SEW EURODRIVE

MOVITRAC® B

Edition 06/2009
16816412 / EN

Catalog

SEW EURODRIVE

Contents

1 System Description MOVITRAC® B

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

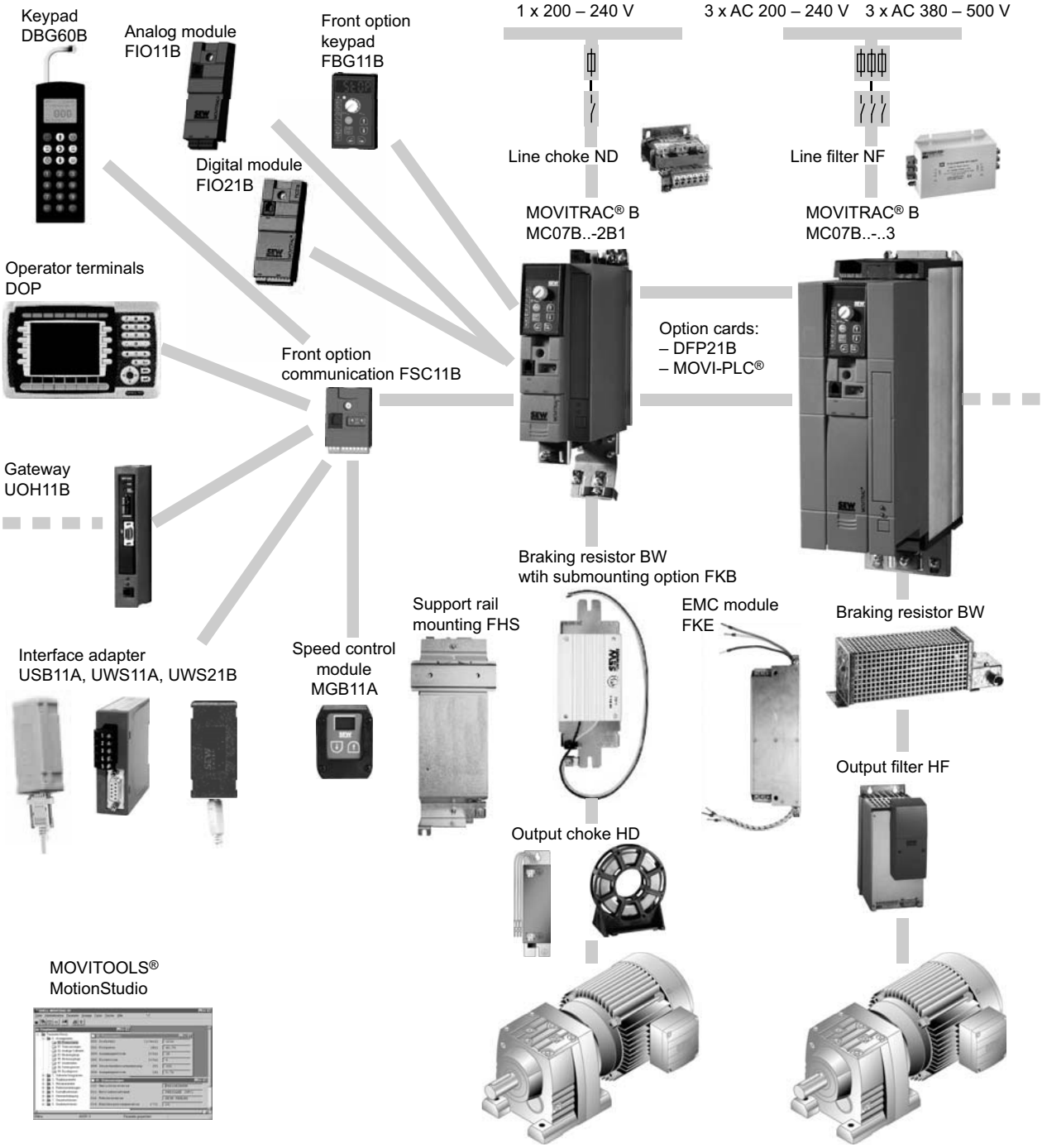
1.1 MOVITRAC® B – compact, versatile and universal

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



Power supply 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, or
- FIO21B digital module (in preparation), or
- FSC11B communication for connecting (only one option possible):
  - DBG60B keypad
  - Gateway UFx / UOH
  - UWS/USB interface adapter
  - SBus / RS-485
  - DOP operator terminals
  - MBG11A speed control module

Option cards
- PROFIBUS
- MOVI-PLC® controller

Installation
- FHS mounting rail attachment
- Submounting option for FKB braking resistor
- FKE EMC-module

MOVITOOLS® MotionStudio software

1.3 The units at a glance

Power supply connection	Motor power	Rated output current	MOVITRAC® B type	Size
230 V, 1-phase	0.25 kW / 0.34 HP	AC 1.7 A	MC07B**0003**-2B1-4-00	0XS
	0.37 kW / 0.50 HP	AC 2.5 A	MC07B**0004**-2B1-4-00	
	0.55 kW / 0.74 HP	AC 3.3 A	MC07B**0005**-2B1-4-00	0S
	0.75 kW / 1.0 HP	AC 4.2 A	MC07B**0008**-2B1-4-00	
	1.1 kW / 1.5 HP	AC 5.7 A	MC07B**0011**-2B1-4-00	0L
	1.5 kW / 2.0 HP	AC 7.3 A	MC07B**0015**-2B1-4-00	
	2.2 kW / 3.0 HP	AC 8.6 A	MC07B**0022**-2B1-4-00	
230 V, 3-phase	0.25 kW / 0.34 HP	AC 1.7 A	MC07B**0003**-2A3-4-00	0XS
	0.37 kW / 0.50 HP	AC 2.5 A	MC07B**0004**-2A3-4-00	
	0.55 kW / 0.74 HP	AC 3.3 A	MC07B**0005**-2A3-4-00/S0	0S
	0.75 kW / 1.0 HP	AC 4.2 A	MC07B**0008**-2A3-4-00/S0	
	1.1 kW / 1.5 HP	AC 5.7 A	MC07B**0011**-2A3-4-00/S0	0L
	1.5 kW / 2.0 HP	AC 7.3 A	MC07B**0015**-2A3-4-00/S0	
	2.2 kW / 3.0 HP	AC 8.6 A	MC07B**0022**-2A3-4-00/S0	
	3.7 kW / 5.0 HP	AC 14.5 A	MC07B**0037**-2A3-4-00	1
	5.5 kW / 7.4 HP	AC 22A	MC07B**0055**-2A3-4-00	2
	7.5 kW / 10 HP	AC 29 A	MC07B**0075**-2A3-4-00	
	11 kW / 15 HP	AC 42 A	MC07B**0110**-203-4-00	3
	15 kW / 20 HP	AC 54 A	MC07B**0150**-203-4-00	
	22 kW / 30 HP	AC 80 A	MC07B**0220**-203-4-00	4
	30 kW / 40 HP	AC 95 A	MC07B**0300**-203-4-00	
400 V, 3-phase	0.25 kW / 0.34 HP	AC 1.0 A	MC07B**0003**-5A3-4-00	0XS
	0.37 kW / 0.50 HP	AC 1.6 A	MC07B**0004**-5A3-4-00	
	0.55 kW / 0.74 HP	AC 2.0 A	MC07B**0005**-5A3-4-00/S0	0S
	0.75 kW / 1.0 HP	AC 2.4 A	MC07B**0008**-5A3-4-00/S0	
	1.1 kW / 1.5 HP	AC 3.1 A	MC07B**0011**-5A3-4-00/S0	
	1.5 kW / 2.0 HP	AC 4.0 A	MC07B**0015**-5A3-4-00/S0	
	2.2 kW / 3.0 HP	AC 5.5 A	MC07B**0022**-5A3-4-00/S0	0L
	3.0 kW / 4.0 HP	AC 7.0 A	MC07B**0030**-5A3-4-00/S0	
	4.0 kW / 5.4 HP	AC 9.5 A	MC07B**0040**-5A3-4-00/S0	
	5.5 kW / 7.4 HP	AC 12.5 A	MC07B**0055**-5A3-4-00	2S
	7.5 kW / 10 HP	AC 16 A	MC07B**0075**-5A3-4-00	
	11 kW / 15 HP	AC 24 A	MC07B**0110**-5A3-4-00	2
	15 kW / 20 HP	AC 32 A	MC07B**0150**-503-4-00	3
	22 kW / 30 HP	AC 46 A	MC07B**0220**-503-4-00	
	30 kW / 40 HP	AC 60 A	MC07B**0300**-503-4-00	
	37 kW / 50 HP	AC 73 A	MC07B**0370**-503-4-00	4
	45 kW / 60 HP	AC 89 A	MC07B**0450**-503-4-00	
	55 kW / 74 HP	AC 105 A	MC07B**0550**-503-4-00	5
	75 kW / 100 HP	AC 130 A	MC07B**0750**-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_N continuous duty
  - 150 % I_N for at least 60 s
  - Maximum 200 % breakaway torque (size 0)
- Rated operation up to an ambient temperature ϑ = 50 °C (122 °F), operation up to an ambient temperature ϑ = 60 °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 capable due to integrated brake chopper.
- Compact unit design for minimum control cabinet space requirement and optimum utilization of control cabinet volume.
- Units with "safe stop" function:
  - Unit variant (..-S0):
    - 3 × AC 380 – 500 V, 0.55 – 4.0 kW (0.74 – 5.4 HP)
    - 3 × AC 200 – 240 V, 0.55 – 2.2 kW (0.74 – 3.0 HP)
  - Standard unit: 3 × AC 380 – 500 V, 5.5 – 75 kW (7.4 – 100 HP)
- Integrated EMC line filter to maintain the specified limit classes on the line side / C1/ C2 to EN 61800-3:
  - Sizes 0 to 2: C2 without further measures
  - Sizes 0 to 5: C1 with corresponding filters / folding 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.

- Optional 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
  - Data backup parameter set
- Braking resistor can be submounted as an option for size 0.
- Separable signal terminals.
- Size 0:
  - Separable power terminals and signal terminals
  - EMC capacitor can be insulated for reduced earth-leakage currents and operation in IT system.
  - "Cold plate" installation possible.
  - Long motor cable length
- Up to size 2S: Operation on MDR regenerative power supply unit possible (see MOVIDRIVE® B documentation).

1.4.2 Controller

- 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 stationary speed accuracy.
- Motor stall protection by sliding current limitation in the field weakening range
- 2 complete motor parameter sets.
- Factory setting can be restored.
- Parameter lock for protection against changes to parameters.
- Protective functions for protection against
  - Overcurrent
  - 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
- 6 fixed setpoints.
- Frequency input.

1.4.4 Optional communication / operation

- CAN based system bus (SBus) for networking max. 64 MOVITRAC® B units. SBus master can be a PC, PLC or MOVIDRIVE®.
- 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
    - Ethernet/IP

1.5 MOVITOOLS® MotionStudio

The MOVITOOLS® MotionStudio program includes:

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

MOVITRAC® B has the following functions:

- Startup
- Parameter setting
- Visualization / diagnostics

1.5.1 SCOPE

SCOPE for MOVITOOLS® MotionStudio an oscilloscope program for SEW inverters. SCOPE allows you to optimize the drives yourself. 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 quickly get familiar with how to use SCOPE.

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

2 Technical Data

2.1 CE marking, UL approval and C-Tick

2.1.1 CE-marking

MOVITRAC® B frequency inverters comply with the regulations of the Low Voltage Directive 73/23/EEC.

MOVITRAC® B frequency inverters are designed for use as components for installation in machines 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/EEC. For detailed information on EMC compliant installation, refer to the publication "Electromagnetic Compatibility in Drive Engineering" from SEW-EURODRIVE.

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

The CE mark on the nameplate indicates conformity with the low voltage directive 73/23/EEC. We can provide a declaration of conformity on request.

2.1.2 UL approval / CSA / GOST-R certificate / C-Tick

UL and cUL approval (USA) has been granted for the following MOVITRAC® B units:

- 230 V / single-phase
- 230 V / 3-phase
- 400/500 V / 3-phase (0.25 – 45 kW / 0.34 – 60 HP)

cUL approval has been applied for the other units. cUL is equivalent to CSA approval.

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

C-Tick approval was applied for the entire MOVITRAC® B series. C-Tick certifies conformity with ACMA (Australian Communications and Media Authority) standards.

2.2 General technical data

The following technical data applies to all MOVITRAC® B frequency inverters independent 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)] • Sizes 0 to 2: C2 without further measures • Sizes 0 to 5: C1 with corresponding filters / folding ferrites C1/C2 to EN 61800-3
Leakage current	> 3.5 mA
Ambient temperature ϑ_A (up to 60 °C with current reduction)	• **230 V, 0.25 – 2.2 kW (0.34 – 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 = 100 % I_N / f_{PWM} = 4 kHz: –10 °C – +40 °C (14 °F – 104 °F) **Without overload capacity:** I_D = 100 % I_N / f_{PWM} = 4 kHz: –10 °C – +50 °C (14 °F – 122 °F) I_D = 100 % I_N / f_{PWM} = 8 kHz: –10 °C – +40 °C (14 °F – 104 °F) I_D = 125 % I_N / f_{PWM} = 4 kHz: –10 °C – +40 °C (14 °F – 104 °F) • **3 × 230 V, 3.7 – 30 kW (5.0 – 40 HP) / 400/500 V, 5.5 – 75 kW (7.4 – 100 HP)** **With overload capacity** (max. 150% for 60 s): I_D = 100 % I_N / f_{PWM} = 4 kHz: 0 °C – +40 °C (32 °F – 104 °F) **Without overload capacity:** I_D = 100 % I_N / f_{PWM} = 4 kHz: 0 °C – +50 °C (32 °F – 122 °F) I_D = 100 % I_N / f_{PWM} = 8 kHz: 0 °C – +40 °C (32 °F – 104 °F) I_D = 125 % I_N / f_{PWM} = 4 kHz: 0 °C – +40 °C (32 °F – 104 °F) • Mounting plate with **"cold plate"** < 70°C (+158 °F)
Derating ambient temperature (current reduction)	2.5 % I_N per K at 40 °C – 50 °C (104 °F – 122 °F) 3 % I_N per K at 50 °C – 60 °C (122 °F – 140 °F)
Climate class	EN 60721-3-3, class 3K3
Storage temperature Transport temperature	–25 °C – +75 °C (–13 °F – 167 °F) –25 °C – +75 °C (–13 °F – 167 °F)
Type of cooling	Self-cooled: 230 V: ≤ 0.75 kW (1.0 HP); 400/500 V: ≤ 1.1 kW (1.5 HP) Forced cooling: 230 V: ≥ 1.1 kW (1.5 HP) (temperature controlled fan, 400/500 V: ≥ 1.5 kW (3.0 HP) Response threshold 45 °C (113 °F)
Degree of protection EN 60529 (NEMA1)	Sizes 0 to 3: IP20 Sizes 4 – 5 power connections: • IP00 • With the supplied Plexiglas cover mounted and shrinking tube mounted (not supplied) IP10
Duty cycle	Continuous duty
Overvoltage category	III according to IEC 60664-1 (VDE 0110-1)
Mains voltage tolerance	EN 50160: ±10 %
Pollution class	2 according to IEC 60664-1 (VDE 0110-1)

MOVITRAC® B	All sizes
Installation altitude	Up to h ≤ 1000 m (3281 ft) without restrictions. The following restrictions apply at h ≥ 1000 m (3281 ft): • from 1000 m (3281 ft) to max. 4000 m (13120 ft): – I_N reduction by 1 % per 100 m (328 ft) • from 2000 m (6562 ft) to max. 4000 m (13120 ft): – AC 230 V units: Reduction of the rated mains voltage V_{mains} by AC 3 V per 100 m (328 ft) – AC 500 V units: Reduction of the rated mains voltage V_{mains} 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.
Dimensioning	According to DIN ISO 276-v
Size 0: Restrictions for continuous duty with 125 % I_N	• Maximum ambient temperature ϑ_A: 40 °C (104 °F) • Maximum rated mains voltage V_{mains}: 400 V • No DIN rail mounting / submounting resistor • At 1 × 230 V: Provide ND line choke

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[1] (differential input)	X10:1 X10:2 X10:3 X10:4	REF1 AI11 (+) AI12 (–) GND		+10 V, R_{Lmin} = 3 kΩ 0 – +10 V (R_i > 200 kΩ) 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/halt CCW/halt Enable/stop n11/n21 n12/n22	R_i = 3 kΩ, I_E = 10 mA, sampling time 5 ms, PLC compatible Signal level according to EN 61131-2 type 1 or 3: • +11 – +30 V → 1 / contact closed • –3 – +5 V → 0 / contact open • X12:2 / DI01 with fixed assignment CW/halt • 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 kΩ
Auxiliary voltage output/external voltage supply[2]	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 See the Project planning/external DC 24 V voltage supply section.
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	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

Function	Terminal	Designation	Default	Data
Safety contact	X17:1	GND: Reference potential for X17:2		
	X17:2	VO24: U_{OUT} = DC 24 V, only to supply X17:4 of the same unit; it **cannot be used** to supply other units.		
	X17:3	SOV24: Reference potential for DC+24 V "safe stop" input (safety contact)		
	X17:4	SVI24: DC+24 V "safe stop" input (safety contact)		
	Permitted cable cross section			One core per terminal: 0.08 – 1.5 mm² (AWG28 – 16) Two cores per terminal: 0.25 – 1.0 mm² (AWG23 – 17)
	Power consumption X17:4			Size 0: 3 W Size 1: 5 W Size 2, 2S: 6 W Size 3: 7.5 W Size 4: 8 W Size 5: 10 W
	Input capacitance X17:4			Size 0: 27 µF Sizes 1 to 5: 270 µF
	Time for restart Time to inhibit output stage			t_A = 200 ms t_S = 200 ms
	Signal level			DC +19.2 V – +30 V = "1" = contact closed DC –30 V – +5 V = "0" = contact open
Terminal response times	Binary input and output terminals are updated every 5 ms			
Max. cable cross-section	1.5 mm² (AWG15) without conductor end sleeves 1.0 mm² (AWG17) with conductor end sleeves			
Cable stripping length	X10 / X12 / X13: 5 mm FSC11B / FIO11B / FIO21B: 7 mm			
Tightening torque	X10 / X12 / X13: 0.25 Nm FSC11B / FIO11B / FIO21B: 0.22 – 0.25 Nm			

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

2) The MC07B...-S0 unit type must always be supplied with external voltage.

2.3.1 DC 24 V power demand for 24 V backup mode

Size	Basic unit power demand[1)]	DBG60B	FIO11B	Fieldbus option[2)3)]	DHP11B[3)]
0 MC07B..-00	5 W	1 W	2 W	3 W	4.5 W
0 MC07B..-S0	12 W				
1, 2S, 2	17 W				
3	23 W				
4, 5	25 W				

1) FBG11B, FSC11B (UWS11A/USB11A) included. Take account of the additional load of the binary inputs with 2.4 W per 100 mA.

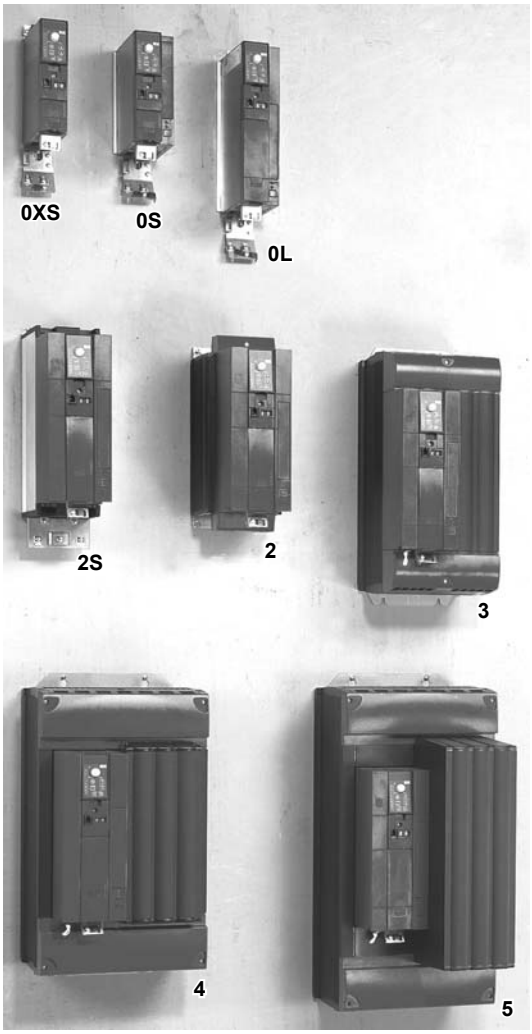
2) Fieldbus options are: DFP21B, DFD11B, DFE11B, ...

3) These options must always be supplied externally.

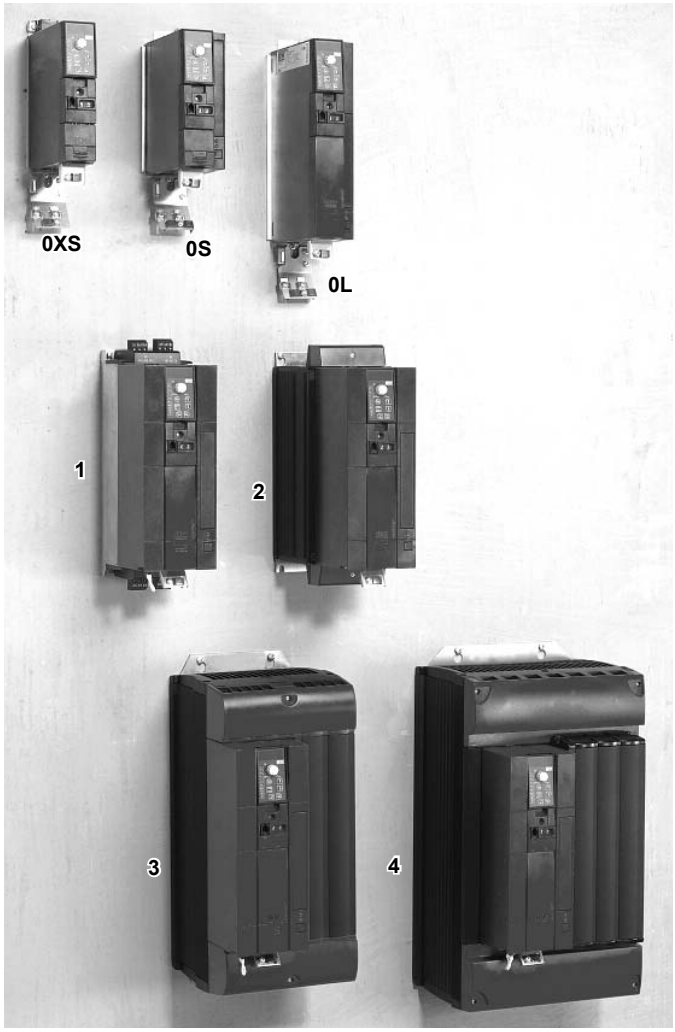
2.4 Technical data of MOVITRAC® B

2.4.1 Overview of MOVITRAC® B

400 / 500 V



230 V

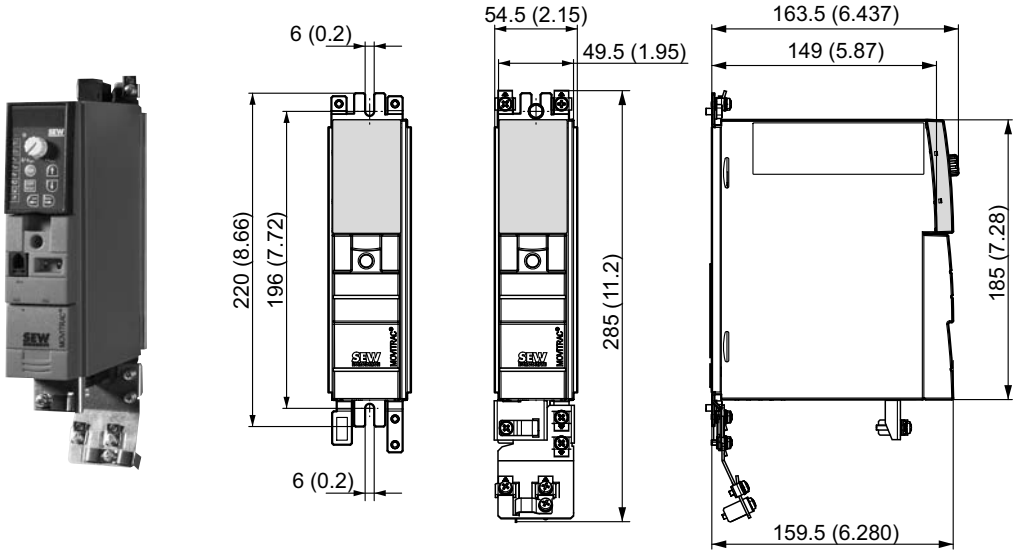


Power supply connection 400 / 500 V / 3-phase								
Size	**0XS**	**0S**	**0L**	**2S**	**2**	**3**	**4**	**5**
Power [kW / HP]	0.25 / 0.34 0.37 / 0.50	0.55 / 0.74 0.75 / 1.0 1.1 / 1.5 1.5 / 2.0	2.2 / 3.0 3.0 / 4.0 4.0 / 5.4	5.5 / 7.4 7.5 / 10	11 / 15	15 / 20 22 / 30 30 / 40	37 / 50 45 / 60	55 / 74 75 / 100

Power supply connection 230 V / 1-phase			
Size	**0XS**	**0S**	**0L**
Power [kW / HP]	0.25 / 0.34 0.37 / 0.50	0.55 / 0.74 0.75 / 1.0	1.1 / 1.5 1.5 / 2.0 2.2 / 3.0

Power supply connection 230 V / 3-phase							
Size	**0XS**	**0S**	**0L**	**1**	**2**	**3**	**4**
Power [kW / HP]	0.25 / 0.34 0.37 / 0.50	0.55 / 0.74 0.75 / 1.0	1.1 / 1.5 1.5 / 2.0 2.2 / 3.0	3.7 / 5.0	5.5 / 7.4 7.5 / 10	11 / 15 15 / 20	22 / 30 30 / 40

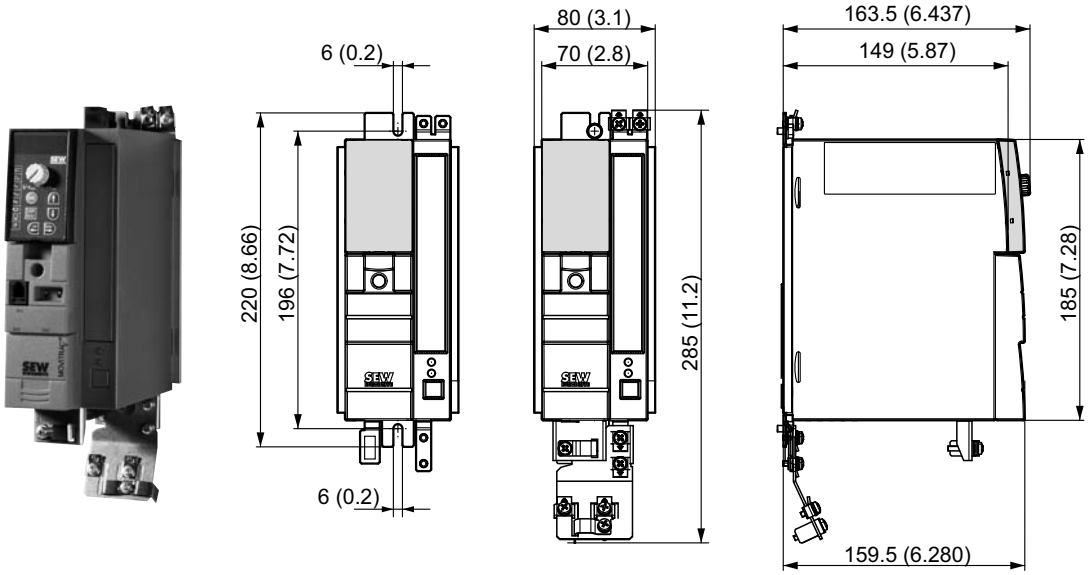
2.4.2 AC 400 / 500 V / 3-phase / size 0XS / 0.25 / 0.37 kW / 0.34 / 0.50 HP



MOVITRAC® MC07B (3-phase power supply) Part number		0003-5A3-4-00 828 515 2	0004-5A3-4-00 828 516 0
INPUT[1]			
Rated mains voltage	V_{mains}	3 × AC 380 – 500 V	
Rated mains frequency	f_{mains}	50 / 60 Hz ± 5 %	
Rated mains current, 100 % operation Rated mains current, 125 % operation	I_{mains} $I_{mains\ 125}$	AC 0.9 A AC 1.1 A	AC 1.4 A AC 1.8 A
OUTPUT			
Output voltage	V_O	3 × 0 – U_{mains}	
Recommended motor power 100 % operation Recommended motor power 125 % operation	P_{Mot} $P_{Mot\ 125}$	0.25 kW / 0.34 HP 0.37 kW / 0.50 HP	0.37 kW / 0.50 HP 0.55 kW / 0.74 HP
Rated output current 100 % operation Rated output current 125 % operation	I_N $I_{N\ 125}$	AC 1.0 A AC 1.3 A	AC 1.6 A AC 2.0 A
Apparent output power 100 % operation Apparent output power 125 % operation	S_N $S_{N\ 125}$	0.7 kVA 0.9 kVA	1.1 kVA 1.4 kVA
Minimum permitted braking resistance value (4 quadrant operation)	R_{BW_min}	68 Ω	
GENERAL INFORMATION			
Power loss 100 % operation Power loss 125 % operation	P_V $P_{V\ 125}$	30 W 35 W	35 W 40 W
Current limitation		150 % I_N for at least 60 seconds	
Terminal cross section / tightening torque	Terminals	4 mm^2 / AWG12 / 0.5 Nm / 4 lb in	
Dimensions	W × H × D	54.5 × 185 × 163.5 mm / 2.15 × 7.28 × 6.437 in	
Mass	m	1.3 kg / 2.9 lb	

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

2.4.3 AC 400 / 500 V / 3-phase / size 0S / 0.55 / 0.75 / 1.1 / 1.5 kW / 0.74 / 1.0 / 1.5 / 2.0 HP

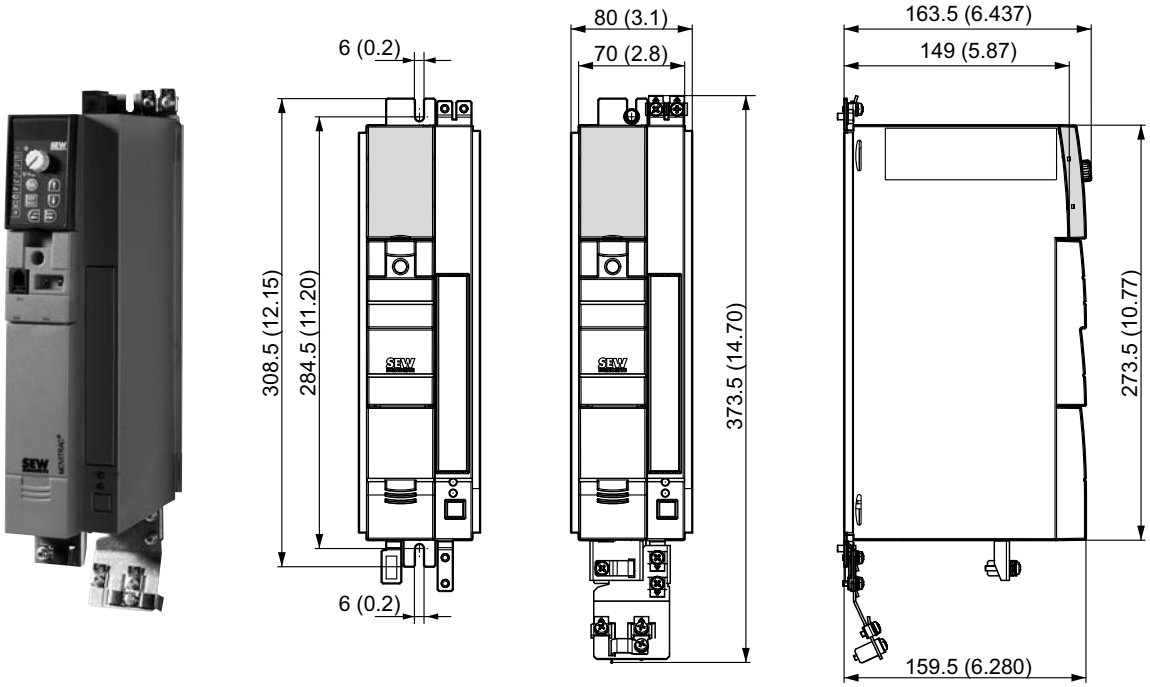


MOVITRAC® MC07B (3-phase power supply)		0005-5A3-4-x0	0008-5A3-4-x0	0011-5A3-4-x0	0015-5A3-4-x0
Part number, standard unit (-00) **Part number "Safe stop" (-S0)[1])**		**828 517 9** **828 995 6**	**828 518 7** **828 996 4**	**828 519 5** **828 997 2**	**828 520 9** **828 998 0**
INPUT[2)]					
Rated mains voltage	V_{mains}	3 × AC 380 – 500 V			
Rated mains frequency	f_{mains}	50 / 60 Hz ± 5 %			
Rated mains current, 100 % operation Rated mains current, 125 % operation	I_{mains} $I_{mains\ 125}$	AC 1.8 A AC 2.3 A	AC 2.2 A AC 2.6 A	AC 2.8 A AC 3.5 A	AC 3.6 A AC 4.5 A
OUTPUT					
Output voltage	V_O	3 × 0 – V_{mains}			
Recommended motor power 100 % operation Recommended motor power 125 % operation	P_{Mot} $P_{Mot\ 125}$	0.55 kW / 0.74 HP 0.75 kW / 1.0 HP	0.75 kW / 1.0 HP 1.1 kW / 1.5 HP	1.1 kW / 1.5 HP 1.5 kW / 2.0 HP	1.5 kW / 2.0 HP 2.2 kW / 3.0 HP
Rated output current 100 % operation Rated output current 125 % operation	I_N $I_{N\ 125}$	AC 2.0 A AC 2.5 A	AC 2.4 A AC 3.0 A	AC 3.1 A AC 3.9 A	AC 4.0 A AC 5.0 A
Apparent output power 100 % operation Apparent output power 125 % operation	S_N $S_{N\ 125}$	1.4 kVA 1.7 kVA	1.7 kVA 2.1 kVA	2.1 kVA 2.7 kVA	2.8 kVA 3.5 kVA
Minimum permitted braking resistance value (4 quadrant operation)	R_{BW_min}	68 Ω			
GENERAL INFORMATION					
Power loss 100 % operation Power loss 125 % operation	P_V $P_{V\ 125}$	40 W 45 W	45 W 50 W	50 W 60 W	60 W 75 W
Current limitation		150 % I_N for at least 60 seconds			
Terminal cross section / tightening torque	Terminals	4 mm^2 / AWG12 / 0.5 Nm / 4 lb in			
Dimensions	W × H × D	80 × 185 × 163.5 mm / 3.1 × 7.28 × 6.437 in			
Mass	m	1.5 kg / 3.3 lb			

1) The unit type MC07B...-S0 must always be supplied by an external DC 24 V power supply unit.

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

2.4.4 AC 400 / 500 V / 3-phase / size 0L / 2.2 / 3.0 / 4.0 kW / 3.0 / 4.0 / 5.4 HP

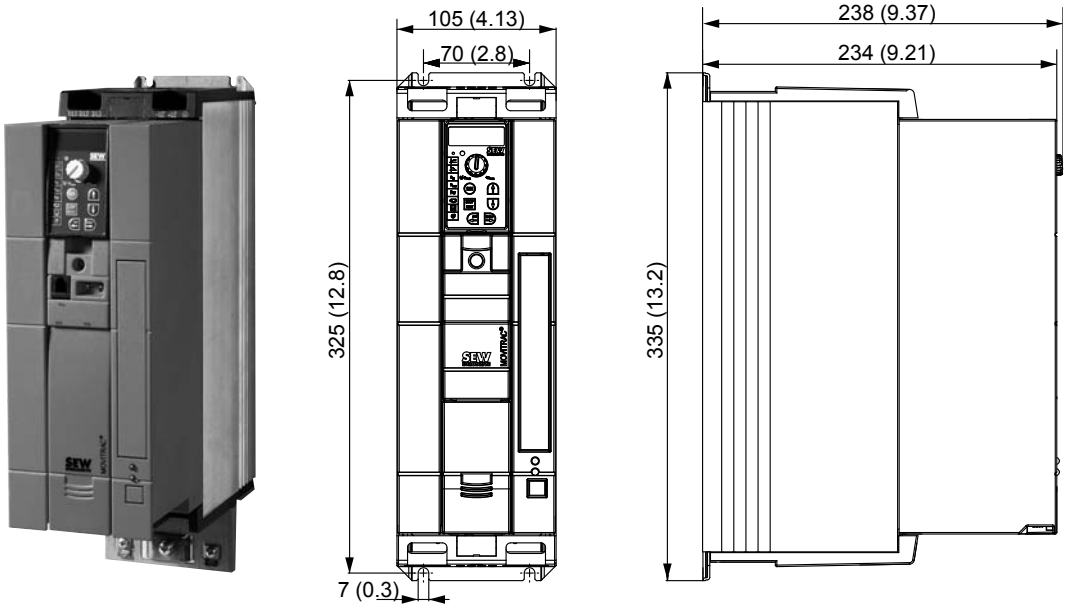


MOVITRAC® MC07B (3-phase power supply)		0022-5A3-4-x0	0030-5A3-4-x0	0040-5A3-4-x0
Part number, standard unit (-00) **Part number "Safe stop" (-S0)[1])**		**828 521 7** **828 999 9**	**828 522 5** **829 000 8**	**828 523 3** **829 001 6**
INPUT[2)]				
Rated mains voltage	V_{mains}	3 × AC 380 – 500 V		
Rated mains frequency	f_{mains}	50 / 60 Hz ± 5 %		
Rated mains current, 100 % operation Rated mains current, 125 % operation	I_{mains} $I_{mains\ 125}$	AC 5.0 A AC 6.2 A	AC 6.3 A AC 7.9 A	AC 8.6 A AC 10.7 A
OUTPUT				
Output voltage	V_O	3 × 0 – V_{mains}		
Recommended motor power 100 % operation Recommended motor power 125 % operation	P_{Mot} $P_{Mot\ 125}$	2.2 kW / 3.0 HP 3.0 kW / 4.0 HP	3.0 kW / 4.0 HP 4.0 kW / 5.4 HP	4.0 kW / 5.4 HP 5.5 kW / 7.4 HP
Rated output current 100 % operation Rated output current 125 % operation	I_N $I_{N\ 125}$	AC 5.5 A AC 6.9 A	AC 7.0 A AC 8.8 A	AC 9.5 A AC 11.9 A
Apparent output power 100 % operation Apparent output power 125 % operation	S_N $S_{N\ 125}$	3.8 kVA 4.8 kVA	4.8 kVA 6.1 kVA	6.6 kVA 8.2 kVA
Minimum permitted braking resistance value (4 quadrant operation)	R_{BW_min}	68 Ω		
GENERAL INFORMATION				
Power loss 100 % operation Power loss 125 % operation	P_V $P_{V\ 125}$	80 W 95 W	95 W 120 W	125 W 180 W
Current limitation		150 % I_N for at least 60 seconds		
Terminal cross section / tightening torque	Terminals	4 mm^2 / AWG12 / 0.5 Nm / 4 lb in		
Dimensions	W × H × D	80 × 273.5 × 163.5 mm / 3.1 × 10.77 × 6.437 in		
Mass	m	2.1 kg / 4.6 lb		

1) The unit type MC07B...-S0 must always be supplied by an external DC 24 V power supply unit.

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

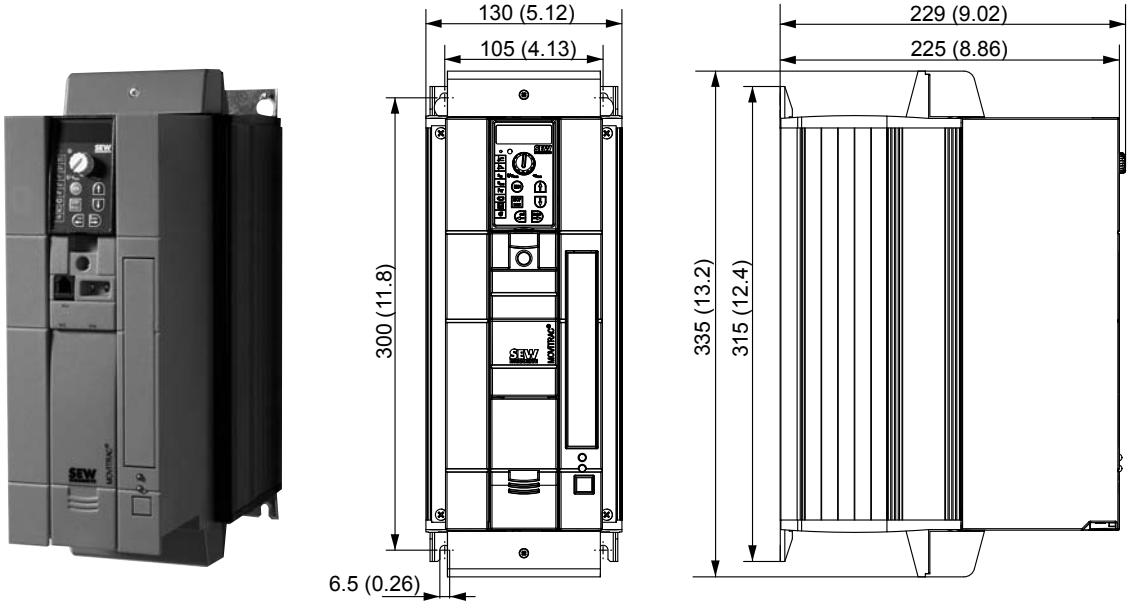
2.4.5 AC 400 / 500 V / 3-phase / size 2S / 5.5 / 7.5 kW / 7.4 / 10 HP



MOVITRAC® MC07B (3-phase power supply) Part number		0055-5A3-4-00 828 524 1	0075-5A3-4-00 828 526 8
INPUT[1]			
Rated mains voltage	V_{mains}	3 × AC 380 – 500 V	
Rated mains frequency	f_{mains}	50 / 60 Hz ± 5 %	
Rated mains current, 100 % operation Rated mains current, 125 % operation	I_{mains} $I_{mains\ 125}$	AC 11.3 A AC 14.1 A	AC 14.4 A AC 18.0 A
OUTPUT			
Output voltage	V_O	3 × 0 – U_{mains}	
Recommended motor power 100 % operation Recommended motor power 125 % operation	P_{Mot} $P_{Mot\ 125}$	5.5 kW / 7.4 HP 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_N $I_{N\ 125}$	AC 12.5 A AC 15.6 A	AC 16 A AC 20 A
Apparent output power 100 % operation Apparent output power 125 % operation	S_N $S_{N\ 125}$	8.7 kVA 10.8 kVA	11.1 kVA 13.9 kVA
Minimum permitted braking resistance value (4 quadrant operation)	R_{BW_min}	47 Ω	
GENERAL INFORMATION			
Power loss 100 % operation Power loss 125 % operation	P_V $P_{V\ 125}$	220 W 290 W	290 W 370 W
Current limitation		150 % I_N for at least 60 seconds	
Terminal cross section / tightening torque	Terminals	4 mm^2 / AWG12 / 0.6 Nm / 5 lb in	
Dimensions	W × H × D	105 × 335 × 238 mm / 4.13 × 13.2 × 9.37 in	
Mass	m	5.0 kg / 11 lb	

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

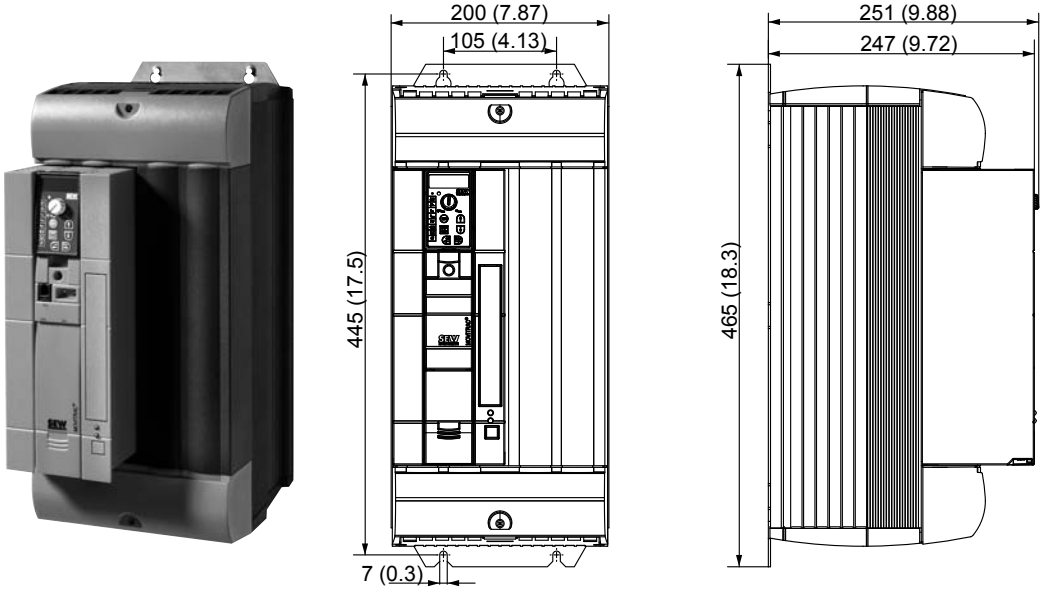
2.4.6 AC 400 / 500 V / 3-phase / size 2 / 11 kW / 15 HP



MOVITRAC® MC07B (3-phase power supply) Part number		0110-5A3-4-00 828 527 6
INPUT[1]		
Rated mains voltage	V_{mains}	3 × AC 380 – 500 V
Rated mains frequency	f_{mains}	50 / 60 Hz ± 5 %
Rated mains current, 100 % operation Rated mains current, 125 % operation	I_{mains} $I_{mains\ 125}$	AC 21.6 A AC 27.0 A
OUTPUT		
Output voltage	V_O	3 × 0 – V_{mains}
Recommended motor power 100 % operation Recommended motor power 125 % operation	P_{Mot} $P_{Mot\ 125}$	11 kW / 15 HP 15 kW / 20 HP
Rated output current 100 % operation Rated output current 125 % operation	I_N $I_{N\ 125}$	AC 24 A AC 30 A
Apparent output power 100 % operation Apparent output power 125 % operation	S_N $S_{N\ 125}$	16.6 kVA 20.8 kVA
Minimum permitted braking resistance value (4 quadrant operation)	R_{BW_min}	22 Ω
GENERAL INFORMATION		
Power loss 100 % operation Power loss 125 % operation	P_V $P_{V\ 125}$	400 W 500 W
Current limitation		150 % I_N for at least 60 seconds
Terminal cross section / tightening torque	Terminals	4 mm^2 / AWG12 / 1.5 Nm / 13 lb in
Dimensions	W × H × D	130 × 335 × 229 mm / 5.12 × 13.2 × 9.02 in
Mass	m	6.6 kg / 15 lb

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

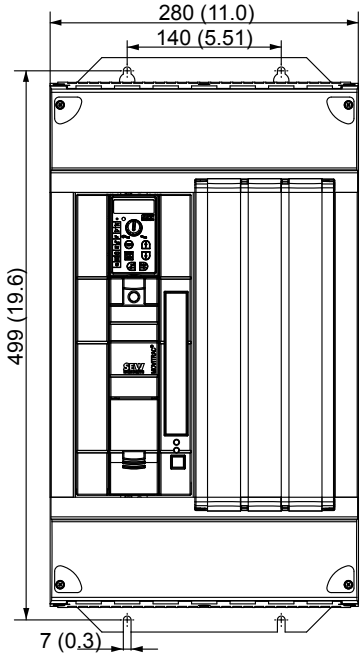
2.4.7 AC 400 / 500 V / 3-phase / size 3 / 15 / 22 / 30 kW / 20 / 30 / 40 HP

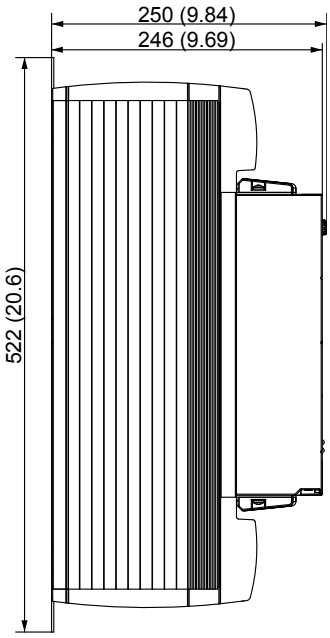


MOVITRAC® MC07B (3-phase power supply) Part number		0150-503-4-00 828 528 4	0220-503-4-00 828 529 2	0300-503-4-00 828 530 6
INPUT[1]				
Rated mains voltage	V_{mains}	3 × AC 380 – 500 V		
Rated mains frequency	f_{mains}	50 / 60 Hz ± 5 %		
Rated mains current, 100 % operation Rated mains current, 125 % operation	I_{mains} $I_{mains\ 125}$	AC 28.8 A AC 36.0 A	AC 41.4 A AC 51.7 A	AC 54.0 A AC 67.5 A
OUTPUT				
Output voltage	V_O	3 × 0 – V_{mains}		
Recommended motor power 100 % operation Recommended motor power 125 % operation	P_{Mot} $P_{Mot\ 125}$	15 kW / 20 HP 22 kW / 30 HP	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_N $I_{N\ 125}$	AC 32 A AC 40 A	AC 46 A AC 57.5 A	AC 60 A AC 75 A
Apparent output power 100 % operation Apparent output power 125 % operation	S_N $S_{N\ 125}$	22.2 kVA 27.7 kVA	31.9 kVA 39.8 kVA	41.6 kVA 52.0 kVA
Minimum permitted braking resistance value (4 quadrant operation)	R_{BW_min}	15 Ω	12 Ω	
GENERAL INFORMATION				
Power loss 100 % operation Power loss 125 % operation	P_V $P_{V\ 125}$	550 W 690 W	750 W 940 W	950 W 1250 W
Current limitation		150 % I_N for at least 60 seconds		
Terminal cross section / tightening torque	Terminals	6 mm^2 / AWG10	10 mm^2 / AWG8	16 mm^2 / AWG6
		3.5 Nm / 31 lb in		
Dimensions	W × H × D	200 × 465 × 251 mm / 7.87 × 18.3 × 9.88 in		
Mass	m	15 kg / 33 lb		

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

2.4.8 AC 400 / 500 V / 3-phase / size 4 / 37 / 45 kW / 50 / 60 HP

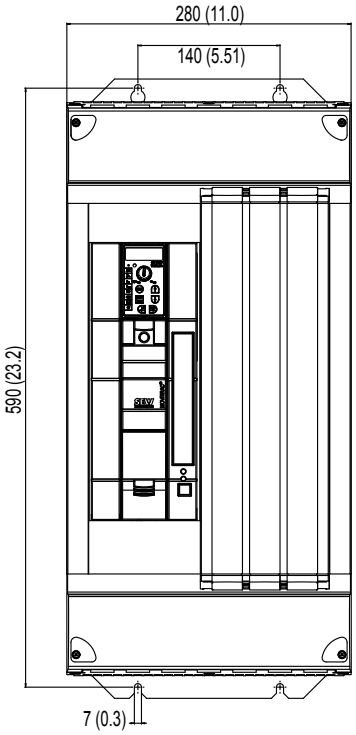


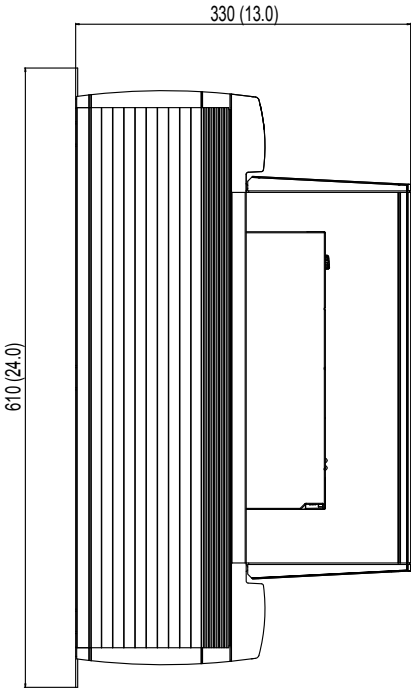


MOVITRAC® MC07B (3-phase power supply) Part number		0370-503-4-00 828 531 4	0450-503-4-00 828 532 2
INPUT[1]			
Rated mains voltage	V_{mains}	3 × AC 380 – 500 V	
Rated mains frequency	f_{mains}	50 / 60 Hz ± 5 %	
Rated mains current, 100 % operation Rated mains current, 125 % operation	I_{mains} $I_{mains\ 125}$	AC 65.7 A AC 81.9 A	AC 80.1 A AC 100.1 A
OUTPUT			
Output voltage	V_O	3 × 0 – V_{mains}	
Recommended motor power 100 % operation Recommended motor power 125 % operation	P_{Mot} $P_{Mot\ 125}$	37 kW / 50 HP 45 kW / 60 HP	45 kW / 60 HP 55 kW / 74 HP
Rated output current 100 % operation Rated output current 125 % operation	I_N $I_{N\ 125}$	AC 73 A AC 91.3 A	AC 89 A AC 111.3 A
Apparent output power 100 % operation Apparent output power 125 % operation	S_N $S_{N\ 125}$	50.6 kVA 63.2 kVA	61.7 kVA 77.1 kVA
Minimum permitted braking resistance value (4 quadrant operation)	R_{BW_min}	6 Ω	
GENERAL INFORMATION			
Power loss 100 % operation Power loss 125 % operation	P_V $P_{V\ 125}$	1200 W 1450 W	1400 W 1820 W
Current limitation		150 % I_N for at least 60 seconds	
Terminal cross section / tightening torque	Terminals	25 mm^2 / AWG4	35 mm^2 / AWG2
		14 Nm / 120 lb in	
Dimensions	W × H × D	280 × 522 × 250 mm / 11.0 × 20.6 × 9.84 in	
Mass	m	27 kg / 60 lb	

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

2.4.9 AC 400 / 500 V / 3-phase / size 5 / 55 / 75 kW / 74 / 100 HP

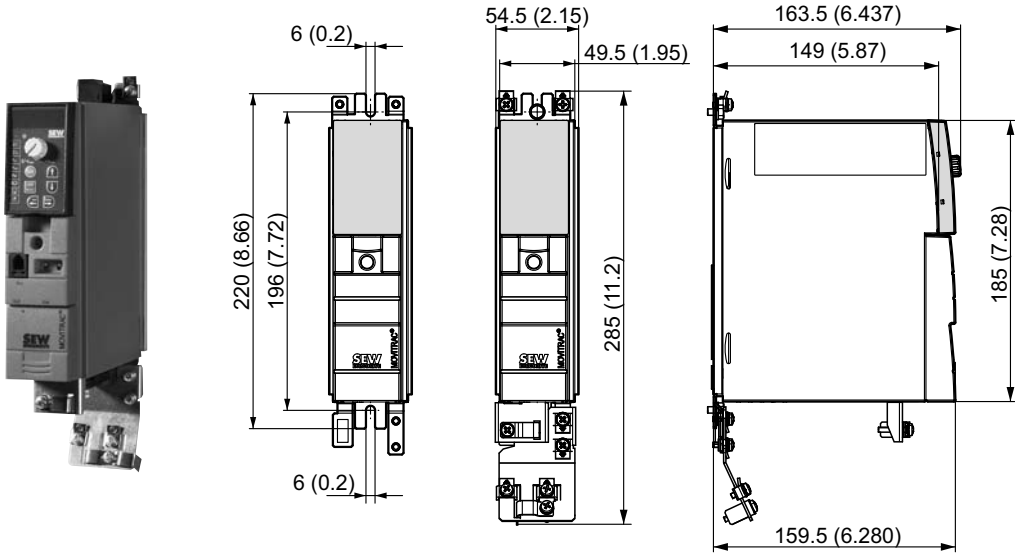




MOVITRAC® MC07B (3-phase power supply) Part number		0550-503-4-00 829 527 1	0750-503-4-00 829 529 8
INPUT[1]			
Rated mains voltage	V_{mains}	3 × AC 380 – 500 V	
Rated mains frequency	f_{mains}	50 / 60 Hz ± 5 %	
Rated mains current, 100 % operation Rated mains current, 125 % operation	I_{mains} $I_{mains\ 125}$	AC 94.5 A AC 118.1 A	AC 117 A AC 146.3 A
OUTPUT			
Output voltage	V_O	3 × 0 – V_{mains}	
Recommended motor power 100 % operation Recommended motor power 125 % operation	P_{Mot} $P_{Mot\ 125}$	55 kW / 74 HP 75 kW / 100 HP	75 kW / 100 HP 90 kW / 120 HP
Rated output current 100 % operation Rated output current 125 % operation	I_N $I_{N\ 125}$	AC 105 A AC131 A	AC 130 A AC 162 A
Apparent output power 100 % operation Apparent output power 125 % operation	S_N $S_{N\ 125}$	73.5 kVA 90.8 kVA	91.0 kVA 112.2 kVA
Minimum permitted braking resistance value (4 quadrant operation)	R_{BW_min}	6 Ω	4 Ω
GENERAL INFORMATION			
Power loss 100 % operation Power loss 125 % operation	P_V $P_{V\ 125}$	1700 W 2020 W	2000 W 2300 W
Current limitation		150 % I_N for at least 60 seconds	
Terminal cross section / tightening torque	Terminals	35 mm^2 / AWG2	50 mm^2 / AWG0
		14 Nm / 120 lb in	
Dimensions	W × H × D	280 × 610 × 330 mm / 11.0 × 24.0 × 13.0 in	
Mass	m	35 kg / 77 lb	

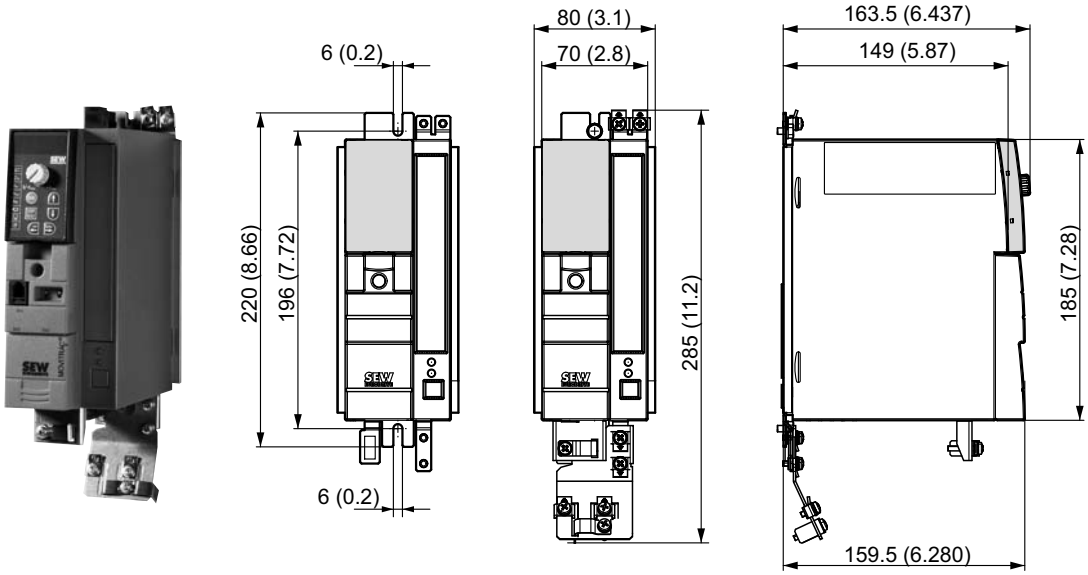
1) The mains and output currents must be reduced by 20 % from the nominal values for V_{mains} = 3 × AC 500 V.

2.4.10 AC 230 V / 1-phase / size 0XS / 0.25 / 0.37 kW / 0.34 / 0.50 HP



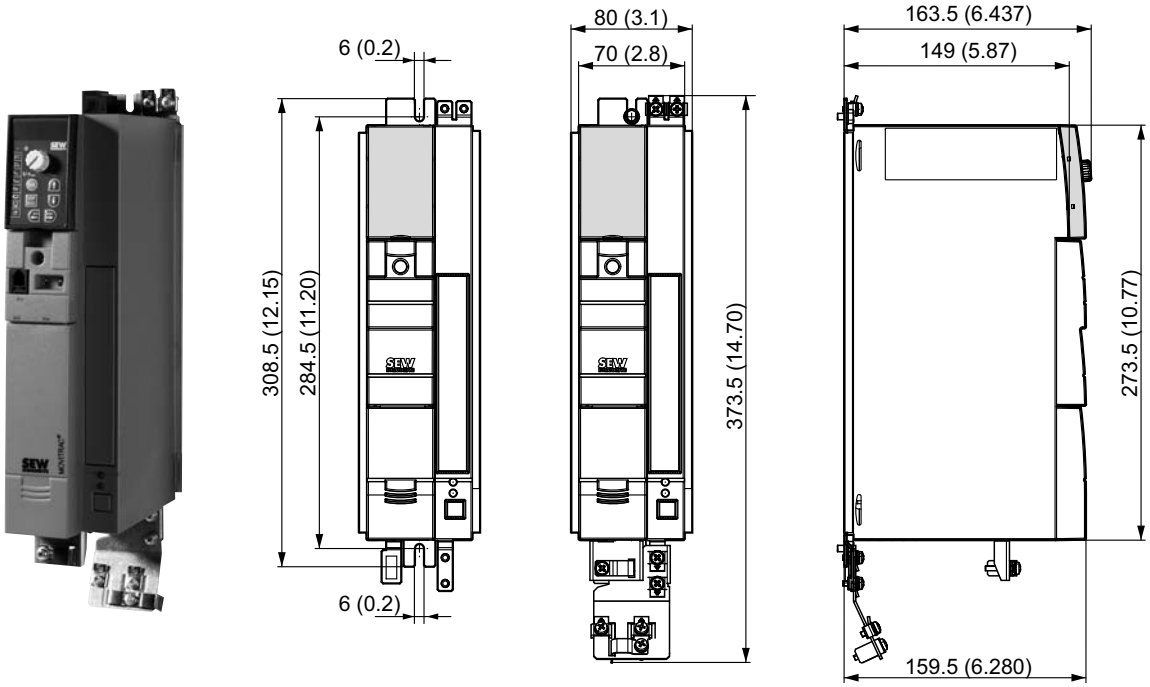
MOVITRAC® MC07B (1-phase power supply) Part number		0003-2B1-4-00 828 491 1	0004-2B1-4-00 828 493 8
INPUT			
Rated mains voltage	V_{mains}	1 × AC 200 – 240 V	
Rated mains frequency	f_{mains}	50 / 60 Hz ± 5 %	
Rated mains current, 100 % operation Rated mains current, 125 % operation	I_{mains} $I_{mains\ 125}$	AC 4.3 A AC 5.5 A	AC 6.1 A AC 7.5 A
OUTPUT			
Output voltage	V_O	3 × 0 – V_{mains}	
Recommended motor power 100 % operation Recommended motor power 125 % operation	P_{Mot} $P_{Mot\ 125}$	0.25 kW / 0.34 HP 0.37 kW / 0.50 HP	0.37 kW / 0.50 HP 0.55 kW / 0.74 HP
Rated output current 100 % operation Rated output current 125 % operation	I_N $I_{N\ 125}$	AC 1.7 A AC 2.1 A	AC 2.5 A AC 3.1 A
Apparent output power 100 % operation Apparent output power 125 % operation	S_N $S_{N\ 125}$	0.7 kVA 0.9 kVA	1.0 kVA 1.3 kVA
Minimum permitted braking resistance value (4 quadrant operation)	R_{BW_min}	27 Ω	
GENERAL INFORMATION			
Power loss 100 % operation Power loss 125 % operation	P_V $P_{V\ 125}$	30 W 35 W	35 W 45 W
Current limitation		150 % I_N for at least 60 seconds	
Terminal cross section / tightening torque	Terminals	4 mm^2 / AWG12 / 0.5 Nm / 4 lb in	
Dimensions	W × H × D	54.5 × 185 × 163.5 mm / 2.15 × 7.28 × 6.437 in	
Mass	m	1.3 kg / 2.9 lb	

2.4.11 AC 230 V / 1-phase / size 0S / 0.55 / 0.75 kW / 0.74 / 1.0 HP



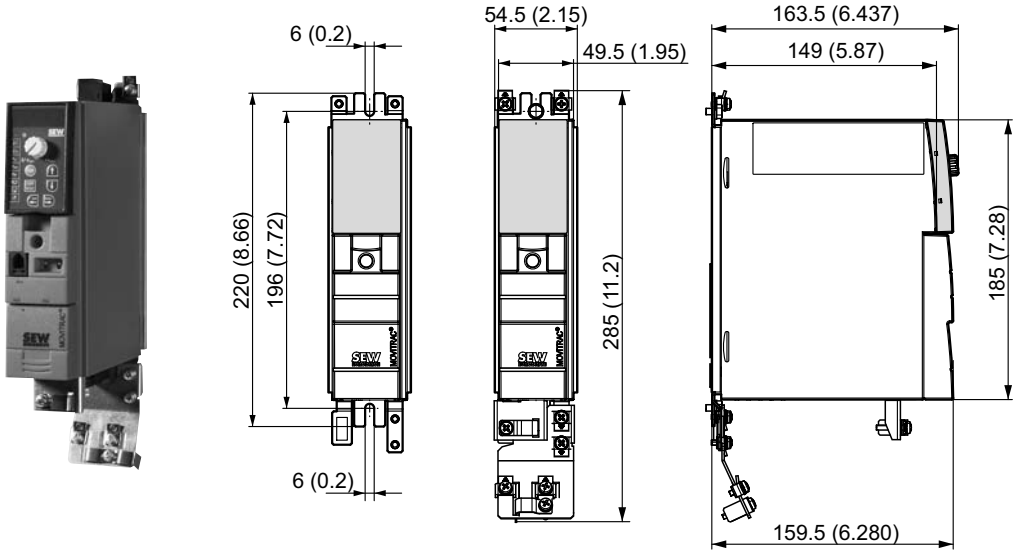
MOVITRAC® MC07B (1-phase power supply) Part number		0005-2B1-4-00 828 494 6	0008-2B1-4-00 828 495 4
INPUT			
Rated mains voltage	V_{mains}	1 × AC 200 – 240 V	
Rated mains frequency	f_{mains}	50 / 60 Hz ± 5 %	
Rated mains current, 100 % operation Rated mains current, 125 % operation	I_{mains} $I_{mains\ 125}$	AC 8.5 A AC 10.2 A	AC 9.9 A AC 11.8 A
OUTPUT			
Output voltage	V_O	3 × 0 – V_{mains}	
Recommended motor power 100 % operation Recommended motor power 125 % operation	P_{Mot} $P_{Mot\ 125}$	0.55 kW / 0.74 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_N $I_{N\ 125}$	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_N $S_{N\ 125}$	1.4 kVA 1.7 kVA	1.7 kVA 2.1 kVA
Minimum permitted braking resistance value (4 quadrant operation)	R_{BW_min}	27 Ω	
GENERAL INFORMATION			
Power loss 100 % operation Power loss 125 % operation	P_V $P_{V\ 125}$	45 W 50 W	50 W 65 W
Current limitation		150 % I_N for at least 60 seconds	
Terminal cross section / tightening torque	Terminals	4 mm^2 / AWG12 / 0.5 Nm / 4 lb in	
Dimensions	W × H × D	80 × 185 × 163.5 mm / 3.1 × 7.28× 6.437 in	
Mass	m	1.5 kg / 3.3 lb	

2.4.12 AC 230 V / 1-phase / size 0L / 1.1 / 1.5 / 2.2 kW / 1.5 / 2.0 / 3.0 HP



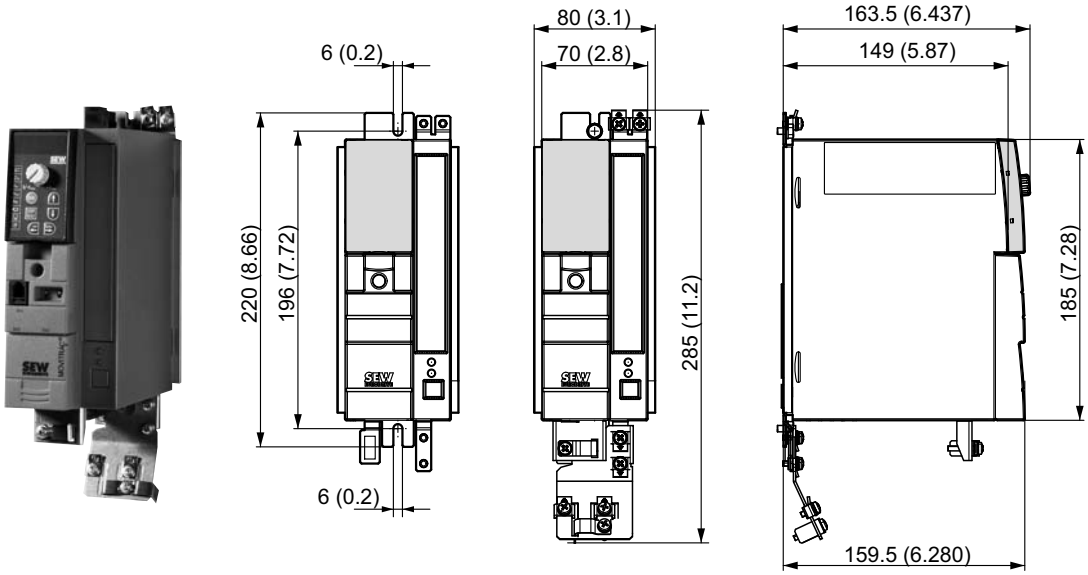
MOVITRAC® MC07B (1-phase power supply) Part number		0011-2B1-4-00 828 496 2	0015-2B1-4-00 828 497 0	0022-2B1-4-00 828 498 9
INPUT				
Rated mains voltage	V_{line}	1 × AC 200 – 240 V		
Rated mains frequency	f_{mains}	50 / 60 Hz ± 5 %		
Rated mains current, 100 % operation Rated mains current, 125 % operation	I_{mains} $I_{mains\ 125}$	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_O	3 × 0 – V_{mains}		
Recommended motor power 100 % operation Recommended motor power 125 % operation	P_{Mot} $P_{Mot\ 125}$	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_N $I_{N\ 125}$	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_N $S_{N\ 125}$	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_{BW_min}	27 Ω		
GENERAL INFORMATION				
Power loss 100 % operation Power loss 125 % operation	P_V $P_{V\ 125}$	70 W 90 W	90 W 110 W	105 W 132 W
Current limitation		150 % I_N for at least 60 seconds		
Terminal cross section / tightening torque	Terminals	4 mm^2 / AWG12 / 0.5 Nm / 4 lb in		
Dimensions	W × H × D	80 × 273.5 × 163.5 mm / 3.1 × 10.77 × 6.437 in		
Mass	m	2.2 kg / 4.9 lb		

2.4.13 AC 230 V / 3-phase / size 0XS / 0.25 / 0.37 kW / 0.34 / 0.50 HP



MOVITRAC® MC07B (3-phase power supply) Part number		0003-2A3-4-00 828 499 7	0004-2A3-4-00 828 500 4
INPUT			
Rated mains voltage	V_{mains}	3 × AC 200 – 240 V	
Rated mains frequency	f_{mains}	50 / 60 Hz ± 5 %	
Rated mains current, 100 % operation Rated mains current, 125 % operation	I_{mains} $I_{mains\ 125}$	AC 1.6 A AC 1.9 A	AC 2.0 A AC 2.4 A
OUTPUT			
Output voltage	V_O	3 × 0 – V_{mains}	
Recommended motor power 100 % operation Recommended motor power 125 % operation	P_{Mot} $P_{Mot\ 125}$	0.25 kW / 0.34 HP 0.37 kW / 0.50 HP	0.37 kW / 0.50 HP 0.55 kW / 0.74 HP
Rated output current 100 % operation Rated output current 125 % operation	I_N $I_{N\ 125}$	AC 1.7 A AC 2.1 A	AC 2.5 A AC 3.1 A
Apparent output power 100 % operation Apparent output power 125 % operation	S_N $S_{N\ 125}$	0.7 kVA 0.9 kVA	1.0 kVA 1.3 kVA
Minimum permitted braking resistance value (4 quadrant operation)	R_{BW_min}	27 Ω	
GENERAL INFORMATION			
Power loss 100 % operation Power loss 125 % operation	P_V $P_{V\ 125}$	35 W 40 W	40 W 50 W
Current limitation		150 % I_N for at least 60 seconds	
Terminal cross section / tightening torque	Terminals	4 mm^2 / AWG12 / 0.5 Nm / 4 lb in	
Dimensions	W × H × D	54.5 × 185 × 163.5 mm / 2.15 × 7.28 × 6.437 in	
Mass	m	1.3 kg / 2.9 lb	

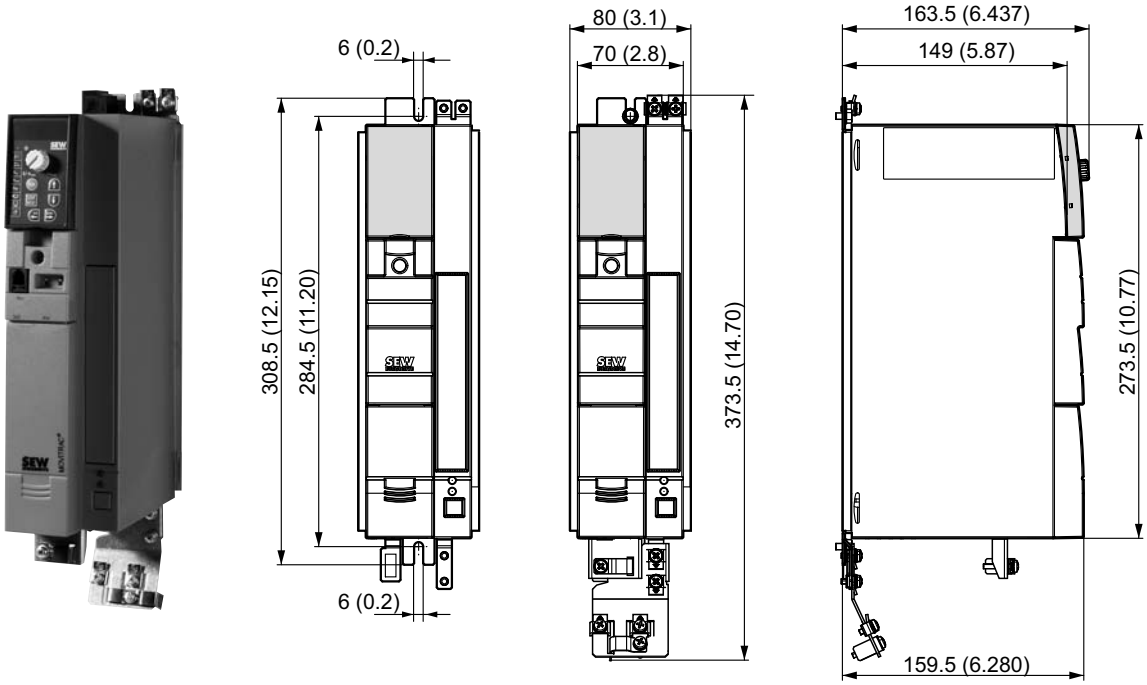
2.4.14 AC 230 V / 3-phase / size 0S / 0.55 / 0.75 kW / 0.74 / 1.0 HP



MOVITRAC® MC07B (3-phase power supply)		0005-2A3-4-x0	0008-2A3-4-x0
Part number, standard unit (-00) **Part number "Safe stop" (-S0)[1)]**		**828 501 2** **829 987 0**	**828 502 0** **829 988 9**
INPUT			
Rated mains voltage	V_{mains}	3 × AC 200 – 240 V	
Rated mains frequency	f_{mains}	50 / 60 Hz ± 5 %	
Rated mains current, 100 % operation Rated mains current, 125 % operation	I_{mains} $I_{mains\ 125}$	AC 2.8 A AC 3.4 A	AC 3.3 A AC 4.1 A
OUTPUT			
Output voltage	V_O	3 × 0 – V_{mains}	
Recommended motor power 100 % operation Recommended motor power 125 % operation	P_{Mot} $P_{Mot\ 125}$	0.55 kW / 0.74 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_N $I_{N\ 125}$	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_N $S_{N\ 125}$	1.4 kVA 1.7 kVA	1.7 kVA 2.1 kVA
Minimum permitted braking resistance value (4 quadrant operation)	R_{BW_min}	27 Ω	
GENERAL INFORMATION			
Power loss 100 % operation Power loss 125 % operation	P_V $P_{V\ 125}$	50 W 60 W	60 W 75 W
Current limitation		150 % I_N for at least 60 seconds	
Terminal cross section / tightening torque	Terminals	4 mm^2 / AWG12 / 0.5 Nm / 4 lb in	
Dimensions	W × H × D	80 × 185 × 163.5 mm / 3.1 × 7.28 × 6.437 in	
Mass	m	1.5 kg / 3.3 lb	

1) The unit type MC07B...-S0 must always be supplied by an external DC 24 V power supply unit.

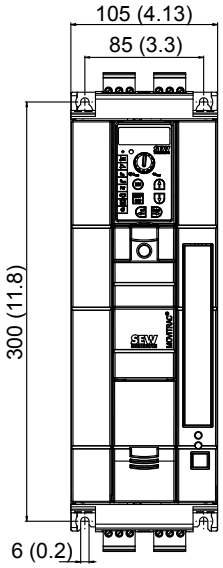
2.4.15 AC 230 V / 3-phase / size 0L / 1.1 / 1.5 / 2.2 kW / 1.5 / 2.0 / 3.0 HP

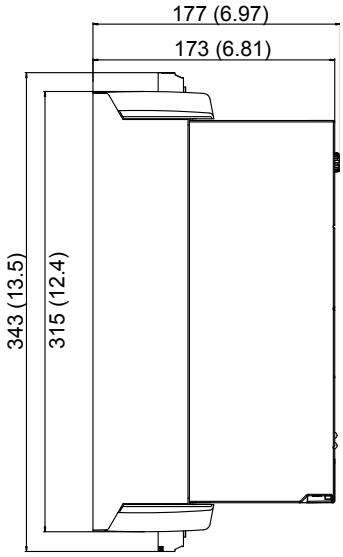


MOVITRAC® MC07B (3-phase power supply)		0011-2A3-4-00	0015-2A3-4-00	0022-2A3-4-00
Part number standard design (-00) **Part number "Safe technology" (-S0)[1])**		**828 503 9** **829 989 7**	**828 504 7** **829 990 0**	**828 505 5** **829 991 9**
INPUT				
Rated mains voltage	V_{mains}	3 × AC 200 – 240 V		
Rated mains frequency	f_{mains}	50 / 60 Hz ± 5 %		
Rated mains current, 100 % operation Rated mains current, 125 % operation	I_{mains} $I_{mains\ 125}$	AC 5.1 A AC 6.3 A	AC 6.4 A AC 7.9 A	AC 7.6 A AC 9.5 A
OUTPUT				
Output voltage	V_O	3 × 0 – V_{mains}		
Recommended motor power 100 % operation Recommended motor power 125 % operation	P_{Mot} $P_{Mot\ 125}$	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_N $I_{N\ 125}$	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_N $S_{N\ 125}$	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_{BW_min}	27 Ω		
GENERAL INFORMATION				
Power loss 100 % operation Power loss 125 % operation	P_V $P_{V\ 125}$	75 W 90 W	90 W 110 W	105 W 140 W
Current limitation		150 % I_N for at least 60 seconds		
Terminal cross section / tightening torque	Terminals	4 mm^2 / AWG12 / 0.5 Nm / 4 lb in		
Dimensions	W × H × D	80 × 273.5 × 163.5 mm / 3.1 × 10.77 × 6.437 in		
Mass	m	2.2 kg / 4.9 lb		

1) The unit type MC07B...-S0 must always be supplied by an external DC 24 V power supply unit.

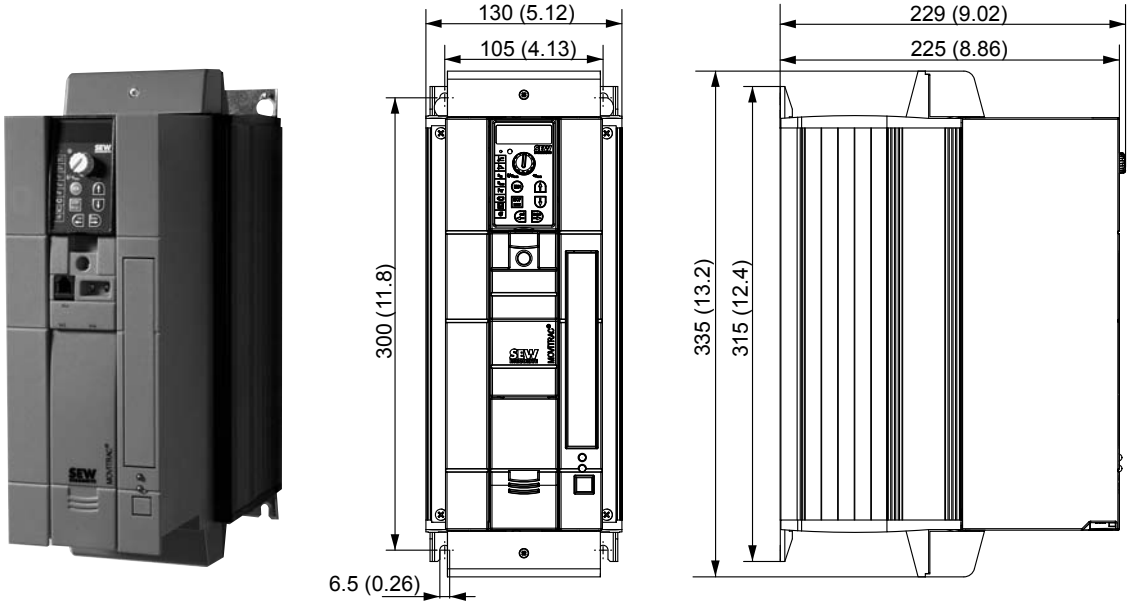
2.4.16 AC 230 V / 3-phase / size 1 / 3.7 kW / 5.0 HP





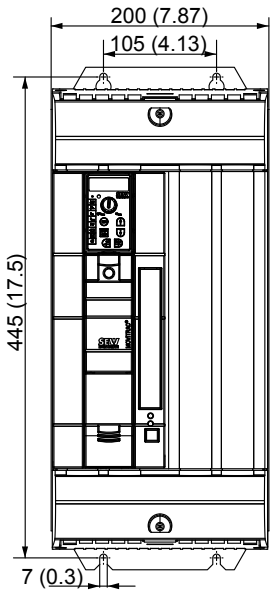
MOVITRAC® MC07B (3-phase power supply) **Part number**		**0037-2A3-4-00** **828 506 3**
INPUT		
Rated mains voltage	V_{mains}	3 × AC 200 – 240 V
Rated mains frequency	f_{mains}	50 / 60 Hz ± 5 %
Rated mains current, 100 % operation Rated mains current, 125 % operation	I_{mains} $I_{mains\ 125}$	AC 12.9 A AC 16.1 A
OUTPUT		
Output voltage	V_O	3 × 0 – V_{mains}
Recommended motor power 100 % operation Recommended motor power 125 % operation	P_{Mot} $P_{Mot\ 125}$	3.7 kW / 5.0 HP 5.5 kW / 7.4 HP
Rated output current 100 % operation Rated output current 125 % operation	I_N $I_{N\ 125}$	AC 14.5 A AC 18.1 A
Apparent output power 100 % operation Apparent output power 125 % operation	S_N $S_{N\ 125}$	5.8 kVA 7.3 kVA
Minimum permitted braking resistance value (4 quadrant operation)	R_{BW_min}	27 Ω
GENERAL INFORMATION		
Power loss 100 % operation Power loss 125 % operation	P_V $P_{V\ 125}$	210 W 270 W
Current limitation		150 % I_N for at least 60 seconds
Terminal cross section / tightening torque	Terminals	4 mm^2 / AWG12 / 0.6 Nm / 5 lb in
Dimensions	W × H × D	105 × 315 × 173 mm / 4.13 × 12.4 × 6.81 in
Mass	m	3.5 kg / 7.7 lb

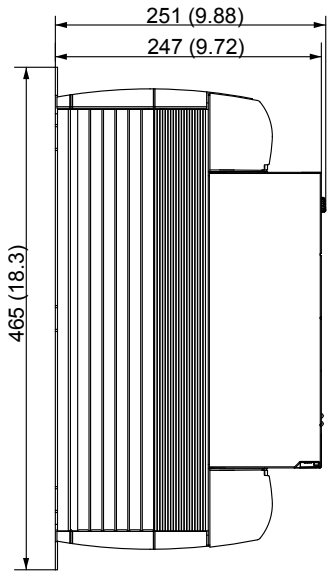
2.4.17 AC 230 V / 3-phase / size 2 / 5.5 / 7.5 kW / 7.4 / 10 HP



MOVITRAC® MC07B (3-phase power supply) Part number		0055-2A3-4-00 828 507 1	0075-2A3-4-00 828 509 8
INPUT			
Rated mains voltage	V_{mains}	3 × AC 200 – 240 V	
Rated mains frequency	f_{mains}	50 / 60 Hz ± 5 %	
Rated mains current, 100 % operation Rated mains current, 125 % operation	I_{mains} $I_{mains\ 125}$	AC 19.5 A AC 24.4 A	AC 27.4 A AC 34.3 A
OUTPUT			
Output voltage	V_O	3 × 0 – V_{mains}	
Recommended motor power 100 % operation Recommended motor power 125 % operation	P_{Mot} $P_{Mot\ 125}$	5.5 kW / 7.4 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_N $I_{N\ 125}$	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_N $S_{N\ 125}$	8.8 kVA 11.0 kVA	11.6 kVA 14.5 kVA
Minimum permitted braking resistance value (4 quadrant operation)	R_{BW_min}	12 Ω	
GENERAL INFORMATION			
Power loss 100 % operation Power loss 125 % operation	P_V $P_{V\ 125}$	300 W 375 W	380 W 475 W
Current limitation		150 % I_N for at least 60 seconds	
Terminal cross section / tightening torque	Terminals	4 mm^2 / AWG12 / 1.5 Nm / 13 lb in	
Dimensions	W × H × D	130 × 335 × 229 mm / 5.12 × 13.2 × 9.02 in	
Mass	m	6.6 kg / 15 lb	

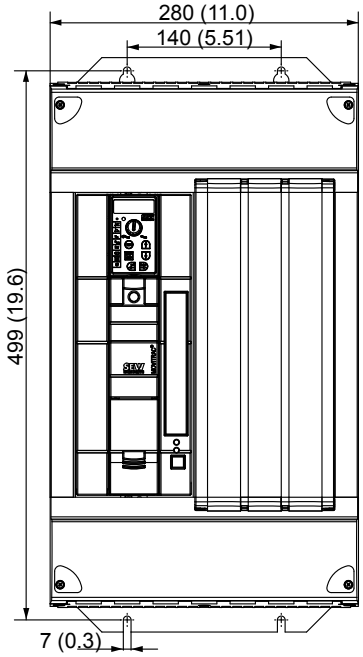
2.4.18 AC 230 V / 3-phase / size 3 / 11 / 15 kW / 15 / 20 HP

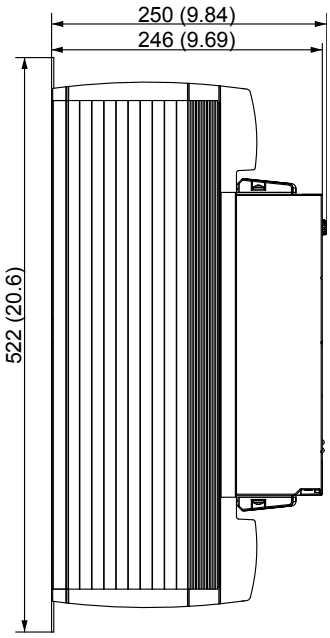




MOVITRAC® MC07B (3-phase power supply) **Part number**		**0110-203-4-00** **828 510 1**	**0150-203-4-00** **828 512 8**
INPUT			
Rated mains voltage	V_{mains}	3 × AC 200 – 240 V	
Rated mains frequency	f_{mains}	50 / 60 Hz ± 5 %	
Rated mains current, 100 % operation Rated mains current, 125 % operation	I_{mains} $I_{mains\ 125}$	AC 40.0 A AC 50.0 A	AC 48.6 A AC 60.8 A
OUTPUT			
Output voltage	V_O	3 × 0 – V_{mains}	
Recommended motor power 100 % operation Recommended motor power 125 % operation	P_{Mot} $P_{Mot\ 125}$	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_N $I_{N\ 125}$	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_N $S_{N\ 125}$	16.8 kVA 21.0 kVA	21.6 kVA 26.9 kVA
Minimum permitted braking resistance value (4 quadrant operation)	R_{BW_min}	7.5 Ω	5.6 Ω
GENERAL INFORMATION			
Power loss 100 % operation Power loss 125 % operation	P_V $P_{V\ 125}$	580 W 720 W	720 W 900 W
Current limitation		150 % I_N for at least 60 seconds	
Terminal cross section / tightening torque	Terminals	6 mm^2 / AWG10	10 mm^2 / AWG8
		3.5 Nm / 31 lb in	
Dimensions	W × H × D	200 × 465 × 251 mm / 7.87 × 18.3 × 9.88 in	
Mass	m	15 kg / 33 lb	

2.4.19 AC 230 V / 3-phase / size 4 / 22 / 30 kW / 30 / 40 HP





MOVITRAC® MC07B (3-phase power supply) Part number		0220-203-4-00 828 513 6	0300-203-4-00 828 514 4
INPUT			
Rated mains voltage	V_{mains}	3 × AC 200 – 240 V	
Rated mains frequency	f_{mains}	50 / 60 Hz ± 5 %	
Rated mains current, 100 % operation Rated mains current, 125 % operation	I_{mains} $I_{mains\ 125}$	AC 72 A AC 90 A	AC 86 A AC 107 A
OUTPUT			
Output voltage	V_O	3 × 0 – V_{mains}	
Recommended motor power 100 % operation Recommended motor power 125 % operation	P_{Mot} $P_{Mot\ 125}$	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_N $I_{N\ 125}$	AC 80 A AC 100 A	AC 95 A AC 118.8 A
Apparent output power 100 % operation Apparent output power 125 % operation	S_N $S_{N\ 125}$	31.9 kVA 39.9 kVA	37.9 kVA 47.4 kVA
Minimum permitted braking resistance value (4 quadrant operation)	R_{BW_min}	3 Ω	
GENERAL INFORMATION			
Power loss 100 % operation Power loss 125 % operation	P_V $P_{V\ 125}$	1100 W 1400 W	1300 W 1700 W
Current limitation		150 % I_N for at least 60 seconds	
Terminal cross section / tightening torque	Terminals	25 mm^2 / AWG4	35 mm^2 / AWG2
		14 Nm / 120 lb in	
Dimensions	W × H × D	280 × 522 × 250 mm / 11.0 × 20.6 × 9.84 in	
Mass	m	27 kg / 60 lb	

2.5 Front option FBG11B keypad

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

Part number	1820 635 2
Functions	• Display process values and status • Error memory and error reset queries • Display and set parameters • Backup and transfer of parameter sets • Easy-to-use startup menu for SEW and non-SEW motors • Manual control of MOVITRAC® B
Features	• 5-digit, 7-segment display / 6 buttons / 8 icons / speed control module • Selection of short or long menu • Can be plugged onto the inverter (during operation) • Degree of protection IP20 (EN 60529)

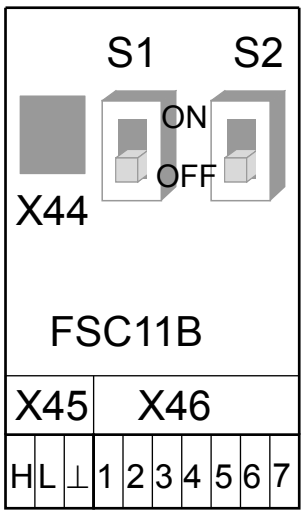
2.6 FSC11B communication module

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

Part number: 1820 716 2

Functions:
- 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:
- 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	Designation	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 according to CAN specification 2.0, parts A and B, transmission technology according to ISO 11898, max. 64 stations, terminating resistor (120 Ω) can be activated using DIP switch **S1**. 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:⊥ X44 RJ10	ST11: RS-485+ ST12: RS-485– GND: Reference potential Service interface	EIA standard, 9.6 kBaud, max. 32 stations 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 Connection: 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 upgrades the basic version with the following interfaces:

- Setpoint input
- Analog output
- RS-485 interface
- The options FIO11B, FSC11B and FIO21B are mounted on the same fastening place and therefore cannot be used simultaneously.

2.7.2 Electronics data FIO11B analog module

Function	Terminal	Designation	Data
Setpoint input[1)]	X40:1 X40:2	AI2: Voltage input GND: Reference potential	–10 – +10 V R_i > 40 kΩ 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 mA 0 (4) – 20 mA Resolution 10 bit Sampling time 5 ms Short-circuit proof, protected against external voltage up to 30 V Load impedance R_L ≤ 750 Ω
RS-485 interface	X45:H X45:L X45:⊥ X44 RJ10	ST11: RS-485+ ST12: RS-485– GND: Reference potential Service interface	EIA standard, 9.6 kBaud, max. 32 stations Maximum cable length 200 m (656 ft) Dynamic terminating resistor with fixed installation Terminal cross-section: – 1.5 mm² (AWG15) without conductor end sleeves – 1.0 mm² (AWG17) with conductor end sleeves Connection: Only for service purposes, solely for point-to-point connection Maximum cable length 3 m (10 ft)

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

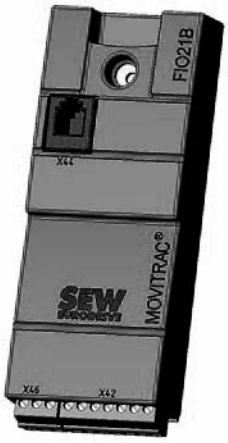
2.8 FIO21B digital module

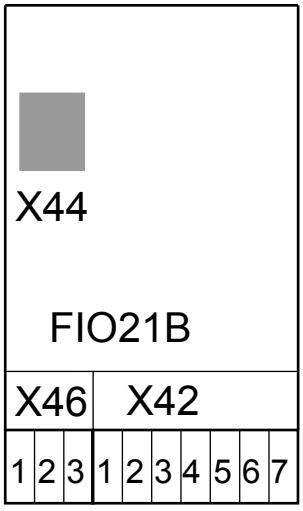
Part number 1822 541 1

2.8.1 Description

The FIO21B digital module upgrades the basic unit with the following interfaces:

- 7 additional binary inputs DI10 – DI16
- RS-485 service interface
- CAN-based system bus (SBus), plug-in terminals
- The options FIO11B, FSC11B and FIO21B are mounted on the same fastening place and therefore cannot be used simultaneously.





2.8.2 Electronics data of the FIO21B digital module

Function	Terminal	Designation	Data
Binary inputs	X42:1 X42:2 X42:3 X42:4 X42:5 X42:6 X42:7	DI10 DI11 DI12 DI13 DI14 DI15 DI16	R_i = 3 kΩ, IE = 10 mA, sampling interval 5 ms, PLC compatible Signal level according to EN 61131-2 type 1 or 3: • +11 V – +30 V: Contact closed • –3 V – +5 V: Contact open Factory set to "no function"
Service interface	X44 RJ10	Service interface	EIA standard, 9.6 kBaud Connection: Only for service purposes, solely for point-to-point connection Maximum cable length 3 m (10 ft)
System bus (SBus)	X46:1 X46:2 X46:3	SC11: CAN High SC12: CAN Low GND: Reference potential	CAN bus to CAN specification 2.0, parts A and B Transmission technology according to ISO 11898, max. 64 stations Bus termination possible between SC11 and SC12 with enclosed 120 Ω resistor. Terminal cross-section: • 1.5 mm^2 (AWG15) without conductor end sleeves • 1.0 mm^2 (AWG17) with conductor end sleeves

2.9 DBG60B keypad

2.9.1 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 set[1]	**Description (= scope of delivery)**	**Part number**
	DBM60B	• Housing for DBG60B (IP65) • DKG60B extension cable, length 5 m (20 ft)	824 853 2
	Extension cable	**Description (= scope of delivery)**	**Part number**
	DKG60B	• 5 m long (20 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.

2.9.2 Functions

- Display process values and status
- Display status of 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
- The FSC11B, FIO11B or FIO21B front option is required for connection

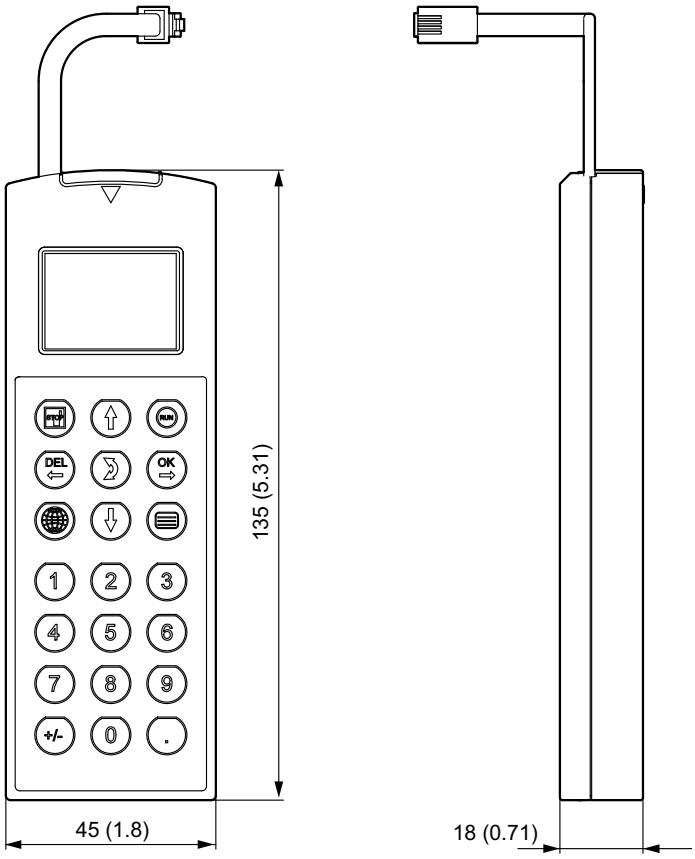
2.9.3 Features

- Illuminated plain text display, choice of 7 languages
- Keypad with 21 keys
- Can be connected via extension cable DKG60B (5 m (20 ft))
- Degree of protection IP40 (EN 60529)

	TIP
	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.

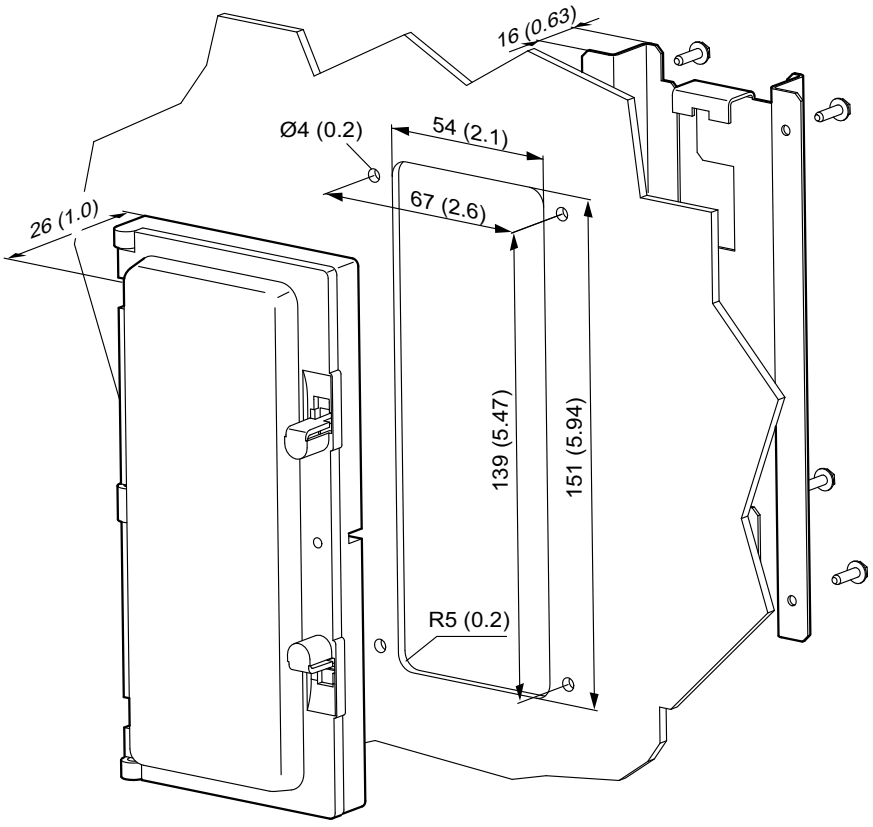
2.9.4 Dimension drawing for DBG60B

Dimension drawing for DBG60B, dimensions in mm



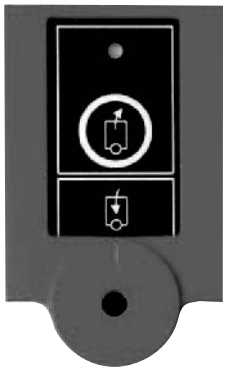
2.9.5 DBG60B housing dimension drawing

The DBM60B option can be used to mount the DBG60B keypad in the control cabinet door, for example. The DBM60B option consists of housing in degree of protection IP65 and a 5 m (20 ft) long DKG60B extension cable.



2.10 UBP11A parameter module

Part number: 823 933 9



Functional description:

- For saving data from the inverter to the parameter module
- Data from the parameter module can be read back into the inverter
- Operating status display
- The UBP11A parameter module requires front option FSC11B or FIO11B. Simultaneous operation of UBP11A and PC, RS-485 connection, MOVIDRIVE® or MOVITRAC® is not possible.
- Meaning of the LED:
  - Green: Data available
  - Flashing green: Data transmission in progress
  - Yellow: No data available
  - Red: Copy error

2.11 MBG11A speed control module

Functional description:

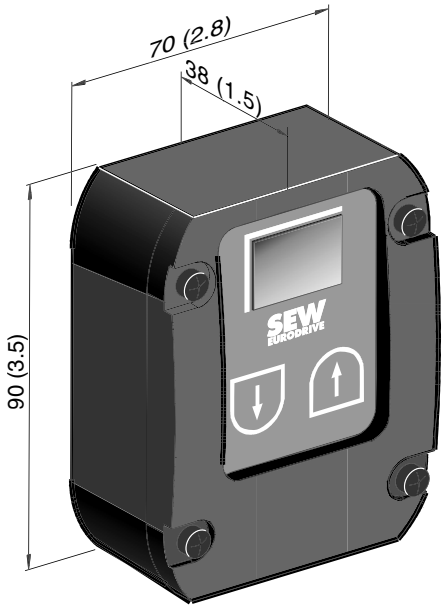
- The MBG11A speed control module has 2 keys and a display. They allow for remote speed control in the range of –100 % – +100 % f_{max} (potentiometer f1).
- Up to 31 MOVITRAC® B units can be controlled at the same time (broadcasting).
- The MBG11A setpoint control module requires the front option FSC11B or FIO11B.

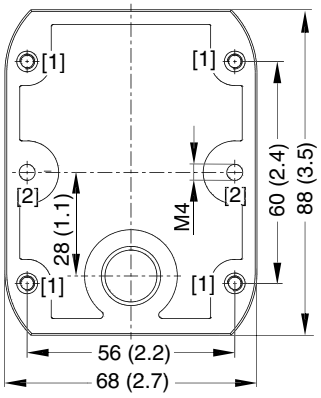
Technical data:

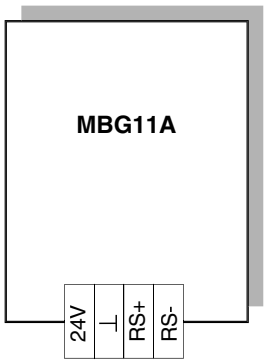
MBG11A option	
Part number	822 547 8
Input voltage	DC 24 V ± 25 %
Current consumption	ca 70 mA
Setpoint resolution	1 %
Serial interface[1)]	RS-485 for connecting max. 31 MOVITRAC® inverters (max. 200 m, (656 ft), 9600 baud)
Degree of protection	IP 65
Ambient temperature	–15 – 60 °C (5 – 140 °F)

1) with integrated dynamic terminating resistor

Dimensions and connection assignment:

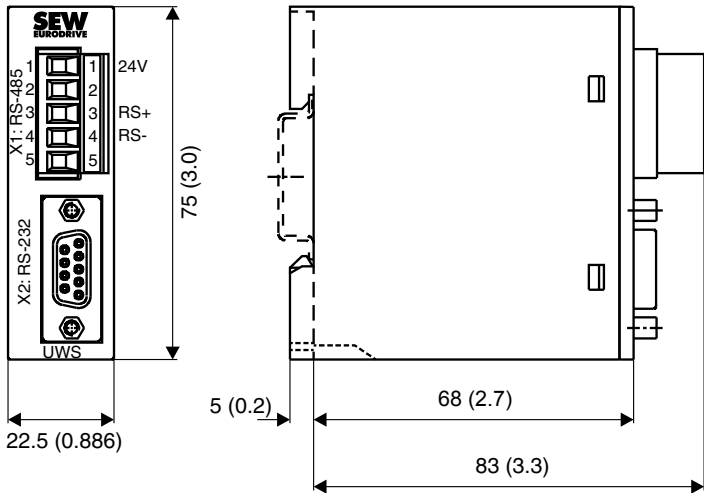






[1] Tapped hole on the rear
[2] Retaining holes for M4 screws

2.12 UWS11A interface adapter RS-232 / RS-485 for support rail

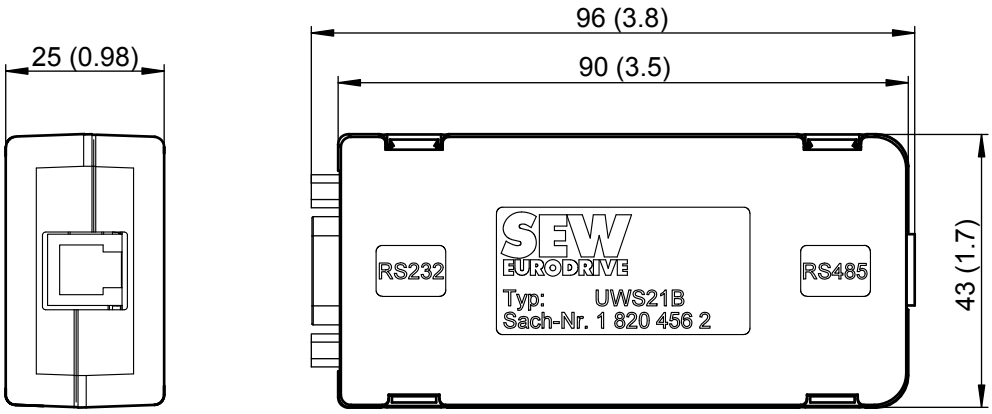
Part number	822 689 X **The FSC11B or FIO11B is required for connecting the UWS11A.**
Ambient temperature	0 – 40 °C (32 – 104 °F)
Degree of protection	IP20
Description	The UWS11A option converts RS-232 signals, for example from the PC, into RS-485 signals. These RS-485 signals can then be routed to the RS-485 interface of MOVITRAC® B. The UWS11A option requires a DC 24 V 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 RS485 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 mm² (AWG 24 – 12) 2 cores per terminal 0.20 – 1 mm² (AWG 24 – 17)
Dimension drawing	

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

2.13 UWS21B interface adapter RS-232/RS-485

Part number	18204562 **The FSC11B or FIO11B is required for connecting the UWS21B.**
Ambient temperature	0 – 40 °C (32 – 104 °F)
Degree of protection	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 MOVITRAC® B.
RS-232 interface	The UWS21B is connected to the PC using a standard serial interface cable (shielded).
RS-485 interface	The connection between UWS21B and MOVITRAC® B is made using a serial interface cable with RJ10 plugs.
Scope of delivery	The scope of delivery for the UWS21B option includes: • UWS21B • Serial interface cable with 9-pin sub D socket and 9-pin D-sub connector to connect the UWS21B option to the PC. • Serial interface cable with two RJ10 plugs to connect UWS21B and MOVITRAC® B. • CD-ROM with drivers and MOVITOOLS® MotionStudio

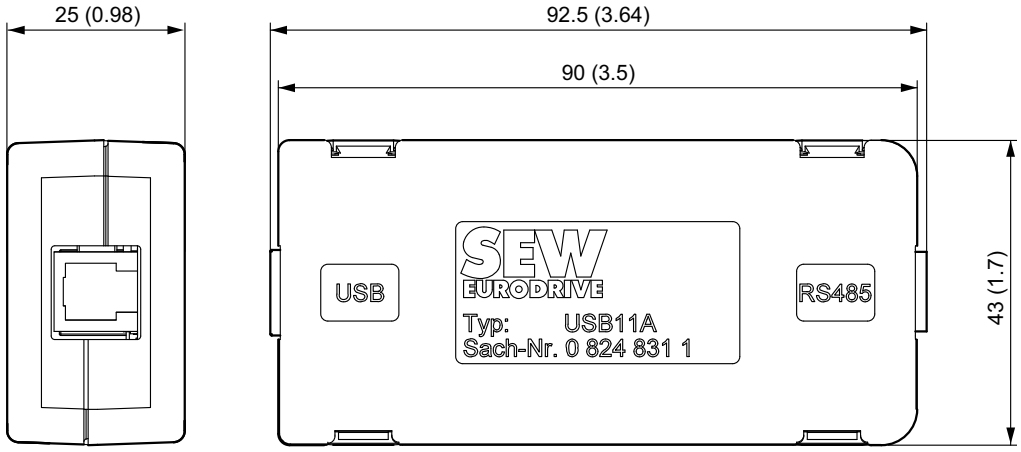
Dimension drawing for UWS21B



2.14 USB11A interface adapter USB/RS-485

Part number	824 831 1 **The FSC11B or FIO11B is required for connecting the USB11A.**
Ambient temperature	0 – 40 °C (32 – 104 °F)
Degree of protection	IP20
Description	The USB11A option is used to connect a PC or laptop with USB interface to the X44 interface of MOVITRAC® B. The USB11A interface adapter supports USB 1.1 and USB 2.0.
USB 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: • USB11A unit • USB connection cable type USB A-B to connect PC to USB11A • Serial interface cable with two RJ10 connectors to connect MOVITRAC® B and USB11A. • CD-ROM with drivers and MOVITOOLS® MotionStudio.

Dimension drawing for USB11A



2.15 BW series braking resistors

2.15.1 General information

BW series braking resistors are adapted to the MOVITRAC® B inverter series. The type of cooling is KS = self-cooling (air ventilation).

The resistor surfaces reach high temperatures under load with P_N. Make sure that you select an installation site that will accommodate these high temperatures. As a rule, braking resistors are therefore mounted on the control cabinet roof.

Provide for a load derating of 4 % per 10 K from an ambient temperature of 45 °C (118 °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 braking resistors in the control cabinet.

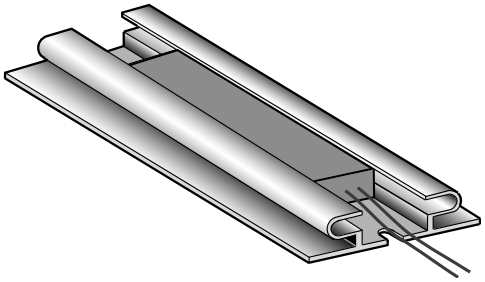
UL and cUL approval

Type BW.. braking resistors are UL and cUL approved in conjunction with MOVITRAC® frequency inverters. SEW-EURODRIVE will provide certification on request. The BW..-T and BW..-P braking resistors have cRUus approval independent of the MOVITRAC® inverter.

2.15.2 PTC braking resistors

Observe the following points for 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 signals a brake chopper fault (fault code 04).



Assignment of the PTC braking resistors:

Braking resistor type	BW1	BW2	BW3	BW4
Part number	822 897 3	823 136 2	823 598 8	823 599 6
Ambient temperature ϑ_A	–25 °C – +60 °C (–13 °F – 140 °F)			
For MOVITRAC® B	0003 – 0040 (400/500 V)		0003 – 0022 (230 V)	

2.15.3 Flat design

Flat-type resistors have degree of protection IP54 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. Submounted braking resistors do not reach the specified CDF power. The FHS and FKB options are only suitable for the BW027-003 and BW072-003 braking resistors.
- Attach to a mounting 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 50 % cdf 25 % cdf 12 % cdf 6 % cdf	230 W 310 W 410 W 550 W 980 W	450 W 610 W 840 W 1200 W 2360 W
Resistance value R_{BW}	27 Ω ±10 %	27 Ω ±10 %
Trip current	1.0 A	1.4 A
Ambient temperature ϑ_A	–20 °C – +45 °C (–4 °F – 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 50 % cdf 25 % cdf 12 % cdf 6 % cdf	230 W 310 W 420 W 580 W 1000 W	450 W 600 W 830 W 1110 W 2000 W
Resistance value R_{BW}	72 Ω ±10 %	72 Ω ±10 %
Trip current	0.6 A	1.0 A
Ambient temperature ϑ_A	–20 °C – +45 °C (–4 °F – 113 °F)	
For MOVITRAC® B 400/500 V	0003 – 0040	0003 – 0040

2.15.4 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® B system manual, section "Selecting the braking resistor").
- A temperature switch is integrated in the BW..-T braking resistor
- A thermal over-current relay is integrated in the BW..-P braking resistor

SEW-EURODRIVE recommends implementing additional protection against overload for the wire and grid resistors by using a bimetallic relay with trip characteristics of trip class 10 or 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 BW..-T / BW..-P series braking resistors, you can connect the integrated temperature sensor / over-current relay using a 2-core, shielded cable as an alternative to a bimetallic relay. The cable entry for BW..-T and BW..-P series braking resistors can be run from the front or the back (→ dimension drawing for BW... / BW..-T / BW..-P braking resistors). Use filler plugs for tapped holes that are not connected.

The resistor surfaces reach high temperatures under load with P_N. Make sure that you select an installation site that will accommodate these high temperatures. As a rule, braking resistors are therefore mounted on the control cabinet roof.

The performance data listed in the following tables indicate the load capacity of the braking resistors depending on their cyclic duration factor. The cyclic duration factor cdf of the braking resistor is indicated in % and is based on a cycle duration of ≤ 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 141 5
Type BW..-P part number	–	–	–	–	–	1820 414 7	–	–
100 % cdf	0.6 kW	1.2 kW	1.5 kW	3.5 kW	7.5 kW	2.5 kW	5.0 kW	10 kW
50 % cdf	1.1 kW	2.1 kW	2.7 kW	5.9 kW	12.8 kW[1)]	4.2 kW	8.5 kW	17 kW
25 % cdf	1.9 kW	3.8 kW	4.8 kW	10.5 kW	12.8 kW[1)]	7.5 kW	15.0 kW	19.2 kW[1)]
12 % cdf	3.6 kW	7.2 kW	9.0 kW	13.0 kW[1)]	12.8 kW[1)]	11.2 kW	19.2 kW[1)]	19.2 kW[1)]
6 % cdf	5.7 kW	8.7 kW[1)]	12.8 kW[1)]	13.0 kW[1)]	12.8 kW[1)]	19.0 kW	19.2 kW[1)]	19.2 kW[1)]
Resistance	27 Ω ±10 %		18 Ω ±10 %			12 Ω ±10 %		
Trip current I_F	4.7 A_{RMS}	6.7 A_{RMS}	9.1 A_{RMS}	13.9 A_{RMS}	20.4 A_{RMS}	14.4 A_{RMS}	20.4 A_{RMS}	28.9 A_{RMS}
Connections	Ceramic terminals 2.5 mm^2 (AWG12)			M8 stud				
Tightening torque	0.5 Nm / 4 lb in		6 Nm / 50 lb in					
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	0.6 kW	1.2 kW	2.6 kW	15.3 kW	13 kW	18 kW
50 % cdf	0.5 kW	1.1 kW	2.1 kW	4.6 kW	15.3 kW	24 kW	32 kW
25 % cdf	1.0 kW	1.9 kW	3.8 kW	5.9 kW[1)]	15.3 kW[1)]	38.4 kW[1)]	38.4 kW[1)]
12 % cdf	1.7 kW	3.5 kW	5.9 kW[1)]	5.9 kW[1)]	15.3 kW[1)]	38.4 kW[1)]	38.4 kW[1)]
6 % cdf	2.8 kW	5.7 kW	5.9 kW[1)]	5.9 kW[1)]	15.3 kW[1)]	38.4 kW[1)]	38.4 kW[1)]
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 lb in				6 Nm / 50 lb in		
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 50 % cdf 25 % cdf 12 % cdf 6 % cdf	0.6 kW 1.1 kW 1.9 kW 3.6 kW 5.7 kW	0.8 kW 1.4 kW 2.6 kW 4.8 kW 7.6 kW	1.2 kW 2.2 kW 3.8 kW 6.7 kW 10 kW[1]	1.2 kW 2.2 kW 3.8 kW 7.2 kW 11 kW	2.0 kW 3.8 kW 6.4 kW 12 kW 19 kW	4.0 kW 7.6 kW 12.8 kW 20 kW[1] 20 kW[1]
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 lb in					1.6 Nm / 14 lb in
Design	Wire resistor					
For MOVITRAC® B	0015 ... 0040			0055 / 0075		

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

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 50 % cdf 25 % cdf 12 % cdf 6 % cdf	1.2 kW 2.1 kW 3.8 kW 7.0 kW 11.4 kW	2.6 kW 4.6 kW 8.3 kW 15.3 kW 24.0 kW[1]	5.0 kW 8.5 kW 15.0 kW 24.0 kW[1] 24.0 kW[1]	1.5 kW 2.5 kW 4.5 kW 6.7 kW 11.4 kW	3.5 kW 5.9 kW 10.5 kW 15.7 kW 26.6 kW	7.5 kW 12.7 kW 22.5 kW 33.7 kW 52.2 kW[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 lb in		6 Nm / 50 lb in	1.0 Nm / 8.9 lb in	6 Nm / 50 lb in	
Design	Wire resistor		Grid resistor			
For MOVITRAC® B	0110		0110	0150 / 0220		

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

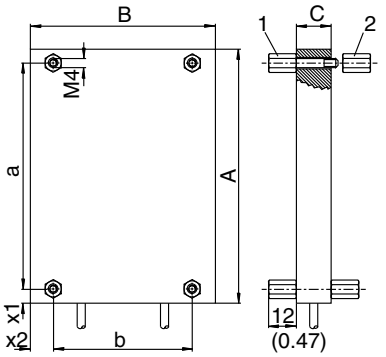
Type	BW915	BW012-025	BW012-050	BW012-100	BW0106	BW206
Part number	–	821 680 0	–	–	–	–
Type BW..-T part number	1820 413 9	–	1820 140 7	1820 141 5	1820 083 4	1820 412 0
Type BW..-P part number	–	1820 414 7	–	–	–	–
100 % cdf 50 % cdf 25 % cdf 12 % cdf 6 % cdf	16 kW 27 kW 45 kW[1] 45 kW[1] 45 kW[1]	2.5 kW 4.2 kW 7.5 kW 11.2 kW 19.0 kW	5.0 kW 8.5 kW 15.0 kW 22.5 kW 38.0 kW	10 kW 17 kW 30 kW 45 kW 56 kW[1]	13.5 kW 23 kW 40 kW 61 kW 102 kW	18 kW 30.6 kW 54 kW 81 kW 136.8 kW
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					
Tightening torque	6 Nm / 50 lb in					
Design	Grid resistor					
For MOVITRAC® B	0220	0300			0370 ... 0750	

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

2.15.5 Dimension drawing for BW braking resistors

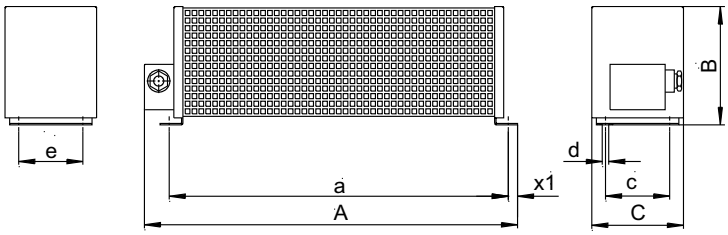
Flat-design

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.



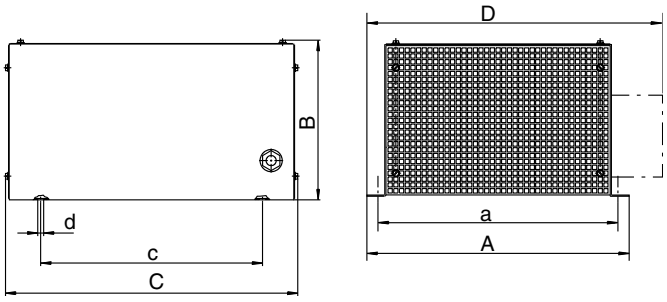
Type	Main dimensions [mm (in)]			Fastening parts [mm (in)]				Mass [kg (lb)]
	A	B	C	a	b	x1	x2	
BW072-003 BW027-003	110 (4.33)	80 (3.1)	15 (0.59)	98 (3.9)	60 (2.4)	6 (0.2)	10 (0.39)	0.3 (0.7)
BW072-005 BW027-005	216 (8.50)	80 (3.1)	15 (0.59)	204 (8.03)	60 (2.4)	6 (0.2)	10 (0.39)	0.6 (1)

Wire resistors



Type	Main dimensions [mm (in)]				Fastening parts [mm (in)]				Mass	BW..-T
	A	A BW..-T	B	C	a	c/e	x1	d	[kg (lb)]	
BW027-006	486 (19.1)	–	120 (4.72)	92 (3.6)	430 (16.9)	64 (2.5)	10 (0.39)	6.5 (0.26)	2.3 (5.1)	–
BW027-012	486 (19.1)	–	120 (4.72)	185 (7.28)	430 (16.9)	150 (5.91)	10 (0.39)	6.5 (0.26)	4.3 (9.5)	–
BW100-006 (-T)	486 (19.1)	549 (21.6)	120 (4.72)	92 (3.6)	430 (16.9)	64 (2.5)	10 (0.39)	6.5 (0.26)	2.3 (5.1)	3 (7)
BW168 (-T)	365 (14.4)	479 (18.9)	120 (4.72)	185 (7.28)	330 (13.0)	150 (5.91)	10 (0.39)	6.5 (0.26)	3.3 (7.3)	4 (9)
BW268 (-T)	465 (18.3)	549 (21.6)	120 (4.72)	185 (7.28)	430 (16.9)	150 (5.91)	10 (0.39)	6.5 (0.26)	4.3 (9.5)	4.9 (11)
BW147 (-T)	465 (18.3)	549 (21.6)	120 (4.72)	185 (7.28)	430 (16.9)	150 (5.91)	10 (0.39)	6.5 (0.26)	4.3 (9.5)	4.9 (11)
BW247 (-T)	665 (26.2)	749 (29.5)	120 (4.72)	185 (7.28)	630 (24.8)	150 (5.91)	10 (0.39)	6.5 (0.26)	6.1 (13)	6.7 (15)
BW347 (-T)	670 (26.4)	749 (29.5)	210 (5.71)	185 (13.4)	630 (24.8)	150 (5.91)	10 (0.39)	6.5 (0.26)	13.2 (29.1)	11.9 (26.2)
BW039-003	286 (11.3)	–	120 (4.72)	92 (3.6)	230 (9.06)	64 (2.5)	10 (0.39)	6.5 (0.26)	1.5 (3.3)	
BW039-006	486 (23.1)	–	120 (4.72)	92 (3.6)	430 (16.9)	64 (2.5)	10 (0.39)	6.5 (0.26)	2.3 (5.1)	
BW039-012 (-T)	486 (19.1)	549 (21.6)	120 (4.72)	185 (7.28)	430 (16.9)	150 (5.91)	10 (0.39)	6.5 (0.26)	4.3 (9.5)	4.9 (11)
BW039-026-T	–	649 (25.6)	120 (4.72)	275 (10.8)	530 (20.9)	240 (9.45)	10 (0.39)	6.5 (0.26)	–	8 (20)
BW018-015	600 (23.6)	–	120 (4.72)	92 (3.6)	544 (21.4)	80 (3.1)	10 (0.39)	6.5 (0.26)	4 (9)	–
BW018-015-P	649 (25.6)	–	120 (4.72)	185 (7.28)	526 (20.7)	150 (5.91)	10 (0.39)	6.5 (0.26)	5.8 (13)	–

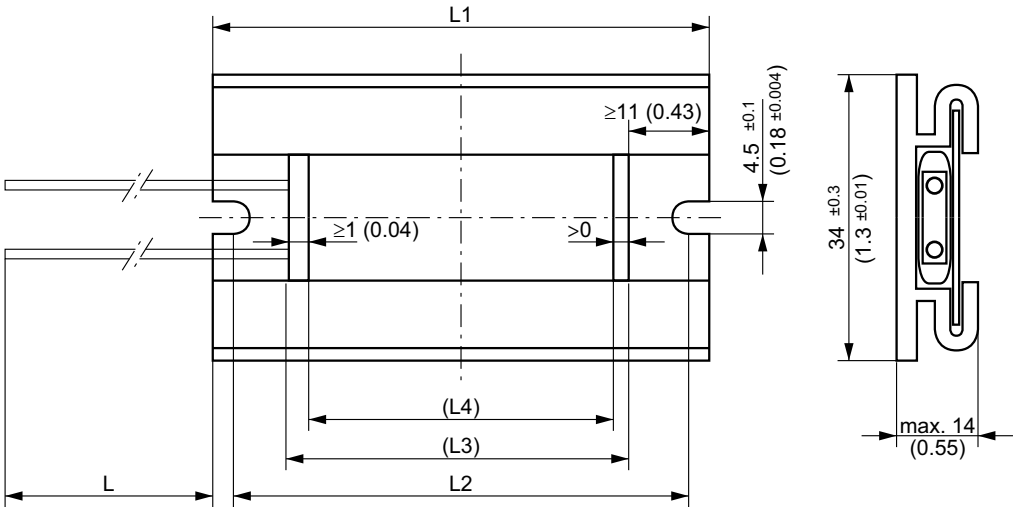
Grid resistors



Type	Main dimensions [mm (in)]				Fastening parts [mm (in)]			Mass [kg (lb)]
	A	A BW..-T	B	C	a	c	d	
BW012-025	295 (11.6)	–	260 (10.2)	490 (19.3)	270 (10.6)	380 (15.0)	10.5 (0.413)	8.0 (18)
BW012-025-P[1)]	295 (11.6)	–	260 (10.2)	490 (19.3)	270 (10.6)	380 (15.0)	10.5 (0.413)	8.0 (18)
BW012-050-T	–	395 (15.6)	260 (10.2)	490 (19.3)	370 (14.6)	380 (15.0)	10.5 (0.413)	12 (26)
BW012-100-T	–	595 (23.4)	270 (10.6)	490 (19.3)	570 (22.4)	380 (15.0)	10.5 (0.413)	21 (46)
BW018-035-T	–	295 (11.6)	260 (10.2)	490 (19.3)	270 (10.6)	380 (15.0)	10.5 (0.413)	9.0 (20)
BW018-075-T	–	595 (23.4)	270 (10.6)	490 (19.3)	570 (22.4)	380 (15.0)	10.5 (0.413)	18 (40)
BW039-050-T	–	395 (15.6)	260 (10.2)	490 (19.3)	370 (14.6)	380 (15.0)	10.5 (0.413)	12 (26)
BW915-T	–	795 (31.3)	270 (10.6)	490 (19.3)	770 (30.3)	380 (15.0)	10.5 (0.413)	32 (71)
BW106-T	–	795 (31.3)	270 (10.6)	490 (19.3)	770 (30.3)	380 (15.0)	10.5 (0.413)	30 (66)
BW206-T	–	995 (39.2)	270 (10.6)	490 (19.3)	970 (38.2)	380 (15.0)	10.5 (0.413)	40 (88)

1) D = 355 mm (14.0 in)

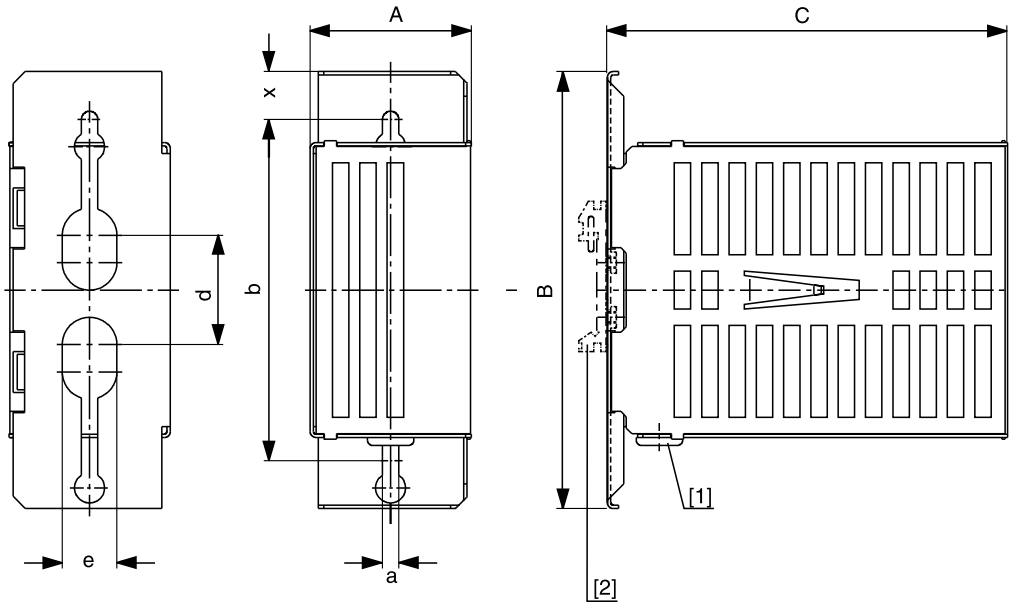
PTC braking resistors



Type	L1	L2	L3	L4	L
BW1	89 (3.5)	82 (3.2)	64 (2.5)	60 (2.4)	100 (3.94)
BW2	124 (4.88)	117 (4.61)	97 (3.8)	95 (3.7)	165 (6.50)
BW3	89 (3.5)	82 (3.2)	64 (2.5)	60 (2.4)	100 (3.94)
BW4	124 (4.88)	117 (4.61)	97 (3.8)	95 (3.7)	165 (6.50)

2.16 BS touch guard

Dimension drawing for touch guard:



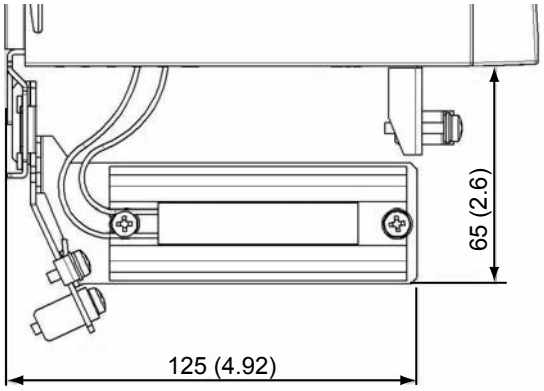
[1] Grommet
[2] Support rail mounting

Type	Main dimensions [mm (in)]			Mounting dimensions [mm (in)]				
	A	B	C	b	d	e	a	x
BS-003	60 (2.4)	160 (6.30)	146 (5.75)	125 (4.92)	40 (1.6)	20 (0.8)	6 (0.2)	17.5 (0.689)
BS-005	60 (2.4)	160 (6.30)	252 (9.92)	125 (4.92)	40 (1.6)	20 (0.8)	6 (0.2)	17.5 (0.689)

Type	Mass [kg (lb)]	Part number	Support rail installation	BW
BS-003	0.35 (0.77)	813 151 3	Accessory S001 / part number 822 194 4	BW027-003 / BW072-003
BS-005	0.5 (1)	813 152 X		BW027-005 / BW072-005

2.17 Mounting PTC braking resistors FKB10B

For sizes 0XS, 0S, 0L



Type	Part number	Size	230 V	400 V
FKB10B	18 216 218	0XS, 0S, 0L	BW3	BW1

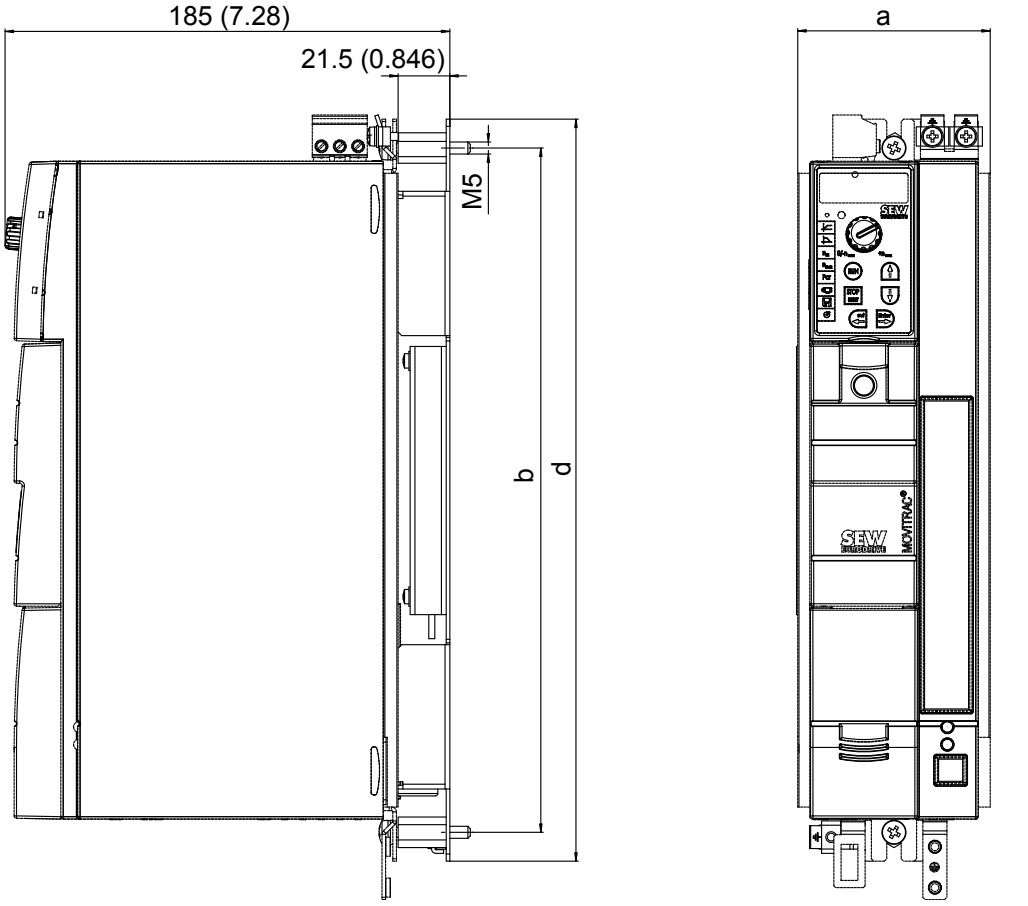
2.18 Submounting of flat-type FKB11/12/13B braking resistors

The FKB..B is used for submounting 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		

Submounted braking resistors do not reach the specified CDF power.

Dimension drawing:



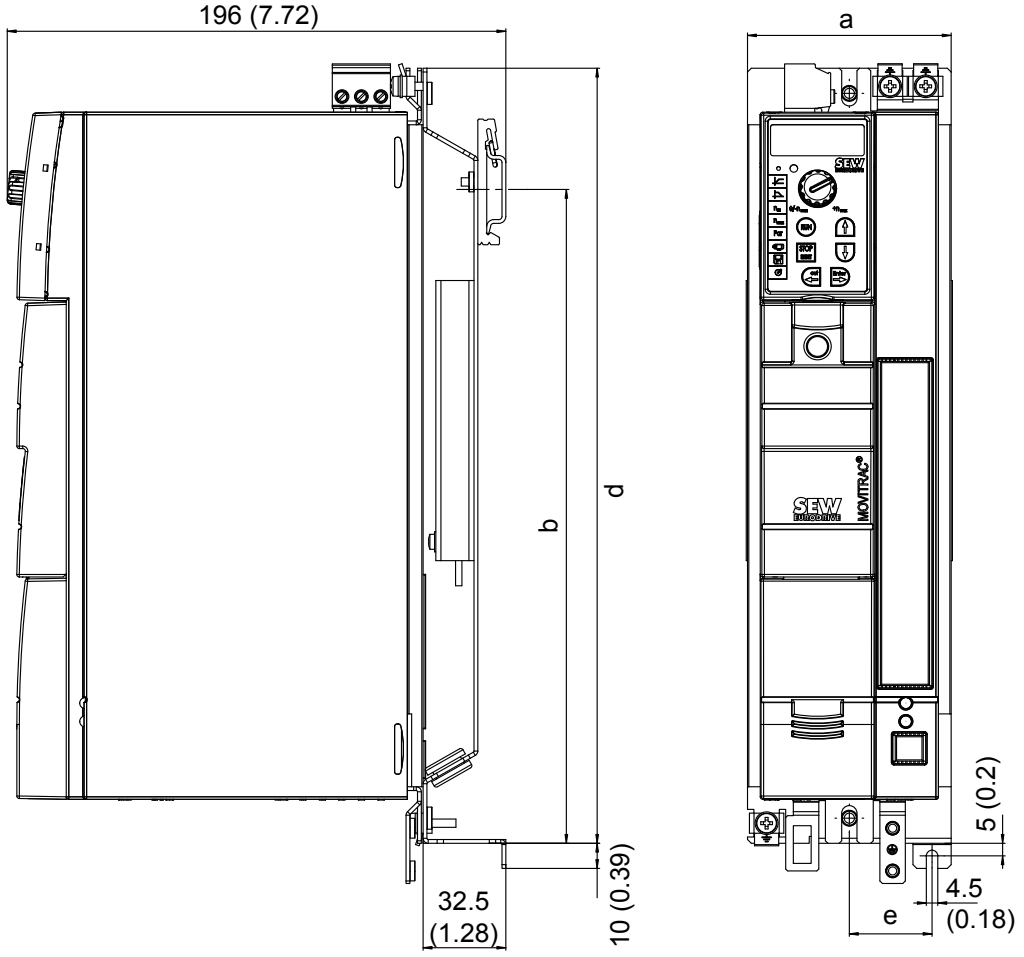
MOVITRAC® B size	a	b	d
0XS	55 (2.2)	196 (7.72)	220 (8.66)
0S	80 (3.1)	196 (7.72)	220 (8.66)
0L	80 (3.1)	284.5 (11.20)	308.5 (12.15)

2.19 FHS11B/12B/13B 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 (2.2)	171.5 (6.752)	220 (8.66)	7.5 (0.30)
0S	80 (3.1)	171.5 (6.752)	220 (8.66)	32.5 (1.28)
0L	80 (3.1)	260.3 (10.25)	308.5 (12.15)	32.5 (1.28)

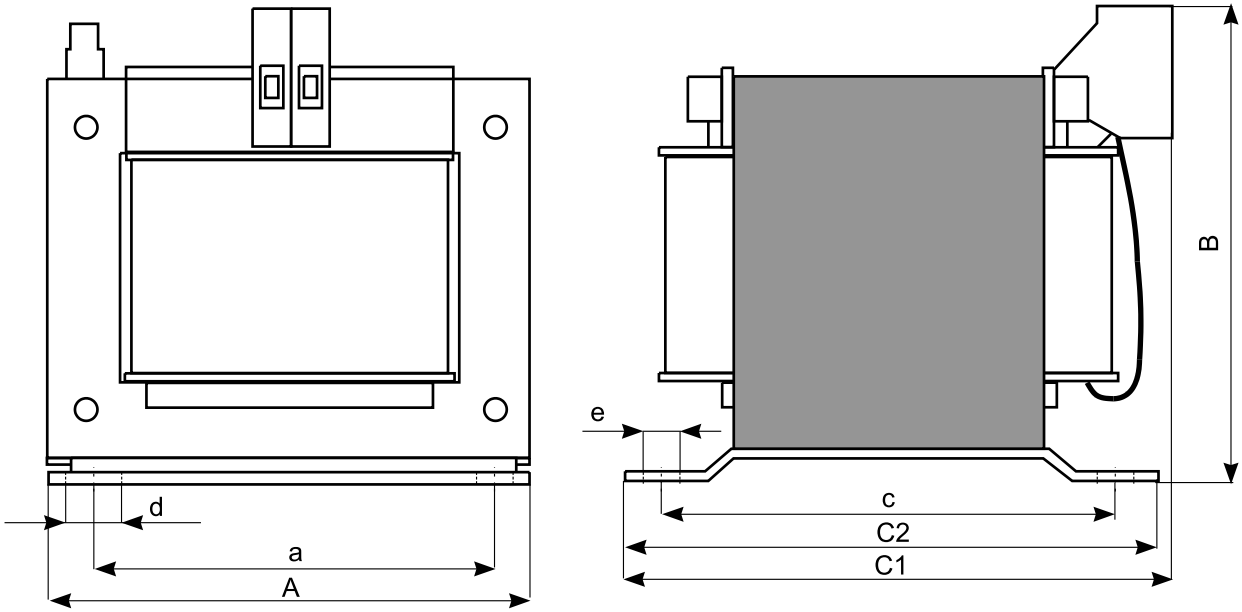
2.20 ND line chokes

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 MOVITRAC® B. The ambient temperature is –25 – +45 °C (–13 – 113 °F). The degree of protection is IP00 (EN 60529).

Line choke type	ND 010-301	ND 020-151
Part number	826 972 6	826 973 4
Rated voltage V_N	1 x AC 230 V ±10 %	
Rated current I_N	AC 10 A	AC 20 A
Power loss at I_N P_V	6 W	10 W
Inductance L_N	3 mH	1.5 mH
Terminal strip	4 mm² (AWG10)	10 mm² (AWG8)
Tightening torque	0.6 Nm / 5 lb in	1.5 Nm / 13 lb in
Suitable for MOVITRAC® B		
1-phase 230 V	0003 – 0008	0011 – 0022

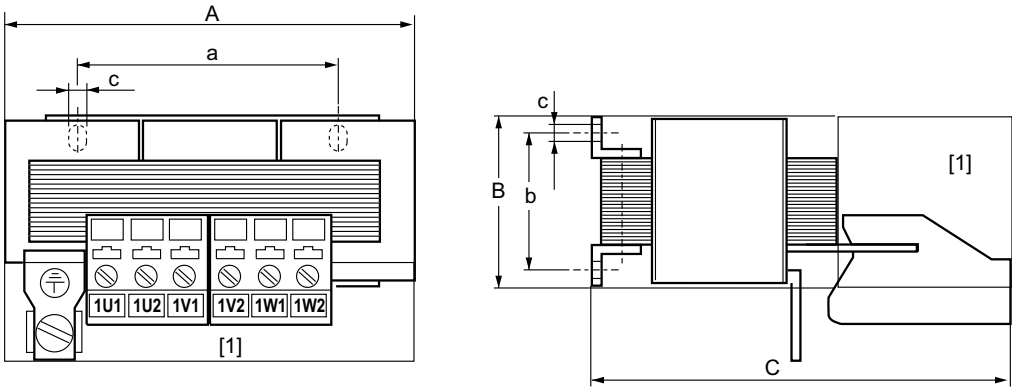
Line choke type		ND 020-013	ND045-013	ND085-013	ND150-013
Part number		826 012 5	826 013 3	826 014 1	825 548 2
Rated voltage V_N		3 x AC 380 – 500 V ±10 %			
Rated current I_N		AC 20 A	AC 45 A	AC 85 A	AC 150 A
Power loss at I_N P_V		10 W	15 W	25 W	65 W
Inductance L_N		0.1 mH			
Terminal strip		4 mm² (AWG10)	10 mm² (AWG8)	35 mm² (AWG2)	M10/PE stud: M8
Tightening torque		0.6 – 0.8 Nm / 5 – 7 lb in	2.5 Nm / 22 lb in	3.2 – 3.7 Nm / 28 – 33 lb in	M10 stud: 10 Nm / 89 lb in PE: 6 Nm / 50 lb in
Suitable for MOVITRAC® B					
3-phase 400/500 V	100 % I_N	0003 – 0075	0110 – 0220	0300 – 0450	0550 – 0750
	125 % I_N	0003 – 0075	0110 – 0150	0220 – 0370	0450 – 0750
3-phase 230 V	100 % I_N	0003 – 0055	0075 – 0110	0150 – 0220	0300
	125 % I_N	0003 – 0037	0055 – 0750	0110 – 0150	0220 – 0300

2.20.1 Dimension drawing for 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 (3.94)	80 (3.1)	70 (2.8)	64 (2.5)	52 (2.0)	4.4 (0.17)	7.4 (0.29)	1.4 (3.1)
ND 020-151	90 (3.5)	100 (3.94)	90 (3.5)	70 (2.8)	64 (2.5)	52 (2.0)	4.4 (0.17)	7.4 (0.29)	1.4 (3.1)

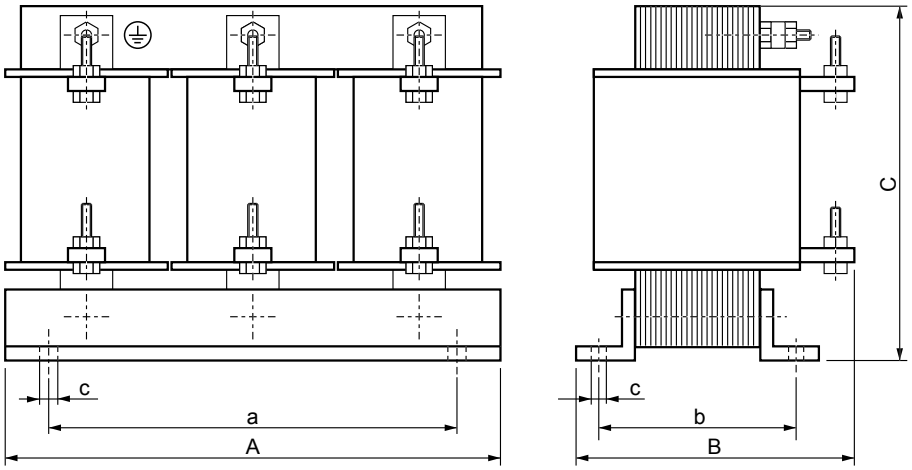
2.20.2 Dimension drawing for ND 020-013 / ND 045-013 / ND 085-013



[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 (3.3)	60 (2.4)	120 (4.72)	50 (2.0)	31 (1.2)	5 – 10 (0.2 – 0.39)	0.5 (1)
ND 045-013	125 (4.92)	95 (3.7)	170 (6.69)	84 (3.3)	55 – 75 (2.2 – 3.0)	6 (0.2)	2.5 (5.5)
ND 085-013	185 (7.28)	115 (4.53)	235 (9.25)	136 (5.35)	56 (2.2)	7 (0.3)	8 (20)

2.20.3 Dimension drawing for 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 150-013	250 (9.84)	160 (6.30)	230 (9.06)	180 (7.09)	77 (3.0)	8 (0.3)	17 (37)

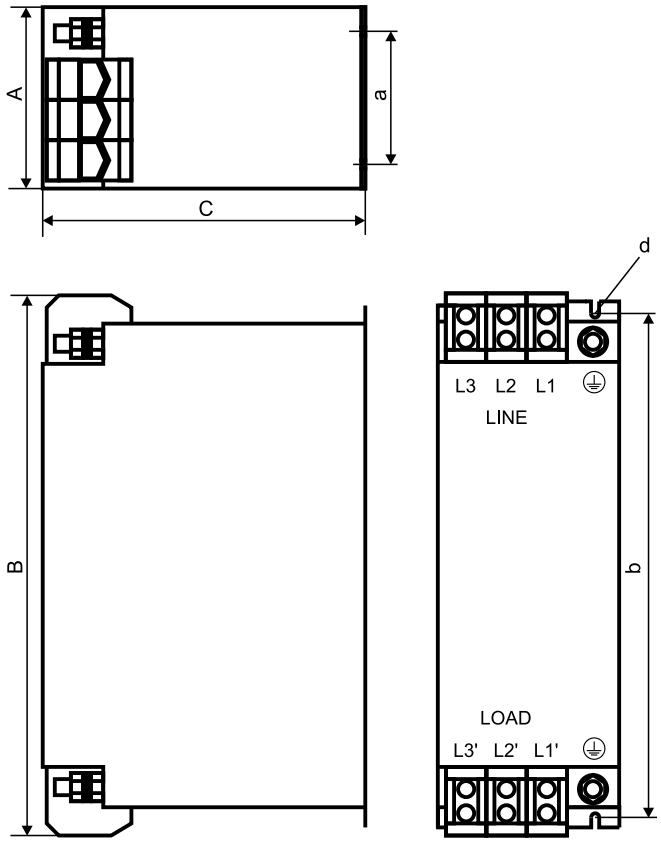
2.21 NF line filters

The line filter suppresses interference emissions on the line side of inverters. The ambient temperature is –25 – +45 °C (–13 – 113 °F). The degree of protection is IP20 (EN 60529). NF line filters have cRUus approval independent of 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	9 W	12 W	15 W	22 W
Earth-leakage current		≤ 25 mA	≤ 25 mA	≤ 25 mA	≤ 25 mA	≤ 40 mA
Connections PE screw		4 mm^2 (AWG10) M5			10 mm^2 (AWG8) M5/M6	
Tightening torque		0.6 – 0.8 Nm / 5 – 7 lb in			1.8 Nm / 16 lb in	
Suitable for MOVITRAC® B						
3 x 400/ 500 V	100 % I_N	0003 – 0040	0055 / 0075	–	0110 / 0150	0220
	125 % I_N	0003 – 0030	0040 / 0055	0075	0110	0150
3 x 230 V	100 % I_N	0015 / 0022	0037	–	0055 / 0075	0110
	125 % I_N	0015	0022	0037	0055 / 0075	–

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	35 W	60 W	90 W
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	50 mm^2 (AWG1/0) M10
Tightening torque		3 Nm / 30 lb in	3.7 Nm / 33 lb in		
Suitable for MOVITRAC® B					
3 x 400/ 500 V	100 % I_N	0300	0370 / 0450	0550	0750
	125 % I_N	0220	0300 / 0370	0450	0550 / 0750
3 x 230 V	100 % I_N	0150	0220	0300	–
	125 % I_N	0110 / 0150	–	0220 / 0300	–

Dimension drawing for line filter [mm (in)]:



Line filter type	Main dimensions		
	A	B	C
NF009-503	55 (2.2)	195 (7.68)	80 (3.1)
NF014-503		225 (8.86)	
NF018-503	50 (2.0)	255 (10.0)	
NF035-503	60 (2.4)	275 (10.8)	100 (3.94)
NF048-503		315 (12.4)	
NF063-503	90 (3.5)	260 (10.2)	
NF085-503		320 (12.6)	140 (5.51)
NF115-503	100 (3.94)	330 (13.0)	155 (6.10)
NF150-503			

Line filter type	Mounting dimensions		Hole dimension	PE connection	Mass kg (lb)
	a	b	d		
NF009-503	20 (0.79)	180 (7.09)	5.5 (0.22)	M5	0.8 (2)
NF014-503		210 (8.27)			0.9 (2)
NF018-503		240 (9.45)			1.1 (2.4)
NF035-503	30 (1.2)	255 (10.0)			1.7 (3.7)
NF048-503		295 (11.6)		M6	2.1 (4.6)
NF063-503	60 (2.4)	235 (9.25)	6.5 (0.26)		2.4 (5.3)
NF085-503		255 (10.0)		M8	3.5 (7.7)
NF115-503	65 (2.6)			M10	4.8 (11)
NF150-503					5.6 (12)

2.22 ULF11A folding ferrites

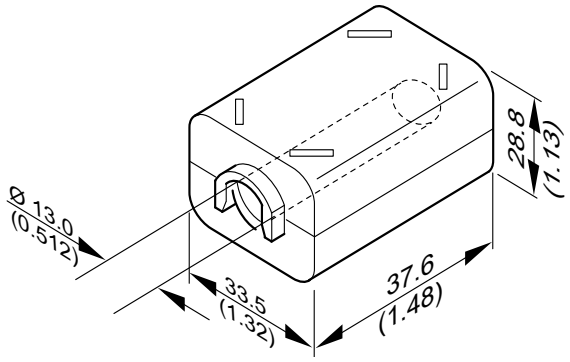
Folding ferrites are used to reduce intereference radiated from the mains cable. Only use folding ferrites with single-phase units.

The delivery scope contains 3 folding ferrites, which much be installed according to the installation instructions.

Technical data:

Part number	1821 213 1 (3 pcs)
For cable diameter	10.5 – 12.5 mm (0.413 – 0.492 in)
Storage temperature	–40 °C – +85 °C (–40 – +185 °F)
Operating temperature	–25 °C – +105 °C (–13 – +221 °F)

Dimension drawing for folding ferrites:



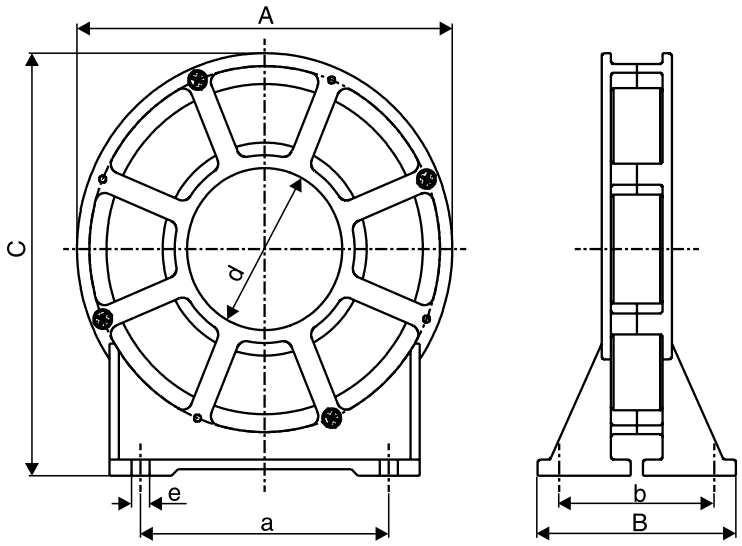
2.23 HD output chokes

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

Output choke type	HD001	HD002	HD003
Part number	813 325 5	813 557 6	813 558 4
Max. power loss P_{Vmax}	15 W	8 W	30 W
Mass	0.5 kg (1 lb)	0.2 kg (0.4 lb)	1.1 kg (2.4 lb)
For cable cross sections	1.5 – 16 mm^2 AWG16 – 6	≤ 1.5 mm^2 ≤ AWG16	≥ 16 mm^2 ≥ AWG6

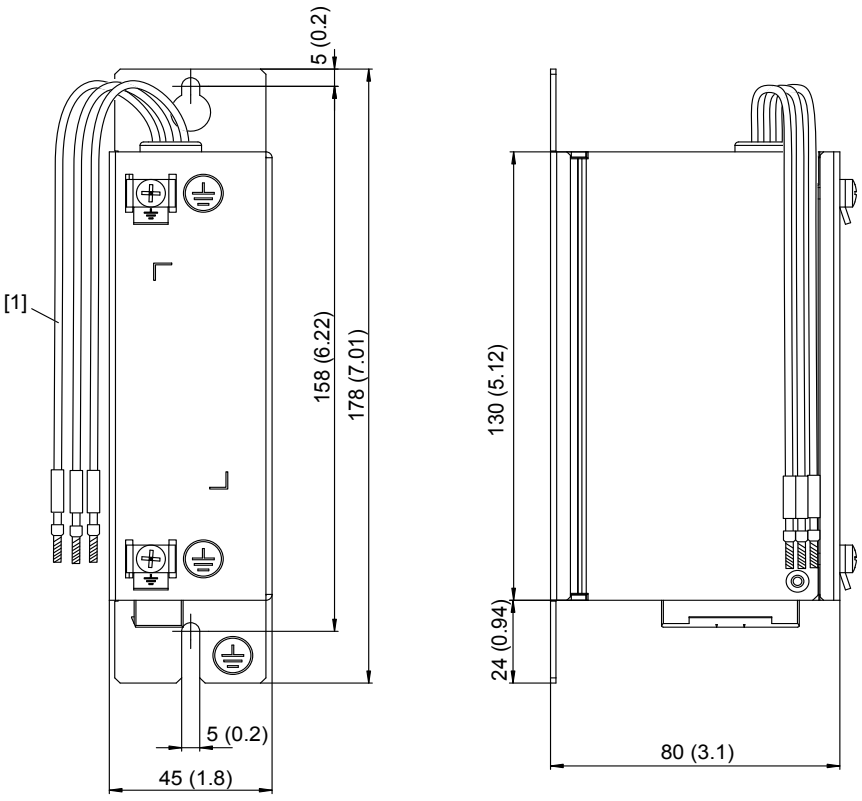
Output choke type	HD012	HD100	HD101
Part number	1821 217 4	829 837 8	829 838 6
Rated current	AC 12 A		
Power loss (at rated current)	11 W	20 W	
Ambient temperature	–10 °C – +60 °C (+14 – 140 °F) Derating 3% I_N at 40 °C – 60 °C (113 – 140 °F)		
Degree of protection		IP20	
Mains and motor connection	≤ 4 mm^2 ≤ AWG12	Screw terminals 4 mm^2 (AWG 10)	
Inverter connection		Cables with conductor end sleeves	
Mass	0.55 kg (1.2 lb)	0.40 kg (0.88 lb)	0.48 kg (1.1 lb)
Can be submounted for size	Cannot be sub-mounted	0S	0L
For MOVITRAC® B ...-5A3	0003 – 0040	0005 / 0008 / 0011 / 0015	0022 / 0030 / 0040
For MOVITRAC® B ..-2A3	0003 – 0022	0005 / 0008	0011 / 0015 / 0022

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



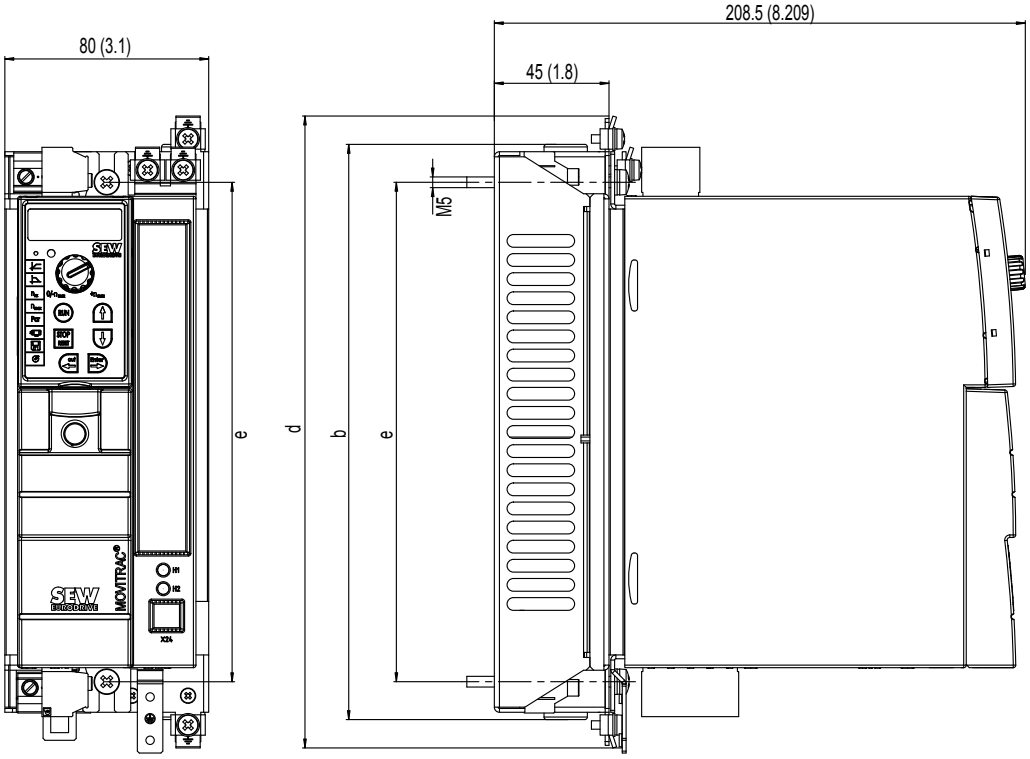
Output choke type	Main dimensions			Mounting dimensions		Inside diameter	Hole dimension
	A	B	C	a	b	d	e
HD001	121 (4.76)	64 (2.5)	131 (5.16)	80 (3.1)	50 (2.0)	50 (2.0)	5.8 (0.23)
HD002	66 (2.6)	49 (1.9)	73 (2.9)	44 (1.7)	38 (1.5)	23 (0.91)	5.8 (0.23)
HD003	170 (6.69)	64 (2.5)	185 (7.28)	120 (4.72)	50 (2.0)	88 (3.5)	7.0 (0.28)

Dimension drawing for HD012



[1] Length = 100 mm (3.94 in)

Dimension drawing for HD100 / HD101:



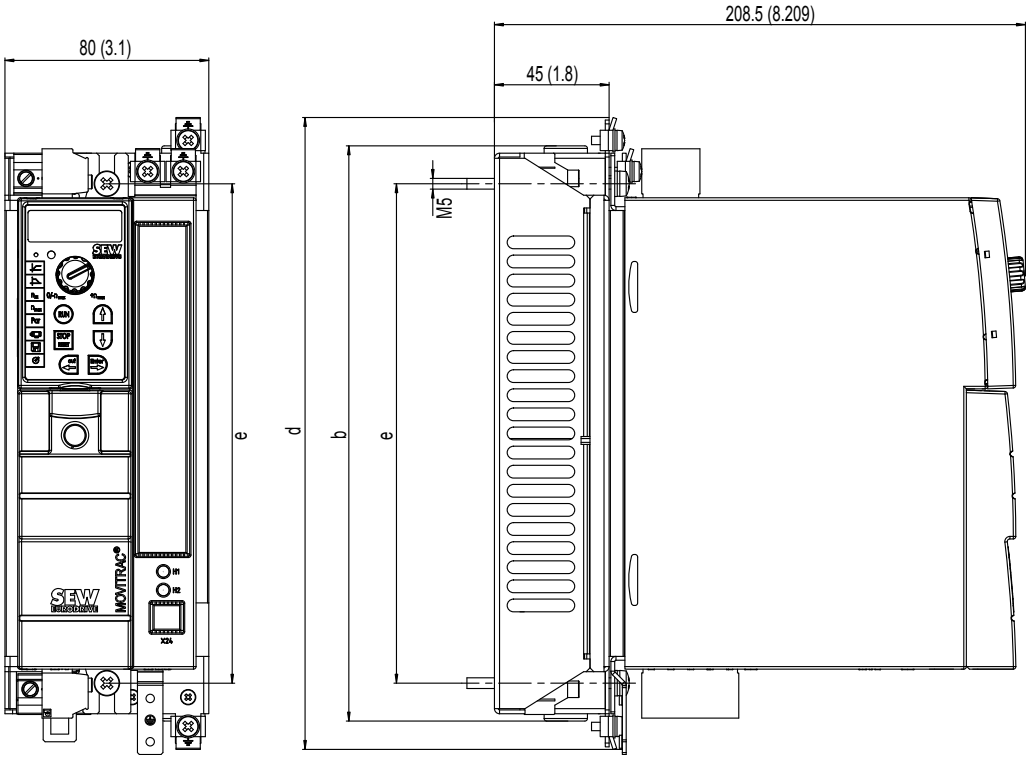
Output choke type	MOVITRAC® B	b	d	e
HD100	Size 0S	226 (8.90)	248 (9.76)	196 (7.72)
HD101	Size 0L	314.5 (12.38)	336.5 (13.25)	284.5 (11.20)

2.24 EMC module FKE12B/13B

Using the EMC module, you can reach limit class C1 (B) on the input and output sides. The EMC module is designed for 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	
Power loss (at rated current)	20 W	
Ambient temperature	–10 °C – +60 °C (+14 – 140 °F) Derating 3% I_N at 40 °C – 60 °C (113 – 140 °F)	
Degree of protection	IP20	
Mains and motor connection	Screw terminals 4 mm^2 (AWG 10)	
Inverter connection	Cables with conductor end sleeves	
Mass	0.40 kg (0.88 lb)	0.48 kg (1.1 lb)
Can be submounted for size	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 (8.90)	248 (9.76)	196 (7.72)
FKE13B	Size 0L	314.5 (12.38)	336.5 (13.25)	284.5 (11.20)

2.25 HF output filters

SEW output filters of the HF type are sine filters. Sine filters smoothen the output voltage of the inverter. 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.
- To protect against overvoltage spikes in long motor cables (> 100 m (328 ft))

	TIP
	Do not use output filters in hoists because of the voltage drop in the filter!

	TIP
	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 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
Mains voltage V_N	3 × AC 200 V –10 % – 3 × AC 500 V +10 %, 50/60 Hz[2)]					
Earth-leakage current at U_N ΔI	0 mA					
Power loss at I_N P_V	25 W	35 W	55 W	65 W	90 W	115 W
Degree of protection (EN 60529)	IP20					
Connections / tightening torque	M4 terminal studs 1.6 Nm ± 20 % / 14 lb in ± 20 %					
Mass	3.1 kg (6.8 lb)	4.4 kg (9.7 lb)			10.8 kg (23.8 lb)	
Assignment to AC 400/500 V units						
Voltage drop at I_N ΔU	< 6.5 % (7.5 %) at AC 400 V / < 4 % (5 %) at AC 500 V and f_{Amax} = 50 Hz (60 Hz)					
Rated throughput current[3)] $I_{N\ 400\ V}$ at V_{mains} = 3 × AC 400 V	AC 2.5 A	AC 4 A	AC 6 A	AC 8 A	AC 10 A	AC 12 A
Rated throughput current[3)] $I_{N\ 500\ V}$ at V_{mains} = 3 × AC 500 V	AC 2 A	AC 3 A	AC 5 A	AC 6 A	AC 8 A	AC 10 A
Rated operation (100 %) [3)]	0003 – 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_N ΔU	–	< 18.5 % (19 %) at AC 230 V with f_{Amax} = 50 Hz (60 Hz)				
Rated throughput current[3)] $I_{N\ 230\ V}$ at V_{mains} = 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)]	0003 – 0008	0011	0015/0022	–	0037	0055
Increased power (125 %) [3)]	0003 – 0005	0008	0011 – 0022	–	–	0037

1) Approved to UL/cUL in conjunction with MOVITRAC® inverters. SEW-EURODRIVE will provide certification on request.

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

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

Output filter type		HF075-503[1]	HF023-403[1]	HF033-403[1]	HF047-403[1]	HF450-503
Part number		826 313 2	825 784 1	825 785 X	825 786 8	826 948 3
Rated voltage	V_N	3 × AC 200 V –10 % – 3 × AC 500 V +10 %, 50/60 Hz[2]				
Earth-leakage current at U_N	ΔI	0 mA				
Power loss at I_N	P_V	135 W	90 W	120 W	200 W	400 W
Degree of protection (EN 60529)		IP 20	IP20			IP 10
Connections / tightening torque		M4 terminal studs 1.6 Nm ± 20 % / 14 lb in ± 20 %	35 mm² (AWG 2) 3.2 Nm / 28 lb in			
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_N	ΔU	< 6.5 % (7.5 %) at AC 400 V / < 4 % (5 %) at AC 500 V and f_{Amax} = 50 Hz (60 Hz)				
Rated throughput current[3] at V_{mains} = 3 × AC 400 V	$I_{N\ 400\ V}$	AC 16 A	AC 23 A	AC 33 A	AC 47 A	AC 90 A
Rated throughput current[3] at V_{mains} = 3 × AC 500 V	$I_{N\ 500\ V}$	AC 13 A	AC 19 A	AC 26 A	AC 38 A	AC 72 A
Rated operation (100 %) [3]		0075	0110	0150/0300[4]	0220	0370/0450/0550[4]/0750[4]
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_N	ΔU	< 18.5 % (19 %) at AC 230 V with f_{Amax} = 50 Hz (60 Hz)				
Rated throughput current[3] at V_{mains} = AC 230 V	$I_{N\ 230\ V}$	AC 29 A	AC 42 A	AC 56.5 A	AC 82.6 A	AC 156 A
Rated operation (100 %) [3]		0075	0110	0150/0300[4]	0220	0300
Increased power (125 %) [3]		0055	0075	0110/0220[4]	0150	0220/0300

1) Approved to UL/cUL in conjunction with MOVITRAC® frequency inverters. SEW-EURODRIVE will provide certification on request.

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

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

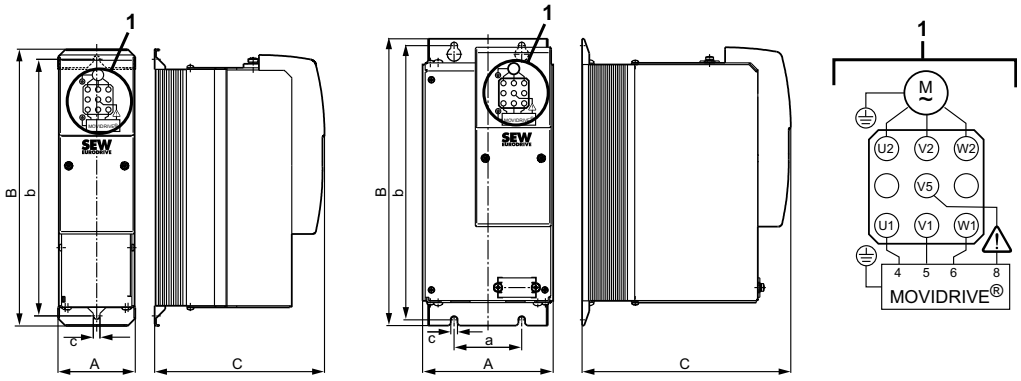
4) For operation with these MOVITRAC® units, connect **2 HF output filters in parallel**.

Output filter type		HF180-403
Part number		829 909 9
Rated voltage	V_N	3 × AC 380 V –10 % – 3 × AC 500 V +10 %, 50/60 Hz[1)]
Earth-leakage current at U_N	ΔI	0 mA
Power loss at I_N	P_V	860 W
Degree of protection (EN 60529)		IP 00
Connections / tightening torque		M10 terminal studs / 70 mm^2 (AWG 3/0) 30 Nm / 270 lb in
Mass		85.3 kg (188 lb)
Assignment to AC 400/500 V units		
Voltage drop at I_N	ΔU	< 6.5 % (7.5 %) at AC 400 V / < 4.6 % (5.5 %) at AC 500 V and f_{Amax} = 50 Hz (60 Hz)
Rated throughput current[2)] at V_{mains} = 3 × AC 400 V	$I_{N\ 400\ V}$	AC 180 A
Rated throughput current[2)] at V_{mains} = 3 × AC 500 V	$I_{N\ 500\ V}$	AC 180 A
Rated operation (100 %)[2)]		0550/0750
Increased power (125 %)[2)]		0550/0750

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

2) 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".

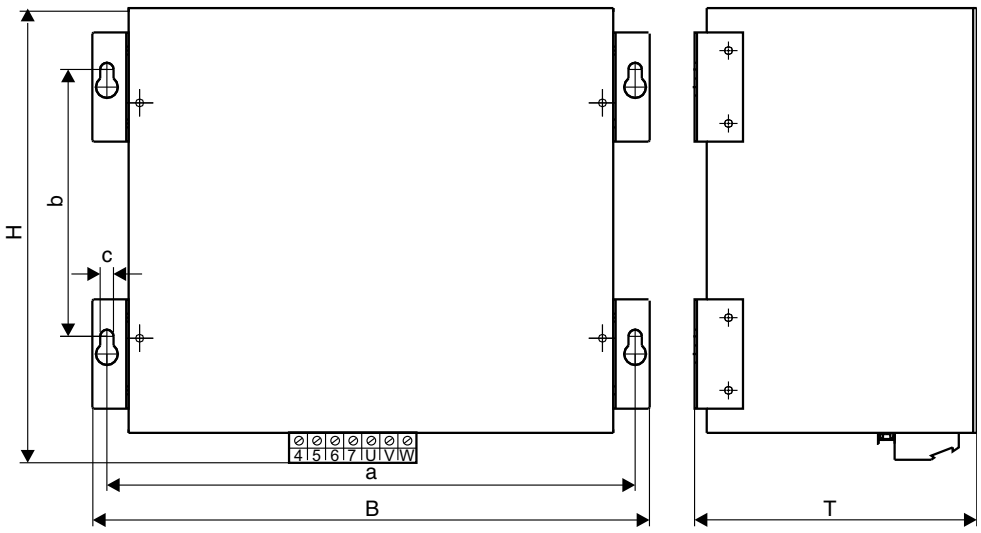
Dimension drawing for HF...-503 [mm (in)]:



Type	Main dimensions		
	A	B	C
HF008 / 015 / 022 / 030-503	80 (3.1)	286 (11.3)	176 (6.93)
HF040 / 055 / 075-503	135 (5.31)	296 (11.7)	216 (8.50)

Type	Mounting dimensions		Hole dimension	Ventilation clearances	
	a	b	c	Above	Below
HF008 / 015 / 022 / 030-503	–	265 (10.4)	7 (0.3)	100 (3.94)	100 (3.94)
HF040 / 055 / 075-503	70 (2.8)	283 (11.1)	7 (0.3)	100 (3.94)	100 (3.94)

Dimension drawing for HF450-503 [mm (in)]:

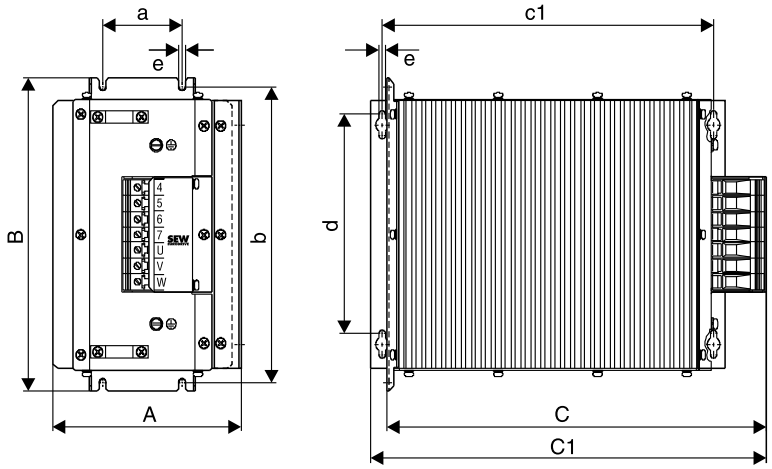


Only the mounting position shown in the dimension drawing is permitted

Output filter type	Main dimensions		
	B	H	T
HF450-503	465 (18.3)	385 (15.2)	240 (9.45)

Output filter type	Mounting dimensions		Hole dimension	Ventilation clearances	
	a	b	c	Above	Below
HF450-503	436 (17.2)	220 (8.66)	8.5 (0.33)	100 (3.94)	100 (3.94)

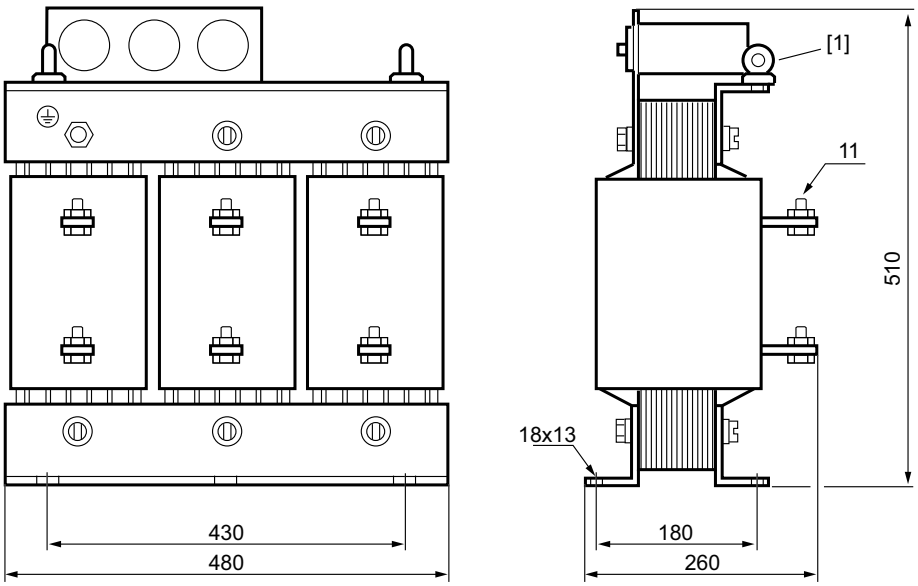
Dimension drawing for HF...-403 [mm (in)]:



Type	Main dimensions			Standard installation	
	A	B	C/C1	b	a
HF023-403	145 (5.71)	284 (11.2)	365/390 (14.4/ 15.4)	268 (10.6)	60 (2.4)
HF033-403					
HF047-403	190 (7.48)	300 (11.8)	385/400 (15.2/ 15.7)	284 (11.2)	80 (3.1)

Type	Horizontal mounting position		Hole dimension	Ventilation clearances		
	d	c1	e	At the sides	Above	Below
HF023-403	210 (8.27)	334 (13.1)	6.5 (0.26)	30 (1.2)	150 (5.91)	150 (5.91)
HF033-403						
HF047-403						

Dimension drawing for HF180-403:



[1] Remove eyelets after transport

2.26 Fieldbus connection

2.26.1 Fieldbus gateways

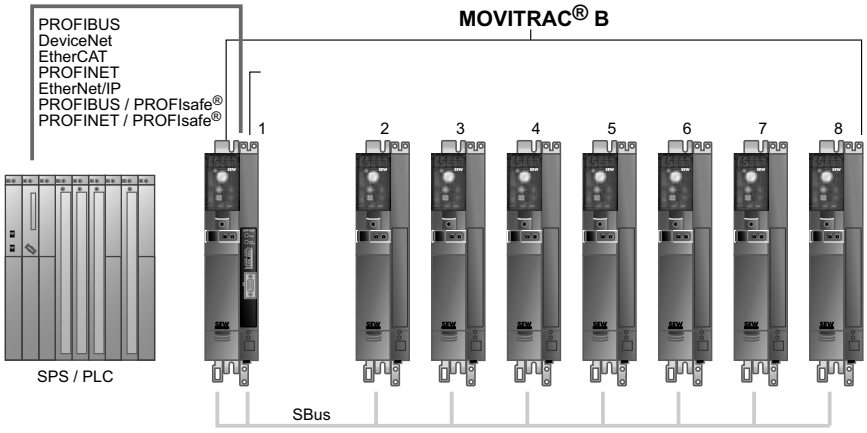
The fieldbus gateways convert standard fieldbuses into the SEW SBus. This means that up to 8 inverters can be triggered using one gateway.

The controller (PLC or PC) and the MOVITRAC® 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.

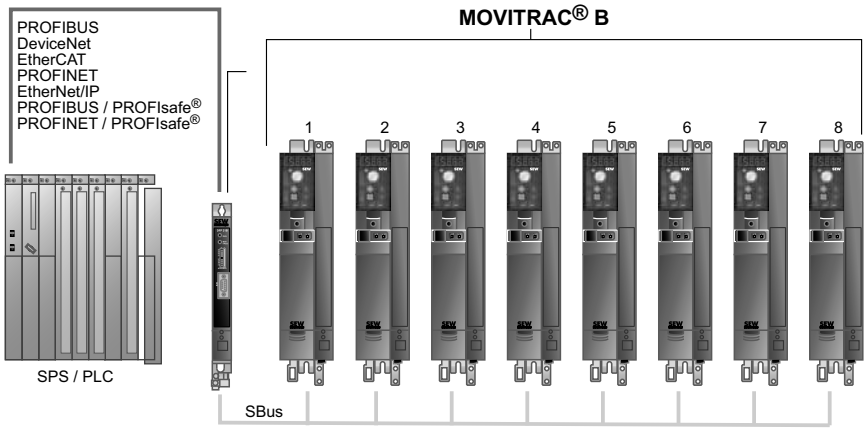
In general, you can also connect and operate other SEW units (such as MOVIDRIVE® inverters) using the SBus.

There are two different versions of gateway functionality:

- Integrated in the inverter: The DF..B fieldbus interface is mounted in MOVITRAC® B.



- In separate housing: The DF..B fieldbus interface is mounted in an UOH11B housing. The UFI11A gateway is available for INTERBUS.



	TIP
	If a fieldbus interface is factory-installed in MOVITRAC® B, then SBus address P881 is already factory set to "1". In MOVITRAC® B without fieldbus interface, SBus address P881 is factory set to "0".

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

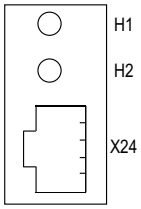
Bus	Separate housing	Integrated in inverter[1)]
PROFIBUS	DFP21B / UOH11B	MC07B.../FSC11B/DFP21B
DeviceNet	DFD11B / UOH11B	MC07B.../FSC11B/DFD11B
EtherCAT	DFE24B / UOH11B	MC07B.../FSC11B/DFE24B
PROFINET	DFE32B / UOH11B	MC07B.../FSC11B/DFE32B
EtherNet/IP	DFE33B / UOH11B	MC07B.../FSC11B/DFE33B
PROFIBUS / PROFIsafe®	DFS11B / UOH11B	MC07B.../FSC11B/DFS11B
PROFINET / PROFIsafe®	DFS21B / UOH11B	MC07B.../FSC11B/DFS21B
INTERBUS	UFI11A (823 898 7)	–

1) Integration in inverter not for size 0XS.

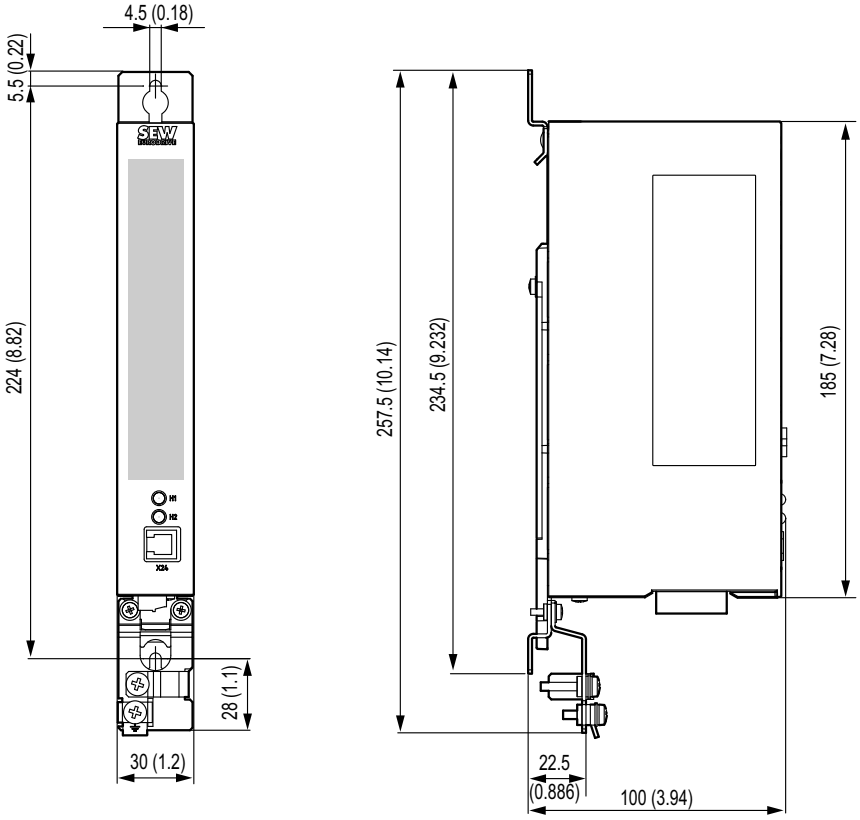
MOVITRAC® B must be supplied with DC 24 V at terminals X12.8 and X12.9 when it supplies the gateways.

Operating principle

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

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

Dimension drawing for UOH



2.26.2 DFP21B fieldbus interface for PROFIBUS

Description

The MOVITRAC® B frequency inverter enables you to use the DFP21B option to connect to higher-level automation systems via PROFIBUS DP and DP-V1 thanks to its powerful, universal fieldbus interface.

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

Electronics data

DFP21B option		
	**External voltage supply via X26**	U = DC 24 V (–15 % / +20 %) I_{max} = DC 200 mA P_{max} = 3.4 W
	PROFIBUS protocol options	PROFIBUS DP and DP-V1 acc. to IEC 61158
	Automatic baud rate detection	9.6 kBd – 12 MBd
	Connection technology	• Via 9-pin D-sub connector • Pin assignment acc. to IEC 61158
	Bus termination	Not integrated, must be implemented using suitable PROFIBUS connector with terminating resistors that can be switched on.
	Station address	1 to 125, adjustable via DIP switches
	GSD file name	SEW_6009.GSD
	DP ID number	$6009_{hex} = 24585_{dec}$
	Application-specific parameter-setting data (Set-Prm-User-Data)	• Length: 3 bytes • Hex parameter setting 00,00,00
	DP configurations for DDLM_Chk_Cfg	See publication "Fieldbus Interface DFP21B PROFIBUS DP-V1".
	Diagnostics data	• Standard diagnostics: 6 bytes

2.26.3 DFD11B fieldbus interface for DeviceNet

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 "DFD11B DeviceNet Fieldbus Interface" for installation.

Electronics data

DFD11B option		
	**External voltage supply via X26**	U = DC 24 V (–15 %, +20 %) I_{max} = DC 200 mA P_{max} = 3.4 W
	Communication protocol	Master/slave connection set according to DeviceNet specification version 2.0
	Number of process data words	Can be set using DIP switch: • 1 – 24 process data words with polled I/O • 1 – 4 process data words with bit-strobe I/O
	Baud rate	125, 250 or 500 kBaud, can be set using DIP switch
	Bus cable length	For thick cable according to DeviceNet specification 2.0 appendix B: • 500 m (1640 ft) with 125 kBaud • 250 m (820 ft) with 250 kBaud • 100 m (656 ft) with 500 kBaud
	Transmission level	ISO 11 98 - 24 V
	Connection technology	• 5-pin Phoenix-Kombicon terminal • Pin assignment according to DeviceNet specification
	MAC ID	0 – 63, can be set using DIP switch Max. 64 stations
	Supported services	• Polled I/O • Bit strobe I/O • Explicit messages: – Get_Attribute_Single – Set_Attribute_Single – Reset – Allocate_MS_Connection_Set – Release_MS_Connection_Set
	EDS file name	SEW_GATEWAY_DFD11B.eds

2.26.4 DFE24B fieldbus interface for EtherCAT

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 "DFE24B EtherCAT Fieldbus Interface" for installation.

Electronics data

DFE24B option		
	**External voltage supply via X26**	U = DC 24 V (–15 %, +20 %) I_{max} = DC 200 mA P_{max} = 3.4 W
	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 1/2	Ethernet II
	Station address	Setting via EtherCAT master (→ Display with P093)
	XML file name	SEW_DFE24B.xml
	Vendor ID	0x59 (CANopenVendor ID)
	EtherCAT services	• CoE (CANopen over EtherCAT) • VoE (Simple MOVILINK protocol over EtherCAT)

2.26.5 DFE32B fieldbus interface for PROFINET IO RT

Description

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

Refer to the publication "DFE32B PROFINET IO Fieldbus Interface" for installation.

Electronics data

DFE32B option		
	**External voltage supply via X26**	U = DC 24 V (–15 %, +20 %) I_{max} = DC 200 mA P_{max} = 3.4 W
	Application protocols	• **PROFINET IO** (Ethernet frames with frame identification 8892_{hex}) to control and set parameters for the inverter. • **HTTP** (Hypertext Transfer Protocol) for diagnostics using a Web browser. • **SMLP** (Simple Movilink Protocol), protocol used by MOVITOOLS® MotionStudio.
	Port numbers used	• 300 (SMLP) • 80 (HTTP)
	Ethernet services	• ARP • ICMP (ping)
	OSI layer 1/2	Ethernet II
	Baud rate	100 MBd in full duplex mode
	Connection technology	2 x RJ45 with internal switch® and auto crossing
	Addressing	4 byte IP address or MAC-ID (00:0F:69:xx:xx:xx)
	Manufacturer ID (vendor ID)	$010A_{hex}$
	GSD file name	GSML-V2.1-SEW-DFE-DFS-2Ports-YYYYMMTT.xml

2.26.6 DFE33B fieldbus interface for EtherNet/IP

Description

The MOVITRAC® B frequency inverter enables you to use the EtherNet/IP DFE33B option to connect to higher-level automation systems via EtherNet/IP thanks to its powerful, universal fieldbus interface.

Refer to the publication "DFE33B EtherNet/IP Fieldbus Interface" for installation.

Electronics data

DFE33B option		
	**External voltage supply via X26**	U = DC 24 V (–15 %, +20 %) I_{max} = DC 200 mA P_{max} = 3.4 W
	Application protocols	• **EtherNet/IP** (Industrial Protocol) to control and set parameters for the inverter. • **HTTP** (Hypertext Transfer Protocol) for diagnostics using a Web browser. • **SMLP** (Simple Movilink Protocol), protocol used by MOVITOOLS® MotionStudio. • **DHCP** (Dynamic Host Configuration Protocol) to assign address parameter automatically.
	Port numbers used	• 44818 (EtherNet/IP TCP) • 2222 (EtherNet/IP UDP) • 300 (SMLP) • 80 (HTTP) • 67 / 88 (DHCP)
	Ethernet services	• ARP • ICMP (ping)
	ISO/OSI layer 1/2 **ISO/OSI layer 3/4**	Ethernet II TCP/IP and UDP/IP
	Baud rate	10 / 100 MBaud
	Connection technology	2 x RJ45 with internal switch and auto crossing
	Addressing	4 byte IP address or MAC-ID (00:0F:69:xx:xx:xx)
	Manufacturer ID (vendor ID)	$013B_{hex}$
	EDS file name	SEW_GATEWAY_DFE33B.eds

2.26.7 DFS11B fieldbus interface for PROFIBUS / PROFIsafe®

Description

The MOVITRAC® B frequency inverter enables you to use the DFS11B option to connect to higher-level automation systems via PROFIBUS with PROFIsafe thanks to its powerful, universal fieldbus interface.

Refer to the publication "DFS11B PROFIBUS DP-V1 with PROFIsafe Fieldbus Interface" for installation.

Electronics data

DFS11B option		
	**External voltage supply via X26**	U = DC 24 V (–15 % / +20 %) I_{max} = DC 200 mA P_{max} = 3.4 W
	PROFIBUS protocol options	PROFIBUS DP and DP-V1 acc. to IEC 61158
	Automatic baud rate detection	9.6 kBaud ... 12 MBaud
	Connection technology	• Via 9-pin D-sub connector • Pin assignment acc. to IEC 61158
	Bus termination	Not integrated, must be implemented using suitable PROFIBUS connector with terminating resistors that can be switched on.
	Station address	1 ... 125, adjustable via DIP switches
	F address	1 ... 1022, adjustable via DIP switches
	GSD file name	SEW_6009.GSD
	DP ID number	6009_{hex} = 24585_{dec}
	Application-specific parameter-setting data (Set-Prm-User-Data)	• Length 3 bytes • Hex parameter setting 00,00,00
	DP configurations for DDLM_Chk_Cfg	See publication "DFS11B PROFIBUS DP-V1 with PROFIsafe Fieldbus Interface".
	Diagnostics data	• Standard diagnostics: 6 bytes

	TIP
	Safety-oriented applications are implemented using PROFIsafe interfaces. Refer to the publication "DFS11B PROFIBUS DP-V1 with PROFIsafe Fieldbus Interface" for installation.

2.26.8 DFS21B fieldbus interface for PROFINET / PROFIsafe

Description

The MOVITRAC® B frequency inverter enables you to use the DFS21B option to connect to higher-level automation systems via PROFINET IO RT with PROFIsafe thanks to its powerful, universal fieldbus interface.

Refer to the publication "DFS21B PROFINET with PROFIsafe" for installation.

Electronics data

DFS21B option		
	**External voltage supply via X26**	U = DC 24 V (–15 %, +20 %) I_{max} = DC 200 mA P_{max} = 3.4 W
	Application protocols	• **PROFINET IO** (Ethernet frames with frame identification 8892_{hex}) to control and set parameters for the inverter. • **HTTP** (Hypertext Transfer Protocol) for diagnostics using a Web browser. • **SMLP** (Simple Movilink Protocol), protocol used by MOVITOOLS® MotionStudio.
	Port numbers used	• 300 (SMLP) • 80 (HTTP)
	Ethernet services	• ARP • ICMP (ping)
	OSI layer 1/2	Ethernet II
	Baud rate	100 MBd in full duplex mode
	Connection technology	2 x RJ45 with internal switch and auto crossing
	Addressing	4 byte IP address or MAC-ID (00:0F:69:xx:xx:xx)
	F address	1 ... 1022, adjustable via DIP switches
	Manufacturer ID (vendor ID)	$010A_{hex}$
	GSD file name	GSML-V2.1-SEW-DFE-DFS-2Ports-YYYYMMTT.xml

TIP

Safety-oriented applications are implemented using PROFIsafe interfaces.

Refer to the publication "DF21B PROFINET with PROFIsafe Fieldbus Interface" for installation.

2.27 MOVI-PLC®

2.27.1 Unit types

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

MOVI-PLC® unit type:		Description
MOVI-PLC® basic	DHP11B-T0	MOVI-PLC® basic controller
	DHP11B-T1[1)]	Technology version I includes the functions electronic cam and synchronous operation in addition to the T0 version.
	DHP11B-T2[1)]	Technology version II includes, for example, handling in addition to the T1 version.
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 consult SEW-EURODRIVE.

2.27.2 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 integrated ex works (not in size 0XS) 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. The DHP11B control card can control 12 units simultaneously (MOVIDRIVE®, MOVITRAC®, MOVIMOT®).

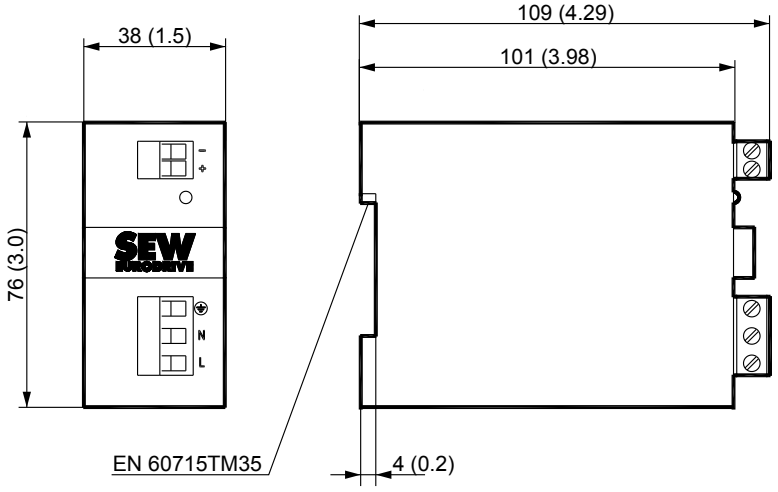
2.27.3 Electronics data

Electronics data of MOVI-PLC® basic DHP11B:

Status display	LEDs for • Voltage supply I/O • Firmware • Program • PROFIBUS • System buses
Fieldbus	• PROFIBUS DP and DPV1 according 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	• 2 system buses (CAN) to control 12 inverters and CANopen I/O modules • CAN layer 2 (SCOM cyclic, acyclic) or via the SEW MOVILINK® protocol • Baud rate: 125 kBd – 1 MBd • External bus terminator • Address range: 0 – 127
Engineering	Via RS485, PROFIBUS and the system buses
Panel operation	Via RS-485 and CAN 2 (in preparation)
Connection technology	• PROFIBUS: 9-pole D-sub 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, 5 of which are interrupt-capable.
Memory	• Program: 512 kByte • Data: 128 kByte • Retain: 24 kByte
Tools for startup	• Programming languages – STL – ST – LD – FBD – CFC – AS • Libraries for optimized inverter control

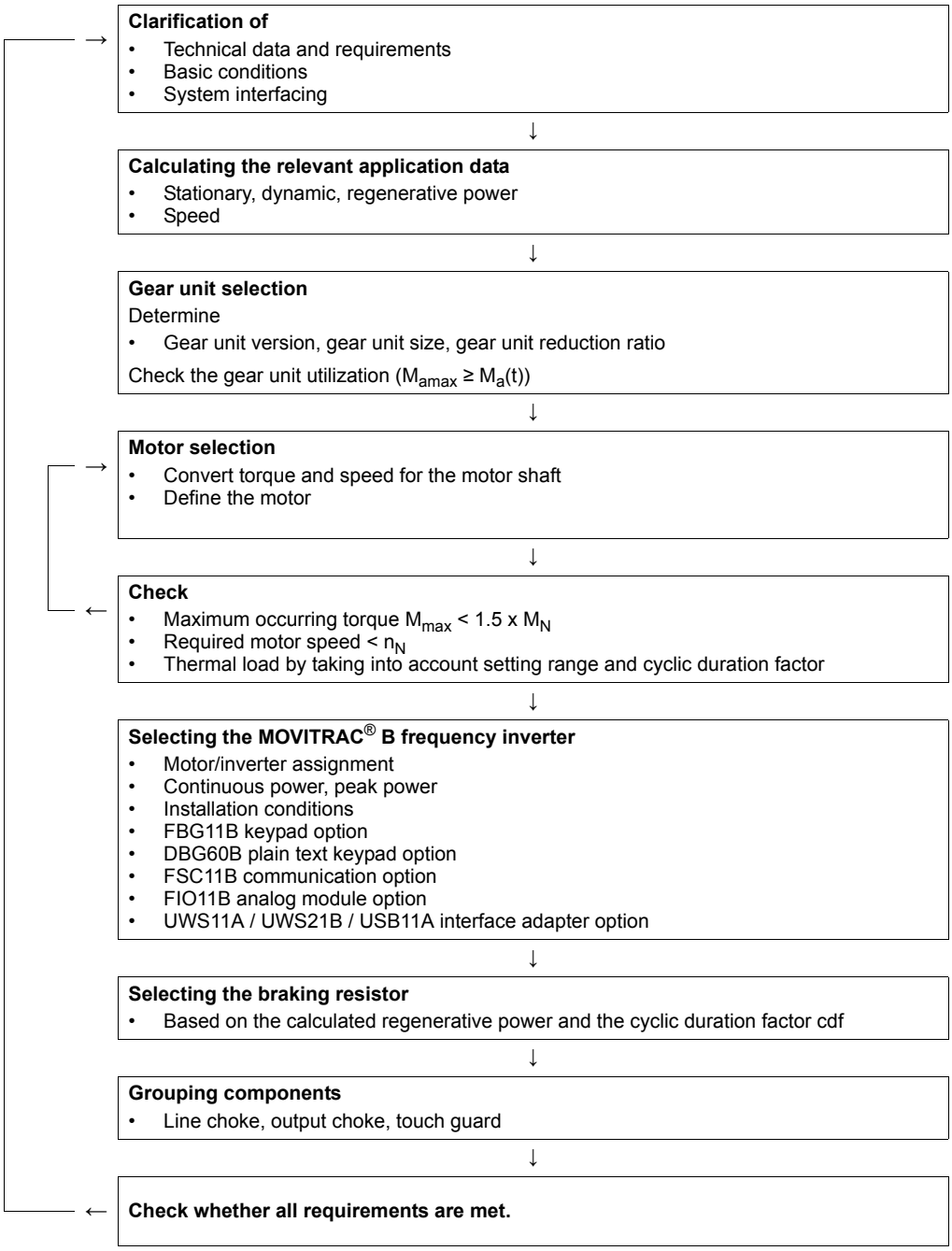
2.28 UWU52A switched-mode power supply

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
Maximum 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 at 55 °C	 DC 2.5 A DC 2.0 A
Residual ripple	< 50 mV_{eff}
Interference voltage	< 120 mV_{SS}
Power loss	< 5.5 W
Mass	0.23 kg (0.51 lb)
Working temperature	0 – +55 °C (+32 – +131 °F) (non-condensing)
Degree of protection	IP20 (EN 60529)
Protection class	I
Connection	Terminal screws for cable cross section of 0.20 – 2.5 mm^2 (AWG24 – AWG13)



3 Project Planning

3.1 Schematic procedure



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 C1.

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 dimensioned. The thermal load determines the required continuous motor power. 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.

Caution!

Speed monitoring is set by changing parameters 500 / 502 and 501 / 503. The sagging of hoists cannot be avoided safely when monitoring is deactivated or the delay time is set too long.

Thermal factors

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

Starting torque

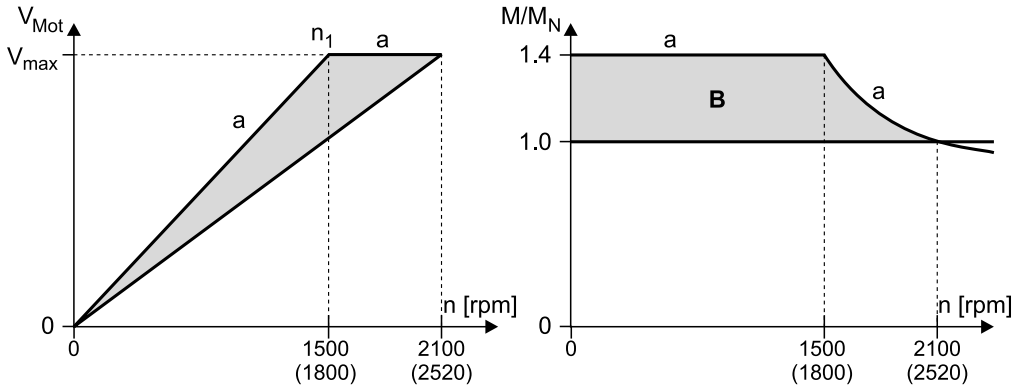
The highest operating torque is required for acceleration with maximum load in the **upwards** hoisting direction.

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 means the gear unit input speed is increased by a factor of 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 on the input shaft in the field weakening range (50 ... 70 Hz or 60 ... 83 Hz). 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 profile
B = Torque reserve range

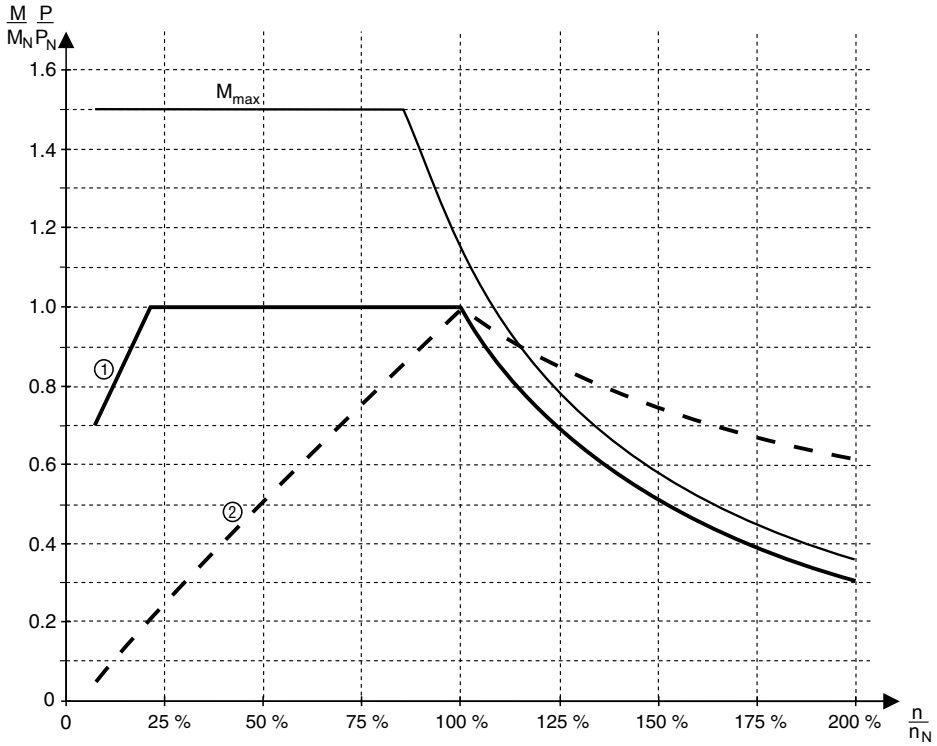
Select the motor power for hoists according to the load type:

- 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 characteristic curve

The speed-torque characteristic curve looks as follows:



[1] M in S1 100 % cdf
[2] P in S1 100 % cdf

To characteristic curve 1:

Below 20 Hz, the drive cannot be loaded with the rated mtoor torque. The reduced speed decreases the self-cooling of the motor. As a result, the motor would heat up excessively.

This limit is not caused by the inverter. Motors with sufficient forced cooling can even be loaded with a rated torque below 20 Hz.

3.5 Motor selection

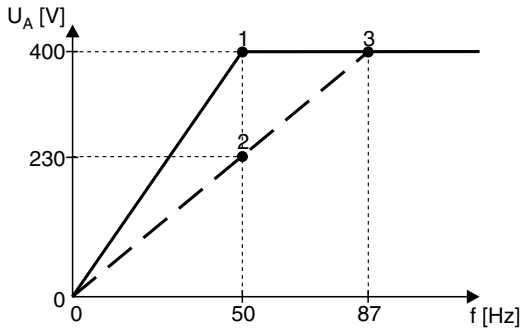
3.5.1 Basic recommendations

- Use only motors with at least thermal class 155 (F).
- Use the TF thermistor or TH bimetallic switch.
- Preferably use 4-pole motors. This applies particularly if you are operating gearmotors 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 setting of MOVITRAC® B. Smaller motors can deteriorate the control behavior.

MOVITRAC® B	Rated power P_N	SEW motor	
Speed [rpm] at 50 Hz		3000	1500
Speed [rpm] at 60 Hz		3600	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 (5.4 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

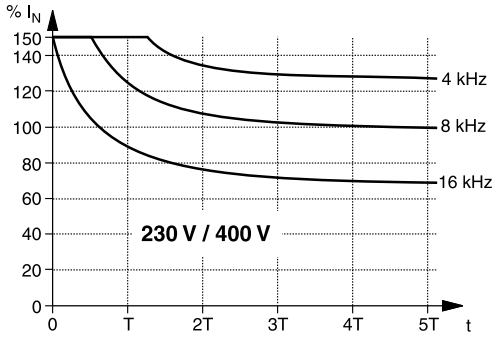
MOVITRAC® B frequency inverters permanently calculate the load on the inverter output stage (unit utilization). They can output the maximum possible power in every operating state.

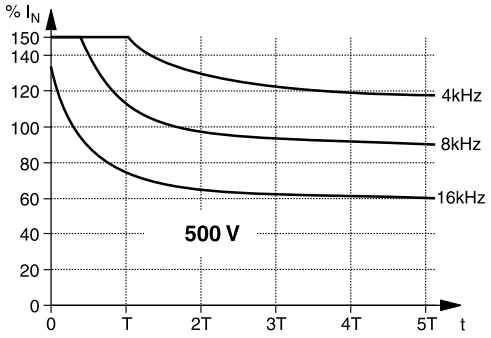
The permitted continuous output current depends on:

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

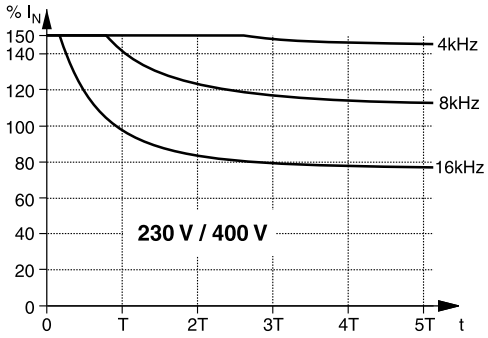
If a PWM frequency > 4 kHz is set and "P862/P863 PWM fix 1/2" is set to off, the inverter automatically reduces the PWM frequency in the event of a unit overload. The inverter responds to a higher than permitted load by issuing the "F44 Unit utilization" error message and an immediate switch-off.

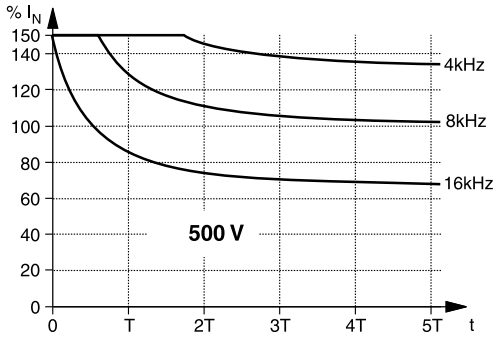
Overload capacity at 40 °C (104 °F)





Overload capacity at 25 °C (77 °F)





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

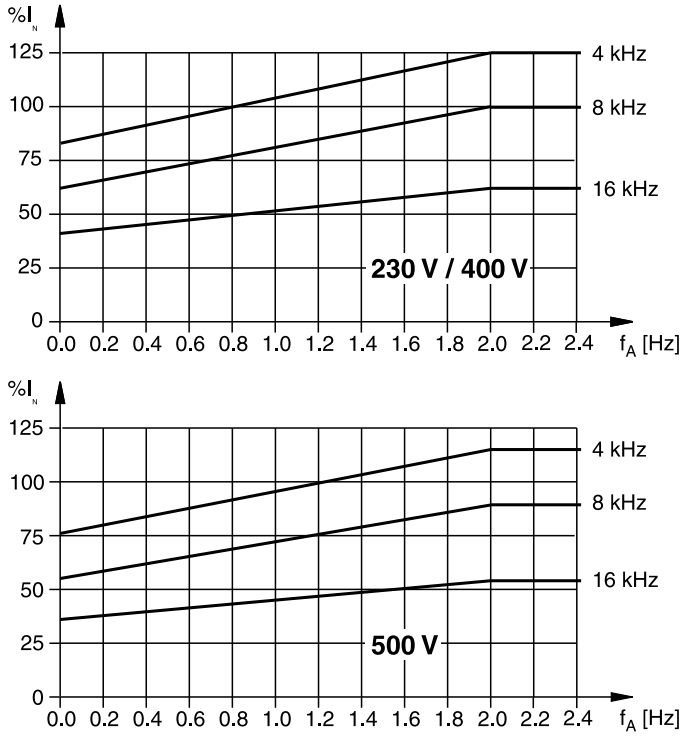
3.7 Load capacity of the units at low output frequencies

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 Project planning for explosion-proof AC asynchronous motors of category 2

Explosion-proof AC motors from SEW-EURODRIVE that are taken into operation with MOVITRAC® B must be approved for such operation according to the nameplate and EC type examination certificate.

3.9 Selecting the braking resistor

DANGER

The supply cables to the braking resistor carry a **high DC voltage (ca. DC 900 V)**.

Severe or fatal injuries from electric shock.

- The braking resistor cables must be suitable for this high DC voltage.
- Install the braking resistor cables according to the regulations.

WARNING

The surfaces of the braking resistors get very hot when the braking resistors are loaded with P_{rated}.

Risk of burns and fire.

- Choose a suitable installation location. Braking resistors are usually mounted on top of the control cabinet.
- Do not touch the braking resistors.

TIPS

- 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 the 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:
  - BW..-T up to overload factor 12
  - BW..-P up to overload factor 40
- The **maximum permitted line length** between **MOVITRAC®** and braking resistor is **100 m (328 ft)**.

- **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 entered in the table.

- **Peak braking power**

  The peak breaking 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

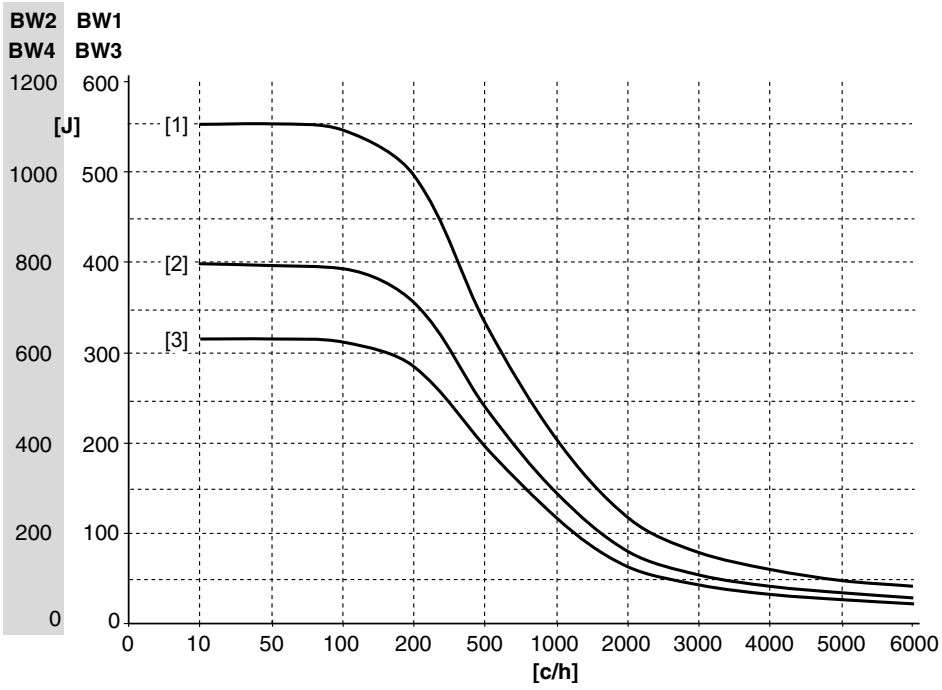
  - With 400 / 500 V units: DC 970 V
  - With 230 V units: DC 485 V

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

3.9.1 Load capacity of PTC braking resistors

The following diagram shows the load capacity of braking resistors BW1 – BW4 per braking operation:



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

Calculation example

Given:

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

Procedure:

Calculating energy from the 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.

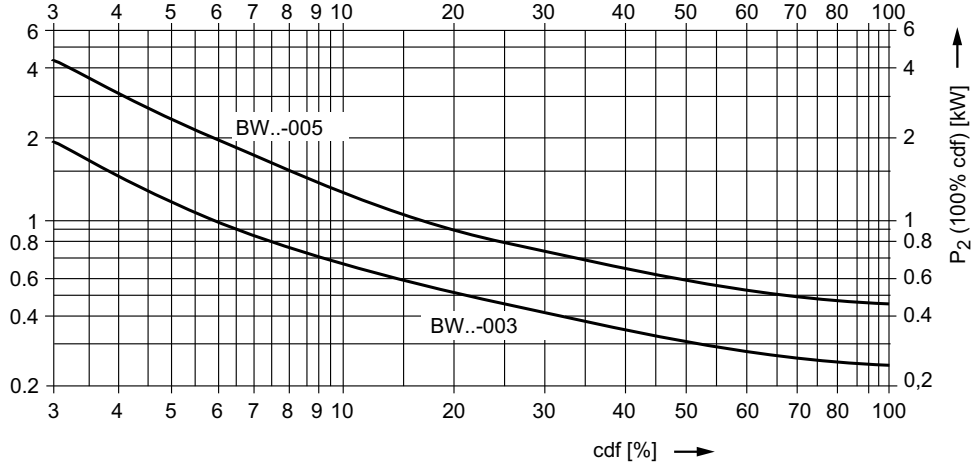
The diagram allows a power of 580 J with a 0.2 s brake ramp at 200 cycles per hour. In this case, the required 500 J can be dissipated with BW2/BW 4.

3.9.2 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 resistor dissipation (100 % cdf power) by means of the power diagrams. The right-hand y axis shows 100 % cdf power. Observe the conditional peak braking power due to the DC link voltage when determining the load capacity.

Flat-design power diagram

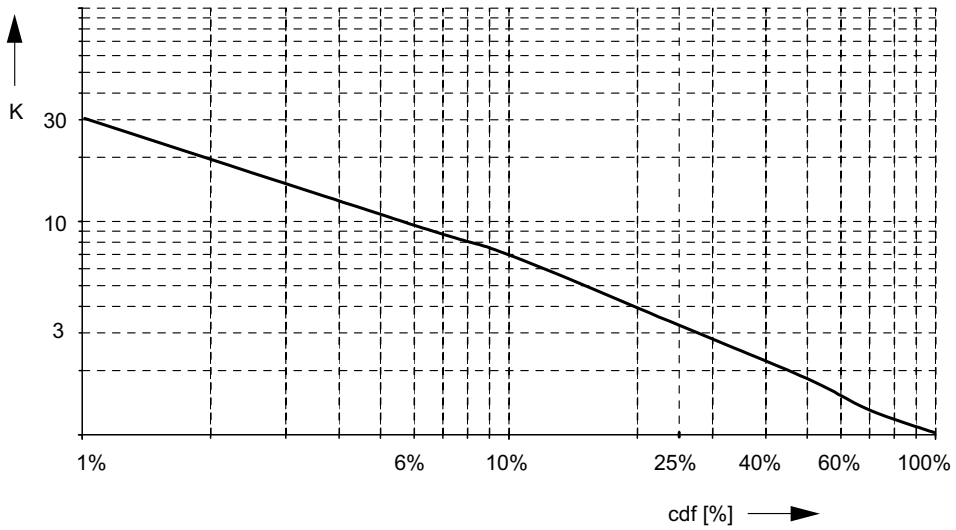
Power diagram for flat-design braking resistors:



P_1 = Short-term power
P_2 = Continuous power
cdf = cyclic duration factor of the braking resistor

Overload factor for wire resistors

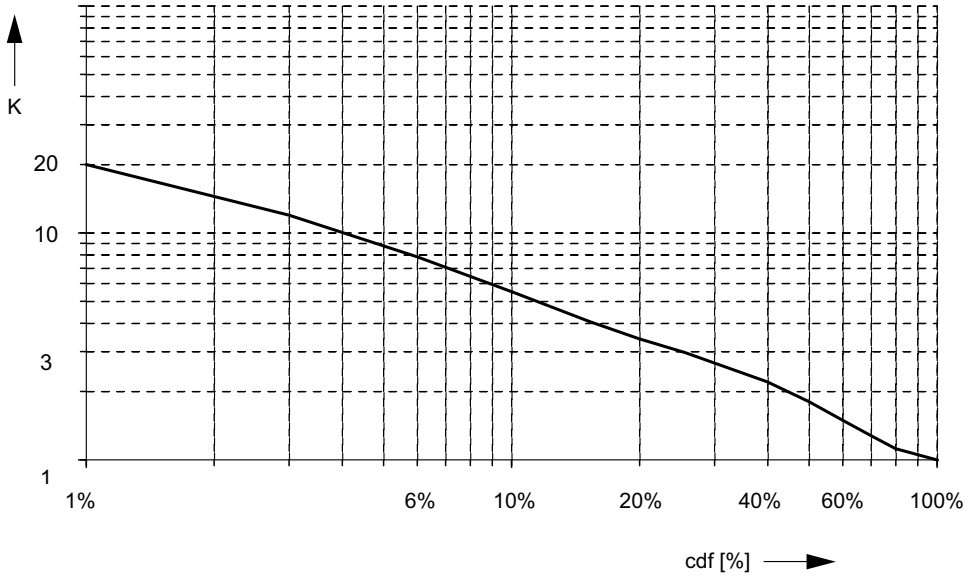
Overload factor dependent on the cycle duration factor for wire resistors:



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
- Average braking power 6.5 kW
- 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.

  100 % cdf power for grid resistors: 856 W.
- The **maximum braking resistance value is 72 Ω** for a peak braking power of 13 kW when using a **MC07B..-5A3 (AC 400/500 V unit)** (→ peak braking power table).
- Select the appropriate braking resistor from the assignment tables with the following points:
  - Maximum braking resistance value
  - MOVITRAC® unit used

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

3.10 Connecting AC brakemotors

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

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

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

3.10.1 Brake rectifier

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

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

Always switch off the brake on the DC and AC sides in:

- All hoist applications

3.10.2 Brake activation

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. 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 when using SEW-EURODRIVE motors with a higher number of poles and non-SEW motors.

3.10.3 Brake parameters

	TIP
	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.

3.11 Mains and motor connection

3.11.1 Permitted voltage supply systems

	TIP
	• **Voltage supply systems with grounded star point** MOVITRAC® B is intended for operation on TN and TT systems with directly grounded star point. • **Voltage supply systems with non-grounded star point** 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 mis-tripping due to the ground capacitance of the inverter. • **Phase conductor earthed power supply systems** Only operate the inverters on supply systems with a maximum line-to-ground voltage of AC 300 V.

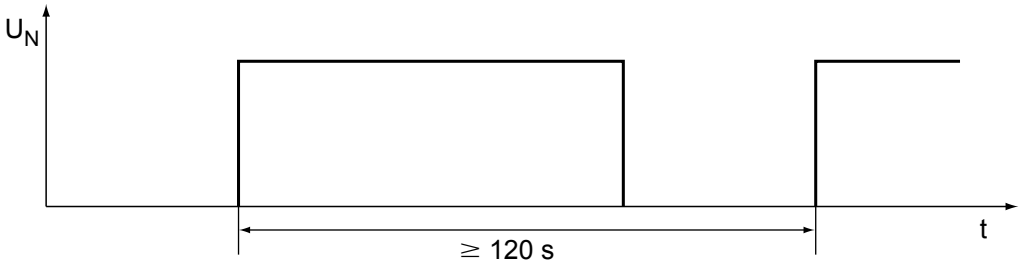
3.11.2 Input contactors and line fuses

Input contactor

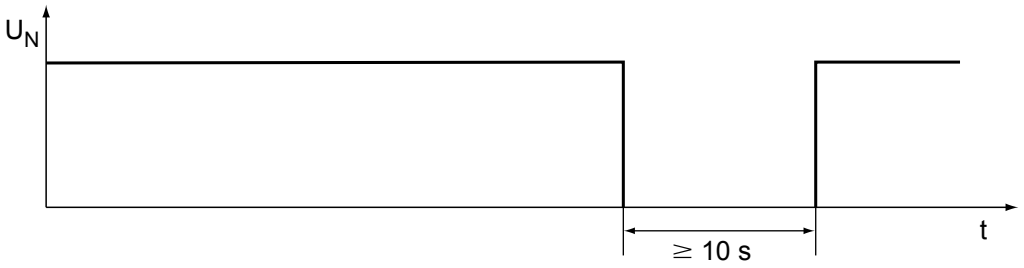
- Only use input contactors of utilization category AC-3 (EN 60947-4-1).

Mains activation

- 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.



	TIP
	• 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: – Enable/stop – CW/halt – CCW/halt

Input fuses

Fuse types:

- Line protection types in the operating classes gL, gG:
  - Rated fusing voltage ≥ rated mains voltage
  - Rated fusing current must be designed for 100 % or 125 % of the rated inverter current depending on the inverter utilization.
- Power circuit breaker with characteristics B, C:
  - Power circuit breaker rated voltage ≥ rated mains voltage
  - Rated power circuit breaker currents must be 10 % above the rated inverter current.

3.11.3 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. If required, also adhere to the notes on **UL compliant installation**.

Always size the shared neutral conductor for the total current when using several single-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 so the voltage drop is as small as possible. An excessively high voltage drop means that the full motor torque is not achieved.

Smallest wire bending space (EN 61800-5-1)

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

Cable cross section [mm²]	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 suggests the following cable cross-sections and fuses for an ambient temperature of 25 °C and rated mains currents of 100% of the rated inverter current:

MOVITRAC® B 1 × 230 V		0003	0004	0005	0008	0011	0015	0022
1-phase	Line protection	C16[1] / gL16 / K16				C32[2] / gL25 / K25 / D20		
	Power supply cable	1.5 mm²				4 mm²		
	PE conductor	2 x 1.5 mm²				2 x 4 mm²		
Motor cable		1.5 mm²				1.5 mm²		
Unit terminal cross section of the power section		Terminal blocks 4 mm² conductor end sleeves DIN 46228						

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	
	Power supply cable	1.5 mm²				4 mm²		
	PE conductor	2 x 1.5 mm²				2 x 4 mm²		
Motor cable		1.5 mm²				1.5 mm²		
Unit terminal cross section of the power section		Terminal blocks 4 mm² conductor end sleeves DIN 46228						

MOVITRAC® B 3 × 230 V	0037	0055	0075	0110	0150	0220	0300
Fuses F11/F12/F13 I_N	25 A	25 A	35 A	50 A	63 A	80 A	100 A
Power supply L1/L2/L3	4 mm²	4 mm²	6 mm²	10 mm²	16 mm²	25 mm²	35 mm²
PE conductor	2 × 4 mm² 1 × 10 mm²	2 × 4 mm² 1 × 10 mm²	2 × 6 mm² 1 × 10 mm²	1 × 10 mm²	1 × 16 mm²	1 × 16 mm²	1 × 16 mm²
Motor cable U/V/W	4 mm²	4 mm²	6 mm²	10 mm²	16 mm²	25 mm²	35 mm²
Unit terminal cross section of the power section	Separable terminal strip 4 mm² conductor end sleeve DIN 46228	M4 screw and washer assembly with terminal clip 4 mm² conductor end sleeve DIN 46228 6 mm² crimp cable lug DIN 46234		M6 screw and washer assembly with washer max. 25 mm² Crimp cable lug DIN 46234		M10 bolt with nut max. 70 mm² 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
	Power supply cable	1.5 mm²									1.5 mm²	1.5 mm²
	PE conductor	2 x 1.5 mm²					2 x 1.5 mm² 1 x 10 mm²				2 x 1.5 mm² 1 x 10 mm²	2 x 1.5 mm² 1 x 10 mm²
Motor cable		1.5 mm²									1.5 mm²	2.5 mm²
Unit terminal cross section of the power section		Terminal blocks 4 mm² conductor end sleeves DIN 46228									M4 screw with washer assembly with terminal clip 4 mm² conductor end sleeve DIN 46228	

MOVITRAC® B 400 / 500 V		0110	0150	0220	0300
3-phase	Line protection	25 A	35 A	50 A	63 A
	Power supply cable	4 mm²	6 mm²	10 mm²	16 mm²
	PE conductor	2 x 4 mm² 1 x 10 mm²	2 x 6 mm² 1 x 10 mm²	1 x 10 mm²	1 x 16 mm²
Motor cable		4 mm²	6 mm²	10 mm²	16 mm²
Unit terminal cross section of the power section		M4 screw with washer assembly with terminal clip 4 mm² conductor end sleeve DIN 46228 6 mm² crimp cable lug DIN 46234	M6 screw and washer assembly with washer max. 25 mm² Crimp cable lug DIN 46234		

MOVITRAC® B 400 / 500 V		0370	0450	0550	0750
3-phase	Line protection	80 A	100 A	100 A	125 A
	Power supply	25 mm²	35 mm²	35 mm²	50 mm²
	PE conductor	1 x 16 mm²			25 mm²
Motor cable		25 mm²	35 mm²	35 mm²	50 mm²
Unit terminal cross section of the power section		Bolt M10 with nut max. 70 mm² crimp cable lug DIN 36235			

Recommendation for standard installation, USA NEC

MOVITRAC® B 1 × 230 V		0003	0004	0005	0008	0011	0015	0022
1-phase	Line protection	C16[1] / gL16 / K16				C32[2] / gL25 / K25 / D20		
	Power supply cable	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	
	Power supply cable	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_N	25 A	25 A	35 A	50 A	63 A	80 A	100 A
Power supply cable L1/L2/L3	AWG12	AWG12	AWG10	AWG6	AWG4	AWG4	AWG3
PE conductor	AWG12	AWG12	AWG10	AWG10	AWG8	AWG8	AWG6
Motor cable 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_N	6 A							10A		15 A
Power supply cable L1/L2/L3	AWG14						AWG14			
PE conductor	AWG14						AWG14			
Motor cable 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_N	20 A		30 A	40 A	60 A	80 A
Power supply cable L1/L2/L3	AWG12		AWG10	AWG8	AWG6	AWG4
PE conductor	AWG12		AWG10	AWG10		AWG8
Motor cable 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 lug			M6 screw and washer assembly with washer max. AWG4 crimp cable lug		

MOVITRAC® B 400/500 V	0450	0370	0550	0750
Size	4		5	
Fuses F11/F12/F13 I_N	90 A	110 A	150 A	175 A
Power supply cable L1/L2/L3	AWG4	AWG3	AWG1	AWG2/0
PE conductor	AWG8	AWG6	AWG6	AWG6
Motor cable 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			

3.11.4 Motor cable length

The maximum motor cable length depends on:

- Cable type
- Voltage drop in the cable
- Set PWM frequency
- 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**
Voltage V_{mains}		**3 AC 400 V 3 AC 230 V 1 AC 230 V**	**3 AC 500 V 3 AC 400 V (125 % I_N)**	**3 AC 230 V 3 AC 400/500 V**	
Shielded cable	4 kHz[1)]	100 (328)	50 (160)	300 (984)	400 (1310)
	8 kHz	70 (230)	35 (110)	250 (820)	300 (984)
	12 kHz	50 (160)	25 (82)	200 (656)	250 (820)
	16 kHz	40 (130)	25 (82)	150 (492)	200 (656)
Unshielded cable	4 kHz[1)]	200 (656)	100 (328)	900 (2950)	1200 (3937)
	8 kHz	140 (459)	70 (230)	750 (2460)	900 (2950)
	12 kHz	100 (328)	50 (160)	600 (1970)	750 (2460)
	16 kHz	80 (2640	50 (160)	450 (1480)	600 (1970)

1) Standard setting

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

3.11.5 Voltage drop

Select the cable cross-section of the motor cable so 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 Δ U [V] with length = 100 m (328 ft) and ϑ = 70 °C (158 °F)															
1.5 mm²	5.3	8	10.6	13.3	17.3	21.3	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)
2.5 mm²	3.2	4.8	6.4	8.1	10.4	12.8	16	1)	1)	1)	1)	1)	1)	1)	1)	1)
4 mm²	1.9	2.8	3.8	4.7	6.5	8.0	10	12.5	1)	1)	1)	1)	1)	1)	1)	1)
6 mm²					4.4	5.3	6.4	8.3	9.9	1)	1)	1)	1)	1)	1)	1)
10 mm²						3.2	4.0	5.0	6.0	8.2	10.2	1)	1)	1)	1)	1)
16 mm²								3.3	3.9	5.2	6.5	7.9	10.0	1)	1)	1)
25 mm²									2.5	3.3	4.1	5.1	6.4	8.0	1)	1)
35 mm²											2.9	3.6	4.6	5.7	7.2	8.6
50 mm²														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 Δ U [V] with length = 100 m (328 ft) and ϑ = 70 °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_{mains} = AC 460 V.

3.12 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".

3.12.1 Motor currents

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

3.12.2 Motor cable

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

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

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

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

n = Number of motors connected in parallel

3.12.3 Motor size

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

3.12.4 Output filter

For groups of more than 3 or 4 motors, SEW-EURODRIVE recommends that you use an HF output filter. An HF output filter is required when the maximum motor cable length (I_{max}) given in the table is exceeded. This may be the case in large groups (n) or when there are long motor cable lengths connected in parallel (I_{tot}). In this case, 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.

3.13 Line chokes

3.13.1 1-phase

Use is required under the following circumstances:

- Mains inductances of less than 100 µH per branch
- Using line chokes is required when operating several units that are switched on simultaneously. The line choke limits overvoltages caused by the switching.

Use is optional in the following instances:

- Reduction in the supply system current harmonics
- Support for overvoltage protection

3.13.2 3-phase

Using line chokes is required when operating more than 4 units that are switched on simultaneously. The line choke limits overvoltages caused by the switching.

Use is optional for supporting overvoltage protection.

3.14 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.

Following the relationship between new and old limit classes:

New limit class according to EN 61800-3	Previous limit class according to EN 55011/55014
C2	A
C1	B

3.14.1 Interference immunity

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

3.14.2 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 industrial and private environments. 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 supply system and the plant configuration.

Limit value class

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

Limit classes C1 and C2 according to EN 61800-3.

Limit value class		Size 0 230 V 1-phase	
		Input end	Output end
C2		No additional filtering required	Output choke HD012 / HD100 / HD101 or shielded motor cable, or HF output filter
C1	Cable conducted	No additional filtering required	Shielded motor cable
	Radiation conducted	Foldable ferrites[1)]	

1) 3 foldable ferrites ULF11A over the supply system cables L and N (without PE)

Limit value class	Size 0 400/500 V / 230 V 3-phase	
	Input end	Output end
C2	No additional filtering required	Output choke HD012 / HD100 / HD101 or shielded motor cable, or HF output filter
C1	Line filter NF	Output choke HD012 / HD100 / HD101 or shielded motor cable
	FKE EMC-module	

Limit value class	Sizes 1 / 2S / 2 400/500 V / 230 V 3-phase	
	Input end	Output end
C2	No additional filter required.	HD output choke, or shielded motor cable, or HF output filter
C1	Line filter NF	HD output choke or shielded motor cable

Limit value class	Size 3 / 4 / 5 400/500 V / 230 V 3-phase	
	Input end	Output end
C2	Line filter NF	HD output choke, or shielded motor cable, or HF output filter
C1		HD output choke or shielded motor cable

3.14.3 Connection

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

3.14.4 IT systems

	NOTES
	• No EMC limits are specified for interference emission in voltage supply systems without an NF earthed star point (IT systems). The efficiency 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.

3.14.5 Inverter-related earth leakage current

Earth-leakage currents ≥ 3.5 mA may occur during normal operation.

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

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.

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

SEW-EURODRIVE recommends that you do not use earth-leakage circuit breakers and instead choose other measures to ensure protection of personnel (e.g. according to EN 61800-5-1, EN 50178, EN 60204-1, etc.).

3.15 HF output filters

3.15.1 Important information

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 HF output filter

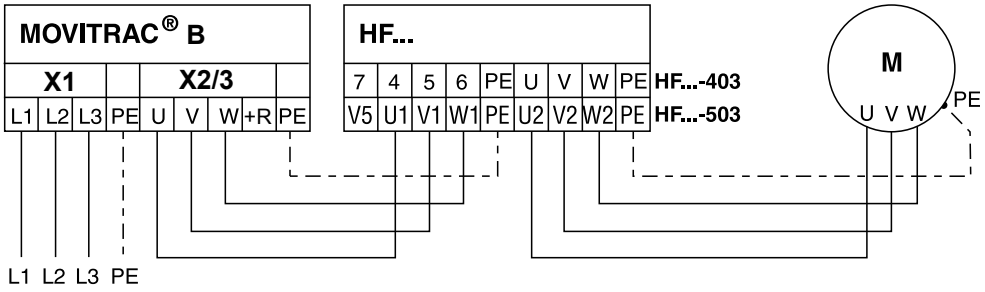
3.15.2 Installation, connection and operation

	TIPS
	• 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 inverter and output filter to the absolutely necessary length. Maximum 1 m (3 ft) with unshielded cable, 10 m (33 ft) with shielded cable. • An unshielded motor line is sufficient when using an output filter. Note the following instructions when you use 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 (66 ft). – Operation with $V_{DC\ link}$ connection is required if the motor cable is longer than 20 m (66 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_N (= rated output current) or 125 % I_N (= continous 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. To do this, connect all like connections to the output filters in parallel. • Considerable noise (magnetostriction) may occur in the output filter especially if operating with f_{PWM} = 4 kHz. In environments susceptible to noise, SEW-EURODRIVE recommends operation with f_{PWM} = 12 kHz (or 16 kHz) and $V_{DC\ link}$ connection. Observe the notes regarding $V_{DC\ link}$ 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). • No $V_{DC\ link}$ connection is permitted for size 0XS units.

3.15.3 $V_{DC\ link}$ connection

Operation without $V_{DC\ link}$ connection:

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



Operation with $V_{DC\ link}$ connection

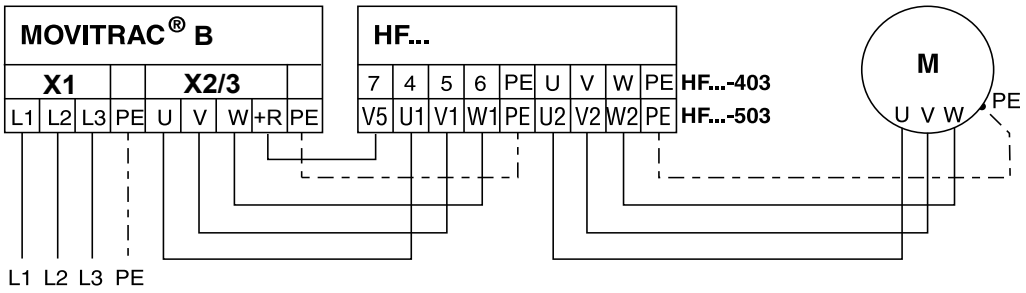
Connection of inverter terminal + R with HF..-503 terminal V5 or HF..-403 terminal 7

TIPS

- 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 is only permitted if V_{mains} ≤ AC 400 V, not if 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 × AC 230 V	V_{mains} = 3 × AC 400 V	V_{mains} = 3 × AC 500 V
12 kHz	4 %	12 %	15 %
16 kHz	3 %	8 %	12 %

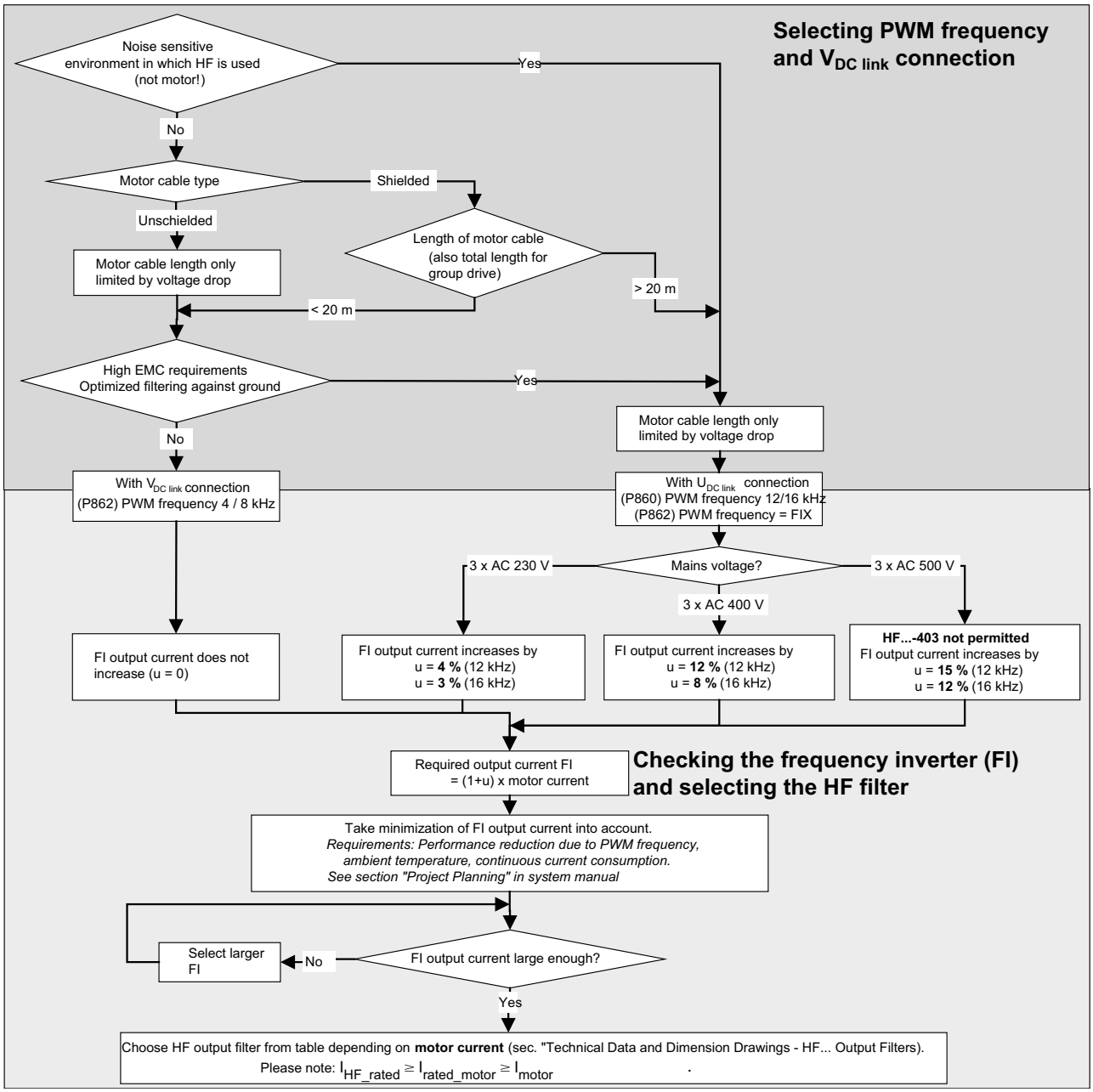
The increased power requirement causes an additional load on the inverter. Take this aspect into account during project planning of the drive. Failure to comply with this aspect may cause the inverter to shut down due to overload.



TIP

No $V_{DC\ link}$ connection is possible with size 0XS units.

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



3.16 Electronics cables and signal generation

3.16.1 Cable type

The electronic terminals are suitable for:

- Cross sections up to 1.5 mm^2 (AWG16) without conductor end sleeves
- Cross sections up to 1.0 mm^2 (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.

3.16.2 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 control cabinet compartments rather than distributing them widely.
- Lay the 0 V cables with at least 1 mm^2 (AWG17) cross section from a central point to each individual unti by the shortest possible route.

3.16.3 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 for switching low voltages and currents (5 – 30 V, 0.1 – 20 mA).

3.17 External voltage supply DC 24 V

The internal voltage supply is sufficient for the basic unit and binary outputs 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.

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.

The DC 24 V voltage output can be switched off with P808. This means external voltage supply is still possible.

DC 24 V power demand of MOVITRAC® B:

Size	Basic unit power demand[1)]	DBG60B	FIO11B / FIO21B	Fieldbus option[2)3)]	DHP11B[3)]
Size 0 MC07B..-00	5 W	1 W	2 W	3 W	4.5 W
Size 0 MC07B..-S0[4)]	12 W[5)]				
1, 2S, 2	17 W				
3	23 W				
4, 5	25 W				

1) FBG11B, FSC11B (UWS11A/USB11A) included. Take account of the additional load of the binary inputs with 2.4 W per 100 mA.

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

3) These options must always be supplied externally.

4) The unit type MC07B..-S0 must always be supplied by an external DC 24 V power supply unit via X17:1 and X17:2.

5) 3 W of the 12 W is the power demand for the output stage via X17:3 SOV24, X17:4 SVI24.

TIPS

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 are otherwise supplied by MOVITRAC® B 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.

3.17.1 Example

MC07B0015-5A3-4-00/DFP21B with options FSC11B & FBG11B. MOVTRAC® B supplies the binary inputs DI01 (CW/halt) 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 a 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
- Power demand of the DFP21B fieldbus option: 3 W
- Power demand of the brake coil: 0 W because output is 0 active in DV 24 V operation.
- Power demand of the fault signal contact: 24 V x 0.05 A = 1.2 W

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

3.18 Parameter set selection

This function is used to operate 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 switchover" function (→ P60./P61.) for this purpose. You can then change from parameter set 1 to 2 and vice versa in INHIBITED inverter status.

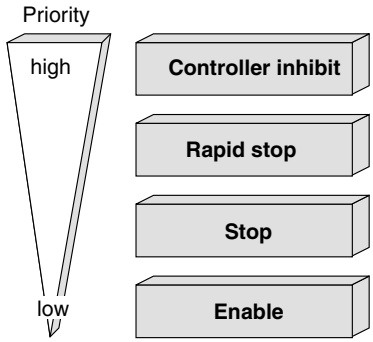
Function	Effect when	
	"0" signal	"1" signal
PARAM. SELECT	Parameter set 1 active	Parameter set 2 active

	TIP
	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. Only switch changeover contactors when the unit is inhibited!

3.19 Priority of the operating states and interrelation between control signals

3.19.1 Priority of operating states

The following illustration shows the priority of operating states:



3.19.2 Interrelation of control signals

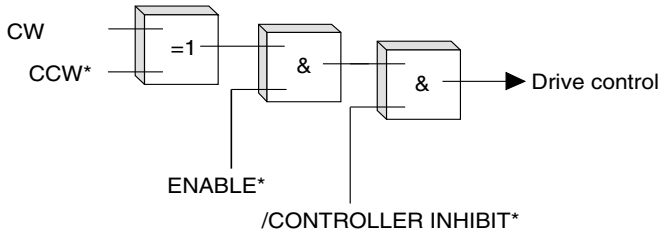
The following table shows the interrelation of control signals. "CW/halt" is programmed to binary input DIØ1 and cannot be changed. The other control signals are only in effect if a binary input is programmed to this function (→ parameter P60.).

/Controller inhibit	Binary input is programmed to			Inverter status
	Enable/ Rapid stop	CW/halt (DI01)	CCW/halt	
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:

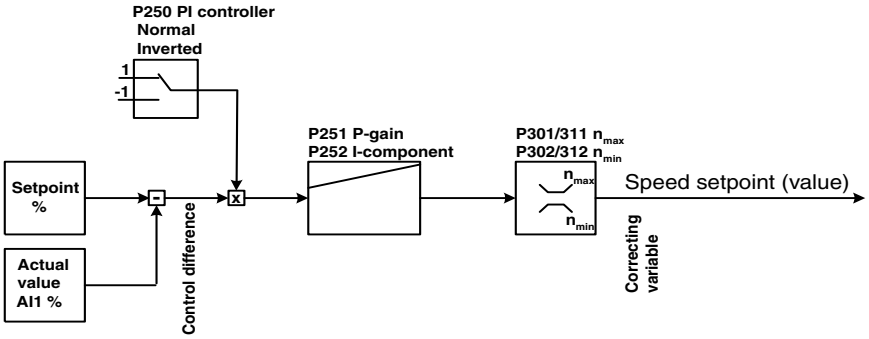


* If a binary input is programmed to this function.

3.20 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 PI-controller setpoint using one of the six programmed fixed setpoints or specify the setpoint using the RS-485 or fieldbus (SBus) interface (*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 a minimum and maximum speed (*P301=Minimum speed1* and *P302=Maximum speed1*). The setting of the speed ramp times has no effect when the PI controller is active.

The default settings for the parameters are indicated in **bold** below.

3.20.1 Parameterization

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:
			0	I-component OFF
			0.01 – 0.99	0.01
			1.0 – 9.9	0.1
			10 – 99	1
			100 – 2000	10

3.20.2 Setpoint selection

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

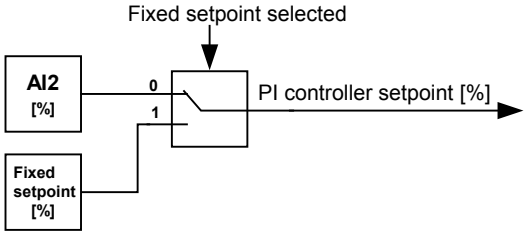
- **Unipolar / Fixed setpoint**: The setpoint zero applies as long as no setpoint is selected. The FBG speed control module can be added to setpoint zero or a fixed setpoint using P121.

  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 speed control module can be added to AI1 or a fixed setpoint using P121.

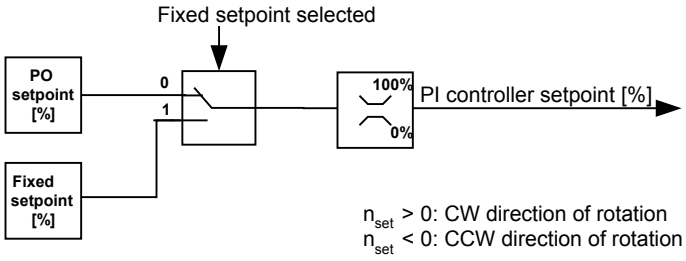


- **RS-485 / fixed setpoint**
- **SBus 1 / Fixed setpoint**: Specify the setpoint and set it using the following bus parameters:

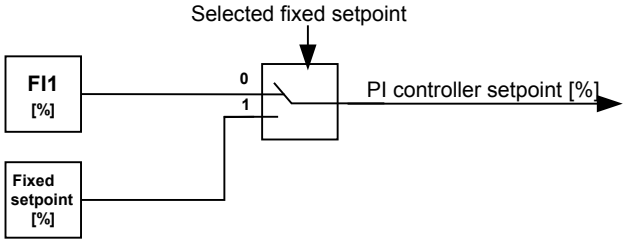
  P870/871/872 Setpoint description PO1/PO2/PO3 [PI controller setpoint [%]

  PO1/PO2/PO3 = 0 – 2^{14} = 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 speed control module can be added to the setpoint or a fixed setpoint using P121.
- The settings **Bipolar / fixed setpoint**, **Motor potentiometer / fixed setpoint** as well as **Fixed setpoint + AI1** and **Fixed setpoint * AI1** do not have any effect. If you set these, the inverter always specifies the setpoint zero.
- **Frequency input / fixed setpoint**



3.20.3 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 parameters 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

3.20.4 Reference signal

With this parameter, you can program a reference signal 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" when	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.

3.20.5 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.

3.21 Application examples

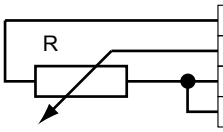
All application examples presented here assume that the unit has been started up correctly in accordance with the "Startup" section.

3.21.1 External setpoint potentiometer

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

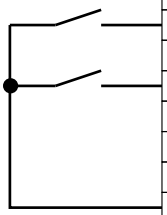
Connect an external setpoint potentiometer as follows:

The resistance value of the external setpoint potentiometer R must be ≥ 3 kΩ.



REF1	1
AI11	2
AI12	3
GND	4

X10:

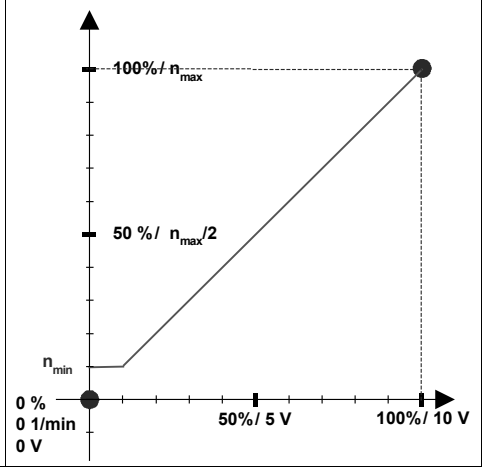


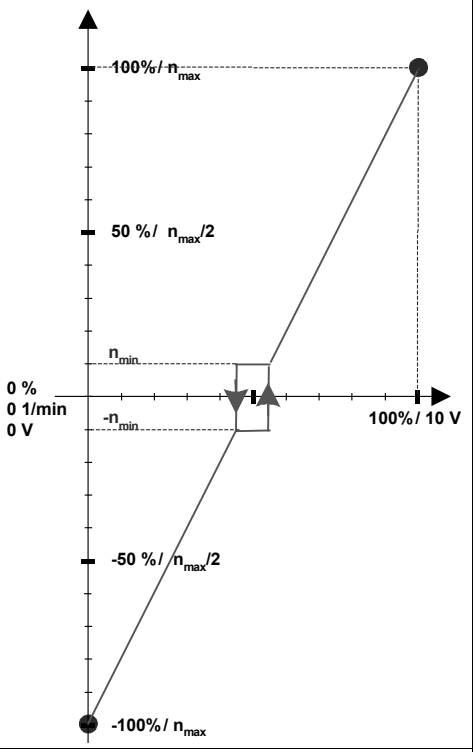
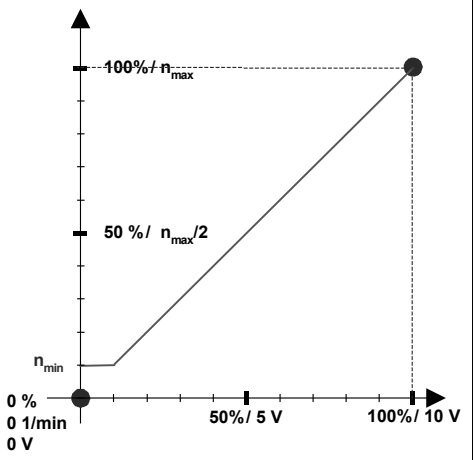
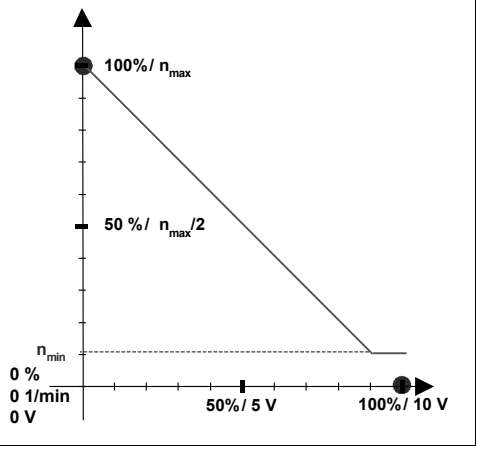
DI00	1
DI01	2
DI02	3
DI03	4
DI04	5
DI05TF	6
VOTF	7
24VIO	8
GND	9

X12:

3.21.2 Setpoint value processing

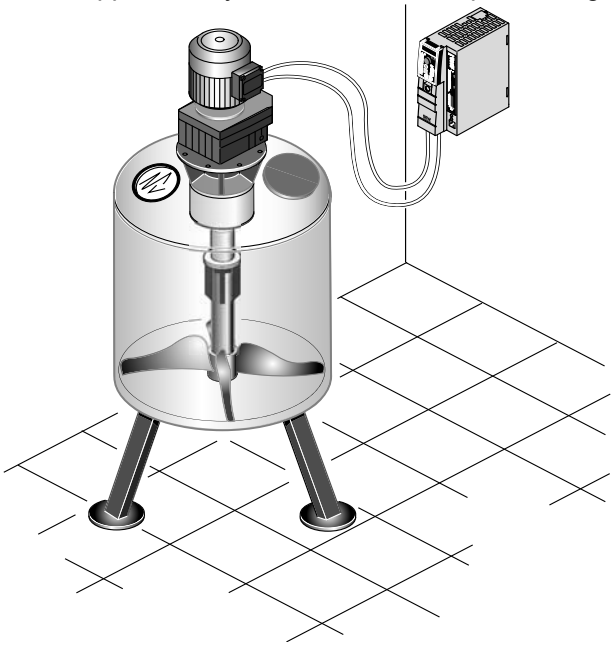
Using AI1 as 0 – 10 V voltage input, no fixed setpoint selected, frequency inverter enabled.

Setpoint source	X1 P116 Y1 P117	X2 P118 Y2 P119	U_{AI1}	Setpoint speed	Diagram
Bipolar	0 % 100 %	100 % 100 %	0 V 5 V 10 V	n_{min} 50 % n_{max} n_{max}	

Setpoint source	X1 P116 Y1 P117	X2 P118 Y2 P119	U_{AI1}	Setpoint speed	Diagram
Bipolar	0 % –100 %	100 % 100 %	0 V 5 V 10 V	$-n_{max}$ $-n_{min}$ / $+n_{min}$ $+n_{max}$	
Unipolar	0 % 100 %	100 % 100 %	0 V 5 V 10 V	n_{min} 50 % n_{max} n_{max}	
Unipolar	0 % 0 %	100 % 0 %	0 V 5 V 10 V	n_{max} 50 % n_{max} n_{min}	

3.21.3 Speed-controlled agitator

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



The keypad is used to control:

- Reset
- Start
- Stop
- Speed control.

Select the "FGB speed control module" icon to operate the agitator.

Parameters

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

3.21.4 Positioning a trolley

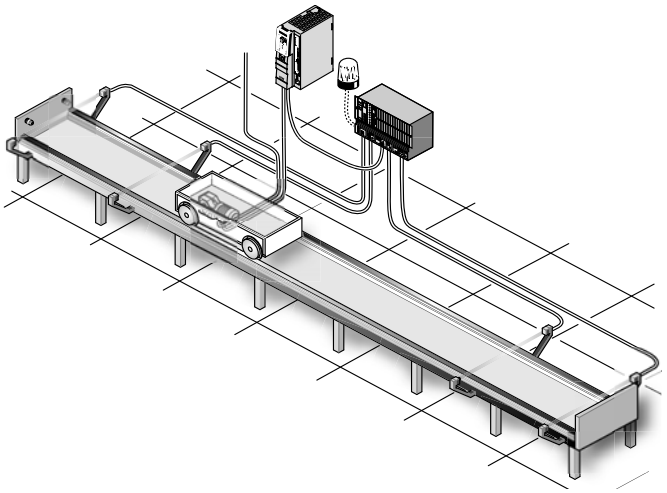
Principle

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.

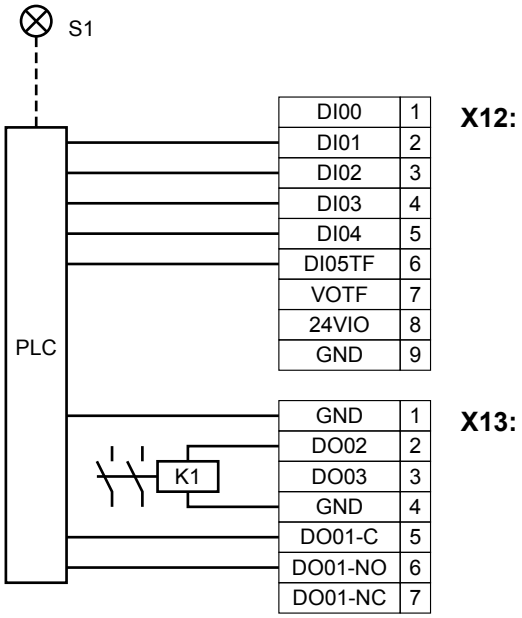


Terminals

- Rapid speed: DI04 = 1 and DI05 = 1
- Slow 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
X12:3: Counterclockwise direction of rotation
X12:4: Start/Stop
X12:5: Rapid speed
X12:6: Slow speed/rapid speed
X12:8: 24 V
X13:6: No malfunction
X13:2: Brake released

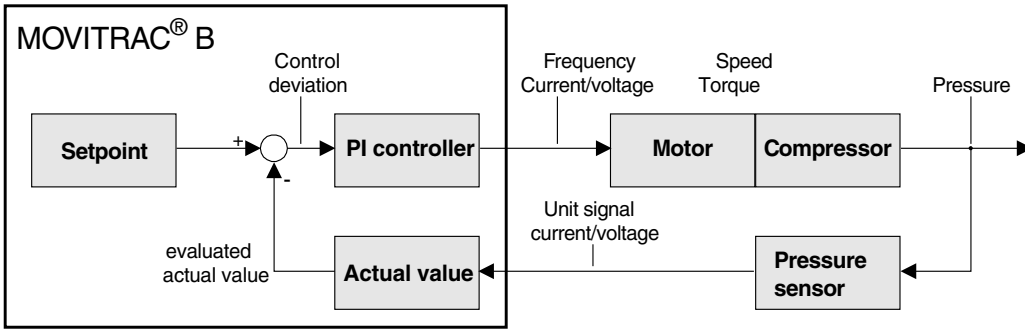
Parameters

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

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

3.21.5 PI controller

Following a diagram showing the basic structure of the control system with a PI controller, taking the example of a pressure control system.



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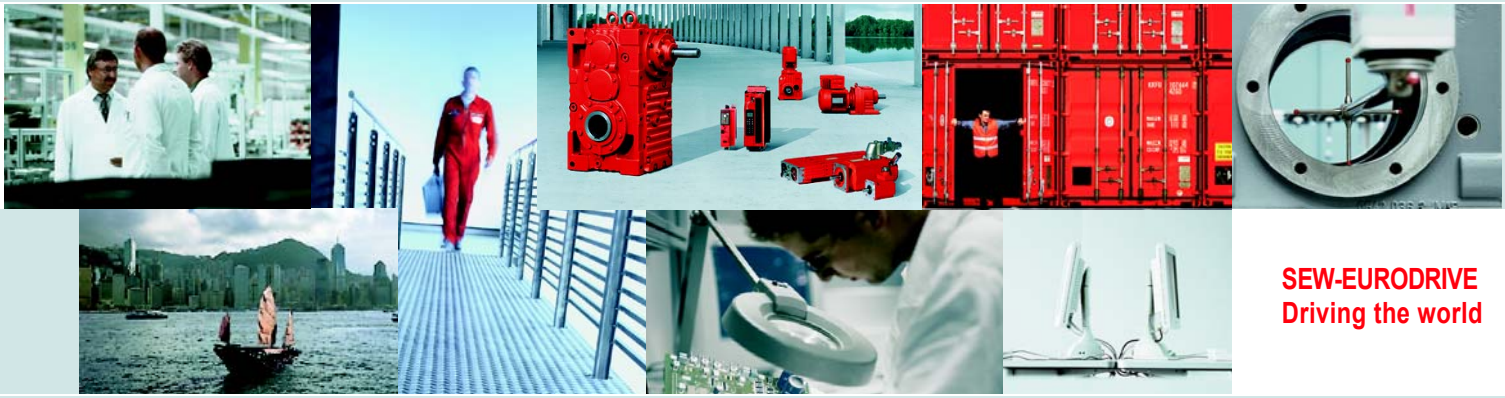

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