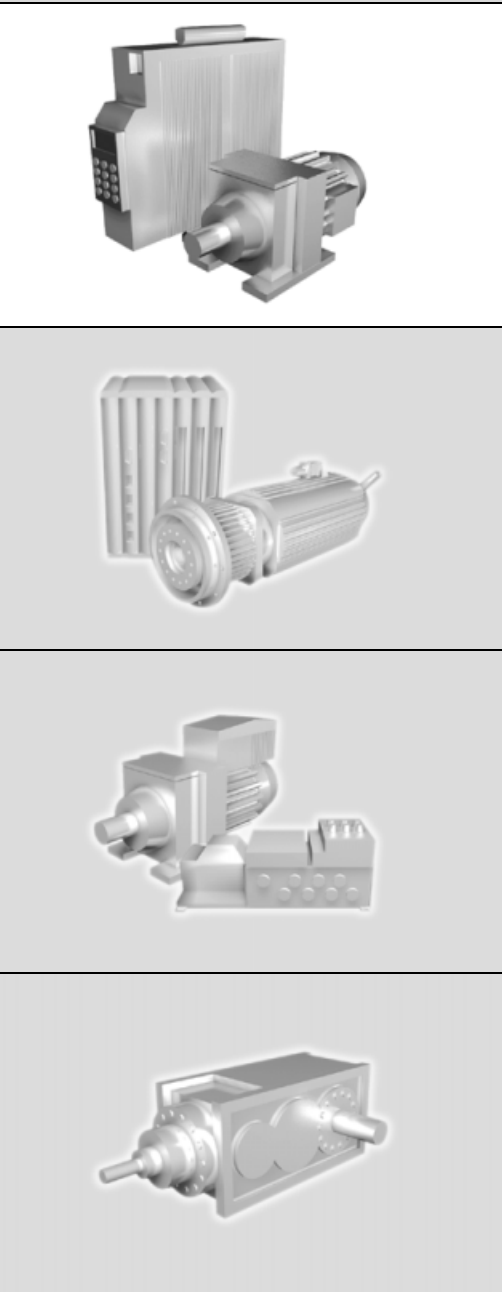




SEW
EURODRIVE

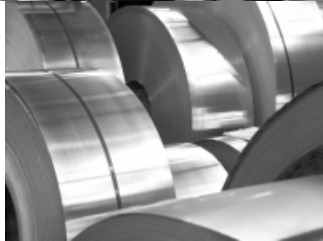
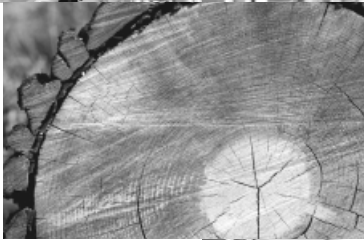


MOVITRAC[®] B

Edition 06/2007

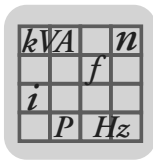
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Catalog





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1 System description MOVITRAC® B



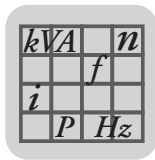
Compact and economic: MOVITRAC® B – the next generation frequency inverter.

1.1 MOVITRAC® B – compact, versatile and universal

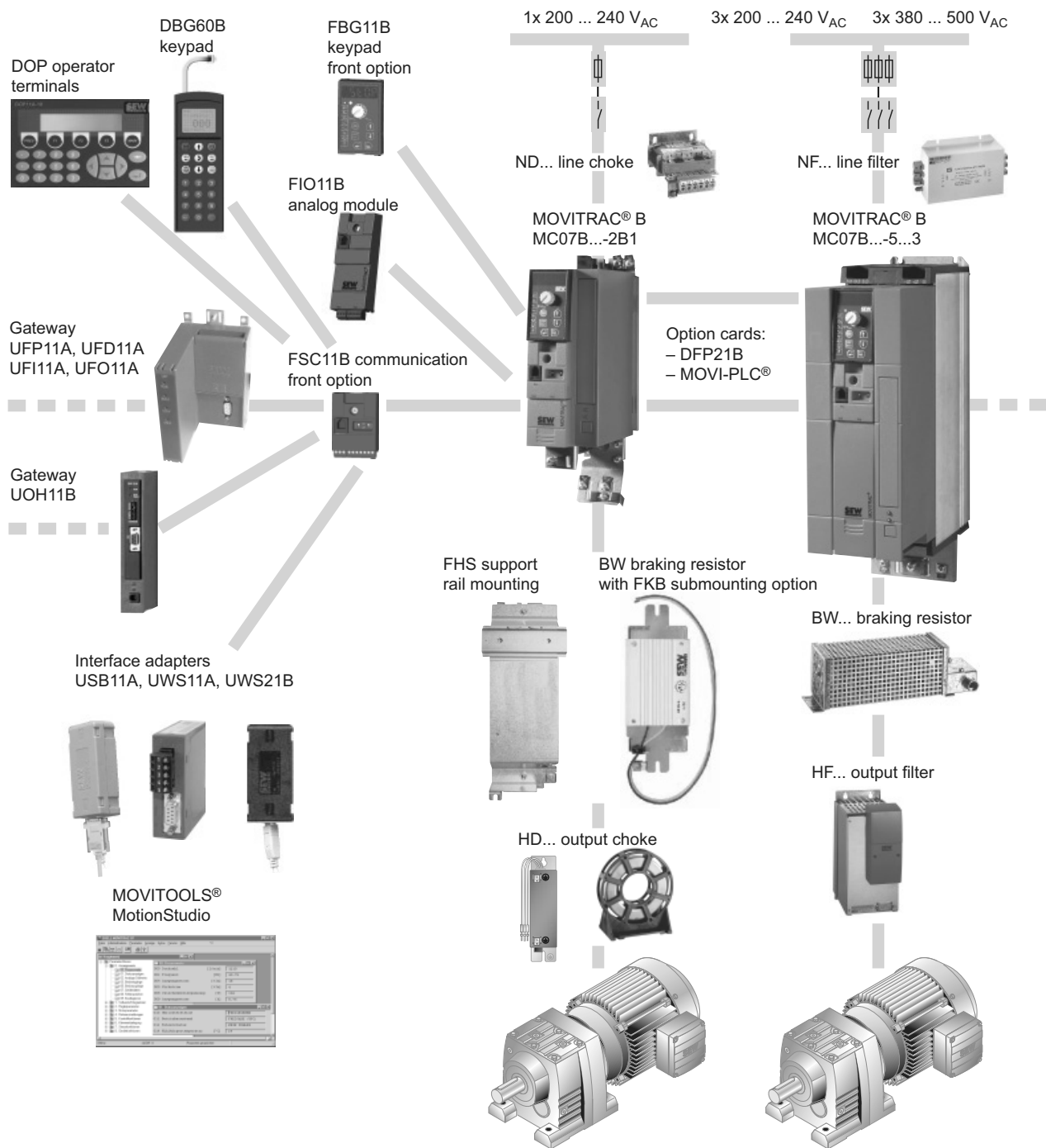
The percentage of speed-variable AC drives with inverter technology is constantly increasing, and these units offer all options to optimize system and machine concepts to the process sequences in addition to machine-conserving drive technology. The expanse of these different fields of application shows that it is difficult to meet the technological and economic requirements with one universal inverter class.

The drive electronics in asynchronous AC motors are separated into standard inverters, for simple applications, e.g. materials handling, and application inverters, for more complex technological applications, e.g. positioning and handling applications. This differentiation of the units allows scaling to different applications while staying with a certain budget.

Operation, parameter setting, diagnostics and integration in automation concepts must offer unit-comprehensive and therefore universal engineering and communication support. Engineering tools for project planning, parameter setting and startup as well as availability of communication interfaces (fieldbuses and Industrial Ethernet) offer users a solution-oriented and unit-independent user interface.



1.2 System overview MOVITRAC® B



Mains connection

- ND line choke
- NF line filter

Power connection

- HF output filter
- HD output choke

BW braking resistor

Front options

- FBG11B keypad
- FIO11B analog module
- FSC11B communication for connecting (only one option possible):
 - DBG60B keypad
 - UFx gateway
 - UOH gateway
 - UWS/USB interface adapter
 - SBus
 - RS-485
 - DOP operator terminals

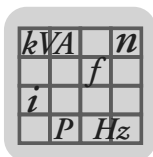
Option cards

- PROFIBUS
- MOVI-PLC® control

Installation

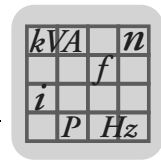
- FHS support rail mounting
- Submounting option for FKB braking resistor

MOVITOOLS® MotionStudio software



1.3 The units at a glance

Mains connection	Motor power	Rated output current	MOVITRAC® B type	Size
230 V 1-phase	0.25 kW (0.4 HP)	AC 1.7 A	MC07B0003-2B1-4-00	0XS
	0.37 kW (0.5 HP)	AC 2.5 A	MC07B0004-2B1-4-00	
	0.55 kW (0.75 HP)	AC 3.3 A	MC07B0005-2B1-4-00	0S
	0.75 kW (1.0 HP)	AC 4.2 A	MC07B0008-2B1-4-00	
	1.1 kW (1.5 HP)	AC 5.7 A	MC07B0011-2B1-4-00	0L
	1.5 kW (2.0 HP)	AC 7.3 A	MC07B0015-2B1-4-00	
	2.2 kW (3.0 HP)	AC 8.6 A	MC07B0022-2B1-4-00	
230 V 3-phase	0.25 kW (0.4 HP)	AC 1.7 A	MC07B0003-2A3-4-00	0XS
	0.37 kW (0.5 HP)	AC 2.5 A	MC07B0004-2A3-4-00	
	0.55 kW (0.75 HP)	AC 3.3 A	MC07B0005-2A3-4-00	0S
	0.75 kW (1.0 HP)	AC 4.2 A	MC07B0008-2A3-4-00	
	1.1 kW (1.5 HP)	AC 5.7 A	MC07B0011-2A3-4-00	0L
	1.5 kW (2.0 HP)	AC 7.3 A	MC07B0015-2A3-4-00	
	2.2 kW (3.0 HP)	AC 8.6 A	MC07B0022-2A3-4-00	
	3.7 kW (5.0 HP)	AC 14.5 A	MC07B0037-2A3-4-00	1
	5.5 kW (7.5 HP)	AC 22 A	MC07B0055-2A3-4-00	2
	7.5 kW (10 HP)	AC 29 A	MC07B0075-2A3-4-00	
	11 kW (15 HP)	AC 42 A	MC07B0110-203-4-00	3
	15 kW (20 HP)	AC 54 A	MC07B0150-203-4-00	
	22 kW (30 HP)	AC 80 A	MC07B0220-203-4-00	4
	30 kW (40 HP)	AC 95 A	MC07B0300-203-4-00	
400 V 3-phase	0.25 kW (0.4 HP)	AC 1.0 A	MC07B0003-5A3-4-00	0XS
	0.37 kW (0.5 HP)	AC 1.6 A	MC07B0004-5A3-4-00	
	0.55 kW (0.75 HP)	AC 2.0 A	MC07B0005-5A3-4-00	0S
	0.75 kW (1.0 HP)	AC 2.4 A	MC07B0008-5A3-4-00	
	1.1 kW (1.5 HP)	AC 3.1 A	MC07B0011-5A3-4-00	
	1.5 kW (2.0 HP)	AC 4.0 A	MC07B0015-5A3-4-00	0L
	2.2 kW (3.0 HP)	AC 5.5 A	MC07B0022-5A3-4-00	
	3.0 kW (4.0 HP)	AC 7.0 A	MC07B0030-5A3-4-00	
	4.0 kW (5.0 HP)	AC 9.5 A	MC07B0040-5A3-4-00	2S
	5.5 kW (7.5 HP)	AC 12.5 A	MC07B0055-5A3-4-00	
	7.5 kW (10 HP)	AC 16.0 A	MC07B0075-5A3-4-00	
	11 kW (15 HP)	AC 24.0 A	MC07B0110-5A3-4-00	2
	15 kW (20 HP)	AC 32.0 A	MC07B0150-503-4-00	3
	22 kW (30 HP)	AC 46.0 A	MC07B0220-503-4-00	
	30 kW (40 HP)	AC 60.0 A	MC07B0300-503-4-00	
	37 kW (50 HP)	AC 65.7 A	MC07B0370-503-4-00	4
	45 kW (60 HP)	AC 80.1 A	MC07B0450-503-4-00	
	55 kW (75 HP)	AC 105 A	MC07B0550-503-4-00	5
75 kW (100 HP)	AC 130 A	MC07B0750-503-4-00		

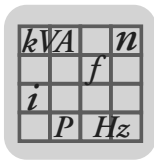


1.4 Functions / features

MOVITRAC® B frequency inverters are characterized by the following features:

1.4.1 Unit properties

- Wide voltage range:
 - 230 V units for the voltage range 1 × AC 200 ... 240 V, 50/60 Hz
 - 230 V units for the voltage range 3 × AC 200 ... 240 V, 50/60 Hz
 - 400/500 V units for the voltage range 3 × AC 380 ... 500 V, 50/60 Hz
- Overload capacity: 125% I_{rated} continuous operation
150% I_{rated} for at least 60 s
Maximum 200% breakaway torque (BG0)
- Rated operation up to an ambient temperature $\vartheta = 50\text{ °C}$ (122 °F), operation up to an ambient temperature $\vartheta = 60\text{ °C}$ (140 °F) possible with current reduction.
- Speed range 0 ... 5500 rpm.
- Output frequency range:
 - VFC: 0 ... 150 Hz
 - V/f: 0 ... 600 Hz
- 4-quadrant capability due to the integrated brake chopper.
- Compact unit design for minimum control cabinet space requirement and optimum utilization of control cabinet volume.
- Devices in the "safe stop" version are available for:
 - 3 × AC 380 ... 500 V, 0.55 ... 75 kW
- Integrated EMC line filter to maintain the specified limit classes (C1/C2 according to EN 61800-3 / A/B according to EN 55011/55014) on the mains side:
 - Sizes 0 ... 2: C2 (A) without further measures
 - Sizes 0 ... 5: C1 (B) with corresponding filters / foldable ferrites
- Configurable inputs / outputs
 - 1 analog input
 - 6 binary inputs
 - 3 binary outputs, including 1 relay output
 - Optional: 1 additional analog input / 1 additional analog output
- Voltage supply and evaluation for TF (PTC temperature sensor) integrated for monitoring the motor temperature.
- Integrated evaluation of TH for monitoring the temperature of the motor.
- Integrated keypad for displaying setpoints and setting parameters
 - 5-digit 7-segment display
 - 9 LEDs for displaying the selected symbols
 - 6 keys for operation
 - 1 setpoint generator for speed specification
 - Parameter set data backup
- Braking resistor can be sub-mounted as an option for size 0.
- Separable signal terminals.



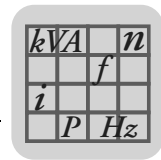
System description MOVITRAC® B

Functions / features

- Size 0:
 - Separable power terminals and signal terminals
 - EMC capacitor can be insulated for reduced earth-leakage currents and operation in IT network.
 - "Cold Plate" installation possible.
 - Large motor cable length
- Up to size 2S: Operation on MDR regenerative power supply unit possible (see MOVIDRIVE® B documentation).

1.4.2 Control

- V/f control or VFC control mode.
- Automatic brake rectifier control by the inverter.
- Standstill current function for:
 - Rapid start
 - Heating current for preventing condensation in the motor at low temperatures
- Flying start function for synchronizing the inverter to the running motor.
- Hoist capability.
- DC braking to decelerate the motor in 1Q mode.
- Slip compensation for high static speed accuracy.
- Motor pull-out protection by sliding current limitation in the field weakening range
- Two complete motor parameter sets
- Factory setting can be restored.
- Parameter lock for protection against changes to parameters.
- Protective functions for protection against
 - Over-current
 - Ground fault
 - Overload
 - Overtemperature of the inverter
 - Overtemperature of the motor (TF/TH)
- Speed monitoring and monitoring of the motor and regenerative limit power.
- 5 fault memories with all relevant operating data at the moment of the fault.
- Standardized operation, parameter setting and identical unit connection technology across all units in the MOVITRAC® B range.
- Configurable signal range monitoring (speed).
- Energy-saving function for optimizing the magnetization current automatically.

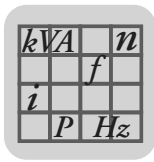


1.4.3 Setpoint technology

- Motor potentiometer.
- External setpoint selections:
 - 0 ... +10 V (unidirectional and bidirectional)
 - 0 ... 20 mA
 - 4 ... 20 mA
 - – 10 V ... + 10 V bidirectional with FIO11B
- Six fixed setpoints.
- Frequency input.

1.4.4 Optional communication / operation

- CAN-based system bus (SBus) for networking a maximum of 64 MOVITRAC® B units. A PC, a PLC or a MOVIDRIVE® unit can be the SBus master.
- CANopen Protocol DS301 V4.
- RS-485 interface.
- Simple parameter setting and startup using optional keypad or MOVITOOLS® MotionStudio software.
- Fieldbus interfaces for
 - PROFIBUS
 - DeviceNet
 - INTERBUS
 - CANopen
 - Ethernet-based:
 - EtherCAT
 - PROFINET (in preparation)
 - Ethernet/IP (in preparation)



1.5 MOVITOOLS® MotionStudio

The MOVITOOLS® MotionStudio program includes:

- Parameter tree
- Startup
- SCOPE
- Application Builder
- Data management

The MOVITRAC® B has the following functions:

- Startup
- Parameter setting
- Visualization / diagnostics

1.5.1 SCOPE

SCOPE for MOVITOOLS® MotionStudio is an oscilloscope program for SEW inverters. You can optimize drives independently using SCOPE. The inverter records, for example, response functions to setpoint changes in real time. You can transfer this information to the PC and graphically display it. SCOPE shows up to four analog and digital measured variables in differently colored curves. You can scale both the x-axis and the y-axis as required.

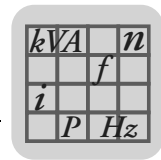
SCOPE also enables you to record digital input and output signals of the inverter. This means you can record complete program sequences of the higher-level controller and then evaluate them.

SCOPE supports simple documentation of the set parameters and the recorded measurement data by providing the following functions:

- Save
- Meta data
- Print

The online help functions enable you to familiarize yourself quickly with how to use SCOPE.

SCOPE is a multi-document interface (MDI application). Enables you to observe and analyze several SCOPE data records simultaneously. SCOPE displays every new data record in a new window. All settings made for displaying and editing the data set apply to the active window only.



2 Technical Data

2.1 CE marking, UL approval and C-Tick

2.1.1 CE marking

Low voltage directive MOVITRAC® B frequency inverters comply with the regulations of the Low Voltage Directive 2006/95/EC and have the CE mark on the nameplate to this effect.

Electromagnetic compatibility (EMC)



The proper use of MOVITRAC® B frequency inverters is as components for installation in machinery and systems. They comply with the EMC product standard EN 61800-3 *Variable-speed electrical drives*. Provided the installation instructions are complied with, they satisfy the relevant requirements for the CE marking for the entire machine / system in which they are installed, on the basis of the EMC Directive 89/336/EMC. For detailed information on EMC compliant installation, refer to the publication "Electromagnetic Compatibility in Drive Engineering" from SEW-EURODRIVE.

Compliance with limit classes C2 / A and C1 / B has been tested on a specified test setup. SEW-EURODRIVE can provide detailed information on request.

2.1.2 UL approval



The UL- and cUL approval (USA) has been awarded to MOVITRAC® B for devices with a power supply connection of 230 V / 1-phase, 230 V / 3-phase, and 400/500 V / 3-phase (0.25 ... 45 kW). cUL approval has been applied for the other units. cUL is equivalent to CSA approval.



The GOST-R certificate (Russia) is approved for the MOVITRAC® B unit series.

2.1.3 C-Tick

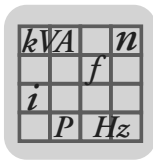


C-Tick approval has been applied for the entire MOVITRAC® B series. C-Tick certifies conformity with ACA (Australian Communications Authority) standards.

2.2 General technical data

The following technical data applies to all MOVITRAC® B frequency inverters, irrespective of size and power:

MOVITRAC® B:	All sizes
Interference immunity	Meets EN 61800-3
Interference emission with EMC compliant installation	According to limit value class ¹⁾ <ul style="list-style-type: none"> • Sizes 0 ... 2: C2 (A) without further measures • Sizes 0 ... 5: C1 (B) with corresponding filters / foldable ferrites C1/C2 according to EN 55011/55014 / A/B according to EN 61800-3
Earth-leakage current	> 3.5 mA

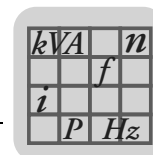


Technical Data

General technical data

MOVITRAC® B:	All sizes
Ambient temperature ϑ_A (up to 60 °C [140 °F] with current reduction) Derating ambient temperature (current reduction) Climate class	<ul style="list-style-type: none"> 230 V, 0.25 ... 2.2 kW (3.0 HP) / 400/500 V, 0.25 ... 4.0 kW (0.34 ... 5.4 HP) With overload capacity (max. 150% for 60 s): $I_D = 125\% I_{rated} / f_{PWM} = 4 \text{ kHz}: -10 \text{ °C (14 °F)} \dots +40 \text{ °C (104 °F)}$ Without high overload capacity: $I_D = 100\% I_{rated} / f_{PWM} = 4 \text{ kHz}: -10 \text{ °C (14 °F)} \dots +50 \text{ °C (122 °F)}$ $I_D = 125\% I_{rated} / f_{PWM} = 4 \text{ kHz}: -10 \text{ °C (14 °F)} \dots +40 \text{ °C (104 °F)}$ $I_D = 100\% I_{rated} / f_{PWM} = 8 \text{ kHz}: -10 \text{ °C (14 °F)} \dots +40 \text{ °C (104 °F)}$ 3 × 230 V, 3.7 ... 30 kW (40 HP) / 400/500 V, 5.5 ... 75 kW (7.4 ... 10 HP) With overload capacity (max. 150% for 60 s): $I_D = 125\% I_{rated} / f_{PWM} = 4 \text{ kHz}: 0 \text{ °C (32 °F)} \dots +40 \text{ °C (104 °F)}$ Without high overload capacity: $I_D = 100\% I_{rated} / f_{PWM} = 4 \text{ kHz}: 0 \text{ °C (32 °F)} \dots +50 \text{ °C (122 °F)}$ $I_D = 125\% I_{rated} / f_{PWM} = 4 \text{ kHz}: 0 \text{ °C (32 °F)} \dots +40 \text{ °C (104 °F)}$ $I_D = 100\% I_{rated} / f_{PWM} = 8 \text{ kHz}: 0 \text{ °C (32 °F)} \dots +40 \text{ °C (104 °F)}$ Mounting platform with "Cold plate" < 70 °C (158 °F) 2.5% I_{rated} per K at 40 °C (104 °F) ... 50 °C (122 °F) 3% I_{rated} per K at 50 °C (+122 °F) ... 60 °C (140 °F) EN 60721-3-3, class 3K3
Storage temperature Shipping temperature	-25 °C (-13 °F) ... +75 °C (167 °F) -25 °C (-13 °F) ... +75 °C (167 °F)
Type of cooling	Self-cooling: 230 V: ≤ 0.75 kW (1.0 HP) 400/500 V: ≤ 1.1 kW (1.5 HP) Forced cooling: (temperature-controlled fans, 230 V: ≥ 1.1 kW (1.5 HP) 400/500 V: ≥ 1.5 kW (2.0 HP) Response threshold 45 °C [113 °F])
Enclosure EN 60529 (NEMA1)	Sizes 0 ... 3: IP20 Sizes 4 ... 5 power connections: <ul style="list-style-type: none"> IP00 With the supplied Plexiglas cover mounted and mounted shrinking tube (not supplied) IP10
Operating mode	Continuous duty (EN 60149-1-1 and 1-3)
Overvoltage category	III according to IEC 60664-1 (VDE 0110-1)
Pollution class	2 according to IEC 60664-1 (VDE 0110-1)
Installation altitude	Up to $h \leq 1000 \text{ m (3281 ft)}$ without restrictions. When $h \geq 1000 \text{ m (3281 ft)}$, the following restrictions apply: <ul style="list-style-type: none"> From 1000 m (3281 ft) to max. 4000 m (13,123 ft): <ul style="list-style-type: none"> I_{rated} reduction by 1% per 100 m (328 ft) From 2000 m (6562 ft) to max. 4000 m (13,123 ft): <ul style="list-style-type: none"> AC 230 V units: V_{rated} reduction by AC 3 V per 100 m (328 ft) AC 500 V units: V_{rated} reduction by AC 6 V per 100 m (328 ft) Over 2000 m (6562 ft) only overvoltage class 2, external measures are required for overvoltage class 3. Overvoltage classes according to DIN VDE 0110-1.
Size 0: Limitations for continuous operation with 125% I_{rated}	<ul style="list-style-type: none"> Maximum ambient temperature ϑ_A: 40 °C (104 °F) Maximum supply voltage V_{Mains}: 400 V No DIN rail mounting / submounting resistor With 1 × 230 V: Provide line choke ND

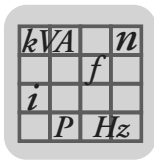
1) Electrical installation in compliance with applicable regulations is necessary for maintaining the EMC limit value class. Comply with the installation notes.



2.3 MOVITRAC® B electronics data

Function	Terminal	Designation	Default	Data
Setpoint input (differential input) ¹⁾	X10:1 X10:2 X10:3 X10:4	10V0 AI11 (+) AI12 (0) GND		+10 V, $I_{max} = 3$ mA 0 ... +10 V ($R_i > 200$ k Ω) 0 ... 20 mA / 4 ... 20 mA ($R_i = 250$ Ω), 10 bit resolution, sampling time 1 ms GND = Reference potential for binary and analog signals, PE potential
Binary inputs	X12:1 X12:2 X12:3 X12:4 X12:5 X12:6	DI00 DI01 DI02 DI03 DI04 DI05TF	Fault reset CW/Stop CCW/Stop Enable/Stop n11/n21 n12/n22	$R_i = 3$ k Ω , $I_E = 10$ mA, sample cycle 5 ms, PLC compatible Signal level according to EN 61131-2 type 1 or 3: <ul style="list-style-type: none"> +11 ... +30 V → 1 / contact made -3 ... +5 V → 0 / contact open <ul style="list-style-type: none"> X12:2 / DI01 with fixed assignment CW/Stop X12:5 / DI04 can be used as frequency input X12:6 / DI05 can be used as TF input
Supply voltage for TF	X12:7	VOTF		Special characteristics for TF according to DIN EN 60947-8/trigger value 3 k Ω
Auxiliary supply output / External voltage supply	X12:8	24VIO		Auxiliary supply output: $V = DC$ 24 V, current carrying capacity $I_{max} = 50$ mA External voltage supply: $V = DC$ 24 V -15% / +20% according to EN 61131-2 $I = DC$: See section Project planning/external DC 24 V voltage supply.
Reference terminal	X12:9	GND		Reference potential for binary and analog signals, PE potential
Binary outputs	X13:1 X13:2 X13:3 X13:4	GND DO02 DO03 GND	Brake released Ready for operation	PLC compatible, response time 5 ms, I_{max} DO02 = 150 mA, I_{max} DO03 = 50 mA, Short-circuit proof, protected against external voltage up to 30 V GND = Reference potential for binary and analog signals, PE potential
Relay output	X13:5 X13:6 X13:7	DO01-C DO01-NO DO01-NC		Shared relay contact NO contact NC contact Load capacity: $V_{max} = 30$ V, $I_{max} = 800$ mA
Safety contact	X17:1 X17:2 X17:3 X17:4	DGND VO24 SVO24 SV24		Reserved, see manuals: <ul style="list-style-type: none"> Safe Disconnection – Conditions Safe Disconnection – Applications
Terminal response times	Binary input and output terminals are updated every 5 ms			
Max. cable cross-section	1.5 mm ² (AWG15) without conductor end sleeves 1.0 mm ² (AWG17) with conductor end sleeves			

1) If the setpoint input is not used, it should be set to GND. Otherwise a measured input voltage of -1... +1 V is set.

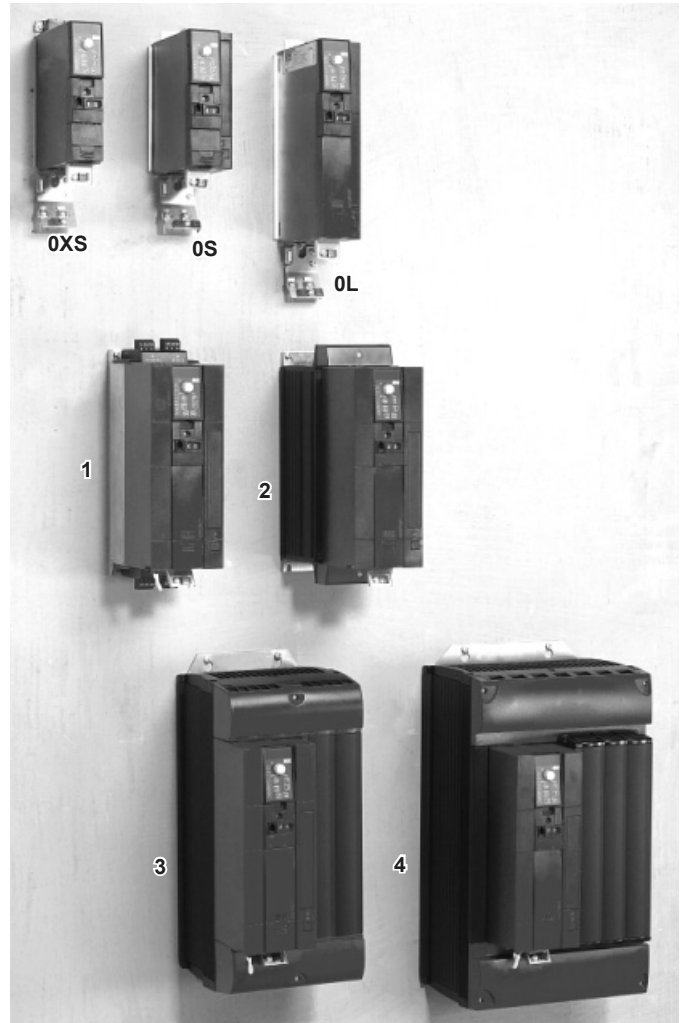
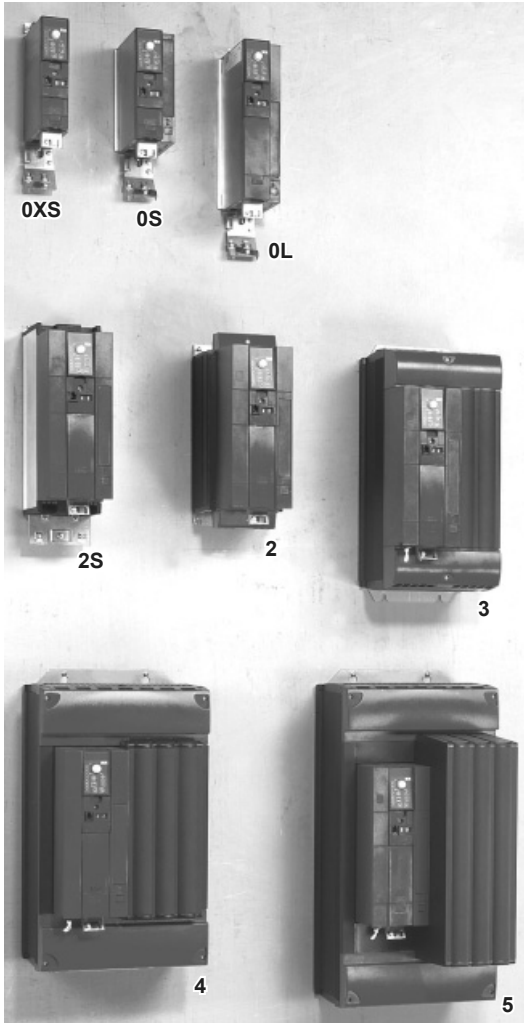


2.4 MOVITRAC® B technical data

2.4.1 MOVITRAC® B overview

400 / 500 V

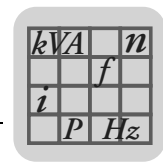
230 V



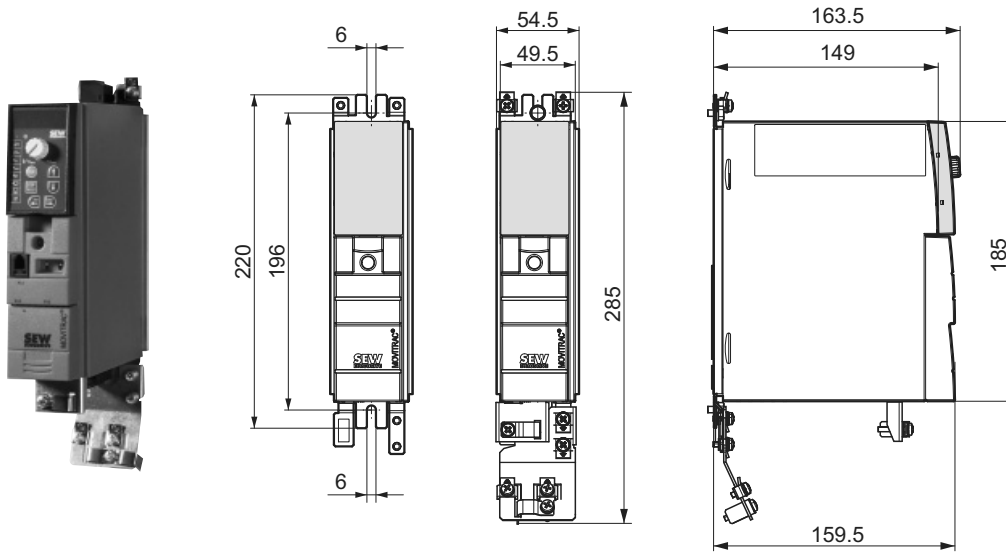
Power supply connection 230 V / 1-phase			
Size	0XS	0S	0L
Power [kW / HP]	0.25 / 0.4 0.37 / 0.5	0.55 / 0.75 0.75 / 1.0	1.1 / 1.5 1.5 / 2.0 2.2 / 3.0

Power supply connection 400 / 500 V / 3-phase								
Size	0XS	0S	0L	2S	2	3	4	5
Power [kW / HP]	0.25 / 0.4 0.37 / 0.5	0.55 / 0.75 0.75 / 1.0 1.1 / 1.5 1.5 / 2.0	2.2 / 3.0 3.0 / 4.0 4.0 / 5.0	5.5 / 7.5 7.5 / 10	11 / 15	15 / 20 22 / 30 30 / 40	37 / 50 45 / 60	55 / 75 75 / 100

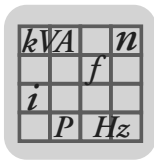
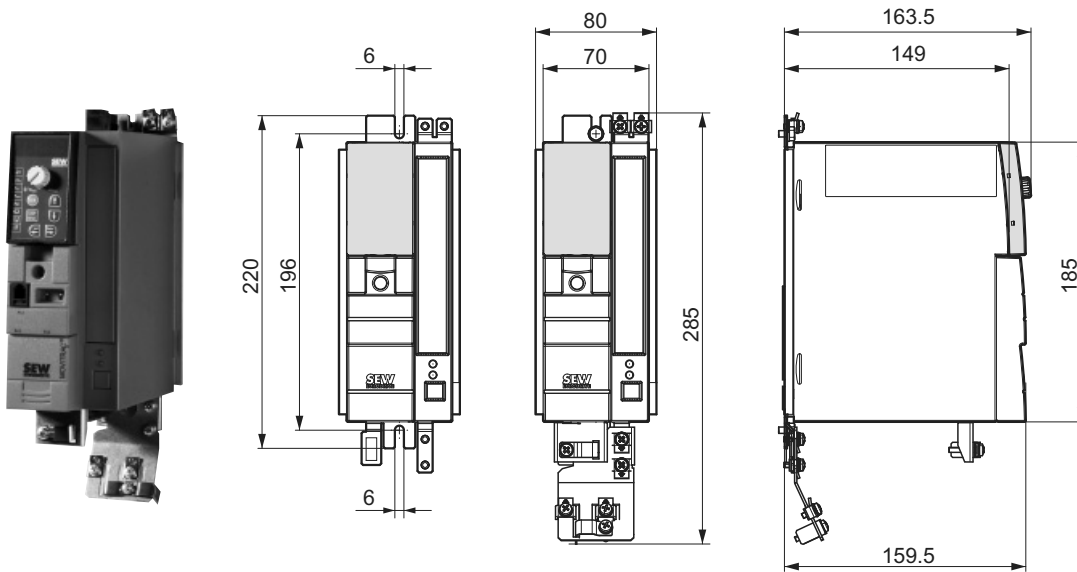
Power supply connection 230 V / 3-phase							
Size	0XS	0S	0L	1	2	3	4
Power [kW / HP]	0.25 / 0.4 0.37 / 0.5	0.55 / 0.75 0.75 / 1.0	1.1 / 1.5 1.5 / 2.0 2.2 / 3.0	3.7 / 5	5.5 / 7.5 7.5 / 10	11 / 15 15 / 20	22 / 30 30 / 40



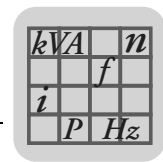
2.4.2 AC 230 V / 1-phase / size 0XS / 0.25... 0.37 kW (0.4 ... 0.5 HP)



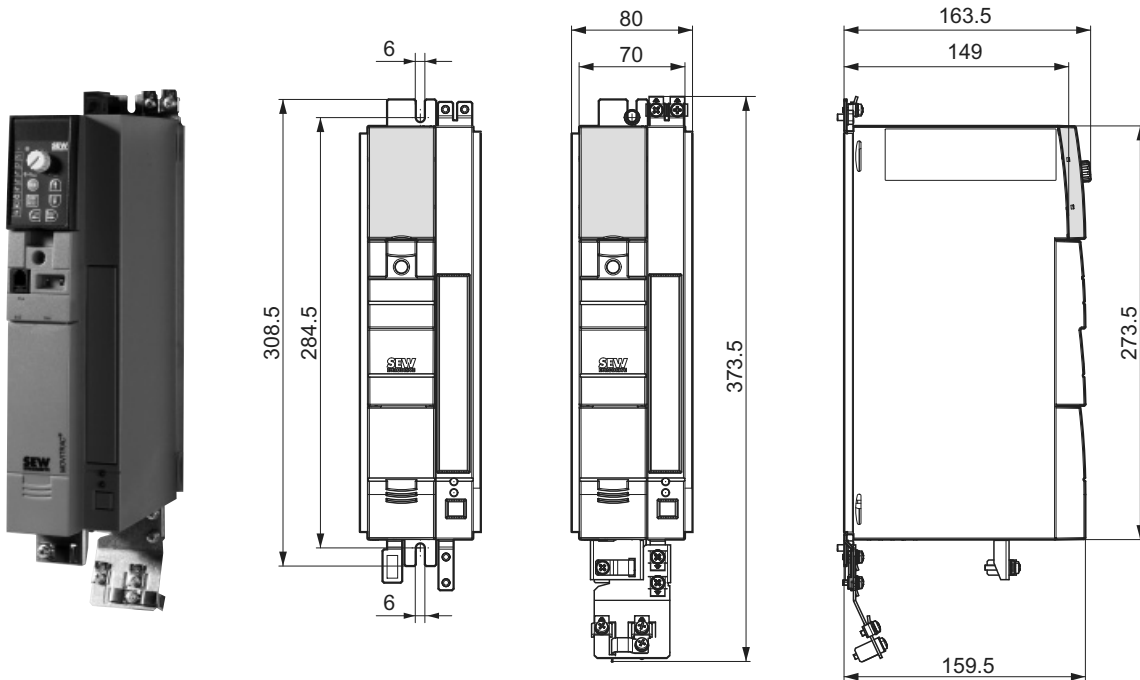
MOVITRAC® MC07B (1-phase mains)		0003-2B1-4-00	0004-2B1-4-00
Part number		828 491 1	828 493 8
INPUT			
Permitted rated supply voltage	V_{Mains}	1 × AC 230 V $V_{\text{Mains}} = \text{AC } 200 \text{ V} - 10\% \dots \text{AC } 240 \text{ V} + 10\%$	
Rated frequency	f_{Mains}	50 / 60 Hz ± 5%	
Rated mains current 100% operation	I_{Mains}	AC 4.3 A	AC 6.1 A
Rated mains current 125% operation	$I_{\text{Mains } 125}$	AC 5.5 A	AC 7.5 A
OUTPUT			
Output voltage	V_A	$3 \times 0 \dots V_{\text{Mains}}$	
Recommended motor power 100% operation	P_{Mot}	0.25 kW (0.4 HP)	0.37 kW (0.5 HP)
Recommended motor power 125% operation	$P_{\text{Mot } 125}$	0.37 kW (0.5 HP)	0.55 kW (0.75 HP)
Rated output current 100% operation	I_{rated}	AC 1.7 A	AC 2.5 A
Rated output current 125% operation	$I_{\text{rated } 125}$	AC 2.1 A	AC 3.1 A
Apparent output power 100% operation	S_{rated}	0.7 kVA	1.0 kVA
Apparent output power 125% operation	$S_{\text{rated } 125}$	0.9 kVA	1.3 kVA
Minimum permitted braking resistance value (4 quadrant operation)	$R_{\text{Br_min}}$	27 Ω	
GENERAL INFORMATION			
Power loss 100% operation	P_{Loss}	30 W (0.040 HP)	35 W (0.047 HP)
Power loss 125% operation	$P_{\text{Loss } 125}$	35 W (0.047 HP)	45 W (0.060 HP)
Current limitation		150% I_{rated} for at least 60 seconds	
Connections/tightening torque	Terminals	4 mm ² (AWG12) / 0.5 Nm (4.4 in-lb)	
Dimensions	W × H × D	54.5 × 185 × 163.5 mm (2.0 × 7.3 × 6.4 in)	
Mass	m	1.3 kg (2.9 lb)	


2.4.3 AC 230 V / single-phase / size 0S / 0.55 ... 0.75 kW (0.75 ... 1.0 HP)


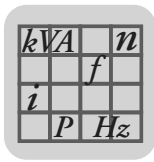
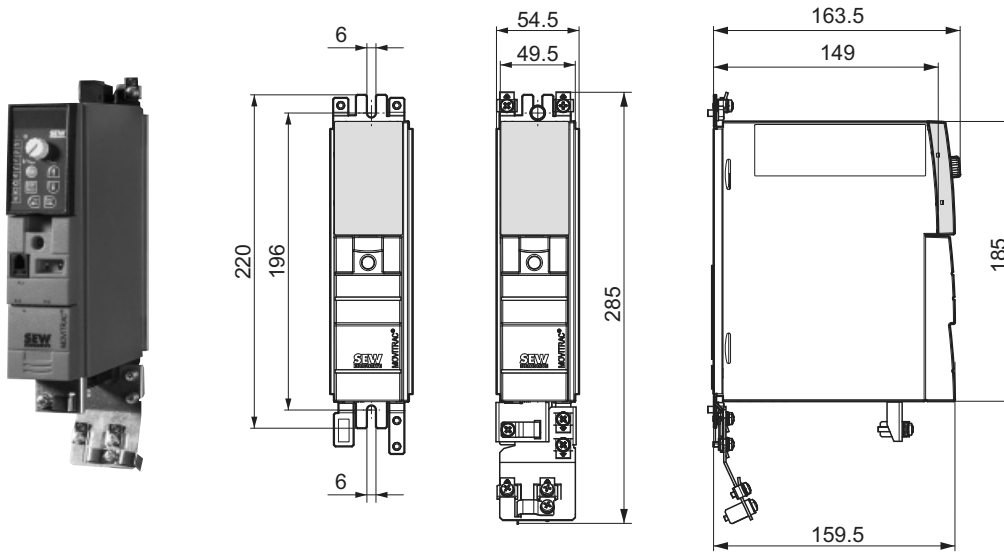
MOVITRAC® MC07B (1-phase mains)		0005-2B1-4-00	0008-2B1-4-00
Part number		828 494 6	828 495 4
INPUT			
Permitted rated supply voltage	V_{Mains}	1 × AC 230 V $V_{\text{Mains}} = \text{AC } 200 \text{ V} - 10\% \dots \text{AC } 240 \text{ V} + 10\%$	
Rated frequency	f_{Mains}	50 / 60 Hz ± 5%	
Rated mains current 100% operation Rated mains current 125% operation	I_{Mains} $I_{\text{Mains } 125}$	AC 8.5 A AC 10.2 A	AC 9.9 A AC 11.8 A
OUTPUT			
Output voltage	V_A	3 × 0 ... V_{Mains}	
Recommended motor power 100% operation Recommended motor power 125% operation	P_{Mot} $P_{\text{Mot } 125}$	0.55 kW (0.75 HP) 0.75 kW (1.0 HP)	0.75 kW (1.0 HP) 1.1 kW (1.5 HP)
Rated output current 100% operation Rated output current 125% operation	I_{rated} $I_{\text{rated } 125}$	AC 3.3 A AC 4.1 A	AC 4.2 A AC 5.3 A
Apparent output power 100% operation Apparent output power 125% operation	S_{rated} $S_{\text{rated } 125}$	1.4 kVA 1.7 kVA	1.7 kVA 2.1 kVA
Minimum permitted braking resistance value (4 quadrant operation)	$R_{\text{Br_min}}$	27 Ω	
GENERAL INFORMATION			
Power loss 100% operation Power loss 125% operation	P_{Loss} $P_{\text{Loss } 125}$	45 W (0.060 HP) 50 W (0.067 HP)	50 W (0.067 HP) 65 W (0.087 HP)
Current limitation		150% I_{rated} for at least 60 seconds	
Connections/tightening torque	Terminals	4 mm ² (AWG12) / 0.5 Nm (4.4 in·lb)	
Dimensions	W × H × D	80 × 185 × 163.5 mm (3.1 × 7.3 × 6.4 in)	
Mass	m	1.5 kg (3.3 lb)	



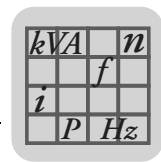
2.4.4 AC 230 V / single-phase / size 0L / 1.1 ... 2.2 kW (1.5 ... 3.0 HP)



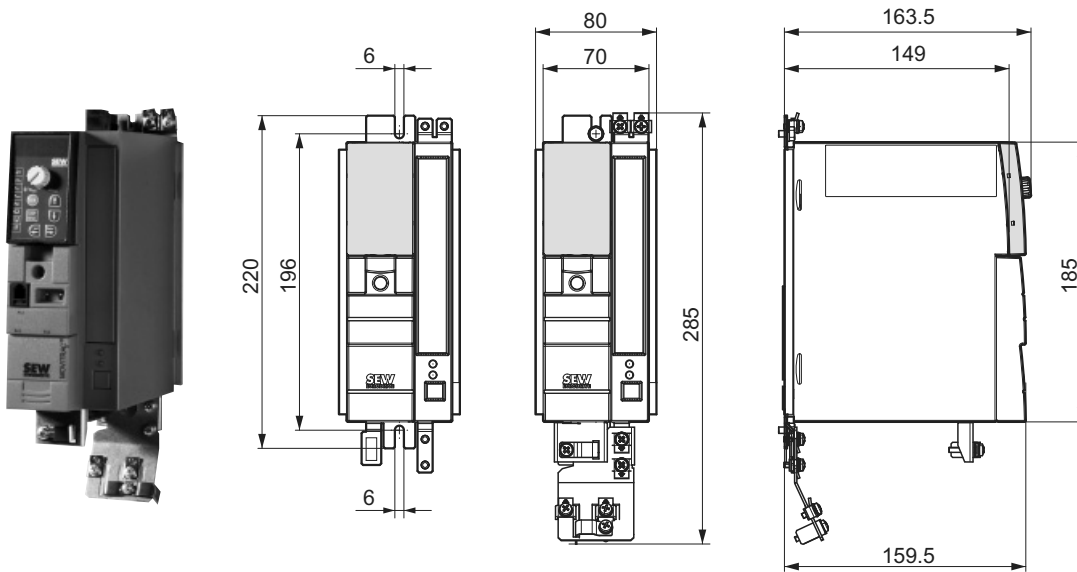
MOVITRAC® MC07B (1-phase mains)	0011-2B1-4-00	0015-2B1-4-00	0022-2B1-4-00
Part number	828 496 2	828 497 0	828 498 9
INPUT			
Permitted rated supply voltage	V_{Mains}	1 × AC 230 V $V_{\text{Mains}} = \text{AC } 200 \text{ V} - 10\% \dots \text{AC } 240 \text{ V} + 10\%$	
Rated frequency	f_{Mains}	50 / 60 Hz ± 5%	
Rated mains current 100% operation Rated mains current 125% operation	I_{Mains} $I_{\text{Mains } 125}$	AC 13.4 A AC 16.8 A	AC 16.7 A AC 20.7 A AC 19.7 A AC 24.3 A
OUTPUT			
Output voltage	V_A	3 × 0 ... V_{Mains}	
Recommended motor power 100% operation Recommended motor power 125% operation	P_{Mot} $P_{\text{Mot } 125}$	1.1 kW (1.5 HP) 1.5 kW (2.0 HP)	1.5 kW (2.0 HP) 2.2 kW (3.0 HP) 2.2 kW (3.0 HP) 3.0 kW (4.0 HP)
Rated output current 100% operation Rated output current 125% operation	I_{rated} $I_{\text{rated } 125}$	AC 5.7 A AC 7.1 A	AC 7.3 A AC 9.1 A AC 8.6 A AC 10.8 A
Apparent output power 100% operation Apparent output power 125% operation	S_{rated} $S_{\text{rated } 125}$	2.3 kVA 2.9 kVA	3.0 kVA 3.7 kVA 3.5 kVA 4.3 kVA
Minimum permitted braking resistance value (4 quadrant operation)	$R_{\text{Br_min}}$	27 Ω	
GENERAL INFORMATION			
Power loss 100% operation Power loss 125% operation	P_{Loss} $P_{\text{Loss } 125}$	70 W (0.094 HP) 90 W (0.12 HP)	90 W (0.12 HP) 110 W (0.148 HP) 105 W (0.141 HP) 132 W (0.177 HP)
Current limitation		150% I_{rated} for at least 60 seconds	
Connections/tightening torque	Terminals	4 mm ² (AWG12) / 0.5 Nm (4.4 in-lb)	
Dimensions	W × H × D	80 × 273.5 × 163.5 mm (3.1 × 10.8 × 6.4 in)	
Mass	m	2.2 kg (4.9 lb)	


2.4.5 AC 230 V / 3-phase / size 0XS / 0.25... 0.37 kW (0.4 ... 0.5 HP)


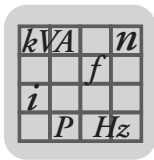
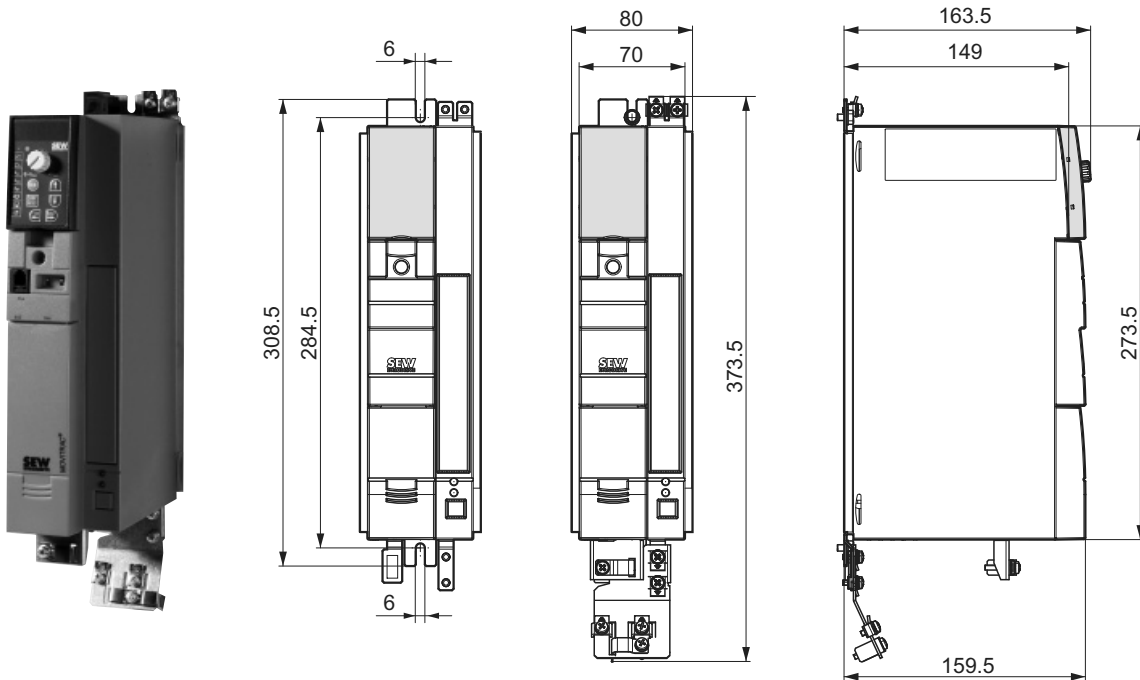
MOVITRAC® MC07B (3-phase mains)		0003-2A3-4-00	0004-2A3-4-00
Part number		828 499 7	828 500 4
INPUT			
Permitted rated supply voltage	V_{Mains}	3 × AC 230 V $V_{\text{Mains}} = \text{AC } 200 \text{ V} - 10\% \dots \text{AC } 240 \text{ V} + 10\%$	
Rated frequency	f_{Mains}	50 / 60 Hz ± 5%	
Rated mains current 100% operation	I_{Mains}	AC 1.6 A	AC 2.0 A
Rated mains current 125% operation	$I_{\text{Mains } 125}$	AC 1.9 A	AC 2.4 A
OUTPUT			
Output voltage	V_A	3 × 0 ... V_{Mains}	
Recommended motor power 100% operation	P_{Mot}	0.25 kW (0.4 HP)	0.37 kW (0.5 HP)
Recommended motor power 125% operation	$P_{\text{Mot } 125}$	0.37 kW (0.5 HP)	0.55 kW (0.75 HP)
Rated output current 100% operation	I_{rated}	AC 1.7 A	AC 2.5 A
Rated output current 125% operation	$I_{\text{rated } 125}$	AC 2.1 A	AC 3.1 A
Apparent output power 100% operation	S_{rated}	0.7 kVA	1.0 kVA
Apparent output power 125% operation	$S_{\text{rated } 125}$	0.9 kVA	1.3 kVA
Minimum permitted braking resistance value (4 quadrant operation)	$R_{\text{Br_min}}$	27 Ω	
GENERAL INFORMATION			
Power loss 100% operation	P_{Loss}	35 W (0.047 HP)	40 W (0.054 HP)
Power loss 125% operation	$P_{\text{Loss } 125}$	40 W (0.054 HP)	50 W (0.067 HP)
Current limitation		150% I_{rated} for at least 60 seconds	
Connections/tightening torque	Terminals	4 mm ² (AWG12) / 0.5 Nm (4.4 in-lb)	
Dimensions	W × H × D	54.5 × 185 × 163.5 mm (2.0 × 7.3 × 6.4 in)	
Mass	m	1.3 kg (2.9 lb)	



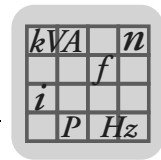
2.4.6 AC 230 V / 3-phase / size 0S / 0.55 ... 0.75 kW (0.75 ... 1.0 HP)



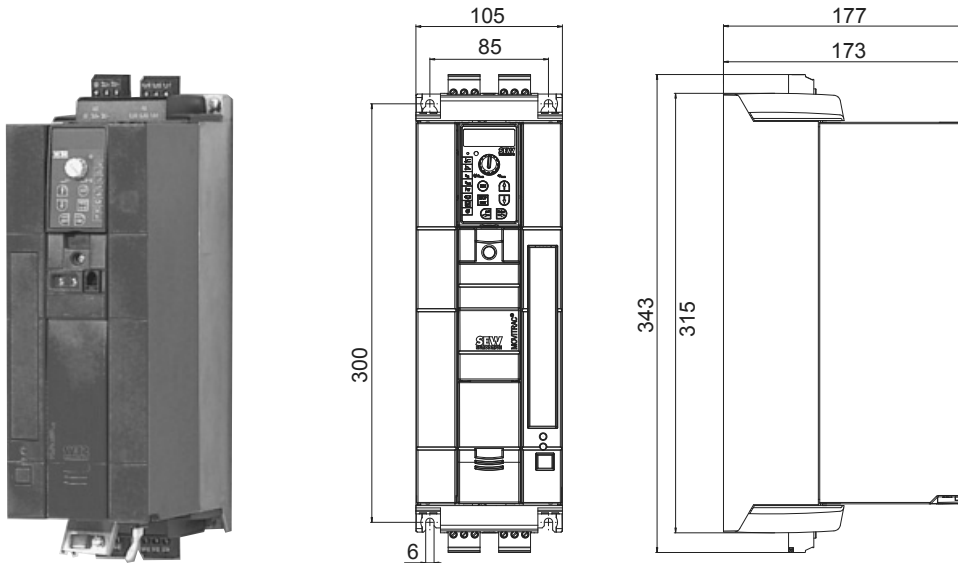
MOVITRAC® MC07B (3-phase mains)		0005-2A3-4-00	0008-2A3-4-00
Part number		828 501 2	828 502 0
INPUT			
Permitted rated supply voltage	V_{Mains}	3 × AC 230 V $V_{\text{Mains}} = \text{AC } 200 \text{ V} - 10\% \dots \text{AC } 240 \text{ V} + 10\%$	
Rated frequency	f_{Mains}	50 / 60 Hz ± 5%	
Rated mains current 100% operation Rated mains current 125% operation	I_{Mains} $I_{\text{Mains } 125}$	AC 2.8 A AC 3.4 A	AC 3.3 A AC 4.1 A
OUTPUT			
Output voltage	V_{Output}	3 × 0 ... V_{Mains}	
Recommended motor power 100% operation Recommended motor power 125% operation	P_{Mot} $P_{\text{Mot } 125}$	0.55 kW (0.75 HP) 0.75 kW (1.0 HP)	0.75 kW (1.0 HP) 1.1 kW (1.5 HP)
Rated output current 100% operation Rated output current 125% operation	I_{rated} $I_{\text{rated } 125}$	AC 3.3 A AC 4.1 A	AC 4.2 A AC 5.3 A
Apparent output power 100% operation Apparent output power 125% operation	S_{rated} $S_{\text{rated } 125}$	1.4 kVA 1.7 kVA	1.7 kVA 2.1 kVA
Minimum permitted braking resistance value (4 quadrant operation)	$R_{\text{Br_min}}$	27 Ω	
GENERAL INFORMATION			
Power loss 100% operation Power loss 125% operation	P_{Loss} $P_{\text{Loss } 125}$	50 W (0.067 HP) 60 W (0.080 HP)	60 W (0.080 HP) 75 W (0.10 HP)
Current limitation		150% I_{rated} for at least 60 seconds	
Connections/tightening torque	Terminals	4 mm ² (AWG12) / 0.5 Nm (4.4 in·lb)	
Dimensions	W × H × D	80 × 185 × 163.5 mm (3.1 × 7.3 × 6.4 in)	
Mass	m	1.5 kg (3.3 lb)	


2.4.7 AC 230 V / single-phase / size 0L / 1.1 ... 2.2 kW (1.5 ... 3.0 HP)


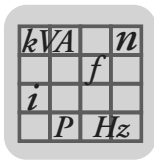
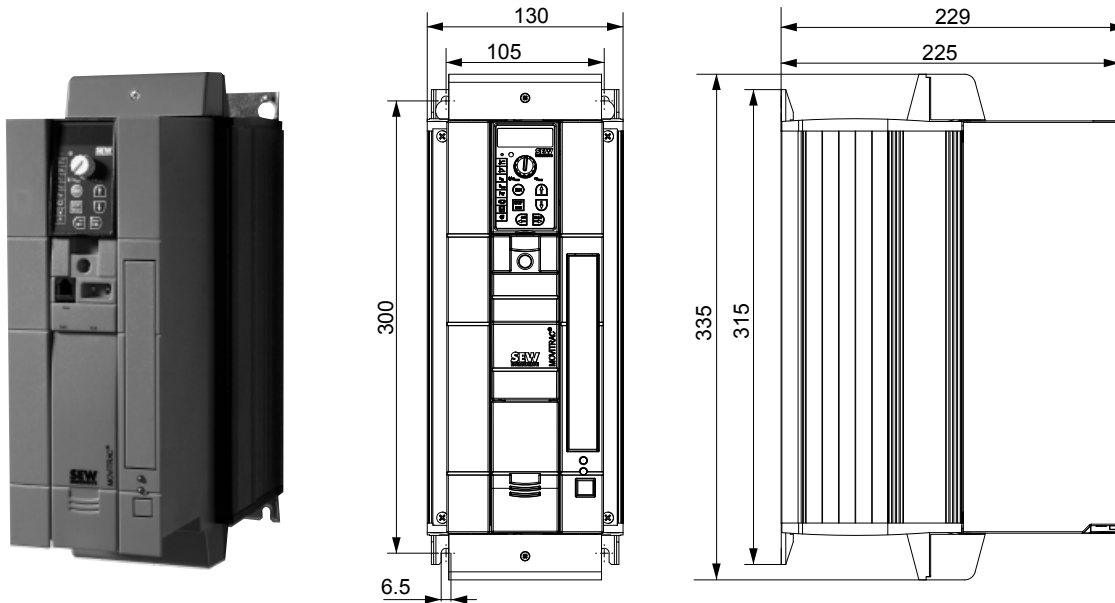
MOVITRAC® MC07B (3-phase mains)		0011-2A3-4-00	0015-2A3-4-00	0022-2A3-4-00
Part number		828 503 9	828 504 7	828 505 5
INPUT				
Permitted rated supply voltage	V_{Mains}	3 × AC 230 V $V_{\text{Mains}} = \text{AC } 200 \text{ V} - 10\% \dots \text{AC } 240 \text{ V} + 10\%$		
Rated frequency	f_{Mains}	50 / 60 Hz ± 5%		
Rated mains current 100% operation	I_{Mains}	AC 5.1 A	AC 6.4 A	AC 7.6 A
Rated mains current 125% operation	$I_{\text{Mains } 125}$	AC 6.3 A	AC 7.9 A	AC 9.5 A
OUTPUT				
Output voltage	V_{Output}	3 × 0 ... V_{Mains}		
Recommended motor power 100% operation	P_{Mot}	1.1 kW (1.5 HP)	1.5 kW (2.0 HP)	2.2 kW (3.0 HP)
Recommended motor power 125% operation	$P_{\text{Mot } 125}$	1.5 kW (2.0 HP)	2.2 kW (3.0 HP)	3.0 kW (4.0 HP)
Rated output current 100% operation	I_{rated}	AC 5.7 A	AC 7.3 A	AC 8.6 A
Rated output current 125% operation	$I_{\text{rated } 125}$	AC 7.1 A	AC 9.1 A	AC 10.8 A
Apparent output power 100% operation	S_{rated}	2.3 kVA	3.0 kVA	3.5 kVA
Apparent output power 125% operation	$S_{\text{rated } 125}$	2.9 kVA	3.7 kVA	4.3 kVA
Minimum permitted braking resistance value (4 quadrant operation)	$R_{\text{Br_min}}$	27 Ω		
GENERAL INFORMATION				
Power loss 100% operation	P_{Loss}	75 W (0.10 HP)	90 W (0.12 HP)	105 W (0.141 HP)
Power loss 125% operation	$P_{\text{Loss } 125}$	90 W (0.12 HP)	110 W (0.148 HP)	140 W (0.188 HP)
Current limitation		150% I_{rated} for at least 60 seconds		
Connections/tightening torque	Terminals	4 mm ² (AWG12) / 0.5 Nm (4.4 in-lb)		
Dimensions	W × H × D	80 × 273.5 × 163.5 mm (3.1 × 10.8 × 6.4 in)		
Mass	m	2.2 kg (4.9 lb)		



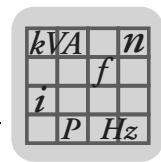
2.4.8 AC 230 V / 3-phase / size 1 / 3.7 kW (5 HP)



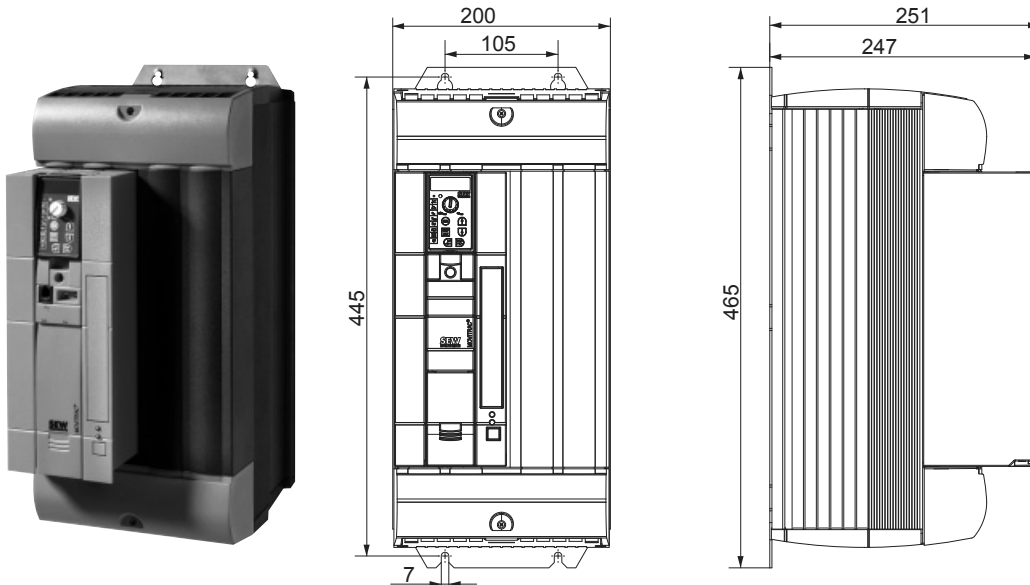
MOVITRAC® MV07B (3-phase mains)		0037-2A3-4-00
Part number		828 506 3
INPUT		
Permitted rated supply voltage	V_{Mains}	$3 \times \text{AC } 400 \text{ V}$ $V_{\text{Mains}} = \text{AC } 380 \text{ V} - 10\% \dots \text{AC } 500 \text{ V} + 10\%$
Rated frequency	f_{Mains}	50 / 60 Hz \pm 5%
Rated mains current 100% operation Rated mains current 125% operation	I_{Mains} $I_{\text{Mains } 125}$	AC 12.9 A AC 16.1 A
OUTPUT		
Output voltage	V_{Output}	$3 \times 0 \dots V_{\text{Mains}}$
Recommended motor power 100% operation Recommended motor power 125% operation	P_{Mot} $P_{\text{Mot } 125}$	3.7 kW (5.5 HP) 5.5 kW (7.5 HP)
Rated output current 100% operation Rated output current 125% operation	I_{rated} $I_{\text{rated } 125}$	AC 14.5 A AC 18.1 A
Apparent output power 100% operation Apparent output power 125% operation	S_{rated} $S_{\text{rated } 125}$	5.8 kVA 7.3 kVA
Minimum permitted braking resistance value (4 quadrant operation)	$R_{\text{Br_min}}$	27 Ω
GENERAL INFORMATION		
Power loss 100% operation Power loss 125% operation	P_{Loss} $P_{\text{Loss } 125}$	210 W (0.282 HP) 270 W (0.362 HP)
Current limitation		150% I_{rated} for at least 60 seconds
Connections/tightening torque	Terminals	4 mm ² (AWG12) / 0.5 Nm (4.4 in-lb)
Dimensions	W x H x D	105 x 315 x 144 mm (4.1 x 12.4 x 5.7 in)
Mass	m	3.5 kg (7.7 lb)


2.4.9 AC 230 V / 3-phase / size 2 / 5.5 ... 7.5 kW (7.5... 10 HP)


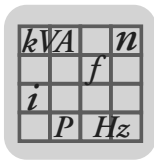
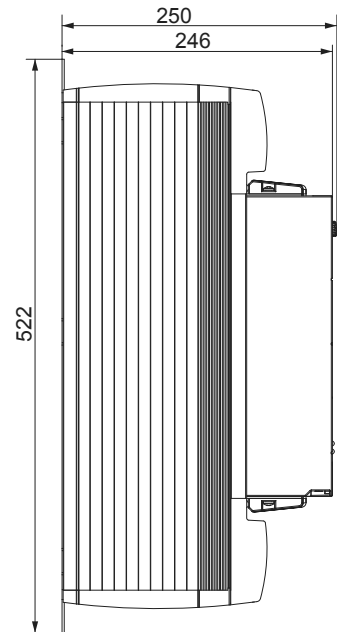
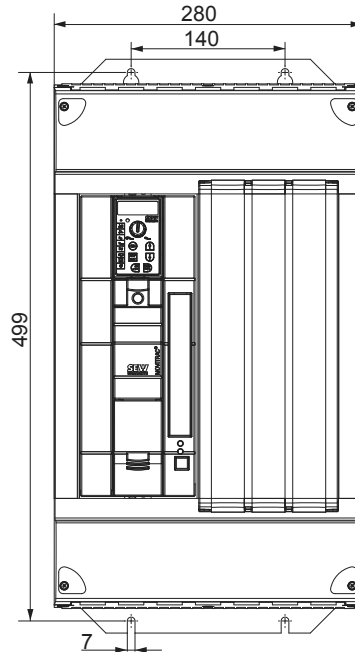
MOVITRAC® MC07B (3-phase mains)		0055-2A3-4-00	0075-2A3-4-00
Part number		828 507 1	828 509 8
INPUT			
Permitted rated supply voltage	V_{Mains}	3 × AC 400 V $V_{\text{Mains}} = \text{AC } 380 \text{ V} - 10\% \dots \text{AC } 500 \text{ V} + 10\%$	
Rated frequency	f_{Mains}	50 / 60 Hz ± 5%	
Rated mains current 100% operation Rated mains current 125% operation	I_{Mains} $I_{\text{Mains } 125}$	AC 19.5 A AC 24.4 A	AC 27.4 A AC 34.3 A
OUTPUT			
Output voltage	V_{Output}	3 × 0 ... V_{Mains}	
Recommended motor power 100% operation Recommended motor power 125% operation	P_{Mot} $P_{\text{Mot } 125}$	5.5 kW (7.5 HP) AC 7.5 kW (10 HP)	7.5 kW (10 HP) 11 kW (15 HP)
Rated output current 100% operation Rated output current 125% operation	I_{rated} $I_{\text{rated } 125}$	AC 22 A AC 27.5 A	AC 29 A AC 36.3 A
Apparent output power 100% operation Apparent output power 125% operation	S_{rated} $S_{\text{rated } 125}$	8.8 kVA 11.0 kVA	11.6 kVA 14.5 kVA
Minimum permitted braking resistance value (4 quadrant operation)	$R_{\text{Br_min}}$	12 Ω	
GENERAL INFORMATION			
Power loss 100% operation Power loss 125% operation	P_{Loss} $P_{\text{Loss } 125}$	300 W (0.402 HP) 375 W (0.503 HP)	380 W (0.510 HP) 475 W (0.637 HP)
Current limitation		150% I_{rated} for at least 60 seconds	
Connections/tightening torque	Terminals	4 mm ² (AWG12) / 1.5 Nm (13.3 in-lb)	
Dimensions	W × H × D	130 × 335 × 229 mm (5.1 × 13.2 × 9.0 in)	
Mass	m	6.6 kg (14.6 lb)	



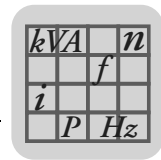
2.4.10 AC 230 V / 3-phase / size 3 / 11 ... 15 kW (15... 20 HP)



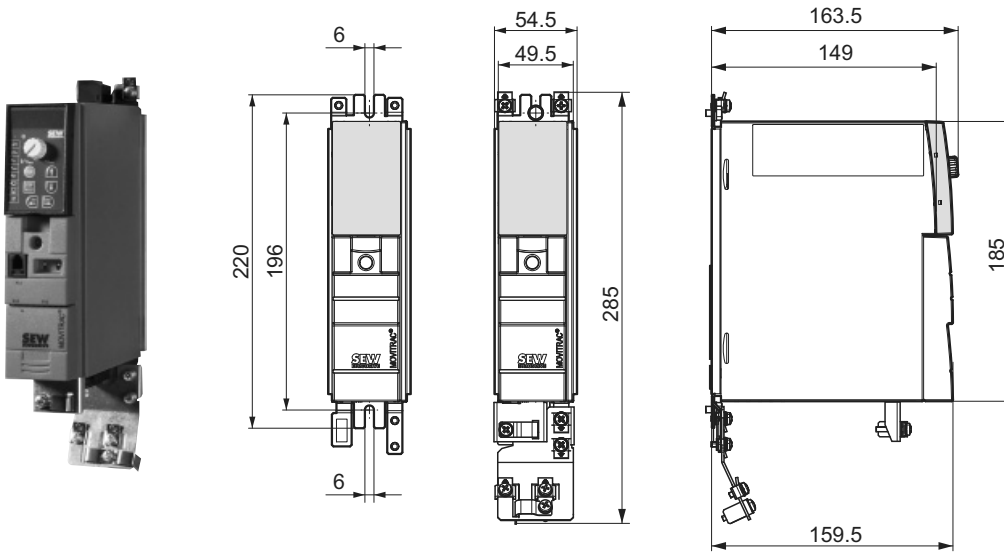
MOVITRAC® MC07B (3-phase mains)		0110-203-4-00	0150-203-4-00
Part number		828 510 1	828 512 8
INPUT			
Permitted rated supply voltage	V_{Mains}	3 × AC 400 V $V_{\text{Mains}} = \text{AC } 380 \text{ V} - 10\% \dots \text{AC } 500 \text{ V} + 10\%$	
Rated frequency	f_{Mains}	50 / 60 Hz ± 5%	
Rated mains current 100% operation Rated mains current 125% operation	I_{Mains} $I_{\text{Mains } 125}$	AC 40.0 A AC 50.0 A	AC 48.6 A AC 60.8 A
OUTPUT			
Output voltage	V_A	3 × 0 ... V_{Mains}	
Recommended motor power 100% operation Recommended motor power 125% operation	P_{Mot} $P_{\text{Mot } 125}$	11 kW (15 HP) 15 kW (20 HP)	15 kW (20 HP) 22 kW (30 HP)
Rated output current 100% operation Rated output current 125% operation	I_{rated} $I_{\text{rated } 125}$	AC 42 A AC 52.5 A	AC 54 A AC 67.5 A
Apparent output power 100% operation Apparent output power 125% operation	S_{rated} $S_{\text{rated } 125}$	16.8 kVA 21.0 kVA	21.6 kVA 26.9 kVA
Minimum permitted braking resistance value (4 quadrant operation)	$R_{\text{Br_min}}$	7.5 Ω	5.6 Ω
GENERAL INFORMATION			
Power loss 100% operation Power loss 125% operation	P_{Loss} $P_{\text{Loss } 125}$	580 W (0.778 HP) 720 W (0.966 HP)	720 W (0.966 HP) 900 W (1.21 HP)
Current limitation		150% I_{rated} for at least 60 seconds	
Connections/tightening torque	Terminals	6 mm ² / AWG10	10 mm ² / AWG8
		3.5 Nm (31.0 in-lb)	
Dimensions	W × H × D	200 × 465 × 251 mm (7.9 × 18.3 × 9.9 in)	
Mass	m	15 kg (33.1 lb)	


2.4.11 AC 230 V / 3-phase / size 4 / 22 ... 30 kW (30... 40 HP)


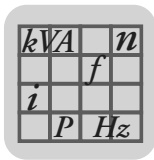
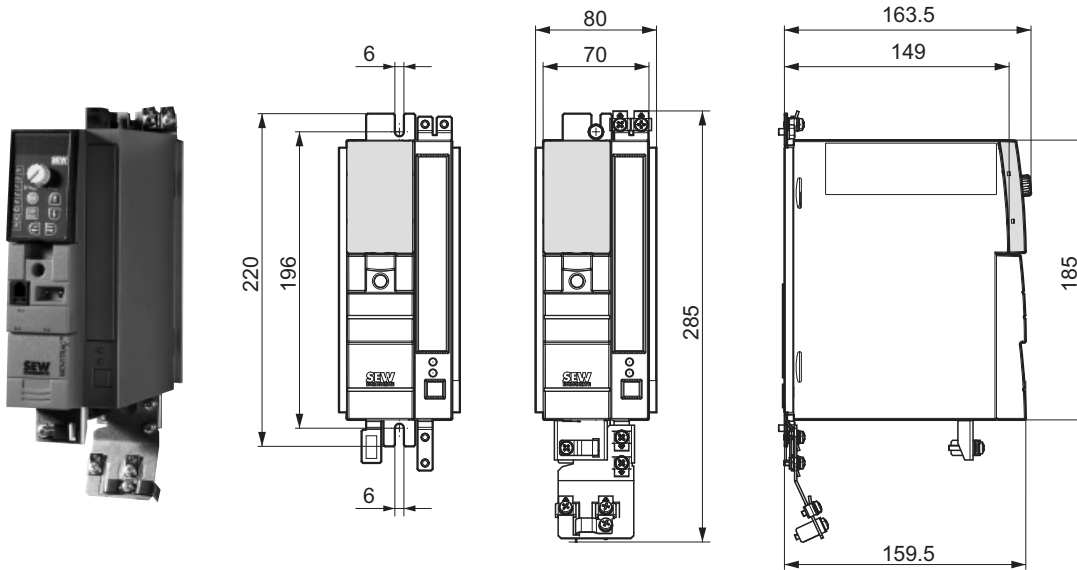
MOVITRAC® MC07B (3-phase mains)		0220-203-4-00	0300-203-4-00
Part number		828 513 6	828 514 4
INPUT			
Permitted rated supply voltage	V_{Mains}	3 × AC 400 V $V_{\text{Mains}} = \text{AC } 380 \text{ V} - 10\% \dots \text{AC } 500 \text{ V} + 10\%$	
Rated frequency	f_{Mains}	50 / 60 Hz ± 5%	
Rated mains current 100% operation Rated mains current 125% operation	I_{Mains} $I_{\text{Mains } 125}$	AC 72 A AC 90 A	AC 86 A AC 107 A
OUTPUT			
Output voltage	V_{A}	3 × 0 ... V_{Mains}	
Recommended motor power 100% operation Recommended motor power 125% operation	P_{Mot} $P_{\text{Mot } 125}$	22 kW (30 HP) 30 kW (40 HP)	30 kW (40 HP) 37 kW (50 HP)
Rated output current 100% operation Rated output current 125% operation	I_{rated} $I_{\text{rated } 125}$	AC 80 A AC 100 A	AC 95 A AC 118.8 A
Apparent output power 100% operation Apparent output power 125% operation	S_{rated} $S_{\text{rated } 125}$	31.9 kVA 39.9 kVA	37.9 kVA 47.4 kVA
Minimum permitted braking resistance value (4 quadrant operation)	$R_{\text{Br_min}}$	3 Ω	
GENERAL INFORMATION			
Power loss 100% operation Power loss 125% operation	P_{Loss} $P_{\text{Loss } 125}$	1100 W (1.475 HP) 1400 W (1.877 HP)	1300 W (1.743 HP) 1700 W (2.280 HP)
Current limitation		150% I_{rated} for at least 60 seconds	
Connections/tightening torque	Terminals	25 mm ² / AWG4	35 mm ² / AWG2
		14 Nm (124 in·lb)	
Dimensions	W × H × D	280 × 522 × 250 mm (11.0 × 20.6 × 9.8 in)	
Mass	m	27 kg (59.5 lb)	



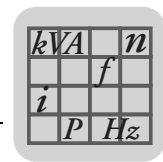
2.4.12 AC 400 / 500 V / 3-phase / size 0XS / 0.25... 0.37 kW (0.4 ... 0.5 HP)



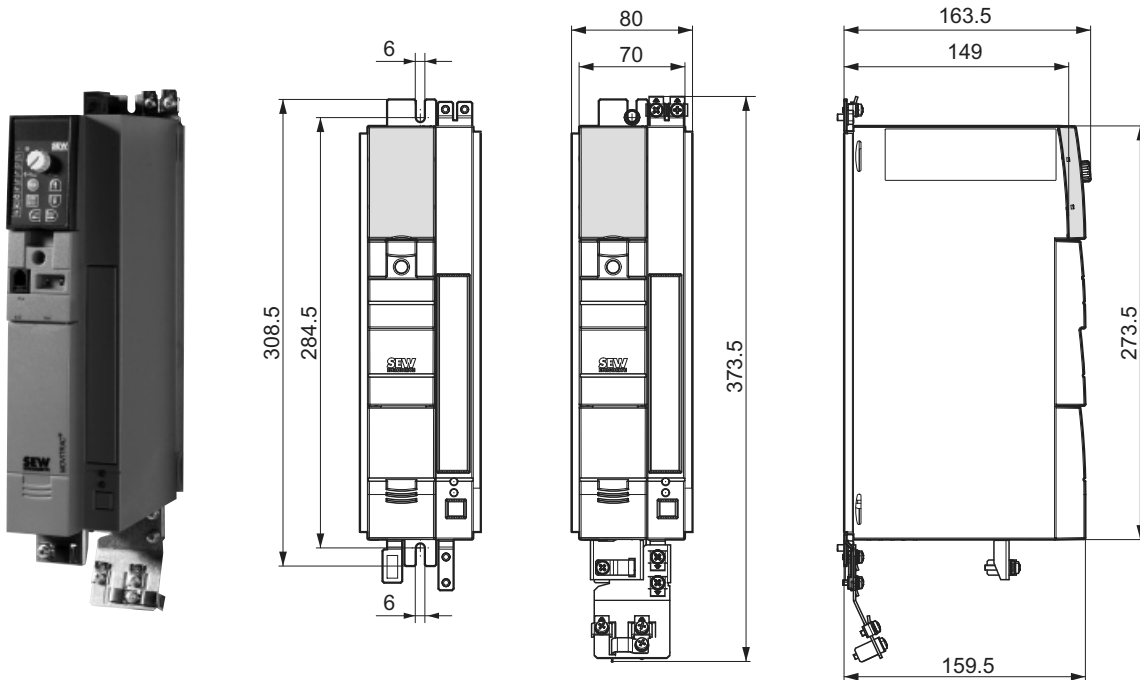
MOVITRAC® MC07BB (3-phase mains)		0003-5A3-4-00	0004-5A3-4-00
Part number		828 515 2	828 516 0
INPUT			
Permitted rated supply voltage	V_{Mains}	3 × AC 400 V $V_{\text{Mains}} = \text{AC } 380 \text{ V} - 10\% \dots \text{AC } 500 \text{ V} + 10\%$	
Rated frequency	f_{Mains}	50 / 60 Hz ± 5%	
Rated mains current 100% operation	I_{Mains}	AC 0.9 A	AC 1.4 A
Rated mains current 125% operation	$I_{\text{Mains } 125}$	AC 1.1 A	AC 1.8 A
OUTPUT			
Output voltage	V_{Output}	3 × 0 ... V_{Mains}	
Recommended motor power 100% operation	P_{Mot}	0.25 kW (0.4 HP)	0.37 kW (0.5 HP)
Recommended motor power 125% operation	$P_{\text{Mot } 125}$	0.37 kW (0.5 HP)	0.55 kW (0.75 HP)
Rated output current 100% operation	I_{rated}	AC 1.0 A	AC 1.6 A
Rated output current 125% operation	$I_{\text{rated } 125}$	AC 1.3 A	AC 2.0 A
Apparent output power 100% operation	S_{rated}	0.7 kVA	1.1 kVA
Apparent output power 125% operation	$S_{\text{rated } 125}$	0.9 kVA	1.4 kVA
Minimum permitted braking resistance value (4 quadrant operation)	$R_{\text{Br_min}}$	68 Ω	
GENERAL INFORMATION			
Power loss 100% operation	P_{Loss}	30 W (0.040 HP)	35 W (0.047 HP)
Power loss 125% operation	$P_{\text{Loss } 125}$	35 W (0.047 HP)	40 W (0.054 HP)
Current limitation		150% I_{rated} for at least 60 seconds	
Connections/tightening torque	Terminals	4 mm ² (AWG12) / 0.5 Nm (4.4 in-lb)	
Dimensions	W × H × D	54.5 × 185 × 163.5 mm (2.0 × 7.3 × 6.4 in)	
Mass	m	1.3 kg (2.9 lb)	


2.4.13 AC 400 / 500 V / 3-phase / size 0S / 0.55 ... 1.5 kW (0.75... 2.0 HP)


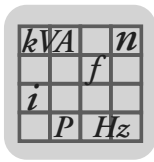
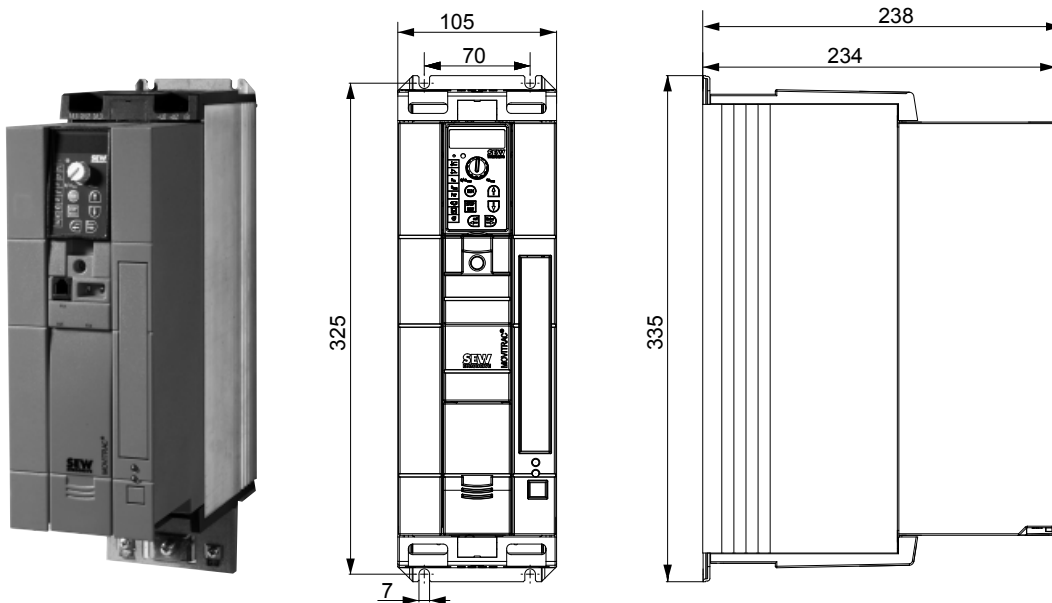
MOVITRAC® MC07B (3-phase mains)		0005-5A3-4-x0	0008-5A3-4-x0	0011-5A3-4-x0	0015-5A3-4-x0
Part number, standard unit (-00)		828 517 9	828 518 7	828 519 5	828 520 9
Part number "Safe stop" (-S0)		828 995 6	828 996 4	828 997 2	828 998 0
INPUT					
Permitted rated supply voltage	V_{Mains}	$3 \times \text{AC } 400 \text{ V}$ $V_{\text{Mains}} = \text{AC } 380 \text{ V} - 10\% \dots \text{AC } 500 \text{ V} + 10\%$			
Rated frequency	f_{Mains}	50 / 60 Hz \pm 5%			
Rated mains current 100% operation	I_{Mains}	AC 1.8 A	AC 2.2 A	AC 2.8 A	AC 3.6 A
Rated mains current 125% operation	$I_{\text{Mains } 125}$	AC 2.3 A	AC 2.6 A	AC 3.5 A	AC 4.5 A
OUTPUT					
Output voltage	V_{Output}	$3 \times 0 \dots V_{\text{Mains}}$			
Recommended motor power 100% operation	P_{Mot}	0.55 kW (0.75 HP)	0.75 kW (1.0 HP)	1.1 kW (1.5 HP)	1.5 kW (2.0 HP)
Recommended motor power 125% operation	$P_{\text{Mot } 125}$	0.75 kW (1.0 HP)	1.1 kW (1.5 HP)	1.5 kW (2.0 HP)	2.2 kW (3.0 HP)
Rated output current 100% operation	I_{rated}	AC 2.0 A	AC 2.4 A	AC 3.1 A	AC 4.0 A
Rated output current 125% operation	$I_{\text{rated } 125}$	AC 2.5 A	AC 3.0 A	AC 3.9 A	AC 5.0 A
Apparent output power 100% operation	S_{rated}	1.4 kVA	1.7 kVA	2.1 kVA	2.8 kVA
Apparent output power 125% operation	$S_{\text{rated } 125}$	1.7 kVA	2.1 kVA	2.7 kVA	3.5 kVA
Minimum permitted braking resistance value (4 quadrant operation)	$R_{\text{Br_min}}$	68 Ω			
GENERAL INFORMATION					
Power loss 100% operation	P_{Loss}	40 W (0.054 HP)	45 W (0.060 HP)	50 W (0.067 HP)	60 W (0.080 HP)
Power loss 125% operation	$P_{\text{Loss } 125}$	45 W (0.060 HP)	50 W (0.067 HP)	60 W (0.080 HP)	75 W (0.10 HP)
Current limitation		150% I_{rated} for at least 60 seconds			
Connections/tightening torque	Terminals	4 mm ² (AWG12) / 0.5 Nm (4.4 in-lb)			
Dimensions	W × H × D	80 × 185 × 163.5 mm (3.1 × 7.3 × 6.4 in)			
Mass	m	1.5 kg (3.3 lb)			



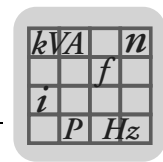
2.4.14 AC 400 / 500 V / 3-phase / size 0L / 2.2... 4.0 kW (3.0... 5.0 HP)



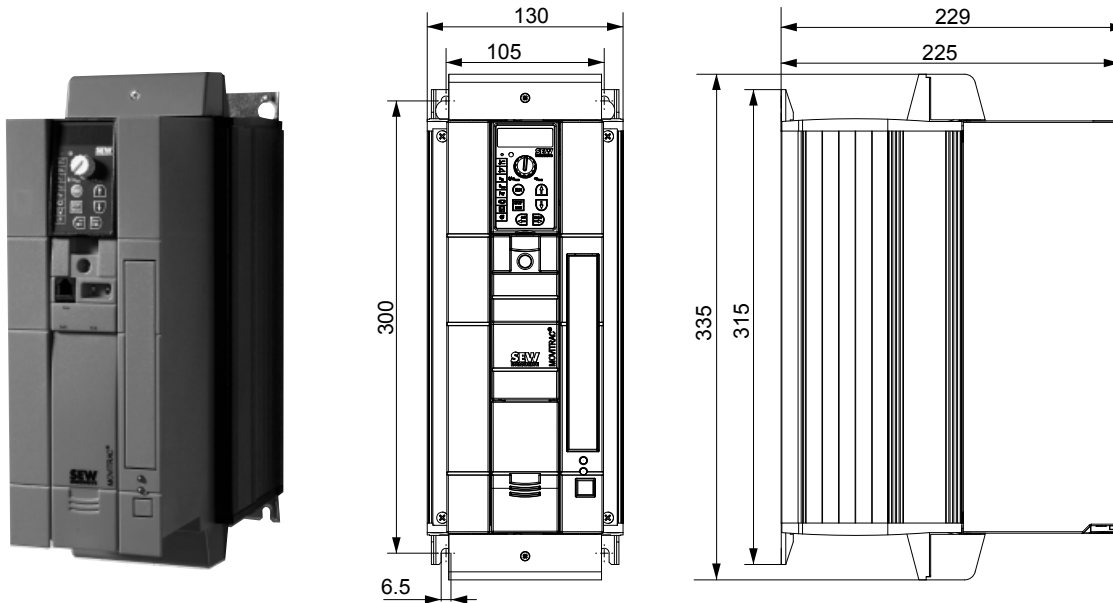
MOVITRAC® MC07B (3-phase mains)		0022-5A3-4-x0	0030-5A3-4-x0	0040-5A3-4-x0
Part number, standard unit (-00)		828 521 7	828 522 5	828 523 3
Part number "Safe stop" (-S0)		828 999 9	829 000 8	829 001 6
INPUT				
Permitted rated supply voltage	V_{Mains}	3 × AC 400 V $V_{\text{Mains}} = \text{AC } 380 \text{ V} - 10\% \dots \text{AC } 500 \text{ V} + 10\%$		
Rated frequency	f_{Mains}	50 / 60 Hz ± 5%		
Rated mains current 100% operation	I_{Mains}	AC 5.0 A	AC 6.3 A	AC 8.6 A
Rated mains current 125% operation	$I_{\text{Mains } 125}$	AC 6.2 A	AC 7.9 A	AC 10.7 A
OUTPUT				
Output voltage	V_{A}	3 × 0 ... V_{Mains}		
Recommended motor power 100% operation	P_{Mot}	2.2 kW (3.0 HP)	3.0 kW (4.0 HP)	4.0 kW (5.0 HP)
Recommended motor power 125% operation	$P_{\text{Mot } 125}$	3.0 kW (4.0 HP)	4.0 kW (5.0 HP)	5.5 kW (7.5 HP)
Rated output current 100% operation	I_{rated}	AC 5.5 A	AC 7.0 A	AC 9.5 A
Rated output current 125% operation	$I_{\text{rated } 125}$	AC 6.9 A	AC 8.8 A	AC 11.9 A
Apparent output power 100% operation	S_{rated}	3.8 kVA	4.8 kVA	6.6 kVA
Apparent output power 125% operation	$S_{\text{rated } 125}$	4.8 kVA	6.1 kVA	8.2 kVA
Minimum permitted braking resistance value (4 quadrant operation)	$R_{\text{Br_min}}$	68 Ω		
GENERAL INFORMATION				
Power loss 100% operation	P_{Loss}	80 W (0.11 HP)	95 W (0.13 HP)	125 W (0.168 HP)
Power loss 125% operation	$P_{\text{Loss } 125}$	95 W (0.13 HP)	120 W (0.161 HP)	180 W (0.241 HP)
Current limitation		150% I_{rated} for at least 60 seconds		
Connections/tightening torque	Terminals	4 mm ² (AWG12) / 0.5 Nm (4.4 in·lb)		
Dimensions	W × H × D	80 × 273.5 × 163.5 mm (3.1 × 10.8 × 6.4 in)		
Mass	m	2.1 kg (4.6 lb)		


2.4.15 AC 400 / 500 V / 3-phase / size 2S / 5.5... 7.5 kW (7.5 ... 10 HP)


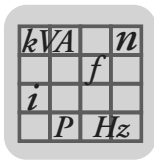
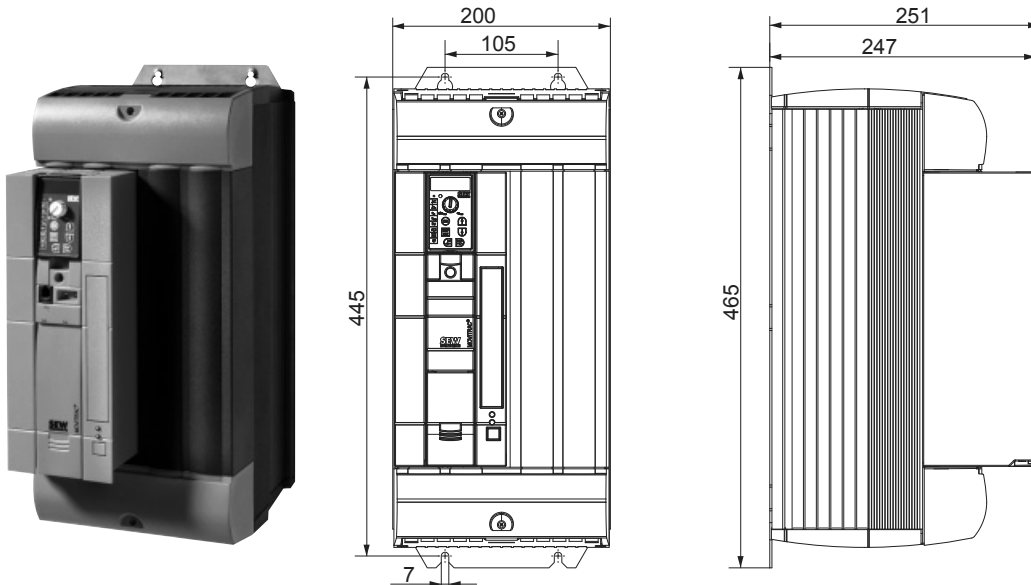
MOVITRAC® MV07B (3-phase mains)		0055-5A3-4-00	0075-5A3-4-00
Part number		828 524 1	828 526 8
INPUT			
Permitted rated supply voltage	V_{Mains}	$3 \times \text{AC } 400 \text{ V}$ $V_{\text{Mains}} = \text{AC } 380 \text{ V} - 10\% \dots \text{AC } 500 \text{ V} + 10\%$	
Rated frequency	f_{Mains}	50 / 60 Hz \pm 5%	
Rated mains current 100% operation	I_{Mains}	AC 11.3 A	AC 14.4 A
Rated mains current 125% operation	$I_{\text{Mains } 125}$	AC 14.1 A	AC 18.0 A
OUTPUT			
Output voltage	V_{Output}	$3 \times 0 \dots V_{\text{Mains}}$	
Recommended motor power 100% operation	P_{Mot}	5.5 kW (7.5 HP)	7.5 kW (10 HP)
Recommended motor power 125% operation	$P_{\text{Mot } 125}$	7.5 kW (10 HP)	11 kW (15 HP)
Rated output current 100% operation	I_{rated}	AC 12.5 A	AC 16 A
Rated output current 125% operation	$I_{\text{rated } 125}$	AC 15.6 A	AC 20 A
Apparent output power 100% operation	S_{rated}	8.7 kVA	11.1 kVA
Apparent output power 125% operation	$S_{\text{rated } 125}$	10.8 kVA	13.9 kVA
Minimum permitted braking resistance value (4 quadrant operation)	$R_{\text{Br_min}}$	47 Ω	
GENERAL INFORMATION			
Power loss 100% operation	P_{Loss}	220 W (0.295 HP)	290 W (0.389 HP)
Power loss 125% operation	$P_{\text{Loss } 125}$	290 W (0.389 HP)	370 W (0.496 HP)
Current limitation		150% I_{rated} for at least 60 seconds	
Connections/tightening torque	Terminals	4 mm ² (AWG12) / 1.5 Nm (13.3 in-lb)	
Dimensions	W × H × D	105 × 335 × 238 mm (4.1 × 13.2 × 9.4 in)	
Mass	m	5.0 kg (11.0 lb)	



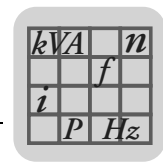
2.4.16 AC 400 / 500 V / 3-phase / size 2 / 11 kW (15 HP)



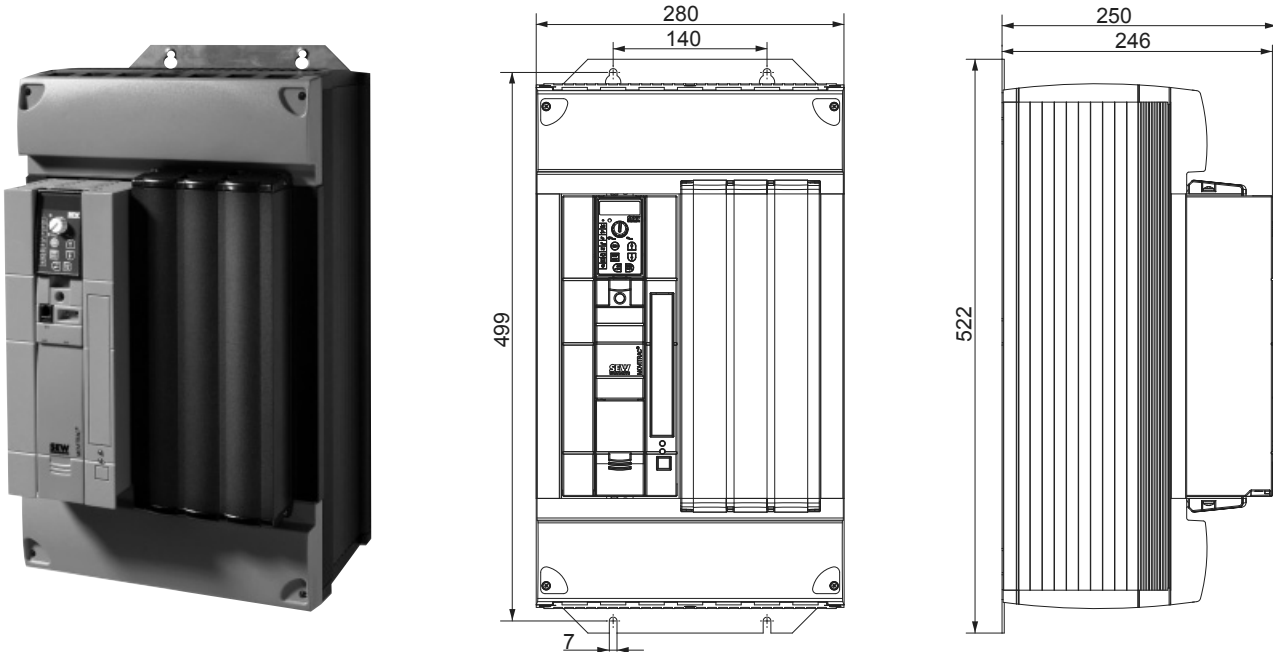
MOVITRAC® MC07B (3-phase mains)		0110-5A3-4-00
Part number		828 527 6
INPUT		
Permitted rated supply voltage	V_{Mains}	3 × AC 400 V $V_{\text{Mains}} = \text{AC } 380 \text{ V} - 10\% \dots \text{AC } 500 \text{ V} + 10\%$
Rated frequency	f_{Mains}	50 / 60 Hz ± 5%
Rated mains current 100% operation Rated mains current 125% operation	I_{Mains} $I_{\text{Mains } 125}$	AC 21.6 A AC 27.0 A
OUTPUT		
Output voltage	V_{Output}	3 × 0 ... V_{Mains}
Recommended motor power 100% operation Recommended motor power 125% operation	P_{Mot} $P_{\text{Mot } 125}$	11 kW (15 HP) 15 kW (20 HP)
Rated output current 100% operation Rated output current 125% operation	I_{rated} $I_{\text{rated } 125}$	AC 24 A AC 30 A
Apparent output power 100% operation Apparent output power 125% operation	S_{rated} $S_{\text{rated } 125}$	16.6 kVA 20.8 kVA
Minimum permitted braking resistance value (4 quadrant operation)	$R_{\text{Br_min}}$	22 Ω
GENERAL INFORMATION		
Power loss 100% operation Power loss 125% operation	P_{Loss} $P_{\text{Loss } 125}$	400 W (0.536 HP) 500 W (0.671 HP)
Current limitation		150% I_{rated} for at least 60 seconds
Connections/tightening torque	Terminals	4 mm ² (AWG12) / 1.5 Nm (13.3 in-lb)
Dimensions	W × H × D	130 × 335 × 229 mm (5.1 × 13.2 × 9.0 in)
Mass	m	6.6 kg (14.6 lb)


2.4.17 AC 400 / 500 V / 3-phase / size 3 / 15... 30 kW (20... 40 HP)


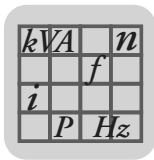
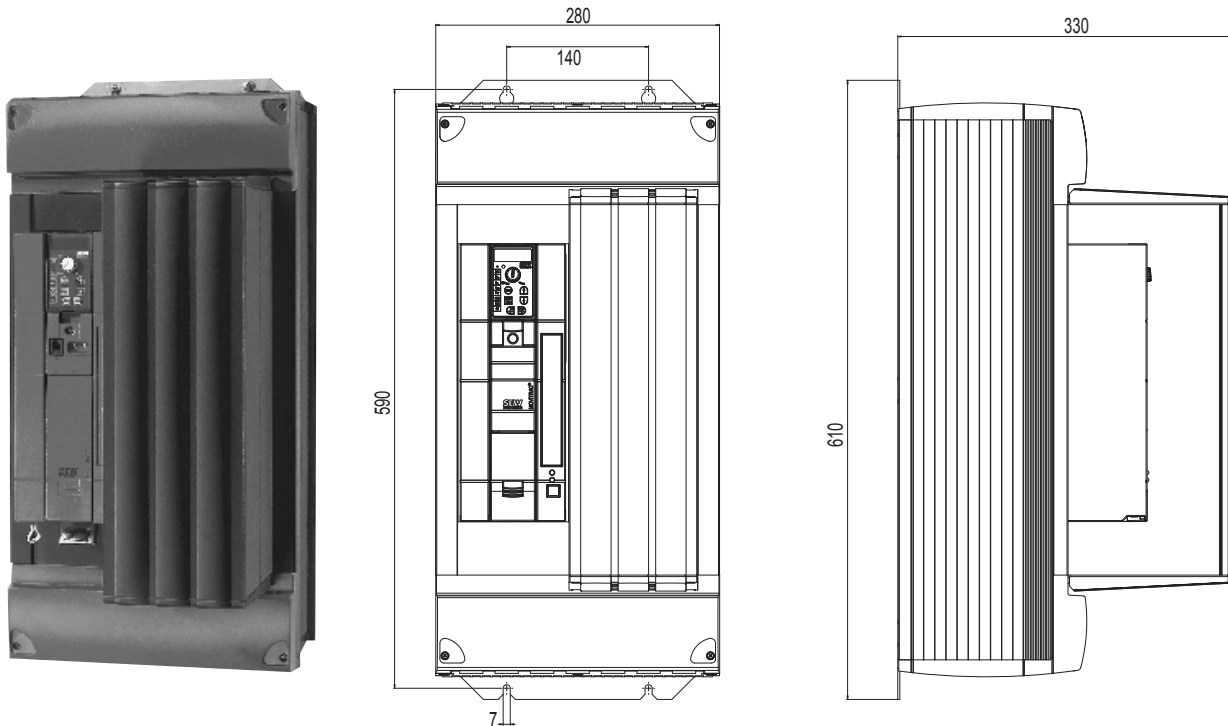
MOVITRAC® MC07B (3-phase mains)		0150-503-4-00	0220-503-4-00	0300-503-4-00
Part number		828 528 4	828 529 2	828 530 6
INPUT				
Permitted rated supply voltage	V_{Mains}	3 × AC 400 V $V_{\text{Mains}} = \text{AC } 380 \text{ V} - 10\% \dots \text{AC } 500 \text{ V} + 10\%$		
Rated frequency	f_{Mains}	50 / 60 Hz ± 5%		
Rated mains current 100% operation	I_{Mains}	AC 28.8 A	AC 41.4 A	AC 54.0 A
Rated mains current 125% operation	$I_{\text{Mains } 125}$	AC 36.0 A	AC 51.7 A	AC 67.5 A
OUTPUT				
Output voltage	V_{Output}	3 × 0 ... V_{Mains}		
Recommended motor power 100% operation	P_{Mot}	15 kW (20 HP)	22 kW (30 HP)	30 kW (40 HP)
Recommended motor power 125% operation	$P_{\text{Mot } 125}$	22 kW (30 HP)	30 kW (40 HP)	37 kW (50 HP)
Rated output current 100% operation	I_{rated}	AC 32 A	AC 46 A	AC 60 A
Rated output current 125% operation	$I_{\text{rated } 125}$	AC 40 A	AC 57.5 A	AC 75 A
Apparent output power 100% operation	S_{rated}	22.2 kVA	31.9 kVA	41.6 kVA
Apparent output power 125% operation	$S_{\text{rated } 125}$	27.7 kVA	39.8 kVA	52.0 kVA
Minimum permitted braking resistance value (4 quadrant operation)	$R_{\text{Br_min}}$	15 Ω		12 Ω
GENERAL INFORMATION				
Power loss 100% operation	P_{Loss}	550 W	750 W (1.01 HP)	950 W (1.27 HP)
Power loss 125% operation	$P_{\text{Loss } 125}$	(0.738 HP) 690 W (0.925 HP)	940 W (1.26 HP)	1250 W (1.676 HP)
Current limitation		150% I_{rated} for at least 60 seconds		
Connections/tightening torque	Terminals	6 mm ² / AWG10	10 mm ² / AWG8	16 mm ² / AWG6
		3.5 Nm (31.0 in·lb)		
Dimensions	W × H × D	200 × 465 × 251 mm (7.9 × 18.3 × 9.9 in)		
Mass	m	15 kg (33.1 lb)		



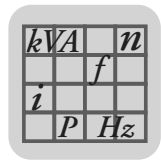
2.4.18 AC 400 / 500 V / 3-phase / size 4 / 37... 45 kW (50... 60 HP)



MOVITRAC® MC07B (3-phase mains)		0370-503-4-00	0450-503-4-00
Part number		828 531 4	828 532 2
INPUT			
Permitted rated supply voltage	V_{Mains}	3 × AC 400 V $V_{\text{Mains}} = \text{AC } 380 \text{ V} - 10\% \dots \text{AC } 500 \text{ V} + 10\%$	
Rated frequency	f_{Mains}	50 / 60 Hz ± 5%	
Rated mains current 100% operation	I_{Mains}	AC 65.7 A	AC 80.1 A
Rated mains current 125% operation	$I_{\text{Mains } 125}$	AC 81.9 A	AC 100.1 A
OUTPUT			
Output voltage	V_{Output}	3 × 0 ... V_{Mains}	
Recommended motor power 100% operation	P_{Mot}	37 kW (50 HP)	45 kW (60 HP)
Recommended motor power 125% operation	$P_{\text{Mot } 125}$	45 kW (60 HP)	55 kW (75 HP)
Rated output current 100% operation	I_{rated}	AC 73 A	AC 89 A
Rated output current 125% operation	$I_{\text{rated } 125}$	AC 91.3 A	AC 111.3 A
Apparent output power 100% operation	S_{rated}	50.6 kVA	61.7 kVA
Apparent output power 125% operation	$S_{\text{rated } 125}$	63.2 kVA	77.1 kVA
Minimum permitted braking resistance value (4 quadrant operation)	$R_{\text{Br_min}}$	6 Ω	
GENERAL INFORMATION			
Power loss 100% operation	P_{Loss}	1200 W (1.609 HP)	1400 W (1.877 HP)
Power loss 125% operation	$P_{\text{Loss } 125}$	1450 W (1.944 HP)	1820 W (2.441 HP)
Current limitation		150% I_{rated} for at least 60 seconds	
Connections/tightening torque	Terminals	25 mm ² / AWG4	35 mm ² / AWG2
		14 Nm (124 in·lb)	
Dimensions	W × H × D	280 × 522 × 250 mm (11.0 × 20.6 × 9.8 in)	
Mass	m	27 kg (59.5 lb)	


2.4.19 AC 400 / 500 V / 3-phase / size 5 / 55... 75 kW (75 ... 100 HP)


MOVITRAC® MC07B (3-phase mains)		0550-503-4-00	0750-503-4-00
Part number		829 527 1	829 529 8
INPUT			
Permitted rated supply voltage	V_{Mains}	3 × AC 400 V $V_{\text{Mains}} = \text{AC } 380 \text{ V} - 10\% \dots \text{AC } 500 \text{ V} + 10\%$	
Rated frequency	f_{Mains}	50 / 60 Hz ± 5%	
Rated mains current 100% operation Rated mains current 125% operation	I_{Mains} $I_{\text{Mains } 125}$	AC 94.5 A AC 118.1 A	AC 117 A AC 146.3 A
OUTPUT			
Output voltage	V_{Output}	3 × 0 ... V_{Mains}	
Recommended motor power 100% operation Recommended motor power 125% operation	P_{Mot} $P_{\text{Mot } 125}$	55 kW (75 HP) 75 kW (100 HP)	75 kW (100 HP) 90 kW (120 HP)
Rated output current 100% operation Rated output current 125% operation	I_{rated} $I_{\text{rated } 125}$	AC 105 A AC 131 A	AC 130 A AC 162 A
Apparent output power 100% operation Apparent output power 125% operation	S_{rated} $S_{\text{rated } 125}$	73.5 kVA 90.8 kVA	91.0 kVA 112.2 kVA
Minimum permitted braking resistance value (4 quadrant operation)	$R_{\text{Br_min}}$	6 Ω	4 Ω
GENERAL INFORMATION			
Power loss 100% operation Power loss 125% operation	P_{Loss} $P_{\text{Loss } 125}$	1700 W (2.280 HP) 2020 W (2.709 HP)	2000 W (2.682 HP) 2300 W (3.084 HP)
Current limitation		150% I_{rated} for at least 60 seconds	
Connections/tightening torque	Terminals	35 mm ² / AWG2	50 mm ² / AWG0
		14 Nm (124 in-lb)	
Dimensions	W × H × D	280 × 610 × 330 mm (11.0 × 24.0 × 13.0 in)	
Mass	m	35 kg (77.2 lb)	

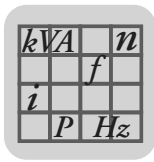


2.5 FBG11B keypad front option

The FBG11B front option can be used for simple diagnostics and startup.

Part number	1820 635 2
Functions	<ul style="list-style-type: none"> • Displaying process values and status • Fault memory queries and fault reset • Displaying and setting parameters • Back up and transfer of parameter sets • Easy-to-use startup menu for SEW and non-SEW motors • Manual control of MOVITRAC® B
Features	<ul style="list-style-type: none"> • 5-digit, 7-segment display / 6 buttons / 8 icons / setpoint control module • Selection of short or long menu • Can be plugged onto the inverter (during operation) • Enclosure IP20 (EN 60529)

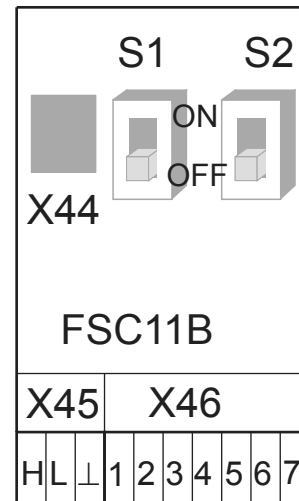
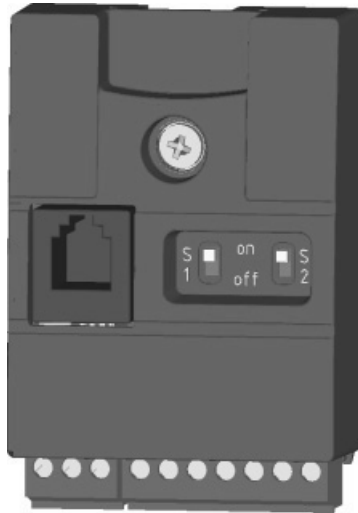




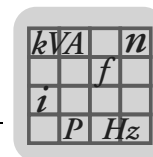
2.6 FSC11B communication module

The FSC11B communication module enables communication with other units. These may include: PC, operator terminals, MOVITRAC® or MOVIDRIVE®.

Part number	1820 716 2
Functions	<ul style="list-style-type: none"> • Communication with PLC / MOVITRAC® B / MOVIDRIVE® / PC • Operation/parameter setting/service (PC) • The options FSC11B and FIO11B are installed at the same fastening place and therefore cannot be used simultaneously.
Features	<ul style="list-style-type: none"> • RS-485 (one interface): Plug-in terminals and service interface (RJ10 socket) • CAN-based system bus (SBus) (plug-in terminals) • Supported protocols: MOVILINK® / SBus / RS-485 / CANopen



Function	Terminal	Description	Data
System bus (SBus)	X46:1 X46:2 X46:3 X46:4 X46:5 X46:6 X46:7	SC11: SBus high SC12: SBus low GND: Reference potential SC21: SBus high SC22: SBus low GND: Reference potential 24VIO: Auxiliary voltage / external voltage supply	CAN bus to CAN specification 2.0, parts A and B, transmission technology to ISO 11898, max. 64 participants, terminating resistor (120 Ω) can be activated using DIP switches Terminal cross-section: 1.5 mm ² (AWG15) without conductor end sleeves 1.0 mm ² (AWG17) with conductor end sleeves
RS-485 interface	X45:H X45:L X45:⊥	ST11: RS-485+ ST12: RS-485- GND: Reference potential	EIA standard, 9.6 kbaud, max. 32 participants Maximum cable length 200 m (656 ft) Dynamic terminating resistor with fixed installation Terminal cross-section: – 1.5 mm ² (AWG15) without conductor end sleeves – 1.0 mm ² (AWG17) with conductor end sleeves
Service interface	X44 RJ10		Only for service purposes, exclusively for point-to-point connection Maximum cable length 3 m (10 ft)



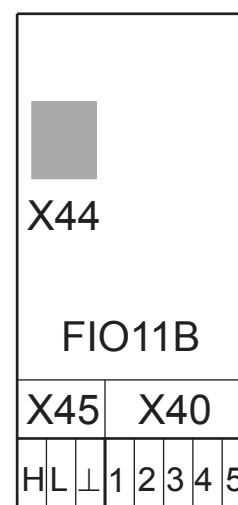
2.7 FIO11B analog module

Part number 1820 637 9

2.7.1 Description

The FIO11B analog module adds the following interfaces to the basic version:

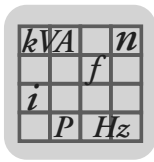
- Setpoint input
- Analog output
- RS-485 interface
- The options FIO11B and FSC11B are mounted on the same fastening place and therefore cannot be used simultaneously.



2.7.2 Electronics data FIO11B analog module

Function	Terminal	Description	Data
Setpoint input ¹⁾	X40:1 X40:2	AI2: Voltage input GND: Reference potential	−10 ... +10 V $R_i > 40 \text{ k}\Omega$ Resolution 10 bit Sampling time 5 ms
Analog output/ alternative as current output or voltage output	X40:3 X40:4 X40:5	GND: Reference potential AOV1: Voltage output AOC1: Current output	0 ... +10 V / $I_{\max} = 2 \text{ mA}$ 0 (4) ... 20 mA Resolution 10 bit Sampling time 5 ms Short-circuit proof, protected against external voltage up to 30 V
RS-485 interface	X45:H X45:L X45:⊥	ST11: RS-485+ ST12: RS-485− GND: Reference potential	EIA standard, 9.6 kbaud, max. 32 participants Maximum cable length 200 m (656 ft) Dynamic terminating resistor with fixed installation Terminal cross-section: – 1.5 mm ² (AWG15) without conductor end sleeves – 1.0 mm ² (AWG17) with conductor end sleeves
Service interface	X44 RJ10		Only for service purposes, exclusively for point-to-point connection Maximum cable length 5 m (16.4 ft)


1) If the setpoint input is not used, it should be set to GND. Otherwise a measured input voltage of −1... +1 V is set.



2.8 DBG60B keypad (in preparation)

2.8.1 Description

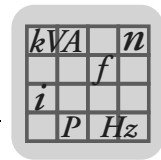
The basic version of MOVITRAC[®] B does not have a DBG60B keypad but has the option of an upgrade to include the plain text keypad.

Keypad	Language	Part number	
	DBG60B-01	DE / EN / FR / IT / ES / PT / NL (German / English / French / Italian / Spanish / Portuguese / Dutch)	1 820 403 1
	DBG60B-02	DE / EN / FR / FI / SV / DA / TR (German / English / French / Finnish / Swedish / Danish / Turkish)	1 820 405 8
	DBG60B-03	DE / EN / FR / RU / PL / CS (German / English / French / Russian / Polish / Czech)	1 820 406 6
	DBG60B-04	DE / EN / FR / ZH (German / English / French / Chinese)	1 820 850 9
Door installation set¹⁾	Description (= scope of delivery)	Part number	
DBM60B	<ul style="list-style-type: none"> Housing for DBG60B (IP65) DKG60B extension cable, length 5 m (16.4 ft) 	824 853 2	
Extension cable	Description (= scope of delivery)	Part number	
DKG60B	<ul style="list-style-type: none"> Length 5 m (16.4 ft) 4-core, shielded cable (AWG26) 	817 583 7	

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

2.8.2 Functions

- Display process values and status
- Status displays of the binary inputs / outputs
- Error memory and error reset queries
- Option to display and set the operating parameters and service parameters
- Data backup and transfer of parameter sets to other MOVITRAC[®] B units.
- User-friendly startup menu
- Manual control of MOVITRAC[®] B
- Connection via FSC11B (is required)



2.8.3 Features

- Illuminated text display, choice of 7 languages
- Keypad with 21 keys
- Can be connected via extension cable DKG60B (5 m [16.4 ft])
- Enclosure IP40 (EN 60529)

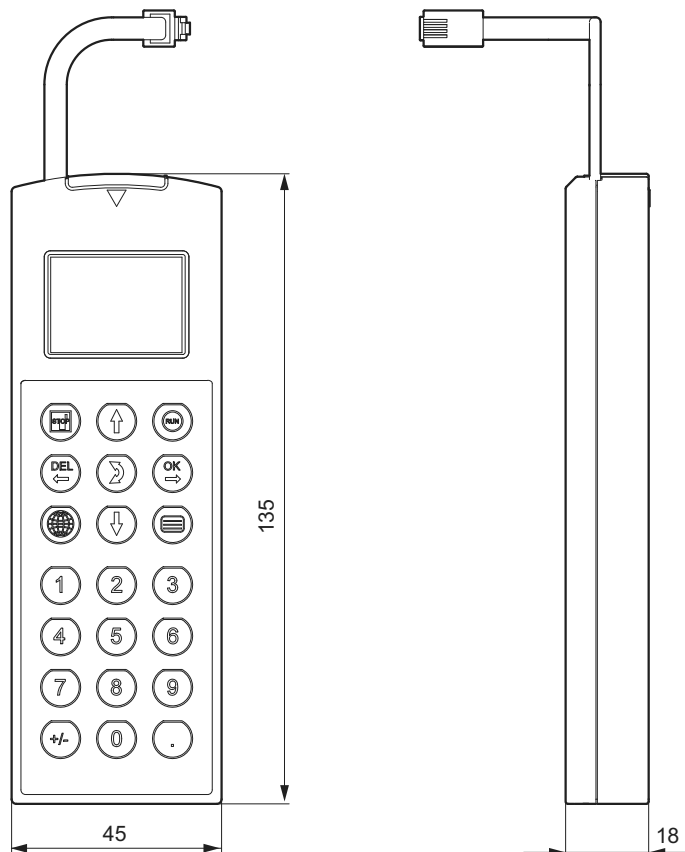


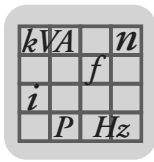
NOTE

The DBG60B keypad option is connected to the FSC11B or FIO11B communication front option. Simultaneous operation of DBG60B and PC, RS-485 connection, MOVIDRIVE[®], or MOVITRAC[®] is not possible.

2.8.4 Dimension drawing for DBG60B

DBG60B dimension drawing, dimensions in mm



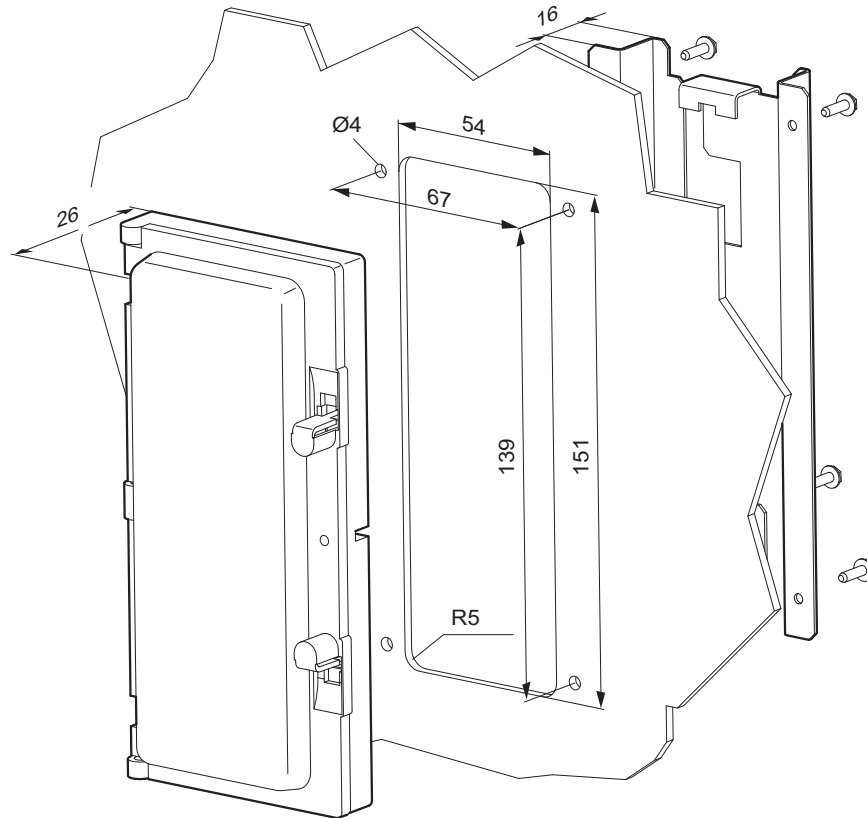


Technical Data

DBG60B keypad (in preparation)

2.8.5 DBG60B housing dimension drawing

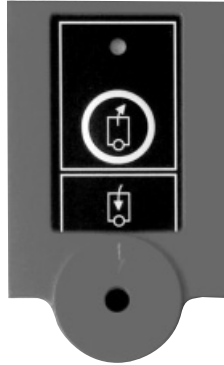
The DBM60B option can be used to mount the keypad close to the inverter (e.g. in the control cabinet door). The DBM60B option consists of housing in enclosure IP65 and a 5 m (16.4 ft) DKG60B extension cable.



kVA		n
		f
i		
P		Hz

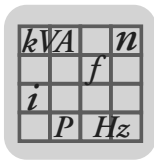
2.9 Parameter module UBP11A

Part number: 823 933 9



Functional description:

- Saving data from the inverter to the parameter module
- Loading data back from the parameter module to the inverter
- Operating status display
- The UBP11A parameter module requires the front option FSC11B or FIO11B. Simultaneous operation of UBP11A and PC, RS-485 connection, MOVIDRIVE[®], or MOVITRAC[®] is not possible.



Technical Data

MBG11A setpoint control module

2.10 MBG11A setpoint control module

Functional description:

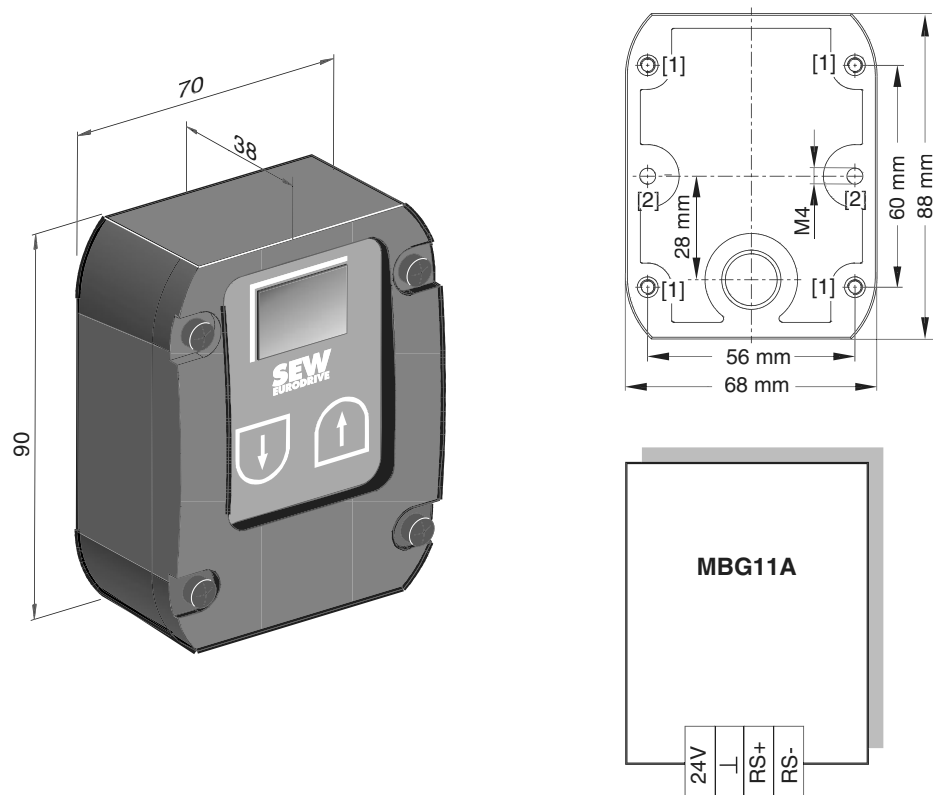
- The MBG11A setpoint control module has two keys and a display. They allow for remote speed control in the range of $-100\% \dots +100\% f_{\max}$ (potentiometer f1).
- Up to 31 MOVITRAC[®] B units can be controlled at the same time (broadcasting).
- The MBG11A setpoint control module requires the front option FSC11B or FIO11B.

Technical data:

MBG11A option	
Part number	822 547 8
Input voltage	DC 24 V \pm 25%
Current consumption	approx. 70 mA
Setpoint resolution	1%
Serial interface ¹⁾	RS-485 for connecting max. 31 MOVIMOT [®] inverters (max. 200 m [656 ft], 9600 baud)
Enclosure	IP 65
Ambient temperature	$-15 \dots 60 \text{ }^\circ\text{C}$ (5 ... 140 $^\circ\text{F}$)

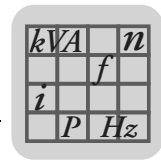
1) with integrated dynamic terminating resistor

Dimensions and connection assignment:



[1] Tapped hole on the rear

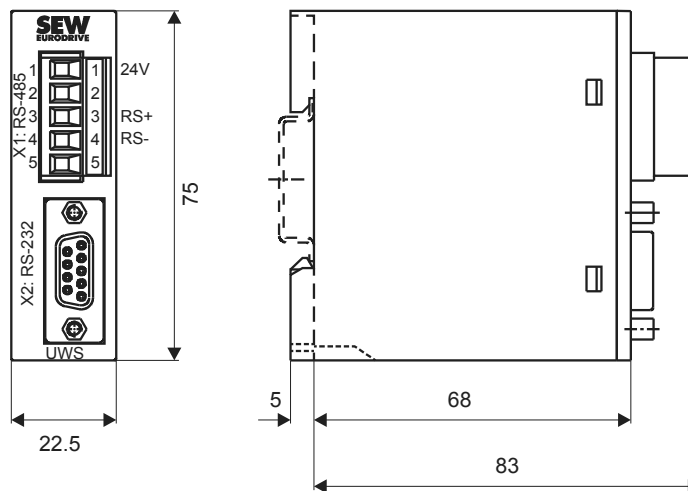
[2] Retaining holes for M4 screws



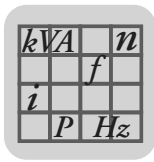
2.11 UWS11A Interface adapter RS-232 RS-485 for support rail

Part number	822 689 X	The FSC11B is required for connecting the UWS11A.
Ambient temperature	0 ... 40 °C (32 .. 104 °F)	
Enclosure	IP20	
Description	The UWS11A option converts RS-232 signals, for example from the PC, into RS-485 signals. These RS-485 signals can then be routed to the RS-485 interface of the MOVITRAC® B. The UWS11A option requires a 24V DC voltage supply ($I_{max} = DC 100 mA$).	
RS-232 interface	The connection between UWS11A and PC is made using a commercially available serial interface cable (shielded!).	
RS-485 interface	You can use the RS-485 interface of the UWS11A to network up to 32 MOVITRAC® B units for communication (max. total cable length 200 m [656 ft]). Do not connect external terminating resistors because dynamic terminating resistors are already installed. Permitted cable cross-section: One core per terminal 0.20...2.5 mm ² (AWG 24...12) Two cores per terminal 0.20...1 mm ² (AWG 24...17)	

Dimension drawing



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



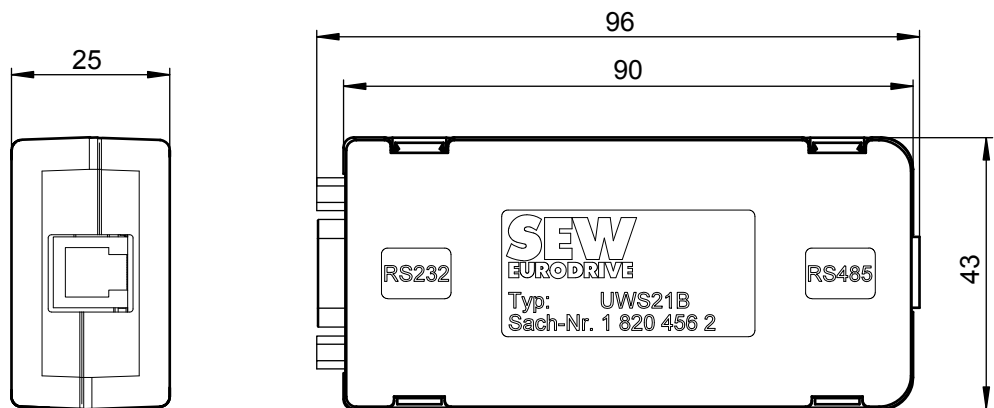
Technical Data

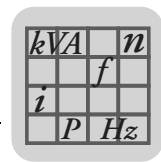
UWS21B RS-232/RS-485 interface adapter

2.12 UWS21B RS-232/RS-485 interface adapter

Part number	18204562	The FSC11B is required for connecting the UWS21B.
Ambient temperature	0... 40 °C (32... 104 °F)	
Enclosure	IP20	
Description	The UWS21B option converts RS-232 signals, for example from the PC, into RS-485 signals. These RS-485 signals can then be routed to the interface of the MOVITRAC® B.	
RS-232 interface	The UWS21B – PC connection is made using a standard serial interface cable (shielded).	
RS-485 interface	UWS21B and MOVITRAC® B are connected using a serial interface cable with RJ10 connectors.	
Scope of delivery	The scope of delivery for the UWS21B option includes: <ul style="list-style-type: none"> • UWS21B unit • Serial interface cable with 9-pin sub D socket and 9-pin sub D connector to connect the UWS21B option to the PC. • Serial interface cable with two RJ10 connectors to connect UWS21B and MOVITRAC® B • CD-ROM with drivers and MOVITOOLS® MotionStudio 	

UWS21B dimension drawing

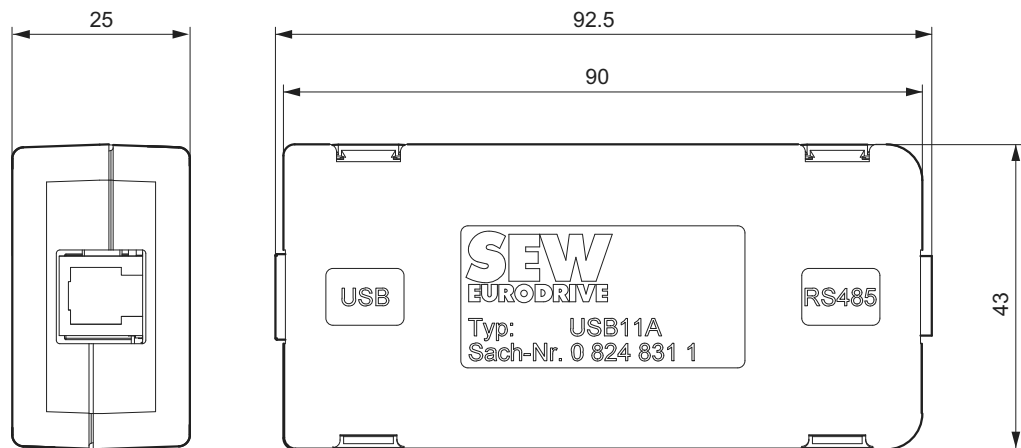


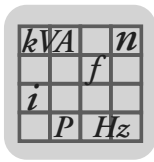


2.13 USB11A USB/RS-485 interface adapter

Part number	824 831 1	The FSC11B is required for connecting the USB11A.
Ambient temperature	0 ... 40 °C (32 .. 104 °F)	
Enclosure	IP20	
Description	Option USB11A enables a PC or laptop with a USB interface to be connected to the X44 interface of MOVITRAC®. The USB11A interface adapter supports USB 1.1 and USB 2.0.	
RS-232 interface	The connection between USB11A and PC is made using a standard USB cable type USB A-B (shielded!).	
Scope of delivery	The scope of delivery for the USB11A option includes: <ul style="list-style-type: none"> • USB11A unit • USB connection cable type USB A-B to connect PC to USB11A • Serial interface cable with two RJ11 connectors to connect MOVITRAC® B and USB11A. • CD-ROM with drivers and MOVITOOLS® MotionStudio. 	

USB11A dimension drawing





2.14 Braking resistors, BW Series

2.14.1 General

BW series braking resistors are designed for the MOVITRAC® B series of inverters. The type of cooling is KS = self-cooling (air ventilation).

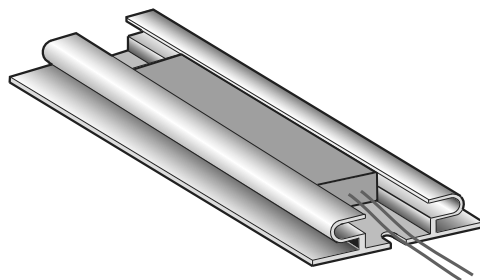
The surfaces of the resistors get very hot if loaded with P_N . Make sure that you select an installation site that will accommodate these high temperatures. As a rule, therefore, braking resistors are mounted on the control cabinet roof.

Plan for a load derating of 4% per 10 K from an ambient temperature of 45 °C (113 °F). Do not exceed the maximum ambient temperature of 80 °C (176 °F). Note the maximum permissible temperature of other components (e.g. MOVITRAC® B) when installing in the control cabinet.

2.14.2 PTC braking resistors

Observe the following points for the PTC braking resistors:

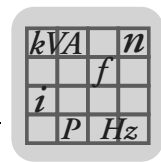
- 4-quadrant operation is recommended for applications in which the level of regenerative energy is low.
- The resistor protects itself (reversible) against regenerative overload by changing abruptly to high resistance and no longer consuming any more energy.
- The inverter then switches off and issues an "overvoltage" error (error code 07).



Assignment of the PTC braking resistors:

Braking resistor type	BW2	BW4
Part number	823 136 2 ¹⁾	823 599 6 ¹⁾
Resistance value R_{BW}	175 Ω \pm 10%	87.5 Ω \pm 10%
Ambient temperature ϑ_A	-25 °C (-13 °F) ... +60 °C (140 °F)	-25 °C (-13 °F) ... +60 °C (140 °F)
For MOVITRAC® B	0003 / 0004 (400/500 V)	0003 / 0004 (230 V)

1) Two screws M4 x 8, included in delivery

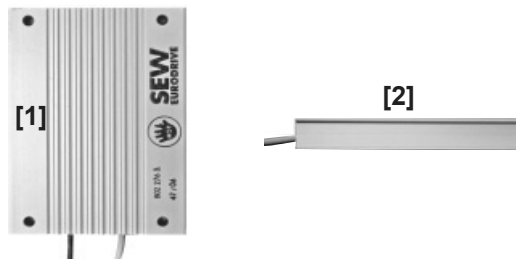


2.14.3 Flat design

The flat-design resistors have IP54 enclosure and are equipped with internal thermal overload protection (cannot be replaced). Depending on their type, you can install the resistors as follows:

- With support rail mounting FHS or submounting FKB under the heat sink. The braking resistors in the submounting do not achieve the specified CDF power. The FHS and FKB options are only suitable for the BW027-003 and BW072-003 braking resistors.
- Attach to a support rail using a BS touch guard.

Important: The load capacity applies for a horizontal mounting position [2]. Values are reduced by 10% for a vertical mounting position [1].

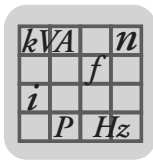


230 V

Braking resistor type	BW027-003	BW027-005
Part number	826 949 1	826 950 5
100% CDF	230 W (0.308 HP)	450 W (0.603 HP)
50% CDF	310 W (0.416 HP)	610 W (0.818 HP)
25% CDF	410 W (0.550 HP)	840 W (1.13 HP)
12% CDF	550 W (0.738 HP)	1200 W (1.609 HP)
6% CDF	980 W (1.31 HP)	2360 W (3.165 HP)
Resistance value R_{BW}	27 Ω \pm 10%	27 Ω \pm 10%
Trip current	1.0 A	1.4 A
Ambient temperature ϑ_A	-20 °C (-4°F) ... +45 °C (113 °F)	
For MOVITRAC® B 230 V	0003 ... 0022	0003 ... 0022

400 / 500 V

Braking resistor type	BW072-003	BW072-005
Part number	826 058 3	826 060 5
100% CDF	230 W (0.308 HP)	450 W (0.603 HP)
50% CDF	310 W (0.416 HP)	600 W (0.805 HP)
25% CDF	420 W (0.563 HP)	830 W (1.11 HP)
12% CDF	580 W (0.778 HP)	1110 W (1.489 HP)
6% CDF	1000 W (1.341 HP)	2000 W (2.682 HP)
Resistance value R_{BW}	72 Ω \pm 10%	72 Ω \pm 10%
Trip current	0.6 A	1.0 A
Ambient temperature ϑ_A	-20 °C (-4°F) ... +45 °C (113 °F)	
For MOVITRAC® B 400 / 500 V	0003 ... 0040	0003 ... 0040



2.14.4 Wire resistors and grid resistors

- Perforated sheet cover (IP20) open to mounting surface
- The short-term load capacity of the wire and grid resistors is higher than in the flat-type braking resistors (→ MOVIDRIVE® system manual, section "Selecting the braking resistor")
- A temperature switch is integrated in the BW...-T braking resistor
- A thermal overcurrent relay is integrated in the BW...-P braking resistor

SEW-EURODRIVE recommends also protecting the wire and grid resistors against overload using a bimetallic relay with trip characteristics of trip class 10 or 10A (in accordance with EN 60947-4-1). Set the trip current to the value I_F (→ following tables). Do not use electronic or electromagnetic fuses because these can be triggered even in case of short-term excess currents that are still within the tolerance range.

For braking resistors in the BW..-T / BW...-P series, you can connect the integrated temperature sensor / overcurrent relay using a 2-core, shielded cable as an alternative to a bimetallic relay. The cable entry for the BW...-T and BW...-P braking resistors can be run from the front or the back (→ dimension drawing for BW... / BW...-T / BW...-P braking resistors). Use filler plugs for tapped holes that are not connected.

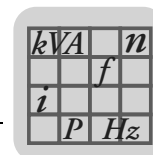
The surfaces of the resistors get very hot if loaded with P_N . Make sure that you select an installation site that will accommodate these high temperatures. As a rule, therefore, braking resistors are mounted on the control cabinet roof.

The performance data listed in the tables below show the load capacity of the braking resistors according to their cyclic duration factor (cyclic duration factor = CDF of the braking resistor in % in relation to a cycle duration ≤ 120 s).

230 V

Type	BW027-006	BW027-012	BW018-015	BW018-035	BW018-075	BW012-025	BW012-050	BW012-100
Part number	822 422 6	822 423 4	–	–	–	821 680 0	–	–
Type BW..-T part number	–	–	1820 416 3	1820 138 5	1820 139 3	–	1820 140 7	1820 083 4
Type BW..-P part number	–	–	–	–	–	1820 414 7	–	–
100% CDF	0.6 kW (0.8 HP)	1.2 kW (1.6 HP)	1.5 kW (2.0 HP)	3.5 kW (4.7 HP)	7.5 kW (10 HP)	2.5 kW (3.4 HP)	5.0 kW (6.7 HP)	10 kW (13 HP)
50% CDF	1.2 kW (1.6 HP)	2.3 kW (3.1 HP)	2.5 kW (3.4 HP)	5.9 kW (7.9 HP)	12.7 kW (17.0 HP)	4.2 kW (5.6 HP)	8.5 kW (11 HP)	17 kW (23 HP)
25% CDF	2.0 kW (2.7 HP)	5.0 kW (6.7 HP)	4.5 kW (6.0 HP)	10.5 kW (14.1 HP)	22.5 kW (30.1 HP)	7.5 kW (10 HP)	15.0 kW (20 HP)	19.2 kW ¹⁾ (25.7 HP)
12% CDF	3.5 kW (4.7 HP)	7.5 kW (10 HP)	6.7 kW (9.0 HP)	15.7 kW (21.1 HP)	25.6 kW ¹⁾ (34.3 HP)	11.2 kW (15.0 HP)	19.2 kW ¹⁾ (25.7 HP)	19.2 kW ¹⁾ (25.7 HP)
6% CDF	6.0 kW (8.0 HP)	8.5 kW ¹⁾ (11 HP)	11.4 kW (15.3 HP)	25.6 kW ¹⁾ (34.3 HP)	25.6 kW ¹⁾ (34.3 HP)	19.0 kW (25 HP)	19.2 kW ¹⁾ (25.7 HP)	19.2 kW ¹⁾ (25.7 HP)
Resistance	27 Ω $\pm 10\%$		18 Ω $\pm 10\%$			12 Ω $\pm 10\%$		
Trip current I_F	4.7 A _{RMS}	6.7 A _{RMS}	4.0 A _{RMS}	8.1 A _{RMS}	14 A _{RMS}	10 A _{RMS}	19 A _{RMS}	27 A _{RMS}
Connections	Ceramic terminals 2.5 mm ² (AWG12)			M8 stud				
Tightening torque	0.5 Nm (4.4 in·lb)		6 Nm (53 in·lb)					
Design	Wire resistor			Grid resistor				
For MOVITRAC® B	0015 ... 0022		2 x parallel with 0110			0055 / 0075		

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



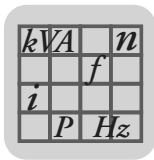
Type	BW039-003	BW039-006	BW039-012	BW039-026	BW915	BW106	BW206
Part number	821 687 8	821 688 6	821 689 4	–	–	–	–
Type BW...T part number	–	–	1820 136 9	1820 415 5	1820 413 9	1820 083 4	1820 412 0
100% CDF	0.3 kW (0.4 HP)	0.6 kW (0.8 HP)	1.2 kW (1.6 HP)	2.6 kW (3.5 HP)	16.0 kW (21 HP)	13 kW (17 HP)	18 kW (24 HP)
50% CDF	0.5 kW (0.7 HP)	1.1 kW (1.5 HP)	2.1 kW (2.8 HP)	4.6 kW (6.2 HP)	27.0 kW (36.2 HP)	24 kW (32 HP)	32 kW (43 HP)
25% CDF	1.0 kW (1.3 HP)	1.9 kW (2.5 HP)	3.8 kW (5.1 HP)	5.9 kW ¹⁾ (7.9 HP)	30.7 kW ¹⁾ (41.2 HP)	38.4 kW ¹⁾ (51.5 HP)	38.4 kW ¹⁾ (51.5 HP)
12% CDF	1.7 kW (2.3 HP)	3.5 kW (4.7 HP)	5.9 kW ¹⁾ (7.9 HP)	5.9 kW ¹⁾ (7.9 HP)	30.7 kW ¹⁾ (41.2 HP)	38.4 kW ¹⁾ (51.5 HP)	38.4 kW ¹⁾ (51.5 HP)
6% CDF	2.8 kW (3.8 HP)	5.7 kW (7.6 HP)	5.9 kW ¹⁾ (7.9 HP)	5.9 kW ¹⁾ (7.9 HP)	30.7 kW ¹⁾ (41.2 HP)	38.4 kW ¹⁾ (51.5 HP)	38.4 kW ¹⁾ (51.5 HP)
Resistance	39 Ω ±10%				15 Ω ±10%	6 Ω ±10%	
Trip current I _F	2.8 A _{RMS}	3.9 A _{RMS}	5.5 A _{RMS}	8.1 A _{RMS}	28 A _{RMS}	38 A _{RMS}	42 A _{RMS}
Connections	Ceramic terminals 2.5 mm ² (AWG12)				M8 stud		
Tightening torque	0.5 Nm (4.4 in-lb)				6 Nm (53 in-lb)		
Design	Wire resistor				Grid resistor		
For MOVITRAC® B	0015 ... 0022				2 x parallel with 0110	0150 / 2 x parallel with 0220/0300	

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

400 V

Type	BW100-006	BW168	BW268	BW147	BW247	BW347
Part number	821 701 7	820 604 X	820 715 1	820 713 5	820 714 3	820 798 4
Type BW...T part number	1820 419 8	1820 133 4	1820 417 1	1820 134 2	1820 084 2	1820 135 0
100% CDF	0.6 kW (0.8 HP)	0.8 kW (1.1 HP)	1.2 kW (1.6 HP)	1.2 kW (1.6 HP)	2.0 kW (2.7 HP)	4.0 kW (5.3 HP)
50% CDF	1.1 kW (1.5 HP)	1.4 kW (1.9 HP)	2.2 kW (3.0 HP)	2.2 kW (3.0 HP)	3.8 kW (5.1 HP)	7.6 kW (10 HP)
25% CDF	1.9 kW (2.5 HP)	2.6 kW (3.5 HP)	3.8 kW (5.1 HP)	3.8 kW (5.1 HP)	6.4 kW (8.6 HP)	12.8 kW (17.2 HP)
12% CDF	3.6 kW (4.8 HP)	4.8 kW (6.4 HP)	6.7 kW (9.0 HP)	7.2 kW (9.7 HP)	12 kW (16 HP)	20 kW ¹⁾ (27 HP)
6% CDF	5.7 kW (7.6 HP)	7.6 kW (10 HP)	10 kW ¹⁾ (13 HP)	11 kW (15 HP)	19 kW (25 HP)	20 kW ¹⁾ (27 HP)
Resistance	100 Ω ±10%	68 Ω ±10%		47 Ω ±10%		
Trip current I _F	2.4 A _{RMS}	3.4 A _{RMS}	4.2 A _{RMS}	5 A _{RMS}	6.5 A _{RMS}	9.2 A _{RMS}
Connections	Ceramic terminals 2.5 mm ² (AWG12)					Ceramic terminals 10 mm ² (AWG8)
Tightening torque	0.5 Nm (4.4 in-lb)					1.6 Nm (14.2 in-lb)
Design	Wire resistor					
For MOVITRAC® B	0015 ... 0040			0055 / 0075		

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



Technical Data

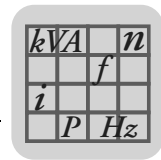
Braking resistors, BW Series

Type	BW039-012	BW039-026	BW039-050	BW018-015	BW018-035	BW018-075
Part number	821 689 4	–	–	821 684 3	–	–
Type BW..-T part number	1820 1369	1820 415 5	1820 137 7	–	1820 138 5	1820 139 3
Type BW..-P part number	–	–	–	1820 416 3	–	–
100% CDF	1.2 kW (1.6 HP)	2.6 kW (3.5 HP)	5.0 kW (6.7 HP)	1.5 kW (2.0 HP)	3.5 kW (4.7 HP)	7.5 kW (10 HP)
50% CDF	2.1 kW (2.8 HP)	4.6 kW (6.2 HP)	8.5 kW (11 HP)	2.5 kW (3.4 HP)	5.9 kW (7.9 HP)	12.7 kW (17.0 HP)
25% CDF	3.8 kW (5.1 HP)	8.3 kW (11 HP)	15.0 kW (20 HP)	4.5 kW (6.0 HP)	10.5 kW (14.1 HP)	22.5 kW (30.1 HP)
12% CDF	7.0 kW (9.4 HP)	15.3 kW (20.5 HP)	24.0 kW ¹⁾ (32 HP)	6.7 kW (9.0 HP)	15.7 kW (21.1 HP)	33.7 kW (45.2 HP)
6% CDF	11.4 kW (15.3 HP)	24.0 kW ¹⁾ (32 HP)	24.0 kW ¹⁾ (32 HP)	11.4 kW (15.3 HP)	26.6 kW (35.7 HP)	52.2 kW (70.0 HP) ¹⁾
Resistance	39 Ω ±10%			18 Ω ±10%		
Trip current I _F	5.5 A _{RMS}	8.1 A _{RMS}	11.3 A _{RMS}	9.1 A _{RMS}	13.9 A _{RMS}	20.4 A _{RMS}
Connections	Ceramic terminals 2.5 mm ² (AWG12)		M8 stud	Ceramic terminals 2.5 mm ² (AWG12)	M8 stud	
Tightening torque	0.5 Nm (4.4 in·lb)		6 Nm (53.1 in·lb)	1.0 Nm (8.9 in·lb)	6 Nm (53.1 in·lb)	
Design	Wire resistor			Grid resistor		
For MOVITRAC® B	0110		0110	0150 / 0220		

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

Type	BW915	BW012-025	BW012-050	BW012-100	BW0106	BW206
Part number	–	821 680 0	–	–	–	–
Type BW..-T part number	1820 413 9	–	1820 140 7	1820 141 5	1820 083 4	1820 412 0
Type BW..-P part number	–	1820 414 7	–	–	–	–
100% CDF	16 kW (21 HP)	2.5 kW (3.4 HP)	5.0 kW (6.7 HP)	10 kW (13 HP)	13.5 kW (18.1 HP)	18 kW (24 HP)
50% CDF	27 kW (36 HP)	4.2 kW (5.6 HP)	8.5 kW (11 HP)	17 kW (23 HP)	23 kW (31 HP)	30.6 kW (41.0 HP)
25% CDF	45 kW ¹⁾ (60 HP)	7.5 kW (10 HP)	15.0 kW (20 HP)	30 kW (40 HP)	40 kW (54 HP)	54 kW (72 HP)
12% CDF	45 kW ¹⁾ (60 HP)	11.2 kW (15.0 HP)	22.5 kW (30.1 HP)	45 kW (60 HP)	61 kW (82 HP)	81 kW (110 HP)
6% CDF	45 kW ¹⁾ (60 HP)	19.0 kW (25 HP)	38.0 kW (51.0 HP)	56 kW ¹⁾ (75 HP)	102 kW (137 HP)	136.8 kW (183.5 HP)
Resistance	15 Ω ±10%	12 Ω ±10%			6 Ω ±10%	
Trip current I _F	32.6 A _{RMS}	14.4 A _{RMS}	20.4 A _{RMS}	28.8 A _{RMS}	47.4 A _{RMS}	54.7 A _{RMS}
Connections	M8 stud	Ceramic terminals 2.5 mm ² (AWG12)			M8 stud	
Tightening torque	6 Nm (53.1 in·lb)	0.5 Nm (4.4 in·lb)			6 Nm (53.1 in·lb)	
Design	Grid resistor					
For MOVITRAC® B	0220	0300			0370 ... 0750	

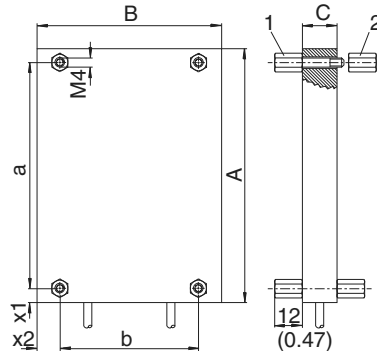
1) Physical power limit due to DC link voltage and resistance value.



2.14.5 Dimensions of BW braking resistors

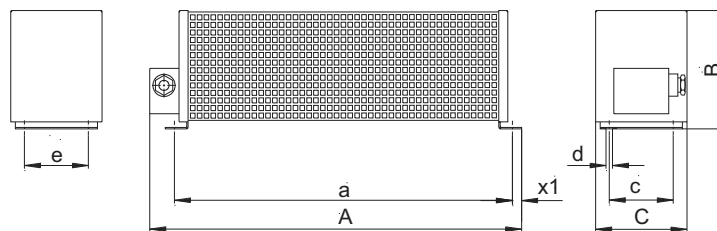
Flat-design

Flat-design resistors: The connecting lead is 500 mm (19.69 in) long. The scope of delivery includes four M4 threaded bushes each of type 1 and 2.

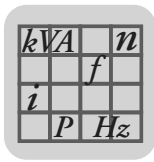


Type	Main dimensions [mm (in)]			Fastening parts [mm (in)]				Mass [kg (lb)]
	A	B	C	a	b/c/e	x1	x2	
BW072-003 BW027-003	110 (4.3)	80 (3.2)	15 (0.6)	98 (3.9)	60 (2.4)	6 (0.2)	10 (0.4)	0.3 (0.7)
BW072-005 BW027-005	216 (8.5)	80 (3.2)	15 (0.6)	204 (8.0)	60 (2.4)	6 (0.2)	10 (0.4)	0.6 (1.3)

Wire resistors

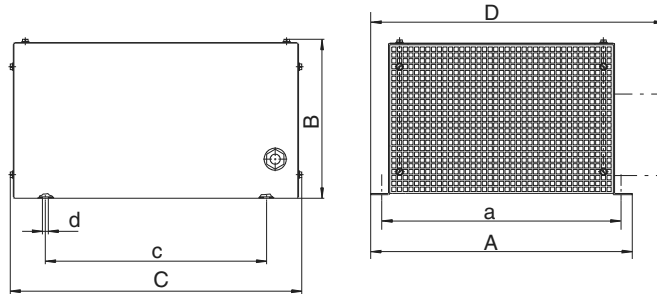


Type	Main dimensions [mm (in)]				Fastening parts [mm (in)]				Mass [kg (lb)]
	A	A BW..-T	B	C	a	b/c/e	x1	d	
BW027-006	486 (19.1)	–	120 (4.7)	92 (3.6)	426 (16.8)	64 (2.5)	10 (0.4)	5.8 (0.2)	2.2 (4.9)
BW027-012	486 (19.1)	–	120 (4.7)	185 (7.3)	426 (16.8)	150 (5.9)	10 (0.4)	5.8 (0.2)	4.3 (9.5)
BW100-006 (-T)	486 (19.1)	486 (19.1)	120 (4.7)	92 (3.6)	426 (16.8)	64 (2.5)	10 (0.4)	5.8 (0.2)	2.2 (4.9)
BW168 (-T)	365 (14.4)	406 (16.0)	120 (4.7)	185 (7.3)	326 (12.8)	150 (5.9)	10 (0.4)	5.8 (0.2)	3.6 (8.0)
BW268 (-T)	465 (18.3)	486 (19.1)	120 (4.7)	185 (7.3)	426 (16.8)	150 (5.9)	10 (0.4)	5.8 (0.2)	4.3 (9.5)
BW147 (-T)	465 (18.3)	486 (19.1)	120 (4.7)	185 (7.3)	426 (16.8)	150 (5.9)	10 (0.4)	5.8 (0.2)	4.3 (9.5)
BW247 (-T)	665 (16.2)	686 (27.0)	120 (4.7)	185 (7.3)	626 (24.7)	150 (5.9)	10 (0.4)	5.8 (0.2)	6.1 (13.5)
BW347 (-T)	670 (26.4)	750 (29.5)	145 (5.7)	340 (13.4)	630 (24.8)	300 (11.8)	10 (0.4)	5.8 (0.2)	13.2 (29.1)
BW039-003	286 (11.3)	–	120 (4.7)	92 (3.6)	226 (8.9)	64 (2.5)	10 (0.4)	5.8 (0.2)	1.5 (3.3)
BW039-006	486 (23.1)	–	120 (4.7)	92 (3.6)	426 (16.8)	150 (5.9)	10 (0.4)	5.8 (0.2)	2.2 (4.9)
BW039-012 (-T)	486 (19.1)	486 (19.1)	120 (4.7)	185 (7.3)	426 (16.8)	150 (5.9)	10 (0.4)	5.8 (0.2)	4.3 (9.5)
BW039-026-T	–	586 (23.1)	120 (4.7)	275 (10.8)	530 (20.9)	240 (9.5)	10 (0.4)	5.8 (0.2)	7.5 (16.6)



Technical Data
Braking resistors, BW Series

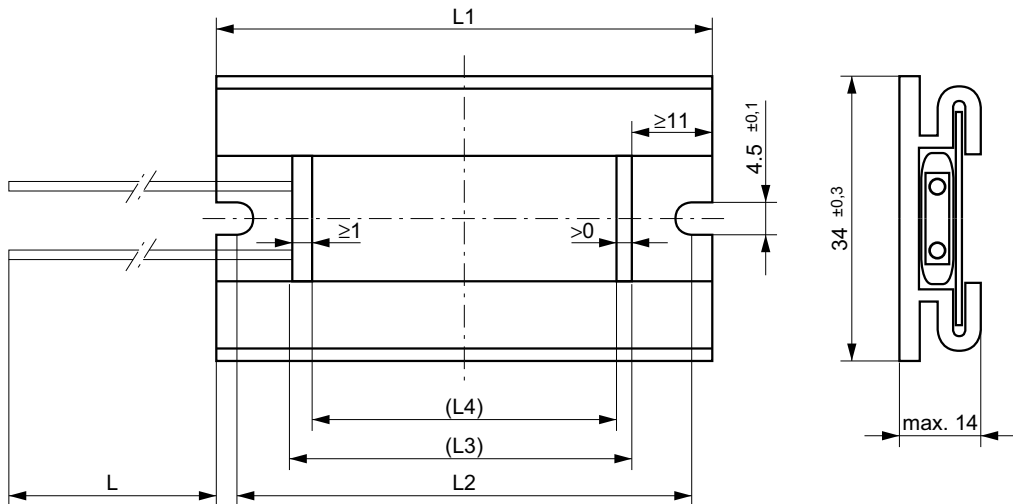
Grid resistors



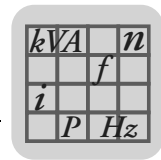
Type	Main dimensions [mm (in)]				Fastening parts [mm (in)]				Mass [kg (lb)]
	A	A BW..-T	B	C	a	b/c/e	x1	d	
BW012-025	295 (11.6)	–	260 (10.2)	490 (19.3)	270 (10.6)	380 (15.0)	–	10.5 (0.4)	8.0 (17.6)
BW012-025-P ¹⁾	295 (11.6)	–	260 (10.2)	490 (19.3)	270 (10.6)	380 (15.0)	–	10.5 (0.4)	8.0 (17.6)
BW012-050-T	–	395 (15.5)	260 (10.2)	490 (19.3)	370 (14.6)	380 (15.0)	–	10.5 (0.4)	12 (26.5)
BW012-100-T	–	595 (23.4)	260 (10.2)	490 (19.3)	570 (22.4)	380 (15.0)	–	10.5 (0.4)	21 (46.3)
BW018-015	600 (23.6)	–	120 (4.7)	92 (3.6)	540 (21.3)	64 (2.5)	10 (0.4)	5.8 (0.2)	4.0 (8.8)
BW018-015-P	620 (24.4)	–	120 (4.7)	92 (3.6)	540 (21.3)	64 (2.5)	10 (0.4)	5.8 (0.2)	4.0 (8.8)
BW018-035-T	–	295 (11.6)	260 (10.2)	490 (19.3)	270 (10.6)	380 (15.0)	–	10.5 (0.4)	9.0 (19.8)
BW018-075-T	–	595 (23.4)	260 (10.2)	490 (19.3)	570 (22.4)	380 (15.0)	–	10.5 (0.4)	21 (46.3)
BW039-050-T	–	395 (15.6)	260 (10.2)	490 (19.3)	370 (14.6)	380 (15.0)	10 (0.4)	10.5 (0.4)	12 (26.5)
BW915-T	–	795 (31.3)	260 (10.2)	490 (19.3)	770 (30.3)	380 (15.0)	–	10.5 (0.4)	26 (57.3)
BW106-T	–	795 (31.3)	260 (10.2)	490 (19.3)	770 (30.3)	380 (15.0)	–	10.5 (0.4)	32 (70.5)
BW206-T	–	995 (39.2)	260 (10.2)	490 (19.3)	970 (38.2)	380 (15.0)	–	10.5 (0.4)	43 (94.8)

1) D = 355 mm (14.0 in)

PTC braking resistors

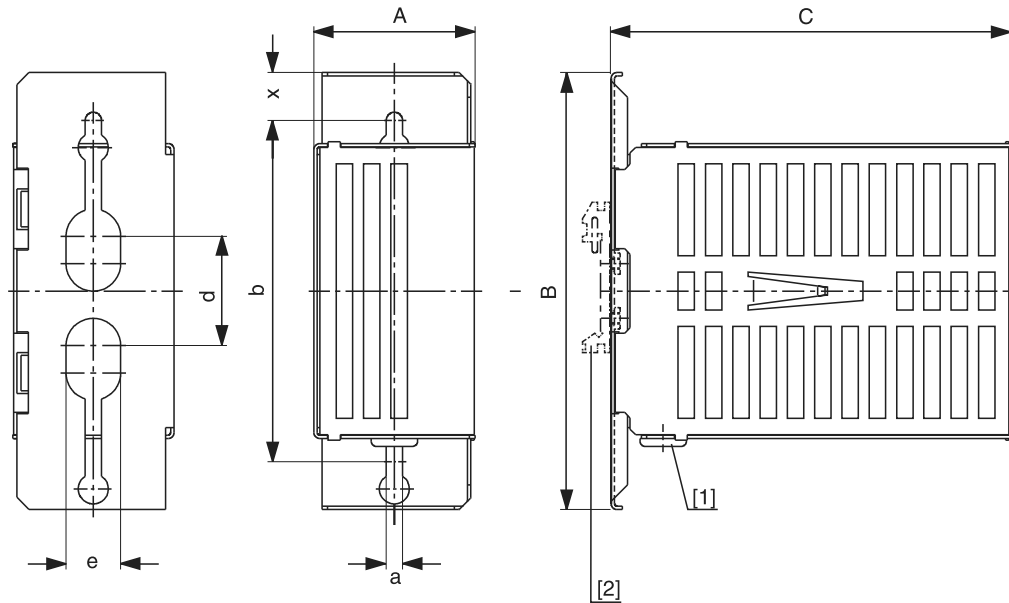


Type	L1	L2	L3	L4
BW2	124 (5.1)	117 (4.6)	97 (3.8)	95 (3.7)
BW4	124 (5.1)	117 (4.6)	97 (3.8)	95 (3.7)



2.15 Touch guard BS

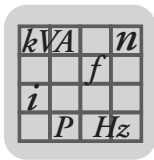
Touch guard dimension drawing:



- [1] Grommet
- [2] Support rail mounting

Type	Main dimensions [mm (in)]			Mounting dimensions [mm (in)]				
	A	B	C	b	d	e	a	x
BS-003	60 (2.4)	160 (6.3)	146 (5.8)	125 (4.9)	40 (1.6)	20 (0.8)	6 (0.2)	17.5 (0.7)
BS-005	60 (2.4)	160 (6.3)	252 (9.9)	125 (4.9)	40 (1.6)	20 (0.8)	6 (0.2)	17.5 (0.7)

Type	Mass [kg (lb)]	Part number	Mounting rail installation	BW
BS-003	0.35 (0.8)	813 151 3	Accessory S001 / part number 822 194 4	BW027-003 / BW072-003
BS-005	0.5 (1.1)	813 152 X		BW027-005 / BW072-005



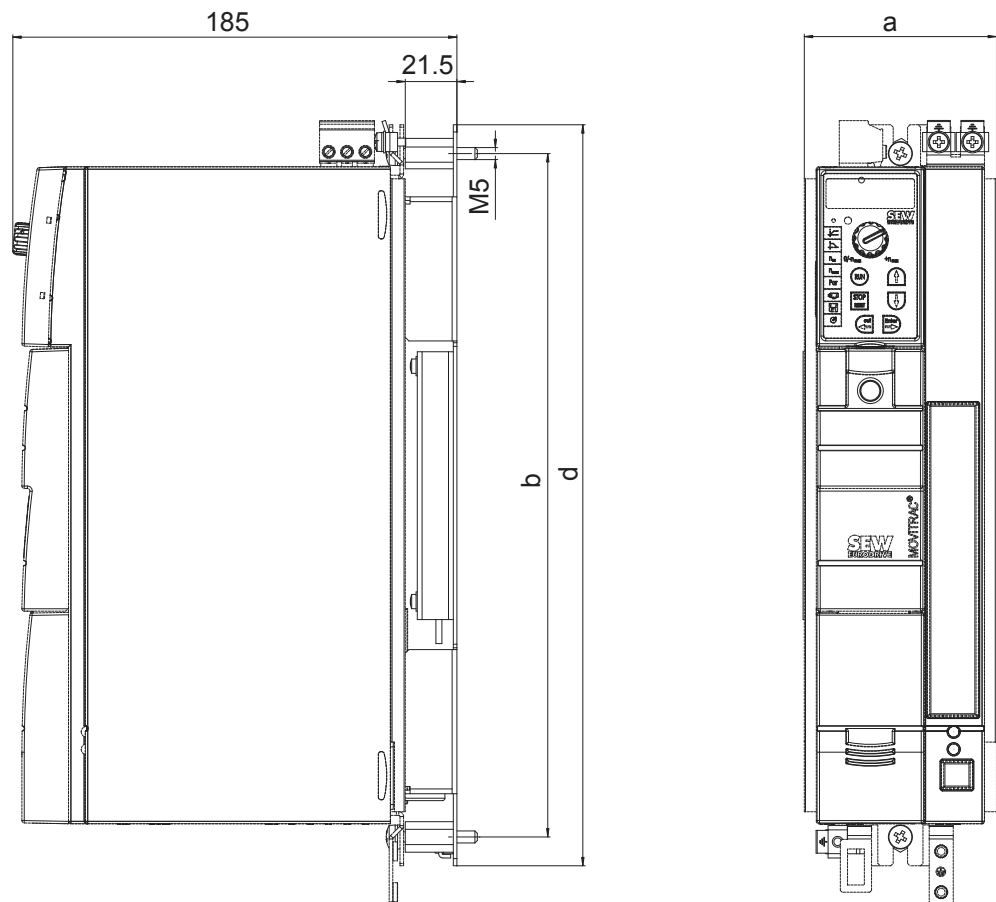
2.16 Submounting of FKB flat-design resistors

FKB..B is used for submounting of flat-design resistors under the inverter.

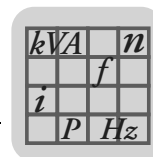
Type	Part number	Size	Braking resistor	
			230 V	400/500 V
FKB11B	1820 728 6	0XS	BW4	BW2
FKB12B	1820 729 4	0S	BW027-003	BW072-003
FKB13B	1820 730 8	0L		

The braking resistors in the submounting do not achieve the specified CDF power.

Dimension drawing:



MOVITRAC® B size	a	b	d
0XS	55	196	220
0S	80	196	220
0L	80	284.5	308.5

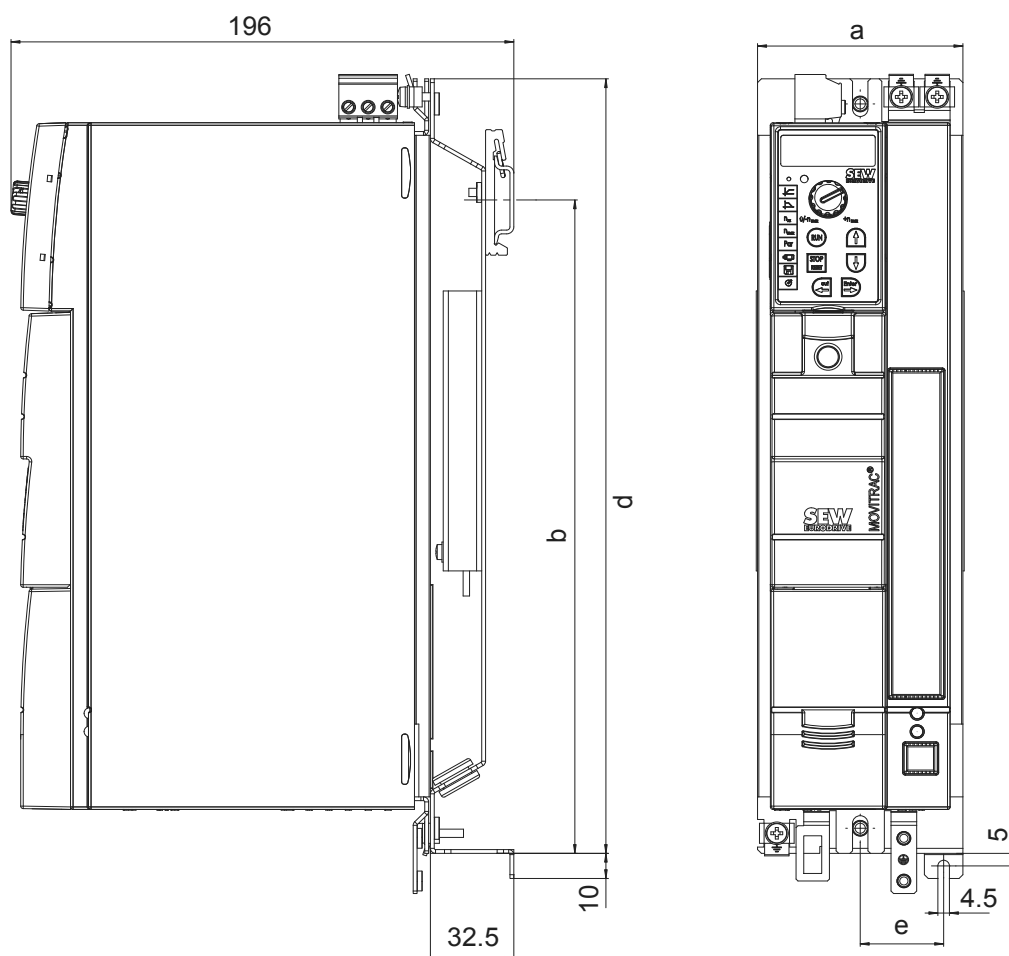


2.17 FHS support rail mounting

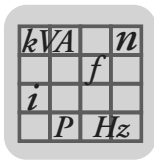
The FHS is used for support rail mounting of MOVITRAC® B frequency inverters and for the submounting of flat-design resistors.

Type	Part number	Size	Braking resistor	
			230 V	400/500 V
FHS11B	1820 724 3	0XS	BW4	BW2
FHS12B	1820 725 1	0S	BW027-003	BW072-003
FHS13B	1820 727 8	0L		

Dimension drawing:



MOVITRAC® B size	a	b	d	e
0XS	55	171.5	220	7.5
0S	80	171.5	220	32.5
0L	80	260.3	308.5	32.5



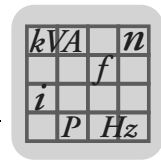
2.18 ND line chokes

The line choke assists in overvoltage protection. The line choke limits the charging current when several inverters are connected together in parallel on the input end with shared mains contactors. ND line filters have cRUus approval independent of the MOVITRAC® B. The ambient temperature range is -25 °C (-13 °F) ... $+45\text{ °C}$ (113 °F). The enclosure is IP00 (EN 60529).

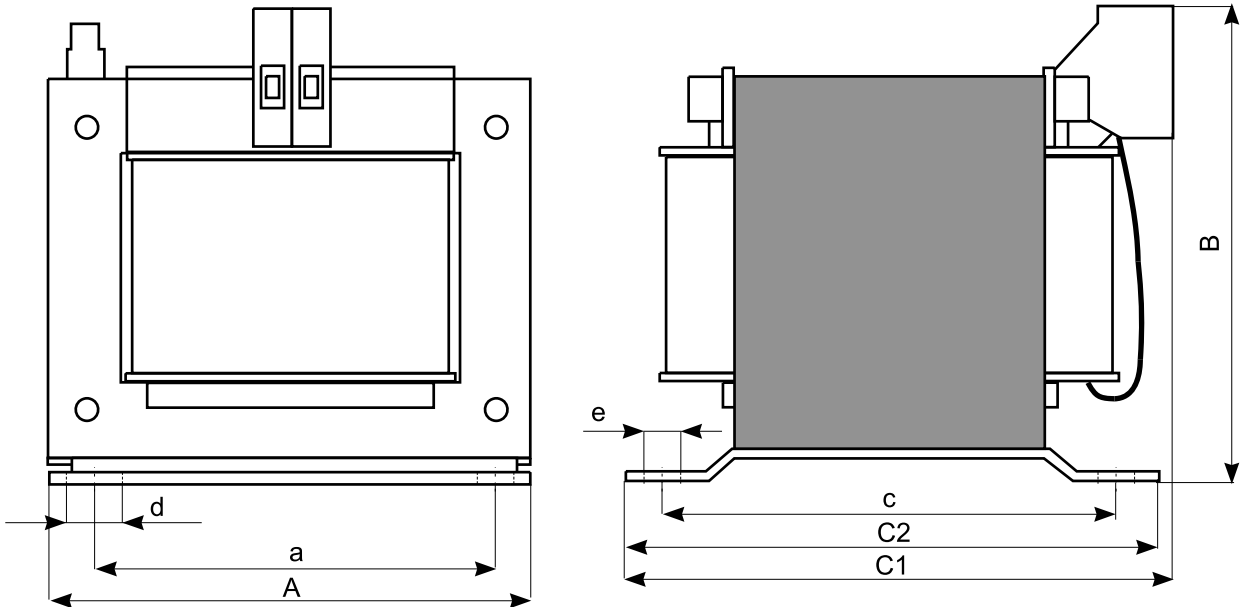
Line choke type	ND 010-301	ND 020-151	ND 027-123 ¹⁾	ND 035-073 ¹⁾
Part number	826 972 6	826 973 4	825 771 X	825 772 8
Rated voltage V_{rated}	1 x AC 230 V $\pm 10\%$		3 x AC 380 ... 500 V $\pm 10\%$	
Rated current I_{rated}	AC 10 A	AC 20 A	AC 27 A	AC 35 A
Power loss at I_{rated} P_V	6 W (0.008 HP)	10 W (0.013 HP)	35 W (0.047 HP)	35 W (0.047 HP)
Inductance L_{rated}	3 mH	1.5 mH	1.2 mH	0.7 mH
Terminal strip	4 mm ² (AWG10)	10 mm ² (AWG8)		
Tightening torque	0.6 Nm (5.3 in·lb)	1.5 Nm (13.3 in·lb)	4.0 ... 4.5 Nm (35.4 ... 39.8 in·lb)	
Suitable for MOVITRAC® B				
Single-phase 230 V	0003 ... 0008	0011 ... 0022	0003 ... 0022	

1) For connecting several single-phase inverters to one three-phase line choke.

Line choke type	ND 020-013	ND045-013	ND085-013	ND150-013	
Part number	826 012 5	826 013 3	826 014 1	825 548 2	
Rated voltage V_{rated}	3 x AC 380 ... 500 V $\pm 10\%$				
Rated current I_{rated}	AC 20 A	AC 45 A	AC 85 A	AC 150 A	
Power loss at I_{rated} P_V	10 W (0.013 HP)	15 W (0.020 HP)	25 W (0.034 HP)	65 W (0.087 HP)	
Inductance L_N	0.1 mH	0.1 mH			
Terminal strip	4 mm ² (AWG10)	10 mm ² (AWG8)	35 mm ² (AWG2)	M10/PE: M8	
Tightening torque	0.6 ... 0.8 Nm (5.3 ... 7.1 in·lb)	2.5 Nm (22.1 in·lb)	3.2 ... 3.7 Nm (28.3 ... 32.7 in·lb)	6 Nm (53.1 in·lb)	
Suitable for MOVITRAC® B					
3-phase 400/500 V	100% I_{rated}	0003 ... 0075	0110 ... 0220	0300 ... 0450	0550 ... 0750
	125% I_{rated}	0003 ... 0075	0110 ... 0150	0220 ... 0370	0450 ... 0750
Single-phase 230 V	100% I_{rated}	0003 ... 0055	0075 ... 0110	0150 ... 0220	0300
	125% I_{rated}	0003 ... 0037	0055 ... 0750	0110 ... 0150	0220 ... 0300

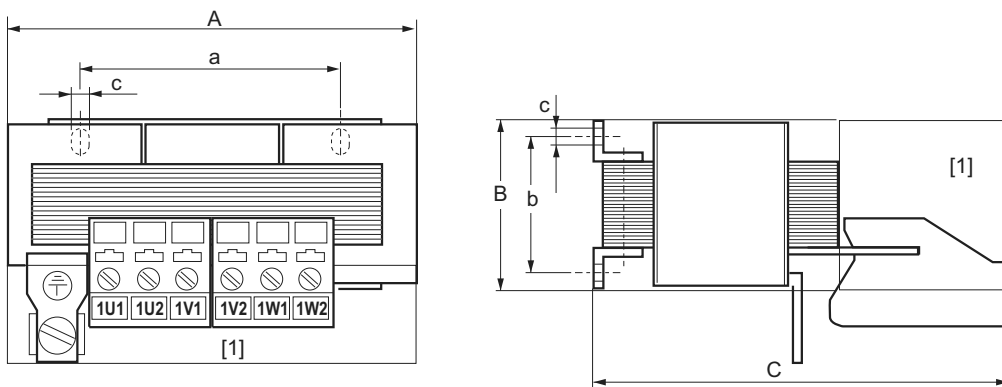


2.18.1 Dimensions ND 010-301 / ND 020-151



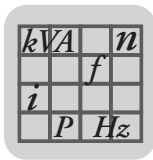
Type	Main dimensions [mm (in)]				Mounting dimensions [mm (in)]				Mass [kg (lb)]
	A	B	C1	C2	a	c	d	e	
ND 010-301	90 (3.5)	100 (3.9)	80 (3.2)	70 (2.8)	64 (2.5)	52 (2.1)	4.4 (0.2)	7.4 (0.3)	1.4 (3.1)
ND 020-151	90 (3.5)	100 (3.9)	90 (3.6)	70 (2.8)	64 (2.5)	52 (2.1)	4.4 (0.2)	7.4 (0.3)	1.4 (3.1)

2.18.2 Dimensions of ND 020-013 / ND 027-123 / ND 035-073 / ND 045-013 / ND 085-013 / ND 150-013



[1] = Space for touch-safe terminal strips

Type	Main dimensions [mm (in)]			Mounting dimensions [mm (in)]			Mass [kg (lb)]
	A	B	C	a	b	d/e	
ND 020-013	85 (3.4)	60 (2.4)	120 (4.7)	50 (2.0)	31 (1.2)	5 – 10 (0.2 – 0.4)	0.5 (1.1)
ND 027-123	185 (7.3)	140 (5.5)	200 (7.9)	136 (5.4)	87 (3.4)	5 – 10 (0.2 – 0.4)	6.0 (13.2)
ND 035-073	185 (7.3)	140 (5.5)	225 (8.9)	136 (5.4)	87 (3.4)	5 – 10 (0.2 – 0.4)	11 (24.2)
ND 045-013	125 (4.9)	95 (3.7)	170 (6.7)	84 (3.3)	55 ... 75 (2.2 ... 3.0)	6 (0.2)	2.5 (5.5)
ND 085-013	185 (7.3)	115 (4.5)	235 (9.3)	136 (5.4)	56 (2.2)	7 (0.3)	8 (17.6)
ND 150-013	257 (10.1)	145 (5.7)	230 (9.1)	170 (6.7)	77 (3.0)	8 (0.3)	17 (37.5)

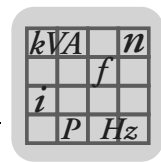


2.19 NF line filter

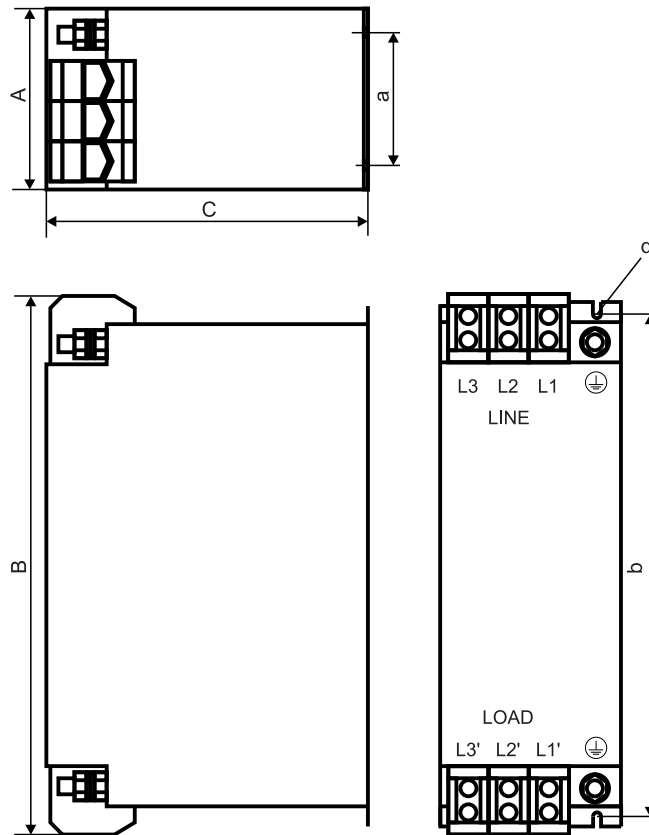
The line filter suppresses interference emissions on the line side of inverters. The ambient temperature range is -25 °C (-13 °F) ... $+45\text{ °C}$ ($+113\text{ °F}$). The enclosure is IP20 (EN 60529). Nf mains filters have cRUus approval independent of the MOVITRAC® B.

Type	NF009-503	NF014-503	NF018-503	NF035-503	NF048-503
Part number	827 412 6	827 116 X	827 413 4	827 128 3	827 117 8
Rated current	AC 9 A	AC 14 A	AC 18 A _{AC}	AC 35 A	AC 48 A
Power loss	6 W (0.008 HP)	9 W (0.01 HP)	12 W (0.016 HP)	15 W (0.020 HP)	22 W (0.030 HP)
Earth-leakage current	≤ 25 mA	≤ 25 mA	≤ 25 mA	≤ 25 mA	≤ 40 mA
Connections PE screw	4 mm ² (AWG10) M6			10 mm ² (AWG8) M6	10 mm ² (AWG8) M6
Tightening torque	0.6 ... 0.8 Nm (5.3 ... 7.1 in·lb)			1.8 Nm (15.9 in·lb)	1.8 Nm (15.9 in·lb)
Suitable for MOVITRAC® B					
100% I _{rated} 380 ... 500 V	0003 ... 0040	0055 ... 0075	–	0110 ... 0150	0220
125% I _{rated} 380 ... 500 V	0003 ... 0030	0040 ... 0055	0075	0110	0150

Type	NF063-503	NF085-503	NF115-503	NF150-503
Part number	827 414 2	827 415 0	827 416 9	827 417 7
Rated current	AC 63 A	AC 85 A	AC 115 A	AC 150 A
Power loss	30 W (0.040 HP)	35 W (0.047 HP)	60 W (0.080 HP)	90 W (0.12 HP)
Earth-leakage current	≤ 30 mA	≤ 30 mA	≤ 30 mA	≤ 30 mA
Connections PE screw	16 mm ² (AWG6) M6	35 mm ² (AWG2) M8	50 mm ² (AWG1/0) M10	95 mm ² (AWG4/0) M10
Tightening torque	3 Nm (26.6 in·lb)	3.7 Nm (32.7 in·lb)		
Suitable for MOVITRAC® B				
100% I _{rated} 380 ... 500 V	0300	0370/0450	0550	0750
125% I _{rated} 380 ... 500 V	0220	0300/0370	0450	0550/0750

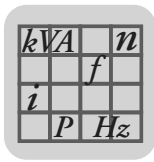


Line filter dimension drawing [mm (in)]:



Line filter type	Main dimensions		
	A	B	C
NF009-503	55 (2.2)	195 (7.7)	80 (3.2)
NF014-503		225 (8.9)	
NF018-503		255 (10.0)	
NF035-503	60 (2.4)	275 (10.8)	100 (3.9)
NF048-503		315 (12.4)	
NF063-503	90 (3.5)	260 (10.2)	140 (5.5)
NF085-503		320 (12.6)	
NF115-503		330 (13.0)	

Line filter type	Mounting dimensions		Hole dimension d	PE connection	Mass kg (lb)	
	a	b				
NF009-503	20 (0.8)	180 (7.1)	5.5 (0.2)	M5	0.8 (1.8)	
NF014-503		210 (8.3)			0.9 (2.0)	
NF018-503		240 (9.4)			1.1 (2.4)	
NF035-503	30 (1.2)	255 (10.0)	6.5 (0.3)	M6	1.7 (3.7)	
NF048-503		295 (11.6)			2.1 (4.6)	
NF063-503	60 (2.4)	235 (9.3)	6.5 (0.3)	M8	2.4 (5.3)	
NF085-503		255 (10.0)			M10	3.5 (7.7)
NF115-503						65 (2.6)



2.20 ULF11A foldable ferrites

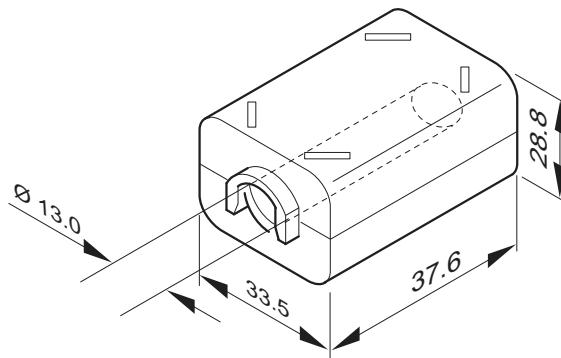
Foldable ferrites can be used to reduce the noise emission of the mains cable. Only use foldable ferrites with single-phase units.

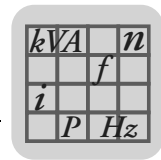
The delivery scope contains three foldable ferrites, which must be installed according to the installation instructions.

Technical data:

Part number	1821 213 1 (3 pcs)
For cable diameter	10.5 ... 12.5 mm
Storage temperature	- 40 °C (-40 °F) ... +85 °C (+185 °F)
Operating temperature	-25 °C (-13 °F) ... +105 °C (+221 °F)

Foldable ferrites dimension drawing:



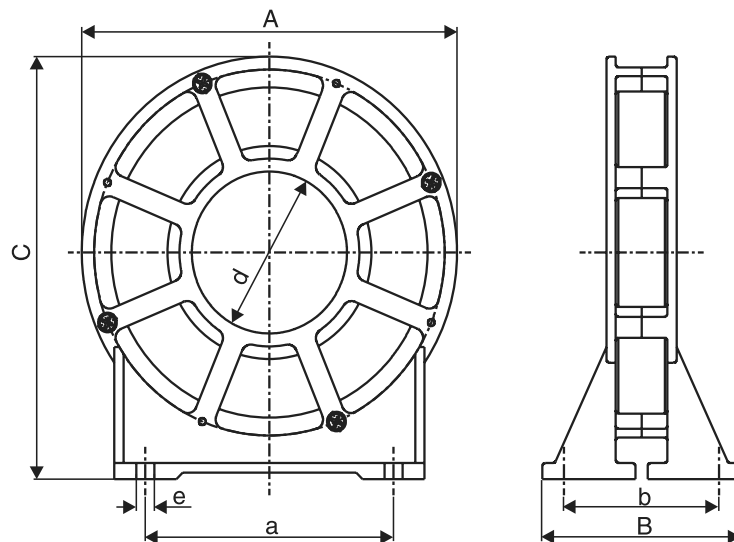


2.21 HD series output chokes

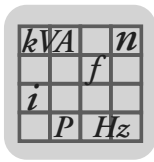
You can reduce the radiated interference of the unshielded motor cable by using an output choke.

Output choke type	HD001	HD002	HD003	HD012
Part number	813 325 5	813 557 6	813 558 4	1821 217 4
Max. power loss P_{Vmax}	15 W (0.020 HP)	8 W (0.01 HP)	30 W (0.040 HP)	11 W (0.015 HP)
Mass	0.5 kg 1.1 lb	0.2 kg 0.44 lb	1.1 kg 2.4 lb	0.55 kg 1.2 lb
For cable cross sections	1.5 ... 16 mm ² AWG16 ... 6	≤ 1.5 mm ² ≤ AWG16	≥ 16 mm ² ≥ AWG6	≤ 4 mm ² ≤ AWG12
Ambient temperature	depends on inverter			-10 ... +60 °C (14 ... 140 °F) / derating 3% I_{rated} at 40 ... 60 °C (104 ... 140 °F)

HD dimension drawing 001 / 002 / 003 [mm (in)]:

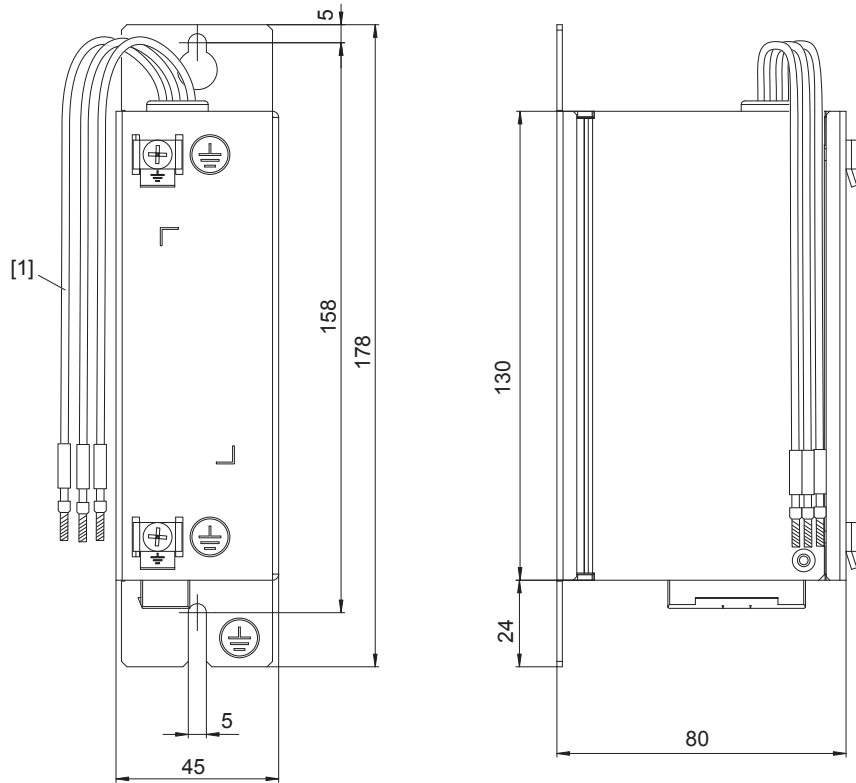


Output choke type	Main dimensions			Mounting dimensions		Inner diameter d	Hole dimension e
	A	B	C	a	b		
HD001	121 (4.8)	64 (2.5)	131 (5.2)	80 (3.2)	50 (2.0)	50 (2.0)	5.8 (0.2)
HD002	66 (2.6)	49 (1.9)	73 (2.9)	44 (1.7)	38 (1.5)	23 (0.9)	5.8 (0.2)
HD003	170 (6.7)	64 (2.5)	185 (7.3)	120 (4.7)	50 (2.0)	88 (3.5)	7.0 (0.3)

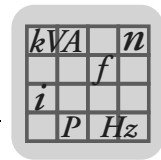


Technical Data
HD series output chokes

HD012 dimensions



[1] Length = 100 mm (3.94 in)

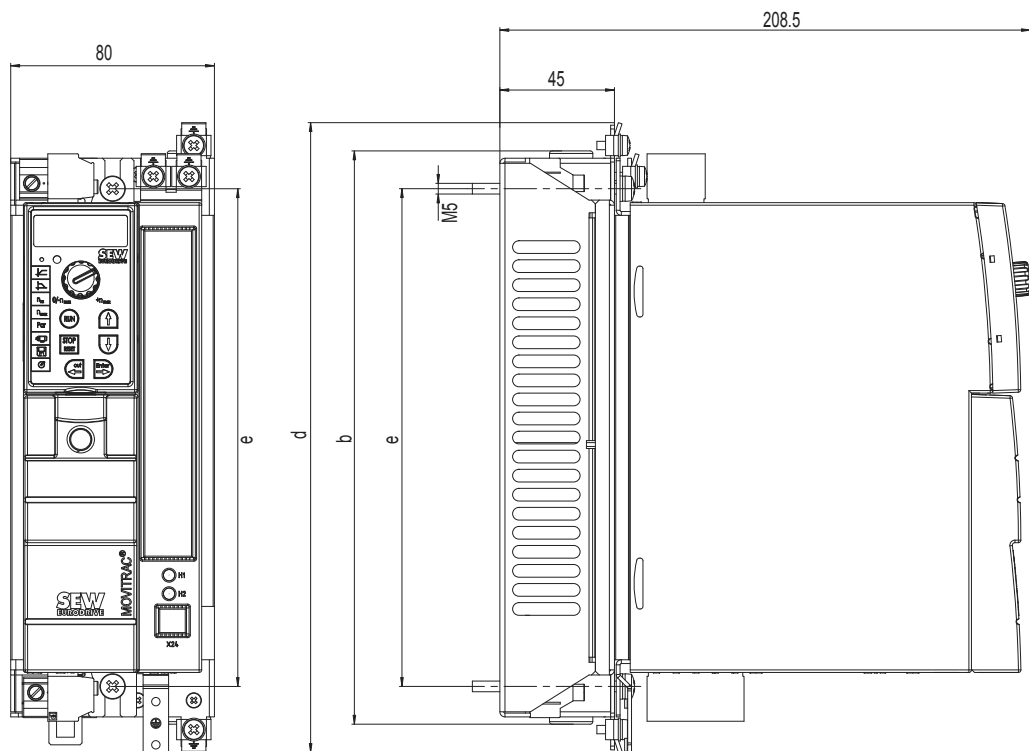


2.22 FKE EMC-module

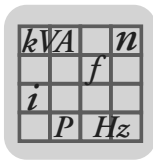
Using the EMC-module, they can reach limit class C1 (B) on the input side and output side. The EMC-module is designed 100% operation and 125% operation.

Type	FKE12B	FKE13B
Part number	829 590 5	829 591 3
Rated voltage	3 × AC 230 ... 500 V	
Voltage drop in the filter (at rated current)	< 1%	
Rated current	AC 12 A	
Earth-leakage current (at rated current)	< 14 mA	
Power loss (at rated current)	20 W (0.027 HP)	
Ambient temperature	-10 °C (14 °F) ... +60 °C (140 °F) / derating 3% I _{rated} at 40 °C (104 °F) ... 60 °C (140 °F)	
Enclosure	IP20	
Mains and the motor connection	Terminal screws 4 mm ² (AWG 10)	
Inverter connection	Cables with conductor end sleeves	
Mass	400 g (0.88 lb)	480 g (1.06 lb)
Can be sub-mounted for sizes	0S	0L
For MOVITRAC® B...-5A3	0005 / 0008 / 0011 / 0015	0022 / 0030 / 0040
For MOVITRAC® B...-2A3	0005 / 0008	0011 / 0015 / 0022

Dimension drawing




EMC module	MOVITRAC® B	b	d	e
FKE12B	Size 0S	226	248	196
FKE13B	Size 0L	314.5	336.5	284.5




2.23 HF output filter

SEW output filters of the HF type are sine filters. Sine filters smooth the output voltage of inverters. Use output filters in the following cases:

- In group drives (several motor leads in parallel); the discharge currents in the motor cables are suppressed.
- To protect the motor winding insulation of non-SEW motors, which are not suitable for inverters.
- For protection against overvoltage spikes in long motor cables (> 100 m [328 ft])

	NOTE
	Do not use output filters in hoists because of the voltage drop in the filter.

	NOTE
	During project planning of the drive, take into account the voltage drop in the output filter and consequently the reduced motor torque available. This applies particularly to AC 230 V units with output filters.

Output filters attenuate interference emission via unshielded motor lines.

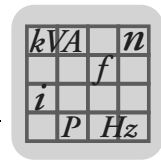
The ambient temperature range is 0 ... +45 °C (32 ... 113 °F), reduction: 3% per K up to max. 60 °C (140 °F)

Output filter type	HF008-503 ¹⁾	HF015-503 ¹⁾	HF022-503 ¹⁾	HF030-503 ¹⁾	HF040-503 ¹⁾	HF055-503 ¹⁾
Part number	826 029 X	826 030 3	826 031 1	826 032 X	826 311 6	826 312 4
Rated voltage V_{rated}	3 × AC 380 V –10% ... 3 × AC 500 V +10%, 50/60 Hz ²⁾					
Earth-leakage current at V_{rated} ΔI	0 mA					
Power loss with I_{rated} P_v	25 W (0.034 HP)	35 W (0.047 HP)	55 W (0.074 HP)	65 W (0.087 HP)	90 W (0.12 HP)	115 W (0.154 HP)
Interference emission via unshielded motor cable	In accordance with class B limit according to EN 55011 and EN 55014 complies with EN 50081, parts 1 and 2					
Enclosure (EN 60529)	IP20					
Connections / Tightening torque	M4 terminal stud 1.6 Nm ± 20% (14.2 in-lb ± 20%)					
Mass	3.1 kg (6.8 lb)	4.4 kg (9.7 lb)			10.8 kg (23.8 lb)	
Assignment of AC 400/500 V units						
Voltage drop at I_{rated} ΔV	< 6.5% (7.5%) at AC 400 V / < 4% (5%) at AC 500 V at $f_{Amax} = 50$ Hz (60 Hz)					
Rated throughput I_{rated} 400 V current³⁾ (with $V_{mains} = 3 \times AC$ 400 V)	AC 2.5 A	AC 4 A	AC 6 A	AC 8 A	AC 10 A	AC 12 A
Rated throughput I_{rated} 500 V current³⁾ (with $V_{mains} = 3 \times AC$ 500 V)	AC 2 A	AC 3 A	AC 5 A	AC 6 A	AC 8 A	AC 10 A
Rated operation (100%)³⁾	0003 ... 0008	0011/0015	0022	0030	0040	0055
Increased power (125%)³⁾	0003 ... 0005	0008/ 0011	0015	0022	0030	0040
Assignment to AC 230 V units						
Voltage drop at I_{rated} ΔV	–	< 18.5% (19%) at AC 230 V with $f_{Amax} = 50$ Hz (60 Hz)				
Rated throughput I_{rated} 230 V current³⁾ (with $V_{mains} = 3 \times AC$ 230 V)	AC 4.3 A	AC 6.5 A	AC 10.8 A	AC 13 A	AC 17.3 A	AC 22 A
Rated operation (100%)³⁾	–	–	0015/0022	–	0037	0055
Increased power (125%)³⁾	–	–	0015/0022	–	–	0037

1) Approved in accordance with UL/cUL in conjunction with MOVIDRIVE[®] drive inverters. SEW-EURODRIVE will provide a certificate on request.

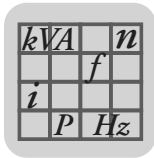
2) A reduction of 6% I_{rated} per 10 Hz applies above $f_{AN} = 60$ Hz for the rated through current I_{rated} .

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



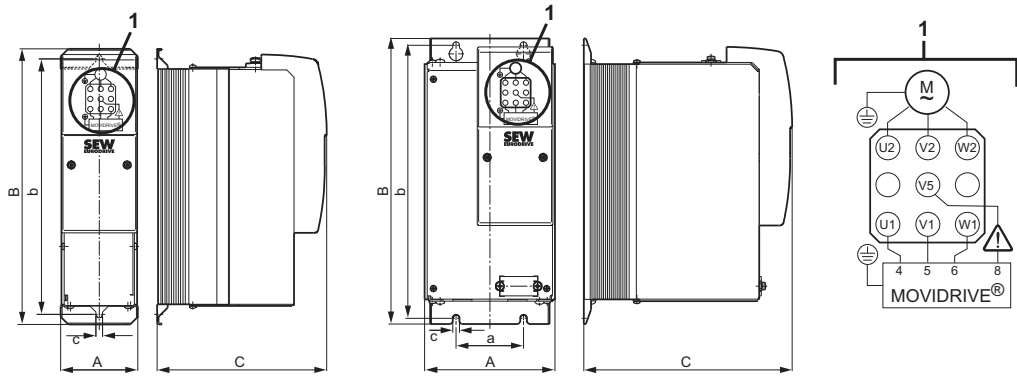
Output filter type	HF075-503 ¹⁾	HF023-403 ¹⁾	HF033-403 ¹⁾	HF047-403 ¹⁾	HF450-503
Part number	826 313 2	825 784 1	825 785 X	825 786 8	826 948 3
Rated voltage V_{rated}	3 × AC 380 V –10% ... 3 × AC 500 V +10%, 50/60 Hz ²⁾				
Earth-leakage current at V_{rated} ΔI	0 mA				
Power loss with I_{rated} P_V	135 W (0.181 HP)	90 W (0.12 HP)	120 W (0.161 HP)	200 W (0.268 HP)	400 W (0.536 HP)
Interference emission via unshielded motor cable	In accordance with class B limit according to EN 55011 and EN 55014 complies with EN 50081, parts 1 and 2				
Enclosure (EN 60529)	IP 20	IP20			IP 10
Connections / Tightening torque	M4 terminal stud 1.6 Nm ± 20% (14.2 in·lb ± 20%)	35 mm ² (AWG 2) 3.2 Nm (38.3 in·lb)			
Mass	10.8 kg (23.8 lb)	15.9 kg (35.1 lb)	16.5 kg (36.4 lb)	23 kg (51 lb)	32 kg (71 lb)
Assignment to AC 400/500 V units					
Voltage drop at I_{rated} ΔV	< 6.5% (7.5%) at AC 400 V / < 4% (5%) at AC 500 V at $f_{Amax} = 50$ Hz (60 Hz)				
Rated throughput I_{rated} 400 V current ³⁾ (with $V_{mains} = 3 \times AC 400$ V)	AC 16 A	AC 23 A	AC 33 A	AC 47 A	AC 90 A
Rated throughput I_{rated} 500 V current ³⁾ (with $V_{mains} = 3 \times AC 500$ V)	AC 13 A	AC 19 A	AC 26 A	AC 38 A	AC 72 A
Rated operation (100%) ³⁾	0075	0110	0150/0300 ⁴⁾	0220	0370/0450/ 0550 ⁴⁾ /0750 ⁴⁾
Increased power (125%) ³⁾	0055	0075	0110/0220 ⁴⁾	0150	0300/0370/0450/ 0550 ⁴⁾ /0750 ⁴⁾
Assignment to AC 230 V units					
Voltage drop at I_{rated} ΔV	< 18.5% (19%) at AC 230 V with $f_{Amax} = 50$ Hz (60 Hz)				
Rated throughput I_{rated} 230 V current ³⁾ (with $V_{mains} = 3 \times AC 230$ V)	AC 29 A	AC 42 A	AC 56.5 A	AC 82.6 A	AC 156 A
Rated operation (100%) ³⁾	0075	0110	0150/0300 ⁴⁾	0220	0300
Increased power (125%) ³⁾	0055	0075	0110/0220 ⁴⁾	0150	0220/0300

- 1) Approved to UL/cUL in conjunction with MOVIDRIVE[®] frequency inverters. SEW-EURODRIVE will provide a certificate on request.
- 2) A reduction of 6% I_{rated} per 10 Hz applies above $f_{AN} = 60$ Hz for the rated through current I_{rated} .
- 3) Only applies for operation without V_{DC} link connection. For operation with V_{DC} link connection, observe the project planning instructions in the MOVITRAC[®] system manual, section "Project Planning/Connecting the optional power components".
- 4) Connect **two HF.... output filters in parallel** for operation with these MOVITRAC[®] units.



Technical Data
HF output filter

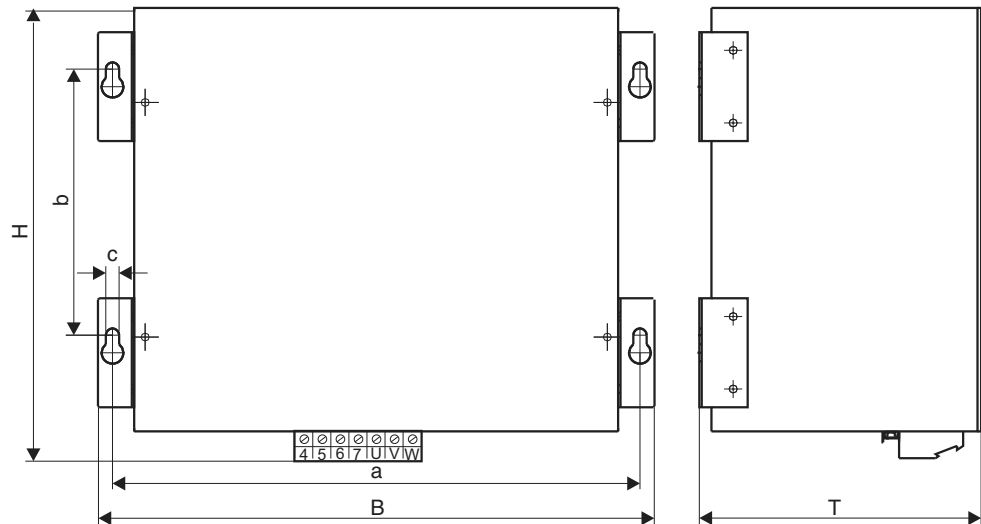
HF...-503 dimension drawing [mm (in)]:



Type	Main dimensions		
	A	B	C
HF008 / 015 / 022 / 030-503	80 (3.2)	286 (11.3)	176 (6.9)
HF040 / 055-503	135 (5.3)	296 (11.7)	216 (8.5)

Type	Mounting dimensions		Hole dimension c	Ventilation clearances	
	a	b		Top	Below
HF008 / 015 / 022 / 030-503		265 (10.4)	7 (0.28)	100 (3.9)	100 (3.9)
HF040 / 055-503	70 (2.8)	283 (11.1)	7 (0.28)	100 (3.9)	100 (3.9)

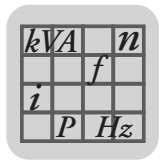
HF450-503 dimension drawing [mm (in)]:



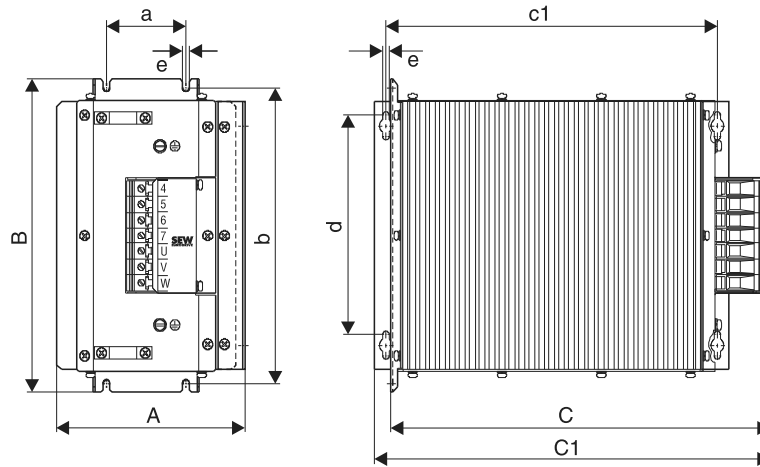
Only the mounting position shown in the dimension drawing is permitted

Output filter type	Main dimensions		
	W	H	D
HF450-503	465 (18.31)	385 (15.16)	240 (9.45)

Output filter type	Mounting dimensions		Hole dimension c	Ventilation clearances	
	a	b		Top	Below
HF450-503	436 (17.17)	220 (8.66)	8.5 (0.33)	100 (3.94)	100 (3.94)

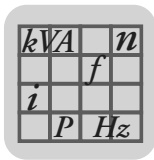


HF...-403 dimension drawing [mm (in)]:



Type	Main dimensions			Standard installation	
	A	B	C/C1	b	a
HF023-403	145 (5.7)	284 (11.2)	365/390 (14.4/15.4)	268 (10.6)	60 (2.4)
HF033-403					
HF047-403	190 (7.5)	300 (11.8)	385/400 (15.2/15.6)	284 (11.2)	80 (3.2)

Type	Horizontal mounting position		Hole dimension e	Ventilation clearances		
	d	c1		At side	Top	Below
HF023-403	210 (8.3)	334 (13.2)	6.5 (0.3)	30 (1.2)	150 (5.9)	150 (5.9)
HF033-403						
HF047-403						



2.24 Fieldbus connection

2.24.1 Fieldbus gateways

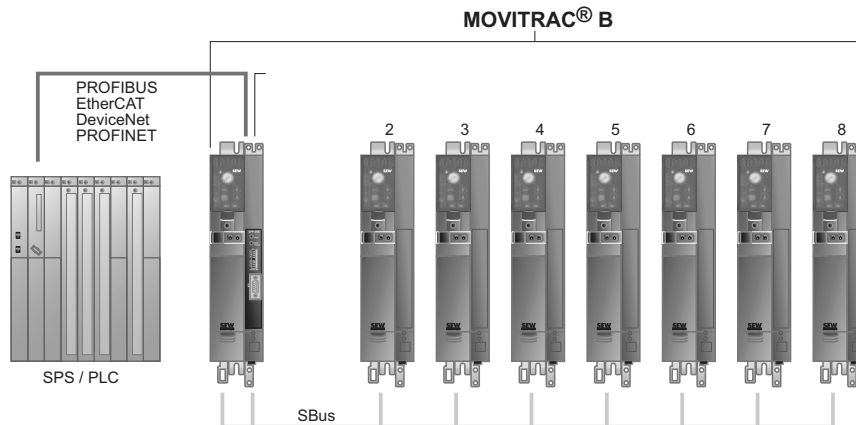
The fieldbus gateways convert standard fieldbuses into the SEW SBus. This means that up to 8 inverters can be triggered using one gateway.

The controller (PLC or PC) and the MOVITRAC® B frequency inverter exchange process data such as a control word or speed using the fieldbus. You need an FSC11B communication option for connecting the MOVITRAC® B unit to the fieldbus gateway. This is also necessary if the gateway is integrated in the inverter. The FIO11B module cannot be used for connecting.

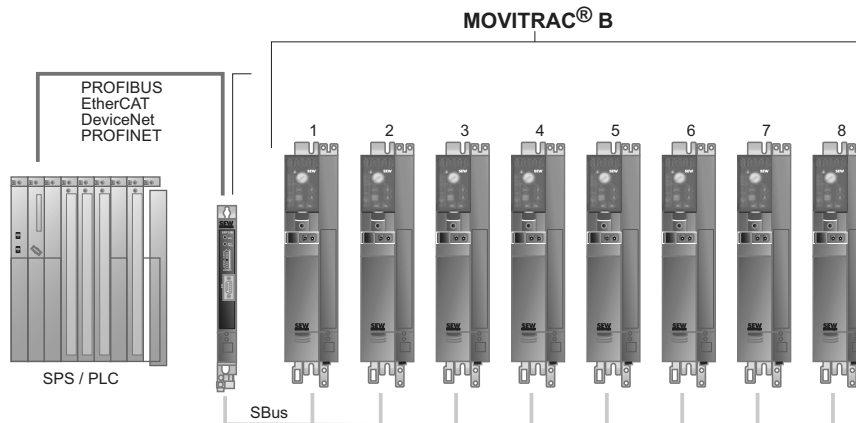
In general, you can also connect and operate other SEW units (such as MOVIDRIVE® drive inverters) using the SBus.

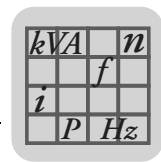
There are two different versions of gateway functionality:

Integrated in the inverter: The DFx..B field bus card is mounted in the inverter.



In separate housing: The DFx..B fieldbus card is installed in a UOH11B housing or available as a gateway (UFI11A).





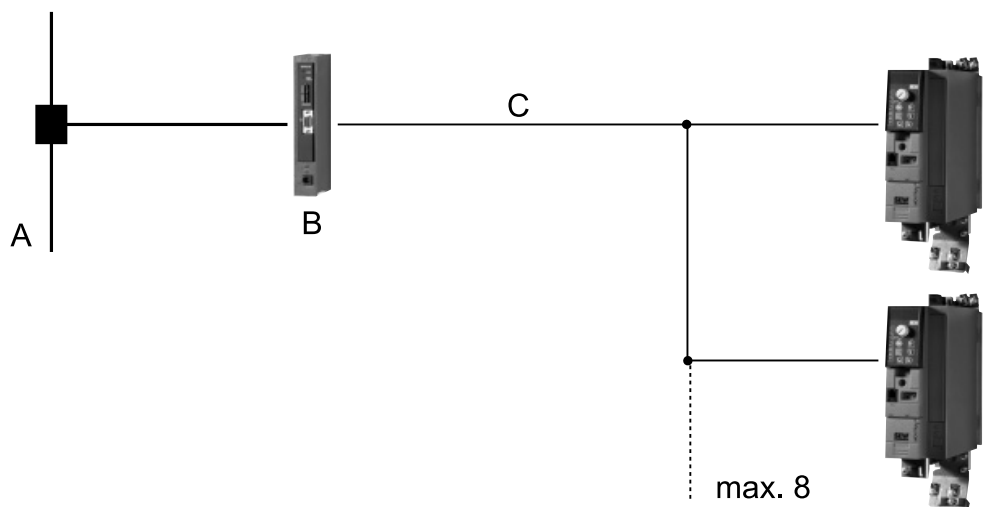
Gateways are available for the following bus systems for connection to fieldbuses.

Bus	Separate housing	Integrated in inverter
PROFIBUS	DFP21B / UOH11B	MC07B.../FSC11B/DFP21B
EtherCAT	DFE24 / UOH11B	MC07B.../FSC11B/DFE24B
DeviceNet	DFD11 / UOH11B	MC07B.../FSC11B/DFD11B
PROFINET	DFE32 / UOH11B	MC07B.../FSC11B/DFE32B
INTERBUS	UF11A (823 898 7)	–

MOVITRAC® B must be supplied with DC 24 V at terminals X12.8 and X12.9 when it supplies the gateways.

Operating principle

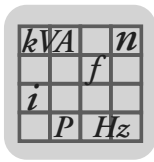
The fieldbus gateways have standardized interfaces. Connect lower-level MOVITRAC® B units to the fieldbus gateway via the SBus unit system bus.



- A = Fieldbus
- B = Gateway
- C = SBus

MOVITRAC® B must be supplied with DC 24 V at terminals X12.8 and X12.9 when it supplies the DFP21B.

Front view of MOVITRAC® B / UOH 11B	Description	Function
	LED H1 (red)	System error (only for gateway functions)
	LED H2 (green)	Reserved
	X24 X terminal	RS-485 interface for diagnostics via PC and MOVITOOLS® MotionStudio



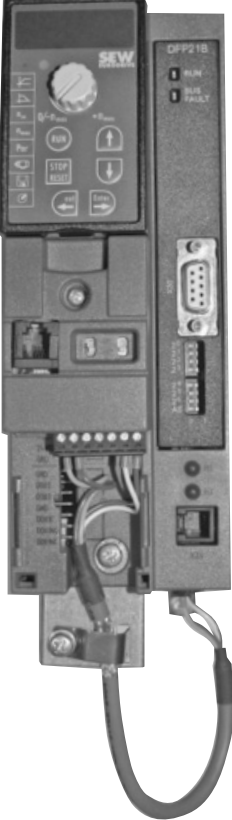
2.2.4.2 PROFIBUS DFP21B fieldbus interface

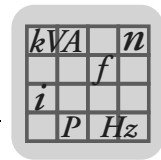
Description

The MOVITRAC® B drive inverter enables you to use the DFP21B option to connect to higher-level automation systems via PROFIBUS thanks to its powerful, universal fieldbus interface.

Refer to the publication "Fieldbus interface DFP21B PROFIBUS DP-V1" for installation.

Electronics data

DFP21B option		
	Part number	824 240 2
	Power consumption	P = 3 W (0.004 HP)
	PROFIBUS protocol options	PROFIBUS DP and DP-V1 to IEC 61158
	Automatic baud rate detection	9.6 kbaud to 12 Mbaud
	Connection technology	<ul style="list-style-type: none"> Via 9-pin sub D plug Pin assignment to IEC 61158
	Bus termination	Not integrated, implement using suitable PROFIBUS plug with terminating resistors that can be switched on.
	Station address	1 ... 125, adjustable via DIP switches
	GSD file name	<ul style="list-style-type: none"> SEW_6003.GSD (PROFIBUS DP) SEWA6003.GSD (PROFIBUS DP-V1)
	DP ID number	6003 _{hex} = 24579 _{dec}
	Application-specific parameter-setting data (Set-Prm application data)	<ul style="list-style-type: none"> Length: 9 bytes Hex parameter settings 00,00,00,06,81,00,00,01,01 = DP diagnostic alarm = OFF Hex parameter settings 00,00,00,06,81,00,00,01,00 = DP diagnostic alarm = ON
DP configurations for DDLM_Chk_Cfg	<ul style="list-style-type: none"> F0hex = 1 process data word (1 I/O word) F1hex = 2 process data words (2 I/O words) F2hex = 3 process data words (3 I/O words) 0hex, F5hex = 6 process data words (6 I/O words) 0hex, F9hex = 10 process data words (10 I/O words) F3hex, F0hex = parameter channel + 1 process data word (5 I/O words) F3hex, F1hex = parameter channel + 2 process data words (6 I/O words) F3hex, F2hex = parameter channel + 3 process data words (7 I/O words) F3hex, F5hex = parameter channel + 6 process data words (10 I/O words) F3hex, F9hex = parameter channel + 10 process data words (14 I/O words) 	
Diagnostics data	<ul style="list-style-type: none"> Max. 8 bytes Standard diagnostics: 6 bytes 	



2.24.3 EtherCat DFE24B fieldbus interface

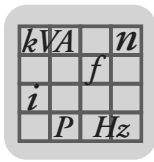
Description

The MOVITRAC[®] B frequency inverter enables you to use the DFE24B option to connect to higher-level automation systems via EtherCat thanks to its powerful, universal fieldbus interface.

Refer to the publication "MOVIDRIVE[®] MDX61B EtherCat DFE24B fieldbus interface" for installation.

Electronics data

DFE24B option	
Part number	1821 126 7
Power consumption	P = 3 W (0.004 HP)
Standards	IEC 61158, IEC 61784-2
Baud rate	100 Mbaud full duplex
Connection technology	2 × RJ45 (8x8 modular jack)
Bus termination	Not integrated because bus termination is automatically activated.
OSI Layer	EtherNet II
Station address	Setting via EtherCat master (→ Display with P093)
XML file name	SEW_DFE24B.xml
Vendor ID	0x59 (CANopenVendor ID)
EtherCAT services	<ul style="list-style-type: none"> • CoE (CANopen over EtherCAT) • VoE (Simple MOVILINK protocol over EtherCAT)
MOVITRAC[®] B firmware status	824 854 0.18 or higher (→ Display with P076)



2.2.4.4 DeviceNet DFD11B fieldbus interface

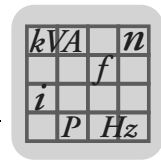
Description

The MOVITRAC[®] B frequency inverter together with the DFD11B option and its high-performance universal fieldbus interface enable the connection to higher-level automation systems via the open and standardized DeviceNet fieldbus system.

Refer to the publication "MOVIDRIVE[®] MDX61B DeviceNet DFD11B fieldbus interface" for installation.

Electronics data

DFD11B option	
Part number	824 972 5
Power consumption	P = 3 W (0.004 HP)
Communication protocol	Master/slave connection set according to DeviceNet specification version 2.0
Number of process data words	Can be adjusted using DIP switch: <ul style="list-style-type: none"> • 1 ... 10 process data words • 1 ... 4 process data words with Bit-Strobe I/O
Baud rate	125, 250 or 500 kbaud, to be set via DIP switches
Bus cable length	For thick cable according to DeviceNet specification 2.0 Appendix B <ul style="list-style-type: none"> • 500 m (1640 ft) at 125 kbaud • 250 m (820 ft) at 250 kbaud • 100 m (328 ft) at 500 kbaud
Transmission level	ISO 11 98 – 24 V
Connection technology	<ul style="list-style-type: none"> • 2-wire bus and 2-wire supply voltage DC 24 V with 5-pole Phoenix terminal • Pin assignment according to DeviceNet specification
MAC-ID	0 ... 63, can be set using DIP switch Max. 64 stations
Supported services	<ul style="list-style-type: none"> • Polled I/O: 1 ... 10 words • Bit-strobe I/O: 1 ... 4 words • Explicit message: <ul style="list-style-type: none"> – Get_Attribute_Single – Set_Attribute_Single – Reset – Allocate_MS_Connection_Set – Release_MS_Connection_Set
Firmware version of MOVITRAC[®] B	Firmware version 824 854 0.11 or above (→ Display with P076)



2.24.5 PROFINET DFE32B fieldbus interface

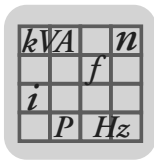
Description

The MOVITRAC® B frequency inverter enables you to use the DFE32B PROFINET IO option to connect to higher-level automation systems via PROFINET IO thanks to its powerful, universal fieldbus interface.

Refer to the publication "MOVIDRIVE® MDX61B PROFINET DFE32B fieldbus interface" for installation.

Electronics data

DFE32B option	
Part number	1821 345 6
Power consumption	P = 3 W (0.004 HP)
Application protocol	<ul style="list-style-type: none"> • PROFINET IO (Ethernet frames with frame identification 8892_{hex}) to control and set parameters for the drive inverter. • HTTP (Hypertext Transfer Protocol) for diagnostics using a Web browser. • SMLP (Simple Movilink Protocol), protocol used by MOVITOOLS. • DHCP (Dynamic Host Configuration Protocol) to assign address parameter automatically.
Port numbers used	<ul style="list-style-type: none"> • 300 (SMLP) • 80 (HTTP) • 67 / 68 (DHCP)
Ethernet services	<ul style="list-style-type: none"> • ARP • ICMP (Ping)
ISO / OSI layer 2	Ethernet II
Baud rate	100 Mbaud in full duplex process
Connection technology	RJ45
Addressing	4 byte IP address or MAC-ID (00:0F:69:xx:xx:xx)
Manufacturer ID (Vendor ID)	010A _{hex}
Firmware version of MOVITRAC® B	Firmware version 824 854 0.17 or above (→ Display with P076)



2.25 MOVI-PLC®

2.25.1 Unit versions

The MOVI-PLC® controller is available in different versions, which differ in the modules available from a range of libraries. Refer to the publication "MOVI-PLC® Control" for installation.

Unit design MOVI-PLC®		Description
MOVI-PLC® basic	DHP11B-T0	MOVI-PLC® basic controller
	DHP11B-T1 ¹⁾	Application version I (in addition to version T0, enables additional functions including electronic cam and synchronous operation)
	DHP11B-T2 ¹⁾	Application version II (in addition to version T1, enables additional functions including handling)
MOVI-PLC® advanced	DHE41B	Functionality of MOVI-PLC® basic, but also enormous power reserves and high-speed interfaces.

1) Versions T1 and T2 are only partly useful together with MOVITRAC® B. Please contact SEW-EURODRIVE in this case.

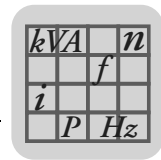
2.25.2 Description

With the MOVI-PLC® basic DHP11B controller, SEW-EURODRIVE's product portfolio offers a user-programmable controller compliant with the IEC 61131-3 and PLCopen standards for the first time.

The DHP11B option is available starting with size 0S (0.55 kW [0.74 HP]) It is not available in the size 0XS (0.25 and 0.37 kW [0.34 and 0.50 HP]).

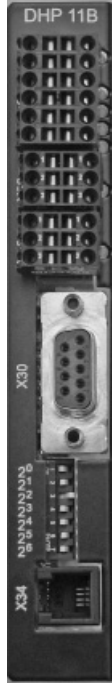
The DHP11B option is integrated ex works or supplied in a separate UOH housing. Only SEW EURODRIVE can carry out an expansion of the unit with this option.

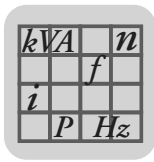
The MOVI-PLC® DHP11B controller is equipped with a PROFIBUS-DPV1 slave interface, 2 SBus interfaces (CAN), RS-485, and 8 digital inputs / outputs, of which 5 are interrupt capable. DHP11B can control 12 units simultaneously (MOVIDRIVE®, MOVITRAC®, MOVIMOT®).



2.25.3 Electronics data

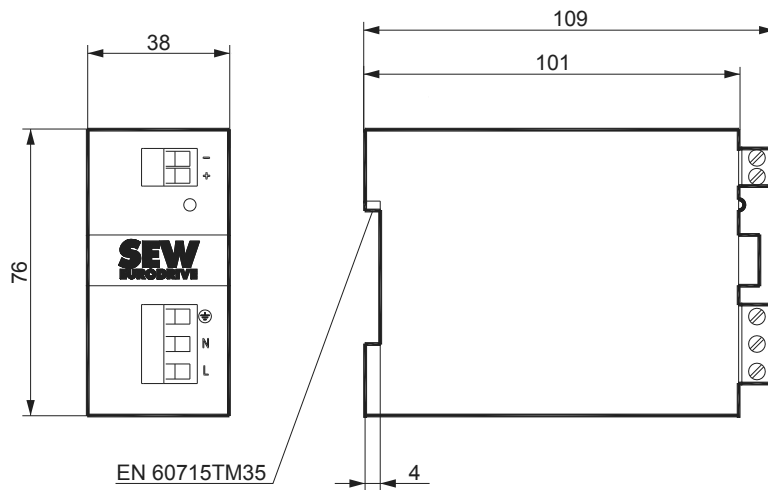
MOVI-PLC® basic DHP11B electronics data:

	Status displays	LEDs for I/O voltage supply, firmware, program, PROFIBUS, system busses
	Fieldbus	<ul style="list-style-type: none"> • PROFIBUS DP and DPV1 to IEC 61158 • Automatic baud rate detection from 9.6 kbaud to 12 Mbaud • Implement bus connection with suitable connector • GSD file SEW_6007.GSD • DP ident. number 6007_{hex} (24579_{dec}) • Maximum 32 process data
	System bus	<ul style="list-style-type: none"> • 2 system buses (CAN) for control of 12 inverters and CANopen I/O modules • CAN layer 2 (SCOM cyclic, acyclic) or via the SEW-MOVILINK® protocol • Baud rate: 125 kbaud ... 1 Mbaud • External bus terminator • Address range: 0 ... 127
	Engineering	Via RS-485, PROFIBUS and the system busses
	Panel operation	Via RS-485 and CAN 2 (in preparation)
	Connection technology	<ul style="list-style-type: none"> • PROFIBUS: 9-pole sub-D connector according to IEC 61158 • System buses and I/Os: plug-in terminals • RS-485: RJ10
	Binary inputs / outputs	8 I/Os to IEC 61131-2; can be configured as inputs or outputs. Five are interrupt-capable
	Memory	<ul style="list-style-type: none"> • Program: 512 kByte • Data: 128 kByte • Retain: 24 kByte
	Tools for startup	MOVITOOLS® MotionStudio with integrated PLC editor (Programming languages AWL, ST, KOP, FUP, CFC, AS; libraries to optimize control of the inverters)



2.26 UWU52A switched-mode power supply

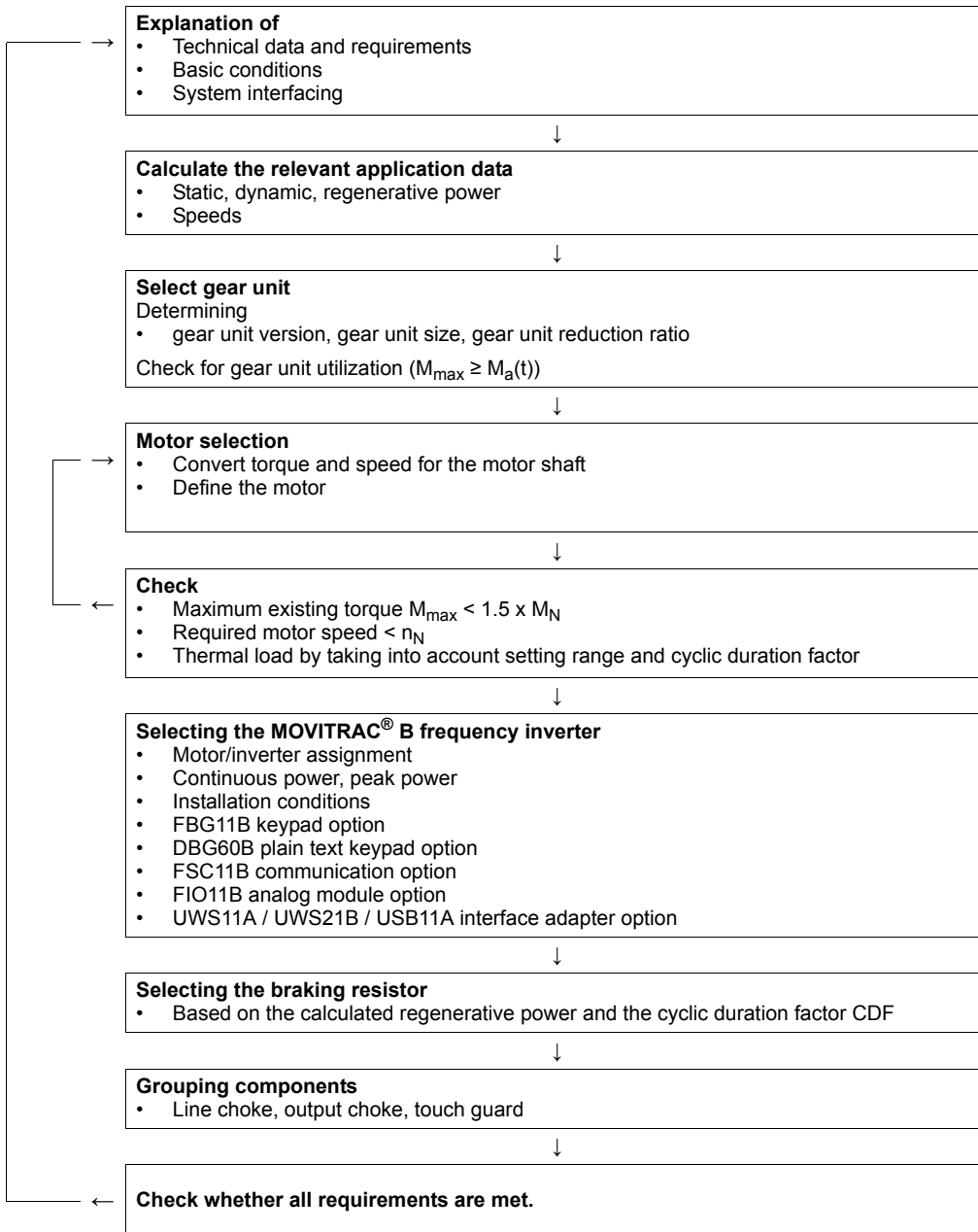
UWU52A switched-mode power supply	
Part number	188 181 7
Input voltage	1 × AC 110 V ... AC 240 V
Voltage range	AC 95 ... 265 V, DC 110 ... 300 V
Frequency	50/60 Hz
Max. no-load current	AC 40 mA
Rated input current at 1 × AC 110 V at 1 × AC 230 V	AC 1.04 A AC 0.63 A
Output voltage	DC 24 V (−1% / +3%)
Rated output current at 40 °C (104 °F) at 55 °C (131 °F)	DC 2.5 A DC 2.0 A
Residual ripple	< 50 mV _{eff}
Interference voltage	< 120 mV _{SS}
Power loss	< 5.5 W (0.0074 HP)
Mass	0.23 kg (0.51 lb)
Working temperature	0 ... +55 °C (32 ... 131 °F) (non-condensing)
Enclosure	IP20 (EN 60529)
Protection class	I
Connection	Screw terminals for line cross-section 0.20 – 2.5 mm ²





3 Project planning

3.1 Schematic sequence





3.2 Options for standard applications

Refer to the following table for available options for simple applications. Conditions for simple applications:

- Vertical movement: Braking time is less than 25% of cyclic duration factor CDF and no longer than 30 s.
- Horizontal movement: Braking time is less than 12% of cyclic duration factor CDF and no longer than 15 s.

Type MC07B	Braking resistor		Output choke	Line filter		
	Horizontal movement	Vertical movement				
230 V 1-phase	0003	BW027-003	BW027-003	HD012	Integrated ¹⁾	
	0004	BW027-003	BW027-003	HD012		
	0005	BW027-003	BW027-003	HD012		
	0008	BW027-003	BW027-005	HD012		
	0011	BW027-003	BW027-005	HD012		
	0015	BW027-003	BW027-006	HD012		
	0022	BW027-005	BW027-012	HD012		
230 V 3-phase	0003	BW027-003	BW027-003	HD012	Integrated ¹⁾	
	0004	BW027-003	BW027-003	HD012		
	0005	BW027-003	BW027-003	HD012		
	0008	BW027-003	BW027-006	HD012		
	0011	BW027-003	BW027-006	HD012		
	0015	BW027-003	BW027-006	HD012		
	0022	BW027-006	BW027-012	HD012		
	0037	BW027-006	BW027-012	HD012		
	0055	BW012-025	BW012-025	HD001		
	0075	BW012-015	BW012-025	HD001		
	0110	BW012-025	BW012-050	HD003		NF048-503
	0150	2 × BW012-025	2 × BW012-050	HD003		NF063-503
	0220	2 × BW106	2 × BW106	HD003		NF085-503
0300	2 × BW106	2 × BW106	HD003	NF115-503		
400 V 3-phase	0003	BW072-003	BW072-003	HD012	Integrated ¹⁾	
	0004	BW072-003	BW072-003	HD012		
	0005	BW072-003	BW072-003	HD012		
	0008	BW072-003	BW072-005	HD012		
	0011	BW072-003	BW072-005	HD012		
	0015	BW072-003	BW168	HD012		
	0022	BW072-005	BW168	HD012		
	0030	BW072-005	BW268	HD012		
	0040	BW168	BW268	HD012		
	0055	BW147	BW247	HD001		
	0075	BW147	BW347	HD001		
	0110	BW039-026	BW039-050	HD001		
	0150	BW018-035	BW018-075	HD003		NF035-503
	0220	BW018-035	BW018-075	HD003		NF048-503
	0300	BW018-075	BW915	HD003		NF063-503
	0370	2 × BW012-025	BW106	HD003		NF085-503
	0450	BW106	BW206	HD003		NF085-503
	0550	BW106	BW206	HD003		NF115-503
	0750	BW106	3 × BW012-100	HD003		NF150-503

1) Additional components are required to reach limit value class B.



3.3 Description of applications

3.3.1 Project planning for trolleys

The motor load in the dynamic sections determines the peak motor power to be sized. The thermal load determines the required continuous power of the motor. Refer to the travel cycle for determining the thermal load. The speed profile is the significant factor in determining the self-cooling of the motor.

3.3.2 Project planning for hoists

In practice, you must take particular account of thermal and safety-relevant criteria when sizing hoists.

The control must be designed so that the direction of rotation of the drive can only be changed when it is at a standstill.

Thermal considerations

In contrast to trolleys, hoists require approx. 70...90% of the motor rated torque at constant speed.

Starting torque

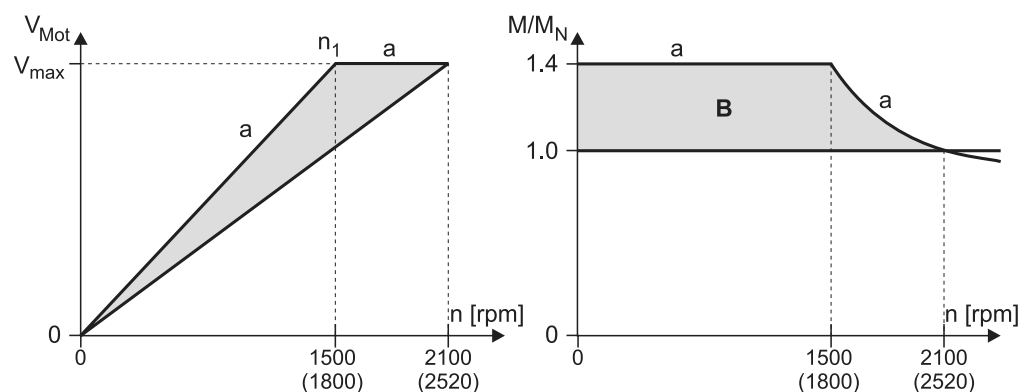
The motor requires the highest operating torque in the event of acceleration with maximum load and an **upward** hoisting direction.

As a rule, design the 4-pole gearmotor for a maximum speed of

- 2100 rpm (70 Hz) at a transition speed of 1500 rpm (50 Hz)
- 2500 rpm (83 Hz) at a transition speed of 1800 rpm (60 Hz)

This that means the gear unit input speed is increased by a factor of approx. 1.4. This is why you have to select a 1.4 times higher gear unit reduction ratio. The motor will not lose any torque in the field weakening range (50 ... 70 Hz or 60 ... 83 Hz) at the input shaft. The higher gear unit ratio compensates for the inversely proportionate decrease in torque in relation to speed. Furthermore, the startup torque is 1.4 times greater. Further advantages are that the speed range is greater and the self-cooling of the motor more powerful.

Hoist voltage / speed characteristic curve



- a = Recommended voltage / speed characteristic curve and resultant torque characteristic
- B = Torque reserve range



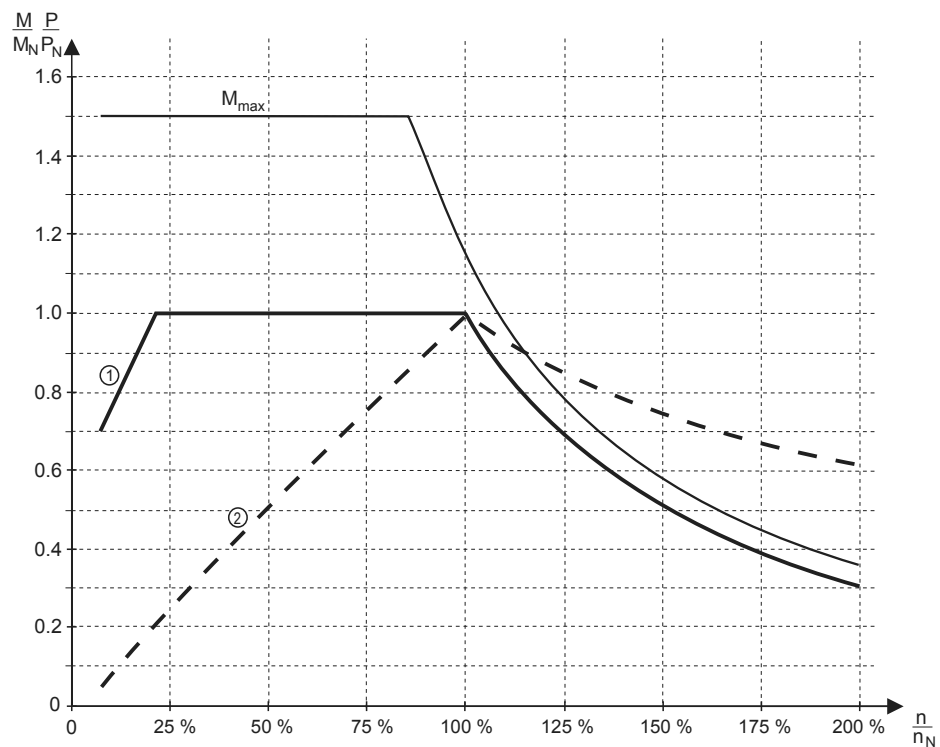
Select the motor power for hoists according to the load type:

- S1 (100% CDF): Select the motor power of the next higher motor type than the selected inverter power, e.g. for lengthy upwards travel or continuous elevators.
- S3 (40% CDF): Select the motor power according to the selected inverter power.

Activate the hoisting function by selecting operating mode P700 = VFC & hoist regardless of the above guidelines.

3.4 Speed-torque characteristics

The speed-torque characteristic curve appears as follows:



- [1] M in S1 100% CDF
[2] P in S1 100% CDF



3.5 Motor selection

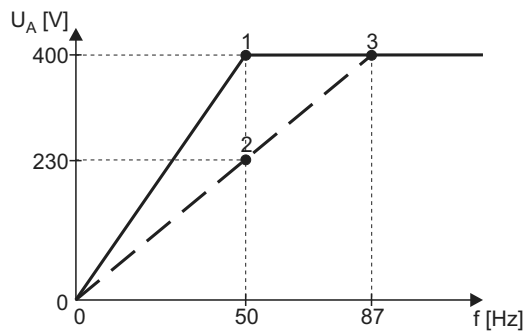
3.5.1 Basic recommendations

- Only use motors with at least thermal class F.
- Use the TF thermistor or TH bimetallic switch.
- Preferably use 4-pole motors. This applies particularly if you are operating gear-motors with a high oil filling level because of their vertical mounting position. 2-pole motors cause large churning losses.

3.5.2 Voltage-frequency characteristic curve

The asynchronous motor follows a load-dependent voltage/frequency characteristic in V/f operating modes. The motor model is continuously calculated in the VFC operating mode. At startup, set the characteristic curve with rated motor voltage and rated motor frequency. The setting determines the speed-dependent torque and power characteristics of the asynchronous motor.

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



- 1 Star connection; 400 V, 50 Hz
- 2 Delta connection 230 V / 50 Hz
- 3 Delta connection 400 V / 87 Hz

The MOVITRAC[®] B output voltage is limited by the provided supply voltage.

3.5.3 Dynamic applications

For dynamic applications, you must have a drive with a rated inverter current greater than the rated motor current.

Set the following parameters so the motor can generate at most 150% of the rated motor torque:

- *Current limit P303*
- *Slip compensation P324*

Increase these parameters manually by a factor of approx. 1.4 for dynamic applications.



3.5.4 Inverter/motor combinations

The following table shows possible inverter / motor combinations. You can also assign the next higher motor size to the inverters. The 4-pole motors (1500 rpm) are included in the factory settings of MOVITRAC[®] B. Smaller motors can deteriorate the control behavior.

MOVITRAC [®] B: Speed [rpm] at 50 Hz Speed [rpm] at 60 Hz	Rated power P _{rated}	SEW motor	
		3000 3600	1500 1800
MC07B0003-...-4-00	0.25 kW (0.34 HP)	DFR63M2	DFR63L4
MC07B0004-...-4-00	0.37 kW (0.50 HP)	DFR63L2	DT71D4
MC07B0005-...-4-00	0.55 kW (0.74 HP)	DT71D2	DT80K4
MC07B0008-...-4-00	0.75 kW (1.0 HP)	DT80K2	DT80N4
MC07B0011-...-4-00	1.1 kW (1.5 HP)	DT80N2	DT90S4
MC07B0015-...-4-00	1.5 kW (2.0 HP)	DT90S2	DT90L4
MC07B0022-...-4-00	2.2 kW (3.0 HP)	DT90L2	DV100M4
MC07B0030-...-4-00	3.0 kW (4.0 HP)	DV100M2	DV100L4
MC07B0040-...-4-00	4.0 kW (5.3 HP)	DV112M2	DV112M4
MC07B0055-...-4-00	5.5 kW (7.4 HP)	DV132S2	DV132S4
MC07B0075-...-4-00	7.5 kW (10 HP)	DV132M2	DV132M4
MC07B0110-...-4-00	11 kW (15 HP)	DV160M2	DV160M4
MC07B0150-...-4-00	15 kW (20 HP)	DV160L2	DV160L4
MC07B0220-...-4-00	22 kW (30 HP)	DV180L2	DV180L4
MC07B0300-...-4-00	30 kW (40 HP)	–	DV200L4
MC07B0370-...-4-00	37 kW (50 HP)	–	DV225S4
MC07B0450-...-4-00	45 kW (60 HP)	–	DV225M4
MC07B0550-...-4-00	55 kW (74 HP)	–	DV250M4
MC07B0750-...-4-00	75 kW (100 HP)	–	DV280S4



3.6 Overload capacity

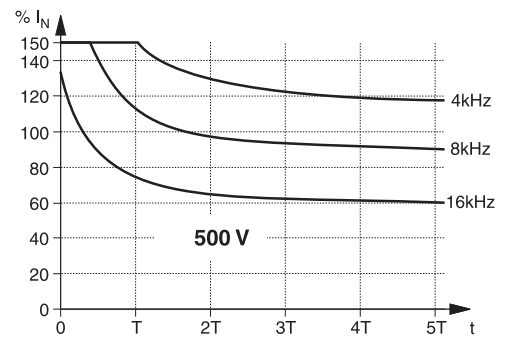
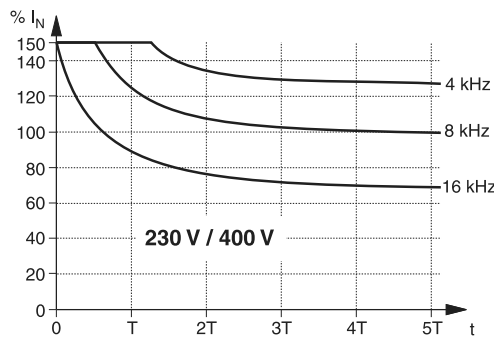
MOVITRAC® B frequency inverters permanently calculate the load at the inverter output stage (unit utilization). They can output the maximum possible power in every operating status.

The permitted continuous output current depends on:

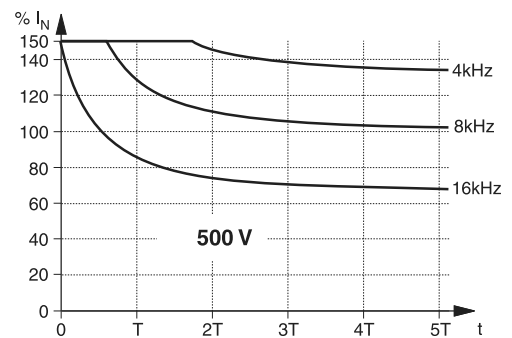
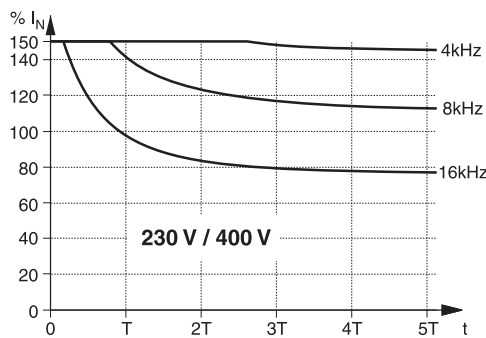
- Ambient temperature
- Heat sink temperature
- Mains voltage
- PWM frequency

If a PWM frequency > 4 kHz is set and "P862/P863 PWM fix 1/2" is set to off, the inverter automatically reduces the PWM frequency in the event of a unit overload. The inverter reacts to a higher than permitted load by issuing the "F44 Unit utilization" error message and an immediate switch-off.

Overload capacity at 40 °C (104 °F)



Overload capacity at 25 °C (77 °F)



Size	0XS	0S < 1.5 kW (2.0 HP)	0S 1.5 kW (2.0 HP)	0L	1	2S	2	3	4
T (min)	20	20	8	8	3.5	4	5	4	9



3.7 Load capacity of the units at low output frequencies

The thermal model in MOVITRAC[®] B implements dynamic limiting of the maximum output current. Consequently, the thermal model only permits less than 100% output current at output frequencies less than 2 Hz if the capacity utilization is high.

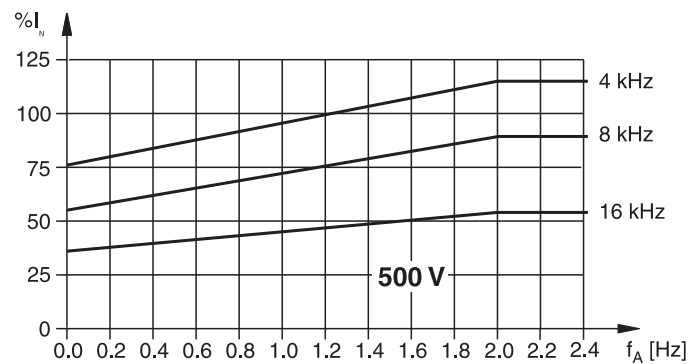
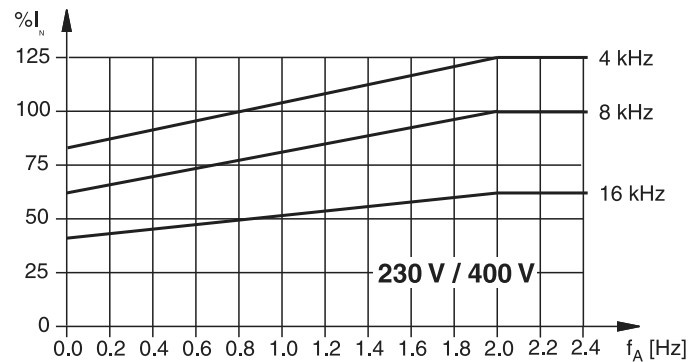
In such operating states, configure the average output current of the inverter to max. 70% of the rated inverter current.



NOTE

The output frequency of the inverter is comprised of the rotational frequency (speed) and the slip frequency.

Guaranteed continuous currents depending on the output frequency:





3.8 Selecting the braking resistor

	<p>! DANGER</p> <p>The supply cables to the braking resistor carry a high DC voltage (ca. DC 900 V). Severe or fatal injuries from electric shock.</p> <ul style="list-style-type: none"> • The braking resistor cables must be suitable for this high DC voltage. • Install the braking resistor cables according to the regulations.
	<p>! WARNING</p> <p>The surfaces of the braking resistors get very hot when the braking resistors are loaded with P_N. Risk of burns and fire.</p> <ul style="list-style-type: none"> • Choose a suitable installation location. Braking resistors are usually mounted on top of the control cabinet. • Do not touch the braking resistors.
	<p>NOTES</p> <ul style="list-style-type: none"> • The data applies to BW..., BW...-T and BW...-P braking resistors. • For BW..., BW...-T and BW...-P braking resistors, plan for a load derating of 4% per 10 K from an ambient temperature of 45 °C (113 °F) Do not exceed a maximum ambient temperature of 80 °C (176 °F). • The overload factor of the BW...-T and BW...-P braking resistors is limited by using an integrated temperature relay: <ul style="list-style-type: none"> – BW...-T up to overload factor 12 – BW...-P up to overload factor 40 • The maximum permitted cable length between MOVITRAC® and the braking resistor is 100 m (328 ft).



Project planning

Selecting the braking resistor

- **Parallel connection**

Two braking resistors must be connected in parallel for some inverter/resistor combinations. In this case, set the trip current on the bimetallic relay to twice the value of I_F provided in the table.

- **Peak braking power**

The peak braking power can be lower than the load capacity of the braking resistor due to the DC link voltage and the resistance value. Formula for calculating the peak braking power:

$$P_{\max} = V_{DC}^2/R$$

V_{DC} is the maximum permitted DC link voltage. Its value is:

- With 400 / 500 V units: DC 970 V
- With 230 V units: DC 485 V

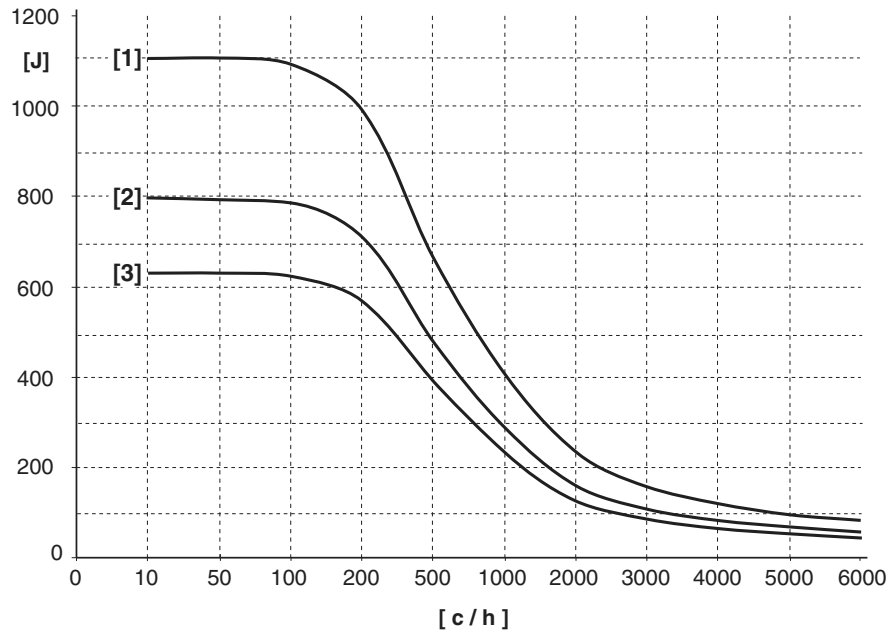
The following table lists the peak braking power levels that are possible for the different resistance values.

Resistance [Ω]	Peak breaking power [KW]	
	400 / 500 V units	230 V units
100	9.4	–
72	13.0	–
68	13.8	–
47	20.0	–
39	24.0	–
27	34.8	8.7
18	52.2	–
15	62.7	–
12	78.4	19.6
9 (2 × 18 Ω parallel)	–	26.1
6	156	39.2



3.8.1 Load capacity of PTC braking resistors

The following diagram shows the load capacity of the braking resistors BW2 and BW4 per braking operation:



[1] Brake ramp 10 s
 [2] Brake ramp 4 s
 [3] Brake ramp 0.2 s
 c/h Cycles/hour

Calculation example

Given:

- Average braking power: 0.25 kW (0.34 HP)
- Brake ramp: 2 s
- 200 brake applications per hour

Procedure:

Calculate energy and power of the brake ramp:

$$W = P \times t = 0.25 \text{ kW} \times 2 \text{ s} = 500 \text{ J}$$

The brake ramp [3] (0.2 s) can be used for the brake ramp in the diagram. Use the characteristic curve with the shorter brake ramp because a shorter brake ramp means more power.

The diagram allows a power of 580 J with a 0.2 s brake ramp at 200 cycles per hour. In this case, the required 500 J can be dissipated with BW2 / BW4.

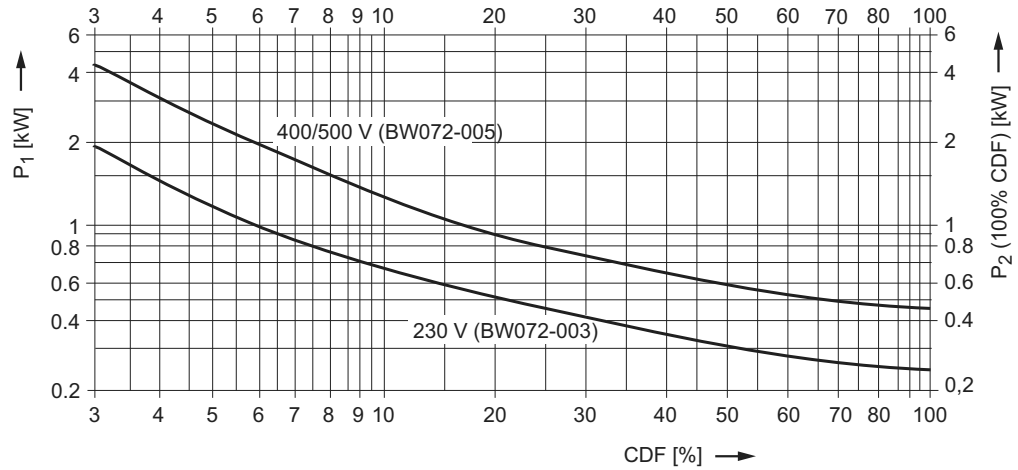


3.8.2 Load capacity flat design, wire resistors, grid resistors

In braking operations within the cycle duration T_D (standard: $T_D \leq 120$ s), the CDF braking power can be used to determine the resulting continuous resistance rating (100% CDF power) with reference to the power diagrams. The right-hand y axis shows the 100% CDF power. Observe the conditional peak braking power due to the DC link voltage when determining the load capacity.

Flat-design power diagram

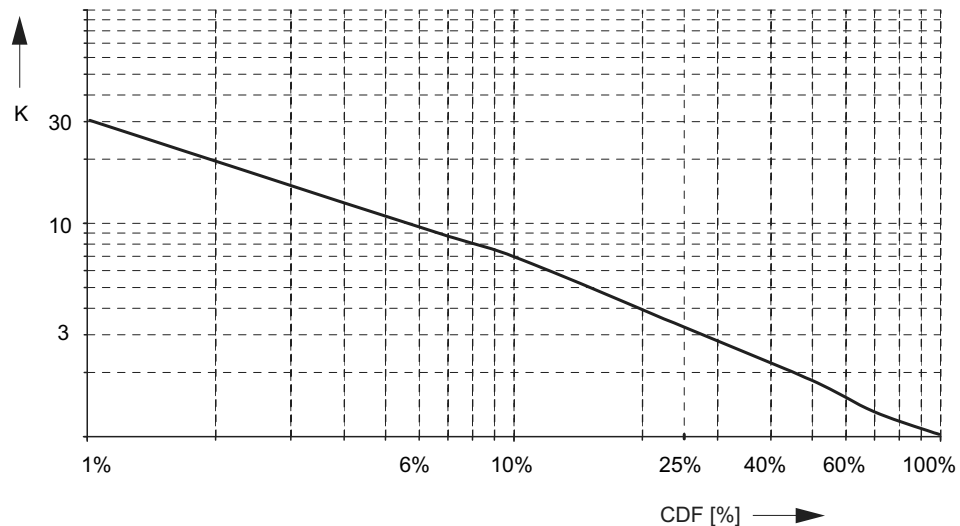
Power diagram for flat-design braking resistors:



P_1 = Short-term power
 P_2 = Continuous power
 CDF = Cyclic duration factor of the braking resistor

Overload factor for wire resistors

Overload factor dependent on the cycle duration factor for wire resistors:

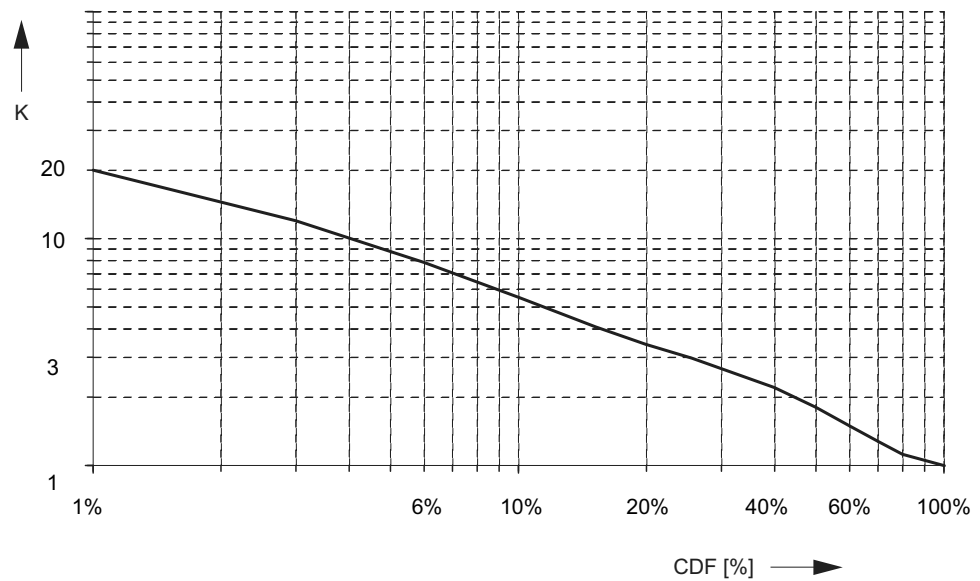


Cyclic duration factor CDF	1%	3%	6%	15%	25%	40%	60%	80%	100%
Overload factor K	30	15	9.5	5	3.2	2.2	1.5	1.12	1



Overload factor for grid resistors

Overload factor depending on cycle duration factor for grid resistors:



Cyclic duration factor CDF	1%	3%	6%	15%	25%	40%	60%	80%	100%
Overload factor K	20	12	7.6	4	3	2.2	1.5	1.12	1

Calculation example

Given:

- Peak braking power 13 kW (17 HP)
- Average braking power 6.5 kW (8.7 HP)
- Cyclic duration factor CDF 6%

Required:

- BW.. braking resistor

Procedure

- The 100% CDF power for wire and grid resistors is initially calculated using the following formula:

Average braking power / overload factor (wire / grid resistor)

Refer to the diagrams for the overload factor (wire and grid resistor) with a cyclic duration factor (CDF) of 6%.

- Results:

100% CDF power for wire resistors: 685 W (0.919 HP).

100% CDF power for grid resistors: 856 W (1.15 HP).

- The **maximum braking resistance value is 72 Ω** for a peak braking power of 13 kW (17 HP) when using an **MC07B...-5A3 (AC 400 / 500 V unit)** (→ Peak braking power table).
- Select the appropriate braking resistor from the assignment tables with the following points:

- Max. permitted braking resistance value
- MOVITRAC® unit used

Result when using MC07B0110-5A3, for example: BW039-12



3.9 Connecting AC brake motors

For detailed information about the SEW brake system, refer to the "Gearmotors" catalog, which you can order from SEW-EURODRIVE.

SEW brake systems are disc brakes with a DC coil that release electrically and brake using spring force. A brake rectifier provides the brake with DC voltage.



NOTE

The brake rectifier must have a separate supply system cable for inverter operation; it must not be powered using the motor voltage!

3.9.1 Disconnecting the brake rectifier

The brake rectifier can be switched off, causing the brake to be applied, in two ways:

1. Cut-off in the AC circuit
2. Cut-off in the DC and AC circuit (faster cut-off)

Always switch off the brake in the DC and AC circuits with:

- All hoist applications

3.9.2 Activating the brake

Always activate the brake via binary output DOØ2 "/Brake": do not use the PLC.

The binary output DOØ2 "/Brake" is configured as an output for operating a relay with free-wheeling diode and a control voltage of DC +24 V / max. 150 mA / 3.6 W (0.0048 HP). A power contactor can be controlled directly with a DC 24 V coil voltage or the BMK brake rectifier. This power contactor is used to switch the brake.

The startup function in the FBG11B keypad and in the MotionStudio software sets the brake parameters for the 2-pole and 4-pole motors from SEW-EURODRIVE. The brake parameters (P73_) must be set manually in the case of SEW-EURODRIVE motors with a higher number of poles and non-SEW motors.

3.9.3 Brake parameters



NOTE

The brake parameters are adapted to the brake activation arrangement shown in the wiring diagram. If the values set for the brake release and application times are too short, e.g. for long response times in the brake control system, hoists, for example, may sag.



3.10 Mains and the motor connection

3.10.1 Permitted voltage supply systems

	<p>NOTE</p> <p>MOVITRAC® B is intended to be operated on mains systems with a directly grounded star point (TN and TT systems). Operation on mains systems with a non-grounded star point (for example IT power systems) is also permitted. SEW recommends using an earth-leakage monitor for this according to the PCM (pulse code measuring) principle. Using such devices prevents the earth-leakage monitor from mis-tripping due to the ground capacitance of the inverter.</p>
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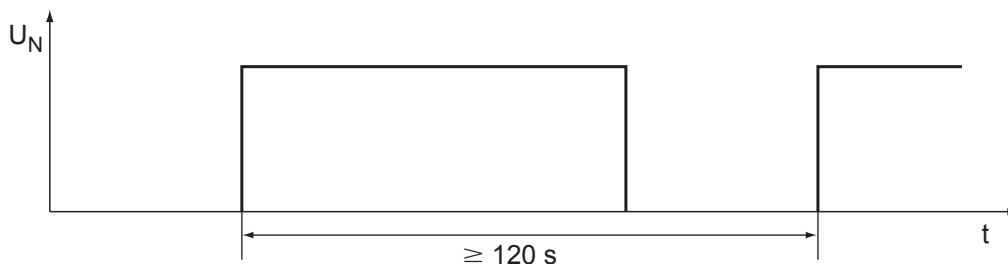
3.10.2 Input contactors and input fuses

Mains contactor

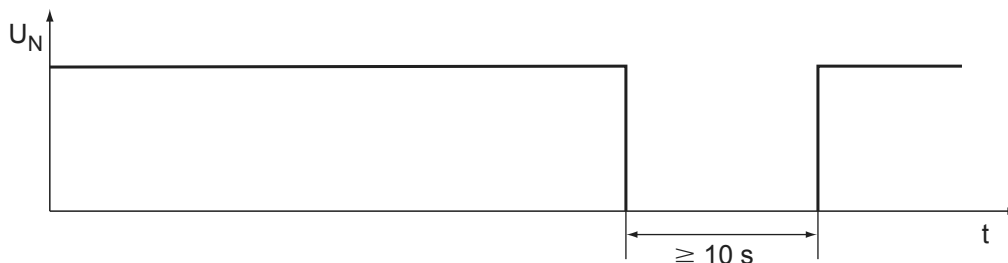
- Only use mains contactors of utilization category AC-3 (EN 60947-4-1).

Mains activations

- Ensure a minimum time of 120 s between two mains activations for AC 230 V / 1-phase units.



- Maintain a minimum switch-off time of 10 s for 3-phase units.



	<p>NOTE</p> <ul style="list-style-type: none"> • Do not use the K11 input contactor for jog mode, but only for switching the inverter on and off. Use the following commands for jog mode: <ul style="list-style-type: none"> – Enable/Stop – CW/Stop – CCW/Stop
--	--



Mains fuses

Fusing types:

- Line protection types in the operating classes gL, gG:
 - Rated fusing voltage \geq Rated supply voltage
 - Rated fusing current must be designed for 100% or 125% of the rated inverter current depending on the inverter utilization.
- Line protection switches with characteristics B, C:
 - Circuit breaker rated voltage \geq Mains rated voltage
 - Circuit breaker rated currents must be 10% above the rated inverter current.

3.10.3 Line protection and core cross-section

Comply with the regulations of the specific country and for the specific machine regarding fusing and selecting cable cross-sections. Also comply with the instructions for **UL-compliant installation** if necessary.

Always size the shared neutral conductor for the total current when using several 1-phase units. Also size it according to the total current even if the unit connections are distributed over the three mains phases. This is because the third supply current harmonics are always cumulative.

Select the cable cross-section of the motor lead so the voltage drop is as small as possible. An excessively high voltage drop means that the full motor torque is not achieved.

Smallest bending space (EN 61800-5-1)

As stipulated in EN 61800-5-1, the distance between a power connection terminal and an obstruction toward which the wire is directed on leaving the terminal must correspond with the minimum values given in the table below.

Cable cross-section [mm ²]	Smallest bending space [mm]		
	Wires per connection terminal		
	1	2	3
10 ... 16	40	–	–
25	50	–	–
35	65	–	–
50	125	125	180
70	150	150	190
95	180	180	205
120	205	205	230
150	255	255	280
185	305	305	330



Recommendation for standard installation, metric

If single-core copper cables with PVC insulation routed in cable ducts are used, SEW-EURODRIVE proposes the following cable cross-sections and fuses for an ambient temperature of 25 °C (77 °F) and rated mains currents of 100% of the rated inverter current:

MOVITRAC® B 1 × 230 V		0003	0004	0005	0008	0011	0015	0022	
Single phase	Line protection	C16 ¹⁾ / gL16 / K16				C32 ²⁾ / gL25 / K25 / D20			
	Supply system lead	1.5 mm ²				4 mm ²			
	PE conductor	2 x 1.5 mm ²				2 x 4 mm ²			
Motor cable		1.5 mm ²				1.5 mm ²			
Unit terminal cross-section of the power section		Disconnectable terminal strip 4 mm ² conductor end sleeve DIN 46228 (German Industrial Standard)							

1) If there has been a pause of at least two minutes between turning the unit off and on again: B16

2) If there has been a pause of at least two minutes between turning the unit off and on again: B32

MOVITRAC® B 3 × 230 V		0003	0004	0005	0008	0011	0015	0022	
3-phase	Line protection	10 A					16 A		
	Supply system lead	1.5 mm ²					4 mm ²		
	PE conductor	2 x 1.5 mm ²					2 x 4 mm ²		
Motor cable		1.5 mm ²					1.5 mm ²		
Unit terminal cross-section of the power section		Disconnectable terminal strip 4 mm ² conductor end sleeve DIN 46228 (German Industrial Standard)							

MOVITRAC® B 3 × 230 V	0037	0055	0075	0110	0150	0220	0300
Fuses F11/F12/F13 I_{rated}	25 A	25 A	35 A	50 A	63 A	80 A	100 A
Supply system lead L1/L2/L3	4 mm ²	4 mm ²	6 mm ²	10 mm ²	16 mm ²	25 mm ²	35 mm ²
PE conductor	2 x 4 mm ² 1 x 10 mm ²	2 x 4 mm ² 1 x 10 mm ²	2 x 6 mm ² 1 x 10 mm ²	1 x 10 mm ²	1 x 16 mm ²	1 x 16 mm ²	1 x 16 mm ²
Motor feeder U/V/W	4 mm ²	4 mm ²	6 mm ²	10 mm ²	16 mm ²	25 mm ²	35 mm ²
Unit terminal cross-section of the power section	Separable terminal strip 4 mm ² conductor end sleeve DIN 46228 (German Industrial Standard)	M4 screw and washer assembly with terminal clip 4 mm ² conductor end sleeve DIN 46228 (German Industrial Standard) 6 mm ² crimp cable lug DIN 46234 (German Industrial Standard)		M6 screw and washer assembly with washer Max. 25 mm ² Crimp cable lug DIN 46234		M10 bolt with nut Max. 70 mm ² Press cable lug DIN 46235	

MOVITRAC® B 400 / 500 V		0003	0004	0005	0008	0011	0015	0022	0030	0040	0055	0075	
3-phase	Line protection	10 A					16 A					16 A	16 A
	Supply system lead	1.5 mm ² (AWG16)										1.5 mm ²	1.5 mm ²
	PE conductor	2 x 1.5 mm ² (2 x AWG16)					2 x 1.5 mm ² (2 x AWG16) 1 x 10 mm ² (1 x AWG8)					2 x 1.5 mm ² 1 x 10 mm ²	2 x 1.5 mm ² 1 x 10 mm ²
Motor cable		1.5 mm ² (AWG16)										1.5 mm ²	2.5 mm ²
Unit terminal cross-section of the power section		Disconnectable terminal strip 4 mm ² conductor end sleeve DIN 46228 (German Industrial Standard)										M4 screw and washer assembly with terminal clip 4 mm ² conductor end sleeve DIN 46228 (German Industrial Standard)	

MOVITRAC® B 400 / 500 V		0110					0150		0220		0300	
3-phase	Line protection	25 A					35 A		50 A		63 A	
	Supply system lead	4 mm ²					6 mm ²		10 mm ²		16 mm ²	
	PE conductor	2 x 4 mm ² 1 x 10 mm ²					2 x 6 mm ² 1 x 10 mm ²		1 x 10 mm ²		1 x 16 mm ²	
Motor cable		4 mm ²					6 mm ²		10 mm ²		16 mm ²	



MOVITRAC® B 400 / 500 V		0110		0150	0220	0300
Unit terminal cross-section of the power section		M4 screw and washer assembly with terminal clip 4 mm ² conductor end sleeve DIN 46228 (German Industrial Standard) 6 mm ² crimp cable lug DIN 46234 (German Industrial Standard)		M6 screw and washer assembly with washer Max. 25 mm ² Crimp cable lug DIN 46234		
MOVITRAC® B 400 / 500 V		0370	0450	0550	0750	
3-phase	Line protection	80 A	100 A	100 A	125 A	
	Supply system lead	25 mm ²	35 mm ²	35 mm ²	50 mm ²	
	PE conductor	1 x 16 mm ²			25 mm ²	
Motor cable		25 mm ²	35 mm ²	35 mm ²	50 mm ²	
Unit terminal cross-section of the power section		Bolt M10 with nut max. 70 mm ² crimp cable lug DIN 36235 (German Industrial Standard)				

Recommendation for standard installation, USA NEC

MOVITRAC® B 1 × 230 V		0003	0004	0005	0008	0011	0015	0022	
Single phase	Line protection	C16 ¹⁾ / gL16 / K16				C32 ²⁾ / gL25 / K25 / D20			
	Supply system lead	AWG16				AWG12			
	PE conductor	2 x AWG16				2 x AWG12			
Motor cable		AWG16				AWG16			
Unit terminal cross-section of the power section		Separable terminal strip AWG10 conductor end sleeve							

- 1) If there has been a pause of at least two minutes between turning the unit off and on again: B16
- 2) If there has been a pause of at least two minutes between turning the unit off and on again: B32

MOVITRAC® B 3 × 230 V		0003	0004	0005	0008	0011	0015	0022	
3-phase	Line protection	10 A				16 A			
	Supply system lead	AWG16				AWG12			
	PE conductor	2 x AWG16				2 x AWG12			
Motor cable		AWG16				AWG16			
Unit terminal cross-section of the power section		Separable terminal strip AWG10 conductor end sleeve							

MOVITRAC® B 3 × 230 V		0037	0055	0075	0110	0150	0220	0300
Fuses F11/F12/F13 I _{rated}		25 A	25 A	35 A	50 A	63 A	80 A	100 A
Supply system lead L1/L2/L3		AWG12	AWG12	AWG10	AWG6	AWG4	AWG4	AWG3
PE conductor		AWG12	AWG12	AWG10	AWG10	AWG8	AWG8	AWG6
Motor feeder U/V/W		AWG12	AWG10	AWG10	AWG6	AWG4	AWG4	AWG3
Unit terminal cross-section of the power section		Separable terminal strip AWG10 conductor end sleeve	M4 screw and washer assembly with terminal clip AWG10 conductor end sleeve AWG10 crimp cable lug	M6 screw and washer assembly with washer Max. AWG10 crimp cable lug	M10 bolt with nut Max. AWG2/0 crimp cable lug			

MOVITRAC® B 400 / 500 V		0003	0004	0005	0008	0011	0014	0015	0022	0030	0040	
Size		0						1				
Fuses F11/F12/F13 I _{rated}		6 A						10A		15 A		
Supply system lead L1/L2/L3		AWG14						AWG14				
PE conductor		AWG14						AWG14				
Motor feeder U/V/W		AWG14						AWG14				
Unit terminal cross-section of the power section		Separable terminal strip AWG10 conductor end sleeve						Separable terminal strip AWG10 conductor end sleeve				



MOVITRAC® B 400 / 500 V	0055	0075	0110	0150	0220	0300
Size	2			3		
Fuses F11/F12/F13 I_{rated}	20 A		30 A	40 A	60 A	80 A
Supply system lead L1/L2/L3	AWG12		AWG10	AWG8	AWG6	AWG4
PE conductor	AWG12		AWG10	AWG10		AWG8
Motor feeder U/V/W	AWG12		AWG10	AWG8	AWG6	AWG4
Unit terminal cross-section of the power section	M4 screw and washer assembly with terminal clip AWG10 conductor end sleeve AWG10 crimp cable connector			M6 screw and washer assembly with washer Max. AWG4 crimp cable lug		

MOVITRAC® B 400 / 500 V	0370	0450	0550	0750
Size	4		5	
Fuses F11/F12/F13 I_{rated}	90 A	110 A	150 A	175 A
Supply system lead L1/L2/L3	AWG4	AWG3	AWG1	AWG2/0
PE conductor	AWG8	AWG6	AWG6	AWG6
Motor feeder U/V/W	AWG4	AWG3	AWG1	AWG2/0
Unit terminal cross-section of the power section	M10 bolt with nut Max. AWG2/0 crimp cable lug			

3.10.4 Motor cable length

The maximum motor cable length depends on:

- Cable type
- Voltage drop in the cable
- Set PWM frequency.
- Using an output filter

The limit values in the tables do not apply if you use an output filter. The motor cable length is then solely limited by the voltage drop on the motor cable.

MOVITRAC® B:		Permitted maximum motor cable length in m (ft)			
Size		0XS / 0S / 0L		2S 0055	2S 0075 / 2 / 3 / 4 / 5
V_{Mains} voltage		3 x AC 400 V 3 x AC 230 V 1 x AC 230 V	3 x AC 500 V 3 x AC 400 V (125% I_{rated})	400 / 500 V	
Shielded cable	4 kHz ¹⁾	100 (330)	50 (165)	300 (990)	400 (1320)
	8 kHz	70 (231)	35 (116)	250 (825)	300 (990)
	12 kHz	50 (165)	25 (83)	200 (660)	250 (825)
	16 kHz	40 (132)	25 (83)	150 (495)	200 (660)
Unshielded cable	4 kHz	200 (660)	100 (330)	900 (2970)	1200 (3960)
	8 kHz	140 (462)	70 (231)	750 (2475)	900 (2970)
	12 kHz	100 (330)	50 (165)	600 (1980)	750 (2475)
	16 kHz	80 (264)	50 (165)	450 (1485)	600 (1980)

1) Standard setting



NOTE

Do not use an earth-leakage circuit breaker with long motor cables. The earth-leakage currents caused by cable capacitance may cause mis-tripping.



3.10.5 Voltage drop

Select the cable cross-section of the motor cable so that the **voltage drop is as small as possible**. An excessively high voltage drop means that the full motor torque is not achieved.

You can determine the expected voltage drop using the following tables. For shorter cables, you can calculate the voltage drop by converting in proportion to the length.

Cable cross section	Load with I [A] =															
	4	6	8	10	13	16	20	25	30	40	50	63	80	100	125	150
Copper	Voltage drop ΔU [V] with length = 100 m (330 ft) and $\vartheta = 70\text{ °C}$ (158 °F)															
1.5 mm ²	5.3	8	10.6	13.3	17.3	21.3	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)
2.5 mm ²	3.2	4.8	6.4	8.1	10.4	12.8	16	1)	1)	1)	1)	1)	1)	1)	1)	1)
4 mm ²	1.9	2.8	3.8	4.7	6.5	8.0	10	12.5	1)	1)	1)	1)	1)	1)	1)	1)
6 mm ²					4.4	5.3	6.4	8.3	9.9	1)	1)	1)	1)	1)	1)	1)
10 mm ²						3.2	4.0	5.0	6.0	8.2	10.2	1)	1)	1)	1)	1)
16 mm ²								3.3	3.9	5.2	6.5	7.9	10.0	1)	1)	1)
25 mm ²									2.5	3.3	4.1	5.1	6.4	8.0	1)	1)
35 mm ²											2.9	3.6	4.6	5.7	7.2	8.6
50 mm ²														4.0	5.0	6.0

1) Load not permitted, in accordance with VDE 0100 part 430.

Cable cross section	Load with I [A] =															
	4	6	8	10	13	16	20	25	30	40	50	63	80	100	125	150
Copper	Voltage drop ΔU [V] with length = 100 m (330 ft) and $\vartheta = 70\text{ °C}$ (158 °F)															
AWG16	7.0	10.5	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)
AWG14	4.2	6.3	8.4	10.5	13.6	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)
AWG12	2.6	3.9	5.2	6.4	8.4	10.3	12.9	1)	1)	1)	1)	1)	1)	1)	1)	1)
AWG10					5.6	6.9	8.7	10.8	13.0	1)	1)	1)	1)	1)	1)	1)
AWG8						4.5	5.6	7.0	8.4	11.2	1)	1)	1)	1)	1)	1)
AWG6								4.3	5.1	6.9	8.6	10.8	13.7	1)	1)	1)
AWG4									3.2	4.3	5.4	6.8	8.7	10.8	13.5	1)
AWG3									2.6	3.4	4.3	5.1	6.9	8.6	10.7	12.8
AWG2											3.4	4.2	5.4	6.8	8.5	10.2
AWG1												3.4	4.3	5.4	6.8	8.1
AWG1/0												2.6	3.4	4.3	5.4	6.8
AWG2/0													2.7	3.4	4.3	5.1

1) More than 3% voltage drop in relation to $V_{\text{Mains}} = 460\text{ V}_{\text{AC}}$.



3.11 Multi-motor drive / group drive

Group drives are mechanically decoupled from each other (e.g., different conveyor belts). In this operating mode, the inverter operates without slip compensation and with a constant V/f ratio.

Multi-motor drives are mechanically coupled to each other (e.g., chain drive with multiple motors). Observe the notes in the publication "Multi-Motor Drives".

3.11.1 Motor currents

The total of the motor currents must not exceed the rated output current of the inverter.

3.11.2 Motor cable

You can calculate the permitted total length of all motor cables connected in parallel as follows:

$$l_{total} \leq \frac{l_{max}}{n}$$

l_{total} = Total length of the motor cables connected in parallel

l_{max} = Recommended maximum motor cable length for individual drives

n = Number of motors connected in parallel

3.11.3 Motor size

The motors in a group must not be more than 3 type sizes apart.

3.11.4 Output filter

Usually, there is no need for an output filter with small groups of 2 to 3 motors. An HF... output filter is required if the maximum motor cable length (l_{max}) given in the table is not adequate. This may be the case in large groups (n) or when there are long motor cable lengths connected in parallel (l_{tot}). In this case, it is the voltage drop on the motor cable that limits the maximum motor cable length, not the limit value in the table. The total of the rated motor currents must not exceed the rated through-current of the output filter.



3.12 *Line chokes*

3.12.1 1-phase

Use is optional in the following instances:

- Reduction in the mains current harmonics
- Support for overvoltage protection

Use is required under the following circumstances:

- Mains inductances of less than 100 μH per branch
- For limiting the inrush current when operating more than one unit on a shared mains contactor

3.12.2 3-phase

Use is optional for supporting overvoltage protection.

Use is required for limiting the inrush current when operating more than 4 units on a mains contactor.

3.12.3 **Connecting several 1-phase inverters on one 3-phase line choke**

Requirements for connecting several 1-phase inverters to one 3-phase line choke:

- Design the input contactor for at least the total current.
- The fuse must correspond to at least the rated current of the line choke.
- Connect the MOVITRAC[®] B frequency inverters with identical configuration to the line choke.

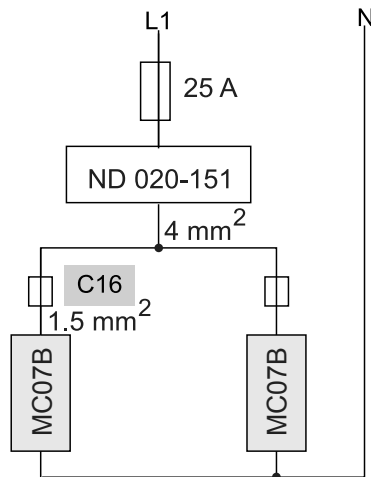


Example:
Two 1-phase
inverters on one
1-phase line choke

2 MOVITRAC® MC07B0008-2B1 units (0.75 kW [1.0 HP]) are connected to one line choke ND 020-151. The inverters have a rated current of 9.9 A.

Make sure the cable cross-section corresponds to the selected fuse. In addition, you must configure the neutral conductor in accordance with the total current.

Connecting two 1-phase inverters to one 1-phase line choke

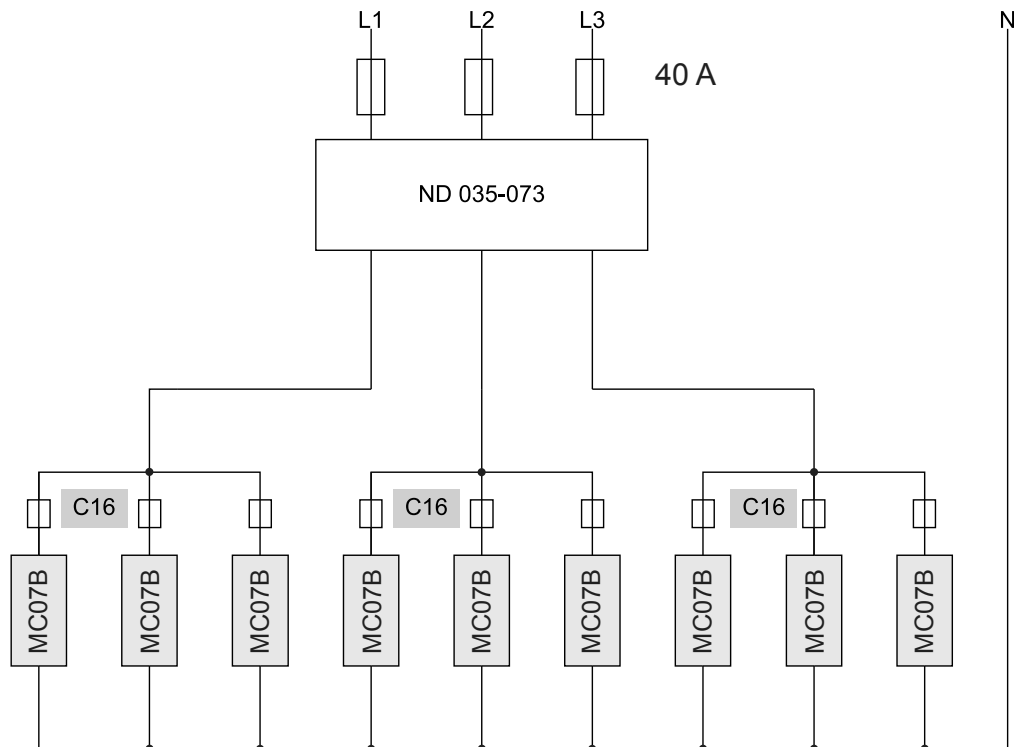


Example:
Nine 1-phase
inverters on one
3-phase line choke

9 MOVITRAC® MC07B-0008-2B1-00 units (0.75 kW [1.0 HP]) are connected to a 3-phase line choke ND 035-073. The inverters have a rated current of 9.9 A.

Make sure the cable cross-section corresponds to the selected fuse. In addition, you must configure the neutral conductor in accordance with the total current.

Connection of several inverters on one 3-phase line choke





3.13 Electromagnetic compatibility (EMC)

MOVITRAC[®] B frequency inverters are components of machines and systems. They comply with the EMC product standard EN 61800-3 **variable-speed electrical drives**. If you want to equip the machine / system with frequency inverters compliant with the EMC directive 89/336/EEC: Adhere to the notes on EMC compliant installation.

Compliance with EMC limit value classes C2 / A and C1 / B has been tested on a specified test setup. Compliance with class C1 / B for signal interference is achieved by the proper installation of the foldable ferrites ULF11A.

3.13.1 Interference immunity

MOVITRAC[®] B meets the minimum requirements stipulated in EN 61800-3 with regard to interference immunity.

3.13.2 Interference emission

The interference emission of MOVITRAC[®] B was tested using standard equipment. The limit values complied with allow the units to be used in both the industrial and private sphere. The following measures are recommended depending on the target limit value class. Higher levels of interference are permitted in industrial environments. In industrial environments, you can dispense with the measures listed below depending on the situation of the mains supply and the system configuration.

Limit value class

The following possible solutions exist for EMC-compliant installation, depending on the system configuration. Perform an EMC compliant installation.

Limit value class C1 and C2 according to EN 61800-3; A and B according to EN 55011.

Limit value class	Input side		Output side		
	0		0		
	230 V 1-phase	400/500 V / 230 V 3-phase	230 V 1-phase	400/500 V / 230 V 3-phase	
C2 (A)	No additional filtering required		HD012 output choke or shielded motor cable		
C1 (B)	Cable conducted	No additional filtering required	Line filter NF or EMC module FKE	Shielded motor cable	HD012 output choke, shielded motor cable or EMC module FKE
	Radiation conducted	Foldable ferrites ¹⁾			

1) 3 foldable ferrites over the supply system cables L and N (without PE)

Limit value class	Input side		Output side	
	1 / 2S / 2	3 / 4 / 5	1 / 2S / 2	3 / 4 / 5
	400/500 V / 230 V 3-phase		400/500 V / 230 V 3-phase	
C2 (A)	No additional filtering required	NF line filter	HD output choke or shielded motor cable	
C1 (B)	NF line filter			

The unit complies with the cable conduction and radiation requirements of limit value class C2 / A. Cable conduction requirements for limit value class C1 / B are also met. When additional measures are implemented, limit value class B can also be maintained for emissions.



3.13.3 Connection

Observe the "Installation" section for EMC-compliant connection.

3.13.4 Reducing earth-leakage currents (size 0 only)

You can deactivate the suppression capacitors to PE (see section "Installation / Installation for IT systems") to reduce earth-leakage currents in the inverter.

The earth leakage currents are determined mainly by:

- The amount of DC link voltage
- The PWM frequency
- The motor cable used and its length.
- the motor used

When the suppression capacitors are deactivated, the EMC filter is no longer active.

3.13.5 IT systems



NOTES

- No EMC limits are specified for interference emission in voltage supply systems without an NF earthed star point (IT systems). The effectiveness of line filters is severely limited.
- In size 0, you can deactivate the suppression capacitors. See the section "Installation / Installation for IT systems."
- It is important that you deactivate the suppression capacitors when using earth-leakage monitors with pulse code measurement.



3.14 HF... output filter type

3.14.1 Important notes

Observe the following instructions when using output filters:

- Do not use output filters in hoist applications.
- During project planning of the drive, take into account the voltage drop in the output filter and consequently the reduced motor torque available. This applies particularly to AC 230 V units with output filters.
- Flying start function is not possible with output filter HF...

3.14.2 Installation, connection and operation



NOTES

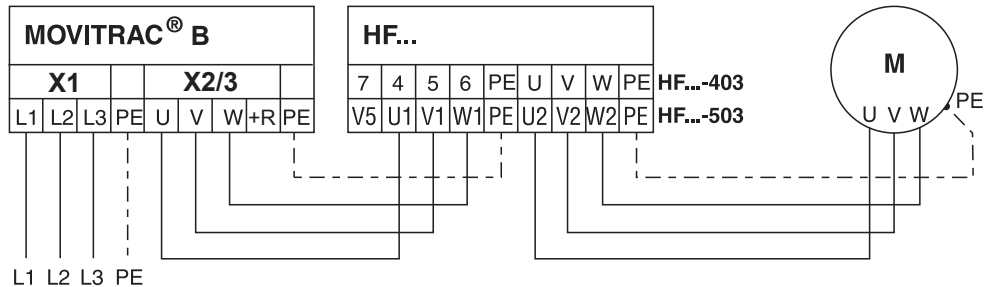
- Install output filters next to the corresponding inverter. Leave a ventilation space of at least 100 mm (3.94 in) below and above the output filter. No clearance is required on the sides.
- Limit the connection cable between the inverter and output filter to the absolute minimum length required. Maximum 1 m (3.3 ft) with an unshielded cable and 10 m (33 ft) for a shielded cable.
- An unshielded motor cable is sufficient when using an output filter. Note the following instructions when you are using an **output filter together with a shielded motor cable**:
 - The maximum permitted length of the motor cable for operation without V_{DC} link connection is 20 m (65.6 ft).
 - Operation with V_{DC} link connection is required if the motor cable is longer than 20 m (65.6 ft).
 - Observe the notes "Operation with V_{DC} link connection" on the next page.
- The rated through current of the output filter must be higher than or equal to the output current of the inverter. Note whether the projected output current of the inverter is 100% I_{rated} (= rated output current) or 125% I_{rated} (= continuous output current).
- Several motors can be connected together to one output filter when operating a motor group from one inverter. The total value of the rated motor currents must not exceed the rated throughput current of the output filter.
- It is possible to connect two output filters of the same type to one inverter output to increase the rated through current. All like connections must be connected in parallel to the output filters.
- Considerable noise (magnetostriction) may occur in the output filter especially if operating with $f_{PWM} = 4$ kHz. In environments susceptible to noise, SEW-EURO-DRIVE recommends operation with $f_{PWM} = 12$ kHz (or 16 kHz) and V_{DC} link connection. Observe the notes for V_{DC} link connection.
- When the inverter is operated with $f_{PWM} = 4$ or 8 kHz, the output filter connection V5 (with HF...-503) or 7 (with HF...-403) must **not** be connected (no V_{DC} link connection).



3.14.3 V_{DC} link connection

Operation without V_{DC} link connection:

- Approved only for PWM frequency 4 kHz or 8 kHz.



NOTES

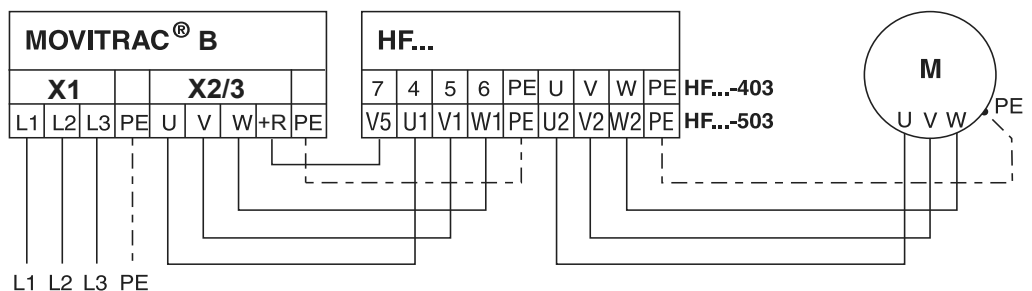
Operation with V_{DC} link connection (from 3.7 kW [5.0 HP] 230 V / 5.5 kW [7.4 HP] 500 V)

(Connection of inverter terminal + R with HF...-503 terminal V5 or HF...-403 terminal 7):

- Optimized grounded filter effect.
- Improved filter effect in the low-frequency range (≤ 150 kHz).
- Only approved for PWM frequency 12 kHz or 16 kHz. Note that increased losses (= power reduction) occur in the inverter when operating with 12 kHz or 16 kHz.
- Set PMW fix = on; the inverter must not be able to reduce the PWM frequency automatically.
- Strictly observe the following for HF...-403: V_{DC} link connection only permitted if V_{Mains} \leq AC 400 V, not with V_{Mains} = AC 500 V.
- The V_{DC} link connection increases the inverter load. The DC link connection increases the required inverter output current in relation to the rated output current of the inverter as shown in the following table.

f _{PWM}	V _{mains} = 3 x AC 230 V	V _{mains} = 3 x AC 400 V	V _{mains} = 3 x AC 500 V
12 kHz	4%	12%	15%
16 kHz	3%	8%	12%

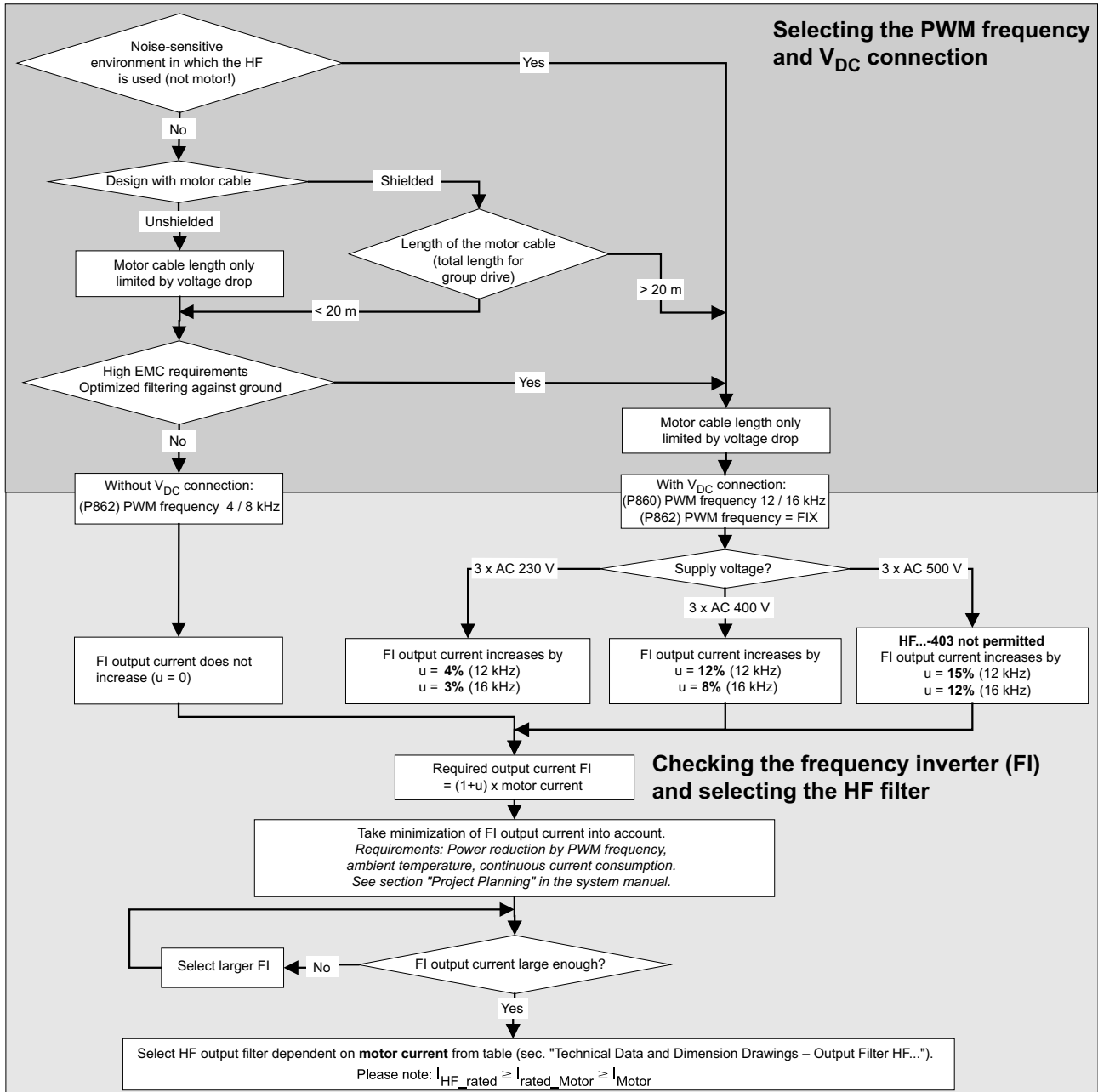
The increased power requirement causes an additional load on the inverter. Take this aspect into account during project planning of the drive. Failure to comply with this aspect may cause the inverter to shut down due to overload.





Project planning HF... output filter type

The procedure for selecting the PWM frequency and checking the inverter is summarized in the following figure.





3.15 Electronics cables and signal generation

3.15.1 Cable type

The electronic terminals are suitable for:

- Cross-sections of up to 1.5 mm² (AWG16) without conductor end sleeves
- Cross-sections of up to 1.0 mm² (AWG17) with conductor end sleeves

Use shielded cables as standard. Ground the shield at both ends. Route electronics cables separately from power cables and leads to contactor controls or braking resistors.

3.15.2 0 V cables

Never connect 0 V cables GND for generating signals. The 0 V cables of several electrical units which are connected should not be looped from unit to unit, but rather wired up in a star configuration. This means:

- Install the units in adjacent switch cabinet compartments rather than distributing them widely.
- Lay the 0 V cables with at least a 1 mm² (AWG17) cross-section from a central point to each individual unit by the shortest possible route.

3.15.3 Coupling relays

You can use coupling relays for electrical isolation of the binary inputs and binary outputs to the functional ground. Use only coupling relays with encapsulated, dust-protected electronic contacts. The relays must be suitable to switch small voltages and current (5 ... 30 V, 0.1 ... 20 mA).



3.16 External voltage supply DC 24 V

The internal voltage supply is sufficient for the basic unit and binary output up to 200 mA (DO02: 150 mA; DO03: 50 mA). FBG11B, FSC11B with options DBG60B, USB11A, UWS21A, or UWS21B can also be supplied by the internal voltage supply.

The MOVITRAC® B can be supplied via an external DC 24 V voltage supply. This is useful, for example, with bus operation. The voltage supply must be sized large enough to operate the digital outputs also. Fieldbus options always require an external voltage supply,

In this case, you must always switch on the external DC 24 V power supply unit prior to the mains contactor or after switching off the mains contactor.

DC 24 V power demand of MOVITRAC® B:

Size	Basic unit power demand ¹⁾	DBG60B	FIO11B	Fieldbus option ²⁾³⁾	DHP11B ³⁾
Size 0 MC07B...-00	5 W (0.007 HP)	1 W (0.001 HP)	2 W (0.003 HP)	3 W (0.004 HP)	4.5 W (0.0060 HP)
Size 0 MC07B...-S0	12 W (0.016 HP)				
1, 2S, 2	17 W (0.023 HP)				
3	23 W (0.031 HP)				
4, 5	25 W (0.034 HP)				

1) FBG11B, FSC11B (UWS11A/USB11A) included The load of the binary outputs must also be taken into account with 2.4 W (0.0032 HP) per 100 mA.

2) Fieldbus options are: DFP21B, DFD11B, DFE11B, ...

3) These options must always be externally supplied also.



NOTES

When using an auxiliary voltage for the backup mode on VIO24, you must ensure that the backup voltage is always applied in mains operation because other units connected to VIO24 by MOVITRAC® B are otherwise supplied in mains operation without a backup voltage supply.

The maximum current load for looping through the backup voltage supply from VIO24 / basic unit to VIO24 / FSC/FIO is 1 A.

3.16.1 Example

MC07B0015-5A3-4-00/DFP21B with options FSC11B & FBG11B. MOVTRAC® B supplies the binary inputs DI01 (CW/Stop) and DI03 (Enable) with voltage. The motor brake is controlled via DO02. The brake coil of the brake relay requires 100 mA at DC 24 V. The master PLC evaluates the fault signal contact via DO00 at current consumption of 50 mA.

Calculating the total power demand:

- Power demand of the basic unit (incl. FSC11B and power supply of the binary inputs): 5 W (0.007 HP)
- Power demand of the DFP21B fieldbus option: 3 W (0.004 HP)
- Power demand of the brake coil: 0 W (0 HP) because output is 0 active in DV 24 V operation.
- Power demand of the fault signal contact: $24 \text{ V} \times 0.05 \text{ A} = 1.2 \text{ W}$ (0.0016 HP)

The total power demand is 9.2 W (0.012 HP). An external DC 24 V power supply is required in this case.



3.17 Parameter set switchover

This function serves for operating two motors on one inverter using two different parameter sets.

The parameter set is switched over via binary input or fieldbus. A binary input must be programmed to the "Parameter set switch-over" function (→ P60_/P61_) for this purpose. You can then change from parameter set 1 to 2 and vice versa in INHIBITED inverter status.

Function	In effect with	
	"0" signal	"1" signal
PARAM. SELECT	Parameter set 1 active	Parameter set 2 active



NOTE

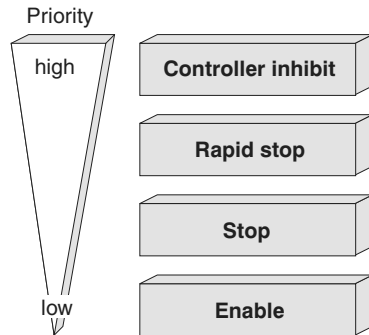
A changeover contactor should be provided for each of the two motor cables when two motors are operated alternately on the same inverter with the parameter set switchover function in use (→ P60_/P61_ parameter set switchover). Only switch changeover contactors when the unit is inhibited.



3.18 Priority of the operating statuses and interrelation between control signals

3.18.1 Priority of the operating statuses

The following illustration shows the priority of operating statuses:



3.18.2 Interrelation between control signals

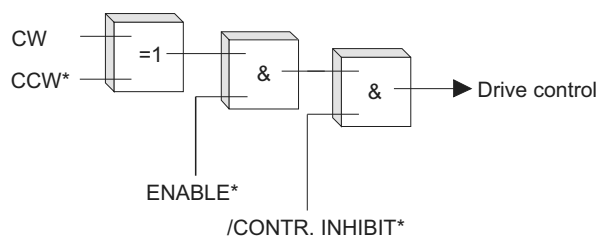
The following table shows the interrelation between control signals. "CW/Stop" is programmed to binary input DIØ1 and cannot be changed. The other control signals are only in effect if a binary input is programmed to this function (→ parameter P60_).

/Controller inhibit	Binary input is programmed to			Inverter status
	Enable/ Rapid stop	CW/stop (DIØ1)	CCW/stop	
"0"	1)	1)	1)	Inhibited
"1"	"0"	2)	2)	
"1"	"1"	"1"	"0"	CW enabled
"1"	"1"	"0"	"1"	CCW enabled

1) Not relevant when the binary input is on controller inhibit and "/Control inhibit" = "0"

2) Not relevant if "Enable/Rapid stop" = "0"

Linking control signals:



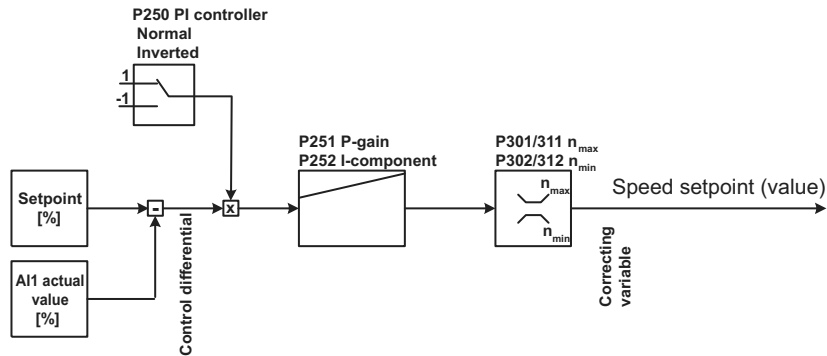
* If a binary input is programmed to this function.



3.19 PI controller

You can use the implemented PI controller for temperature control, pressure control or other applications. The PI controller can be switched on and off.

Structural diagram showing installation of the PI controller



Connect the actual value from the sensor (temperature, pressure, etc.) to analog input AI1. You can scale the actual value up or down and assign an offset value, thereby adapting it to the working range of the PI controller.

You can set the setpoint of the PI controller using one of the 6 programmable fixed setpoints, or you can specify the setpoint via the RS-485 interface or fieldbus (SBus) (*P100=Setpoint source*). Furthermore you can specify the setpoint using the local setpoint potentiometer.

The correcting variable of the PI controller is a speed setpoint limited to the minimum and maximum speed (*P301 = Minimum speed 1* and *P302 = Maximum speed 1*). The setting of the speed ramp times has no effect when the PI controller is active.

Default parameter settings are shown in **bold** below.

3.19.1 Parameter setting

Activating the PI controller

Switch the PI controller on and off using parameter P250. The values set for setpoint and actual values mentioned in the beginning are active when you switch on the PI controller.

The *Normal* setting increases the correcting variable if there is a positive system deviation; the correcting variable is reduced if there is a negative system deviation.

The *Inverted* setting increases the correcting variable if there is a negative system deviation; the correcting variable is reduced if there is a positive system deviation.

P 250 PI controller **Off**
 Normal
 Inverted

Controller parameters

You can adapt the controller to the application using the following settings:

P 251	P-gain	0 ... 1 ... 64	Step width:	0.01
P 252	I-component	0 ... 1 ... 2000 [s]	Range:	Step width: I-component OFF
			0	0.01
			0.01 ... 0.99	0.1
			1.0 ... 9.9	1
			10 ... 99	1
			100 ... 2000	10



3.19.2 Setpoint selection

The following settings are possible as the setpoint source. You can select the setpoint source with parameter P100.

- **Unipolar / Fixed setpoint:** The setpoint zero applies as long as no setpoint is selected. The FBG setpoint control module can be added to setpoint zero or a fixed setpoint using P121.

P163/164/165 Setpoint n11/12/13 scales PI-controller [0 ... 100%] step width: 0.1%

P173/174/175 Setpoint n21/22/23 scales PI controller [0... 100%] step width: 0,1%

Operation with optional second analog input (e.g., FIO1B)

The setpoint from the AI2 analog input applies as long as no setpoint is selected. The FBG setpoint control module can be added to AI1 or a fixed setpoint using P121.

- **RS 485 / Fixed setpoint**
- **SBus 1 / Fixed setpoint:** Specify the setpoint and set it using the following bus parameters:

P870/871/872 Setpoint description PO1/PO2/PO3 [PI controller setpoint [%]]

PO1/PO2/PO3 = 0 – 2¹⁴ = 0 ... 100% PI controller setpoint

Setpoint selection is **always unipolar**. The inverter restricts negative setpoints (e.g. via RS-485 or SBus) to zero.

- **For all setpoint sources:** The FBG setpoint control module can be added to the setpoint or a fixed setpoint using P121.
- The following settings do not have any effect: **Bipolar / Fixed setpoint, Motor potentiometer / Fixed setpoint** as well as **Fixed setpoint + AI1** and **Fixed setpoint *AI1**. If you set these, the inverter always specifies the setpoint zero.

3.19.3 Actual value detection

The unipolar input AI1 is the actual value input.

You can set the operating mode for the actual value using *P112 AI1 operating mode* (see also parameter 116 ... 119):

- **0 ... 10 V:** The following applies to operation as a voltage input:
0 ... 10 V = 0 ... 100% PI controller actual value
- **0 ... 20 mA:** The following applies to operation as a current input:
0 ... 20 mA = 0 ... 100% PI controller actual value
- **4 ... 20 mA:** The following applies to operation as a current input:
4 ... 20 mA = 0 ... 100% PI controller actual value



You can scale the actual value detected with P253 PI actual value mode with a factor between 0 and 10.

P254 PI actual value scaling 0.1 ... 1 ... 10 Step width: 0.01

This parameter allows you to assign an offset subsequently to the scaled actual value.

P255 PI actual value offset 0 ... 100 [%] Step width: 0.1%

The scaled value with its offset is the actual value for the PI controller.

You can read the actual value via RS-485 or SBus using the following bus parameters:

P873 Actual value description PI1 [PI controller [%]]

P874 Actual value description PI2 [PI controller [%]]

P875 Actual value description PI3 [PI controller [%]]

PI1 = 0 ... 2¹⁴ = 0 ... 100% PI controller setpoint

PI2 = 0 ... 2¹⁴ = 0 ... 100% PI controller setpoint

PI3 = 0 ... 2¹⁴ = 0 ... 100% PI controller setpoint

3.19.4 Reference message

With this parameter, you can program a reference message with regard to the actual value of the PI controller. By doing this, you can monitor the actual value for violation of a limit value.

P450 PI actual value reference 0 ... 100 [%] Step width: 0.1%

P451 Signal = "1" if:
PI actual value < PI reference
PI actual value > PI reference

You have to program a binary output terminal to "PI controller actual value reference" to issue the reference signal. The reference signal operates with a hysteresis of 5%. The reference signal does not have a delay time and signals "1" depending on P451.

You must program the binary output DO01 P620, DO02 P621 or DO03 P622 to PI controller actual value reference.

3.19.5 Inverter control

You can determine the direction of rotation by using the terminals for the direction of rotation "CW/Stop and "CCW/Stop".

Upon enable, the inverter increases the speed up to P301 Minimum speed using the P130 Speed ramp. PI control becomes active once the minimum speed is reached. The PI controller correcting variable directly determines the speed setpoint.

If you revoke the CW/CCW terminal, the inverter deactivates PI control and stores the I-component of the PI controller. The speed decreases using the speed ramp (P131). If you enable the inverter before the drive has reached its stop speed, the PI controller becomes active again with the current setpoint.

If you stop the inverter with the "Enable/Stop" terminal, the drive decelerates with the stop ramp. The inverter stores the I-component of the controller.

With setpoint source RS485 or SBUS, the value of the PO data item determines the direction of rotation. "PI-REGLER %" and the value of the PO data item "PI-REGLER %" act as a setpoint for the PI controller.



3.20 Application examples

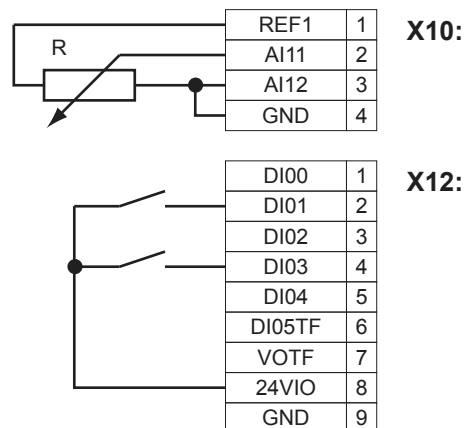
All application examples presented here assume that the unit has been started up correctly in accordance with the "Startup" section.

3.20.1 External setpoint potentiometer

The external setpoint potentiometer is not effective when manual operation is active.

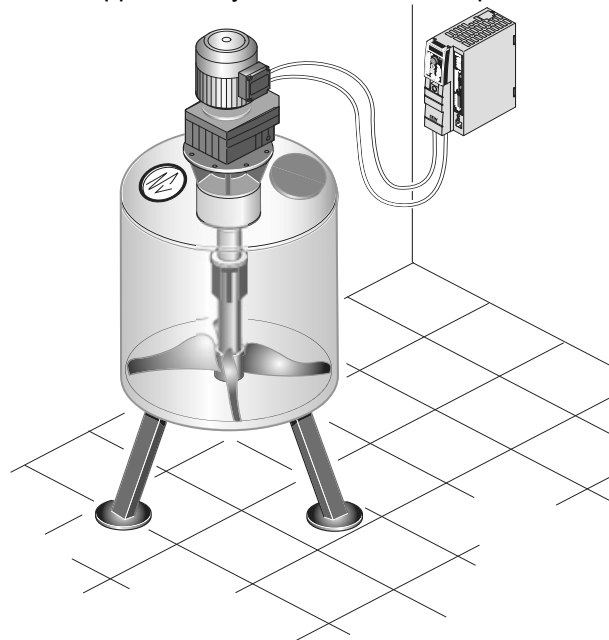
Connect an external setpoint potentiometer as follows:

The resistance value of the external setpoint potentiometer R must be $\geq 10\text{ k}\Omega$.



3.20.2 Speed-controlled agitator

In this application, you can control the speed with the FBG speed control module.



You use the keypad to control reset, start, stop and speed. Select the "FBG speed control module" icon to operate the agitator.



Parameter

Adapt the following parameters for the agitator:

- P122 FBG manual operation: Direction of Rotation
- Ramp t11 up (adjust with keypad or parameter P130)
- Ramp t11 up (adjust via keypad icon or parameter P131)
- P301 minimum speed
- P302 maximum speed
- P860 PWM frequency

3.20.3 Positioning a trolley

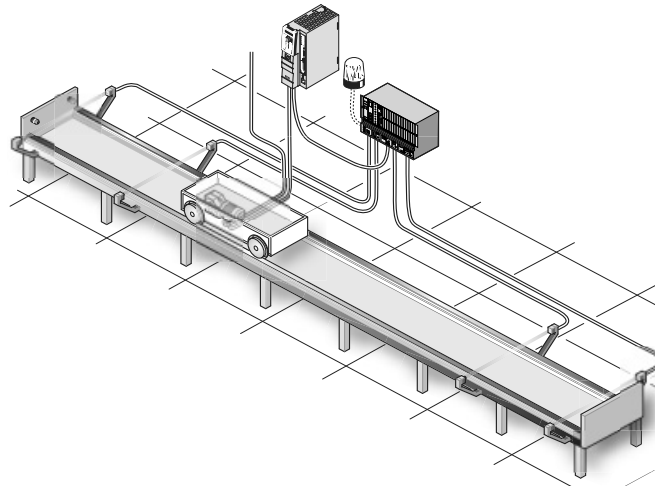
Principle

Positioning a trolley with rapid speed and creep speed, and position detection using proximity sensors.

The emergency off function must be guaranteed using a separate safety circuit.

Install a braking resistor.

Perform a startup for the VFC operating mode.





Project planning

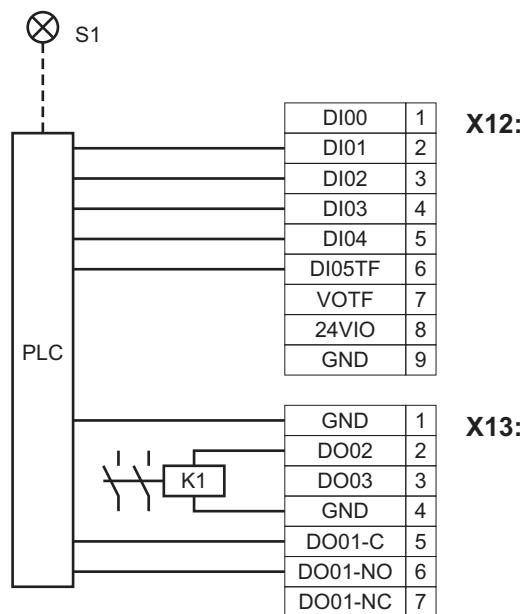
Application examples

Terminals

- Rapid speed: DI04 = 1 and DI05 = 1
- Creep speed: DI04 = 1 and DI05 = 0

Assign the electronics terminal strip with

- DI01 = CW/stop
- DI02 = CCW/Stop
- DI03 = Enable
- DO01-C and DO01-NO = "Fault"
- DO02 = brake



K1 is the brake contactor, S1 the fault indicator light.

The following signals between the machine controller PLC and MOVITRAC[®] B are important:

X12:2: Clockwise direction of rotation	X12:6: Creep speed/rapid speed
X12:3: Counterclockwise direction of rotation	X12:8: 24 V
X12:4: Start/Stop	X13:6: No fault
X12:5: Rapid speed	X13:2: Brake released

Parameter

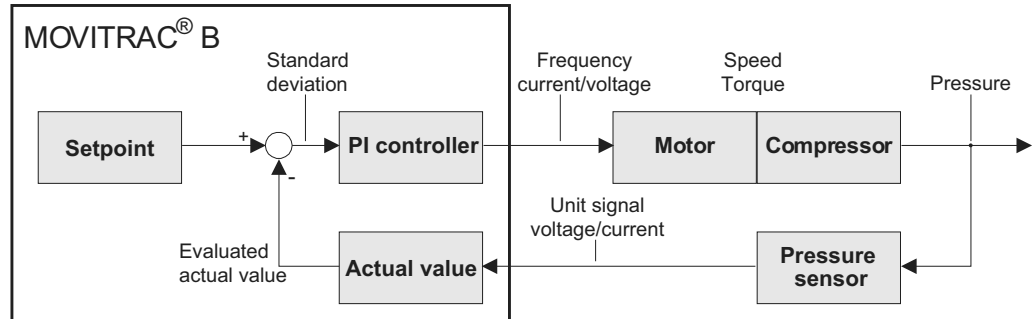
The following parameters are relevant for this application. Check whether you can leave all factory setting values unchanged.

P601 Binary input DI02: CCW/Stop	P604 Binary input DI05: n12/n22
P602 Binary input DI03: Enable	P620 Binary output DO01: Problem
P603 Binary input DI04: n11/n21	P621 Binary output DO02: Brake released



3.20.4 PI controller

This represents the basic structure of the control system with a PI controller, taking the example of a pressure control system.





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Ireland			
Sales Service	Dublin	Alperon Engineering Ltd. 48 Moyle Road Dublin Industrial Estate Glasnevin, Dublin 11	Tel. +353 1 830-6277 Fax +353 1 830-6458 info@alperon.ie
Israel			
Sales	Tel-Aviv	Liraz Handasa Ltd. Ahofer Str 34B / 228 58858 Holon	Tel. +972 3 5599511 Fax +972 3 5599512 office@liraz-handasa.co.il
Italy			
Assembly Sales Service	Milano	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Via Bernini,14 I-20020 Solaro (Milano)	Tel. +39 02 96 9801 Fax +39 02 96 799781 http://www.sew-eurodrive.it sewit@sew-eurodrive.it
Technical Offices	Bologna	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Via della Grafica, 47 I-40064 Ozzano dell'Emilia (Bo)	Tel. +39 051 65-23-801 Fax +39 051 796-595
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	Firenze	RIMA Via Einstein, 14 I-50013 Campi Bisenzio (Firenze)	Tel. +39 055 898 58-21 Fax +39 055 898 58-30
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	Verona	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Via P. Sgulmero, 27/A I-37132 Verona	Tel. +39 045 89-239-11 Fax +39 045 97-6079
Ivory Coast			
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Japan			
Assembly Sales Service	Iwata	SEW-EURODRIVE JAPAN CO., LTD 250-1, Shimoman-no, Iwata Shizuoka 438-0818	Tel. +81 538 373811 Fax +81 538 373814 http://www.sew-eurodrive.co.jp sewjapan@sew-eurodrive.co.jp
Technical Offices	Fukuoka	SEW-EURODRIVE JAPAN CO., LTD. C-go, 5th-floor, Yakuin-Hiruzu-Bldg. 1-5-11, Yakuin, Chuo-ku Fukuoka, 810-0022	Tel. +81 92 713-6955 Fax +81 92 713-6860 sewkyushu@jasmine.ocn.ne.jp
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	Tokyo	SEW-EURODRIVE JAPAN CO., LTD. Izumi-Bldg. 5 F 3-2-15 Misaki-cho Chiyoda-ku, Tokyo 101-0061	Tel. +81 3 3239-0469 Fax +81 3 3239-0943 sewtokyo@basil.ocn.ne.jp



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	DaeJeon	SEW-EURODRIVE KOREA Co., Ltd. No. 2017, Hongin officitel 536-9, Bongmyung-dong, Yusung-ku Daejeon 305-301	Tel. +82 42 828-6461 Fax +82 42 828-6463 sewdaejeon@netsgo.com
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	Szczecinek	SEW-EURODRIVE Polska Sp.z.o.o. ul. Mickiewicza 2 pok. 36 PL-78-400 Szczecinek	Tel. +48 94 3728820 Fax +48 94 3728821
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	Togliatti	ZAO SEW-EURODRIVE Sportivnaya Str. 4B, office 2 Samarskaya obl. RUS-445057 Togliatti	Tel. +7 8482 710529 Fax +7 8482 810590
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	Technical Offices	Port Elizabeth	SEW-EURODRIVE PTY LTD. 5 b Linsay Road Neave Township 6000 Port Elizabeth
Richards BayRichards Bay		SEW-EURODRIVE PTY LTD. 25 Eagle Industrial Park Alton Richards Bay P.O. Box 458 Richards Bay 3900	Tel. +27 35 797-3805 Fax +27 35 797-3819 dtait@sew.co.za



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	Lugo	Delegación Noroeste Apartado, 1003 E-27080 Lugo	Tel. +34 639 403348 Fax +34 982 202934
	Madrid	Delegación Madrid Gran Vía. 48-2° A-D E-28220 Majadahonda (Madrid)	Tel. +34 91 6342250 Fax +34 91 6340899
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	Stockholm	SEW-EURODRIVE AB Björkholmsvägen 10 S-14125 Huddinge	Tel. +46 8 44986-80 Fax +46 8 44986-93
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	Bern / Solothurn	Rudolf Bühler Muntersweg 5 CH-2540 Grenchen	Tel. +41 32 652 2339 Fax +41 32 652 2331
	Central Switzerland and Ticino	Beat Lütolf Baumacher 11 CH-6244 Nebikon	Tel. +41 62 756 4780 Fax +41 62 756 4786
	Zürich	René Rothenbühler Nörgelbach 7 CH-8493 Saland	Tel. +41 52 386 3150 Fax +41 52 386 3213
	Bodensee and East Switzerland	Markus Künzle Eichweg 4 CH-9403 Goldbach	Tel. +41 71 845 2808 Fax +41 71 845 2809



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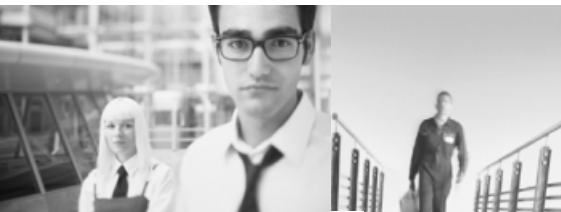
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	Taipei	Ting Shou Trading Co., Ltd. 6F-3, No. 267, Sec. 2 Tung Hwa South Road, Taipei	Tel. +886 2 27383535 Fax +886 2 27368268 Telex 27 245 sewtwn@ms63.hinet.net	
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	Khonkaen	SEW-EURODRIVE (Thailand) Ltd. 4th Floor, Kaow-U-HA MOTOR Bldg, 359/2, Mitraphab Road. Muang District Khonkaen 40000	Tel. +66 43 225745 Fax +66 43 324871 sew-thailand@sew-eurodrive.com	
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	Technical Offices	Ankara	SEW-EURODRIVE Hareket Sistemleri San. ve Tic. Ltd. Sti. Özcelik Is Merkezi, 14. Sok, No. 4/42 TR-06370 Ostim/Ankara	Tel. +90 312 3853390 / +90 312 3544715 / +90 312 3546109 Fax +90 312 3853258
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Assembly Sales Service	San Francisco	SEW-EURODRIVE INC. 30599 San Antonio St. Hayward, California 94544-7101	Tel. +1 510 487-3560 Fax +1 510 487-6381 cshayward@seweurodrive.com
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	Dayton	SEW-EURODRIVE INC. 2001 West Main Street Troy, Ohio 45373	Tel. +1 937 335-0036 Fax +1 937 440-3799 cstroy@seweurodrive.com
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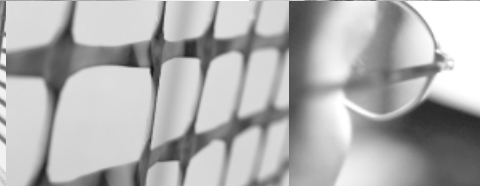
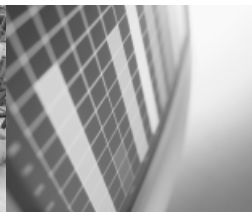
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