)	131 (1157)					
	$n_{transition}$ [rpm]							1056	1177	1273					
DV160L4	M_{max} [Nm] ([lb.in])								154 (1363)	177 (1565)	177 (1565)				
	$n_{transition}$ [rpm]								1113	1292	1401				
DV180M4	M_{max}[Nm] ([lb.in])		**Please note:** The maximum torque M_{max} is limited to 180 % of the rated motor torque M_N.							217 (1917)	217 (1917)	217 (1917)			
	$n_{transition}$ [rpm]									1177	1440	1561			
DV180L4	M_{max} [Nm] ([lb.in])									218 (1930)	258 (2280)	258 (2280)	258 (2280)		
	$n_{transition}$ [rpm]									1088	1177	1344	1452		
DV200L4	M_{max} [Nm] ([lb.in])										308 (2730)	351 (3100)	351 (3100)	351 (3100)	
	$n_{transition}$ [rpm]										1075	1139	1331	1472	
DV225S4	M_{max} [Nm] ([lb.in])											374 (3307)	433 (3826)	433 (3826)	433 (3826)
	$n_{transition}$ [rpm]											1004	1043	1190	1363
DV225M4	M_{max} [Nm] ([lb.in])												456 (4037)	526 (4648)	526 (4648)
	$n_{transition}$ [rpm]												1094	1113	1324



1) The values also apply to 400 V / 60 Hz and 440 V / 60 Hz.

2. Double-star connection ⅄⅄ or double-delta ΔΔ 200 V / 50 Hz:

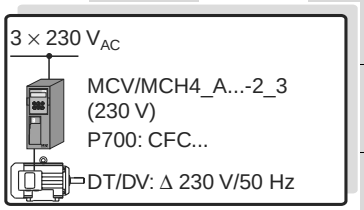
Motor		MOVIDRIVE® *compact* MCV/MCH4_A...-5_3 (400/500 V units) in CFC operating modes (P700)													
⅄⅄, ΔΔ 200 V / 50 Hz[1]		0015	0022	0030	0040	0055	0075	0110	0150	0220	0300	0370	0450	0550	0750
DT80K4	M_{max} [Nm] ([lb.in])	6.9 (61)	6.9 (61)												
	$n_{transition}$ [rpm]	2035	2112												
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)	48.4 (427)						
	$n_{transition}$ [rpm]							2457	2796						
DV132S4	M_{max} [Nm] ([lb.in])							58.3 (515)	66.1 (585)	66.1 (585)					
	$n_{transition}$ [rpm]							2355	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])		**Please note:** The maximum torque M_{max} is limited to 180 % of the rated motor torque M_N.									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)
	$n_{transition}$ [rpm]													2240	2662
DV200L4	M_{max} [Nm] ([lb.in])														336 (2975)
	$n_{transition}$ [rpm]														2233
DV225S4	M_{max} [Nm] ([lb.in])														330 (2917)
	$n_{transition}$ [rpm]														2112



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

DT/DV motor selection with the delta connection type (230 V_{AC} / 50 Hz)

Motor			MOVIDRIVE® *compact* MCV/MCH4_A...-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]					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

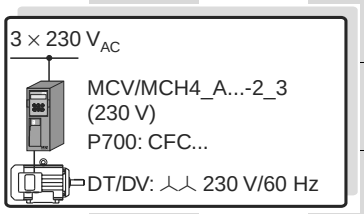


Please note: The maximum torque M_{max} is limited to 180 % of the rated motor torque M_N.

DT/DV motor selection with the double-star topology (230 V_{AC} / 60 Hz)

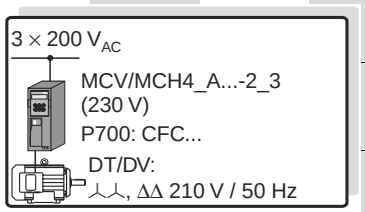
Motor			MOVIDRIVE® *compact* MCV/MCH4_A...-2_3 (230 V units) in CFC operating modes (P700)								
⅄⅄ 230 V / 60 Hz			0015	0022	0037	0055	0075	0110	0150	0220	0300
DT80K4	M_{max}	[Nm] ([lb.in])	7.0 (62)								
	$n_{transition}$	[rpm]	1100								
DT80N4	M_{max}	[Nm] ([lb.in])	9.3 (82)								
	$n_{transition}$	[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

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



DT/DV motor selection with the double-star or double-delta topology (200 V_{AC} / 50 Hz)

Motor			MOVIDRIVE® *compact* MCV/MCH4_A...-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])		**Please note:** The maximum torque M_{max} is limited to 180 % of the rated motor torque M_N.						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



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 always using the latest version of MOVITOOLS (2.70 or later) for startup. The latest MOVITOOLS version can be downloaded from our homepage (www.sew-eurodrive.de).

Motor characteristics

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

Technically speaking, these 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.

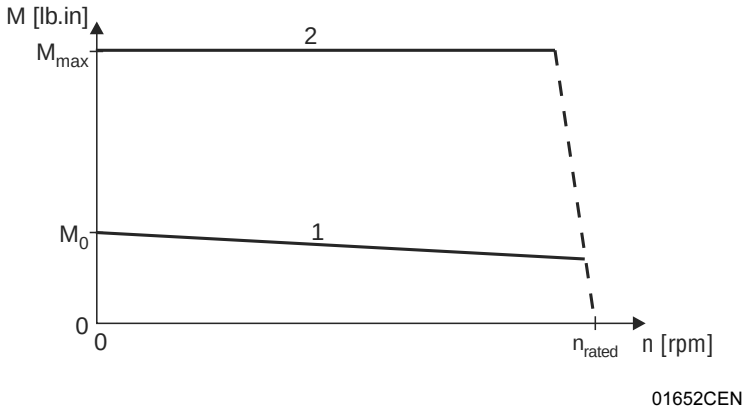


Figure 45: Speed/torque characteristic curve of the DFY servomotor

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.

Refer to the motor table (CM → page 112, DFS/DFY → page 115) for the values for M_0.

Refer to the motor table (CM → page 113, DFS/DFY → page 116) for the values for M_0.

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 undertaken 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 45, 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 45, 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 as a result of 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 % rated inverter current

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

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

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M_0 Continuous static torque according to the motor table DFS/DFY (→ page 115)

I_0 Continuous static torque according to the motor table DFS/DFY (→ page 115)

Motor table CM

Additional project planning notes and information about the type CM synchronous servomotors can be found in the 'Geared Servo Motors' catalog. This can be ordered from SEW.

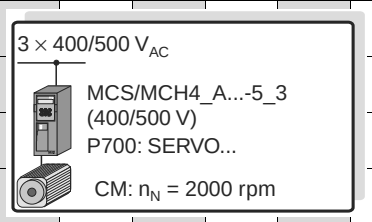
Characteristic values at V_{max} = 400 V_{AC}

n_N	Motor	Without forced cooling fan		With forced cooling fan VR		I_{max}	Mass 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	**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	**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)

CM motor selection

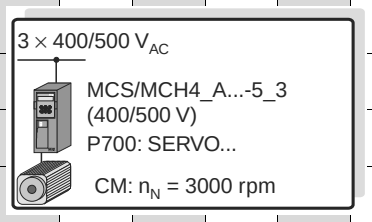
1. Rated speed n_N = 2000 rpm:

Motor		MOVIDRIVE® *compact* MCS/MCH4_A...-5_3 (400/500 V units) in SERVO operating modes (P700)													
		0015	0022	0030	0040	0055	0075	0110	0150	0220	0300	0370	0450	0550	0750
CM71S	M_{max} [Nm] ([lb.in])	13.0 (115)	16.0 (141)	16.5 (145)											
CM71M	M_{max} [Nm] ([lb.in])	13.0 (115)	16.9 (149)	19.8 (175)	21.5 (190)										
CM71L	M_{max} [Nm] ([lb.in])		18.5 (163)	22.8 (201)	28.5 (252)	31.4 (278)									
CM90S	M_{max} [Nm] ([lb.in])		18.5 (163)	23.3 (206)	30.8 (272)	38.0 (336)	39.6 (350)								
CM90M	M_{max} [Nm] ([lb.in])			22.5 (199)	30.5 (269)	39.2 (346)	47.9 (423)	52.2 (461)							
CM90L	M_{max} [Nm] ([lb.in])				31.9 (282)	41.4 (366)	52.5 (464)	72.5 (640)	75.6 (668)						
CM112S	M_{max} [Nm] ([lb.in])				35.3 (312)	45.8 (405)	57.3 (506)	77.6 (686)	81.1 (717)						
CM112M	M_{max} [Nm] ([lb.in])					45.9 (405)	58.3 (515)	84.3 (745)	102.3 (904)	107.0 (945)					
CM112L	M_{max} [Nm] ([lb.in])							87.4 (772)	112.8 (997)	150.4 (1329)	161.2 (1425)				



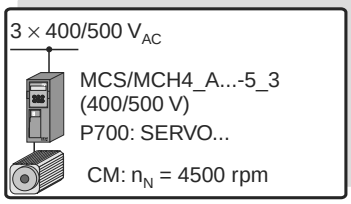
2. Rated speed n_N = 3000 rpm:

Motor		MOVIDRIVE® *compact* MCS/MCH4_A...-5_3 (400/500 V units) in SERVO operating modes (P700)													
		0015	0022	0030	0040	0055	0075	0110	0150	0220	0300	0370	0450	0550	0750
CM71S	M_{max} [Nm] ([lb.in])	9.0 (80)	11.9 (105)	14.3 (126)	16.5 (145)	16.5 (145)									
CM71M	M_{max} [Nm] ([lb.in])		12.2 (107)	14.8 (130)	18.9 (167)	21.5 (190)	21.5 (190)								
CM71L	M_{max} [Nm] ([lb.in])			15.8 (140)	20.6 (182)	26.1 (230)	30.5 (270)	31.4 (278)							
CM90S	M_{max} [Nm] ([lb.in])				21.2 (187)	27.0 (238)	33.6 (297)	39.6 (350)							
CM90M	M_{max} [Nm] ([lb.in])					27.4 (242)	34.4 (304)	48.1 (425)	52.2 (461)						
CM90L	M_{max} [Nm] ([lb.in])						36.5 (322)	53.1 (469)	67.6 (597)	75.0 (663)					
CM112S	M_{max} [Nm] ([lb.in])						39.0 (344)	56.6 (500)	71.7 (633)	80.6 (712)					
CM112M	M_{max} [Nm] ([lb.in])							55.8 (493)	72.9 (644)	98.0 (866)	106.3 (940)				
CM112L	M_{max} [Nm] ([lb.in])								77.6 (686)	109.0 (963)	137.2 (1213)	157.5 (1392)	162.6 (1437)		



3. Rated speed n_N = 4500 rpm:

Motor		MOVIDRIVE® *compact* MCS/MCH4_A...-5_3 (400/500 V units) in SERVO operating modes (P700)													
		0015	0022	0030	0040	0055	0075	0110	0150	0220	0300	0370	0450	0550	0750
CM71S	M_{max} [Nm] ([lb.in])		8.0 (70)	10.0 (88)	13.0 (115)	15.7 (138)	16.5 (145)								
CM71M	M_{max} [Nm] ([lb.in])			9.9 (87)	13.3 (117)	16.7 (147)	19.8 (175)	21.5 (190)							
CM71L	M_{max} [Nm] ([lb.in])					18.1 (160)	22.1 (195)	29.8 (263)	31.4 (277)						
CM90S	M_{max} [Nm] ([lb.in])					18.4 (162)	23.1 (204)	33.6 (297)	39.6 (350)	39.6 (350)					
CM90M	M_{max} [Nm] ([lb.in])						24.1 (213)	34.9 (308)	45.2 (400)	52.2 (461)					
CM90L	M_{max} [Nm] ([lb.in])							36.5 (322)	47.9 (423)	65.5 (580)	75.6 (668)	75.6 (668)			
CM112S	M_{max} [Nm] ([lb.in])							39.2 (346)	51.2 (452)	70.0 (618)	81.1 (716)	81.1 (716)			
CM112M	M_{max} [Nm] ([lb.in])								52.7 (465)	73.5 (650)	90.5 (800)	104.2 (921)	107.0 (945)		
CM112L	M_{max} [Nm] ([lb.in])									73.8 (652)	94.0 (830)	112.8 (997)	133.0 (1175)	150.4 (1330)	162.2 (1434)



Motor table DFS/DFY

Additional project planning notes and information about the type DFS/DFY synchronous servomotors can be found in the 'Geared Servo Motors' catalog. This document can be ordered from SEW.

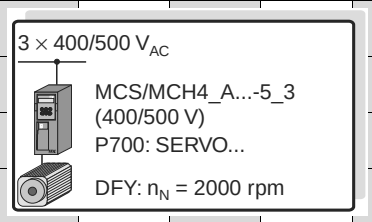
Characteristic values at V_{max} = 400 V_{AC}

n_N	Motor	Without forced cooling fan		With forced cooling fan VY		I_{max}	Mass moment of inertia J_M	
		M_0	I_0	M_{0_VY}	I_{0_VY}		Without brake	With brake
[rpm]		[Nm (lb.in)]	[A]	[Nm (lb.in)]	[A]	[A]	[10^{-4} kgm^2 (10^{-3} lb.ft^2)]	
2000	DFY71S	2.5 (22)	1.25	4.0 (35)	2.0	3.75	3.42 (8.12)	5.46 (13.0)
	DFY71M	3.7 (33)	1.8	5.9 (52)	2.9	5.4	4.85 (11.5)	6.89 (16.3)
	DFY71ML	5.0 (44)	2.5	8.0 (71)	4.0	7.5	6.27 (14.9)	8.31 (19.7)
	DFY71L	7.5 (66)	3.7	12 (106)	5.9	11.1	9.1 (21.6)	11.1 (26.3)
	DFY90S	9.0 (80)	4.0	14.4 (127)	6.4	12	14.3 (34.0)	19.8 (47.0)
	DFY90M	12 (106)	5.3	19.2 (170)	8.5	15.9	18.6 (44.1)	24.1 (57.2)
	DFY90L	18 (159)	8.0	28.9 (255)	12.9	24	27.1 (64.3)	32.6 (77.4)
	DFY112S	12 (106)	5.5	19.2 (170)	8.8	16.5	47.2 (112)	67.4 (160)
	DFY112M	17.5 (155)	8.0	28 (248)	12.8	24	67.4 (160)	87.5 (208)
	DFY112ML	24 (212)	11	38.5 (340)	17.6	33	87.4 (207)	108 (256)
	DFY112L	35 (309)	16	56 (495)	25.5	48	128 (304)	148 (351)
3000	DFS56M	1.0 (8.8)	1.55	-	-	4.65	0.47 (1.12)	0.85 (2.02)
	DFS56L	2.0 (18)	2.22	-	-	6.66	0.82 (1.95)	1.2 (2.85)
	DFY71S	2.5 (22)	1.85	4.0 (35)	3.0	5.55	3.42 (8.12)	5.46 (13.0)
	DFY71M	3.7 (33)	2.7	5.9 (52)	4.3	8.1	4.85 (11.5)	6.89 (16.3)
	DFY71ML	5.0 (44)	3.8	8.0 (71)	6.1	11.4	6.27 (14.9)	8.31 (19.7)
	DFY71L	7.5 (66)	5.5	12 (106)	8.8	16.5	9.1 (21.6)	11.1 (26.3)
	DFY90S	9.0 (80)	5.9	14.4 (127)	9.4	17.7	14.3 (34.0)	19.8 (47.0)
	DFY90M	12 (106)	7.9	19.2 (170)	12.6	23.7	18.6 (44.1)	24.1 (57.2)
	DFY90L	18 (159)	12	29 (256)	19.7	36	27.1 (64.3)	32.6 (77.4)
	DFY112S	12 (106)	8.0	19.2 (170)	12.8	24	47.2 (112)	67.4 (160)
	DFY112M	17.5 (155)	12	28 (248)	19.2	36	67.4 (160)	87.5 (208)
	DFY112ML	24 (212)	16.5	38.5 (340)	26.5	49.5	87.4 (207)	108 (256)
	DFY112L	35 (309)	24	56 (495)	38	72	128 (304)	148 (351)
4500	DFS56M	1.0 (8.8)	1.55	-	-	4.65	0.47 (1.12)	0.85 (2.02)
	DFS56L	2.0 (18)	2.22	-	-	6.66	0.82 (1.95)	1.2 (2.85)
	DFY71S	2.5 (22)	2.8	4.0 (35)	4.5	8.4	3.42 (8.12)	5.46 (13.0)
	DFY71M	3.7 (33)	4.1	5.9 (52)	6.6	12.3	4.85 (11.5)	6.89 (16.3)
	DFY71ML	5.0 (44)	5.8	8.0 (71)	9.3	17.4	6.27 (14.9)	8.31 (19.7)
	DFY71L	7.5 (66)	8.2	12 (106)	13.1	24.6	9.1 (21.6)	11.1 (26.3)
	DFY90S	9.0 (80)	9.0	14.4 (127)	14.4	27	14.3 (34.0)	19.8 (47.0)
	DFY90M	12 (106)	11.6	19.2 (170)	18.6	34.8	18.6 (44.1)	24.1 (57.2)
	DFY90L	18 (159)	18	29 (256)	29	54	27.1 (64.3)	32.6 (77.4)
	DFY112S	12 (106)	11.7	19.2 (170)	18.7	35.1	47.2 (112)	67.4 (160)
	DFY112M	17.5 (155)	18	28 (248)	28.8	54	67.4 (160)	87.5 (208)
	DFY112ML	24 (212)	24.5	38.5 (340)	39.2	73.5	87.4 (207)	108 (256)
	DFY112L	35 (309)	36.5	56 (495)	58.4	109	128 (304)	148 (351)

DFS/DFY motor selection

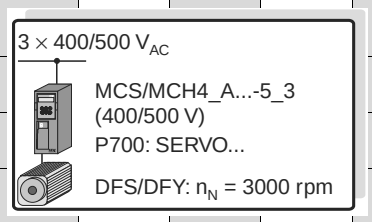
1. Rated speed n_N = 2000 rpm:

Motor		MOVIDRIVE® *compact* MCS/MCH4_A...-5_3 (400/500 V units) in SERVO operating modes (P700)										
		0015	0022	0030	0040	0055	0075	0110	0150	0220	0300	0370
DFY71S	M_{max} [Nm] ([lb.in])	7.5 (66.3)										
DFY71M	M_{max} [Nm] ([lb.in])	11.1 (98.1)										
DFY71ML	M_{max} [Nm] ([lb.in])	12.0 (106)	15.0 (133)									
DFY71L	M_{max} [Nm] ([lb.in])	12.2 (108)	16.7 (148)	21.3 (188)	22.5 (199)							
DFY90S	M_{max} [Nm] ([lb.in])	13.5 (119)	18.6 (164)	23.6 (209)	27.0 (238)							
DFY90M	M_{max} [Nm] ([lb.in])		18.7 (165)	23.7 (210)	32.2 (285)	36.0 (318)						
DFY90L	M_{max} [Nm] ([lb.in])				32.1 (284)	42.2 (373)	54.0 (477)					
DFY112S	M_{max} [Nm] ([lb.in])		18.0 (159)	22.9 (202)	31.1 (275)	36.0 (318)						
DFY112M	M_{max} [Nm] ([lb.in])				31.2 (276)	41.0 (362)	52.5 (464)					
DFY112ML	M_{max} [Nm] ([lb.in])					40.9 (362)	52.3 (462)	72.0 (636)				
DFY112L	M_{max} [Nm] ([lb.in])						52.5 (464)	78.8 (697)	105 (928)			



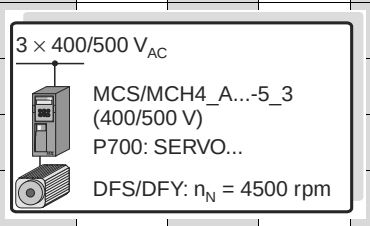
2. Rated speed n_N = 3000 rpm:

Motor		MOVIDRIVE® *compact* MCS/MCH4_A...-5_3 (400/500 V units) in SERVO operating modes (P700)										
		0015	0022	0030	0040	0055	0075	0110	0150	0220	0300	0370
DFS56M	M_{max} [Nm] ([lb.in])	3.0 (26.5)										
DFS56L	M_{max} [Nm] ([lb.in])	5.0 (44.2)	6.0 (53.2)									
DFY71S	M_{max} [Nm] ([lb.in])	7.5 (66.4)										
DFY71M	M_{max} [Nm] ([lb.in])	8.2 (72.7)	11.1 (97.9)									
DFY71ML	M_{max} [Nm] ([lb.in])	7.9 (69.8)	10.9 (96.0)	13.8 (122)	15.0 (133)							
DFY71L	M_{max} [Nm] ([lb.in])		11.2 (99.4)	14.3 (127)	19.4 (172)	22.5 (199)						
DFY90S	M_{max} [Nm] ([lb.in])			16.0 (142)	21.7 (192)	27.0 (238)						
DFY90M	M_{max} [Nm] ([lb.in])				21.6 (191)	28.5 (252)	36.0 (318)					
DFY90L	M_{max} [Nm] ([lb.in])					28.1 (249)	36.0 (318)	54.0 (477)				
DFY112S	M_{max} [Nm] ([lb.in])				21.4 (189)	28.1 (249)	36.0 (318)					
DFY112M	M_{max} [Nm] ([lb.in])					27.3 (242)	35.0 (309)	52.5 (464)				
DFY112ML	M_{max} [Nm] ([lb.in])							52.4 (463)	69.8 (617)	72.3 (639)		
DFY112L	M_{max} [Nm] ([lb.in])							52.4 (463)	70.0 (619)	100 (890)	105 (928)	



3. Rated speed n_N = 4500 rpm:

Motor		MOVIDRIVE® *compact* MCS/MCH4_A...-5_3 (400/500 V units) in SERVO operating modes (P700)										
		0015	0022	0030	0040	0055	0075	0110	0150	0220	0300	0370
DFS56M	M_{max} [Nm] ([lb.in])	3.0 (26.5)										
DFS56L	M_{max} [Nm] ([lb.in])	5.0 (44.2)	6.0 (53.2)									
DFY71S	M_{max} [Nm] ([lb.in])	5.4 (47.4)	7.4 (65.1)	7.5 (66.3)								
DFY71M	M_{max} [Nm] ([lb.in])		7.4 (65.8)	9.5 (83.8)	11.1 (97.8)							
DFY71ML	M_{max} [Nm] ([lb.in])			9.1 (80.0)	12.3 (109)	15.0 (132)						
DFY71L	M_{max} [Nm] ([lb.in])				13.0 (115)	17.1 (152)	22.0 (194)	22.5 (199)				
DFY90S	M_{max} [Nm] ([lb.in])				14.3 (126)	18.8 (166)	24.0 (212)	27.0 (238)				
DFY90M	M_{max} [Nm] ([lb.in])					19.4 (171)	24.8 (219)	36.0 (318)				
DFY90L	M_{max} [Nm] ([lb.in])							36.0 (318)	48.0 (424)	53.8 (576)		
DFY112S	M_{max} [Nm] ([lb.in])					19.2 (170)	24.6 (218)	36.0 (318)				
DFY112M	M_{max} [Nm] ([lb.in])							35.0 (309)	46.7 (413)	52.3 (463)		
DFY112ML	M_{max} [Nm] ([lb.in])								47.0 (416)	67.6 (598)	71.7 (634)	
DFY112L	M_{max} [Nm] ([lb.in])									66.2 (585)	86.3 (763)	105 (928)



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	Alsace Nord	SEW-USOCOME 32, rue Jeanne d'Arc F-67250 Surbourg	Tel. +33 (0) 3 88 54 74 44 Fax +33 (0) 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 (0) 5 57 26 39 00 Fax +33 (0) 5 57 26 39 09
	Ardennes Lorraine	SEW-USOCOME 7, rue de Prény F-54000 Nancy	Tel. +33 (0) 3 83 96 28 04 Fax +33 (0) 3 83 96 28 07
	Bourgogne	SEW-USOCOME 10, rue de la Poste F-71350 St. Loup de la Salle	Tel. +33 (0) 3 85 49 92 18 Fax +33 (0) 3 85 49 92 19
	Bretagne Ouest	SEW-USOCOME 4, rue des Châtaigniers F-44830 Brains	Tel. +33 (0) 2 51 70 54 04 Fax +33 (0) 2 51 70 54 05
	Centre Pays de Loire	SEW-USOCOME 9, rue des Erables F-37540 Saint Cyr sur Loire	Tel. +33 (0) 2 47 41 33 23 Fax +33 (0) 2 47 41 34 03
	Centre Auvergne	SEW-USOCOME 17, boulevard de la liberté F-63200 Riom	Tel. +33 (0) 4 73 64 85 60 Fax +33 (0) 4 73 64 85 61
	Champagne	SEW-USOCOME 139, rue Thiers F-10120 Saint André les Vergers	Tel. +33 (0) 3 25 79 63 24 Fax +33 (0) 3 25 79 63 25
	Lyon Nord-Est	SEW-USOCOME Parc d'Affaires Roosevelt Rue Jacques Tati F-69120 Vaulx en Velin	Tel. +33 (0) 4 72 15 37 03 Fax +33 (0) 4 72 15 37 15
	Lyon Ouest	SEW-USOCOME Parc d'Affaires Roosevelt Rue Jacques Tati F-69120 Vaulx en Velin	Tel. +33 (0) 4 72 15 37 04 Fax +33 (0) 4 72 15 37 15
	Lyon Sud-Est	SEW-USOCOME 4, Montée du Pavé F-26750 Génissieux	Tel. +33 (0) 4 75 05 65 95 Fax +33 (0) 4 75 05 65 96
	Nord	SEW-USOCOME 348, rue du Calvaire F-59213 Bermerain Cidex 102	Tel. +33 (0) 3 27 27 07 88 Fax +33 (0) 3 27 27 24 41
	Normandie	SEW-USOCOME Les Courtillages Hameau de Coupigny F-14370 Airan	Tel. +33 (0) 2 31 78 99 70 Fax +33 (0) 2 31 78 99 72

France			
	Paris Est	SEW-USOCOME Résidence Le Bois de Grâce 2, allée des Souches Vertes F-77420 Champs sur Marne	Tel. +33 (0) 1 64 68 40 50 Fax +33 (0)1 64 68 45 00
	Paris Ouest	SEW-USOCOME 1, rue Matisse F-78960 Voisins le Bretonneux	Tel. +33 (0) 1 30 64 46 33 Fax +33 (0) 1 30 57 54 86
	Paris Picardie	SEW-USOCOME 25 bis, rue Kléber F-92300 Levallois Perret	Tel. +33 (0) 1 41 05 92 74 Fax +33 (0) 1 41 05 92 75
	Paris Sud	SEW-USOCOME 6. chemin des Bergers Lieu-dit Marchais F-91410 Roinville sous Dourdan	Tel. +33 (0) 1 60 81 10 56 Fax +33 (0) 1 60 81 10 57
	Provence	SEW-USOCOME Chemin Les Grands Vallons F-13100 St Marc Jaumegarde	Tel. +33 (0) 4 42 24 90 05 Fax +33 (0) 4 42 24 90 13
	Pyrénées	SEW-USOCOME 271, Lieu-dit Ninaut F-31190 Caujac	Tel. +33 (0) 5 61 08 15 85 Fax +33 (0) 5 61 08 16 44
	Sud-Atlantique	SEW-USOCOME 12, rue des Pinsons F-44120 Vertou	Tel. +33 (0) 2 40 80 32 23 Fax +33 (0) 2 40 80 32 13

Algeria			
Technical Office	**Alger**	Réducom 16, rue des Frères Zaghnoun Bellevue El-Harrach 16200 Alger	Tel. +213 (0) 2 82 22 84 Fax +213 (0) 2 82 22 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 (0) 33 27 45 72 84 Fax +54 (0) 33 27 45 72 21 sewar@sew-eurodrive.com.ar

Australia			
Assembly **Sales** **Service**	**Melbourne**	SEW-EURODRIVE PTY. LTD. 27 Beverage Drive Tullamarine, Victoria 3043	Tel. +61 (0) 3 99 33 10 00 Fax +61 (0) 3 99 33 10 03 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 (0) 2 97 25 99 00 Fax +61 (0) 2 97 25 99 05 enquires@sew-eurodirve.com.au
Technical Offices	**Adelaide**	SEW-EURODRIVE PTY. LTD. Unit 1/601 Anzac Highway Glenelg, S.A. 5045	Tel. +61 (0) 8 82 94 82 77 Fax +61 (0) 8 82 94 28 93 enquires@sew-eurodrive.com.au
	Perth	SEW-EURODRIVE PTY. LTD. 105 Robinson Avenue Belmont, W.A. 6104	Tel. +61 (0) 8 94 78 26 88 Fax +61 (0) 8 92 77 75 72 enquires@sew-eurodrive.com.au
	Brisbane	SEW-EURODRIVE PTY.LTD. 1 /34 Collinsvale St Rocklea, Queensland, 4106	Tel. +61 (0) 7 32 72 79 00 Fax +61 (0) 7 32 72 79 01 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 (0) 16 17 55 00-0 Fax +43 (0) 16 17 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 (0) 7 32 65 51 09-0 Fax +43 (0) 7 32 65 51 09-20 sew@linz.sew-eurodrive.at
	Graz	SEW-EURODRIVE Ges.m.b.H. Grabenstraße 231 A-8045 Graz	Tel. +43 (0) 316 68 57 56-0 Fax +43 (0) 316 68 57 55 sew@graz.sew-eurodrive.at

Bangladesh			
	Dhaka	Triangle Trade International Bldg-5, Road-2, Sec-3, Uttara Model Town Dhaka-1230 Bangladesh	Tel. +880 (0) 28 91 22 46 Fax +880 (0) 28 91 33 44

Belgium			
Assembly **Sales** **Service**	**Brüssel**	CARON-VECTOR S.A. Avenue Eiffel 5 B-1300 Wavre	Tel. +32 (0) 10 23 13 11 Fax +32 (0) 10 2313 36 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 (0) 92 27 34 52 Fax +32 (0) 92 27 41 55

Bolivia			
	La Paz	GRUPO LARCOS LTDA. Av. Jose Carrasco Not. 1398 Entre Hugo Estrada Y Av. Busch La Paz	Tel. +591 (0) 2 34 06 14 Fax +591 (0) 2 35 79 17

Brazil			
Production **Sales** **Service**	**Sao Paulo**	SEW-EURODRIVE Brasil Ltda. Avenida Amâncio Gaiolli, 50 Caixa Postal: 201-07111-970 Guarulhos - Cep.: 07251-250	Tel. +55 (0) 11 64 89 90 00 Fax +55 (0) 11 64 89 90 09 http://www.sew.com.br filial.sp@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 (0) 9 29 53 25 65 Fax +359 (0) 9 29 54 93 45 bever@mbox.infotel.bg

Cameroon			
Technical Office	**Douala**	Electro-Services Rue Drouot Akwa B.P. 2024 Douala	Tel. +237 (0) 43 22 99 Fax +237 (0) 42 77 03

Canada			
Assembly **Sales** **Service**	**Toronto**	SEW-EURODRIVE CO. OF CANADA LTD. 210 Walker Drive Bramalea, Ontario L6T3W1	Tel. +1 (0) 905 7 91-15 53 Fax +1 (0) 905 7 91-29 99 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 (0) 604 9 46-55 35 Fax +1 (0) 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 (0) 514 3 67-11 24 Fax +1 (0) 514 3 67-36 77 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 Correro Quilicura - Santiago - Chile	Tel. +56 (0) 26 23 82 03 + 6 23 81 63 Fax +56 (0) 26 23 81 79 sewsales@entelchile.net

China			
Production **Assembly** **Sales** **Service**	**Tianjin**	SEW-EURODRIVE (Tianjin) Co., Ltd. No. 46, 7th Avenue, TEDA Tianjin 300457	Tel. +86 (0) 22 25 32 26 12 Fax +86 (0) 22 25 32 26 11 http://www.sew.com.cn
Technical Offices	**Beijing**	SEW-EURODRIVE (Tianjin) Co., LTD Room 1205/1206, Golden Corner Building, No. 129 Xuanwumen Xidajie, Xicheng District Beijing 100031	Tel. +86 (0) 10 66 41 20 26 Fax +86 (0) 10 66 41 10 17 beijing@sew.com.cn
	Chengdu	SEW-Eurodrive (Tianjin) Co. Ltd. Room 715, Sichuan International Building No. 206, Shun Cheng Avenue Chengdu 610015	Tel. +86 (0) 2 86 52 15 60 Fax +86 (0) 2 85 52 15 63 chengdu@sew.com.cn
	Fuzhou	SEW-Eurodrive (Tianjin) Co. Ltd. Unit D, 15/F, Oriental Hotel Fujian Fuzhou 350001	Tel. +86 (0) 59 17 50 75 96 Fax +86 (0) 59 17 50 72 85 fuzhou@sew.com.cn
	Guangzhou	SEW-EURODRIVE Pte.Ltd. Rm 1702, No. 138, Tiyudong Road Guangzhou, Guangdong, 510620	Tel. +86 (0) 20 38 78 00 12 Fax +86 (0) 20 38 78 00 13 guangzhou@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 (0) 53 16 41 26 22 Fax +86 (0) 53 16 41 24 30 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 (0) 87 13 11 36 77 Fax +86 (0) 87 13 15 44 54 kunming@sew.com.cn
	Nanjing	SEW-Eurodrive (Tianjing) Co.Ltd. Room 710, Jianda Plaza No. 223, North Zhongshan Road Nanjing 210009	Tel. +86 (0) 2 53 34 67 68 Fax +86 (0) 2 53 34 68 71 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 (0) 21 64 69 35 34 Fax +86 (0) 21 64 69 55 32 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 (0) 24 22 52 15 96 Fax +86 (0) 24 22 52 15 79 shenyang@sew.com.cn
	Wuhan	SEW-Eurodrive (Tianjin) Co.Ltd. Room 911, Tai He Plaza Wusheng Road Wuhan 430033	Tel. +86 (0) 27 85 71 22 93 Fax +86 (0) 27 85 71 22 82 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 (0) 2 97 81 13 27 Fax +86 (0) 2 97 81 13 27 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 (0) 5715 47 50 50 Fax +57 (0) 5715 47 50 44 sewcol@andinet.com

Croatia			
Sales **Service**	**Zagreb**	KOMPEKS d. o. o. PIT Erdödy 4 II HR 10 000 Zagreb	Tel. +385 (0) 14 61 31 58 Fax +385 (0) 14 61 31 58 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 (0) 2 20 12 12 34 + 2 20 12 12 36 Fax +420 (0) 2 20 12 12 37 http://www.sew-eurodrive.cz sew@sew-eurodrive.cz
Technical Offices	**Brno**	SEW-EURODRIVE CZ S.R.O. Zvonarka 16 CZ-61700 Brno	Tel. +420 (0) 5 43 25 61 51 + 5 43 25 61 63 Fax +420 (0) 5 43 25 68 45
	Hradec Kralove	SEW-EURODRIVE CZ S.R.O. Technicka Kancelar - vychodni Cechy Smermova CZ-53374 Horni Jeleni	Tel. +420 (0) 6 02 41 03 88 Fax +420 (0) 4 56 89 36 34

Denmark			
Assembly **Sales** **Service**	**Kopenhagen**	SEW-EURODRIVEA/S Geminivej 28-30, P.O. Box 100 DK-2670 Greve	Tel. +45 (0) 43 95 8500 Fax +45 (0) 43 95 8509 http://www.sew-eurodrive.dk sew@sew-eurodrive.dk
Technical Offices	**Aarhus**	SEW-EURODRIVEA/S Birkenhaven 45 DK-8520 Lystrup	Tel. +45 (0) 86 22 8344 Fax +45 (0) 86 22 8490
	Helsingør	SEW-EURODRIVEA/S Rømøvej 2 DK-3140 Ålsgårde	Tel. +45 (0) 49 75 5700 Fax +45 (0) 49 75 5800
	Odense	SEW-EURODRIVEA/S Lindelyvei 29, Nr. Søby DK-5792 Arslev	Tel. +45 (0) 65 90 2070 Fax +45 (0) 65 90 2309

Egypt			
	Cairo	Copam Egypt for Engineering & Agencies 33 El Hegaz ST, Heliopolis, Cairo	Tel. +20 (0) 22 56 62 99 + 22 41 06 39 Fax +20 (0) 22 59 47 57 + 22 40 47 87 copam@datum.com.eg

Estonia			
Sales	**Tallin**	ALAS-KUUL AS Paldiski mnt.125 EE 0006 Tallin	Tel. +372 (0) 6 59 32 30 Fax +372 (0) 6 59 32 31

Finland			
Assembly **Sales** **Service**	**Lahti**	SEW-EURODRIVE OY Vesimäentie 4 FIN-15860 Hollola 2	Tel. +358 (0) 3 589 300 Fax +358 (0) 3 780 6211 http://www.sew-eurodrive.fi sew@sew-eurodrive.fi
Technical Offices	**Helsinki**	SEW-EURODRIVE OY Luutnantinaukio 5C LT2 FIN-00410 Helsinki	Tel. +358 (0) 3 589 300 Fax + 358 (0) 9 566 6311
	Vaasa	SEW-EURODRIVE OY Kauppapuistikko 15 A FIN-65100 Vaasa	Tel. +358 (0) 3 589 300 Fax +358 (0) 6 312 7470

Gabon			
Technical Office	**Libreville**	Electro-Services B.P. 1889 Libreville	Tel. +241 (0) 73 40 11 Fax +241 (0) 73 40 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 (0) 19 24 89 38 55 Fax +44 (0) 19 24 89 37 02 http://www.sew-eurodrive.co.uk info@sew-eurodrive.co.uk
Technical Offices	**London**	SEW-EURODRIVE Ltd. 764 Finchely Road, Temple Fortune GB-London N.W.11 7TH	Tel. +44 (0) 20 84 58 89 49 Fax +44 (0) 20 84 58 74 17
	Midlands	SEW-EURODRIVE Ltd. 5 Sugar Brook court, Aston Road, Bromsgrove, Worcs B60 3EX	Tel. +44 (0) 15 27 87 73 19 Fax +44 (0) 15 27 57 52 45
	Scotland	SEW-EURODRIVE Ltd. Scottish Office No 37 Enterprise House Springkerse Business Park GB-Stirling FK7 7UF Scotland	Tel. +44 (0) 17 86 47 87 30 Fax +44 (0) 17 86 45 02 23

Greece			
Sales **Service**	**Athen**	Christ. Boznos & Son S.A. 12, Mavromichali Street P.O. Box 80136, GR-18545 Piraeus	Tel. +30 (0) 1 04 22 51 34 Fax +30 (0) 1 04 22 51 59 http://www.boznos.gr Boznos@otenet.gr
Technical Office	**Thessaloniki**	Christ. Boznos & Son S.A. Maiandrou 15 562 24 Evosmos, Thessaloniki	Tel. +30 (0) 3 10 70 54 00 Fax +30 (0) 3 10 70 55 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 (0) 2-7 96 04 77 + 79 60 46 54 Fax +852 (0) 2-7 95-91 29 sew@sewhk.com

Hungary			
Sales **Service**	**Budapest**	SEW-EURODRIVE Kft. H-1037 Budapest Kunigunda u. 18	Tel. +36 (0) 1 437 06 58 Fax +36 (0) 1 437 06 50 sew-eurodrive.voros@matarnet.hu

Iceland			
	Hafnarfirdi	VARMAVERK ehf Dalshrauni 5 IS - 220 Hafnarfirdi	Tel. +354 (0) 5 65 17 50 Fax +354 (0) 5 65 19 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 (0) 265-83 10 86 Fax +91 (0) 265-83 10 87 sew.baroda@gecsl.com
Technical Offices	**Calcutta**	SEW EURODRIVE INDIA PVT. LTD. Juthika Apartment, Flat No. B1 11/1, Sunny Park Calcutta - 700 019	Tel. +91 (0) 33-4 85 39 18 Fax +91 (0) 33-4 85 38 26 sewcal@cal.vsnl.net.in
	Chennai	SEW-EURODRIVE India Private Limited 2nd Floor, Hariram Building Chennai - 600 006, Tamil Nadu	Tel. +91 (0) 44-8 21 44 71 Fax +91 (0) 44-8 21 44 73
	New Delhi	SEW-EURODRIVE India Private Limited 303 Kirti Deep, 2-Nangal Raya Business Centre New Delhi 110 046	Tel. +91 (0) 11-5 61 15 66 Fax +91 (0) 11-5 51 34 94
	Pune	SEW-EURODRIVE India Private Limited 206, Metro House 7 Mangaldas Road Pune 411001, Maharashtra	Tel. +91 (0) 20 60 10 54 Fax +91 (0) 20 63 13 65 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 (0) 21 535-90 66/7 Fax +62 (0) 21 536-36 86

Ireland			
Sales **Service**	**Dublin**	Alperton Engineering Ltd. 48 Moyle Road Dublin Industrial Estate Glasnevin, Dublin 11	Tel. +353 (0) 18 30 62 77 Fax +353 (0) 18 30 64 58

Israel			
	Tel-Aviv	Liraz Handasa Ltd. Ahofer Str 34B / 228 58858 Holon	Tel. +972 (0) 3-5 59 95 11 Fax +972 (0) 3-5 59 95 12 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 (0) 2 96 98 01 Fax +39 (0) 2 96 79 97 81 sewit@sew-eurodrive.it
Technical Offices	**Bologna**	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Via Emilia,172 I-40064 Ozzano dell'Emilia (Bo)	Tel. +39 (0) 51 79 66 60 Fax +39 (0) 51 79 65 95
	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 (0) 8 23 45 06 11 Fax +39 (0) 8 23 42 14 14
	Firenze	RIMA Via Einstein, 14 I-50013 Campi Bisenzio (Firenze)	Tel. +39 (0) 5 58 98 58 21 /-22 Fax +39 (0) 5 58 98 58 30
	Roma	Elettromec Via Castel Rosso, 10 I-00144 Roma	Tel. +39 (0) 65 92 45 30 Fax +39 (0) 65 92 45 30
	Torino	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Corso G. Ferraris,146 I-10129 Torino	Tel. +39 (0) 1 13 18 66 06 Fax +39 (0) 1 13 19 0115
	Verona	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Via P. Sgulmero, 27/A I-37132 Verona	Tel. +39 (0) 45 97 77 22 Fax +39 (0) 45 97 60 79

Ivory Coast			
Technical Office	**Abidjan**	SICA Ste industrielle et commerciale pour l'Afrique 165, Bld de Marseille B.P. 2323, Abidjan 08	Tel. +225 (0) 25 79 44 Fax +225 (0) 25 84 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 (0) 53 83 7 3811-13 Fax +81 (0) 53 83 7 3814 sewjapan@lilac.ocn.ne.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 (0) 92 713 69 55 Fax +81 (0) 92 713 68 60 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 (0) 6 64 44-83 30 Fax +81 (0) 6 64 44-83 38 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 (0) 3 32 39-04 69 Fax +81 (0) 3 32 39-09 43 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 (0) 3 14 92-80 51 Fax +82 (0) 3 14 92-80 56 master@sew-korea.co.kr
Technical Offices	**Busan**	SEW-EURODRIVE KOREA Co., Ltd. No. 407, Samjoo officetel. 116-7, Kamjun-2-dong, Sasang-ku Busan 617-724	Tel. +82 (0) 5 13 13 48 04 Fax +82 (0) 5 13 13 48 05 sewpu2@channeli.net
	Daegu	SEW-EURODRIVE KOREA Co., Ltd. No.1108 Sungan officete l 87-36, Duryu 2-dong, Dalseo-ku Daegu 704-712	Tel. +82 (0) 5 36 50-7111 Fax +82 (0) 5 36 50-7112 sewdaegu@netsgo.com
	DaeJeon	SEW-Eurodrive KOREA Co., Ltd. No. 2017, Hongin offictel 536-9, Bongmyung-dong, Yusung-ku Daejeon 305-710	Tel. +82 (0) 4 28 28-64 61 Fax +82 (0) 4 28 28-64 63 sewdaejeon@netsgo.com
	Kwangju	SEW-EURODRIVE KOREA Co., Ltd. 4fl., Shinhyun B/D 96-16 Unam-dong, Buk-ku Kwangju 500-170	Tel. +82 (0) 62 511-9172 Fax +82 (0) 62 511-9174 sewkwangju@netsgo.com
	Seoul	SEW-EURODRIVE KOREA Co., Ltd. No.1104 Sunkyung officetel 106-4 Kuro 6-dong, Kuro-ku Seoul 152-056	Tel. +82 (0) 28 62-80 51 Fax +82 (0) 28 62-81 99 sewseoul@netsgo.com

Lebanon			
Technical Office	**Beirut**	Gabriel Acar & Fils sarl B. P. 80484 Bourj Hammoud, Beirut	Tel. +961 (0) 1 49 47 86 +961 (0) 1 49 82 72 +961 (0) 3 27 45 39 Fax +961 (0) 1 49 49 71 gacar@beirut.com

Luxembourg			
Assembly **Sales** **Service**	**Brüssel**	CARON-VECTOR S.A. Avenue Eiffel 5 B-1300 Wavre	Tel. +352 (0) 10 23 13 11 Fax +352 (0) 10 2313 36 http://www.caron-vector.be info@caron-vector.be

Macedonia			
Sales	**Skopje**	SGS-Skopje / Macedonia "Teodosij Sinactaski" 66 91000 Skopje / Macedonia	Tel. +389 (0) 9 91 38 43 90 Fax +389 (0) 9 91 38 43 90 sgs@mol.com.mk

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 (0) 73 54 57 07 + 73 54 94 09 Fax +60 (0) 73 5414 04 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 (0) 88-42 47 92 Fax +60 (0) 88-42 48 07
	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 (0) 35 22 96 33 Fax +60 (0) 35 22 96 22 sewpjy@po.jaring.my
	Penang	SEW-EURODRIVE Sdn. Bhd. No. 38, Jalan Bawal Kimsar Garden 13700 Prai, Penang	Tel. +60 (0) 43 99 93 49 + 43 99 98 35 Fax +60 (0) 43 99 93 48 seweurodrive@po.jaring.my

Mexico			
	Tultitlan	SEW-EURODRIVE, Sales and Distribution, S.A.de C.V. Boulevard Tultitlan Oriente #2 "G" Colonia Ex-Rancho de Santiaguito Tultitlan, Estado de Mexico, Mexico 54900	Tel. +52 (0) 55 58 88 29 76 Fax +52 (0) 55 58 88 29 77 scmexico@seweurodrive.com.mx

Morocco			
Technical Office	**Casablanca**	S. R. M. Société de Réalisations Mécaniques 5, rue Emir Abdelkader 05 Casablanca	Tel. +212 (0) 2 61 86 69 + 61 86 70 + 61 86 71 Fax +212 (0) 2 62 15 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 (0) 10 44 63 700 Fax +31 (0) 10 41 55 552 http://www.vector-aandrijftechniek.nl 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 (0) 9-2 74 56 27 Fax +64 (0) 9-2 74 01 65 sales@sew-eurodrive.co.nz
	Christchurch	SEW-EURODRIVE NEW ZEALAND LTD. 10 Settlers Crescent, Ferrymead Christchurch	Tel. +64 (0) 3-3 84 62 51 Fax +64 (0) 3-3 85 64 55 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 (0) 6-3 55 21 65 Fax +64 (0) 6-3 55 23 16 sales@sew-eurodrive.co.nz

Norway			
Assembly **Sales** **Service**	**Moss**	SEW-EURODRIVE A/S Solgaard skog 71 N-1599 Moss	Tel. +47 (0) 69 2410 20 Fax +47 (0) 69 2410 40 sew@sew-eurodrive.no

Pakistan			
Technical Office	**Karachi**	SEW-EURODRIVE Pte. Ltd. Karachi Liaison Office A/3,1 st Floor, Central Commercial Area Sultan Ahmed Shah Road Block7/8, K.C.H.S. Union Ltd., Karachi	Tel. +92 (0) 92-21-43 93 69 Fax +92 (0) 92-21-43 73 65

Paraguay			
	Asunción	EQUIS S. R. L. Avda. Madame Lynchy y Sucre Asunción	Tel. +595 (0) 21 67 21 48 Fax +595 (0) 21 67 21 50

Peru			
Assembly **Sales** **Service**	**Lima**	SEW DEL PERU MOTORES REDUCTORES S.A.C. Los Calderos # 120-124 Urbanizacion Industrial Vulcano, ATE, Lima	Tel. +51 (0) 511 349-52 80 Fax +51 (0) 511 349-30 02 sewperu@terra.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 (0) 2-8 94 27 52 54 Fax +63 (0) 2-8 94 27 44 sewmla@i-next.net

Poland			
Sales	**Lodz**	SEW-EURODRIVE Polska Sp.z.o.o. ul. Techniczna 3/5 PL-92-519 Lodz	Tel. +48 (0) 4 26 77 10 90 Fax +48 (0) 4 26 77 10 99 http://www.sew-eurodrive.pl sew@sew-eurodrive.pl
Technical Office	**Katowice**	SEW-EURODRIVE Polska Sp.z.o.o. ul. Nad Jeziorem 87 PL-43-100 Tychy	Tel. +48 (0) 3 22 17 50 26 + 3 22 17 50 27 Fax +48 (0) 3 22 27 79 10 + 3 22 17 74 68 + 3 22 17 50 26 + 3 22 17 50 27
	Bydgoszcz	SEW-EURODRIVE Polska Sp.z.o.o. ul. Fordonska 246 PL-85-959 Bydgoszcz	Tel. +48 (0) 5 23 60 65 90 Fax +48 (0) 5 23 60 65 91
	Szczecinek	SEW-EURODRIVE Polska Sp.z.o.o. ul. Mickiewicza 2 pok. 36 PL-78-400 Szczecinek	Tel. +48 (0) 9 43 72 88 20 Fax +48 (0) 5 23 72 88 21

Portugal			
Assembly **Sales** **Service**	**Coimbra**	SEW-EURODRIVE, LDA. Apartado 15 P-3050-901 Mealhada	Tel. +351 (0) 2 31 20 96 70 Fax +351 (0) 2 31 20 36 85 http://www.sew-eurodrive.pt infosew@sew-eurodrive.pt
Technical Offices	**Lisboa**	Tertir Edificio Lisboa Gabinete 119 P-2615 Alverca do Ribatejo	Tel. +351 (0) 2 19 58 01 98 Fax +351 (0) 2 19 58 02 45 esc.lisboa@sew-eurodrive.pt
	Porto	AV. D. AFONSO HENRIQUES, 1196-9° Sala 909 - Edificio Acia P- 4450 Matosinhos	Tel. +351 (0) 2 29 35 03 83 Fax +351 (0) 2 29 35 03 84 MobilTel. +351 (0) 9 33 2 55 91 10 esc.porto@sew-eurodrive.pt

Romania			
Sales **Service**	**Bucuresti**	Sialco Trading SRL str. Madrid nr.4 71222 Bucuresti	Tel. +40 (0) 2 12 30 13 28 Fax +40 (0) 2 12 30 71 70 sialco@sialco.ro

Russia			
Sales	**St. Petersburg**	ZAO SEW-EURODRIVE P.O. Box 263 RUS-195220 St. Petersburg	Tel. +7 (0) 812 5 35 71 42 + 812 5 35 04 30 Fax +7 (0) 812 5 35 22 87 sew@sew-eurodrive.ru
Technical Office	**Moskau**	ZAO SEW-EURODRIVE RUS-113813 Moskau	Tel. +7 (0) 9 52 38 76 11 Fax +7 (0) 9 52 38 04 22

Senegal			
Technical Office	**Dakar**	SENEMECA Mécanique Générale Km 8, Route de Rufisque B.P. 3251, Dakar	Tel. +221 (0) 849 47 70 Fax +221 (0) 849 47 71 senemeca@sentoo.sn

Singapore			
Assembly **Sales** **Service**		SEW-EURODRIVE PTE. LTD. No 9, Tuas Drive 2 Jurong Industrial Estate Singapore 638644	Tel. +65 (0) 68 62 17 01 ... 17 05 Fax +65 (0) 68 61 28 27 Telex 38 659 sales@sew-eurodrive.com.sg

Slovenia			
Sales **Service**	**Celje**	Pakman - Pogonska Tehnika d.o.o. UI. XIV. divizije 14 SLO – 3000 Celje	Tel. +386 (0) 3 490 83 20 Fax +386 (0) 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 (0) 11 248 70 00 Fax +27 (0) 11 494 23 11 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 (0) 21 552 98 20 Fax +27 (0) 21 552 98 30 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 (0) 31 700 34 51 Fax +27 (0) 31 700 38 47 dtait@sew.co.za
Technical Offices	**Nelspruit**	SEW-EURODRIVE (PTY) LTD. 7 Christie Crescent Vintonia P.O.Box 1942 Nelspruit 1200	Tel. +27 (0) 13 752 80 07 Fax +27 (0) 13 752 80 08 robermeyer@sew.co.za
	Port Elizabeth	SEW-EURODRIVE PTY LTD. 5 b Linsay Road Neave Township 6000 Port Elizabeth	Tel. +27 (0) 41 453 03 03 Fax +27 (0) 41 453 03 05 dswanepoel@sew.co.za
	Richards Bay	SEW-EURODRIVE PTY LTD. 25 Eagle Industrial Park Alton Richards Bay P.O. Box 458 Richards Bay 3900	Tel. +27 (0) 35 797 38 05 Fax +27 (0) 35 797 38 19 dtait@sew.co.za

Spain			
Assembly **Sales** **Service**	**Bilbao**	SEW-EURODRIVE ESPAÑA, S.L. Parque Tecnológico, Edificio, 302 E-48170 Zamudio (Vizcaya)	Tel. +34 (0) 9 44 31 84 70 Fax +34 (0) 9 44 31 84 71 sew.spain@sew-eurodrive.es
Technical Offices	**Barcelona**	Delegación Barcelona Avenida Francesc Maciá 40-44 Oficina 3.1 E-08206 Sabadell (Barcelona)	Tel. +34 (0) 9 37 16 22 00 Fax +34 (0) 9 37 23 30 07
	Lugo	Delegación Noroeste Apartado, 1003 E-27080 Lugo	Tel. +34 (0) 6 39 40 33 48 Fax +34 (0) 9 82 20 29 34
	Madrid	Delegación Madrid Gran Via. 48-2° A-D E-28220 Majadahonda (Madrid)	Tel. +34 (0) 9 16 34 22 50 Fax +34 (0) 9 16 34 08 99

Sri Lanka			
	Colombo 4	SM International (Pte) Ltd 254, Galle Raod Colombo 4, Sri Lanka	Tel. +94 (0) 941-59 79 49 Fax +94 (0) 941-58 29 81

Sweden			
Assembly **Sales** **Service**	**Jönköping**	SEW-EURODRIVE AB Gnejsvägen 6-8 S-55303 Jönköping Box 3100 S-55003 Jönköping	Tel. +46 (0) 36 34 42 00 Fax +46 (0) 36 34 42 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 (0) 3 17 09 68 80 Fax +46 (0) 3 17 09 68 93
	Malmö	SEW-EURODRIVE AB Borrgatan 5 S-21124 Malmö	Tel. +46 (0) 4 06 80 64 80 Fax +46 (0) 4 06 80 64 93
	Stockholm	SEW-EURODRIVE AB Björkholmsvägen 10 S-14125 Huddinge	Tel. +46 (0) 84 49 86 80 Fax +46 (0) 84 49 86 93
	Skellefteå	SEW-EURODRIVE AB Trädgårdsgatan 8 S-93131 Skellefteå	Tel. +46 (0) 9 10 71 53 80 Fax +46 (0) 9 10 71 53 93

Switzerland			
Assembly **Sales** **Service**	**Basel**	Alfred Imhof A.G. Jurastrasse 10 CH-4142 Münchenstein bei Basel	Tel. +41 (0) 6 14 17 17 17 Fax +41 (0) 6 14 17 17 00 http://www.imhof-sew.ch info@imhof-sew.ch
Technical Offices	**Suisse romande**	André Gerber Es Perreyres 1436 Chamblon	Tel. +41 (0) 2 44 45 38 50 Fax +41 (0) 2 44 45 48 87
	Bern	Rudolf Bühler Allerheiligenstraße 97d 2540 Grenchen	Tel. +41 (0) 3 26 52 23 39 Fax +41 (0) 3 26 52 23 31
	Luzern	Beat Lütolf Baumacher 11 6244 Nebikon	Tel. +41 (0) 6 27 56 47 80 Fax +41 (0) 6 27 56 47 86
	Zürich	René Rothenbühler Nörgelbach 7 8493 Saland	Tel. +41 (0) 5 23 86 31 50 Fax +41 (0) 5 23 86 3213

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 (0) 27 38 35 35 Fax +886 (0) 27 36 82 68 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 (0) 38 21 40 22 Fax +66 (0) 38 21 45 31 sewthailand@sew-eurodrive.co.th
Technical Offices	**Bangkok**	SEW-EURODRIVE PTE LTD Bangkok Liaison Office TPS Building, Room No. 5/4 1023, Phattanakarn Road Klongtan, Phrakanong, Bangkok,10110	Tel. +66 (0) 2717 81 51 Fax +66 (0) 2717 81 52 sewthailand@sew-eurodrive.co.th
	Hadyai	SEW-EURODRIVE (Thailand) Ltd. Hadyai Country Home Condominium 59/101 Soi.17/1 Rachas-Utid Road. Hadyai, Songkhla 90110	Tel. +66 (0) 74-35 94 41 Fax +66 (0) 74-35 94 42 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 (0) 43-22 57 45 Fax +66 (0) 43-32 48 71 sewkk@cscoms.com
	Lampang	SEW-EURODRIVE (Thailand) Ltd. 264 Chatchai Road, sub-tuy, Muang, Lampang 52100	Tel. +66 (0) 54-31 02 41 Fax +66 (0) 54-31 02 42 sewthailand@sew-eurodrive.co.th

Tunisia			
Technical Office	**Tunis**	T. M.S. Technic Marketing Service 7, rue Ibn El Heithem Z.I. SMMT 2014 Mégrine Erriadh	Tel. +216 (0) 1 43 40 64 + 1 43 20 29 Fax +216 (0) 1 43 29 76

Turkey			
Assembly **Sales** **Service**	**Istanbul**	SEW-EURODRIVE Hareket Sistemleri Sirketi Bagdat Cad. Koruma Cikmazi No. 3 TR-81540 Maltepe ISTANBUL	Tel. +90 (0) 216 4 41 91 63 + 216 4 41 91 64 + 216 3 83 80 14 Fax +90 (0) 216 3 05 58 67 seweurodrive@superonline.com.tr
Technical Offices	**Ankara**	SEW-EURODRIVE Hareket Sistemleri Sirketi Ehlibeyt Mah. Ceyhun Atif Kansu Cad. 12. Sok. Tepe Apt. No. 7/12 TR-06520 Balgat-Ankara	Tel. +90 (0) 312 286 80 14 Fax +90 (0) 312 286 80 15
	Izmir	SEW-EURODRIVE Hareket Sistemleri Ticaret Ltd. Sirketi 1203/11 Sok. No. 4/613 Hasan Atli Is Merkezi TR-35110 Yenisehir-Izmir	Tel. +90 (0) 232 4 69 62 64 Fax +90 (0) 232 4 33 61 05

Uruguay			
	Montevideo	SEW-EURODRIVE S. A. Sucursal Uruguay German Barbato 1526 CP 11200 Montevideo	Tel. +598 (0) 2 9018 189 Fax +598 (0) 2 9018 188 sewuy@sew-eurodrive.com.uy

USA			
Production **Assembly** **Sales** **Service**	**Greenville**	SEW-EURODRIVE INC. 1295 Old Spartanburg Highway P.O. Box 518 Lyman, S.C. 29365	Tel. +1 (0) 864 4 39 75 37 Fax Sales +1 (0) 864 439-78 30 Fax Manuf. +1 (0) 864 4 39-99 48 Fax Ass. +1 (0) 864 4 39-05 66 Telex 805 550 http://www.seweurodrive.com cslyman@seweurodrive.com
Assembly **Sales** **Service**	**San Francisco**	SEW-EURODRIVE INC. 30599 San Antonio St. Hayward, California 94544-7101	Tel. +1 (0) 510 4 87-35 60 Fax +1 (0) 510 4 87-63 81 cshayward@seweurodrive.com
	Philadelphia/PA	SEW-EURODRIVE INC. Pureland Ind. Complex 200 High Hill Road, P.O. Box 481 Bridgeport, New Jersey 08014	Tel. +1 (0) 856 4 67-22 77 Fax +1 (0) 856 8 45-31 79 csbridgeport@seweurodrive.com
	Dayton	SEW-EURODRIVE INC. 2001 West Main Street Troy, Ohio 45373	Tel. +1 (0) 9 37 3 35-00 36 Fax +1 (0) 9 37 4 40-37 99 cstroy@seweurodrive.com
	Dallas	SEW-EURODRIVE INC. 3950 Platinum Way Dallas, Texas 75237	Tel. +1 (0) 214 3 30-48 24 Fax +1 (0) 214 3 30-47 24 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 (0) 241 8 32 98 04 Fax +58 (0) 241 8 38 62 75 sewventas@cantv.net sewfinanzas@cantv.net

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