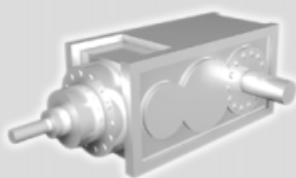
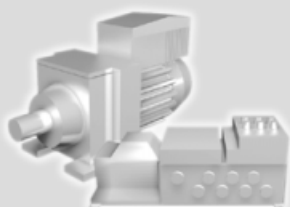
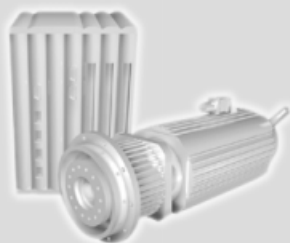
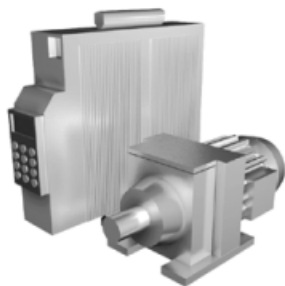




SEW
EURODRIVE



MOVITRAC[®] B

EA3A000

Edition 06/2006

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System Manual





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1 Important notes

1.1 Explanation of pictograms

Always follow the safety and warning notes in this publication.



Hazard

Indicates an imminently hazardous situation, which if not avoided, **WILL** result in death or serious injury.



Warning

Indicates an imminently hazardous situation caused by the product, which if not avoided, **WILL** result in death or serious injury. You will also find this signal to indicate the potential for damage to property.



Caution

Indicates a potentially hazardous situation which, if not avoided, **MAY** result in minor injury or damage to products.



Note

Indicates a reference to useful information, e.g. on startup.



Documentation reference

Indicates a reference to a document, such as operating instructions, catalog, data sheet.



You must adhere to the operating instructions to ensure:

- Fault-free operation
- Fulfillment of any rights to claim under limited warranty

Read the operating instructions before you start working with the unit.

The operating instructions contain important information on servicing. Therefore, keep the manual close to the unit.



1.2 Designated use

The frequency inverters from SEW-EURODRIVE operate AC motors. These motors must be suitable for operation with frequency inverters. Do not connect any other loads to the frequency inverters.

Frequency inverters are devices for stationary installation in control cabinets. Adhere to all instructions referring to the technical data and the permissible conditions where the unit is operated.

Do not start up the unit (take it into operation in the designated fashion) until you have verified that:

- The machine complies with the EMC directive 98/37/EC.
- The end product complies with the Machinery Directive 98/37/EC, also with reference to EN 60204.

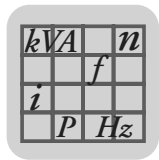
1.2.1 Operational environment

The following applications are prohibited unless measures are expressly taken to make them possible:

- Operation in potentially explosive areas
- Operation in environments with harmful substances to EN 60721, such as oils, acids, gases, vapors, dusts, radiation
- Operation with mechanical vibration and shock loads in excess of the regulations stipulated in EN 61800-5-1
- If the inverter performs safety functions that have to guarantee the protection of machinery and people

1.3 Waste disposal

Please follow the current regulations: Dispose in accordance with the material structure and the regulations in force.



2 System description MOVITRAC® B



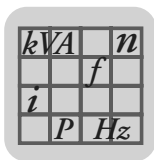
Compact and economical: MOVITRAC® B – the next generation frequency inverter.

2.1 MOVITRAC® B – compact, versatile and universal

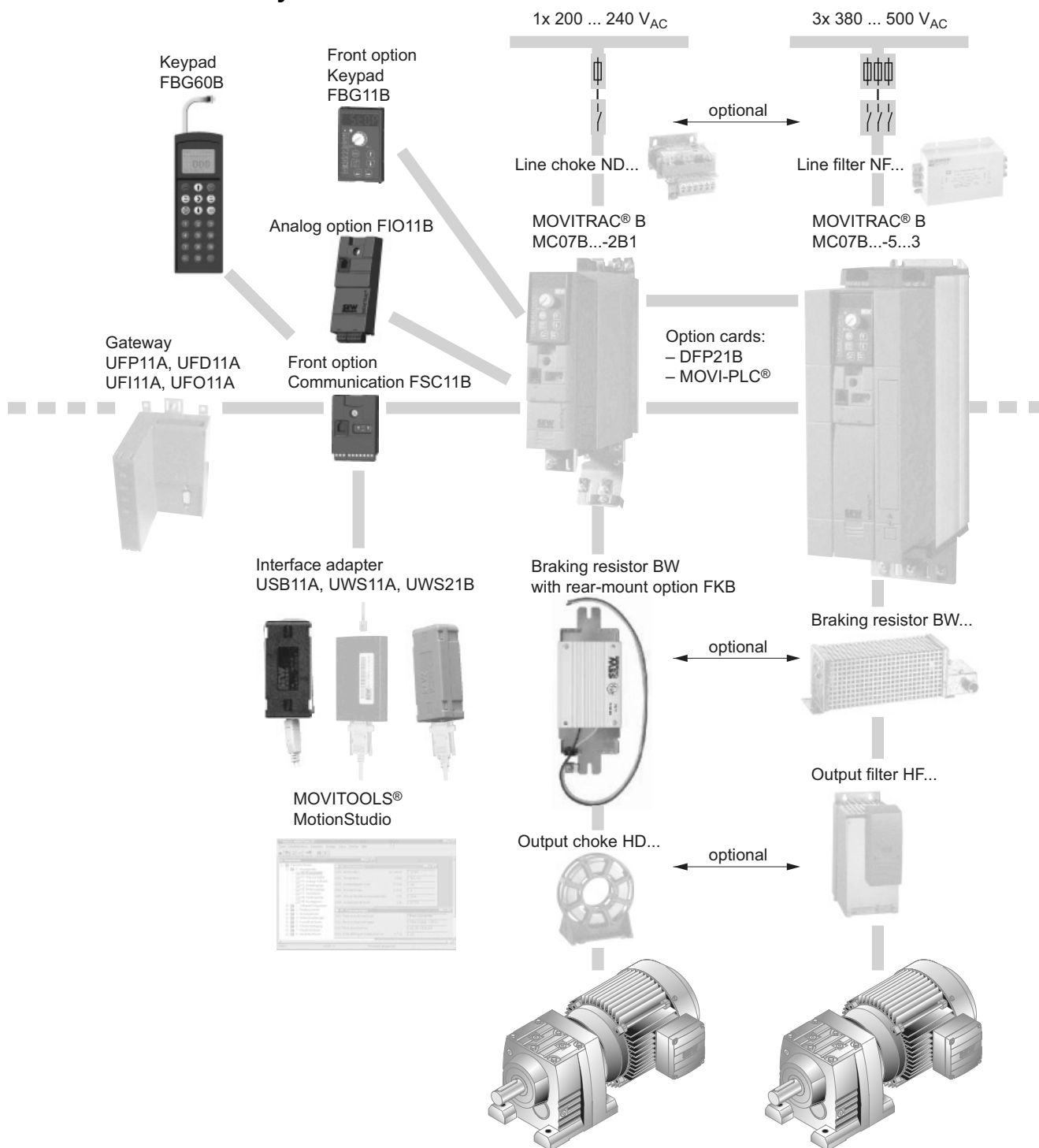
The percentage of speed-variable AC drives with inverter technology is constantly increasing and these units offer all options to optimize system and machine concepts to the process sequences in addition to machine-conserving drive technology. The expanse of these different fields of application shows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

Dive electronics in asynchronous AC motors are distinguished between different applications, such as standard motors for simple applications, e.g. materials handling, and application inverters for more complex technological applications, e.g. positioning and handling applications. Distinguishing between units facilitates scaling to diverse applications while staying within 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 the availability of communication interfaces (field buses and Industrial Ethernet) offer users a solution-oriented and unit-independent user interface.



2.2 MOVITRAC® B system overview



MOVITOOLS® MotionStudio software

Interface adapter / USB11A

Gateways for

- PROFIBUS
- DeviceNet
- INTERBUS
- CANopen

Option cards for

- PROFIBUS fieldbus interface
- MOVI-PLC® control

Line choke

Line filter

Braking resistor

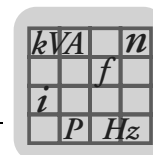
Output choke

Output filter

FBG11B / FBG60 B keypad

FSC11B communication

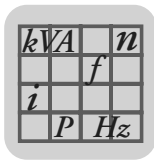
Analog module FIO11B



2.3 The units at a glance

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

Size 2S ... 4 in preparation

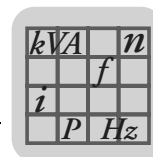


2.4 Functions / features

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

2.4.1 Unit properties

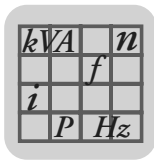
- Large voltage range:
 - 230 V units 1-phase for a voltage range of AC 200 ... 240 V, 50/60 Hz
 - 400/500 V units for the voltage range 3 × AC 380 ... 500 V, 50/60 Hz
- Overload capacity: 125 % I_N continuous duty
 - 150 % I_N for maximum 60 s
 - Maximum 200 % breakaway torque
- Rated operation up to ambient temperature $\vartheta = 50^\circ \text{C}$.
- Speed range 0 ... 5500 rpm.
- Frequency range:
 - VFC: 0 ... 150 Hz
 - V/f: 0 ... 600 Hz
- 4-quadrant capability due to the integrated brake chopper.
- Compact unit design for minimum control cabinet space requirement and optimum utilization of control cabinet volume.
- Integrated EMC line filter to maintain the specified class limits (according to EN 55011) on the line side.
 - 1-phase connection: Class **A / B**
 - 3-phase connection: Class **A**
- Programmable inputs / outputs
 - 1 analog input
 - 6 binary inputs
 - 3 binary outputs, including 1 relay 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
 - 9 LEDs for displaying selected symbols
 - 6 keys for operation
 - 1 setpoint generator for speed specification
 - Parameter set storage / data backup
- Braking resistor can be installed as an option for size 0.



- Standstill current function for:
 - Rapid start
 - Heating current for avoiding condensation at low temperatures
- Flying start function for synchronizing the inverter to the running motor (in preparation).
- Hoist capability.
- 2. Parameter set.
- Separable signal terminals.
- Size 0:
 - Separable terminals.
 - EMC capacitor can be insulated for reduced earth-leakage currents and operation in IT network.
 - "Cold plate" installation possible.

2.4.2 Control

- V/f control or VFC control mode.
- Automatic brake control by the inverter
- DC braking to decelerate the motor in 1-quadrant mode.
- Slip compensation for high static speed accuracy.
- Motor pull-out protection through sliding current limitation in the field weakening range.
- Factory settings can be restored.
- Parameter lock for protection against changes to parameters.
- Protective functions for protection against
 - Over-current
 - Ground fault
 - Overload
 - Overtemperature of the inverter
 - Overtemperature of the motor (TF/TH)
- Speed monitoring and monitoring of the motor and regenerative limit power.
- 5 fault memories with all relevant operating data at the moment of the fault.
- Standardized operation, parameter setting and identical unit connection technology across all units in the MOVITRAC® B range.

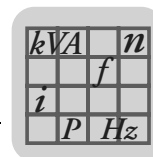


2.4.3 Setpoint technology

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

2.4.4 Optional communication / operation

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



2.5 MOVITOOLS® MotionStudio

The MOVITOOLS® MotionStudio program includes:

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

The MOVITRAC® B has the following functions:

- Parameter setting
- Visualization / diagnostics
- Startup

2.5.1 SCOPE

SCOPE for MOVITOOLS® MotionStudio is an oscilloscope program for SEW inverters. You can optimize drives independently using SCOPE. The inverter records data, such as its response functions to setpoint step changes in real time. You can transfer this information to the PC and graphically display it. SCOPE shows up to 4 analog and digital measured variables in differently colored curves. You can stretch and squash both the vertical and the horizontal axes to meet your requirements.

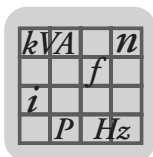
SCOPE also enables you to record digital input and output signals of the inverter. This means you can record complete program sequences of the higher-level controller and then evaluate them.

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

- Save
- Meta data
- Print

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

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



3 Technical data

3.1 CE marking, UL approval and C-Tick

3.1.1 CE marking

*Low voltage
directive*

MOVITRAC® B frequency inverters comply with the regulations of the Low Voltage Directive 73/23/EC and have the CE mark on the nameplate to this effect.

*Electromagnetic
compatibility
(EMC)*



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

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

3.1.2 UL approval

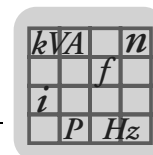


UL and cUL approval has been granted for the MOVITRAC® B sizes 0S and 0L. cUL approval has been applied for for the other units. cUL is equivalent to CSA.

3.1.3 C-Tick



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

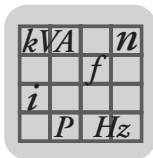


3.2 General technical data

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

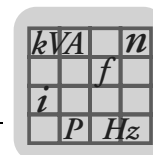
MOVITRAC® B	All sizes
Interference immunity	Fulfills EN 61800-3
Interference emission with EMC compliant installation	According to limit value class 1-phase connection: A / B 3-phase connection: A 230 V: 0.25 ... 7.5 kW 400/500 V: 0.25 ... 11 kW According to EN 55011 and EN 55014; meets EN 61800-3
Leakage current	> 3.5 mA
Ambient temperature ϑ_A Derating ambient temperature Climate class	230 V, 0.25 ... 2.2 kW / 400/500 V, 0.25 ... 4.0 kW -10 °C... +50 °C at $I_D = 100\% I_N$ and $f_{PWM} = 4$ kHz -10 °C... +40 °C at $I_D = 125\% I_N$ and $f_{PWM} = 4$ kHz -10 °C... +40 °C at $I_D = 100\% I_N$ and $f_{PWM} = 8$ kHz 400/500 V, 5.5 ... 45 kW 0 °C ... +50 °C at $I_D = 100\% I_N$ and $f_{PWM} = 4$ kHz 0 °C ... +40 °C at $I_D = 125\% I_N$ and $f_{PWM} = 4$ kHz 0 °C ... +40 °C at $I_D = 100\% I_N$ and $f_{PWM} = 8$ kHz - Mounting platform with "cold plate" < 70 °C 3% I_N per K at 50 °C ... 60 °C EN 60721-3-3, class 3K3
Storage temperature ¹⁾	-25 °C... +75 °C
Shipping temperature	-25 °C... +75 °C
Type of cooling	Self-cooled: 230 V: ≤ 0.75 kW 400/500 V: ≤ 1.1 kW Forced cooled: 230 V: ≥ 1.1 kW 400/500 V: ≥ 1.5 kW
Enclosure	IP20
Operating mode	Continuous duty (EN 60149-1-1 and 1-3)
Overvoltage category	III according to IEC 60664-1 (VDE 0110-1)
Pollution class	2 according to IEC 60664-1 (VDE 0110-1)
Installation altitude	Up to $h \leq 1000$ m without restrictions. At $h \geq 1000$ m (3280 ft), the following restrictions apply: - From 1000 m (3280 ft.) to max. 4000 m (6561 ft.): I_N reduction by 1 % per 100 m - From 2000 m (6,561 ft.) to max. 4000 m (13,123 ft.): - AC 230 V units: V_N reduction by AC 3V per 100 m (330 ft) - AC 500 V units: V_N reduction by AC 6V per 100 m (330 ft) Over 2000 m only overvoltage class 2, external measures are required for overvoltage class 3. Overvoltage classes according to DIN VDE 0110-1.
Size 0: Limitations for continuous duty with 125 % I_N	- Maximum ambient temperature ϑ_A: 40 °C - Maximum supply voltage V_{Mains}: 400 V - No DIN rail mounting / submounting resistor - with 1 x 230 V: Provide line choke ND

1) If the unit is being stored for a long time, connect it to the mains voltage for at least 5 minutes every 2 years. Else, the unit's service life may be shortened.



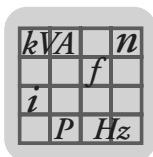
3.3 MOVITRAC® B electronics data

Function	Terminal	Designation	Default	Data
Setpoint input (differential input)	X10:1 X10:2 X10:3 X10:4	REF1 AI11 (+) AI12 (0) GND		0 ... +10 V ($R_i > 200 \text{ k}\Omega$) 0 ... 20 mA / 4 ... 20 mA ($R_i = 250 \text{ }\Omega$) Resolution 10 Bit, sample cycle 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	Error reset CW/Stop CCW/Stop Enable/Stop n11/n21 n12/n22	$R_i = 3 \text{ k}\Omega$, $I_E = 10 \text{ mA}$, sample cycle 5 ms, PLC compatible Signal level according to EN 61131-2 type 1 or 3: +11 ... +30 V $\rightarrow$ 1 / contact made -3 ... +5 V $\rightarrow$ 0 / contact open - X12:2 / DI01 with fixed assignment CW/Stop - X12:5 / DI04 can be used as frequency input - X12:6 / DI05 can be used as TF input
Supply voltage for TF	X12:7	VOTF		Special characteristics for TF according to DIN EN60947-8
Auxiliary supply output / External voltage supply	X12:8	24VIO		Auxiliary supply output: $V = 24\text{V DC}$, current carrying capacity = 50 mA External voltage supply: $V = 24\text{V DC} -15 \% / +20 \% \text{ acc. to EN 61131-2}$
Reference terminal	X12:9	GND		Reference potential for binary and analog signals, PE potential
Binary outputs	X13:1 X13:2 X13:3 X13:4	GND DO02 DO03 GND	Brake released Ready for operation	PLC compatible, response time 5 ms, $I_{\max} \text{ DO02} = 150 \text{ mA}$, $I_{\max} \text{ DO03} = 50 \text{ mA}$, 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: $V_{\max} = 30 \text{ V}$, $I_{\max} = 800 \text{ mA}$
Safety contact (from BG2S / in preparation)	X17:1 X17:2 X17:3 X17:4	Reserved		
Terminal response times	Binary input and output terminals are updated every 5 ms			
Max. cable cross-section	1.5 mm ² (AWG15) without conductor end sleeves 1.0 mm ² (AWG17) with conductor end sleeves			



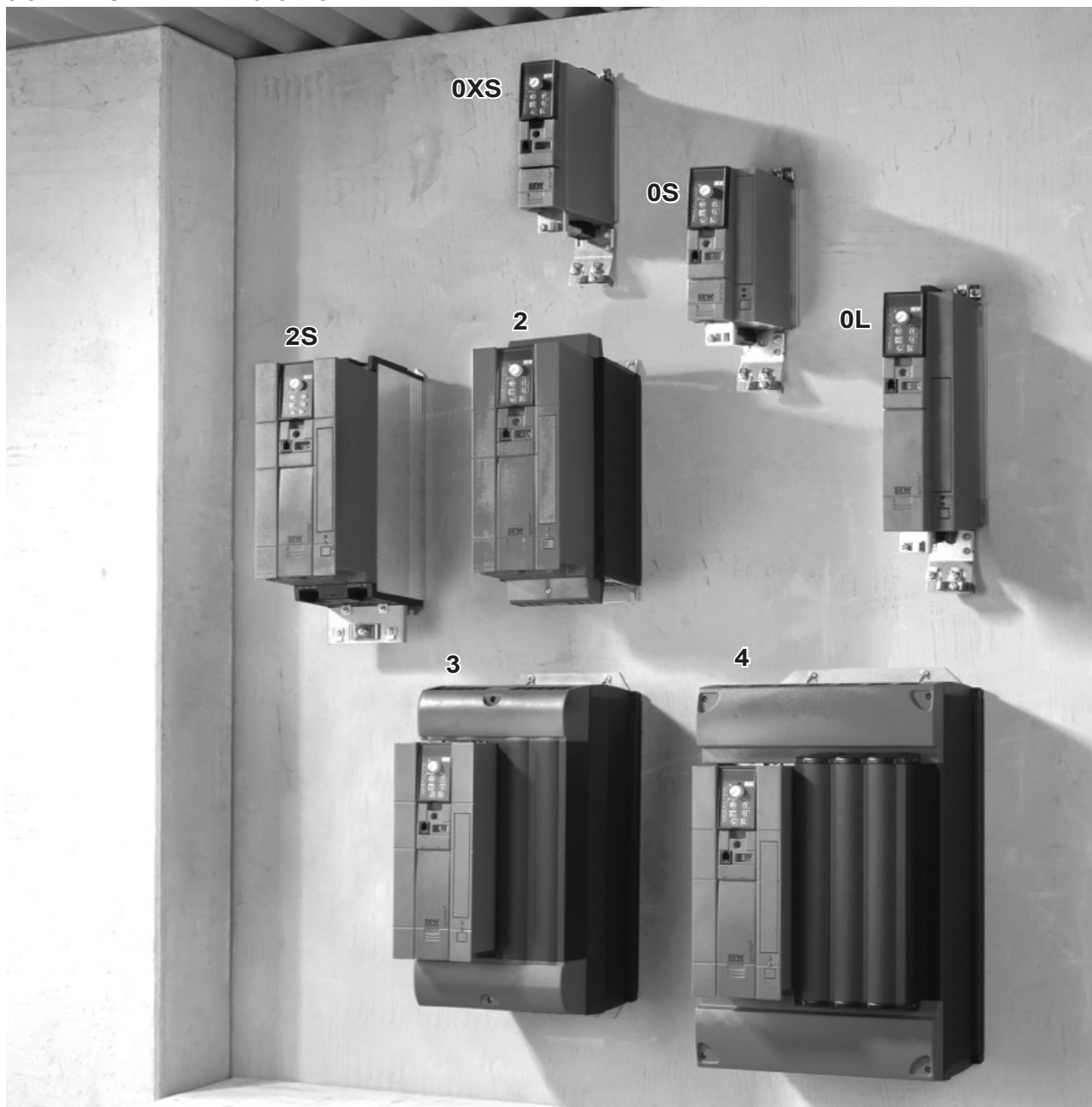
3.4 Electronics data communication interface FSC11B

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 power supply / 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 switches Terminal cross-section: 1.5 mm ² (AWG15) without conductor end sleeves 1.0 mm ² (AWG17) with conductor end sleeves
RS-485 interface	X45:H X45:L X45:A	ST11: RS-485+ ST12: RS-485- GND: Reference potential	EIA standard, 9.6 kBaud, maximum 32 stations Maximum cable length 200 m Dynamic terminating resistor with fixed installation Terminal cross-section: – 1.5 mm ² (AWG15) without conductor end sleeves – 1.0 mm ² (AWG17) with conductor end sleeves
Service interface	X44 RJ10		Only for service purposes, exclusively for point-to-point connection Maximum cable length 3 m (10 ft)



3.5 MOVITRAC® B technical data

3.5.1 MOVITRAC® B overview

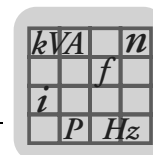


230 V / 1-phase power supply connection

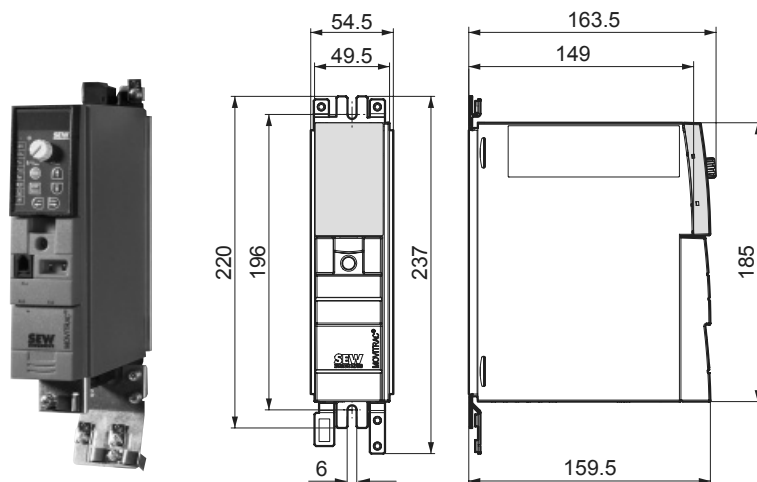
Size	0XS	0S	0L
Power [kW / HP]	0.25 / 0.4 0.37 / 0.5	0.55 / 0.75 0.75 / 1.0	1.1 / 1.5 1.5 / 2.0 2.2 / 3.0

400 / 500 V / 3-phase power supply connection

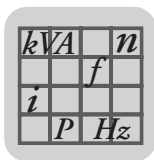
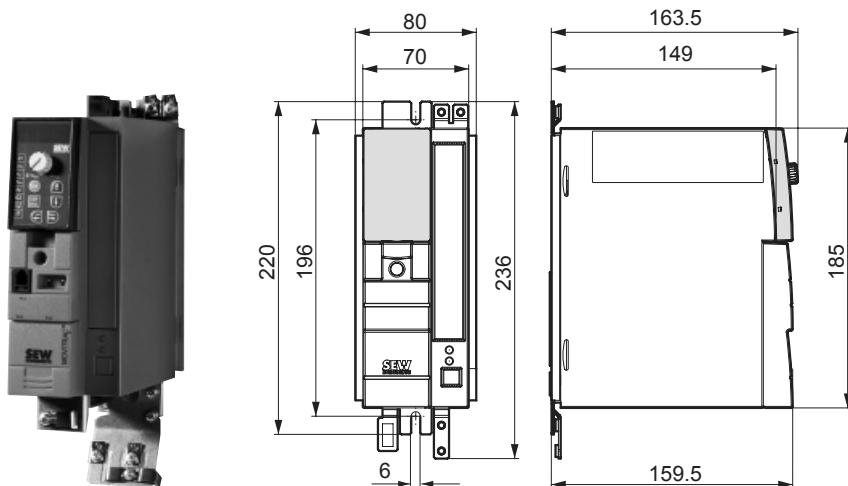
Size	0XS	0S	0L	2S	2	3	4
Power [kW / HP]	0.25 / 0.4 0.37 / 0.5	0.55 / 0.75 0.75 / 1.0 1.1 / 1.5 1.5 / 2.0	2.2 / 3.0 3.0 / 4.0 4.0 / 5.0	5.5 / 7.5 7.5 / 10	11 / 15	15 / 20 22 / 30 30 / 40	37 / 50 45 / 60



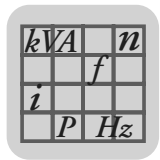
3.5.2 AC 230 V / 1-phase / size 0XS / 0.25 ... 0.37 kW / 0.4... 0.5 HP



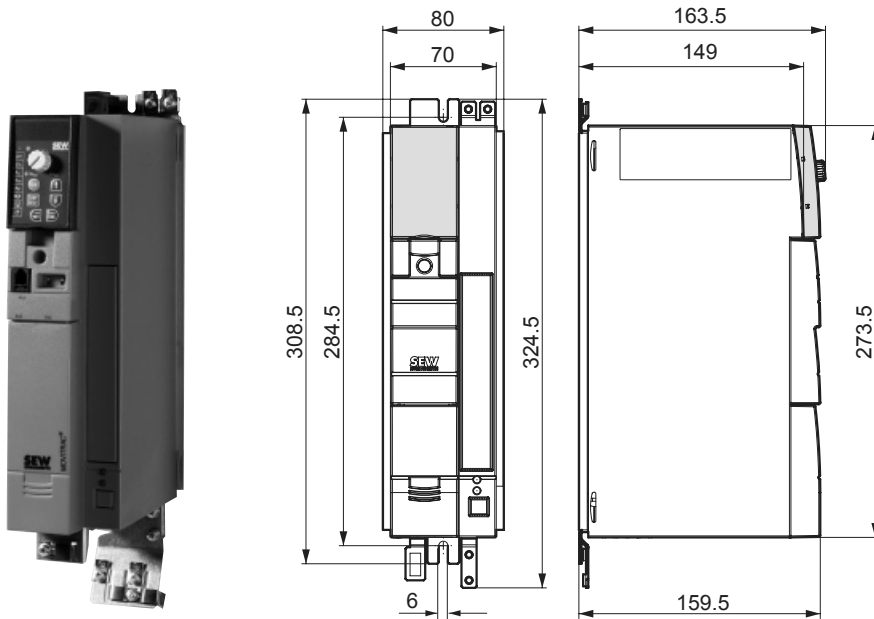
MOVITRAC® MC07B (1-phase supply system)		0003-2B1-4-00	0004-2B1-4-00
Part number		828 491 1	828 493 8
INPUT			
Permitted rated supply voltage	V _N	1 × AC 230 V V _{Mains} = AC 200 V – 10 % ... AC 240 V + 10 %	
Rated supply frequency	f _N	50 / 60 Hz ± 5 %	
Rated mains current 1-phase with V _{Mains} = AC 230 V		AC 4.3 A	AC 6.1 A
OUTPUT			
Output voltage	U _A	3 × 0 ... V _{Mains}	
Recommended motor power under constant load (with V _{Mains} = AC 230 V)	P _{Mot}	0.25 kW 0.4 HP	0.37 kW 0.5 HP
Rated output current with V _{Mains} = AC 230 V	I _N	AC 1.7 A	AC 2.5 A
Minimum braking resistor value (4-Q operation)	R _{BW_min}		
GENERAL INFORMATION			
Power loss at I _N	P _V	30 W	35 W
Current limitation		150 % I _N for maximum 60 seconds	
Connections		Terminals 4 mm ² / AWG12	
Dimensions	W × H × D	55 × 185 × 163 mm / 2.0 × 7.3 × 6.4 in	
Weight	m	1.3 kg / 2.9 lbs.	


3.5.3 AC 230 V / 1-phase / size 0S / 0.55 ... 0.75 kW / 0.75 ... 1.0 HP


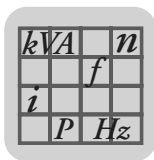
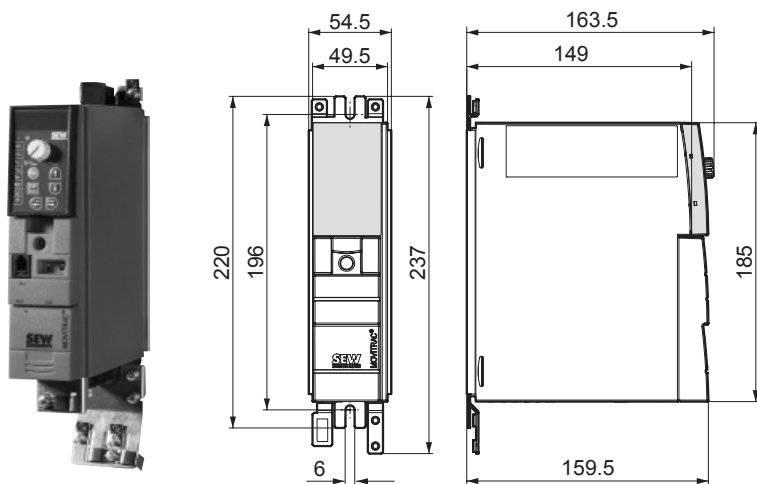
MOVITRAC® MC07B (1-phase supply system)		0005-2B1-4-00	0008-2B1-4-00
Part number		828 494 6	828 495 4
INPUT			
Permitted rated supply voltage	V _N	1 × AC 230 V V _{Mains} = AC 200 V – 10 % ... AC 240 V + 10 %	
Rated supply frequency	f _N	50 / 60 Hz ± 5 %	
Rated mains current 1-phase with V _{Mains} = AC 230 V		AC 8.5 A	AC 9.9 A
OUTPUT			
Output voltage	U _A	3 × 0 ... V _{Mains}	
Recommended motor power under constant load (with V _{Mains} = AC 230 V)	P _{Mot}	0.55 kW 0.75 HP	0.75 kW 1.0 HP
Rated output current with V _{Mains} = AC 230 V	I _N	AC 3.3 A	AC 4.2 A
Minimum braking resistor value (4-Q operation)	R _{BW_min}	27 Ω	
GENERAL INFORMATION			
Power loss at I _N	P _V	55 W	65 W
Current limitation		150 % I _N for maximum 60 seconds	
Connections		Terminals 4 mm² / AWG12	
Dimensions	W × H × D	80 × 185 × 163 mm / 3.1 × 7.3 × 6.4 in	
Weight	m	1.5 kg / 3.3 lbs.	



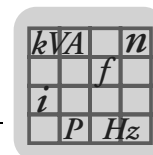
3.5.4 AC 230 V / 1-phase / size 0L / 1.1 ... 2.2 kW / 1.5 ... 3.0 HP



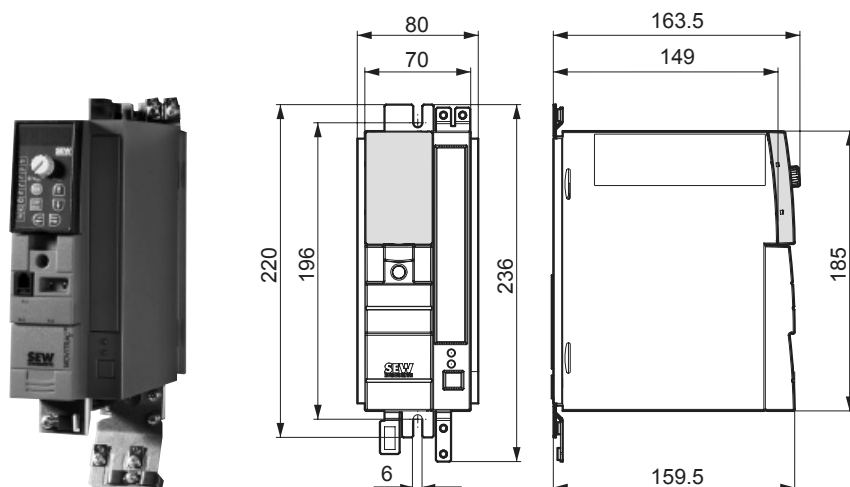
MOVITRAC® MC07B (1-phase supply system)		0011-2B1-4-00	0015-2B1-4-00	0022-2B1-4-00
Part number		828 496 2	828 497 0	828 498 9
INPUT				
Permitted rated supply voltage	V _N	1 × AC 230 V V _{Mains} = AC 200 V – 10 % ... AC 240 V + 10 %		
Rated supply frequency	f _N	50 / 60 Hz ± 5 %		
Rated mains current 1-phase with V _{Mains} = AC 230 V		AC 13.4 A	AC 16.7 A	AC 19.7 A
OUTPUT				
Output voltage	U _A	3 × 0 ... V _{Mains}		
Recommended motor power under constant load (with V _{Mains} = AC 230 V)	P _{Mot}	1.1 kW 1.5 HP	1.5 kW 2.0 HP	2.2 kW 3.0 HP
Rated output current with V _{Mains} AC 230 V	I _N	AC 5.7 A	AC 7.3 A	AC 8.6 A
Minimum permitted braking resistor value (4-Q operation)	R _{BW_min}	27 Ω		
GENERAL INFORMATION				
Power loss at I _N	P _V	75 W	100 W	125 W
Current limitation		150 % I _N for maximum 60 seconds		
Connections	Terminals	4 mm ² / AWG12		
Dimensions	W × H × D	80 × 273.5 × 163 mm / 3.1 × 10.8 × 6.4 in		
Weight	m	2.2 kg / 4.9 lbs.		


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


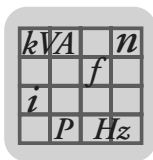
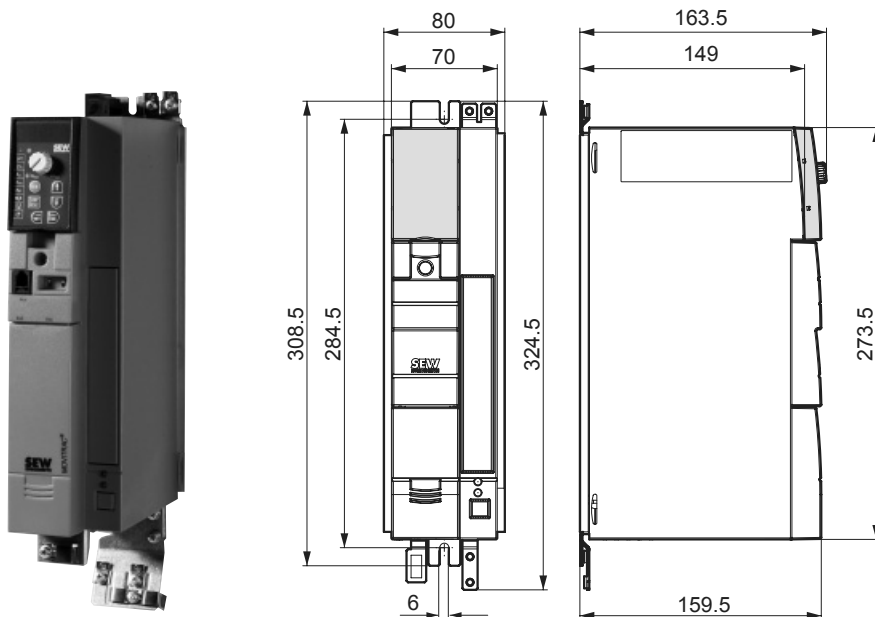
MOVITRAC® MC07BB (3-phase supply system)		0003-5A3-4-00	0004-5A3-4-00
Part number		828 515 2	828 516 0
INPUT			
Permitted rated supply voltage	V _N	3 × AC 400 V V _{Mains} = AC 380 V – 10 % ... AC 500 V + 10 %	
Rated supply frequency	f _N	50 / 6 Hz ± 5 %	
Rated mains current 3-phase with V _{Mains} = AC 400 V		AC 0.9 A	AC 1.4 A
OUTPUT			
Output voltage	U _A	3 × 0 ... V _{Mains}	
Recommended motor power under constant load (with V _{Mains} = AC 400 V)	P _{Mot}	0.25 kW 0.4 HP	0.37 kW 0.5 HP
Rated output current with V _{Mains} = AC 400 V	I _N	AC 1.0 A	AC 1.6 A
Minimum permitted braking resistor value (4-Q operation)	R _{BW_min}	68 Ω	
GENERAL INFORMATION			
Power loss at I _N	P _V	30 W	35 W
Current limitation		150 % I _N for maximum 60 seconds	
Connections	Terminals	4 mm ² / AWG12	
Dimensions	W × H × D	50 × 185 × 163 mm / 2.0 × 7.3 × 6.4 in	
Weight	m	1.3 kg / 2.9 lbs.	



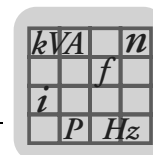
3.5.6 AC 400 / 500 V / 3-phase / size 0S / 0.55 ... 1.5 kW / 0.75 ... 2.0 HP



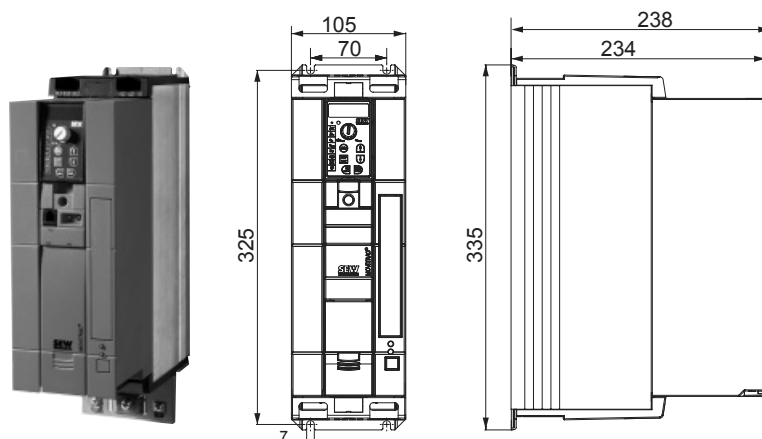
MOVITRAC® MC07B (3-phase supply system)		0005-5A3-4-00	0008-5A3-4-00	0011-5A3-4-00	0015-5A3-4-00
Part number		828 517 9	828 518 7	828 519 5	828 520 9
INPUT					
Permitted rated supply voltage	V _N	3 × AC 400 V V _{Mains} = AC 380 V – 10 % ... AC 500 V + 10 %			
Rated supply frequency	f _N	50 / 60 Hz ± 5 %			
Rated mains current 3-phase with V _{Mains} = AC 400 V		AC 1.8 A	AC 2.2 A	AC 2.8 A	AC 3.6 A
OUTPUT					
Output voltage	U _A	3 × 0 ... V _{Mains}			
Recommended motor power under constant load (with V _{Mains} = AC 400 V)	P _{Mot}	0.55 kW 0.75 HP	0.75 kW 1.0 HP	1.1 kW 1.5 HP	1.5 kW 2.0 HP
Rated output current with V _{Mains} = AC 400 V	I _N	AC 2.0 A	AC 2.4 A	AC 3.1 A	AC 4.0 A
Minimum permitted braking resistor value (4-Q operation)	R _{BW_min}	68 Ω			
GENERAL INFORMATION					
Power loss at I _N	P _V	42 W	48 W	58 W	74 W
Current limitation		150 % I _N for maximum 60 seconds			
Connections	Terminals	4 mm² / AWG12			
Dimensions	W × H × D	80 × 185 × 163 mm / 3.1 × 7.3 × 6.4 in			
Weight	m	1.5 kg / 3.3 lbs.			


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


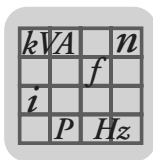
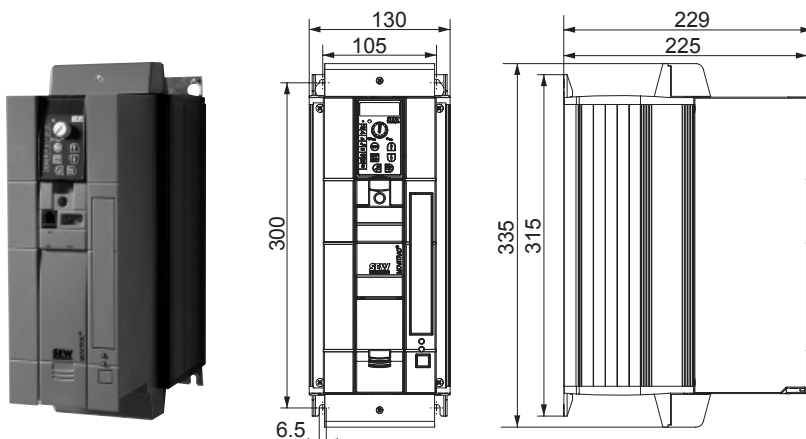
MOVITRAC® MC07B (3-phase supply system)		0022-5A3-4-00	0030-5A3-4-00	0040-5A3-4-00
Part number		828 521 7	828 522 5	828 523 3
INPUT				
Permitted rated supply voltage	V _N	3 × AC 400 V V _{Mains} = AC 380 V – 10 % ... AC 500 V + 10 %		
Rated supply frequency	f _N	50 / 60 Hz ± 5 %		
Rated mains current 3-phase with V _{Mains} = AC 400 V		AC 5.0 A	AC 6.3 A	AC 9.5 A
OUTPUT				
Output voltage	U _A	3 × 0 ... V _{Mains}		
Recommended motor power under constant load (with V _{Mains} = AC 400 V)	P _{Mot}	2.2 kW 3.0 HP	3.0 kW 4.0 HP	4.0 kW 5.0 HP
Rated output current with V _{Mains} = AC 400 V	I _N	AC 5.5 A	AC 7.0 A	AC 9.5 A
Minimum permitted braking resistor value (4-Q operation)	R _{BW_min}	68 Ω		
GENERAL INFORMATION				
Power loss at I _N	P _V	97 W	123 W	155 W
Current limitation		150 % I _N for maximum 60 seconds		
Connections	Terminals	4 mm ² / AWG12		
Dimensions	W × H × D	80 × 273.5 × 163 mm / 3.1 × 10.8 × 6.4 in		
Weight	m	2.1 kg / 4.6 lbs.		



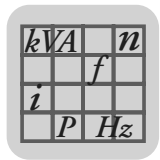
3.5.8 AC 400 / 500 V / 3-phase / size 2S / 5.5 ... 7.5 kW / 7.5 ... 10 HP



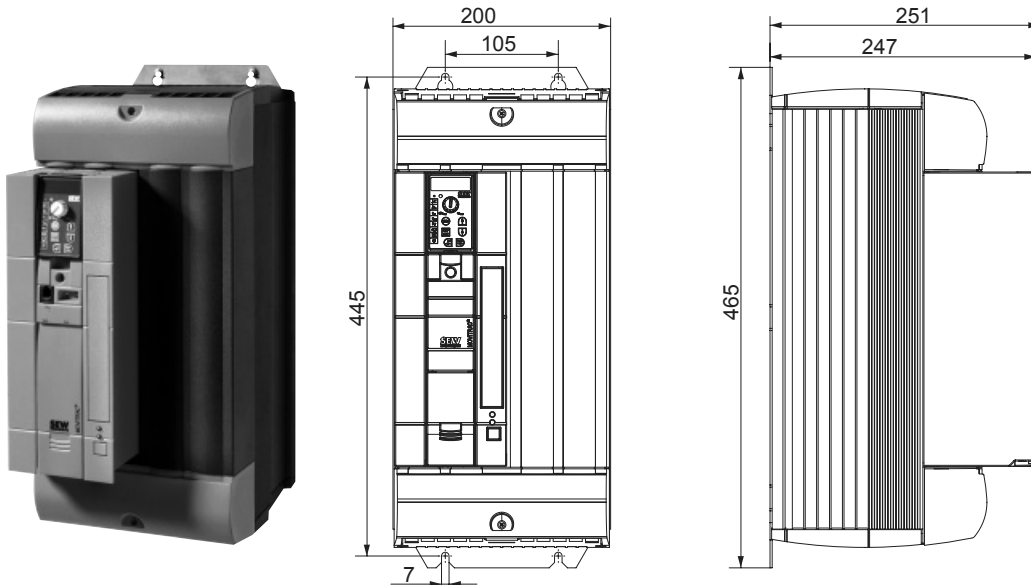
MOVITRAC® MV07B (3-phase supply system)		0055-5A3-4-00	0075-5A3-4-00
Part number		828 524 1	828 526 8
INPUT			
Permitted rated supply voltage	V _N	3 × AC 400 V V _{Mains} = AC 380 V – 10 % ... AC 500 V + 10 %	
Rated supply frequency	f _N	50 / 60 Hz ± 5 %	
Rated mains current 3-phase with V _{Mains} = AC 400 V		AC 11.3 A	AC 14.4 A
OUTPUT			
Output voltage	U _A	3 × 0 ... V _{Mains}	
Recommended motor power under constant load (with V _{Mains} = AC 400 V)	P _{Mot}	5.5 kW 7.5 HP	7.5 kW 10 HP
Rated output current with V _{Mains} = AC 400 V	I _N	AC 12.5 A	AC 16 A
Minimum permitted braking resistor value (4-Q operation)	R _{BW_min}	47 Ω	
GENERAL INFORMATION			
Power loss at I _N	P _V	220 W	290 W
Current limitation		150 % I _N for maximum 60 seconds	
Connections	Terminals	4 mm ² / AWG12	
Dimensions	W × H × D	105 × 335 × 238 mm / 4.1 × 13.2 × 9.4 in	
Weight	m	5.0 kg / 11.0 lbs.	


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


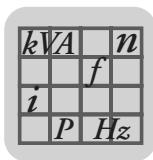
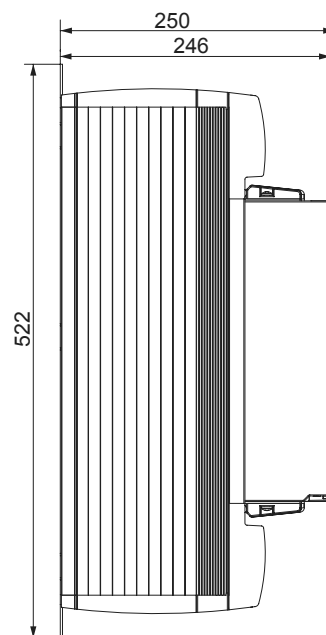
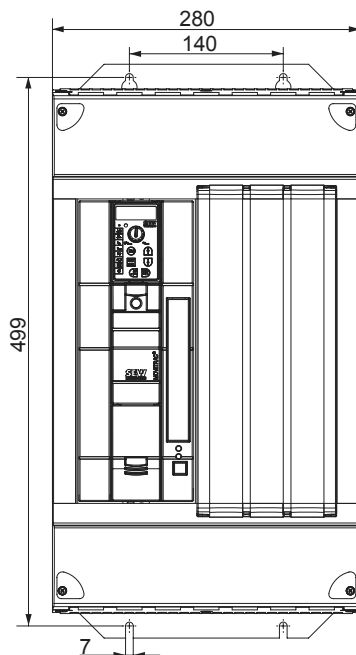
MOVITRAC® MC07B (3-phase supply system)		0110-5A3-4-00
Part number		828 527 6
INPUT		
Permitted rated supply voltage	V_N	$3 \times \text{AC } 400 \text{ V}$ $V_{\text{Mains}} = \text{AC } 380 \text{ V} - 10 \% \dots \text{AC } 500 \text{ V} + 10 \%$
Rated supply frequency	f_N	$50 / 60 \text{ Hz} \pm 5 \%$
Rated mains current 3-phase with $V_{\text{Mains}} = \text{AC } 400 \text{ V}$		$\text{AC } 21.6 \text{ A}$
OUTPUT		
Output voltage	U_A	$3 \times 0 \dots V_{\text{Mains}}$
Recommended motor power under constant load (with $V_{\text{Mains}} = \text{AC } 400 \text{ V}$)	P_{Mot}	11 kW 15 HP
Rated output current with $V_{\text{Mains}} = \text{AC } 400 \text{ V}$	I_N	$\text{AC } 24 \text{ A}$
Minimum permitted braking resistor value (4-Q operation)	$R_{\text{BW_min}}$	
GENERAL INFORMATION		
Power loss at I_N	P_V	400 W
Current limitation		$150 \% I_N$ for maximum 60 seconds
Connections	Terminals	$4 \text{ mm}^2 / \text{AWG}12$
Dimensions	$W \times H \times D$	$130 \times 335 \times 229 \text{ mm} / 5.1 \times 13.2 \times 9.0 \text{ in}$
Weight	m	$6.6 \text{ kg} / 14.6 \text{ lbs.}$



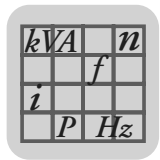
3.5.10 AC 400 / 500 V / 3-phase / size 3 / 15 ... 30 kW / 20 ... 40 HP



MOVITRAC® MC07B (3-phase supply system)		0150-503-4-00	0220-503-4-00	0300-503-4-00
Part number		828 528 4	828 529 2	828 530 6
INPUT				
Permitted rated supply voltage	V _N	3 × AC 400 V V _{Mains} = AC 380 V – 10 % ... AC 500 V + 10 %		
Rated supply frequency	f _N	50 / 60 Hz ± 5 %		
Rated mains current 3-phase with V _{Mains} = AC 400 V		AC 28.8 A	AC 41.4 A	AC 54.0 A
OUTPUT				
Output voltage	U _A	3 × 0 ... V _{Mains}		
Recommended motor power under constant load (with V _{Mains} = AC 400 V)	P _{Mot}	15 kW 20 HP	22 kW 30 HP	30 kW 40 HP
Rated output current with V _{Mains} = AC 400 V	I _N	AC 32 A	AC 46 A	AC 60 A
Minimum permitted braking resistor value (4-Q operation)	R _{BW_min}			12 Ω
GENERAL INFORMATION				
Power loss at I _N	P _V	550 W	750 W	950 W
Current limitation		150 % I _N for maximum 60 seconds		
Connections	Terminals	6 mm ² / AWG10	10 mm ² / AWG8	16 mm ² / AWG6
Dimensions	W × H × D	200 × 465 × 251 mm / 7.9 × 18.3 × 9.9 in		
Weight	m	15 kg / 33.1 lbs.		


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


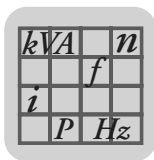
MOVITRAC® MC07B (3-phase supply system)		0370-503-4-00	0450-503-4-00
Part number		828 531 4	828 532 2
INPUT			
Permitted rated supply voltage	V _N	3 × AC 400 V V _{Mains} = AC 380 V – 10 % ... AC 500 V + 10 %	
Rated supply frequency	f _N	50 / 60 Hz ± 5 %	
Rated mains current 3-phase with V _{Mains} = AC 400 V		AC 65.7 A	AC 80.1 A
OUTPUT			
Output voltage	U _A	3 × 0 ... V _{Mains}	
Recommended motor power under constant load (with V _{Mains} = AC 400 V)	P _{Mot}	37 kW 50 HP	45 kW 60 HP
Rated output current with V _{Mains} = AC 400 V	I _N	AC 73 A	AC 89 A
Minimum permitted braking resistor value (4-Q operation)	R _{BW_min}		
GENERAL INFORMATION			
Power loss at I _N	P _V	1200 W	1400 W
Current limitation		150 % I _N for maximum 60 seconds	
Connections	Terminals	25 mm ² / AWG4	35 mm ² / AWG2
Dimensions	W × H × D	280 × 522 × 250 mm / 11.0 × 20.6 × 9.8 in	
Weight	m	27 kg / 59.5 lbs.	



3.6 FBG11B keypad front option

Part number	1820 635 2
Functions	• Process values and status displays • Error memory and error reset queries • Displaying and setting parameters • Data backup and parameter set transfer • Convenient startup menu for SEW and non-SEW motors • Manual control of MOVITRAC® B
Features	• 5-digit, 7-segment display / 6 keys / 8 icons / speed control module • Choice of short or long menu • Can be plugged onto the inverter (during operation) • Enclosure IP20 (EN 60529)



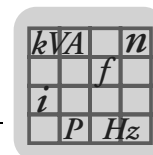


3.7 FSC11B communication module

Part number	1820 716 2
Functions	• Communication with PLC / MOVITRAC® B / PC • Operation / parameter settings / service (PC)
Features	• RS-485 (one interface): Plug-in terminals and service interface (RJ10 socket) • CAN-based system bus (SBus) (plug-in terminals)



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 power supply / external voltage supply	CAN bus to CAN specification 2.0, parts A and B, transmission technology to ISO 11898, max. 64 stations, terminating resistor (120 Ω) can be activated using DIP switches Terminal cross-section: 1.5 mm ² (AWG15) without conductor end sleeves 1.0 mm ² (AWG17) with conductor end sleeves
RS-485 interface	X45:H X45:L X45:⊥	ST11: RS-485+ ST12: RS-485– GND: Reference potential	EIA standard, 9.6 kBaud, max. 32 stations Maximum cable length 200 m Dynamic terminating resistor with fixed installation Terminal cross-section: – 1.5 mm ² (AWG15) without conductor end sleeves – 1.0 mm ² (AWG17) with conductor end sleeves
Service interface	X44 RJ10		Only for service purposes, exclusively for point-to-point connection Maximum cable length 3 m (10 ft)



3.8 DBG60B keypad (in preparation)

3.8.1 Description

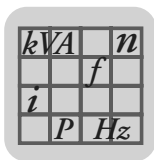
The basic version of MOVITRAC® does not have a DBG60B keypad and can be upgraded to include the keypad as an option.

Keypad		Language	Part number
	DBG60B-01	DE / EN / FR / IT / ES / PT / NL (German / English / French / Italian / Spanish / Portuguese / Dutch)	1 820 403 1
	DBG60B-02	DE / EN / FR / FI / SV / DA / TR (German / English / French / Finnish / Swedish / Danish / Turkish)	1 820 405 8
	DBG60B-03	DE / EN / FR / RU / PL / CS (German / English / French / Russian / Polish / Czech)	1 820 406 6
	DBG60B-04	DE / EN / FR / ZH (German / English / French / Chinese)	1 820 850 9
	Door installation set¹⁾	Description (= scope of delivery)	Part number
	DBM60B	- Housing for DBG60B (IP65) - DKG60B extension cable, length 5 m	824 853 2
	Extension cable	Description (= scope of delivery)	Part number
DKG60B	- Length 5 m 4-core, shielded cable (AWG26)	817 583 7	

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

3.8.2 Functions

- Process values and status displays
- Status displays of the binary inputs / outputs
- Error memory and error reset queries
- Option to display and set the operating parameters and service parameters
- Data backup and transfer of parameter sets to other MOVITRAC® units
- User-friendly startup menu
- Manual control for MOVITRAC®



Technical data

DBG60B keypad (in preparation)

3.8.3 Features

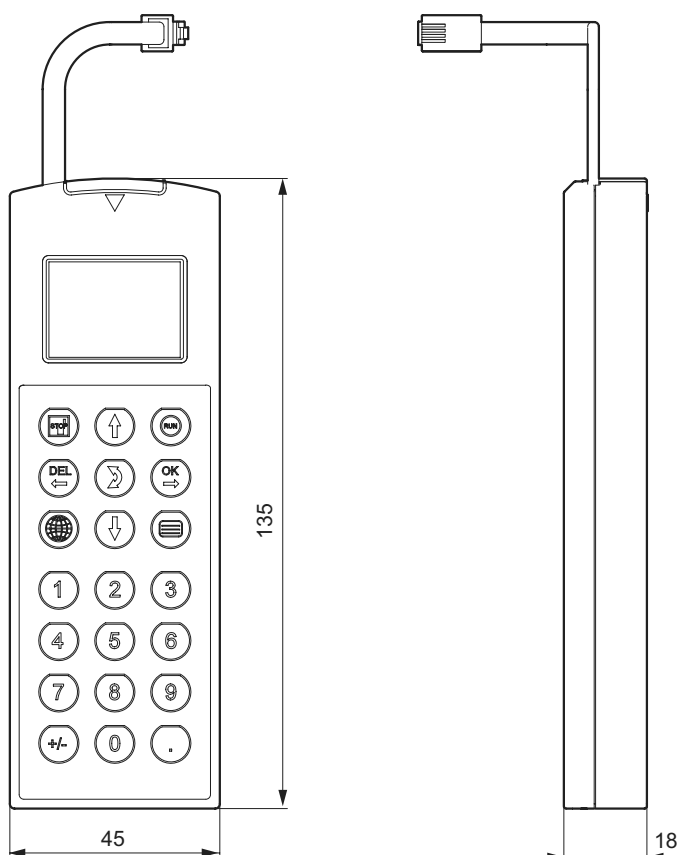
- Illuminated text display, choice of 7 languages
- Keypad with 21 keys
- Can be connected via extension cable DKG60B (5 m)
- Enclosure IP40 (EN 60529)

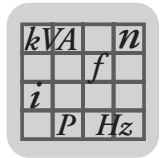


The DBG60B keypad option is connected to the FSC11B communication front option. In this case, the FSC11B interface can no longer be connected to a PC or DOP via RS-485.

3.8.4 DBG60B dimension drawing

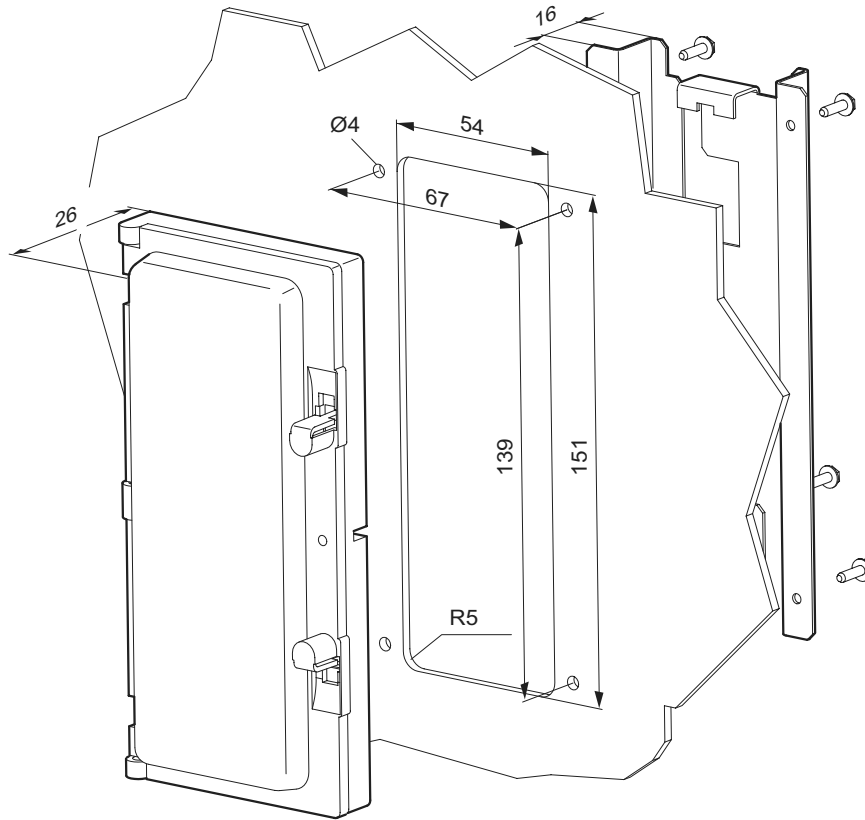
DBG60B dimension drawing, dimensions in mm

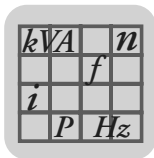




3.8.5 DBG60B housing imension drawing

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





Technical data

Analog module FIO11B (in preparation)

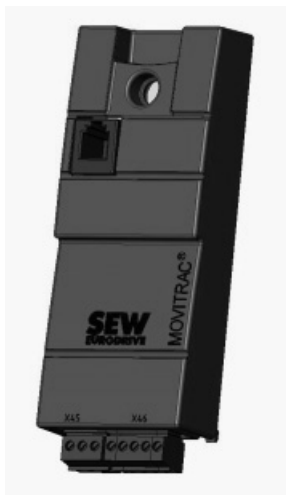
3.9 Analog module FIO11B (in preparation)

Part number 1820 637 9

3.9.1 Description

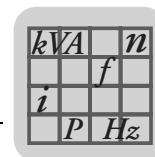
The FIO11B analog module upgrades the basic version with the following interfaces:

- Setpoint input
- Analog output
- RS-485 interface



3.9.2 Electronics data

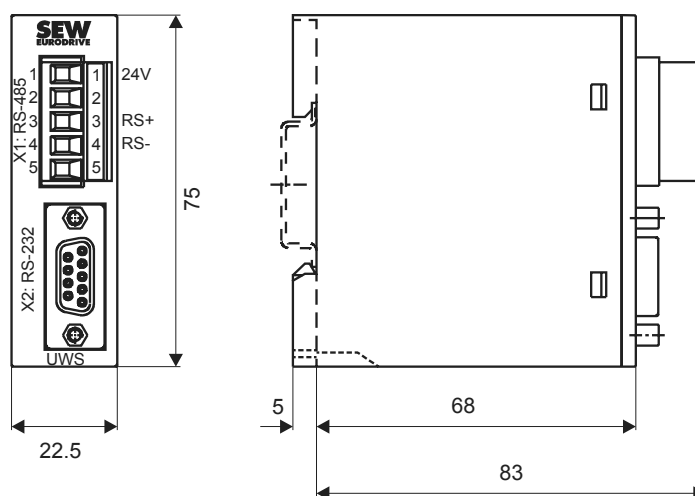
Function	Terminal	Designation	Data
Setpoint input	X40:1 X40:2	AI2: Voltage input GND: Reference potential	–10 ... +10 V $R_i > 200 \text{ k}\Omega$ 10 bit resolution Sampling interval 5ms
Analog output / alternative as current output or voltage output	X40:3 X40:4 X40:5	GND: Reference potential AOV1: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



3.10 UWS11A interface adapter for communication

Part number	822 689 X	The FSC11B is required for connecting the UWS11A.
Description	The UWS11A option converts RS-232 signals, for example from the PC, into RS-485 signals. These RS-485 signals can then be routed to the RS-485 interface of the MOVITRAC® B. The UWS11A option requires a 24V DC voltage supply ($I_{\max} = \text{DC } 100 \text{ mA}$).	
RS-232 interface	The connection between UWS11A and PC is made using a commercially available serial interface cable (shielded!).	
RS-485 interface	Use the RS485 interface of the UWS11A to network up to 32 MOVITRAC® B units for communication (max. cable length 200 m total). Do not connect external terminating resistors because dynamic terminating resistors are already installed! Permitted cable cross-section: One core per terminal 0.20...2.5 mm ² (AWG 24...12) Two cores per terminal 0.20...1 mm ² (AWG 24...17)	

Dimension drawing

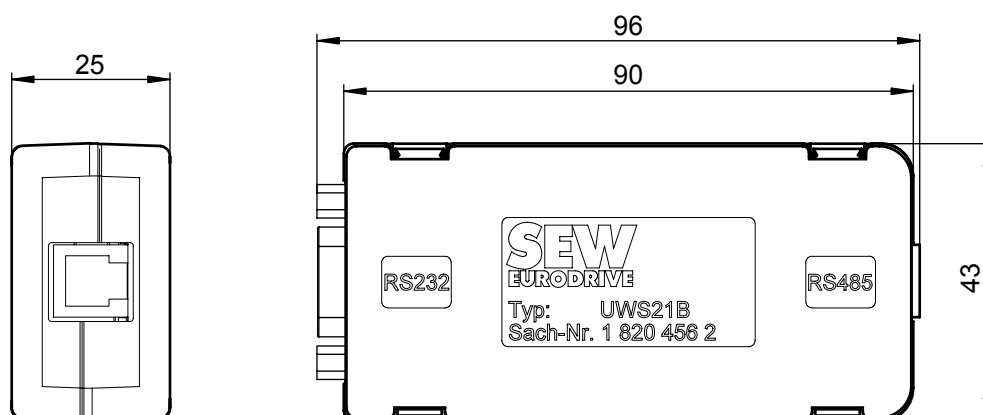


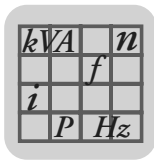
The UWS11A option is mounted on a support rail (EN 50022-35 × 7.5) in the switch cabinet.

3.11 UWS21B interface adapter for service purposes

Part number	18204562	The FSC11B is required for connecting the UWS21B.
Description	The UWS21B option converts RS-232 signals, for example from the PC, into RS-485 signals. These RS-485 signals can then be routed to the interface of the MOVITRAC® B.	
RS-232 interface	The connection between UWS21A and PC is made using a commercially available serial interface cable (shielded!).	
RS-485 interface	UWS21A and MOVITRAC® B are connected using a serial interface cable with RJ10 connectors.	
Scope of delivery	The scope of delivery for the UWS21B option includes: • UWS21B unit • Serial interface cable with 9-pin sub D socket and 9-pin sub D connector to connect the UWS21B option to the PC. • Serial interface cable with two RJ10 connectors to connect UWS21B and MOVITRAC® B • CD-ROM with drivers and MOVITOOLS® MotionStudio	

UWS21B dimension drawing

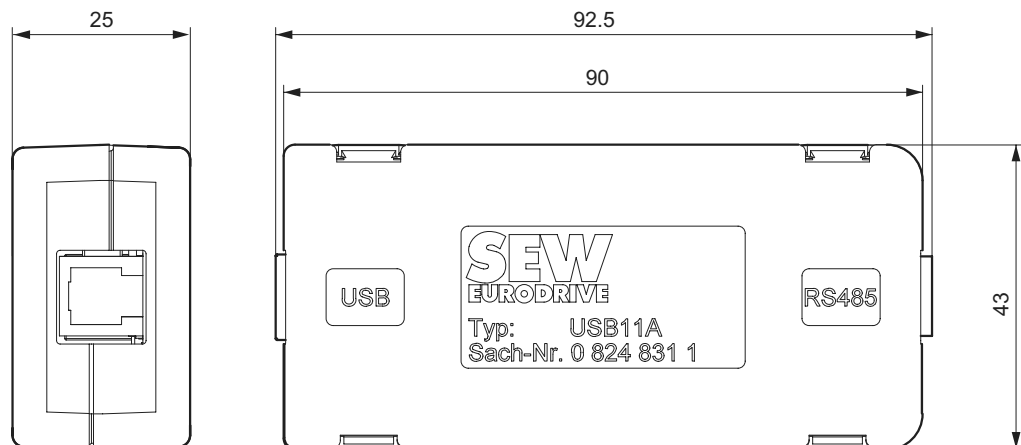


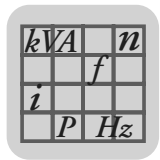


3.12 USB11A interface adapters for service purposes

Part number	824 831 1	The FSC11B is required for connecting the USB11A.
Description	Option USB11A enables a PC or laptop with a USB interface to be connected to the Xterminal interface of the MOVIDRIVE® unit. The USB11A interface adapter supports USB1.1 and USB2.0. The USB11A interface adapter supports USB1.1 and USB2.0.	
RS-232 interface	The connection between USB11A and PC is made using a commercial 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.	

USB11A dimension drawing





3.13 Braking resistors, BW series

3.13.1 General information

Braking resistor types

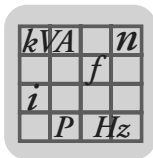
BW are matched to the MOVITRAC® B inverter series. The type of cooling is KS = self-cooling (air ventilation). The permitted ambient temperature range is $-20\text{ °C} \dots +45\text{ °C}$.

3.13.2 PTC braking resistors

Observe the following points for the PTC braking resistors:

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

Braking resistor type	BW2	BW4
Part number	800 622 9	800 624 5
Resistance value R_{BW}		$87.5\ \Omega \pm 10\ \%$
Connection	Conductor end sleeves	
Ambient temperature ϑ_A	$-25\text{ °C} \dots +155\text{ °C}$	$-25\text{ °C} \dots +135\text{ °C}$
For MOVITRAC® B	400/500 V	230 V

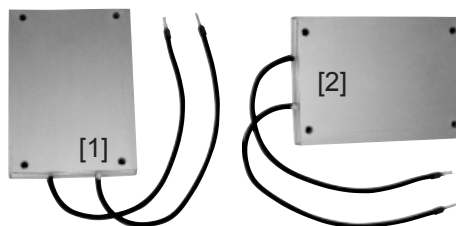


3.13.3 Flat-design

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

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

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

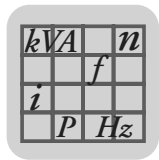


230 V

Braking resistor type		BW027-003	BW027-005
Part number		826 949 1	826 950 5
100 % CDF		230 W	450 W
50 % CDF		310 W	610 W
25 % CDF		410 W	840 W
12 % CDF		550 W	1200 W
6 % CDF		980 W	2360 W
Resistance value R_{BW}		27 $\Omega \pm 10 \%$	27 $\Omega \pm 10 \%$
Trip current	230 V	1.0 A	1.4 A
Ambient temperature ϑ_A		-20 °C... +45 °C	
For MOVITRAC® B 230 V		0004 ... 0022	0004 ... 0022

400 / 500 V

Braking resistor type		BW072-003	BW072-005
Part number		826 058 3	826 060 5
100 % CDF		230 W	450 W
50 % CDF		310 W	600 W
25 % CDF		420 W	830 W
12 % CDF		580 W	1110 W
6 % CDF		1000 W	2000 W
Resistance value R_{BW}		72 $\Omega \pm 10 \%$	72 $\Omega \pm 10 \%$
Trip current	400/500 V	0.6 A	1.0 A
Ambient temperature ϑ_A		-20 °C... +45 °C	
For MOVITRAC® B 400 / 500 V		0005 ... 0040	0005 ... 0040



3.13.4 Wire resistors and grid resistors

- Perforated sheet cover (IP20) open to mounting surface.
- You can apply a higher load to wire resistors for a short time than you can to flat-design braking resistors.
- A thermostat is integrated in the BW...-T braking resistors.

Fit additional overload protection for the wire resistors by means of a bimetallic relay with trip class 10 or 10A in the R-line (X3). Set the trip current to the value I_F in the following tables. Do not use electronic or electromagnetic fuses because these can be triggered even in case of short-term excess currents that are still within the tolerance range.

For braking resistors in the BW...-T series, you can connect the integrated thermostat using a 2-core, shielded cable as an alternative to a bimetallic relay.

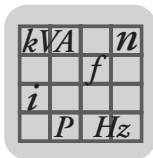
If you operate the resistors at rated power, the surfaces of the resistors will get hot. Make sure to select an installation site that will accommodate these high temperatures. For example, a possible location is the switch cabinet roof.

The performance data listed in the following tables specify the **load capacity of the braking resistors**. The load capacity depends on the cyclic duration factor CDF [%] in relation to a cycle duration of ≤ 120 s.

230 V

Type	BW027-006	BW027-012	BW039-003	BW039-006	BW039-012	BW039-026
Part number	822 422 6	822 423 4	821 687 8	821 688 6	821 689 4	–
BW...-T part number	–	–	–	–	1820 136 9	1820 415 5
100 % CDF	0.6 kW	1.2 kW	0.3 kW	0.6 kW	1.2 kW	2.6 kW
50 % CDF	1.2 kW	2.3 kW	0.5 kW	1.1 kW	2.1 kW	4.6 kW
25 % CDF	2.0 kW	5.0 kW	1.0 kW	1.9 kW	3.8 kW	5.9 kW
12 % CDF	3.5 kW	7.5 kW	1.7 kW	3.5 kW	5.9 kW	5.9 kW
6 % CDF	6.0 kW	8.5 kW ¹⁾	2.8 kW	5.7 kW	5.9 kW	5.9 kW
Resistance	27 $\Omega \pm 10$ %		39 $\Omega \pm 10$ %			
Trip current I_F	4.7 A _{RMS}	6.7 A _{RMS}	2.8 A _{RMS}	3.9 A _{RMS}	5.5 A _{RMS}	8.1 A _{RMS}
Connections	Ceramic terminals 2.5 mm ² (AWG12)					
Design	Wire resistor					
For MOVITRAC® B	0015 ... 0022					

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



Technical data

Braking resistors, BW series

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
BW...-T part number	1820 419 8	1820 133 4	1820 417 1	1820 134 2	1820 084 2	1820 135 0
100 % CDF	0.6 kW	0.8 kW	1.2 kW	1.2 kW	2.0 kW	4.0 kW
50 % CDF	1.1 kW	1.4 kW	2.2 kW	2.2 kW	3.8 kW	7.6 kW
25 % CDF	1.9 kW	2.6 kW	3.8 kW	3.8 kW	6.4 kW	12.8 kW
12 % CDF	3.6 kW	4.8 kW	6.7 kW	7.2 kW	12 kW	20 kW ¹⁾
6 % CDF	5.7 kW	7.6 kW	10 kW ¹⁾	11 kW	19 kW	20 kW ¹⁾
Resistance	100 Ω $\pm$ 10 %	68 Ω $\pm$ 10 %		47 Ω $\pm$ 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)					
Design	Wire resistor					
For MOVITRAC® B	0015 ... 0040			0055 / 0075		

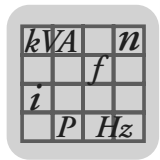
1) Physical power limit due to DC link voltage and resistance value.

Type	BW039-012	BW039-026	BW039-050	BW018-015	BW018-035	BW018-075
Part number	821 689 4	—	—	821 684 3	—	—
BW...-T part number	1820 1369	1820 415 5	1820 137 7	1820 416 3	1820 138 5	1820 139 3
100 % CDF	1.2 kW	2.6 kW	5.0 kW	1.5 kW	3.5 kW	7.5 kW
50 % CDF	2.1 kW	4.6 kW	8.5 kW	2.5 kW	5.9 kW	12.7 kW
25 % CDF	3.8 kW	8.3 kW	15.0 kW	4.5 kW	10.5 kW	22.5 kW
12 % CDF	7.0 kW	15.3 kW	24.0 kW ¹⁾	6.7 kW	15.7 kW	33.7 kW
6 % CDF	11.4 kW	24.0 kW ¹⁾	24.0 kW ¹⁾	11.4 kW	26.6 kW	52.2 kW ¹⁾
Resistance	39 Ω $\pm$ 10 %		39 Ω $\pm$ 10 %	18 Ω $\pm$ 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)					
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	—	—	—	—
BW...-T part number	1820 413 9	1820 414 7	1820 140 7	1820 141 5	1820 083 4	1820 412 0
100 % CDF	16 kW	2.5 kW	5.0 kW	10 kW	13.5 kW	18 kW
50 % CDF	27 kW	4.2 kW	8.5 kW	17 kW	23 kW	30.6 kW
25 % CDF	45 kW ¹⁾	7.5 kW	15.0 kW	30 kW	40 kW	54 kW
12 % CDF	45 kW ¹⁾	11.2 kW	22.5 kW	45 kW	61 kW	81 kW
6 % CDF	45 kW ¹⁾	19.0 kW	38.0 kW	56 kW ¹⁾	102 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	Ceramic terminals 2.5 mm ² (AWG12)			M8 stud	
Design	Grid resistor					
For MOVITRAC® B	0220	0300			0370 / 0450	

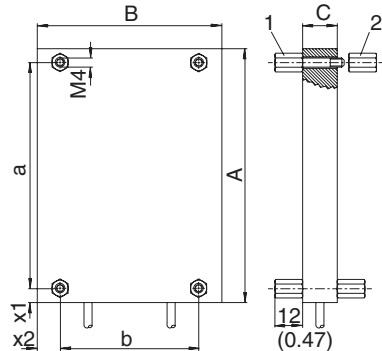
1) Physical power limit due to DC link voltage and resistance value.



3.13.5 Dimensions of BW Braking Resistors

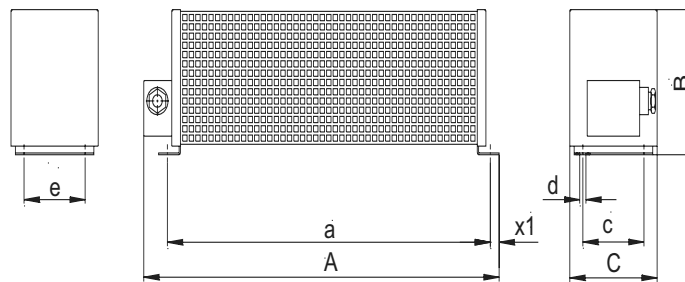
Flat-design

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

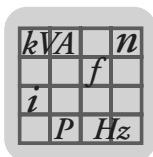


Type	Main dimensions [mm (in)]			Fastening parts [mm (in)]				Weight [kg (lb)]
	A	B	C	a	b/c/e	x1	x2	
BW072-003 BW027-003	110 (4.3)	80 (3.2)	15 (0.6)	98 (3.9)	60 (2.4)	6 (0.2)	10 (0.4)	0.3(0.7)
BW072-005 BW027-005	216 (8.5)	80 (3.2)	15 (0.6)	204 (8.0)	60 (2.4)	6 (0.2)	10 (0.4)	0.6(1.3)

Wire resistors



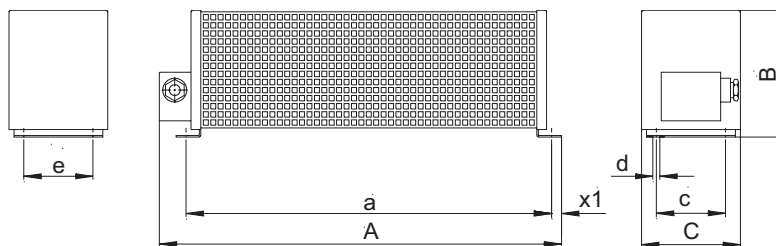
Type	Main dimensions [mm (in)]				Fastening parts [mm (in)]				Weight [kg (lb)]
	A	A BW...-T	B	C	a	b/c/e	x1	d	
BW027-006	486 (19.1)	—	120 (4.7)	92 (3.6)	426 (16.8)	64 (2.5)	10 (0.4)	5.8(0.2)	2.2 (4.9)
BW027-012	486 (19.1)	—	120 (4.7)	185 (7.3)	426 (16.8)	150 (5.9)	10 (0.4)	5.8(0.2)	4.3 (9.5)
BW100-006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



Technical data

Braking resistors, BW series

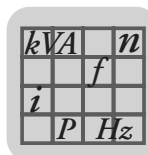
Grid resistors



Type	Main dimensions [mm (in)]				Fastening parts [mm (in)]				Weight [kg (lb)]
	A	A BW..-T	B	C	a	b/c/e	x1	d	
BW012-025-P ¹⁾	295 (11.6)	—	260 (10.2)	490 (19.3)	270 (10.6)	380 (15.0)	—	10.5 (0.4)	9.0 (19.8)
BW012-050	—	395 (15.5)	260 (10.2)	490 (19.3)	370 (14.6)	380 (15.0)	—	10.5 (0.4)	12 (26.5)
BW012-100	—	595 (23.4)	260 (10.2)	490 (19.3)	570 (22.4)	380 (15.0)	—	10.5 (0.4)	21 (46.3)
BW018-015-/P ²⁾	600 (23.6)	—	120 (4.7)	92 (3.6)	540 (21.3)	64 (2.5)	10 (0.4)	5.8 (0.2)	4.0 (8.8)
BW018-035	—	295 (11.6)	260 (10.2)	490 (19.3)	270 (10.6)	380 (15.0)	—	10.5 (0.4)	9.0 (19.8)
BW018-075	—	595 (23.4)	260 (10.2)	490 (19.3)	570 (22.4)	380 (15.0)	—	10.5 (0.4)	21 (46.3)
BW039-050	—	395 (15.6)	260 (10.2)	490 (19.3)	370 (14.6)	380 (15.0)	10 (0.4)	10.5 (0.4)	12 (26.5)
BW915	—	795 (31.3)	260 (10.2)	490 (19.3)	770 (30.3)	380 (15.0)	—	10.5 (0.4)	26 (57.3)
BW106	—	795 (31.3)	260 (10.2)	490 (19.3)	770 (30.3)	380 (15.0)	—	10.5 (0.4)	32 (70.5)
BW206	—	995 (39.2)	260 (10.2)	490 (19.3)	970 (38.2)	380 (15.0)	—	10.5 (0.4)	43 (94.8)

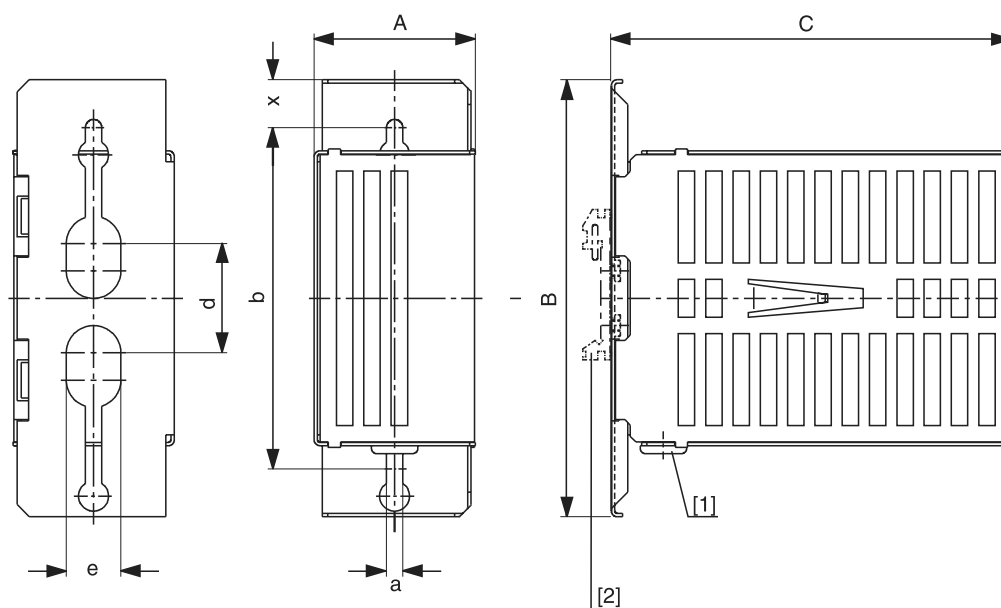
1) D = 355 mm (14.0 in)

2) BW..-P: A = 620 mm (24.4 in)



3.14 Touch guard BS

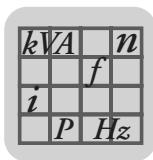
Touch guard dimension drawing:



- [1] Grommet
[2] Support rail mounting

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

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



Technical data

Submounting of flat-design resistors FKB

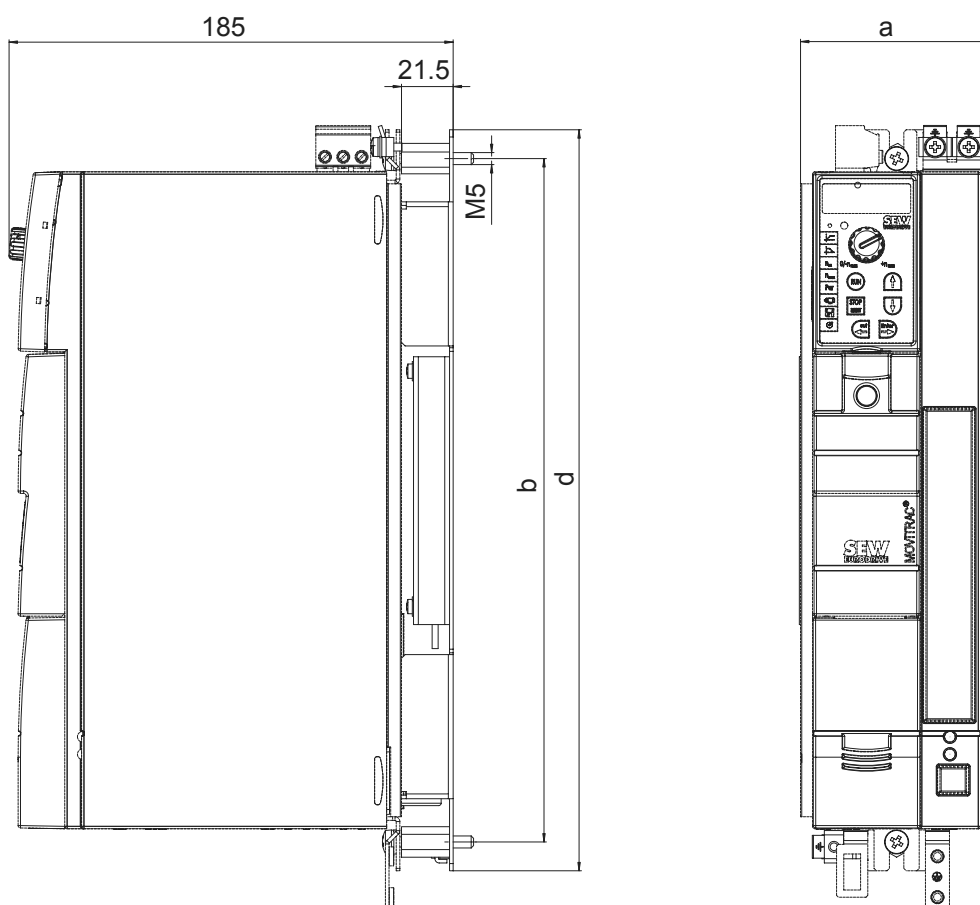
3.15 Submounting of flat-design resistors FKB

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

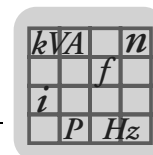
Type	Part number	Size	Braking resistor	
			230 V	400/500 V
FKB11B	1820 728 6	0XS	BW4	BW2
FKB12B	1820 729 4	0S	BW027-003	BW072-003
FKB13B	1820 730 8	0L		

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

Dimension drawing:



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

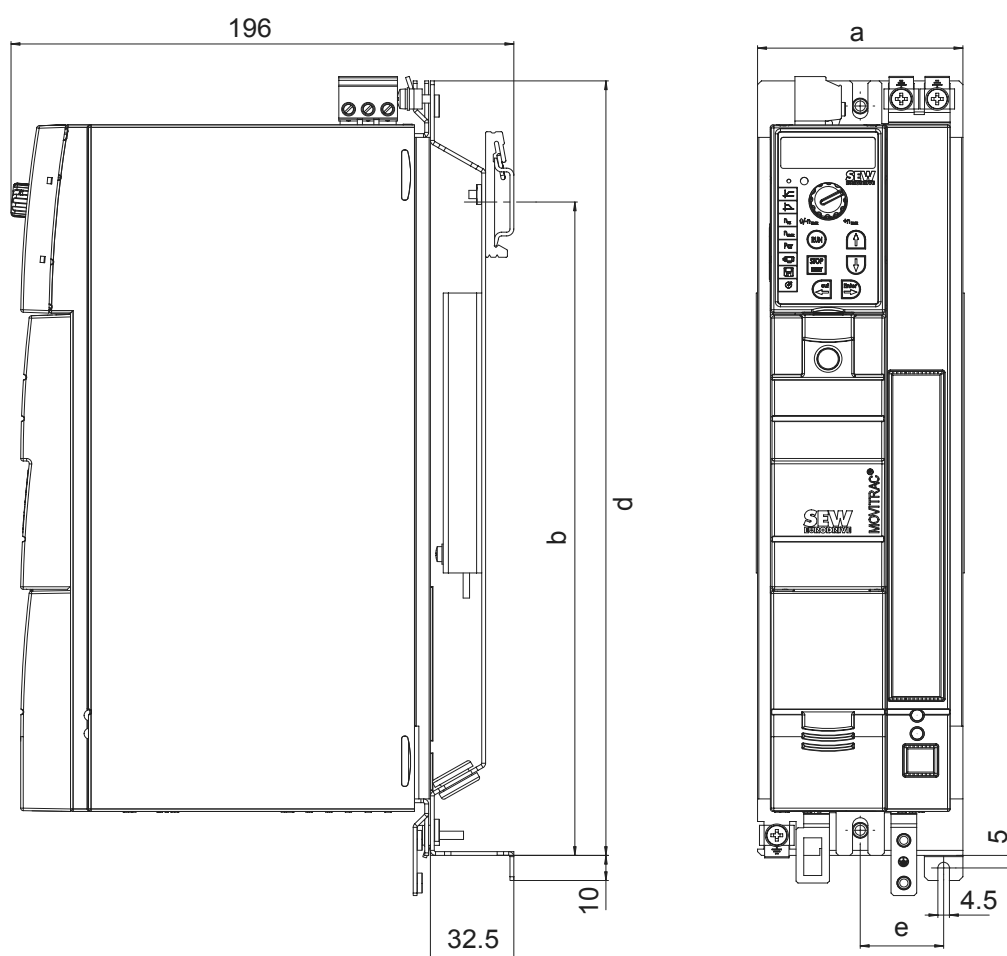


3.16 Support rail mounting FHS

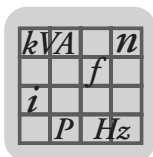
The FHS is used for support rail mounting of MOVITRAC® B frequency inverters and for the submounting of flat-design resistors.

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

Dimension drawing:



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



3.17 Line chokes ND

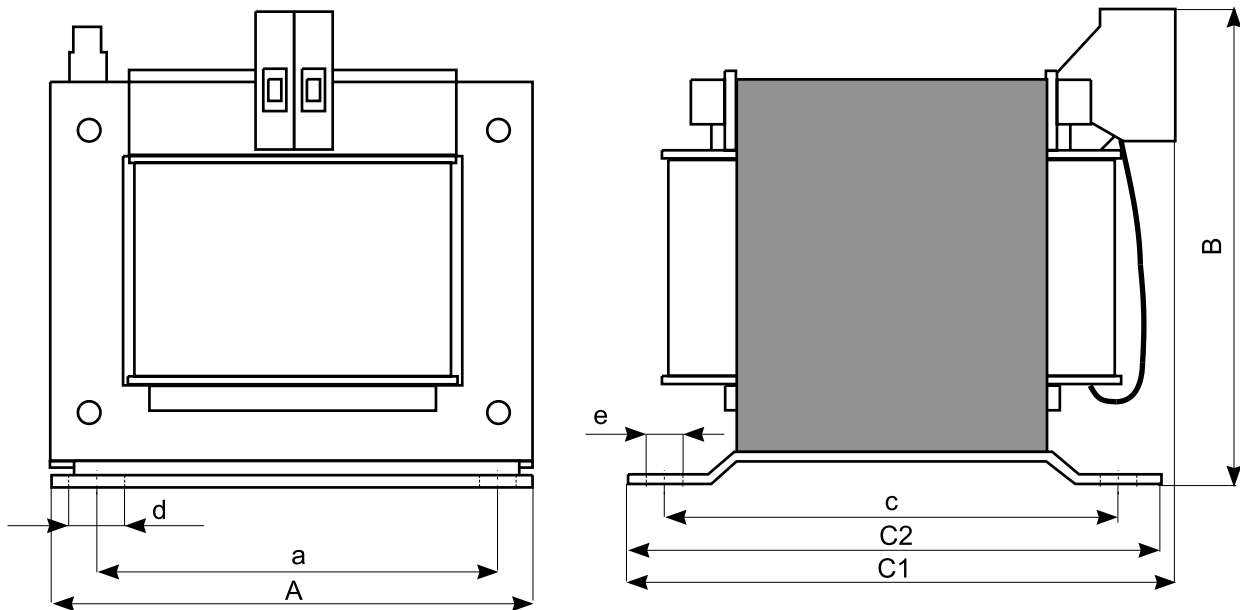
The line choke assists in overvoltage protection. The line choke restricts the charging current when several inverters are connected in parallel on the input side. Application: See section "Project planning." The ambient temperature range is $-25 \dots +45 \text{ }^{\circ}\text{C}$. The enclosure is IP00 (EN 60529).

Line choke type	ND 010-301	ND 020-151	ND 027-123	ND 035-073
Part number	826 972 6	826 973 4	825 771 X	825 772 8
Rated voltage V _N	1 x AC 230 V ±10 %		3 x AC 380 ... 500 V ±10 %	
Rated current I _N	AC 10 A	AC 20 A	AC 27 A	AC 35 A
Power loss at I _N P _V	6 W	10 W	35 W	35 W
Inductance L _N	3 mH	1.5 mH	1.2 mH	0.7 mH
Terminal strip	4 mm ² (AWG10)	10 mm ² (AWG8)		
Suitable for MOVITRAC® B				
1-phase 230 V	0004 ... 0008	0011 ... 0022	0004 ... 0022 ¹⁾	

1) For connecting several 1-phase inverters to a 3-phase line choke.

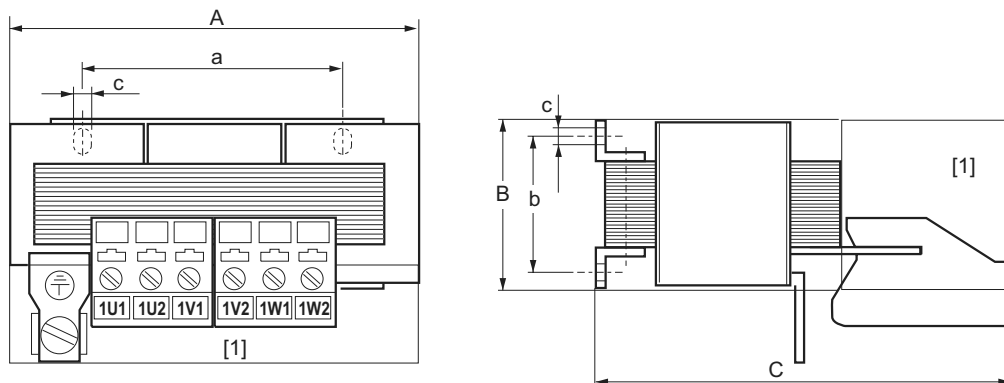
Line choke type	ND 020-013	ND045-013	ND085-013	ND150-013
Part number	826 012 5	826 013 3	826 014 1	825 548 2
Rated voltage V_N	3 x AC 380 ... 500 V $\pm 10 \%$			
Rated current I_N	AC 20 A	AC 45 A	AC 85 A	AC 150 A
Power loss at I_N P_V	10 W	15 W	25 W	65 W
Inductance L_N	0.1 mH	0.1 mH		
Terminal strip	4 mm ² (AWG10)	10 mm ² (AWG8)	35 mm ² (AWG2)	Stud M10/PE: M8
Suitable for MOVITRAC [®] B				
3-phase 400 / 500 V	100 % I_N	0005 ... 0075	0110 ... 0220	0300 ... 0450
	125 % I_N	0005 ... 0075	0110 ... 0150	0220 ... 0370
				0450

3.17.1 ND 010-301 / ND 020-151 dimension drawing



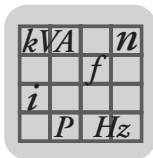
Type	Main dimensions [mm (in)]				Mounting dimensions [mm (in)]				Weight [kg (lb)]
	A	B	C1	C2	a	c	d	e	
ND 010-301	90 (3.5)	100 (3.9)	80 (3.2)	70 (2.8)	64 (2.5)	52 (2.1)	4.4 (0.2)	7.4 (0.3)	1.4 (3.1)
ND 020-151	90 (3.5)	100 (3.9)	90 (3.6)	70 (2.8)	64 (2.5)	52 (2.1)	4.4 (0.2)	7.4 (0.3)	1.4 (3.1)

3.17.2 ND 020-013 / ND 027-123 / ND 035-073 / ND 085-013 / ND 150-013 dimension drawing



[1] = Space for touch-safe terminal strips

Type	Main dimensions [mm (in)]			Mounting dimensions [mm (in)]			Weight [kg (lb)]
	A	B	C	a	b	d/e	
ND 020-013	85 (3.4)	60 (2.4)	120 (4.7)	50 (2.0)	31 (1.2)	5 – 10 (0.2 – 0.4)	0.5 (1.1)
ND 027-123	185 (7.3)	175 (6.9)	120 (4.7)	136 (5.4)	87 (3.4)	5 – 10 (0.2 – 0.4)	6.0 (13.2)
ND 035-073	185 (7.3)	200 (7.9)	120 (4.7)	136 (5.4)	87 (3.4)	5 – 10 (0.2 – 0.4)	11 (24.2)
ND 045-013	125 (4.9)	95 (3.7)	170 (6.7)	84 (3.3)	55 ... 75 (2.2 ... 3.0)	6 (0.2)	2.5 (5.5)
ND 085-013	185 (7.3)	115 (4.5)	235 (9.3)	136 (5.4)	56 (2.2)	7 (0.3)	8 (17.6)
ND 150-013	255 (10.0)	140 (5.5)	230 (9.1)	170 (6.7)	77 (3.0)	8 (0.3)	17 (37.5)



Technical data

Line filter NF

3.17.3 Several inverters on one line choke

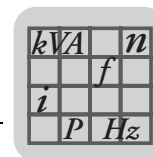
- The input contactor must be designed for the total current.
- The fuse must correspond to the rated current of the line choke.
- Connect the MOVITRAC® B frequency inverters with identical configuration to the line choke.

3.18 Line filter NF

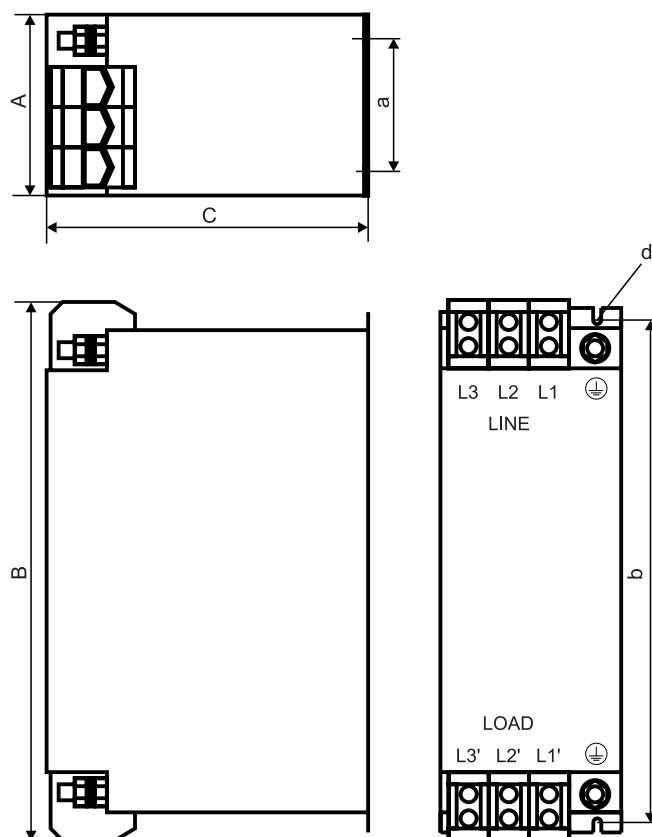
The line filter suppresses interference emissions on the line side of inverters. The ambient temperature range is –25 ... +45 C. The enclosure is IP20 (EN 60529).

Type	NF009-503	NF014-503	NF018-503	NF035-503
Part number	827 412 6	827 116 X	827 413 4	827 128 3
Rated current	AC 9 A	AC 14 A	AC 18 A _{AC}	AC 35 A
Power loss	6 W	9 W	12 W	15 W
Leakage current	≤ 25 mA	≤ 25 mA	≤ 25 mA	≤ 25 mA
Connections PE screw	4 mm ² (AWG10) M6			10 mm ² (AWG8) M6
Suitable for MOVITRAC® B				
100 % I _N 380 ... 500 V	0005 ... 0040	0055 ... 0075	–	0110 ... 0150
125 % I _N 380 ... 500 V	0005 ... 0030	0040 ... 0055	0075	0110

Type	NF048-503	NF063-503	NF085-503	NF115-503
Part number	827 117 8	827 414 2	827 415 0	827 416 9
Rated current	AC 48 A	AC 63 A	AC 85 A	AC 115 A
Power loss	22 W	30 W	35 W	60 W
Leakage current	≤ 40 mA	≤ 30 mA	≤ 30 mA	≤ 30 mA
Connections PE screw	10 mm ² (AWG8) M6	16 mm ² (AWG6) M6	35 mm ² (AWG2) M8	50 mm ² (AWG1/0) M10
Suitable for MOVITRAC® B				
100 % I _N 380 ... 500 V	0220	0300	0370/0450	–
125 % I _N 380 ... 500 V	0150	0220	0300/0370	0450

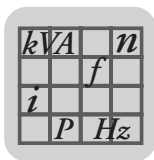


Line filter dimension drawing [mm (in)]:



Line filter type	Main dimensions		
	A	B	C
NF009-503	55 (2.2)	195 (7.7)	80 (3.2)
NF014-503		225 (8.9)	
NF018-503		255 (10.0)	
NF035-503	60 (2.4)	275 (10.8)	100 (3.9)
NF048-503		315 (12.4)	
NF063-503		260 (10.2)	
NF085-503	90 (3.5)	320 (12.6)	140 (5.5)
NF115-503	100 (3.9)	330 (13.0)	155 (6.1)

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



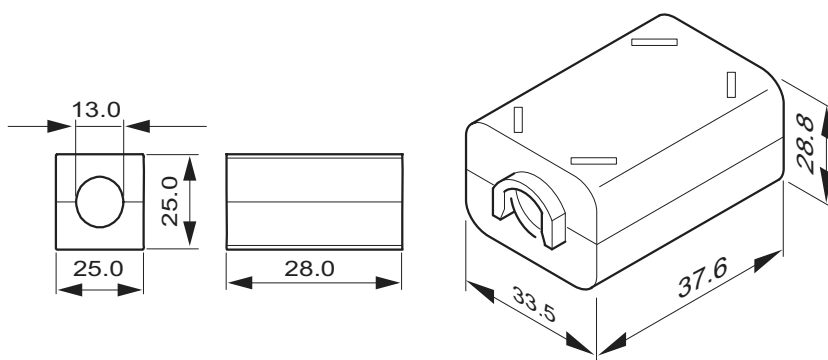
3.19 Foldable ferrites

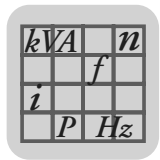
You can reduce the radiated interference of the power cable by using foldable ferrites.

Technical data:

Part number	819 702 4
For cable diameter	10.5 ... 12.5 mm
Storage temperature	−40 °C... +85 °C
Operating temperature	−25 °C... +105 °C

Foldable ferrites dimension drawing:



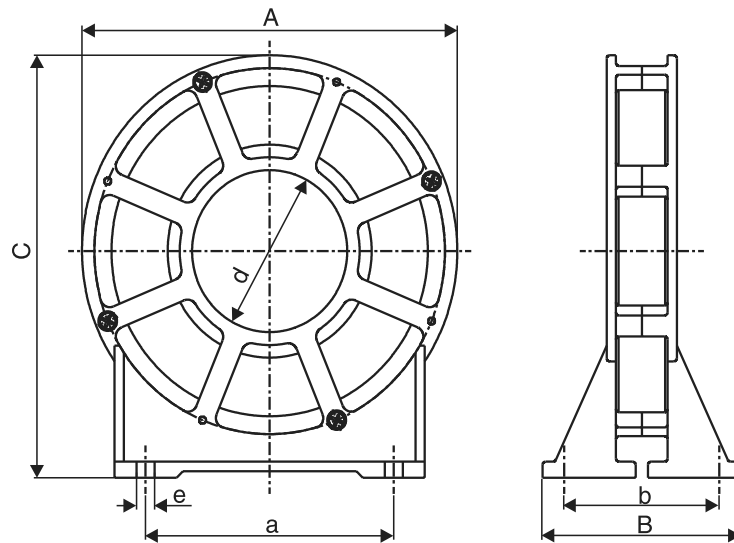


3.20 HD series output chokes

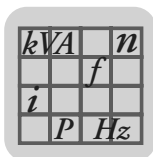
You can reduce the radiated interference of the unshielded motor cable by using an output choke.

Output choke type	HD001	HD002	HD003
Part number	813 325 5	813 557 6	813 558 4
Max. power loss P_{Vmax}	15 W	8 W	30 W
Weight	0.5 kg 1.1 lbs.	0.2 kg 0.44 lbs.	1.1 kg 2.4 lbs.
For cable cross-sections	1.5 ... 16 mm ² AWG16 ... 6	≤ 1.5 mm ² ≤ AWG16	≤ 16 mm ² ≥ AWG6

HD dimension drawing [mm (in)]:



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



3.21 Output filter HF

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

- In group drives (several motor lines in parallel); the discharge currents in the motor cables are suppressed.
- To protect the motor winding insulation of non-SEW motors, which are not suitable for inverters.
- For protection against overvoltage spikes in long motor lines (> 100 m)
- Do not use output filters in hoists because of the voltage drop in the filter!
- During project planning of the drive, take into account the voltage drop in the output filter and consequently the reduced motor torque available. This applies particularly to AC 230 V units with output filters.



Output filters attenuate interference emission via unshielded motor lines.

The ambient temperature range is 0 ... +45 °C (reduction: 3 % per K up to max. 60 °C). The degree of protection is IP20.

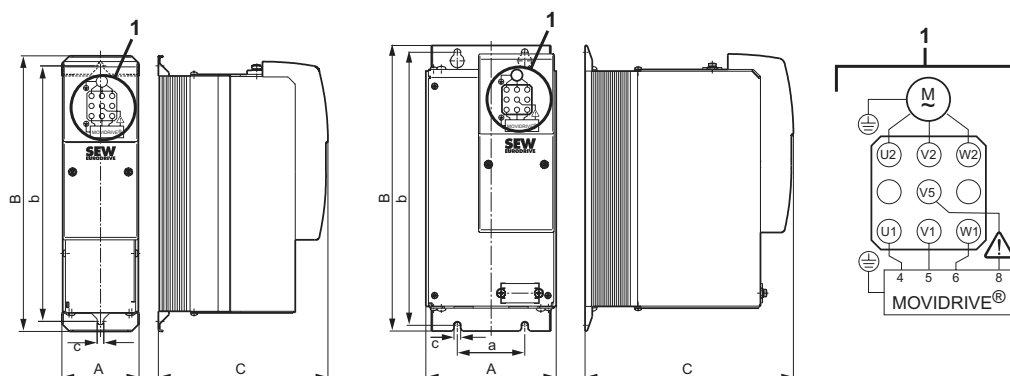
The voltage drop is as follows:

- with 400 V / 50 Hz: < 6.5 %
- with 500 V / 50 Hz: < 4 %
- with 400 V / 60 Hz: < 7.5 %
- with 500 V / 60 Hz: < 5 %

Type		HF008-503	HF015-503	HF022-503	HF030-503	HF040-503	
Part number		826 029 X	826 030 3	826 031 1	826 032 X	826 311 6	
Rated throughput current	400 V	AC 2.5 A	AC 4 A	AC 6 A	AC 8 A	AC 10 A	
	500 V	AC 2 A	AC 3 A	AC 5 A	AC 6 A	AC 8 A	
Power loss		25 W	35 W	55 W	65 W	90 W	
Connections		M4 terminal studs: 0.5 ... 6 mm ² (AWG20 ... 10)					
Weight		3.1 kg (6.8 lbs)	4.4 kg (9.7 lbs)			10.8 kg (23.8 lbs.)	
Suitable for MOVITRAC® B							
100 % I _N		0005/0008	0011/0015	0022	0030	0040	
125 % I _N		0005	0008/011	0015	0022	0030	
Type		HF055-503	HF075-503	HF450-503	HF023-403	HF033-403	HF047-403
Part number		826 312 4	826 313 2	826 948 3	825 784 1	825 785 X	825 786 8
Rated throughput current	400 V	AC 12 A	AC 16 A	AC 90 A	AC 23 A	AC 33 A	AC 47 A
	500 V	AC 10 A	AC 13 A	AC 72 A	AC 19 A	AC 26 A	AC 38 A
Power loss		115 W	135 W	400 W	90 W	120 W	200 W
Connections		10 mm ² (AWG8)		35 mm ² (AWG2)	25 mm ² (AWG4)		
Weight		10.8 kg (23.8 lbs.)		32 kg (70.6 lbs)	15.9 kg (35.0 lbs)	16.5 kg (36.3 lbs)	23.0 kg (50.6 lbs)
Suitable for MOVITRAC® B							
100 % I _N		0055	0075	0370 / 0450	0110	0150 / 0300 ¹⁾	0220
125 % I _N		0040	0055	0300 ... 0450	0075	0110 / 0220 ¹⁾	0150

1) Connect **two HF output filters** together in **parallel** for operation with these units!

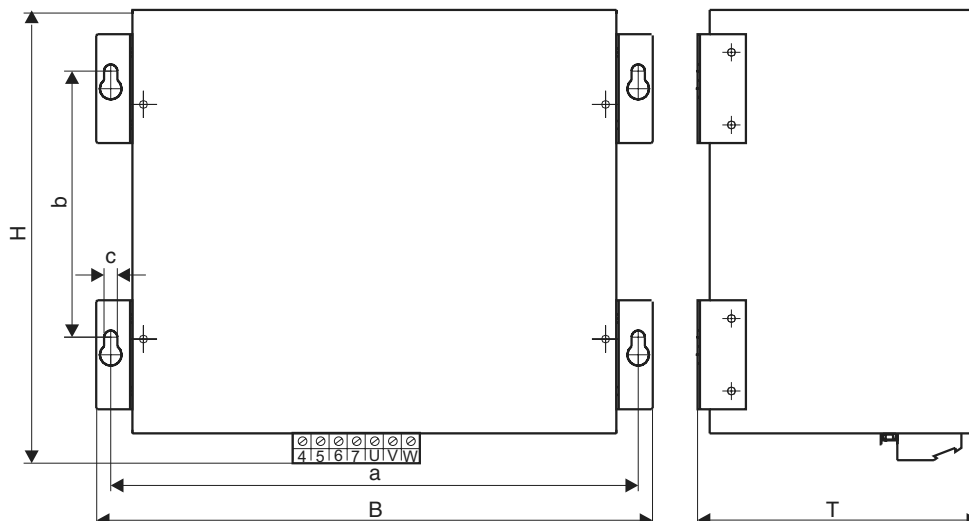
HF...-503 dimension drawing [mm (in)]:



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

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

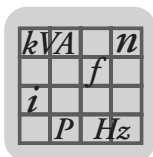
HF450-503 dimension drawing [mm (in)]:



Only the mounting position shown in the dimension drawing is permitted

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

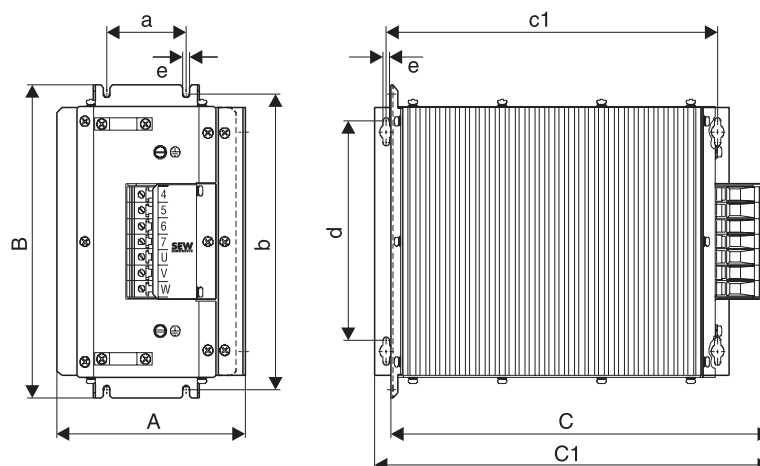
Output filter type	Mounting dimensions		Hole dimension c	Ventilation clearances	
	a	b		Top	below
HF450-503	436 (17.17)	220 (8.66)	8.5 (0.33)	100 (3.94)	100 (3.94)



Technical data

Output filter HF

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



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

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

3.22 Fieldbus gateways

Gateways are available for the following bus systems for connection to fieldbuses (FSC11B is required for connecting the fieldbus gateway):

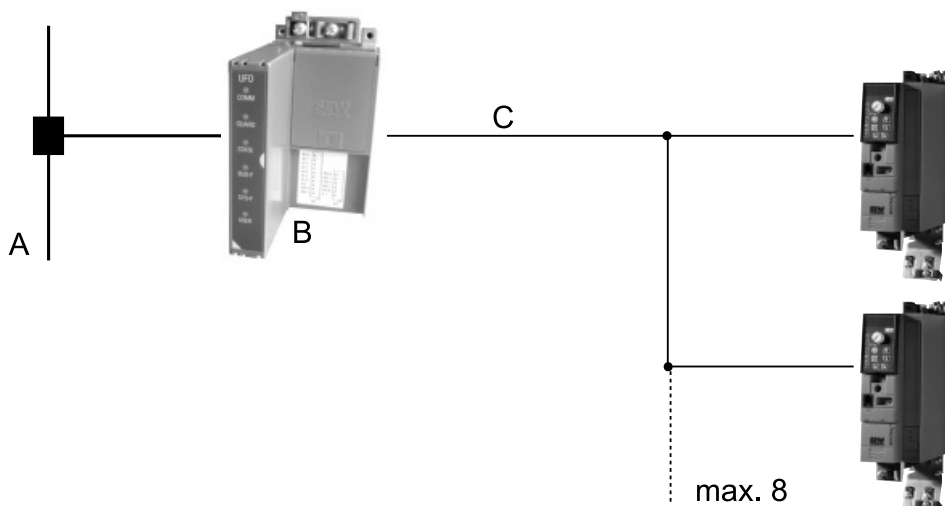
- PROFIBUS (part number: 823 896 0)
- DeviceNet (part number: 823 897 9)
- INTERBUS (part number: 823 898 7)
- CANopen (part number: 824 096 5)



You can control 1 to 8 MOVITRAC® B units with the fieldbus gateways. The controller (PLC or PC) and the MOVITRAC® B frequency inverter exchange process data via the fieldbus. Process data are setpoints, for example:

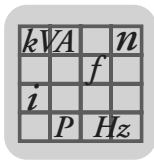
3.22.1 Theory of operation

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



A = Fieldbus
B = Gateway
C = SBus

You can basically connect and operate other SEW units (e.g. MOVIDRIVE®) with the fieldbus via the SBus.



Technical data

PROFIBUS DFP21B fieldbus interface (in preparation)

3.23 PROFIBUS DFP21B fieldbus interface (in preparation)

3.23.1 Description

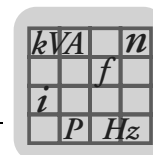
MOVITRAC® can be equipped with a 12 Mbaud fieldbus interface for the PROFIBUS-DP serial bus system. For detailed information, refer to the PROFIBUS documentation package, which can be ordered from SEW-EURODRIVE. This documentation package contains the GSD files and type files for MOVITRAC® in order to help with project planning and to facilitate startup.

PROFIBUS-DP (Decentralized Periphery) is primarily used at the sensor / actuator level where fast response times are required. The principal task of PROFIBUS-DP is to exchange data, e.g. setpoints or binary commands, in rapid cycles between central automation equipment (PROFIBUS master) and decentralized peripheral units (e.g. drive inverters). The DFP21B option supports PROFIBUS-DP and DP-V1. Consequently, MOVITRAC® can be controlled via PLC and PROFIBUS-DP / DP-V1.

You can only connect the DFP21B fieldbus interface via the FSC11B communication front option.

3.23.2 Electronics data

DFP21B option		
	Protocol option	PROFIBUS-DP and DP-V1 acc. to IEC 61158
	Baud rate	Automatic detection of baud rate from 9.6 kbaud to 12 Mbaud
	Connection technology	9-pole sub D connector, pin assignment to IEC 61158
	Bus termination	Not integrated, implement using suitable PROFIBUS connector with terminating resistors that can be activated
	Station address	1 ... 125, adjustable via DIP switches
	Name of the GSD file	SEW_6009.GSD
	DP ident. number	6009 _{hex} (24585 _{dec})
	Max. number of process data	8 x 3 process data



3.24 MOVI-PLC®

3.24.1 Unit types

The MOVI-PLC® basic DHP11B.. controller is available in three designs, which differ according to different POU's from various libraries.

Unit type MOVI-PLC® basic DHP11B..	Part number	Description
DHP11B-T0	1 820 472 4	MOVI-PLC® basic controller
DHP11B-T1	1 820 822 3	Technology type I (enables synchronous operation, electronic cam, etc.)
DHP11B-T2	1 820 823 1	Technology type II (enables handling, etc.)

3.24.2 Description

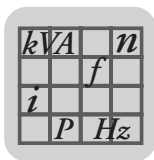
With the MOVI-PLC® basic DHP11B controller, SEW-EURODRIVE's product portfolio for the first time offers a user-programmable controller compliant with the IEC 61131-3 and PLCopen standards.

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

3.24.3 Electronics data

MOVI-PLC® basic DHP11B electronics data:

	Status displays	LEDs for voltage supply of the I/O, firmware, program, PROFIBUS, system buses
	Fieldbus	- PROFIBUS DP and DPV1 acc. to IEC 61158 - Automatic detection of baud rate from 9.6 kbaud to 12 Mbaud - Bus connection implemented 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) for control of 12 inverters and CANopen I/O modules - CAN layer 2 (SCOM cyclic, acyclic) or via the SEW-MOVILINK® protocol. - Baud rate: 125 kBaud ... 1 MBaud - External bus termination - Address range: 0 ... 127
	Engineering	Via RS-485, PROFIBUS and the system buses
	Panel operation	Via RS-485 and CAN 2 (in preparation)
	Connection technology	- PROFIBUS: 9-pole sub D connector according to IEC 61158 - System buses and I/O: plug-in terminals - RS-485: RJ10
	Binary inputs	
	Memory	- Program: 512 kByte - Data: 128 kByte 24 kByte
	Tools for startup	MOVITOOLS® MotionStudio with integrated PLC editor (Programming languages IL, SD, LD, FBP, CFC, SFC; libraries to optimize control of the inverters).



4 Parameters

As a rule, you only set the parameters during startup and if servicing is required. You can set the MOVITRAC® B parameters in various ways:

- With the keypad
- Using the MOVITOOLS® MotionStudio programs on a PC via the RS-485 interface
- Copying the parameters with the keypad

If you set the parameters other than the factory setting: Enter changes in the parameter list in the "Startup" section.

4.1 Explanation of the parameters

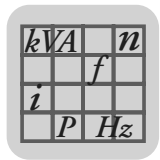
If a choice is offered, the factory setting is indicated in **bold**.

The parameters for the motor startup are described in the section "Startup with the FBG keypad" (see page 143).

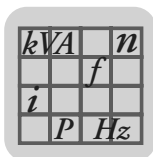
The parameters can be selected at the FBG11B keypad as follows.

-  Choice in short or long menu
-  Choice in short menu
-  Selection via symbol on keypad
-  Select in the FBG motor startup

No.	FBG	Name	Description
0__		Display values	
00_		Process values	
000		Speed (signed) [rpm]	Resolution 1 rpm. The displayed speed is the calculated actual speed.
002		Frequency (signed) [Hz]	Output frequency of the inverter.
004		Output current (amount) [% I _N]	Apparent current in the range 0 ... 200 % of the rated unit current.
005		Active current (signed) [% I]	Active current in the range 0... 200 % of the rated unit current. The display value is positive when torque is in positive sense of rotation; negative when torque is in negative sense of rotation.
008		DC link voltage [V]	DC link voltage.
009		Output current [A]	Apparent current at the inverter output, displayed in AC A.
01_		Status displays	
010		Inverter status	Status of the unit output stage: • INHIBITED • ENABLED



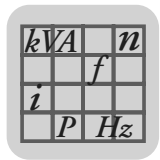
No.	FBG	Name	Description
011		Operating status	The following operating statuses are available: • 24 V OPERATION • CONTROLLER INHIBIT • NO ENABLE • CURRENT AT STANDSTILL • ENABLE • FACTORY SETTING • ERROR
012		Error status	Error number and error in plain text.
013		Current parameter set	Parameter set 1 or 2.
014		Heat sink temperature [°C]	Heat sink temperature of the inverter.
02_		Analog setpoints	
020		Analog input AI1 [V]	Voltage 0 ... + 10 V at analog input AI1. When S11 = ON and P112 AI1 operating mode: • = NMAX, 0 ... 20 mA: Display 0 ... 5 V = 0 ... 20 mA • = NMAX, 4 ... 20 mA: Display 1 ... 5 V = 4 ... 20 mA
03_		Binary inputs	
030		Binary input DI00	Status of binary input DI00 (Error reset = factory setting)
031		Binary input DI01	Status of binary input DI01 (CW/STOP= fixed assignment)
032		Binary input DI02	Status of binary input DI02 (CCW/STOP = factory setting)
033		Binary input DI03	Status of binary input DI03 (ENABLE = factory setting)
034		Binary input DI04	Status of binary input DI04 (n11/n21 = factory setting)
035		Binary input DI05	Status of binary input DI05 (n12/n22 = factory setting)
039		Binary inputs DI00 ... DI05	Collective display of binary inputs.
05_		Binary outputs	
051		Binary output DO01	Status of binary output DO01 (/FAULT = factory setting)
052		Binary output DO02	Status of binary output DO02 (BRAKE RELEASED = factory setting)
053		Binary output DO03	Status of binary output DO03 (READY FOR OPERATION = factory setting)
059		Binary outputs DO01 ... DO03	Collective display of binary outputs.
07_		Unit data	
070		Unit type	The unit type is displayed, e.g. MC07B0008-2B1
071		Rated output current [A]	The rated unit current is displayed in [A]
076		Firmware basic unit	Part number and firmware version
08_		Error memory	
080 ... 084		Error t-0 ... Error t-4 (keypad: error t-0 only)	The unit saves the following information when an error occurs. MOVITOOLS® MotionStudio can display this information if required: • P036/P053 Status of binary inputs / binary outputs • P013 Current parameter set • P011 Operating status of the inverter • P010 Inverter status • P014 Heat sink temperature • P000 Speed • P004 Output current • P005 Active current • Unit utilization • P008 DC link voltage



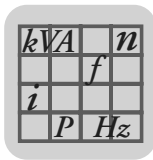
Parameters

Explanation of the parameters

No.	FBG	Name	Description
09_		Bus diagnostics	
094	A-Z ↔	PO 1 Setpoint [hex]	Process data output word 1, setpoint
095	A-Z ↔	PO 2 Setpoint [hex]	Process data output word 2, setpoint
096	A-Z ↔	PO 3 Setpoint [hex]	Process data output word 3, setpoint
097		PI 1 Actual value [hex]	Process data input word 1, actual value
098		PI 2 Actual value [hex]	Process data input word 2, actual value
099		PI 3 Actual value [hex]	Process data input word 3, actual value
1_		Setpoints / ramp generators	
10_		Setpoint selection	
100	abc ↔	Setpoint source	0 / BIPOL./FIX.SETPT The setpoint is provided by the analog input or the fixed setpoints. The unit processes the fixed setpoints according to their value. The speed is limited by the maximum set speed P302 / P312 for an open circuit. 5 ... 10 V setpoint results in CW rotation, 0 ... 5 V setpoint results in CCW rotation. You can not use the analog input AI1 for this operating mode as a current input. 1 / UNIPOL./FIX.SETPT The setpoint is provided by the analog input or the fixed setpoints. The unit processes the fixed setpoints according to their value. The binary inputs specify the direction of rotation. 2 / RS-485 The setpoint is provided by the RS-485 interface. The sign of the setpoint determines the direction of rotation. 4 / MOTOR POTENTIOMETER Set the setpoint using appropriately programmed terminals <i>Motor pot. up</i> and <i>Motor pot. down</i>. The motor potentiometer is a virtual potentiometer that does not correspond to the setpoint potentiometer on the unit. 6 / FIX.SETPT + AI1 The setpoint is calculated by adding together the selected fixed setpoint and analog input AI1. The binary inputs specify the direction of rotation. Furthermore, <i>P112 AI1</i> operating mode applies. 7 / FIX.SETPT * AI1 The value at the analog input AI1 serves as an evaluation factor for the selected fixed setpoint (0 ... 10 V = 0 ... 100 %). If no fixed setpoint is selected, $n_{\min}$ applies. The binary inputs specify the direction of rotation. 10 / SBus The system bus specifies the setpoint. The sign of the setpoint determines the direction of rotation.



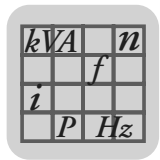
No.	FBG	Name	Description																		
100		Setpoint source	11 / Frequency input The frequency at binary input DI04 specifies the setpoint. The value is set using parameter <i>P102 Frequency scaling</i>. You can influence the value with <i>P110 AI1 scaling</i>. The following parameters are included in the scaling if the PI controller is activated: • <i>P254 PI actual value scaling</i> • <i>P255 PI actual value offset</i> The pulse duty factor (pulse width of the high and low signal) should be about 1 : 1. The factor determines the rising edge and the falling edge of the input signal. Use P102 Frequency scaling to determine at which input frequency the system setpoint 100 % is reached. The reference of the system setpoint is set via P112 AI1 Operating mode. The direction of rotation is set via the binary inputs CW/STOP and CCW/STOP. <table><tr><th>Frequency scaling</th><th>Minimum response time (delay)</th><th>Resolution</th></tr><tr><td>25 ... 65 kHz</td><td>20 ms</td><td>Frequency input</td></tr><tr><td>12.5 ... 24.99 kHz</td><td>40 ms</td><td>50 Hz</td></tr><tr><td>10 ... 12.49 kHz</td><td>60 ms</td><td>25 Hz</td></tr><tr><td>1 ... 9.99 kHz</td><td>500 ms</td><td>16.7 Hz</td></tr><tr><td></td><td></td><td>2 Hz</td></tr></table> Setpoint cascade P302: Maximum speed in rpm P110: Gain 0.1 ... 1 ... 10 P102: Frequency scaling 1 ... 120 kHz P112: Operating mode setpoint Example: A setpoint generator with the value range 1 ... 50 kHz is to set the motor speed of 30...1500 rpm. Set the following parameters for this: • P102 Frequency scaling: 50 kHz • P112 Operating mode setpoint: 3000 rpm • P110 Setpoint scaling P110: 0.5	Frequency scaling	Minimum response time (delay)	Resolution	25 ... 65 kHz	20 ms	Frequency input	12.5 ... 24.99 kHz	40 ms	50 Hz	10 ... 12.49 kHz	60 ms	25 Hz	1 ... 9.99 kHz	500 ms	16.7 Hz			2 Hz
Frequency scaling	Minimum response time (delay)	Resolution																			
25 ... 65 kHz	20 ms	Frequency input																			
12.5 ... 24.99 kHz	40 ms	50 Hz																			
10 ... 12.49 kHz	60 ms	25 Hz																			
1 ... 9.99 kHz	500 ms	16.7 Hz																			
		2 Hz																			
101		Control signal source	0 / TERMINALS The binary inputs determine the control. 1 / RS-485 The RS-485 interface and the binary inputs determine the control. 3 / SBus The system bus and the binary inputs determine the control. 4 / 3-WIRE CONTROL The 3-wire control principle determines the control. In this case, the enable and direction of rotation signals will respond edge-controlled. • Connect start key CW with contact to binary input "CW/Stop." • Connect start key CCW with contact to binary input "CCW/Stop." • Connect stop key with normally open input "Enable/Stop." If you connect CW and CCW at the same time, the drive decelerates with downwards ramp P131 / P141. If the <i>3-WIRE-CONTROL</i> control signal source is active and the drive is started by a start edge: You can stop the drive using the STOP button when the RUN/STOP buttons are enabled. Then you can restart the drive with the RUN button without another start edge being required. The unit stores a start edge if you stop the drive with the stop button. If you then press the RUN key, the unit will enable the drive immediately.																		



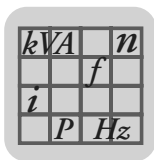
Parameters

Explanation of the parameters

No.	FBG	Name	Description
		Control source 3-WIRE CONTROL	X12: X10: X12:2 = CW/Stop X12:3 = CCW/Stop X12:4 = Enable/Stop X10 = Setpoint input AI f_A = Output frequency f_0 = Start/stop frequency CW = Clockwise CCW = Counterclockwise t11 [1] = t11 UP t11 [2] = t11 DOWN t13 = Stop ramp
102	A-Z ↔	Frequency scaling	Setting range 0.1 ... 10 ... 120.00 [kHz]
11_		Analog input 1 (0 ... +10 V)	
110	A-Z ↔	AI1 scaling	Setting range: 0.1 ... 1 ... +10. Is used to define the slope of the setpoint characteristic curve. If you set the scaling to the value "1", then the input voltage $V = 10\text{ V}$ at the analog input corresponds to the operating mode of the analog input (P112). This is the speed 3000 rpm or the set maximum speed (P302). <i>Slope of the setpoint characteristic curve</i> With a unipolar setpoint source, you can only use the 1st quadrant. Negative setpoint entries then create the setpoint zero. P110 AI1 scaling has no effect if you set the current input operating mode. You set the current input operating mode by setting P112 AI1 to NMAX, 0-20 mA or NMAX, 4-20 mA.



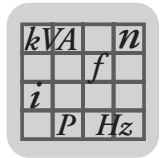
No.	FBG	Name	Description
112	abc ↔	AI1 operating mode Safety against open circuit is only available in operating mode 4 ... 20 mA.	0 / 3000 1/min (0 ... 10 V) Voltage input with reference 3000 rpm (0 ... 10 V = 0 ... 3000 rpm). You can adapt the characteristic curve with <i>AI1 scaling</i>. Switch S11 = V 1 / N-MAX (0 ... 10 V) Voltage input with reference n_{max} (0 ... 10 V = 0 ... n_{max}). You can adapt the characteristic curve with <i>AI1 scaling</i>. Switch S11 = V. 2 / U-Off., N-MAX Voltage input with reference n_{max}. The characteristic curve can be adapted with <i>P113 AI1 voltage offset</i>. <i>P110 AI1 scaling</i> and <i>P114 AI1 speed offset</i> are ineffective. 5 / N-MAX (0 ... 20 mA) Current input 0 ... 20 mA = 0 ... n_{max}. <i>P110 AI1 scaling</i> is ineffective. Switch S11 = mA. 6 / N-MAX (4 ... 20 mA) Current input 4 ... 20 mA = 0 ... n_{max}. <i>P110 AI1 scaling</i> is ineffective. Switch S11 = mA.
113	A-Z ↔	AI1 Setpoint voltage offset	Setting range: -10 V ... 0 ... +10 V The point where the setpoint characteristic passes through zero can be moved along the V_E axis.
12_		Setpoint generator of the FBG11 keypad	
121	abc ↔	Addition setpoint generator of the keypad	0 / OFF The unit does not take into account the value from the setpoint generator of the FBG11 keypad. 1 / ON The value from the setpoint generator of the FBG11 keypad is added to any set setpoint source bipolar / fixed setpoint, unipolar / fixed setpoint, RS-485 / fixed setpoint, frequency input / fixed setpoint or SBus / fixed setpoint. The addition also affects fixed setpoints. 2 / ON (WITHOUT FSP) The value from the setpoint generator of the FBG11 keypad is added to any set setpoint source bipolar / fixed setpoint, unipolar / fixed setpoint, RS-485 / fixed setpoint, frequency input / fixed setpoint or SBus / fixed setpoint. The addition does not act on fixed setpoints.



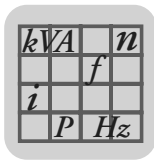
Parameters

Explanation of the parameters

No.	FBG	Name	Description
122		FBG manual operation	Setting the setpoint with the setpoint generator of the FBG11 keypad in FBG manual mode. 0 / UNIPOL. CW Adjustable speed: 0 ... + $n_{\max}$ 1 / UNIPOL. CCW Adjustable speed: 0 ... - $n_{\max}$ 2 / BIPOLAR CW + CCW Adjustable speed: - $n_{\max}$... + $n_{\max}$
13_ / 14_		Speed ramps 1 / 2	
The ramp times refer to a setpoint change of $\Delta n = 3000$ rpm. Ramps t11 / t21 up and t11 / t21 down are effective when the setpoint is changed. The stop ramp t13 / t23 is in effect when the enable is withdrawn by pressing the STOP/RESET key or via the terminals.			
130 / 140		Ramp t11 / t21up	Setting range 0 ... 2 ... 2000 [s]; Acceleration ramp
131 / 141		Ramp t11 / t21 down	Setting range 0 ... 2 ... 2000 [s]; Deceleration ramp
136 / 146		Stop ramp t13 / t23 up = down	Setting range 0 ... 2 ... 20 [s]; Stop ramp when switching to the NO ENABLE operating status
15_		Motor Potentiometer (see P100 Setpoint source) The ramp times refer to a setpoint change of $\Delta n = 3000$ rpm.	
150		Ramp t3 (motor potentiometer)	Setting range 0.2 ... 20 ... 50 [s] The ramp takes effect when the <i>Motor pot. up</i> and <i>Motor pot. down</i> terminal functions are used.
152		Save last setpoint	off / OFF The inverter starts with $n_{\min}$: - After power off and on - After revoking the enable You must set <i>P152 Save last setpoint</i> = OFF if you are using the motor potentiometer for continuous speed control. Otherwise, after approx. 100,000 storage operations, the error message F25 EEPROM will appear. Store only after setpoint change. on / ON The inverter starts with the last motor potentiometer setpoint to have been set: - After power off and on - After revoking the enable
16_ / 17_		Fixed setpoints 1 / 2	
You can activate the fixed setpoints via the binary inputs DI02 ... DI05 with the arguments n11/n21 / n12/n22 and FIXED SETP. CHANGE activated! (parameter 60_) You activate the fixed setpoints n13/n23 by assigning the functions n11/n21 and n12/n22 to two binary inputs and applying a "1" signal to the two inputs.			
160 / 170		Internal setpoint n11 / n21 PI controller activated	Setting range -5000 ... 150 ... 5000 [rpm] Setting range 0 ... 3 ... 100 [%] (see sec. "Project planning / PI controller")
161 / 171		Internal setpoint n12 / n22 PI controller activated	Setting range -5000 ... 750 ... 5000 [rpm] Setting range 0 ... 15 ... 100 [%] (see sec. "Project planning / PI controller")
162 / 172		Internal setpoint n13 / n23 PI controller activated	Setting range -5000 ... 1500 ... 5000 [rpm] Setting range 0 ... 30 ... 100 [%] (see sec. "Project planning / PI controller")



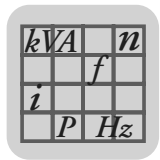
No.	FBG	Name	Description
2_		Controller parameters	
25_		PI controller (see sec. "Project planning / PI controller" for explanations of the parameters)	
250		PI controller	0 / OFF PI controller deactivated. 1 / ON STANDARD PI controller switched on normally. 2 / ON INVERTED PI controller switched on inverted.
251		P-gain	Setting range 0 ... 1 ... 64
252		I-component	Setting range 0 ... 1 ... 2000 [s]
253		PI actual value mode	0 / 0 ... 10 V 1 / 0 ... 10 V 5 / 0 ... 20 mA 6 / 4 ... 20 mA
254		PI actual value scaling	0.1 ... 1.0 ... 10.0
255		PI actual value offset	0.0 ... 100.0 [%]
3_		Motor parameters	
Use this parameter group to adjust the inverter to the motor.			
30_ / 31_		Limits 1 / 2	
300 / 310		Start/stop speed 1 / 2	Setting range 0 ... 60 ... 150 [rpm] 0.5 x the rated slip of the connected motor is set for all operating modes except VFC & hoist. The rated slip of the connected motor is set for startup with the operating modes VFC & hoist. This entry defines the smallest speed request, which the inverter sends to the motor when enabled. The transition to the speed determined in the setpoint selection is made using the active acceleration ramp. When a stop command is performed, this setting also defines the slowest speed at which the motor energization is switched off or at which post-magnetization takes effect and the brake is applied.
301 / 311		Minimum speed 1 / 2	Setting range 0 ... 15 ... 5500 [rpm] The speed value which lower limit must not be exceeded even when zero is selected as the setpoint. The minimum speed also applies when $n_{min} < n_{start/stop}$ has been set. Important: - The slowest speed is 15 rpm when the hoist function is active, even if n_{min} has been set to a lower value. - To enable the drive to move clear of the limit switches even at low speeds, n_{min} is not active for the hardware limit switch with which the drive has come into contact.
302 / 312		Maximum speed 1 / 2	Setting range 0 ... 1500 ... 5500 [rpm] No setpoint greater than the value set here can be entered. If you set $n_{min} > n_{max}$, then the value set in n_{max} applies to the minimum speed and the maximum speed. In the VFC and VFC + DC BRAKING operating mode, you may enter the following maximum speed values depending on the number of poles: 2-pole: max. 5500 rpm 4-pole: max. 4000 rpm 6-pole: max. 2600 rpm 8-pole: max. 2000 rpm Error 08 <i>Speed monitoring</i> may appear if you enter higher values. The unit automatically sets the maximum speed to the transition speed if you perform startup.
303 / 313		Current limit 1 / 2	Setting range 0 ... 150 [% I_N] The internal current limitation refers to the apparent current, i.e. the output current of the inverter. The inverter automatically decreases the current limit internally in the field weakening range. In this way, the inverter implements a stall protection for the motor. A current limit lower than the rated motor current is ignored when the hoist function is activated.



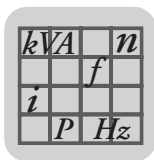
Parameters

Explanation of the parameters

No.	FBG	Name	Description
32_ / 33_		Motor adjustment 1 / 2	
Use function <i>P320 / P330 Automatic adjustment</i> for single-motor operation only. You can use this function for all motors and control modes. The inverter measures the motor during premagnetization and sets the parameters <i>P322 / P332 IxR adjustment</i> and <i>P321 / P331 Boost</i>. The inverter thereby determines a basic setting which is suitable for many applications. The values are saved in volatile memory. The motor is not calibrated if: • <i>P320 / P330 Automatic adjustment</i> = OFF. • VFC & Flying start operating mode is active. • The set Premagnetization time is more than 30 ms shorter than the Premagnetization time calculated during startup. If you deactivate automatic adjustment, the values measured last will be not be saved in volatile memory. The factory setting of parameters 321 ... 324 / 331 ... 334 depends on the motor.			
320 / 330		Auto adjustment 1 / 2	off / OFF No automatic adjustment: The inverter does not calibrate the motor. on / ON Automatic adjustment: The inverter measures the motor when changing to the ENABLE operating mode.
321 / 331		Boost 1 / 2	Setting range 0 ... 100 [%] Manual setting is usually not required. In exceptional cases, manual setting may be necessary to increase the breakaway torque. In this case set to max. 10 %.
322 / 332		IxR adjustment 1 / 2	Setting range 0 ... 100 [%] The inverter sets the value automatically when <i>P320 / P330 Automatic adjustment</i> = ON. Manual alterations to individual controller parameters are reserved for optimization by specialists.
323 / 333		Premagnetization time 1 / 2	Setting range 0 ... 2 [s] Premagnetization builds a magnetic field in the motor when you enable the inverter.
324 / 334		Slip compensation 1 / 2	Setting range 0 ... 50 [rpm] Slip compensation increases the speed accuracy of the motor. Enter the rated slip of the connected motor as a manual entry. Do not enter a value more than 20 % different from the rated slip in order to compensate for fluctuations between various motors. The slip compensation is designed for a ratio smaller than 10 of load moment of inertia to motor moment of inertia. If the ratio is larger and the drive vibrates, then slip compensation must be reduced and even be set to 0 if necessary.
325		No-load damping	on / ON off / OFF No-load damping is used when the motor tends to be instable under no load conditions.
345 / 346		I _N -UL monitoring 1 / 2	Setting range 0.1 ... 500 A The function cannot be deactivated. The factory setting depends on the rated power of the MOVITRAC® B and will be added to the rated current of the SEW motor with the same rating. At 150 % rated motor current, the inverter switches off after 5 minutes. At 500 % rated motor current, the inverter switches off after 20 seconds.



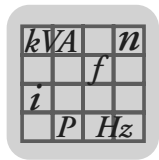
No.	FBG	Name	Description
4_		Reference signals	
The following reference values are used for recording and signaling certain operating states. All signals of parameter group 4_ can be output via binary outputs. The signals are valid if the inverter has signaled <i>Ready</i> after switch-on and there is no error display.			
40_		Speed reference signal	The inverter issues the signal "1" at P403 if the speed is less than or greater than the set reference speed. <i>Speed reference message</i>
400	A-Z ↔	Speed reference value	Setting range 0 ... 750 ... 5000 [rpm]
401	A-Z ↔	Hysteresis	Setting range 0 ... 100 ... 500 [rpm]
402	A-Z ↔	Delay time	Setting range 0 ... 1 ... 9 [s]
403	A-Z ↔	Signal = "1" if:	$0 / n < n_{ref}$ $1 / n > n_{ref}$
45_		PI controller reference signal (see sec. "Project planning / PI controller / Reference signal")	
These parameters determine whether and how the PI reference signal responds			
450	A-Z ↔	PI actual value reference	0.0 ... 100.0 [%]
451	A-Z ↔	Signal = "1" if:	$0 / \text{PI actual value} < \text{PI reference}$ $1 / \text{PI actual value} > \text{PI reference}$
5_		Monitoring functions	
50_		Speed monitoring 1 / 2	
The drive reaches the speed specified by the setpoint only with adequate torque. If the inverter reaches <i>P303 Current limit</i> , this is because it did not attain the required speed. Speed monitoring is triggered if the inverter exceeds the current limit for longer than set in <i>P501 Delay time</i> .			
500 / 502	A-Z ↔	Speed monitoring 1 / 2	off / OFF on / MOT&GENERATOR function of speed monitoring in motor and regenerative operation of the motor
501 / 503	A-Z ↔	Delay time 1 / 2	Setting range 0 ... 1 ... 10 [s] The set current limit can be reached briefly during acceleration, deceleration, or load peaks. You prevent the speed monitoring from responding too sensitively by setting the delay time. The monitoring responds when the current limit for the duration of the delay time is reached.



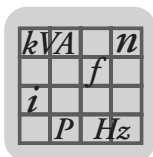
Parameters

Explanation of the parameters

No.	FBG	Name	Description
6__		Terminal assignment	
60_		Binary inputs (DI01 fixed assignment with CW/STOP)	
Effect at		0 signal	1 signal
0: NO FUNCTION:		–	–
1: ENABLE/STOP:		Stop at <i>P136 stop ramp</i>	Enable
2: CW/STOP:		Stop at <i>P131 ramp down</i>	Enable CW
3: CCW/STOP:		Stop at <i>P131 ramp down</i>	Enable CCW
4: n11/n21			
5: n12/n22			
6: FIXED SETP. SELECT:		Fixed setpoints n11/n12/n13	Fixed setpoints n21/n22/n23
7: PARAMETER SET 2		Parameter set 1	Parameter set 2
9: MOTORPOT. UP:		–	Increase setpoint
10: MOTORPOT. DOWN:		–	Decrease setpoint
11: /EXT. ERROR:		External error	–
12: ERROR RESET:		Reset on positive edge 0 to 1	
20: ACCEPT SETPOINT:		Do not take over	Accept setpoint
26: TF SIGNAL (DI05 only):		Overtemperature in motor	No signal
30: /CONTR. INHIBIT:		Inhibited	Enable
Fixed setpoints			
n11/n21 = 0 and n12/n22 = 0:		External setpoints only	
n11/n21 = 1 and n12/n22 = 0:		n11/n21	
n11/n21 = 0 and n12/n22 = 1:		n12/n22	
n11/n21 = 1 and n12/n22 = 1:		n13/n23	
601		Binary input DI02	Factory setting: CCW/STOP
602		Binary input DI03	Factory setting: ENABLE
603		Binary input DI04	Factory setting: n11/n21
604		Binary input DI05	Factory setting: n12/n22
608		Binary input DI00	Factory setting: ERROR RESET
62_		Binary outputs (only use binary output DO02 for controlling the brake rectifier)	
Effect at		0 signal	1 signal
0: NO FUNCTION:		–	–
1: /FAULT:		Collective fault signal	–
2: READY FOR OPERATION:		Not ready for operation	Ready for operation
3: OUTPUT STAGE ON:		Unit inhibited	Unit enabled and motor energized
4: ROTATING FIELD ON:		No rotating field	Rotating field
5: BRAKE RELEASED:		Brake applied	Brake released
9: SPEED REFERENCE:		$n > n_{ref} / n < n_{ref}$ (P403)	$n < n_{ref} / n > n_{ref}$ (P403)
11: SP/ACT.VAL.COMP.		$n \neq n_{set}$	$n = n_{set}$
23: PI ACTUAL VALUE REF.:		–	PI controller actual value has exceeded the set threshold
620		Binary output DO01	Factory setting: /FAULT
621		Binary output DO02	Factory setting: BRAKE RELEASED
622		Binary output DO03	Factory setting: WITHOUT FUNCTION



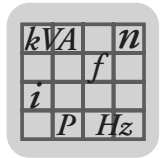
No.	FBG	Name	Description
7__		Control functions	
All settings with regard to the fundamental control properties of the inverter are defined within parameter group 7__. The parameter group comprises functions which the inverter automatically executes when they are activated.			
70__		Operating mode 1 / 2	
This parameter is used to set the basic operating mode of the inverter. Setting at the keypad.			
VFC / V/f CHARACTER: Default setting for asynchronous motors. Suitable for general applications, such as conveyor belts, trolleys, and hoists with counterweight.			
VFC & HOIST: The hoist function automatically provides all functions necessary for operating an unbalanced hoist. In particular for safety reasons, activate monitoring functions that can prevent the drive from starting. Monitoring functions: • Monitor the output current during the premagnetization phase • Avoid sag when the brake is released The unit detects the following incorrect configurations and displays them with the following errors: • 2 or 3-phase motor phase interruption: F82 = Output open • Premagnetization time too short or incorrect motor/inverter combination: F81 = Error start condition • Motor phase failure due to active speed monitoring P500/501: F08 = Error n-monitoring Important: • The control must be designed so that the direction of rotation of the drive can only be changed when it is at a standstill. • SEW-EURODRIVE strongly recommends activating speed monitoring. • Prerequisites for correct performance of the hoist function: motor brake controlled by the inverter.			
VFC & DC BRAK. / V/f CHARACTERISTIC & DC BRAKING: DC braking means the asynchronous motor brakes by using current injection. The motor brakes without braking resistor on the inverter. The following figure shows the braking torque profile when the braking current is the same as the motor rated current. M/M_N 1 0 0 5 Hz f_N f During braking, the inverter injects a constant current with a rotating-field frequency of 5 Hz. The braking torque equals 0 at a standstill. A greater braking torque acts at a slower speed; the braking torque drops as the speed increases. The braking time and consequently the duration of the braking current depends on the load connected to the motor. DC braking stops at a rotating-field frequency of 5 Hz. The motor stops along the stop ramp. Motor rated current is used for the current injection. In all cases, the inverter limits the current to max. 125% I_N. See "Brake function" for information about the brake control system.			
Important: It is not possible to enable a directed stop or to observe a certain ramp using DC braking. The main purpose of DC braking is to drastically reduce the time the motors need for coasting to a halt. The following graphic shows the braking profile. n n_1 5 Hz [1] "1" "0" t n_1 = Set speed [1] = Enable t_{13} = Stop ramp t_B = Braking phase			



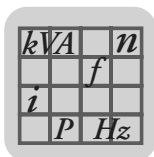
Parameters

Explanation of the parameters

No.	FBG	Name	Description
VFC & FLYING START (in preparation): The flying start function lets you synchronize the inverter to an already running motor. In particular used with drives that are not braked actively, which run on for a long time or which are turned by a flowing medium, e.g. pumps and fans. The maximum flying start time is approx. 200 ms. P320 Automatic adjustment is deactivated in the FLYING START operating mode. It is important that the IxR value P322 (stator resistance) is set correctly to ensure that the flying start function is performed properly. Startup of an SEW motor: The IxR value is set for an SEW motor at operating temperature. This value has to be reduced if flying start takes place with a cold motor. The IxR value is measured at startup when a non-SEW motor is started up with MOVITOOLS®. [1] "1" "0" [1] "1" "0" n_1 = Set speed n_M = Motor speed [1] = Enable The flying start function does not function if an output filter is connected to the inverter. Important: Do not use the flying start function in hoist applications.			
700 / 701		Operating mode 1 / 2	0 / VFC (field-oriented voltage flux control mode) 2 / VFC & HOIST (field-oriented control mode for hoist applications, can only be set in MOVITOOLS®) 3 / VFC & DC BRAK. (field-oriented control mode with DC braking) 4 / VFC & FLYING START (field-oriented control mode with flying start function) (in preparation) 21 / V/f Character (voltage / frequency controlled mode) 22 / V/f CHARACTERISTIC & DC BRAKING (voltage / frequency controlled mode with DC braking)
71_			With activated standstill current function, the inverter injects a current in the motor at standstill. This allows the inverter to fulfill the following functions: - When the ambient temperature of the motor is low, the standstill current prevents the risk of condensation and freezing (in particular of the disc brake). Set the amount of current in such a way that the motor does not overheat. Recommendation: The motor housing should be hand-hot. - With activated standstill current, you can start the motor without Premagnetization. Recommendation: Set to 45 ... 50 % with hoists. You can deactivate the standstill current function by P710 = 0. Set the standstill current in % of the rated motor current. The standstill current cannot exceed the current limit (P303). You can switch off the standstill current with /CONTROLLER INHIBIT = 0. When the standstill current function is activated, the output stage remains enabled even in the "No enable" status to inject the motor standstill current. The standstill current is not switched off by pressing the stop/reset key. You have to set the function of an input terminal to controller inhibit to activate the standstill current function. Else the output stage will be energized directly.
710 / 711		Standstill current function 1 / 2	0 ... 50% I_{Mot}



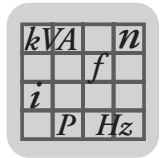
No.	FBG	Name	Description
72_			
Use the <i>P720 / P723 Setpoint stop</i> function to enable the inverter automatically depending on the main setpoint. The inverter is enabled with all the necessary functions, such as Premagnetization and brake control. It is important that you also enable the drive via terminals.			
720 / 723	A-Z ↔	Setpoint stop function 1 / 2	off / OFF on / ON
721 / 724	A-Z ↔	Stop setpoint 1 / 2	0 ... 30 ... 500 [rpm]
722 / 725	A-Z ↔	Start offset 1 / 2	0 ... 30 ... 500 [rpm]
73_		MOVITRAC® B inverters are capable of controlling a brake installed on the motor. The brake function acts on the binary output which has the assignment of the "/BRAKE" function (24 V = brake released). Use DO02 for the brake control system. The brake is always applied when /CONTROL.INHIBIT = 0.	
731 / 734	A-Z ↔	Brake release time 1 / 2	Setting range 0 ... 2 [s] This parameter determines how long the motor will remain at a standstill after expiry of the premagnetization time and how much time the brake has to release.
732 / 735	A-Z ↔	Brake application time 1 / 2	Setting range 0 ... 2 [s] Serves to set the time required for application of the mechanical brake. This parameter prevents a sagging of the drive especially in hoists.
76_		Manual operation	
760	A-Z ↔	Lockout run/stop keys (see Startup / External setpoint selection)	off / OFF (RUN/STOP keys are activated and can be used for starting and stopping the motor) on / ON (RUN/STOP keys are locked and therefore do not function)



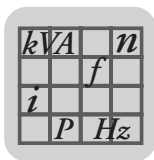
Parameters

Explanation of the parameters

No.	FBG	Name	Description
8__		Unit functions	
80_		Setup	
800		Short menu (with keypad only)	long short Use P800 to switch from the factory setting short menu to the detailed parameter menu.
You can use P802 to reset the factory settings stored in the EPROM for almost all parameters. You can also reset the unit to its initial delivery condition. Selecting DELIVERY STATE also resets the parameters listed above. The statistical data must be reset separately using <i>P804 Reset statistic data</i>. Setting the parameter to YES will restore the factory settings. Set appears on the display while the factory settings are being restored. The previous operating status of the inverter appears on the display after the factory settings have been restored. P802 automatically reverts to NO. Activating the factory setting causes almost all parameter values to be overwritten. Store the set values using MOVITOOLS® before you activate the factory setting. Once the factory setting function has been used, you must adapt the parameter values and terminal assignments in accordance with the requirements.			
802		Factory setting	no (do not restore factory setting) Hrs (restore factory settings) All (delivery status)
Setting <i>P803 Parameter lock</i> = ON enables you to prevent any changes to parameters. This does not apply to P840 Manual reset and P803 itself. The parameter lock makes sense, for example, after the MOVITRAC® B settings have been optimized. You can enable parameter changes again by setting <i>P803 Parameter lock</i> = OFF. The parameter lock also affects parameter changes via the RS-485 and SBus interfaces.			
803		Parameter lock	off / OFF (all parameters can be changed) on / ON (You can change P803 and P840 only)
<i>P804 Reset statistic data</i> permits the statistical data stored in the EEPROM (error memory) to be reset. These data are not affected when restoring the factory settings. The parameter automatically reverts to NO after the reset.			
804		Reset statistics data	NO (no reset is performed) ERROR MEMORY (the content of the error memory is reset)
81_		Serial communication – Do not change these parameters while an IPOS program is running.	
810		RS-485 address	Setting range 0 ... 99 P810 sets the address of the MOVITRAC® B for communication via the serial interface. On delivery, the MOVITRAC® B address is always 0. SEW-EURODRIVE recommends not using address 0, in order to prevent data transfer collisions when serial communication is used with several inverters.
811		RS-485 group address	Setting range 100 ... 199
812		RS-485 Remote timeout	Setting range 0 ... 650 [s]
82_		Brake operation 1 / 2	
P820/P821 switches 4-quadrant operation off/on. 4-quadrant operation is possible if a braking resistor is connected to the MOVITRAC® B. P820 / P821 must be set to OFF if there is no braking resistor connected to MOVITRAC® B, which means regenerative operation is not possible. In this operating mode, the MOVITRAC® B unit attempts to extend the deceleration ramp. As a result, the generated power is not too great and the DC link voltage remains below the switch-off threshold. If the regenerative power is too great despite the extended deceleration ramps, then MOVITRAC® B may switch off with the <i>F07 DC link overvoltage</i> error. In this case you have to extend the deceleration ramps manually (P131). Therefore, do not set unrealistic short deceleration ramps! The unit reacts with error message <i>F34 Ramp/timeout</i> if the ramp is set too short and the ramp which can actually be achieved is significantly longer than the set value.			
820 / 821		4-quadrant operation 1 / 2	off / OFF on / ON



No.	FBG	Name	Description
83_		Error responses	
The EXT. FAULT fault can only be triggered when the inverter status is ENABLED. P830 programs the error response that is triggered by input terminal programmed to /EXT. ERROR.			
830		Response /EXT. ERROR	2 / IMM. STOP/FAULT The inverter performs an emergency stop with an error message. The inverter inhibits the output stage and the brake is applied. The inverter revokes the ready signal and sets the programmed error output. A restart is only possible after an error reset has been performed during which the inverter is reinitialized. 4 / STOP/FAULT The inverter brakes the drive using the specified stop ramp (P136). The inverter uses DC braking in 2-quadrant mode. Once the stop speed is reached, the inverter inhibits the output stage and the brake is applied. The error is signaled immediately. The inverter revokes the ready signal and sets the programmed error output. A restart is only possible after an error reset has been performed during which the inverter is reinitialized. 7 / STOP/WARNING The error response corresponds to STOP/FAULT, except the inverter does not revoke the ready signal and the error output is set.
84_		Reset behavior	
840		Manual reset Parameter P840 corresponds to the STOP/RESET key.	YES MOVITRAC® B resets the existing error. P840 automatically reverts to NO after the reset. The motor immediately restarts to the specified setpoint if all required signals are present after the reset has been performed. Activating the manual reset does not have any effect if there is no error present. NO No reset.
86_		Modulation 1 / 2	
P860 / P861 sets the nominal clock frequency at the inverter output. If P862 / P863 is OFF then the clock frequency can vary independently depending on the unit utilization.			
860 / 861		PWM frequency 1 / 2	4 kHz 8 kHz 12 kHz 16 kHz
862 / 863		PWM fix 1 / 2	on / ON (no independent variation of the clock frequency by the inverter) off / OFF (autonomous variation of the switching frequency by the inverter depending on the utilization)
87_		Fieldbus parameter settings (refer to the MOVITRAC® B Communication manual for more information)	
Use P870 ... P872 can be used to determine the content of the process output data word PO1 ... PO3. This definition is necessary so MOVITRAC® B can allocate the appropriate setpoints. The following process output assignments are available: NO FUNCTION: The content of the process output data word is ignored. SPEED: Speed setpoint entry in rpm. MAX. SPEED: Maximum speed (P302). RAMP: Ramp time for setpoint selection (P130 / P131). CONTROL WORD 1: Control signals for start/stop, etc. SPEED [%]: Selection of a speed setpoint in % of P302. PI CTRL SETPOINT [%]: PI controller setpoint			
870		Setpoint description PO1	Factory setting: CONTROL WORD 1
871		Setpoint description PO2	Factory setting: SPEED
872		Setpoint description PO3	Factory setting: NO FUNCTION



Parameters

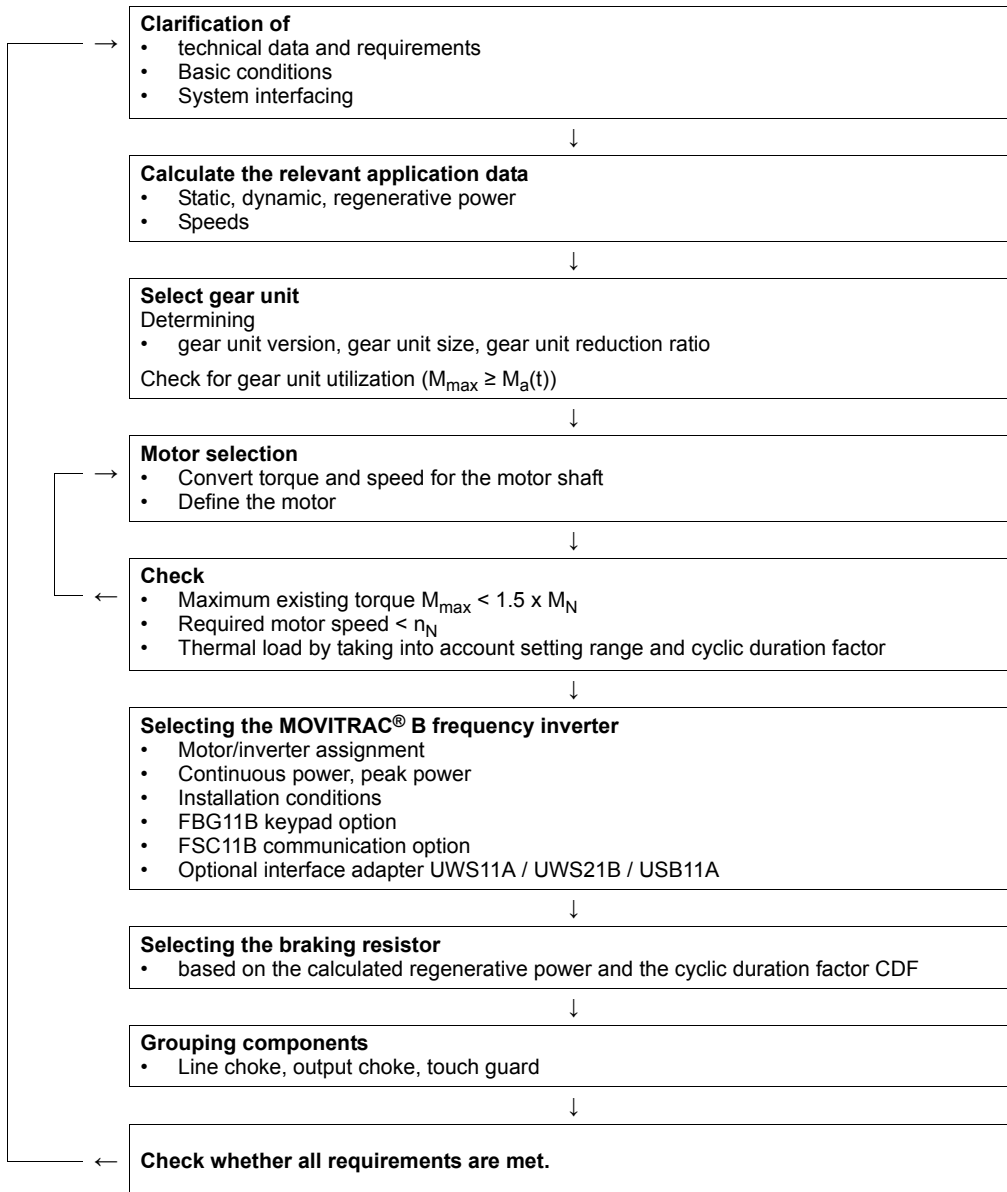
Explanation of the parameters

No.	FBG	Name	Description
Use P873 ... P875 can be used to determine the content of the process input data word PI1 ... PI3. This definition is necessary so MOVITRAC® B can allocate the appropriate actual values. The following process input assignments are available: NO FUNCTION: The content of the process input data word is 0000_{hex} SPEED: Momentary actual speed value in rpm. ACTIVE CURRENT: Momentary active current of the inverter in % of I_N OUTPUT CURRENT: Momentary output current of the inverter in % of I_N STATUS WORD 1: Status information of the inverter. SPEED [%]: Current actual speed value in % of P302. IPOS PI DATA: IPOS Process input data. PI CTRL [%]: Actual values of the PI controller.			
873		Actual value description PI1	Factory setting: STATUS WORD 1
874		Actual value description PI2	Factory setting: SPEED
875		Actual value description PI3	Factory setting: OUTPUT CURRENT
876		PO data enable	OFF The last valid process output data remain in effect. ON The process output data that was last sent from the fieldbus control become effective.
88_			
880		SBus protocol (in preparation)	Setting range SBus MOVILINK / CANopen
881	A-Z ↔	SBus address	Setting range 0 ... 63 P881 sets the system address of the MOVITRAC® B. This address enables the MOVITRAC® B to communicate, for example, with PC, PLC or MOVIDRIVE® via the system bus. On delivery, the MOVITRAC® B address is always 0. SEW-EURODRIVE recommends not using address 0, in order to prevent data transfer collisions when serial communication is used with several inverters.
882		SBus group address	Setting range 0 ... 63 P882 makes it possible to group together several MOVITRAC® B units for communication via the serial interface. All MOVITRAC® B units with the same SBus group address can thus be addressed using a multicast telegram via this address. The data received via the group address are not acknowledged by MOVITRAC® B. For example, the SBus group address makes it possible to send setpoint selections to a group of MOVITRAC® B inverters simultaneously. An inverter with group address 0 is not assigned to a group.
883	A-Z ↔	SBus timeout delay	Setting range 0 ... 650 [s] P883 sets the monitoring time for data transmission via the system bus. MOVITRAC® B performs the error response Stop/Fault if there is no data traffic via the system bus for the period set in P815. No monitoring of data transmission via the system bus takes place when P883 is set to 0.
884	A-Z ↔	SBus baud rate	Use P816 to set the transmission speed of the system bus. 125 / 125 kBaud 250 / 250 kBaud 500 / 500 kBaud 1000 / 1000 kBaud
886		CANopen address (in preparation)	Setting range 1 ... 127 P886 sets the address for serial communication with the SBus.



5 Project planning

5.1 Schematic procedure





5.2 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 30s.
- Horizontal movement: Braking time is less than 12 % of cyclic duration factor CDF and no longer than 15s.

Type MC07B		Braking resistor		Output choke	Line filter
		Horizontal movement	Vertical movement		
230 V 1-phase	0004	BW027-003	BW027-003	HD002	Integrated
	0005	BW027-003	BW027-003	HD002	
	0008	BW027-003	BW027-003	HD002	
	0011	BW027-005	BW039-003	HD002	
	0015	BW039-003	BW027-006	HD002	
	0022	BW027-006	BW027-012	HD002	
400 V 3-phase	0005	BW072-003	BW072-003	HD002	Integrated
	0008	BW072-003	BW072-005	HD002	
	0011	BW072-005	BW072-006	HD002	
	0015	BW100-006	BW072-006	HD002	
	0022	BW100-006	BW168	HD002	
	0030	BW100-006	BW268	HD001	
	0040	BW168	BW268	HD001	
	0055	BW268	BW247	HD001	
	0075	BW147	BW039-050	HD001	
	0110	BW247	BW039-050	HD001	
	0150	BW018-035	BW039-050	HD003	NF035-503
	0220	BW012-050	BW018-075	HD003	NF048-503
	0300	BW018-075	BW012-100	HD003	NF063-503
	0370	BW012-100	BW106	HD003	NF085-503
	0450	BW012-100	BW206	HD003	NF085-503

5.3 Description of applications

5.3.1 Project planning for trolleys

The motor load in the dynamic sections determines the peak motor power according to which the dimensions are to be set. The thermal load determines the required continuous power of the motor. Refer to the travel cycle for determining the thermal load. The speed characteristic is a significant factor in determining the self-cooling of the motor.



5.3.2 Project planning for hoists

In practice, the question of setting the size of hoists is addressed with regard to special thermal and safety-critical criteria.

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

Thermal considerations

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

Starting torque

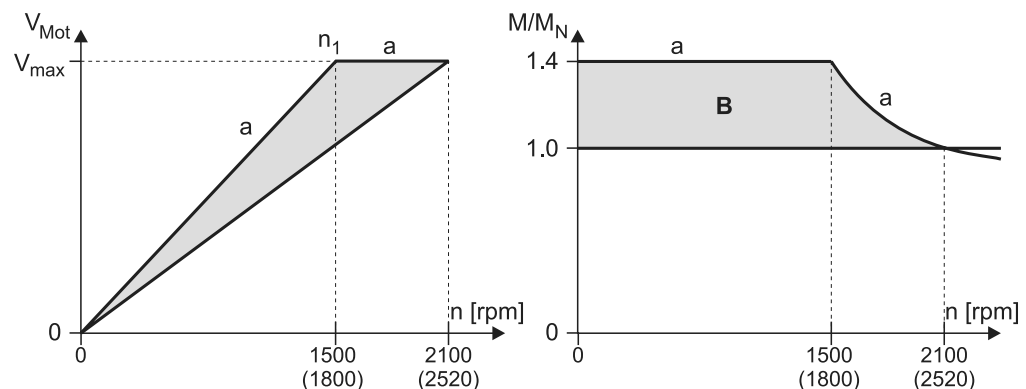
The motor requires the highest operating torque in the event of acceleration with maximum load and the **upwards** hoisting direction.

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

Hoist voltage / speed characteristic curve



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

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

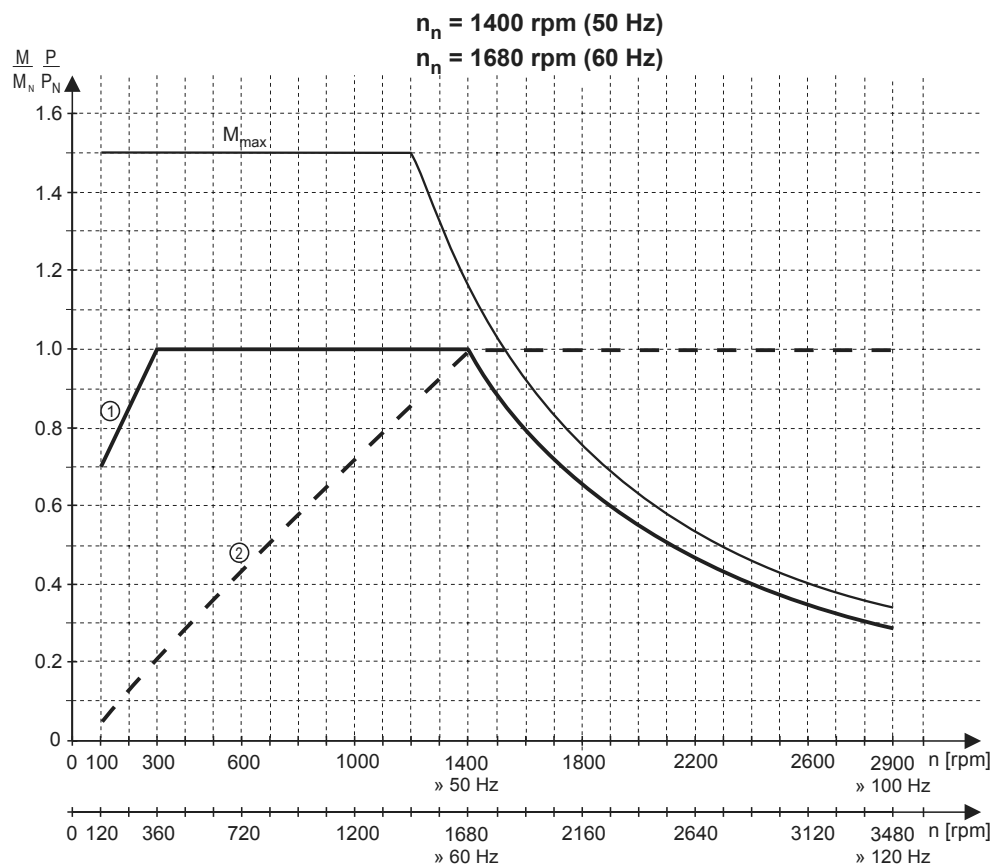
- S1 (100 % CDF): Select the motor power of the next higher motor type than the selected inverter power, e.g. for lengthy upwards travel or continuous elevators.
- S3 (40 % CDF): Select the motor power according to the selected inverter power.

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



5.4 Speed-torque characteristics

The speed / torque characteristic curve appears as follows:



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



5.5 Select motor

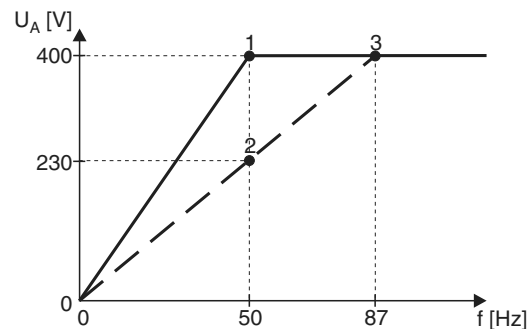
5.5.1 Basic recommendations

- Use motors with at least thermal class F
- Use TF thermistor or TH thermostat.
- Preferably use 4-pole motors. This applies particularly if you are operating gearmotors with a high oil filling level as a result of their vertical mounting position. The churning losses in 2-pole motors will be quite high.

5.5.2 Voltage / frequency characteristics

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.

5.5.3 Dynamic applications

For dynamic applications, it is necessary to have a drive with an inverter rated current greater than the motor rated 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.



5.5.4 Inverter / motor combinations

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

MOVITRAC® B: Speed [rpm] at 50 Hz Speed [rpm] at 60 Hz	Rated power P _N	SEW motor			
		3000 3600	1500 1800	1000 1200	750 900
MC07B0003-...-4-00	0.25 kW	DFR63M2	DFR63L4	DT71D6	DT80N8
MC07B0004-...-4-00	0.37 kW	DFR63L2	DT71D4	DT80K6	DT90S8
MC07B0005-...-4-00	0.55 kW	DT71D2	DT80K4	DT80N6	DT90L8
MC07B0008-...-4-00	0.75 kW	DT80K2	DT80N4	DT90S6	DV100M8
MC07B0011-...-4-00	1.1 kW	DT80N2	DT90S4	DT90L6	DV100L8
MC07B0015-...-4-00	1.5 kW	DT90S2	DT90L4	DV100M6	DV112M8
MC07B0022-...-4-00	2.2 kW	DT90L2	DV100M4	DV112M6	DV132S8
MC07B0030-...-4-00	3.0 kW	DV100M2	DV100L4	DV132S6	DV132M8
MC07B0040-...-4-00	4.0 kW	DV112M2	DV112M4	DV132M6	DV132ML8
MC07B0055-...-4-00	5.5 kW	DV132S2	DV132S4	DV132ML6	DV160M8
MC07B0075-...-4-00	7.5 kW	DV132M2	DV132M4	DV160M6	DV160L8
MC07B0110-...-4-00	11 kW	DV160M2	DV160M4	DV160L6	DV180L8
MC07B0150-...-4-00	15 kW	DV160L2	DV160L4	DV180L6	DV200L8
MC07B0220-...-4-00	22 kW	DV180L2	DV180L4	DV200L6	–
MC07B0300-...-4-00	30 kW	–	DV200L4	–	–
MC07B0370-...-4-00	37 kW	–	DV225S4	DV250M6	–
MC07B0450-...-4-00	45 kW	–	DV225M4	DV280S6	–



5.6 Overload capacity

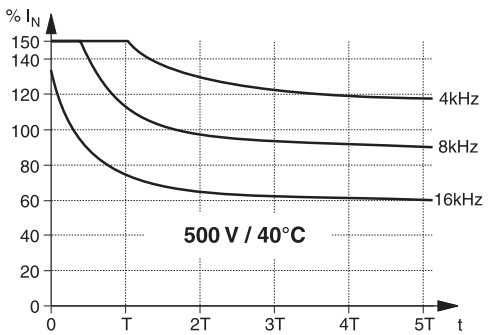
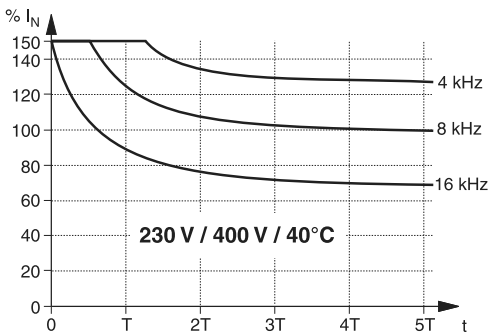
MOVITRAC® B frequency inverters permanently calculate the load on the inverter output stage (unit utilization). They can output the maximum possible power in every operating status.

The permitted continuous output current depends on:

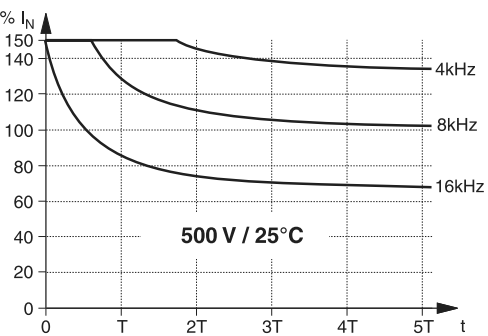
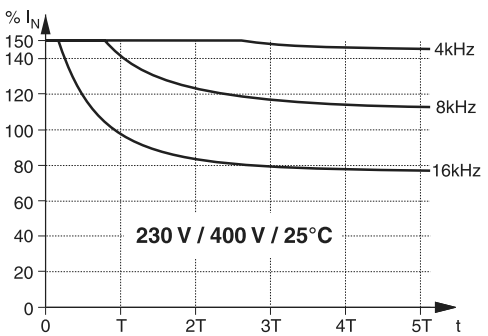
- Ambient temperature
- Heat sink temperature
- Mains voltage
- PWM frequency

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

Overload capacity at 40 °C



Overload capacity at 25 °C



Size	0XS	0S < 1.5 kW	0S 1.5 kW	0L	2S	2	3	4
T (min)	20	20	8	8	4	6	4	9



5.7 Load capacity of the units at low output frequencies

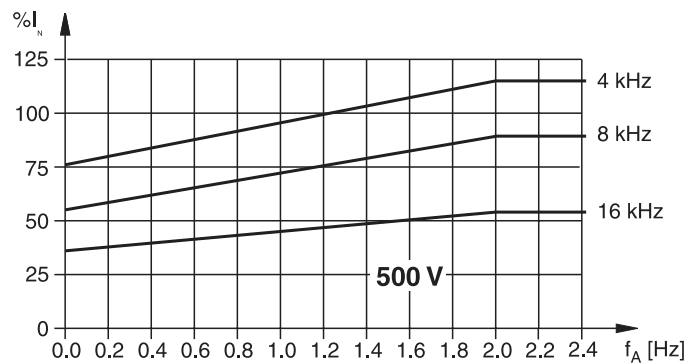
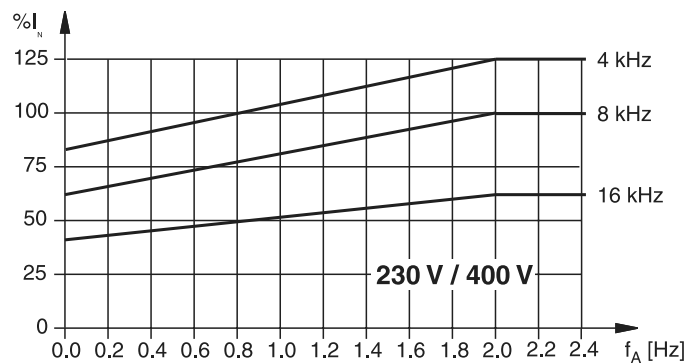
The thermal model in MOVITRAC® B implements dynamic limiting of the maximum output current. Consequently, the thermal model only permits less than 100 % output current at output frequencies less than 2 Hz if the capacity utilization is high.

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



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

Guaranteed continuous currents depending on the output frequency:





5.8 Selecting the braking resistor



- **High voltage**

The connection leads to the braking resistor carry a **high DC voltage (approx. 900 V)**. Select the cables for the braking resistor according to this high DC voltage.



- **Cable length**

The maximum permitted line length between MOVITRAC® B and the braking resistor is 100 m (330 ft).

- **Parallel connection**

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

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

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

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

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

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



Project planning

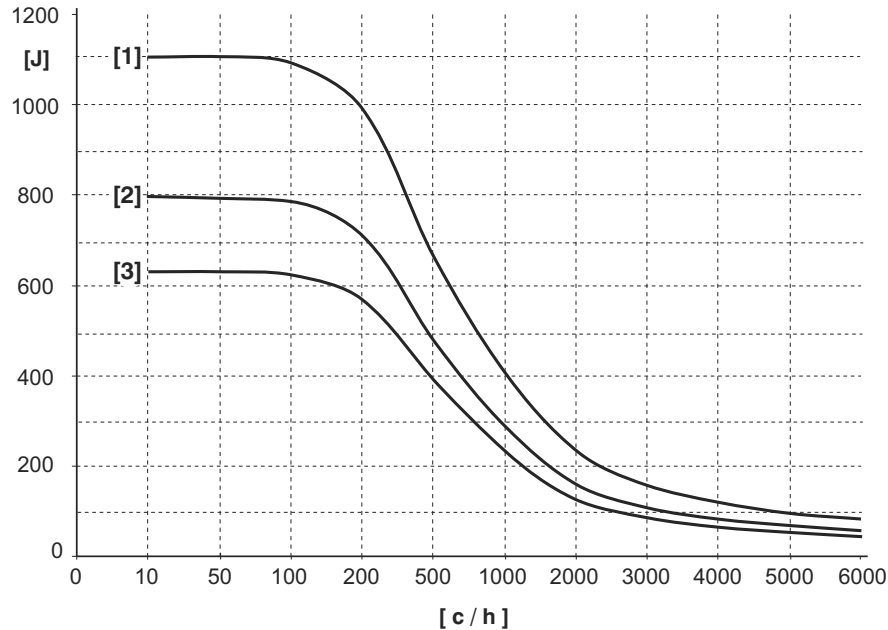
Selecting the braking resistor

5.8.1 Power diagrams

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

*Load capacity of
PTC braking
resistors*

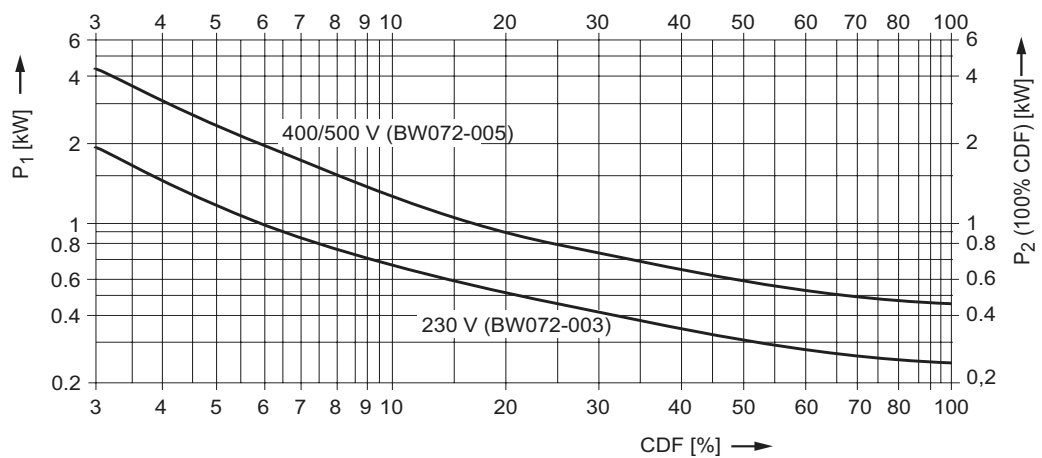
The following diagram shows the load capacity of the braking resistors per brake application:



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

*Flat-design
power diagram*

Power diagram for flat-design braking resistors:

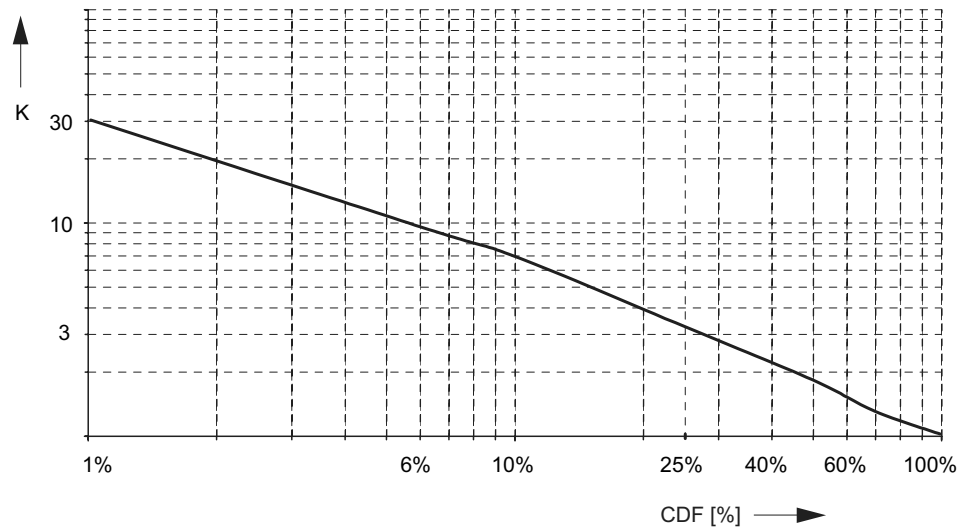


- P_1 = Short-term power
- P_2 = Continuous power
- CDF = Cyclic duration factor of the braking resistor



Overload factor for
wire resistors

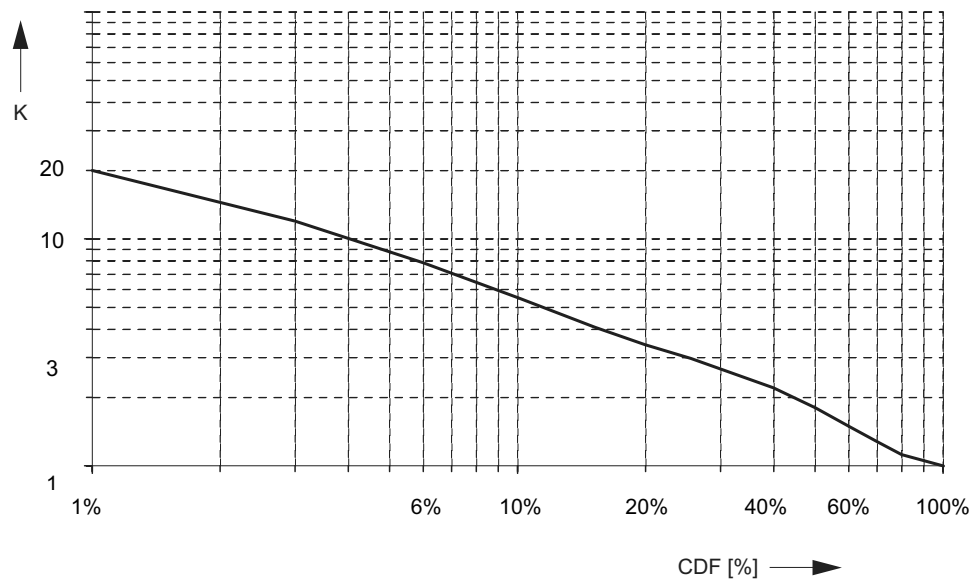
Overload factor depending on cycle duration factor for wire resistors:



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



Project planning

Selecting the braking resistor

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 an **MC07B...-5A3 (AC 400 / 500 V unit)** (→ Peak braking power table).
- Select the appropriate braking resistor from the assignment tables with the following points:

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

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



5.9 Brake connection

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

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



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

5.9.1 Switching off the brake rectifier

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

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

Always disconnect the brake in the DC and AC circuits in:

- All hoist applications

5.9.2 Activating the brake

Always activate the brake via binary output DOØ2 "/Brake", do not use the PLC!



The binary output DOØ2 "/Brake" is configured as an output for operating a relay with free-wheeling diode and a control voltage of DC +24 V / max. 150 mA / 3.6 W. This means 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 operating software sets the brake parameters for the 2 and 4-pole motors from SEW-EURODRIVE. The brake parameters (P73_) must be set manually in the case of SEW-EURODRIVE motors with a higher number of poles and non-SEW motors.

5.9.3 Brake parameters



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.

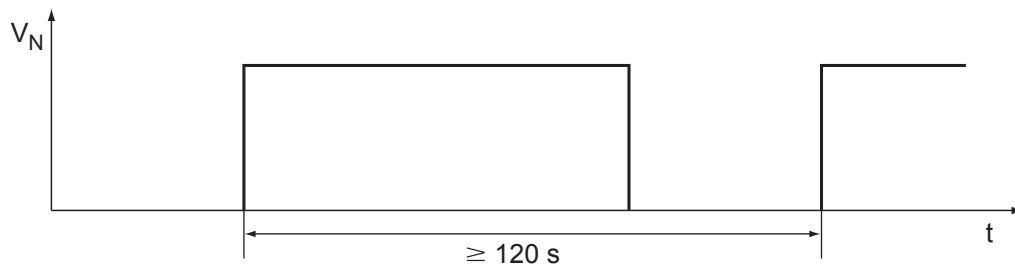


5.10 Input contactor

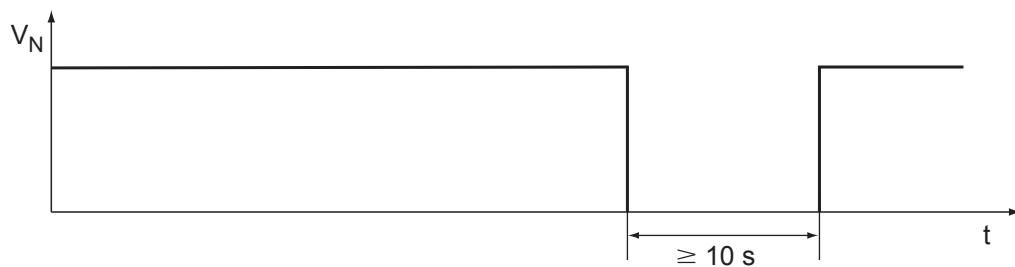
- Only use supply system contactors in utilization category AC-3 (EN 60947-4-1).

Mains activations

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



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



- Do not switch the mains supply for jog mode, but only for switching the inverter on and off. Use the following commands for jog mode:
 - Enable/Stop
 - CW/Stop
 - CCW/Stop



5.11 Mains lead and motor cable

5.11.1 Permitted voltage supply systems

MOVITRAC® B is intended to be operated on voltage supply systems with a directly grounded star point (TN and TT power systems). Operation on voltage supply systems with a non-grounded star point (for example IT power systems) is permitted. In such a case, SEW recommends using an earth-leakage monitor according to the PCM (pulse-code measurement) principle.

5.11.2 Line protection and core cross-section

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

Select the cable cross-section of the motor line so the voltage drop is as small as possible.

When several 1-phase devices are used, the size of the shared neutral conductor must always be selected for the total current. Select with reference to the total current even if the unit connections are distributed over the 3 mains phases. This is because the third mains harmonic is always cumulative.

An excessively high voltage drop means that the full motor torque is not achieved.

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.

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

Line cross-section [mm ²]	Smallest bending radius [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



Project planning

Mains lead and motor cable

*Recommendation
for standard
installation*

MOVITRAC® B 230 V		0003	0004	0005	0008	0011	0015	0022
1-phase	Line protection	C16 ¹⁾ / gL16 / K16				C32 ²⁾ / gL25 / K25 / D20		
	Supply system lead	1.5 mm ² / AWG16				4 mm ² / AWG12		
	PE conductor	2 x 1.5 mm ² / 2 x AWG16				2 x 4 mm ² / 2 x AWG12		
Motor cable		1.5 mm ² / AWG16				1.5 mm ² / AWG16		
Unit terminal cross-section of the power section		Disconnectable terminal strip 4 mm ² conductor end sleeve 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 400 / 500 V		0003	0004	0005	0008	0011	0015	0022	0030	0040
3-phase	Line protection	10 A					16 A			
	Supply system lead	1.5 mm ² / AWG16								
	PE conductor	2 x 1.5 mm ² / 2 x AWG16					2 x 1.5 mm ² / 2 x AWG16 1 x 10 mm ² / 1 x AWG8			
Motor cable		1.5 mm ² / AWG16								
Unit terminal cross-section of the power section		Disconnectable terminal strip 4 mm ² conductor end sleeve DIN 46228								

MOVITRAC® B 400 / 500 V		0055	0075	0110	0150	0220	0300	0370	0450
3-phase	Line protection	16 A	16 A	25 A	35 A	50 A	63 A	80 A	100 A
	Supply system lead	1.5 mm ²	1.5 mm ²	4 mm ²	6 mm ²	10 mm ²	16 mm ²	25 mm ²	35 mm ²
	PE conductor	2 x 1.5 mm ² 1 x 10 mm ²	2 x 1.5 mm ² 1 x 10 mm ²	2 x 4 mm ² 1 x 10 mm ²	2 x 6 mm ² 1 x 10 mm ²	1 x 10 mm ²	1 x 16 mm ²		
Motor cable		1.5 mm ²	2.5 mm ²	4 mm ²	6 mm ²	10 mm ²	16 mm ²	25 mm ²	35 mm ²
Unit terminal cross-section of the power section		M4 screw and washer assembly with terminal clip 4 mm ² conductor end sleeve DIN 46228 6 mm ² crimp cable connector DIN 46234			M6 screw and washer assembly with washer max. 25 mm ² Crimp cable lug DIN 46234			Bolt M10 with nut max. 70 mm ² crimp cable connector DIN 36235	



400 / 500 V units to USA NEC, $V_{Mains} = 3 \times 460 V_{AC}$:

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									15 A
Supply system lead L1/L2/L3	AWG14						AWG14			
PE conductor	AWG14						AWG14			
Motor feeder U/V/W	AWG14						AWG14			
Unit terminal cross-section of the power section	Separable terminal strip AWG10 conductor end sleeve						Separable terminal strip AWG10 conductor end sleeve			

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

MOVITRAC® B 400 / 500 V	0370	0450
Size	4	
Fuses F11/F12/F13 I_N	90 A	110 A
Supply system lead L1/L2/L3	AWG4	AWG3
PE conductor	AWG8	AWG6
Motor feeder U/V/W	AWG4	AWG3
Unit terminal cross-section of the power section	M10 bolt with nut max. AWG2/0 crimp cable connector	



5.11.3 Motor line length

The maximum motor line length depends on:

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

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

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

1) Standard setting



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



5.11.4 Voltage drop

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

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

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

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



5.12 Multi-motor drive / group drive



Switch the frequency inverter output with inhibited output stage only.

5.12.1 Motor currents

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

5.12.2 Motor line

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

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

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

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

N = Number of motors connected in parallel

5.12.3 Motor size

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

5.12.4 Output filter

There is no need for an output filter with smaller groups of two to three motors. An HF... output filter is required if the maximum motor line length (l_{max}) given in the table in section "Motor feeder length" is not adequate. This may be the case in large groups (n) or when there are long motor line lengths connected in parallel (l_{total}). In this case, it is the voltage drop on the motor line that limits the maximum motor line length, not the limit value in the table. The total value of the rated motor currents must not exceed the rated throughput current of the output filter.



5.13 Line chokes

5.13.1 1-phase

Use is optional under the following circumstances:

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

Use is required under the following circumstances:

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

5.13.2 3-phase

Use is optional to support the overvoltage protection.

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

5.13.3 Connecting several 1-phase inverters on one 3-phase line choke

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

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

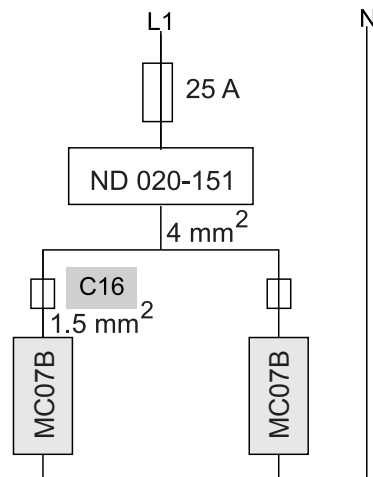


*Example:
Two 1-phase
inverters on one
1-phase line choke*

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

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

Connecting 2 1-phase inverters to one 1-phase line choke

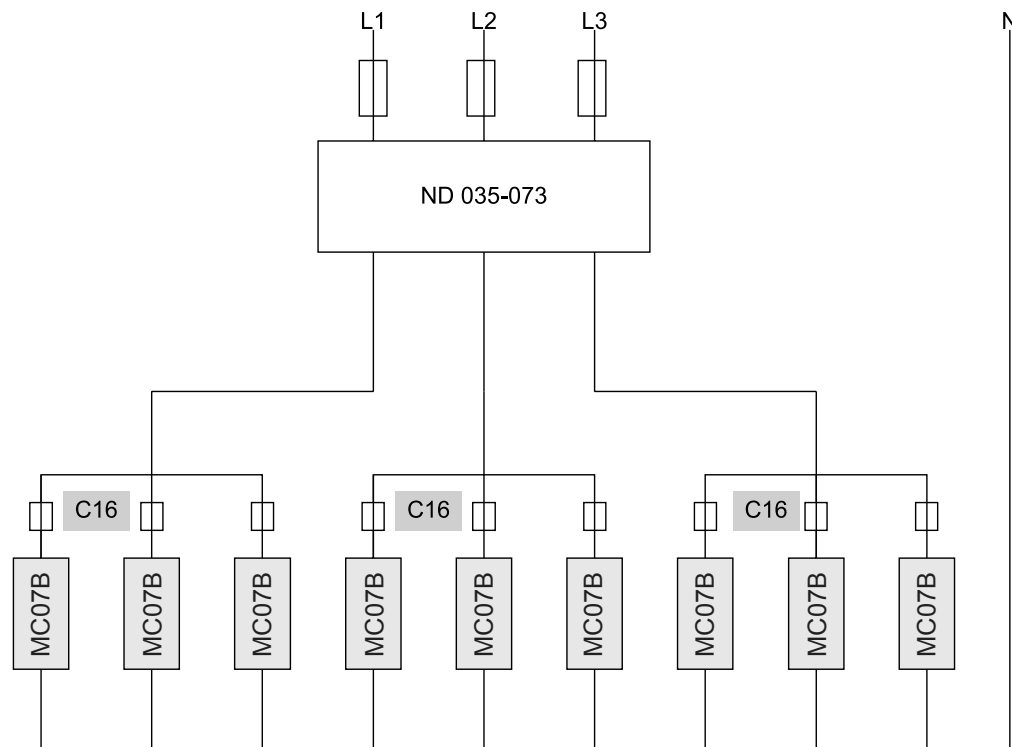


*Example:
Nine 1-phase
inverters on one
3-phase line choke*

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

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

Connection of several inverters on one 3-phase line choke





5.14 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.

5.14.1 Interference immunity

With regard to interference immunity, MOVITRAC® B at least meets the requirements stipulated in EN 61800-3.

5.14.2 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 the industrial and private sphere. The following measures are recommended depending on the target limit value class. Higher levels of interference are permitted in industrial environments. In industrial environments, it may be possible to dispense with the measures listed below depending on the situation of the supply system (mains) and the system configuration.

Limit value class

The following possible solutions exist for EMC-compliant installation, depending on the system configuration. Perform EMC compliant installation in accordance with EN 55011.

Limit value class		Input side			Output side	
Size		0	0 ... 2	3 / 4	0	2S ... 4
Voltage		230 V	400 / 500 V			
A		No additional filtering required			NF line filter	Shielded motor line
B	Cable conducted	No additional filtering required	NF line filter	HD output choke or shielded motor line		
		Foldable ferrites ¹⁾				

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

The unit complies with the cable conduction and emission requirements of limit class A. Cable conduction requirements for limit class B is also reached. Limit class B is also complied with for emissions with additional measures.

5.14.3 Connection

Observe the "Installation" section for EMC compliant connection.



5.14.4 Reducing earth-leakage currents (size 0 only)

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

The earth leakage currents are mainly determined by:

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

The EMC filter is no longer active when the suppression capacitors are deactivated.

5.14.5 IT systems



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

5.15 HF... output filter type

5.15.1 Important notes

Observe the following instructions when using output filters:

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



5.15.2 Installation, connection and operation



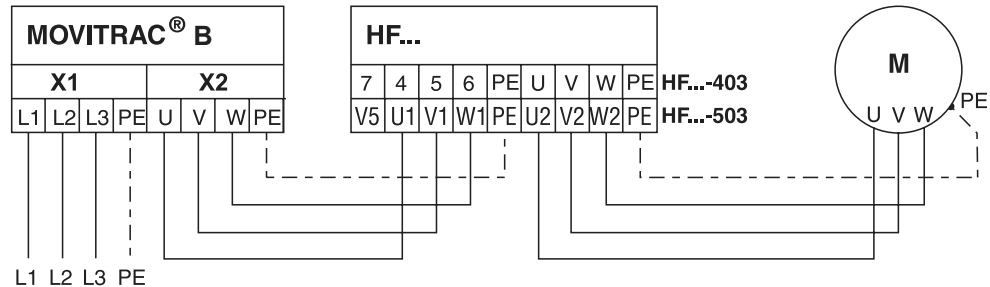
- Install output filters next to the corresponding inverter. Leave a ventilation space of at least 100 mm below and above the output filter. No clearance is required on the sides.
- Limit the connection cable between the inverter and output filter to the absolute minimum length required. Maximum 1 m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



5.15.3 V_{DC} link connection

Operation without V_{DC} link connection:

- Only approved for PWM frequency 4 kHz or 8 kHz.



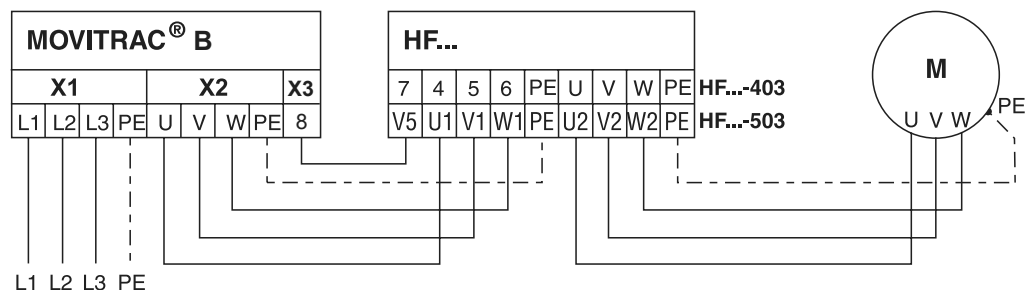
Operation with V_{DC} link connection (from 5.5 kW)

(Connection between inverter terminal 8 and HF... -503 terminal V5 or HF...-403 terminal 7):

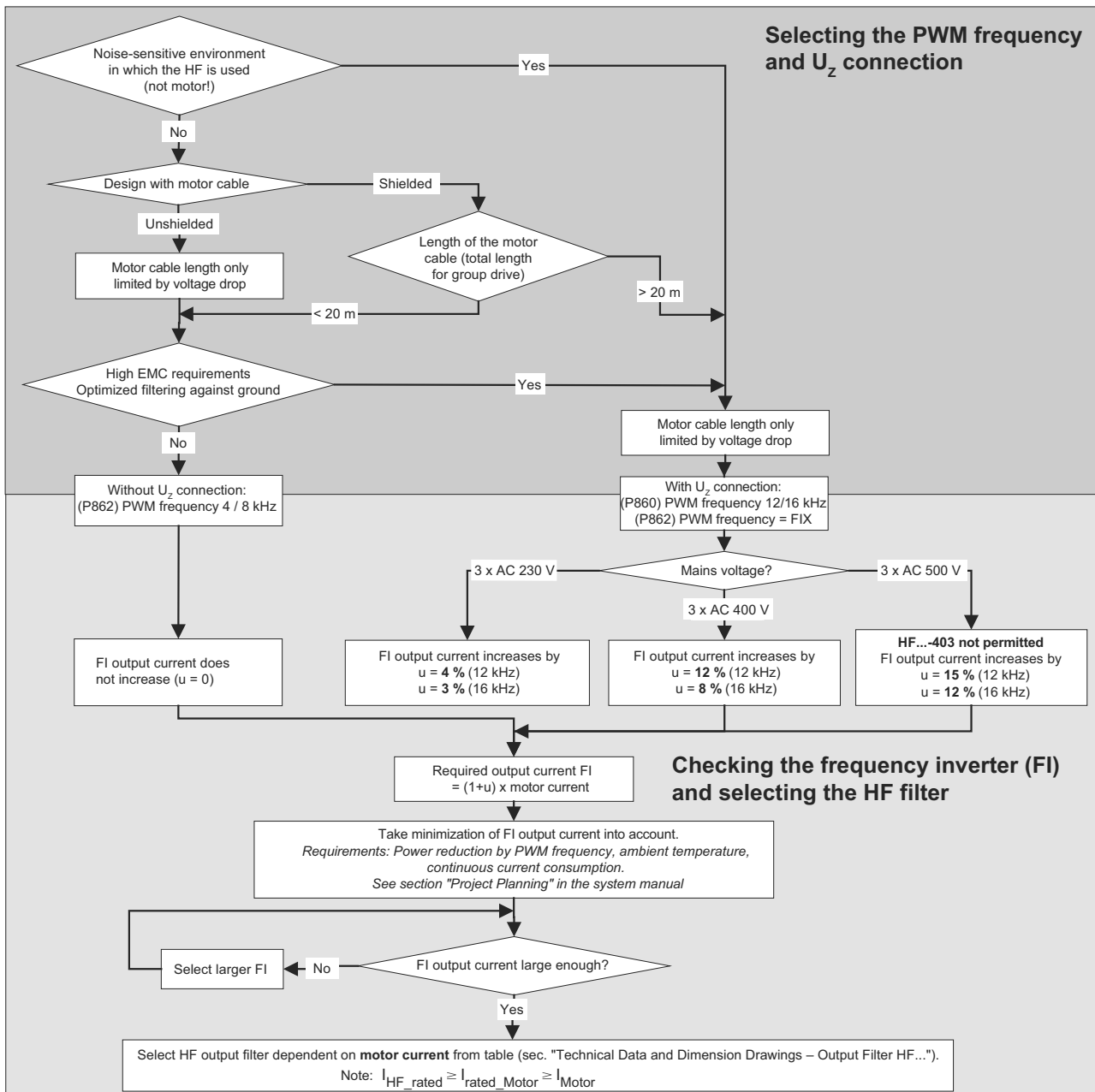
- Optimized grounded filter effect.
- Improved filter effect in the low-frequency range (≤ 150 kHz).
- Only approved for PWM frequency 12 kHz or 16 kHz. Take into account that increased losses (= power reduction) occur in the inverter when operating the inverter with 12 or 16 kHz.
- Set PMW fix = ON;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

f_{PWM}	$V_{mains} = 3 \times AC 230$ V	$V_{mains} = 3 \times AC 400$ V	$V_{mains} = 3 \times AC 500$ 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.



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





5.16 Electronics cables and signal generation

5.16.1 Cable type

The electronic terminals are suitable for:

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

Use shielded cables as standard. Ground the shield at both ends. Route electronics cables separately from power cables and contactor control cables or braking resistor cables.

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

5.16.3 Coupling relays

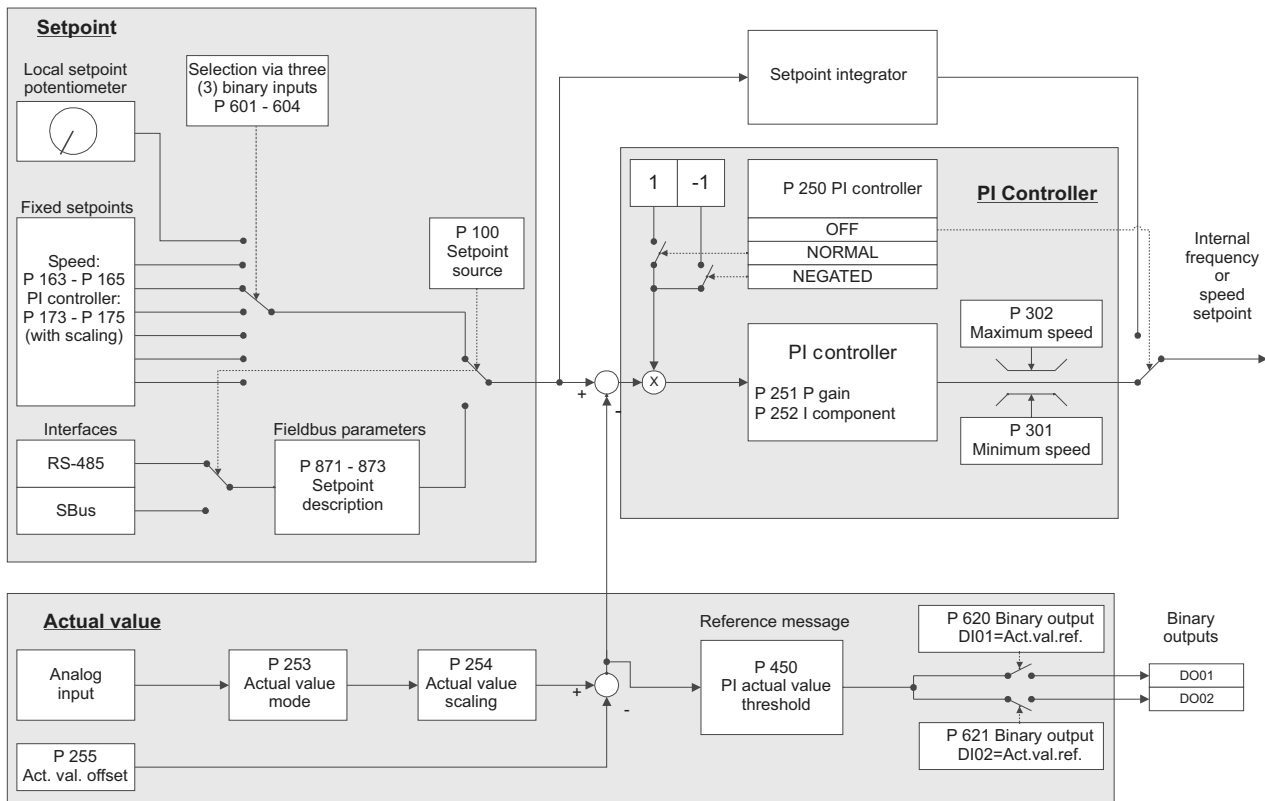
You can use coupling relays for electrical isolation of the binary inputs and binary outputs to the functional ground. If you use coupling relays, then only use relays with encapsulated, dust-protected electronic contacts. The relays must be suitable to switch small voltages and current (5 ... 30 V,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



5.17 PI controller

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

Structural diagram showing installation of the PI controller



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

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

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

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



5.17.1 Parameter settings

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

5.17.2 Setpoint selection

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

- **UNIPOL./FIX.SETPT:** The setpoint set using the local setpoint potentiometer applies until one of the following fixed setpoints is selected:
 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 %
- **RS-485**
- **SBus:** Specify the setpoint and set it using the following bus parameters:
 P870/871/872 Setpoint description PO1/PO2/PO3 [PI controller setpoint [%]]
 $PO1/PO2/PO3 = 0 - 2^{14} = 0 \dots 100\%$ PI controller setpoint

The following settings do not have any effect: **MOTOR POT**, **FIX SETP+AI1** and **FIX SETP*AI1**. If you set these, the inverter always specifies the setpoint zero.

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



5.17.3 Actual value acquisition

The unipolar input AI1 is the actual value input.

You can acquire the actual value as follows using *P253 PI actual value mode*:

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

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

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

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

P255	PI sensor offset	0 ... 100 [%]	Step width:	0.1%
------	------------------	---------------	-------------	------

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

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

P873 Actual value description PI1 [PI controller [%]]
P874 Actual value description PI2 [PI controller [%]]
P875 Actual value description PI3 [PI controller [%]]

PI1 = 0 ... 2¹⁴ = 0 ... 100% PI controller setpoint
 PI2 = 0 ... 2¹⁴ = 0 ... 100% PI controller setpoint
 PI3 = 0 ... 2¹⁴ = 0 ... 100% PI controller setpoint

5.17.4 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 threshold	0 ... 100 [%]	0.1%
P451	Signal = "1" if:	PI actual value < PI reference PI actual value > PI reference	

You have to program a binary output terminal to "PI 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.

Program the binary output DO01 P620, DO02 P621 or DO03 P622 to PI ACT.VALUE REF.



5.17.5 Inverter control

You can determine the direction of rotation by using terminal assigned to "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 controller %" and the value of the PO data item "PI controller %" act as a setpoint for the PI controller.

5.18 Application examples

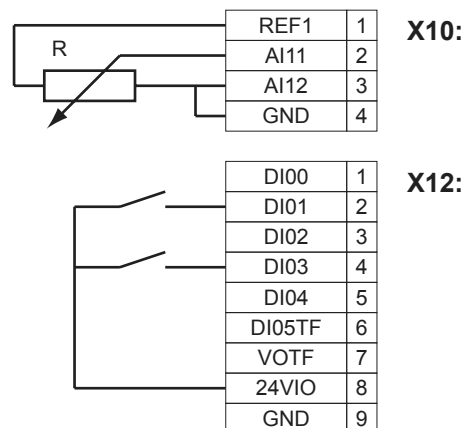
All application examples presented here assume that the unit has been started up correctly in accordance with the "Startup" section.

5.18.1 External setpoint potentiometer

The external setpoint potentiometer is not in effect when manual mode is active.

Connect an external setpoint potentiometer as follows:

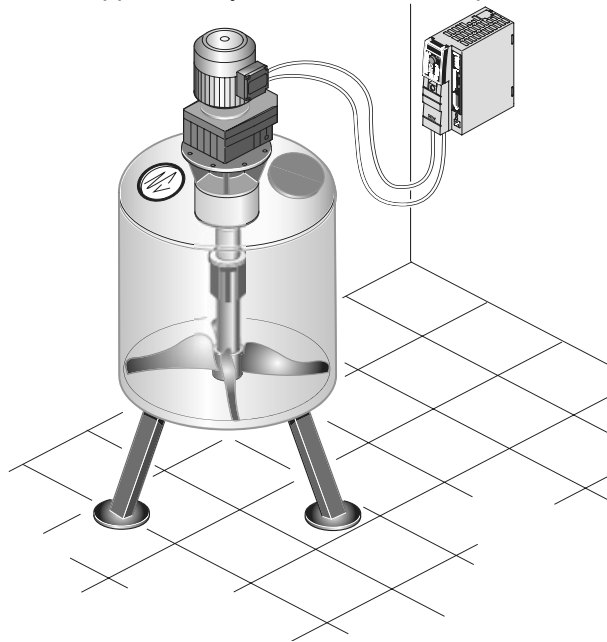
The resistance value of the external setpoint potentiometer R must be $\geq 10 \text{ k}\Omega$.





5.18.2 Speed-controlled agitator

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



You use the keypad to control reset, start, stop and speed. To operate the agitator, select the "FBG setpoint generator" symbol.

Parameter

Adapt the following parameters for the agitator:

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



5.18.3 Positioning a trolley

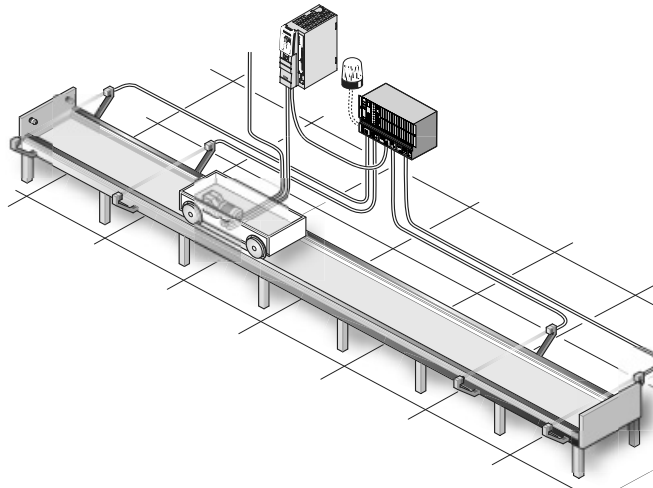
Principle

Positioning of a trolley with rapid speed and creep speed, 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.



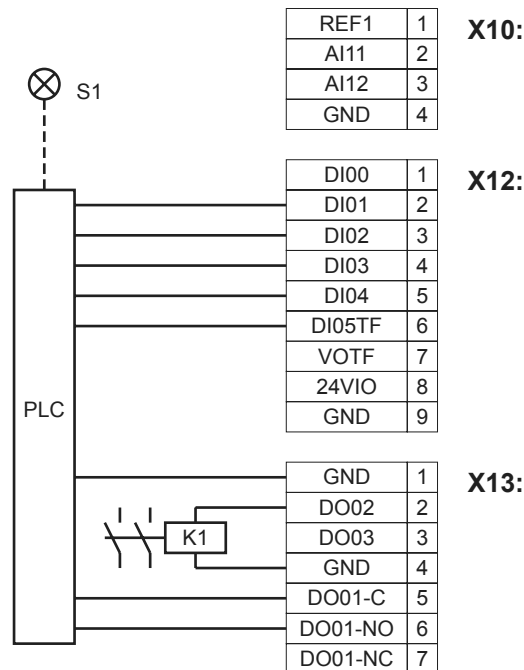
Terminals

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



Assignment of the electronics terminal strip with

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



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

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

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

Parameters

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

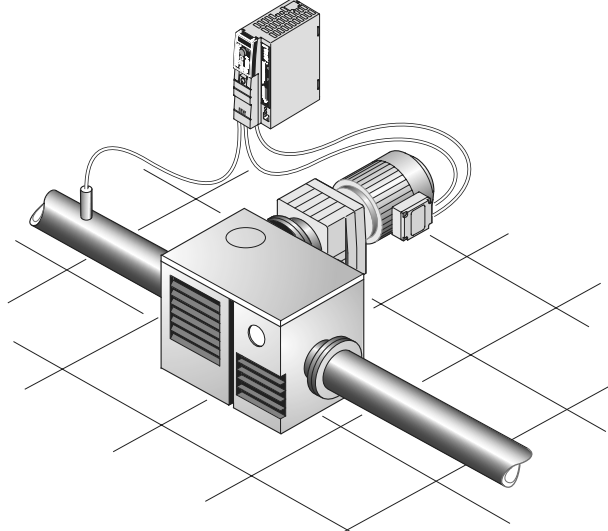
P130 Ramp t11 up	P601 Binary input DI02: CCW/Stop
P131 Ramp t11 down	P602 Binary input DI03: Enable
P136 Stop ramp t13	P603 Binary input DI04: n11/n21
P160 n11	P604 Binary input DI05: n12/n22
P162 n13	P620 Binary output DO01: Fault
P301 n _{min}	P621 Binary output DO02: Brake released
P302 n _{max}	P736 Braking time
P303 Current limit	P820 4-quadrant operation: ON
P320 Automatic adjustment: ON	P830 Response EXT. FAULT: Stop/Fault
P323 Premagnetization	P860 PWM frequency



5.18.4 Pressure control

Principle

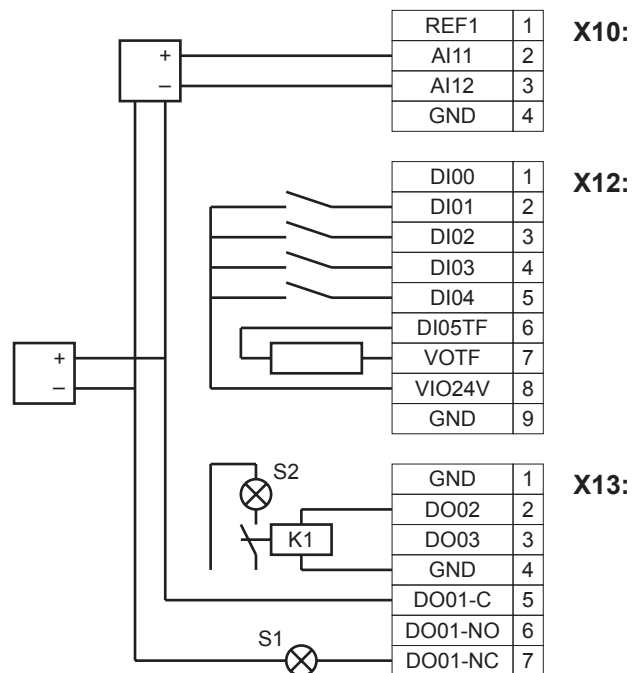
In this application, the inverter controls the water pressure in a pipe system. The PI controller installed in MOVITRAC® B is used for this purpose. P163 "PI controller internal setpoint n11" specifies the pressure setpoint.



Connection

- 2 indicator lamps "Fault" and "Pressure reached"
- Motor temperature monitored by TF

Connection pressure control:





Use the following signals and components for pressure control:

X12:2: Clockwise rotation	S1: Fault
X12:3: Start/Stop button	S2: Pressure reached
X12:4: Required pressure	
X12:5: Reset button	

The pressure setpoint is set in the range 0 to 100 % using the icon.

Use Reset and Enable for controlling the machine.

The controller must detect excess pressure in the pipe system by means of an additional monitoring function and must respond by taking safety precautions.

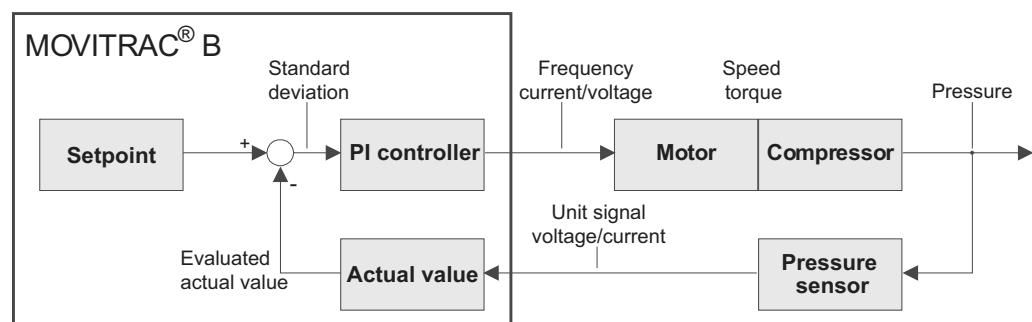
Parameters

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

P163 n11 PI-controller internal setpoint	P450 PI actual value threshold
P250 PI controller	P451 Signal = "1" if: PI actual value / PI reference
P251 P-gain	P601 Binary input DI02: Enable
P252 I-component	P602 Binary input DI03: n11
P253 PI actual value mode	P603 Binary input DI04: Error reset
P254 PI actual value scaling	P604 Binary input DI05: TF error
P255 PI actual value offset	P620 Binary output DO01: Fault
P301 Minimum speed	P621 Binary output DO02: PI ACT.VALUE REF.
P302 Maximum speed	P830 Error response: Immediate stop/Fault
P303 Current limit	P860 PWM frequency

5.18.5 PI controller

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





6 Safety notes

6.1 Installation and startup



- Never install damaged products or take them into operation. Submit a complaint to the shipping company immediately in the event of damage.
- Installation, startup and service work on the unit to be performed by trained personnel only. Such personnel must have undergone accident prevention training and adhere to the applicable regulations (such as EN 60204, VBG 4, DIN-VDE 0100/0113/0160).
- Follow the specific instructions during installation and startup of the motor and the brake!
- Preventive measures and protection devices must correspond to the regulations in force (e.g. EN 60204 oder EN 61800-5-1).

The unit must be grounded as a protective measure.

Overcurrent protection devices are a necessary protection device.
- The unit meets all requirements for reliable isolation of power and electronics connections in accordance with EN 61800-5-1. All connected circuits must also satisfy the requirements for reliable isolation so as to guarantee reliable isolation.
- Take suitable measures to ensure that the connected motor does not start up automatically when the inverter is switched on (for example by disconnecting the electronics terminal block).



6.2 Operation and service



- Disconnect the unit from power supply before you remove the protective cover. Dangerous voltages may still be present for up to ten minutes after disconnection from the power supply source.



- The unit has IP00 enclosure with the protective cover removed. Dangerous voltages are present at all subassemblies except for the control electronics. The unit must be closed during operation.
- When the unit switch is in the ON position, dangerous voltages are present at the output terminals as well as any connected cables and motor terminals. Dangerous voltages may even occur if the unit is inhibited and the motor is at standstill.
- The unit may not necessarily be free from any voltages even if the displays are no longer illuminated.
- Safety functions of the unit or mechanical blocking may result in a motor standstill. Removing the cause of this problem or performing a reset can result in the drive re-starting on its own. If, for safety reasons, this is not permitted for the driven machine, disconnect the unit from the mains before correcting the fault.
- Switch the frequency inverter output with inhibited output stage only.
- Ensure a minimum time of 120 s between two mains activations for AC 230 V / 1-phase units.
- Observe a minimum switch-off time of 10 s for 3-phase units.



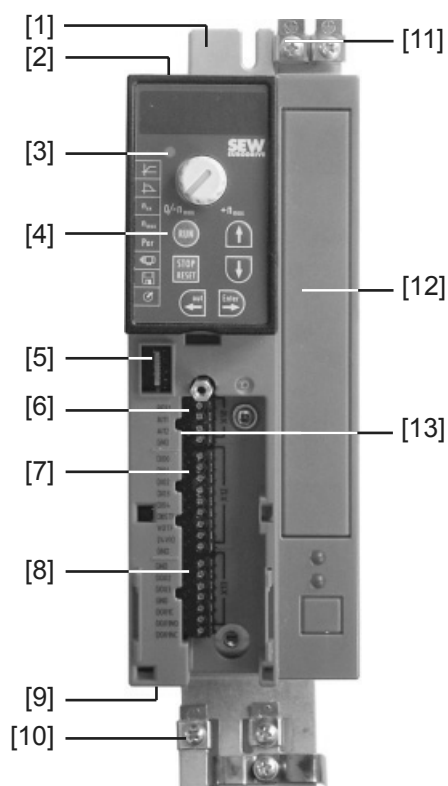
Risk of burns

Braking resistors have surface temperatures of up to 250 °C.



7 Unit design

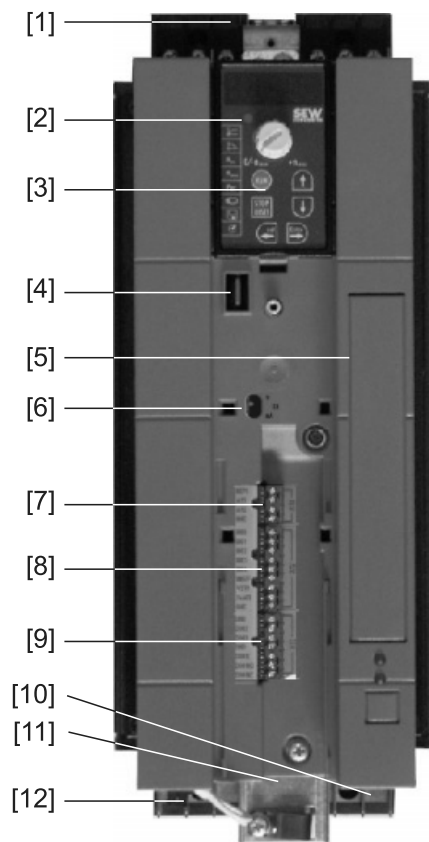
7.1 Sizes 0XS / 0S / 0L



- [1] Fixing strap
- [2] X1: Power supply connection:
3-phase: L1 / L2 / L3
1-phase: L / N
- [3] Status LED (visible without optional keypad)
- [4] Optional keypad
- [5] Connection for optional communication / analog module
- [6] X10: Analog input
- [7] X12: Binary inputs
- [8] X13: Binary outputs
- [9] X2: Motor connection U / V / W / Brake connection +R / -R
- [10] Shield clamp, fixing strap below
- [11] PE connection
- [12] Option card slot (cannot be retrofitted / not for BG0XS)
- [13] Switch S11 for V-mA toggle analog input
(in size 0XS and 0S behind removable connector)



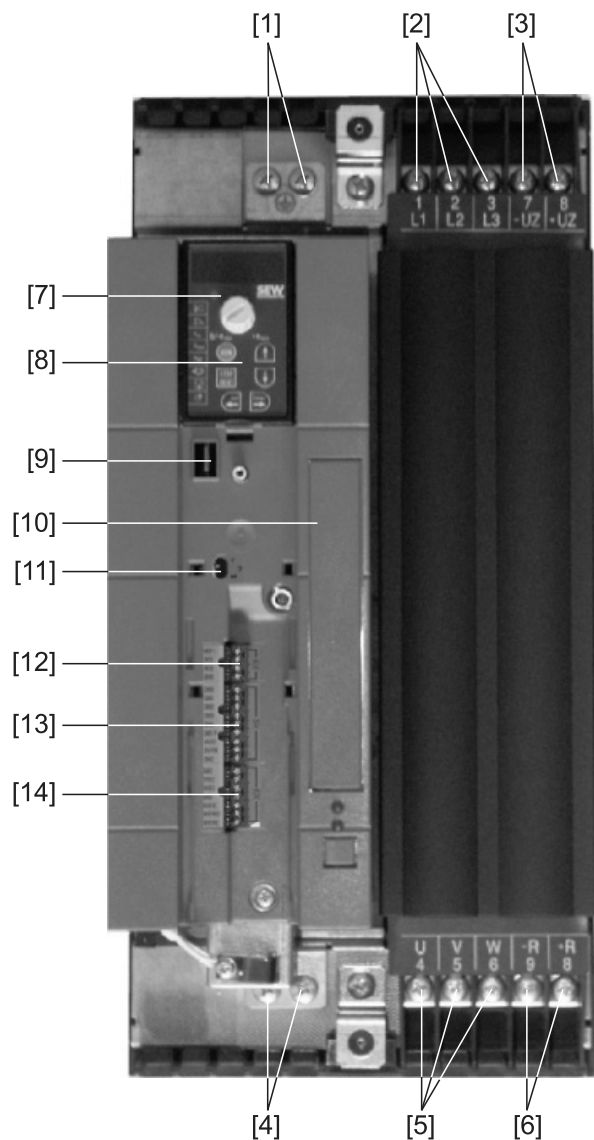
7.2 Size 2S / 2



- [1] X1: Mains connection 3-phase: L1 / L2 / L3 / PE screw
- [2] Status LED (visible without optional keypad)
- [3] Optional keypad
- [4] Connection for optional communication / analog module
- [5] Option card slot
- [6] Switch S11 for V-mA toggle analog input
- [7] X10: Analog input
- [8] X12: Binary inputs
- [9] X13: Binary outputs
- [10] X2: Motor connection U / V / W / PE screw
- [11] Space for power shield clamp
- [12] X3: Braking resistor connection R+ / R- / PE



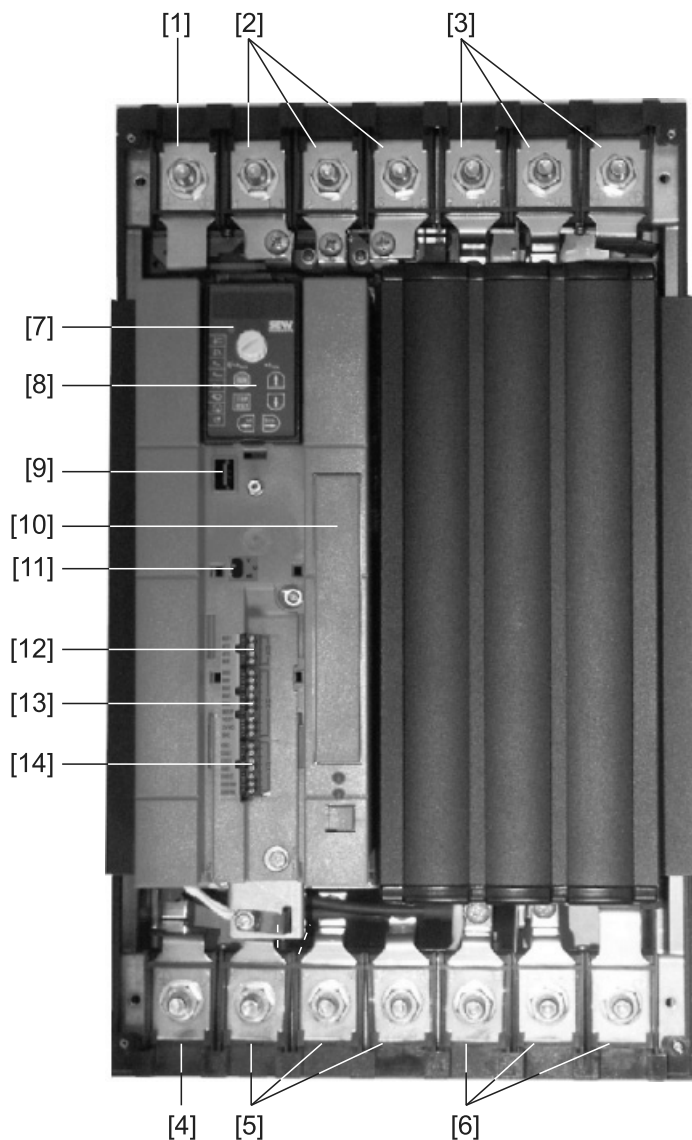
7.3 Size 3



- [1] X2: PE connection
- [2] X1: Mains connection 3-phase: L1 (1) / L2 (2) / L3 (3)
- [3] X4: DC link circuit connection (not used)
- [4] X2: PE connection
- [5] X2: Motor connection U (4) / V (5) / W (6)
- [6] X3: Braking resistor connection R+ (8) / R- (9) and PE connection
- [7] Status LED (visible without optional keypad)
- [8] Optional keypad
- [9] Connection for optional communication / analog module
- [10] Option card slot
- [11] Switch S11 for V-mA toggle analog input
- [12] X10: Analog input
- [13] X12: Binary inputs
- [14] X13: Binary outputs



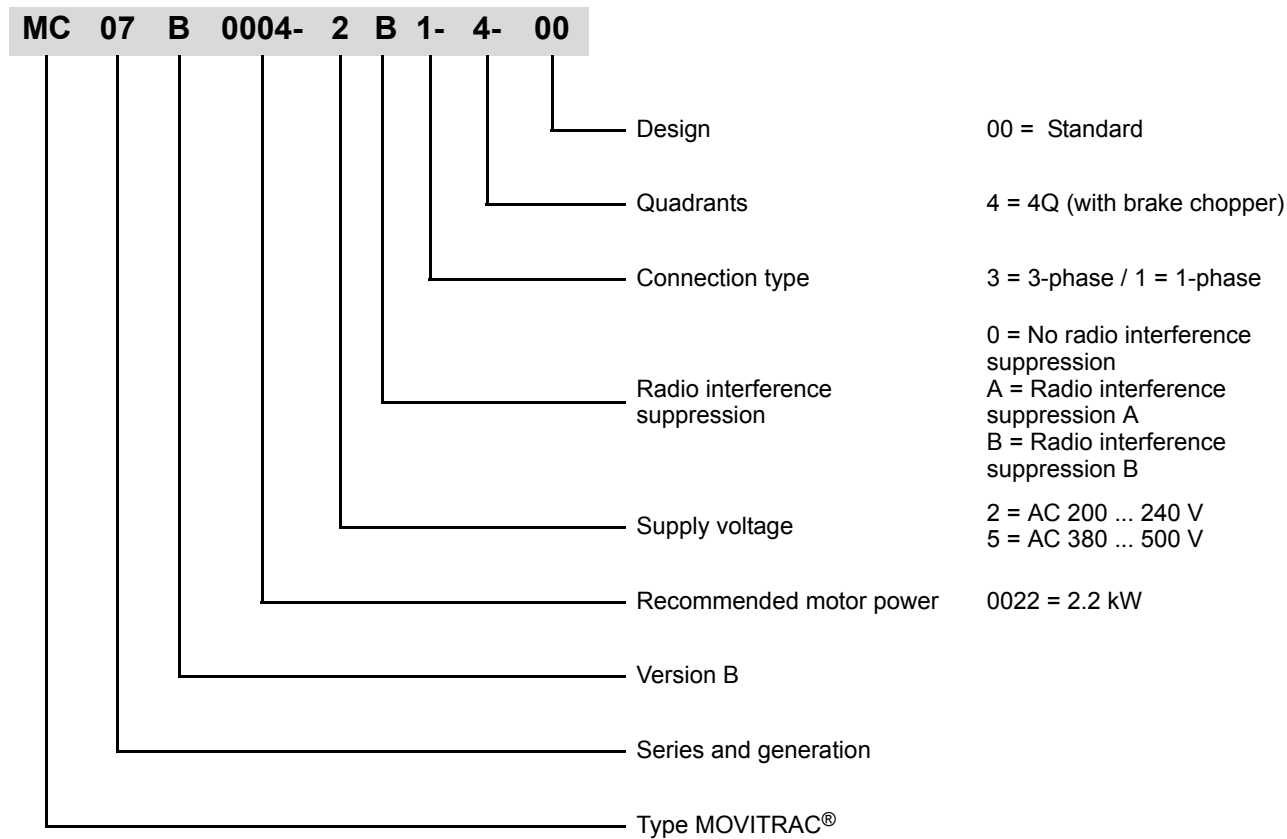
7.4 Size 4



- [1] X2: PE connection
- [2] X1: Mains connection 3-phase: L1 (1) / L2 (2) / L3 (3)
- [3] X4: DC link circuit connection (not used)
- [4] X2: PE connection
- [5] X2: Motor connection U (4) / V (5) / W (6)
- [6] X3: Braking resistor connection R+ (8) / R- (9) and PE connection
- [7] Status LED (visible without optional keypad)
- [8] Optional keypad
- [9] Connection for optional communication / analog module
- [10] Option card slot
- [11] Switch S11 for V-mA toggle analog input
- [12] X10: Analog input
- [13] X12: Binary inputs
- [14] X13: Binary outputs



7.5 Unit designation





8 Installation

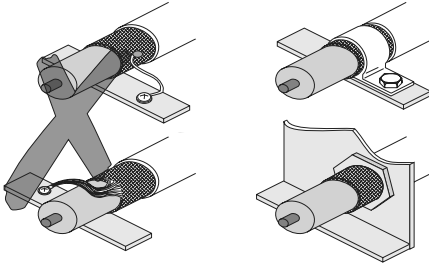
8.1 Installation notes



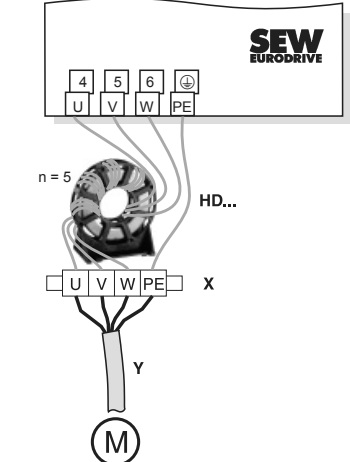
Comply with the Safety notes during installation (see page 112).

Tightening torques	Basic unit power terminals: - Only use genuine connection elements. Note the permitted tightening torques of MOVITRAC® B power terminals. - Size 0S / 0L: 0.5 Nm (4.4 lb.in)
	Line choke: - ND020-013: 0.6 ... 0.8 Nm - ND027-123: 4.0 ... 4.5 Nm - ND035-073: 4.0 ... 4.5 Nm - ND010-301: 0.6 Nm - ND020-151: 1.5 Nm
	Line filter: NF009-503: 0.6 ... 0.8 Nm
	Output filter: HF008 /015/022/030/040-503: 1.6 Nm ± 20 %
Recommended tools	Use a screwdriver with a 2.5 mm wide blade for connecting the electronics terminal strip X10 / X12 / X13.
Minimum clearance and mounting position	Leave 100 mm (4 in) clearance at the top and bottom for optimum cooling. There is no need for clearance at the sides. You can line up the units directly next to one another. Make sure that the circulation of air is not disrupted by cables or other installation materials. Prevent the heated exhaust air from other units from blowing onto this unit. Install the units vertically only. You must not install them horizontally, tilted or upside down.
6 fixed setpoints for multi-stage switching	When more than four 3-phase units or more than one 1-phase unit are connected to a supply system contactor designed for the total current: Insert a line choke in the circuit to limit the inrush current.
Separate cable ducts	Route power leads and electronics leads in separate cable ducts.
Fuses and earth-leakage circuit breaker	Install fuses at the beginning of the supply system lead behind the supply bus junction. Use D, DO, NH fuse types or power circuit breakers. Earth-leakage circuit breaker as sole protection device: Only use earth leakage circuit breakers type B according to EN 61800-5-1.
PE input connection	Connect the PE conductor according to the relevant regulations that are applicable in the specific country. Connect the protective earth connector of the motor to the PE terminal of the corresponding inverter. Ground all units over a large area via short ground connections with large cross-section to a mutual earthable point or a grounding bar. Establish a high-frequency equipotential bonding between system / control cabinet and drive / motor (e. g. by a continuous cable rack).



Shielding and earthing	- Shield the control cables and use the shield clamps. - Connect the shield by the shortest possible route and make sure it is earthed over a wide area at both ends. - You can ground one end of the shield via a suppression capacitor (220 nF / 50 V) to avoid ground loops. - If using double-shielded cables, ground the outer shield on the inverter end and the inner shield on the other end. - Provide high frequency compatible earthing for MOVITRAC® B and all additional units (wide area metal-on-metal contact between the heat sink and ground with unpainted switch cabinet mounting panel).  - Any crossovers of control cable and power cables must be at a right angle. - You can also use earthed sheet-metal ducts or metal pipes to shield the cables.
IT systems	- SEW recommends using (IT system) earth-leakage monitors with a pulse code measuring process. Use of such devices prevents the earth-leakage monitor mis-tripping due to the earth capacitance of the inverter. - For size 0, SEW recommends deactivating the interference suppressor filter using the enclosed insulation discs (see next section).
Contactor	Only use contactors in utilization category AC-3 (EN 60947-4-1).
Cross-sections	- Supply system lead: Cross-section according to rated input current I_{Mains} at rated load. - Motor cable: Cross-section according to rated output current I_N. - Electronics cables: Maximum 1.5 mm² (AWG16) without conductor end sleeves Maximum 1.0 mm² (AWG17) with conductor end sleeves
Cable lengths for individual drives	The line lengths depend on the PWM frequency. The permitted motor line lengths are listed in the "Project Planning" section of the MOVITRAC® B System Manual.
Unit output	Only connect an ohmic/inductive load (motor); do not connect a capacitive load!
Braking resistor connection	- Cut the lines to the required length. - Use 2 tightly twisted leads or a 2-core shielded power cable. Cross-section according to the rated output current of the inverter. - Protect the braking resistor with a bimetallic relay with trip class 10 or 10A (wiring diagram). Set the trip current according to the technical data of the braking resistor. - For braking resistors in the BW...-T series, you can connect the integrated thermostat using a 2-core, shielded cable as an alternative to a bimetallic relay. - The flat-design braking resistors have internal thermal overload protection (fuse cannot be replaced). Install the flat-design braking resistors together with the appropriate touch guard.
Binary outputs	Binary outputs are short-circuit proof and interference-voltage-proof up to 30 V. Higher external voltages can cause irreparable damage to the binary outputs.
Interference emission	Use shielded motor lines for an EMC compliant installation.

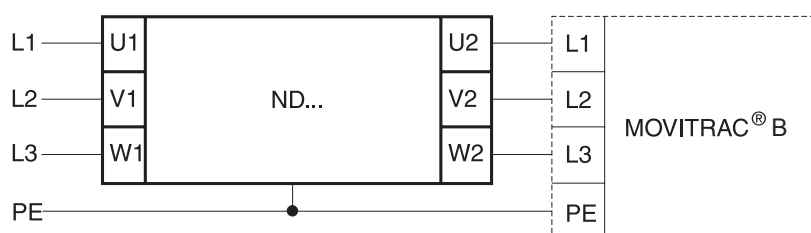


Switched inductances	- Use suppressors to suppress interference on contactors, relays, solenoid valves, etc. - The minimum distance to the inverter must be 150 mm.
Line filter	MOVITRAC® B frequency inverters have an integrated line filter as standard. They comply with the following limit value class to EN 55011 on the line side without further measures: 1-phase connection: B cable conducted 3-phase connection: A STOP No EMC limits are specified for interference emission in voltage supply systems without a grounded star point (IT systems). The effectiveness of line filters is severely limited.
HD output choke	- Install the output choke close to MOVITRAC® B beyond the minimum clearance. - Always route all 3 phases (not PE!) through the output choke. - If the cable is shielded, the shield should not be routed through the output choke.  In the case of the HD output choke, the cable must be wrapped around the choke 5 times. Only 5 loops are possible if the cable has a large diameter. To make up for this, 2 or 3 output chokes should be connected in series. SEW recommends connecting in series 2 output chokes in case of 4 windings and 3 output chokes in case of 3 windings.

8.2 Installation of the optional power components

8.2.1 ND... series line chokes

ND... series connecting line choke



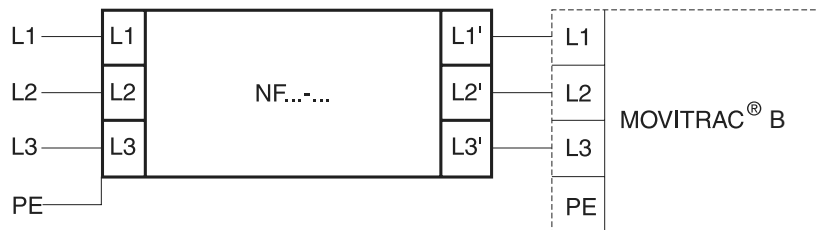


Installation

Installation of the optional power components

8.2.2 NF... series line filters

NF... connecting line filter

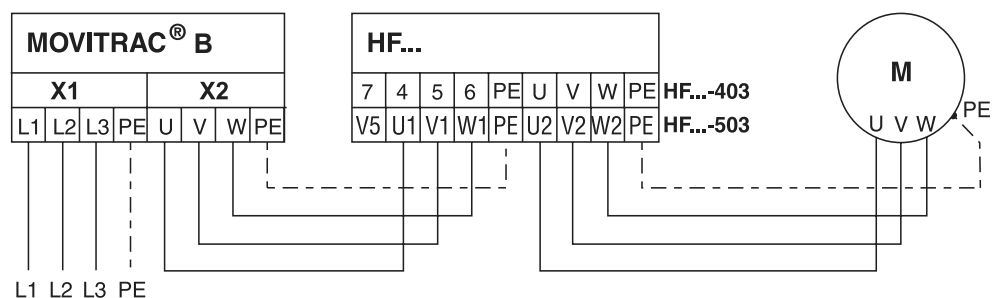


8.2.3 HF... series output filters



- Install output filters next to the corresponding inverter. Leave a ventilation space of at least 100 mm (4 in) below and above the output filter. No clearance is required on the sides.
- Limit the connection cable between the inverter and output filter to the absolute minimum length required. Maximum 1 m / 3.3 ft with unshielded cable, 10 m / 33 ft with shielded cable.
- Several motors can be connected 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.
- 2 identical output filters can be connected in parallel to one inverter output to double the rated through current. To do this, connect all like connections to the output filters in parallel.
- Output filter connection V5 (with HF...-503) or 7 (with HF...-403) must not be connected when the inverter is operated with $f_{PWM} = 4$ or 8 kHz.

Connecting HF...-... output filters





8.3 UL compliant installation

Please note the following points for UL compliant installation:

- Use only copper cables with the temperature range 60/75 °C as connection lead:
- Necessary tightening torques of MOVITRAC® B power terminals: See installation notes.
- Operation of inverters on supply systems with a maximum phase-to-earth voltage of AC 300 V only.
- The inverter can only be operated on IT systems if the phase-to-earth voltage of AC 300 V cannot be exceeded either during operation or in case of an error.
- The MOVITRAC® B frequency inverter is only allowed to be operated on supply systems which can supply maximum values in accordance with the following table. Only use melting fuses. The performance data of the fuses must not exceed the values in the following table.

8.3.1 Maximum values / fuses

The following maximum values / fuses must be observed for UL compliant installation:

230 V units	Max. supply current	Max. supply voltage	Fuses
0005 / 0008	AC 5000 A	AC 240 V	15 A / 250 V
0011 / 0015 / 0022	AC 5000 A	AC 240 V	30 A / 250 V
400/500 V units	Max. supply current	Max. supply voltage	Fuses
0005 / 0008 / 0011 / 0015	AC 5000 A	AC 500 V	15 A / 600 V
0022 / 0030 / 0040	AC 5000 A	AC 500 V	20 A / 600 V
0055 / 0075	AC 5000 A	AC 500 V	60 A / 600 V
0110	AC 5000 A	AC 500 V	110 A / 600 V
0150 / 0220	AC 5000 A	AC 500 V	175 A / 600 V
0300	AC 5000 A	AC 500 V	225 A / 600 V
0370 / 0450	AC 10000 A	AC 500 V	350 A / 600 V



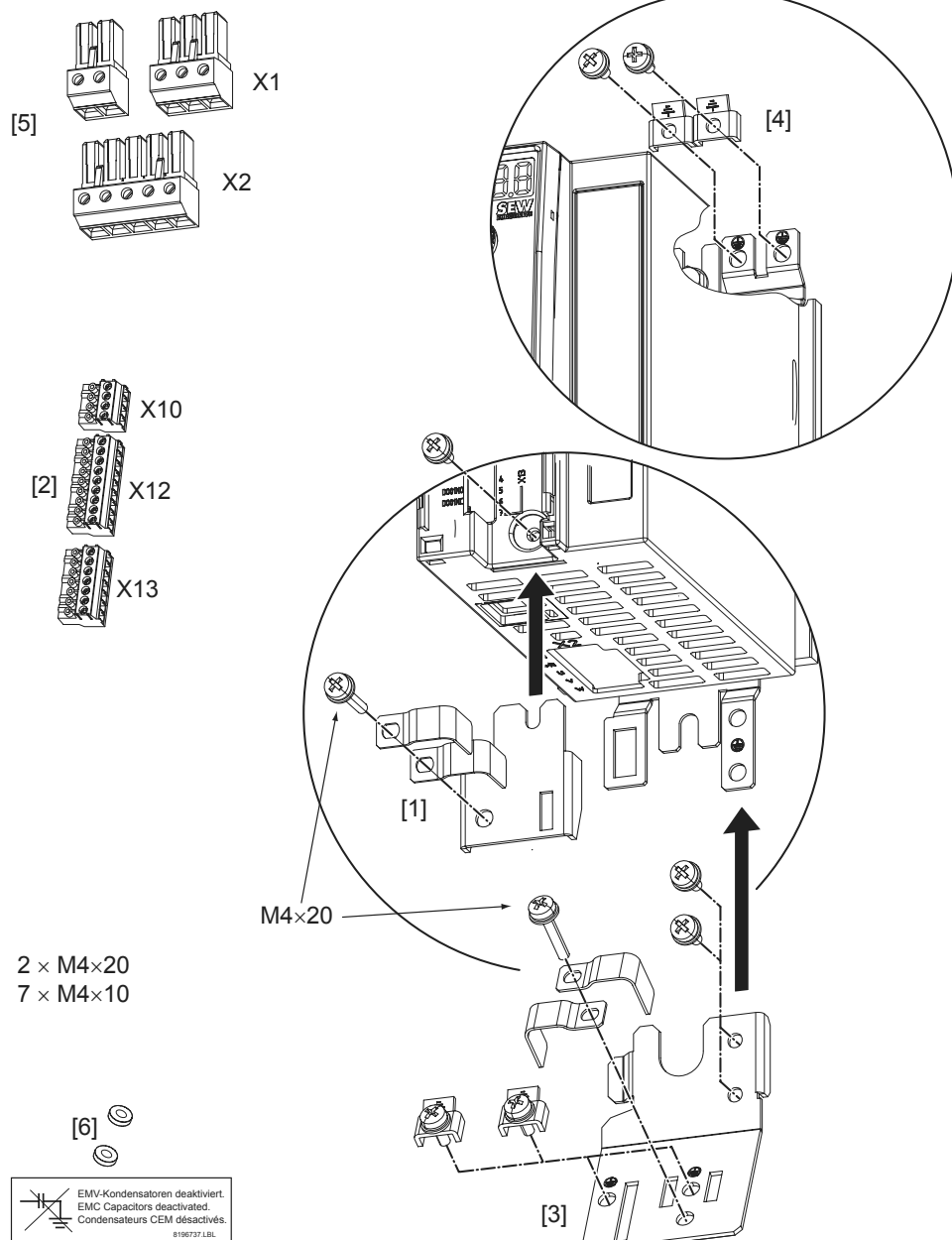
8.4 Scope of delivery and installation of loose items

8.4.1 Scope of delivery, included loose

A loose bag is included in the scope of delivery whose size varies with the size of the inverter.

Scope of delivery of loose items for size				
0XS / 0S / 0L	2S	2	3	4
- Shield plate for electronics cables with clamps and screws [1] 3 connectors for electronics terminals [2]				
Grounding terminals with screws [4]			–	–
- Shield plate for power connection with clamps and screws [3] - Connector for mains (2 or 3-pole) and motor [5] - Plastic insulations with sticker [6]		- Touch guard - Shield plate for power connection with screws		–
		–	–	• Touch guard

Loose items for size 0:

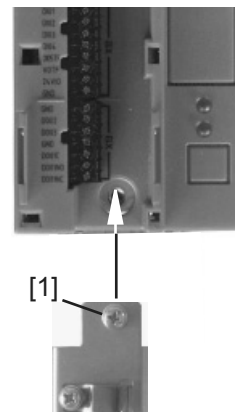




8.4.2 Installation of electronics shield clamps (all sizes)

MOVITRAC® B includes an electronics shield clamp with retaining screw as standard. Install the electronics shield clamp as follows:

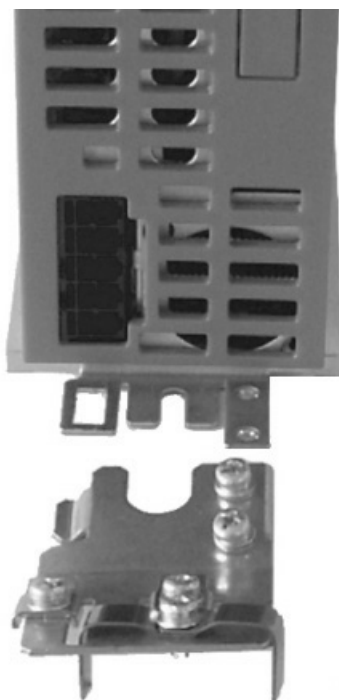
1. Remove the screw [1] from the shield clamp.
2. Install the shield clamp through the slot in the plastic housing.
3. Fasten the shield clamp.



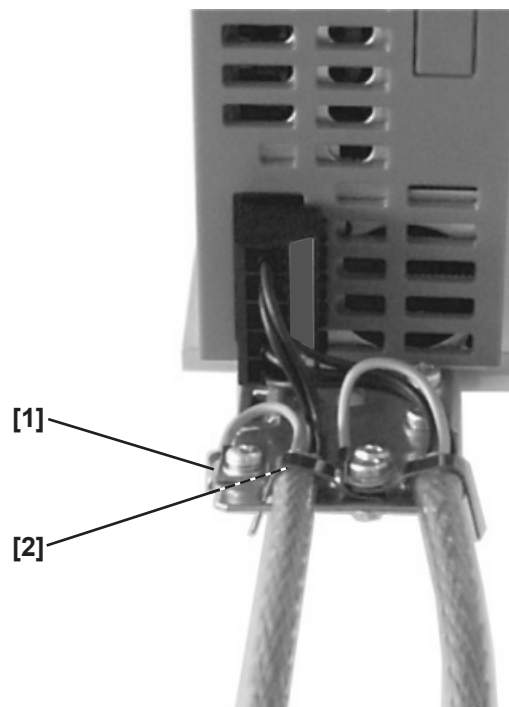
8.4.3 Power shield clamp

Size 0

A power shield clamp with 2 retaining screws is supplied as standard with MOVITRAC® B size 0. Mount this power shield clamp together with the two retaining screws.



[1] PE connection



[2] Shield clamp

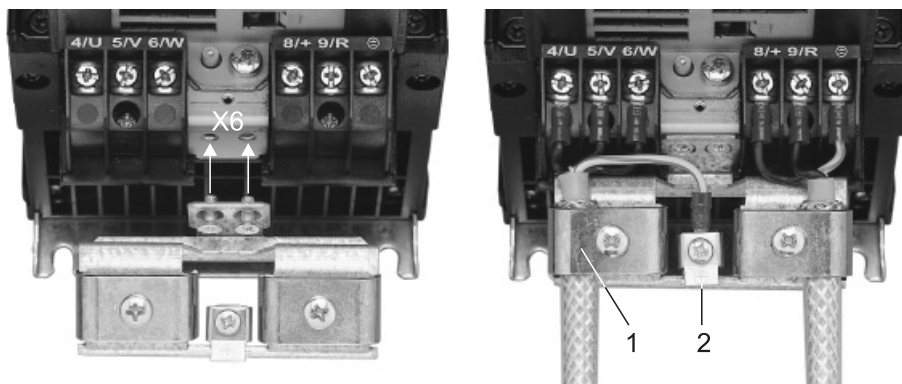


Installation

Scope of delivery and installation of loose items

Size 2S / 2

SEW-EURODRIVE supplies a power shield clamp with 2 retaining screws as standard with MOVITRAC® B size 2S / 2. Mount this power shield clamp together with the two retaining screws. The illustration shows size 2.



[1] Shield clamp

[2] PE connection

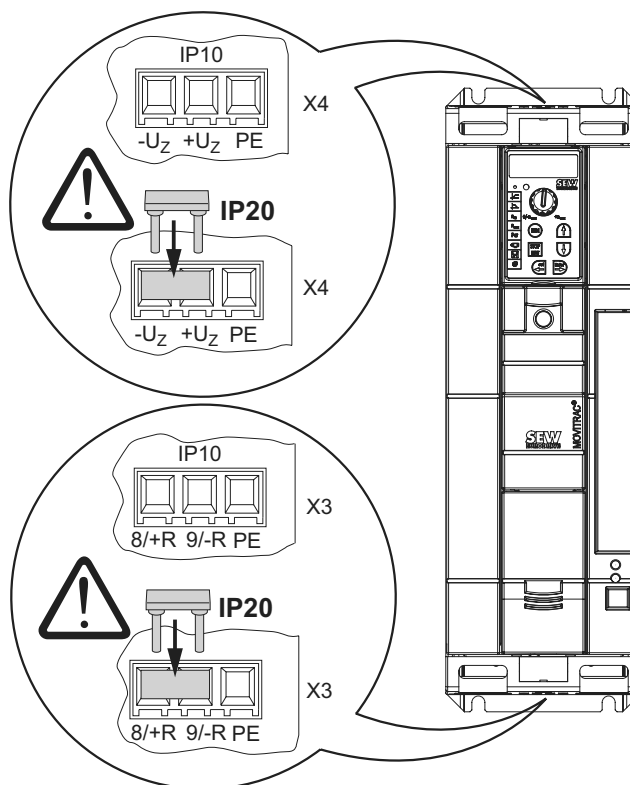
Power shield clamps provide you with a very convenient way of installing the shield for the motor and brake cables. Install the shield and PE conductor as shown in the figures.



8.4.4 Touch guard installation

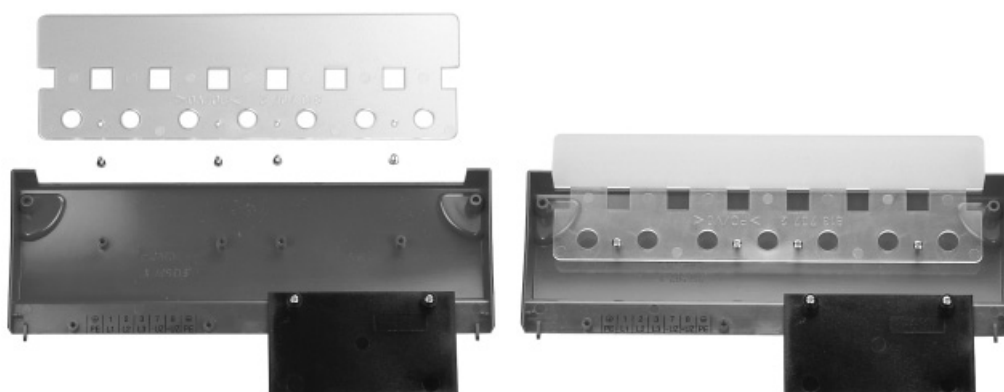
Size 2S

SEW-EURODRIVE supplies two touch guards for the DC link and braking resistor terminals as standard with MOVITRAC® B size 2S. Without touch guard, MOVITRAC® B size 2S has enclosure IP10. When the touch guard is installed, the unit has enclosure IP20.



Size 4

SEW-EURODRIVE supplies two touch guards with eight retaining screws as standard with MOVITRAC® B size 4. Install the touch guard on both covers of the power section terminals.



When the touch guard is installed, MOVITRAC® B size 4 has enclosure IP10. The units have IP00 without touch guard.



Installation

Deactivate the EMC capacitors (size 0 only)

8.4.5 Installation of Cold Plate

The dissipation of the frequency inverter power loss can take place via coolers that work with different cooling media (air, water, oil, etc.).

A good thermal connection to the cooler is important for safe operation of the frequency inverters:

- The contact area between cooler and frequency inverter has to be the size of the frequency inverter cooling plate.
- Level contact surface, deviation max. up to 0.05 mm.
- Connect cooler and cooling plate with all necessary screw connections.
- The mounting plate must not exceed 70 °C during operation. This limit must be ensured by the cooling medium.
- Cold Plate installation is not possible with FHS or FKB.

8.5 Deactivate the EMC capacitors (size 0 only)

Only electro-technical professionals should carry out any conversions. Once converted, the unit must be marked with the sticker provided in the accessory bag.

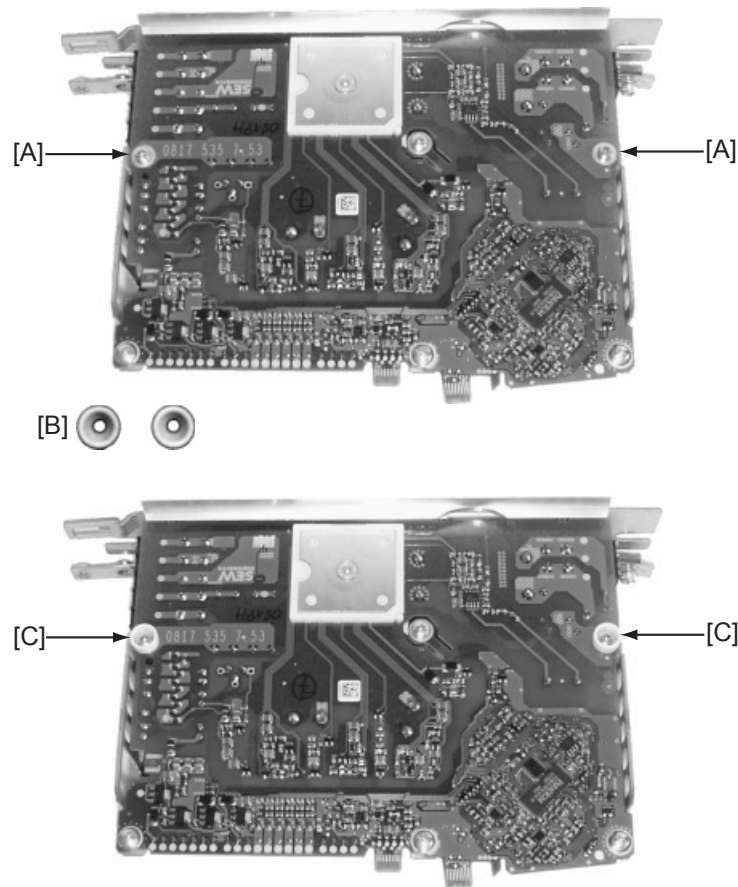
Proceed as follows to deactivate the EMC capacitors for MOVITRAC® B:



- Disconnect the inverter from the power. Switch off the 24 V DC and the supply voltage.
- Take appropriate measures to avoid electrostatic charges (use discharge strap, conductive shoes, etc.) before removing the cover.
- Touch only the unit frame and heat sink. Do not touch any electronic components.
- Open the unit:
 - Remove **all** connectors.
 - Remove the electronics shield clamp.
 - Remove the housing retaining screw in the center of the housing front.
 - Remove the housing.
- Remove the two screws [A] securing the circuit board.
- Install the screws in the provided plastic insulations [B].
- Fasten screws to the unit [C].
- Close the unit.



Deactivate the EMC capacitors:



Deactivating the EMC capacitors stops earth-leakage currents from flowing over the EMC capacitors.

- Please ensure that the earth-leakage currents are essentially only determined by the level of the DC link voltage, the PWM frequency, the applied motor line and its length and the motor used.

The EMC filter is no longer active when the suppression capacitors are deactivated.



IT systems

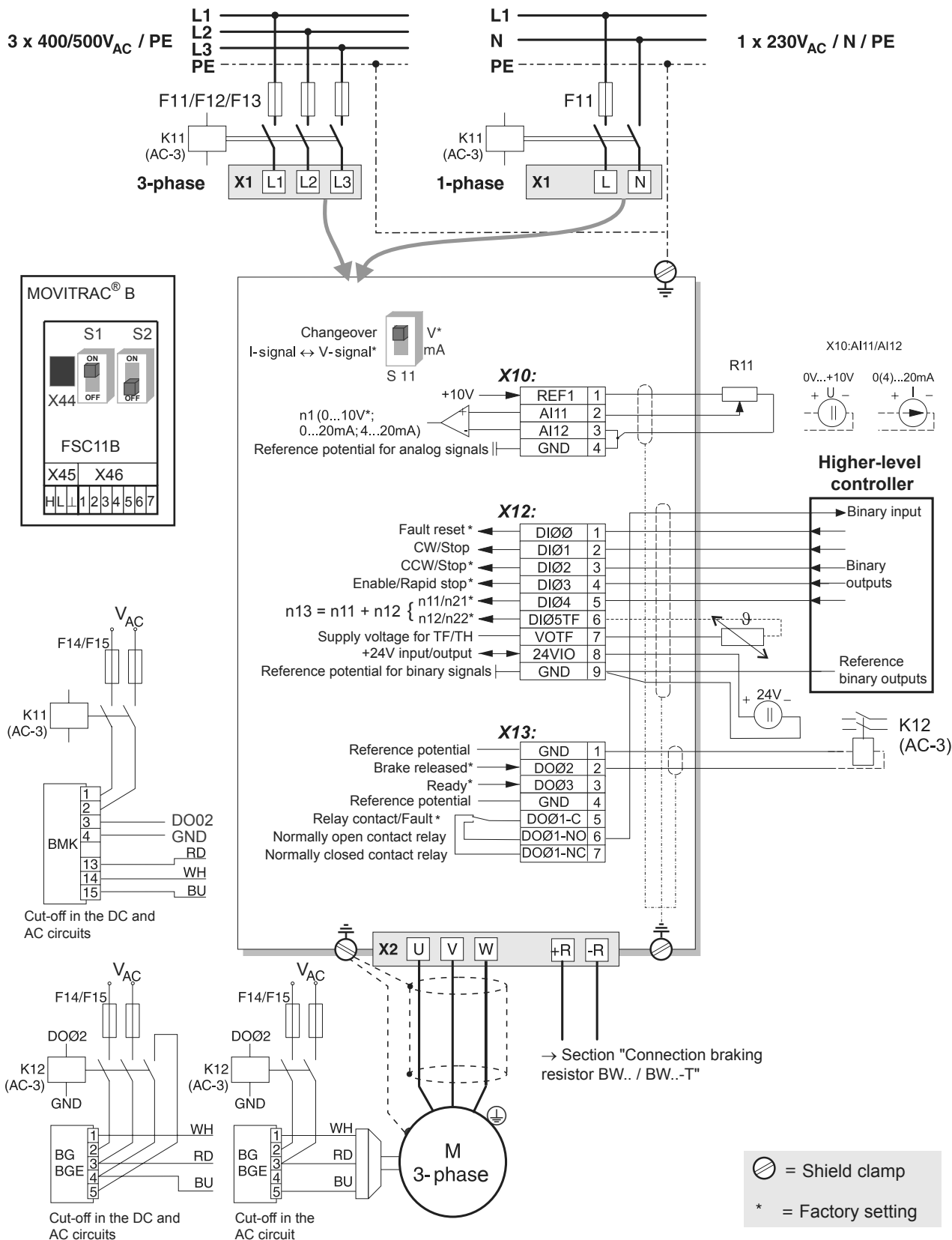
- No EMC limits are specified for interference emission in voltage supply systems without a grounded star point (IT systems).



Installation

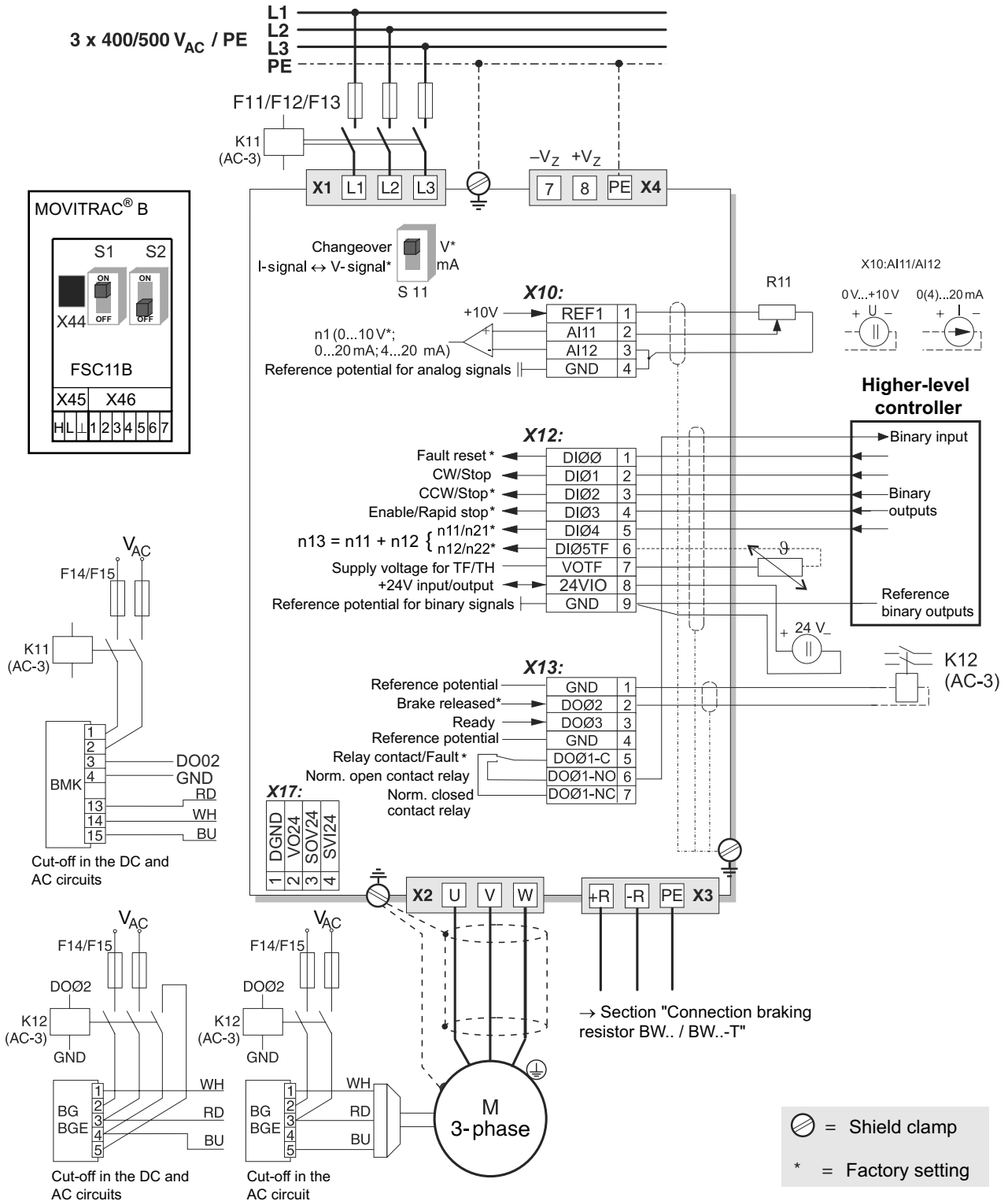
Wiring diagram 230 V 0.37 ... 2.2 kW / 400 V 0.55 ... 4.0 kW

8.6 Wiring diagram 230 V 0.37 ... 2.2 kW / 400 V 0.55 ... 4.0 kW





8.7 Wiring diagram 400 V 5.5 ... 45 kW



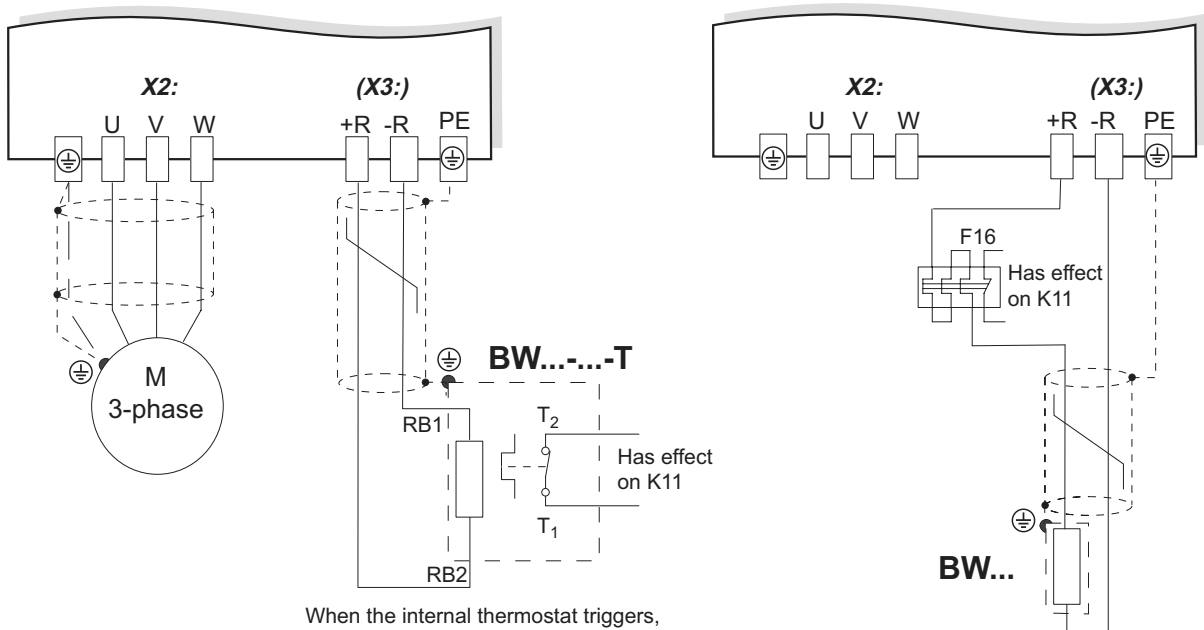


8.8 TF thermistors and TH thermostats

The winding temperature is monitored using TF thermistors or TH thermostats. The connection is made at the TF output VOTF and the TF input DI05TF of MOVITRAC®. The binary input DI05TF must be set to TF MESSAGE. The temperature is then monitored by MOVITRAC®; no additional monitoring unit is required.

A connection can also be made to 24VIO and a binary output when using TH thermostats. Set the binary input to /EXT. FAULT.

8.9 Connection braking resistor BW.. / BW..-T



When the internal thermostat triggers, K11 must be opened and DIØØ "Controller inhibit" must have a "0" signal. The resistance circuit must not be interrupted!

When the external bimetallic relay (F16) triggers, K11 must be opened and DIØØ "controller inhibit" must have a "0" signal. The resistance circuit must not be interrupted!

Overload protection for braking resistors BW:

Braking resistor type	Design specified	Overload protection	
		Internal thermostat (..T)	External bimetallic relay (F16)
BW...	—	—	Required
BW...-T ¹⁾	—	One of the two options (internal thermostat / external bimetallic relay) is required.	
BW...-003 / BW...-005	Adequate	—	Permitted

1) Permitted mounting options: On horizontal or vertical surfaces with brackets at the bottom and perforated sheets at top and bottom. **Mounting not permitted:** on vertical surfaces with brackets at the top, right or left.



8.10 Connection of the brake rectifier



The connection of the brake rectifier requires a separate supply system cable; supply from the motor voltage is not permitted!

Use contactors of utilization category AC-3 for K11 and K12 only.

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

- All hoist applications.
- Drives which require a rapid brake response time.

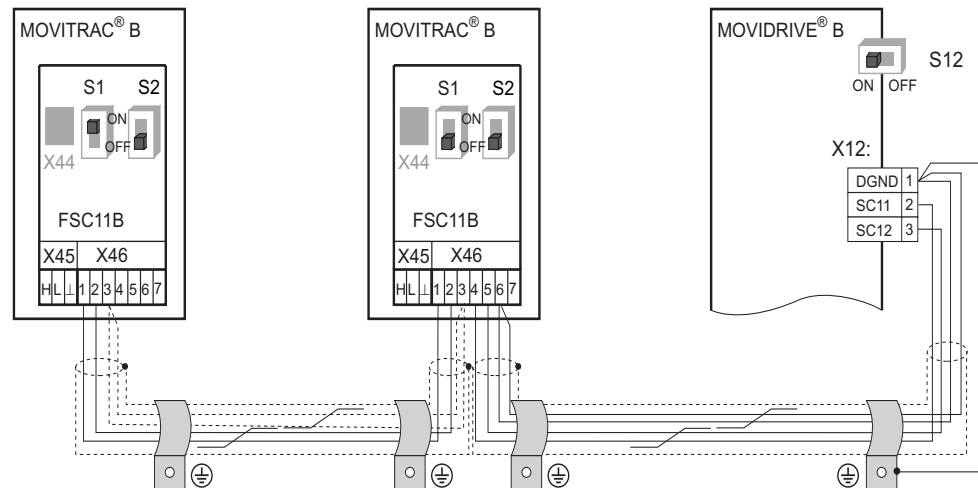
If the brake rectifier is installed in the control cabinet, route the connecting leads between the brake rectifier and the brake separately from other power cables. Routing together with other cables is only permitted if the other cables are shielded.

Note the corresponding connection regulations for brakes without BG/BGE or BME. Refer to the SEW publication "Drive Engineering – Practical Implementation, volume 4" for detailed information about this topic.

8.11 System bus (SBus) installation

Max. 64 CAN bus stations can be addressed using the system bus (SBus). Use a repeater after 20 or 30 stations, depending on the length of the cables and the cable capacity. The SBus supports transmission technology compliant with ISO 11898.

System bus connection MOVITRAC® B (different terminal strips)

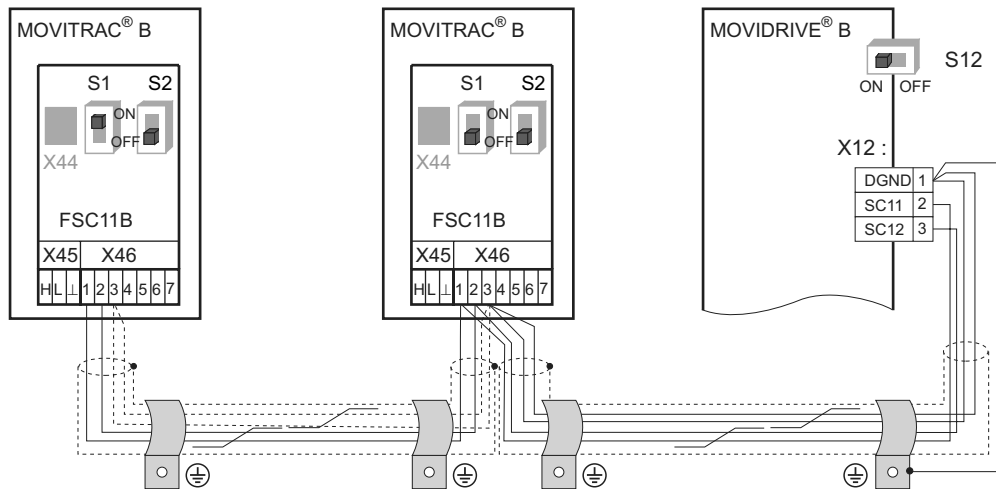




Installation

System bus (SBus) installation

System bus connection MOVITRAC® B (same terminal strips)



VIO24 = Auxiliary supply output / external voltage supply (X46:7)

GND = System bus reference (X46:6)

SC22 = System bus (X46:5)

SC21 = System bus (X46:4)

GND = System bus reference (X46:3)

SC12 = System bus (X46:2)

SC11 = System bus (X46:1)

S1 = System bus terminating resistor

S2 = OFF (reserved)

SBus MOVITRAC® B: Connect the terminating equipment to SC11/SC12.

The 24V DC function of X46:7 is identical with X12:8 of the basic unit. All GND terminals of the unit are connected to each other.

Cable specification

- Use a 4-core twisted and shielded copper cable (data transmission cable with braided copper shield). The cable must meet the following specifications:
 - Core cross-section 0,25 ... 0,75 mm² (AWG 23 ... AWG 18)
 - Line resistance 120 Ω at 1 MHz
 - Capacitance per unit length ≤ 40 pF/m at 1 kHz

Suitable cables include CAN bus or DeviceNet cables.

Shielding

- Connect the shield to the electronics shield clamp on the inverter or master controller and make sure it is connected over a wide area at both ends.
- There is no need for a ground connection for a connection between MOVITRAC® B and gateways with shielded cables.

Line length

- The permitted total cable length depends on the baud rate setting of the SBus (P884):
 - 125 kBaud: 320 m
 - 250 kBaud: 160 m
 - **500 kBaud: 80 m**
 - 1000 kBaud: 40 m

- You must use shielded cables.

Terminating resistor



- Switch on the system bus terminating resistor (S1 = ON) at the start and end of the system bus connection. Switch off the terminating resistor on the other units (S1 = OFF).

Potential displacement

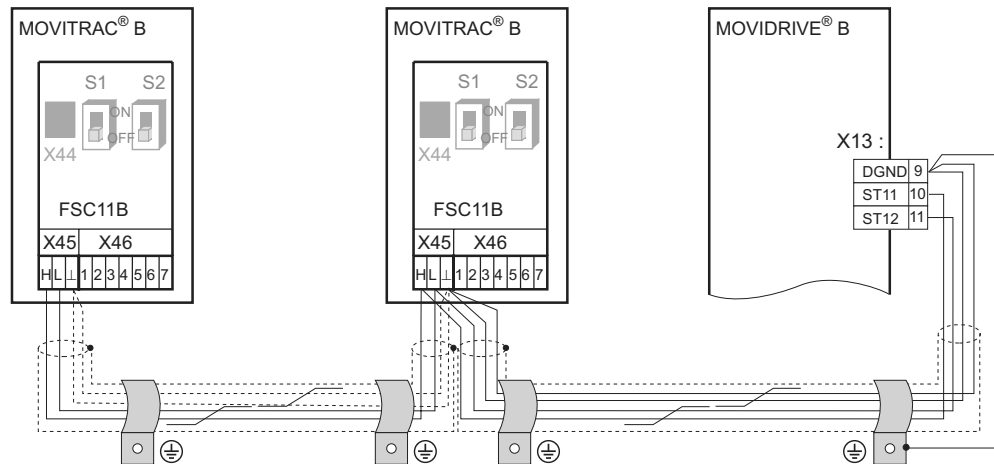
- There must not be any potential displacement between the units connected with the SBus. Take suitable measures to avoid potential displacement, such as connecting the unit ground connectors using a separate cable.



8.12 RS-485 interface installation

The RS-485 interface can be used for connecting max. 32 MOVITRAC® units, e.g. for master/slave operation, or 31 MOVITRAC® units and a master control system (PLC).

MOVITRAC® B RS-485 connection



GND = RS-485 reference (X45:ground)
ST12 = RS-485- (X45:L)
ST11 = RS-485+ (X45:H)

All GND terminals of the unit are connected to each other.

Cable specification

- Use a 4-core twisted and shielded copper cable (data transmission cable with braided copper shield). The cable must meet the following specifications:
 - Core cross-section 0.25 ... 0.75 mm² (AWG 23 ... 18)
 - Cable resistance 100 ... 150 Ω at 1MHz
 - Capacitance per unit length ≤ 40 pF/m at 1 kHz
- For example, the following cable is suitable:
 - BELDEN (www.belden.com), data cable type 3107A

Shielding

- Connect the shield to the electronics shield clamp on the inverter or higher-level controller and make sure it is connected over a wide area at both ends.

Cable length

- The permitted total cable length is 200 m.
- You must use shielded cables.

Terminating resistor



- Dynamic terminating resistors are installed. **Do not connect any external terminating resistors!**

Potential displacement

- There must not be any difference of potential between units that are connected together using the RS-485. Take suitable measures to avoid potential displacement, such as connecting the unit ground connectors using a separate cable.



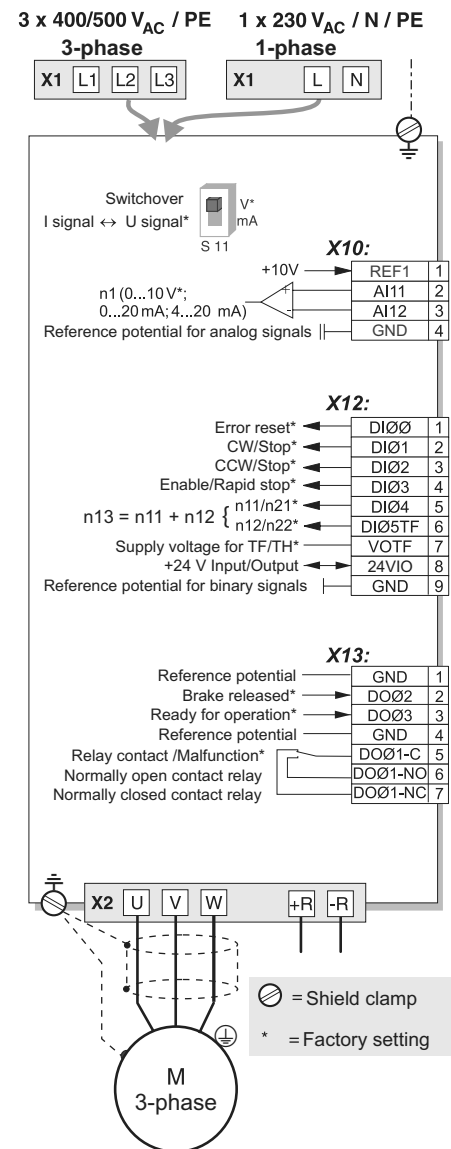
9 Startup

9.1 Startup: Brief description

The frequency inverter MOVITRAC® B can be connected directly to a motor of the same power. For example: A 1.5 kW motor can be connected directly to a MC07B0015.

9.1.1 Procedure

1. Connect the motor to the MOVITRAC® B (terminal X2).
2. You have the option of connecting a braking resistor (terminal X2).
3. The following signal terminals must be controlled with your control system:
 - Enable DI03
 - As required: CW/STOP or CCW/STOP
 - Setpoint:
 - Analog input X10 and/or
 - DI04 = n11 = 150 rpm and/or
 - DI05 = n12 = 750 rpm and/or
 - DI04 + DI05 = n13 = 1500 rpm
 - For brake motors: DO02 = brake control system using brake rectifiers
4. You have the option of connecting the following signal terminals:
 - DI00 = error reset
 - DO01 = /malfunction (designed as a relay contact)
 - DO03 = ready
5. Check the controller for required functionality.
6. Connect the frequency inverter to the mains (X1).



9.1.2 Notes

Signal terminal functions and setpoint settings can be modified using the FBG11B keypad or a PC. A PC connection requires the FSC11B front option or one of the following interface adapters: UWS21A / UWS11A / USB11A.

The MOVITRAC® B frequency inverter should only be operated in strict observance of the detailed operating instructions!



9.2 General startup instructions



It is essential to comply with the safety notes during startup!

9.2.1 Prerequisite

The drive must be configured correctly to ensure that startup is successful.

MOVITRAC® B frequency inverters are factory set to be taken into operation with the SEW motor adapted to the correct power level (4-pole, 50 Hz) in V/f control mode.

9.3 Preliminary work and resources basic unit

- Check the installation (see sec. "Installation").
- Connect the supply system and the motor.
- Connect the signal terminals.
- Switch on the power supply system.

9.4 Preliminary work and resources for MOVITRAC® B with keypad

- Check the installation (sec. "Installation").
- Connect the supply system and the motor. **Do not connect signal terminals!**
- Switch on the power supply system.
- Display shows Stop.
- Program the signal terminals.
- Set the parameters correctly (e.g. ramps).
- Check the set terminal assignment (P601 ... P622).
- Switch off the power supply system.
- Connect the signal terminals.
- Switch on the power supply system.



The inverter automatically changes parameter values once you perform a startup.



9.5 Optional keypad

Key arrangement and symbols on keypad:



9.5.1 Keypad functions

The UP / DOWN and ENTER / OUT buttons are used for navigating through the menus. Use the RUN and STOP/RESET buttons to control the drive. The setpoint generator is used for selecting setpoints.

 	Use UP / DOWN to select symbols and change the values.
 	ENTER / OUT to activate and deactivate the symbols or parameter menus
	Press "RUN" to start the drive.
	"STOP/RESET" is used for resetting errors and for stopping the drive.



The STOP/RESET button has priority over a terminal enable or an enable via the interface. If you stop a drive using the STOP/RESET key, you have to enable it again by pressing the RUN key.



Switching the power supply system off and on re-enables the inverter!

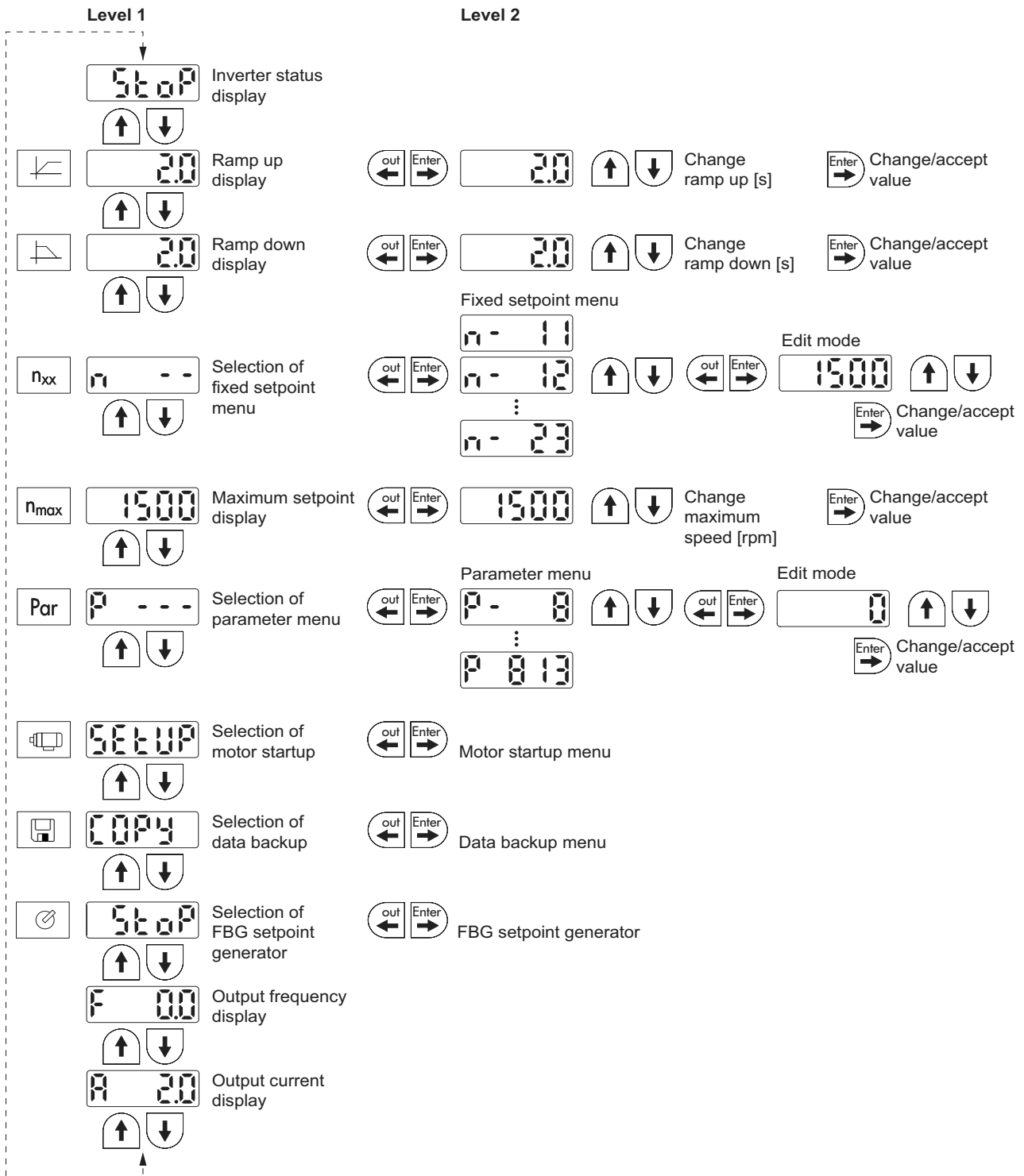
The STOP/RESET key can be used for performing a reset after an error has occurred with a programmed error response. The drive is then inhibited and must be enabled using the RUN key.



If you stop the drive with the STOP/RESET key, the display Stop flashes. This signal indicates you have to enable the drive using the "RUN" key.



9.6 Basic operation of the FBG11 keypad





9.6.1 Menu system

The LED integrated in the symbol lights up when you select a symbol. In the case of symbols, which only represent display values, the current display value appears immediately on the display.

Changing parameters

You can select the required parameter by selecting a symbol and pressing the ENTER key.

Press the ENTER key again to edit the parameter value. You can alter the value when the LED in the corresponding symbol flashes. Pressing the ENTER key again activates the value and the symbol is not flashing any longer.

9.6.2 Status displays

If the status is "Drive enabled," the display will show the calculated actual speed.

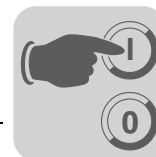
- Drive "Controller inhibit": `oFF`
- Drive "No enable": `StoP`
- Drive "enabled": `8888` (Actual speed)
- Factory settings are being restored: `SEt`
- Current at standstill: `dc`
- 24V operation. `24U`

9.6.3 Error display

In the event of an error or fault, the display changes and flashes the fault code, for example `F-11` (refer to the fault list in the "Operation and Service" section). This situation will not occur during active startup.

9.6.4 Warnings

You may not alter any parameter in any operating mode. If you try to do so, `r-19 ... r-32` appears on the display. The display shows a code depending on the action, e.g. `r-28` (controller inhibit required). You will find a list of warnings in the section "Operation and service".



9.7 FBG setpoint generator and external setpoint selection

FBG setpoint generator of the operating panel (local manual operation):

LED flashes

External setpoint selection

Control via

- Terminals
- Serial interface
- Setpoint potentiometer connected to AI11/AI12

9.7.1 FBG setpoint generator

The only relevant parameters in "manual setpoint generator" operating mode are:

- *P122 FBG manual operation*
- "RUN" and "STOP/RESET" buttons
- Setpoint generator

The LEDs and the symbol are flashing with active manual setpoint generator.

You limit the smallest speed with *P301 Minimum speed* and the largest speed with the $n_{\max}$ symbol.

After an error, a reset can be performed using the "STOP/RESET" button via the terminal or the interface. After a reset, the "manual setpoint generator" operating mode will be active once again. The drive remains stopped.

The `stop` display flashes to indicate that you have to re-enable the drive by pressing "RUN."

The *P760 Locking run/stop keys* parameter does not have any effect in "manual setpoint generator" operating mode.

Removing the FBG11B keypad will trigger a stop response.

9.7.2 External setpoint selection

Set direction of rotation

You can specify the set direction of rotation:

- "CW/STOP" and "CCW/STOP" in *P101 Control signal source* = *TERMINALS* or *P101 Control signal source* = *3-WIRE-CONTROL*
- The polarity of the setpoint in the process data word in *P101 Control signal source* = *RS485 or SBus* and *P100 Setpoint source* = *RS485 or SBus*



Startup

FBG setpoint generator and external setpoint selection

Set speed

You can specify the set speed:

- Setpoint generator (if *P121 Addition setpoint generator* is set to ON)
- *P100 Setpoint source*
 - Fixed setpoints
 - Fixed setpoints with analog input
 - Process data word from SBus or RS-485
 - Motor potentiometer

Direction of rotation enable with RS-485 or SBus

Unipolar setpoint sources:

UNIPOL./FIX.SETPT
MOTOR POTENTIOM.
FIX.SETPT+AI1
FIX.SETPT*AI1
FREQUENCY INPUT

The direction of rotation is set with the CW or CCW terminals.

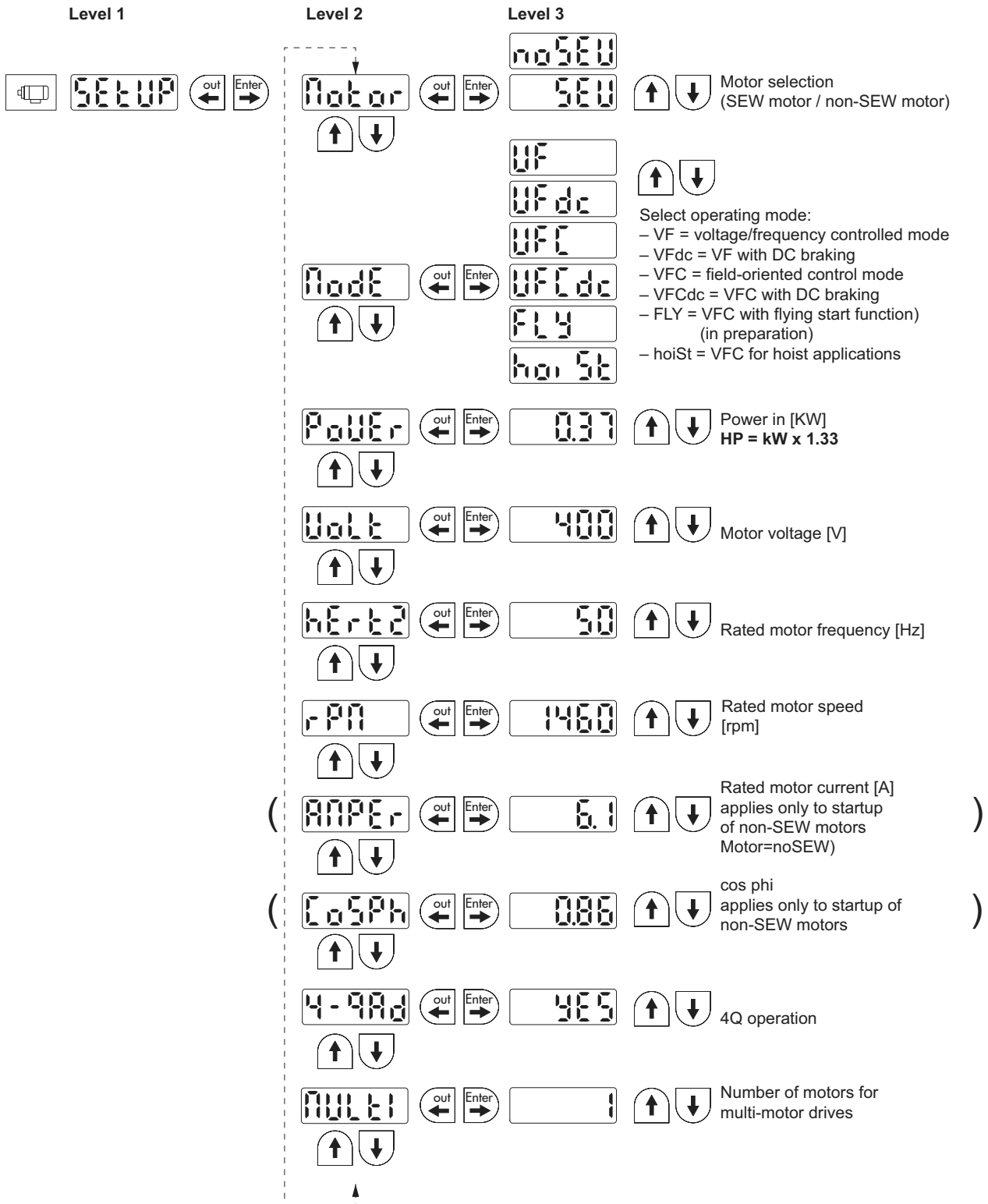
Bipolar setpoint sources:

BIPOL./FIX.SETPT
RS485
SBus

The direction of rotation is set by the setpoint. Enable with terminal CW or CCW.



9.8 Startup with the FBG keypad





Startup

Startup with the FBG keypad

9.8.1 Activating startup

Requirements:

- Drive "No enable": Stop

If a smaller or a larger motor is connected (maximum difference one size), then you have to choose the value closest to the rated motor power.

The complete startup procedure is not complete until you have returned to the main menu level by pressing the OUT key.

9.8.2 V/f

The default operating mode setting is V/f. Use this operating mode if you have no particular requirements and when a high maximum speed is required.

9.8.3 VFC

Startup the inverter in VFC or VFC + DC brake operating mode for the following requirements:

- High torque
- Continuous duty at low frequencies
- Accurate slip compensation
- More dynamic behavior

To do this, during startup you must select operating mode VFC or VFC + DC brake in point P-01.

9.8.4 Startup multi-motor drive

Multi-motor drives are possible with installed identical SEW motors only.

- Set the multi parameter of the motor startup to the number of connected motors.



9.8.5 Startup of group drives

You can operate a group of asynchronous motors on one inverter in V/f CHARACTERISTIC operating mode. Important:

- Select V/f operating mode
- Set the power of the largest motor
- Disable automatic adjustment P320/330
- Set Boost P321/331 to zero
- Set IxR compensation P322/332 to zero
- Set slip compensation P324/334 to zero
- Set current limit P303/313 to 1.5 times the total current of all motors
- Set I_N -UL monitoring P345/346 to the total current of the connected motors. Motor protection must be implemented individually.

In this operating mode, the inverter operates without slip compensation and with a constant V/f ratio.



The parameter settings apply to all connected motors.



Startup

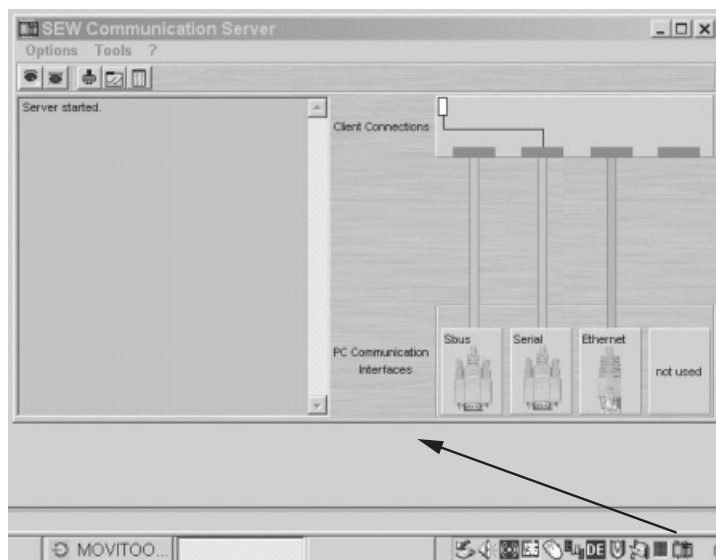
Startup with PC and MOVITOOLS® MotionStudio

9.9 Startup with PC and MOVITOOLS® MotionStudio

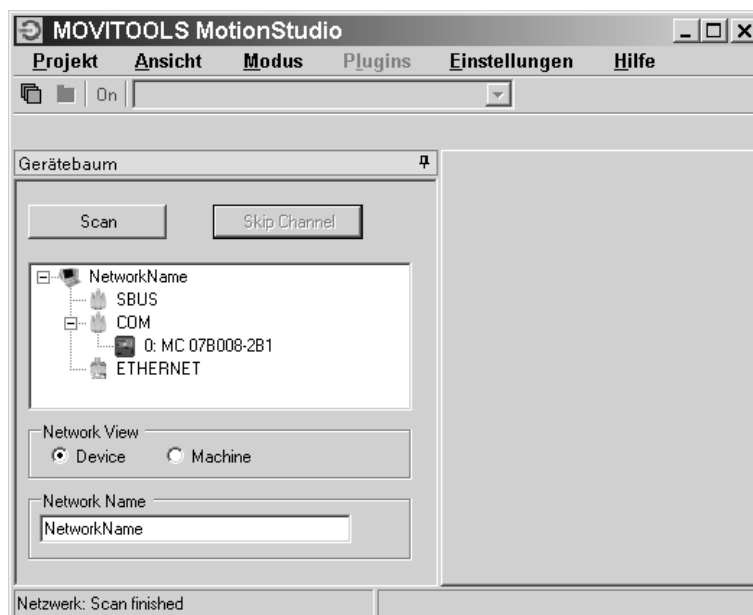
Start MOVITOOLS® MotionStudio in the Windows start menu:

Programs / SEW / MOVITOOLS MotionStudio 5.x / MotionStudio 5.x

Starting the MOVITOOLS® MotionStudio will also start the SEW communication server. Configure the communication server by double-clicking the icon in the task bar.



Press the MOVITOOLS® MotionStudio [Scan] button to list all connected units in the unit tree.



You can perform a startup by making a right mouse-click on one of the units. You will find additional information in the online help.



9.10 Starting the motor

9.10.1 Analog setpoints

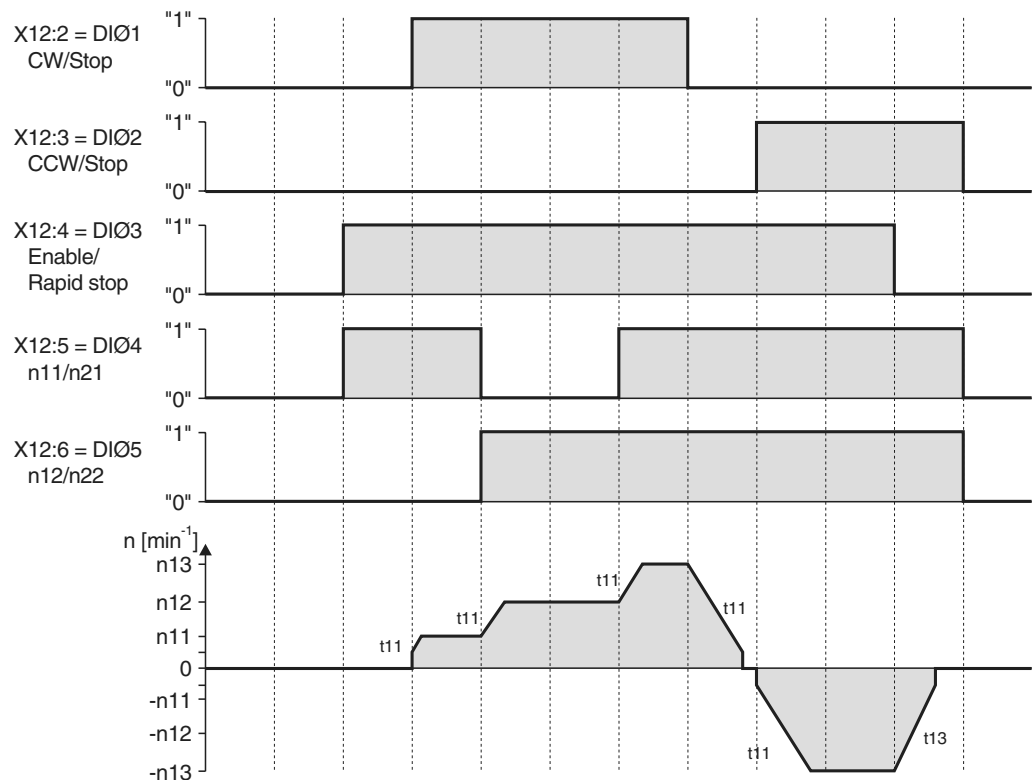
If you want to operate the drive with analog setpoints, use the table below to ensure that, when the "UNIPOL/FIX.SETPT" setpoint (P100) is selected, the correct signals are placed on the terminals X12:2 ... X12:4 (DIØ1 ... DIØ3).

Terminal Function	X10:2/3 Analog input	X12:2 CW/Stop DIØ1	X12:3 CCW/Stop DIØ2	X12:4 Enable DIØ3
/No enable	X	X	X	0
Enable and stop	X	0	0	1
CW 50 % of $n_{\max}$	5 V	1	0	1
CW $n_{\max}$	10 V	1	0	1
CCW 50 % of $n_{\max}$	5 V	0	1	1
CCW $n_{\max}$	10 V	0	1	1

X = any / 0 = low / 1 = high

9.10.2 Fixed setpoints

The following travel cycle shows by way of example how the drive is started with the wiring of terminals X12:2...X12:6 and the internal fixed setpoints.



DIØ4 / n11 and DIØ5 / n12 active simultaneously results in n13.

Default values: $n_{11} = 150 \text{ min}^{-1}$ / $n_{12} = 750 \text{ min}^{-1}$ / $n_{13} = 1500 \text{ min}^{-1}$



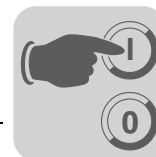
9.11 Parameter list

All parameters which can also be displayed and edited using the keypad are indicated as follows in the "FBG" (keypad) column:

-  Choice in long menu
-  Choice in short or long menu
-  Selection via symbol on keypad
-  Select in the FBG motor startup

If a choice is offered, the factory setting is indicated in **bold**.

No.	FBG	Index dec.	Name	Range / factory setting		Value after startup
				Display	MOVITOOLS® MotionStudio	
0__			Display values (read only)			
00_			Process values			
000		8318	Speed (signed)		[rpm]	
002		8319	Frequency (signed)		[Hz]	
004		8321	Output current (amount)		[% I _N]	
005		8322	Active current (signed)		[% I _N]	
008	A-Z ↔	8325	DC link voltage		[V]	
009		8310	Output current		[A]	
01_			Status displays			
010		8310	Inverter status		[Text]	
011		8310	Operating status		[Text]	
012		8310	Error status		[Text]	
014	A-Z ↔	8327	Heat sink temperature		[°C]	
02_			Analog setpoint			
020		8331	Analog input AI1		[V]	



No.	FBG	Index dec.	Name	Range / factory setting		Value after startup
				Display	MOVITOOLS® MotionStudio	
03_			Binary inputs			
030			Binary input DI00		Error reset	
031		8335	Binary input DI01		CW/STOP (fixed assignment)	
032		8336	Binary input DI02		CCW/STOP	
033		8337	Binary input DI03		ENABLE/RAP.STOP	
034		8338	Binary input DI04		n11/n21	
035		8339	Binary input DI05		n12/n22	
039		8334	Binary inputs DI00 ... DI05		Binary display	
05_			Binary outputs			
051		8350	Binary output DO01		/FAULT	
052		8351	Binary output DO02		BRAKE RELEASED	
053		8916	Binary output DO03		READY FOR OPERATION	
059		8349	Binary outputs DO01, DO02		Binary display	
07_			Unit data			
070		8301	Unit type		[Text]	
071		8361	Rated output current		[A]	
076		8300	Firmware basic unit		[Part number and version]	
08_			Error memory			
080	A-Z ↕		Error t-0	Fault code	Background information for previous errors.	
09_			Bus diagnostics			
094	A-Z ↕	8455	PO1 setpoint		[hex]	
095	A-Z ↕	8456	PO2 setpoint		[hex]	
096	A-Z ↕	8457	PO3 setpoint		[hex]	
097		8458	PI1 actual value		[hex]	
098		8459	PI2 actual value		[hex]	
099		8460	PI3 actual value		[hex]	



Startup Parameter list

No.	FBG	Index dec.	Name	Range / factory setting		Value after startup
				Display	MOVITOOLS® MotionStudio	
1__			Setpoints / Ramp generators (on FBG only parameter set 1)			
10_			Setpoint selection			
100		8461	Setpoint source	0 1 2 4 6 7	BIPOL./FIX.SETPT: UNIPOL./FIX.SETPT RS-485 MOTOR POTENTIOMETER FIX.SETPT. + AI1 FIX.SETPT * AI1	
101		8462	Control signal source	0 1 3 4	TERMINALS RS-485 SBus 3-WIRE CONTROL	
102		8840	Frequency scaling	Setting range 0.1 ... 10 ... 120.00 [kHz]		
11_			Analog Input 1 (0 ... 11 V)			
110		8463	AI1 scaling	0.1... 1 ... 10		
112		8465	AI1 operating mode	0 1 2 5 6	0-10 V / 3000 rpm N-MAX (0 – 10 V) V-Off., N-MAX N-MAX (0 – 20 mA) N-MAX (4 – 20 mA)	
113		8466	Setpoint voltage offset	–10 V ... 0 ... +10 V		
12_			Speed ramps 1 / 2			
121		8811	Addition setpoint generator	0 1 2	OFF ON ON EXCEPT FSP	
122		8799	FBG manual operation	0 1 2	UNIPOLAR CW UNIPOLAR CCW BIPOLAR CW + CCW	
13_ / 14_			Setpoint generator of the FBG keypad			
130 / 140		8807 / 9264	Ramp t11 / t21up	0.1 ... 2 ... 2000 [s]		
131 / 141		8808 / 9265	Ramp t11 / t21 down	0.1 ... 2 ... 2000 [s]		
136 / 146		8476 / 8484	Stop ramp t13 / t23	0.1 ... 2 ... 20 [s]		
15_			Motor potentiometer			
150		8809	Ramp t3 up = down	0.2 ... 20 ... 50 [s]		
152		8488	Save last setpoint	off on	OFF ON	



No.	FBG	Index dec.	Name	Range / factory setting		Value after startup
			Display	MOVITOOLS® MotionStudio		
16_ / 17_			Fixed setpoints			
160 / 170		8489 / 8492	Internal setpoint n11 / n21 PI controller activated	0 ... 150 ... 5000 [rpm] 0 ... 3 ... 100 [%]		
161 / 171		8490 / 8493	Internal setpoint n12 / n22 PI controller activated	0 ... 750 ... 5000 [rpm] 0 ... 15 ... 100 [%]		
162 / 172		8491 / 8494	Internal setpoint n13 / n23 PI controller activated	0 ... 1500 ... 5000 [rpm] 0 ... 30 ... 100 [%]		
2__			Controller parameters			
25_			PI controller			
250		8800	PI controller	0 1 2	OFF ON STANDARD ON INVERTED	
251		8801	P-gain	0 ... 1 ... 64		
252		8802	I-component	0 ... 1 ... 2000 [s]		
253		8465	PI actual value mode	0 1 5 6	0 ... 10 V 0 ... 10 V 0 ... 20 mA 4 ... 20 mA	
254		8463	PI actual value scaling	0.1... 1.0 ... 10.0		
255		8812	PI actual value offset	0.0 ... 100.0 [%]		
3__			Motor parameters (on FBG only parameter set 1)			
30_ / 31_			Limits 1 / 2			
300 / 310		8515 / 8519	Start/stop speed 1 / 2	0 ... 150 [rpm]		
301 / 311		8516 / 8520	Minimum speed 1 / 2	0 ... 15 ... 5500 [rpm]		
302 / 312		8517 / 8521	Maximum speed 1 / 2	0 ... 1500 ... 5500 [rpm]		
303 / 313		8518 / 8522	Current limit 1 / 2	0 ... 150 [% I _N]		
32_ / 33_			Motor adjustment 1 / 2			
320 / 330		8523 / 8528	Auto adjustment 1 / 2	Off On	OFF ON	
321 / 331		8524 / 8529	Boost 1 / 2	0 ... 100 [%]		
322 / 332		8525 / 8530	IxR adjustment 1 / 2	0 ... 100 [%]		



Startup Parameter list

No.	FBG	Index dec.	Name	Range / factory setting		Value after startup
				Display	MOVITOOLS® MotionStudio	
323 / 333	A-Z ↕	8526 / 8531	Premagnetization time 1 / 2	0 ... 2 [s]		
324 / 334	A-Z ↕	8527 / 8532	Slip compensation 1 / 2	0 ... 500 [rpm]		
325	A-Z ↕	8834	No-load vibration damping	Off On	OFF ON	
345 / 346	A-Z ↕	9114 / 9115	I _N -UL monitoring 1 / 2	0.1 ... 500 A		
4__			Reference signals			
40_						
400	A-Z ↕	8539	Speed reference value	0 ... 750 ... 5000 [rpm]		
401	A-Z ↕	8540	Hysteresis	0 ... 100 ... +500 [rpm]		
402	A-Z ↕	8541	Delay time	0 ... 1 ... 9 [s]		
403	A-Z ↕	8542	Signal = "1" if:	0	n < n _{ref} n > n _{ref}	
45_			PI controller reference signal			
450	A-Z ↕	8813	PI actual value reference			
451	A-Z ↕	8796	Signal = "1" if:	0 1	PI actual value > PI reference	
5__			Monitoring functions (on FBG only parameter set 1)			
50_			Speed monitoring 1 / 2			
500 / 502	A-Z ↕	8557 / 8559	Speed monitoring 1 / 2	0	OFF ON	
501 / 503	A-Z ↕	8558 / 8560	Delay time 1 / 2	0 ... 1 ... 10 [s]		
6__			Terminal assignment			
60_			Binary inputs			
601	abc ↕	8336	Binary input DI02		0: NO FUNCTION 1: ENABLE/STOP (factory setting DI03) 2: CW/STOP 3: CCW/STOP (factory setting DI02) 4: n11/n21 (factory setting DI04) 5: n12/n22 (factory setting DI05) n13 = n11 + n12 6: FIXED SETP. SELECT 7: PARAMETER SET 2 9: MOTORPOT. UP 10: MOTORPOT. DOWN 11: /EXT. ERROR 12: ERROR RESET (factory setting DI00) 20: ACCEPT SETPOINT 26: TF RESPONSE (only with DI05) 30: CONTROLLER INHIBIT	
602	abc ↕	8337	Binary input DI03			
603	abc ↕	8338	Binary input DI04			
604	abc ↕	8339	Binary input DI05			
608	abc ↕	8844	Binary input DI00			

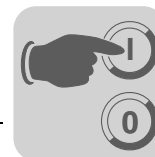


No.	FBG	Index dec.	Name	Range / factory setting		Value after startup
				Display	MOVITOOLS® MotionStudio	
62_			Binary outputs			
620		8350	Binary output DO01		0: NO FUNCTION 1: /FAULT (factory setting DO01) 2: READY (factory setting DO03) 3: OUTPUT STAGE ON 4: ROTATING FIELD ON 5: BRAKE RELEASED (factory setting DO02) 9: SPEED REFERENCE 11: SP/ACT.VAL.COMP. 23: PI ACTUAL VALUE REF.	
621		8351	Binary output DO02			
622		8916	Binary output DO03			
7_			Control functions (on FBG only parameter set 1)			
70_			Operating mode			
700 / 701		8574 / 8575	Operating mode 1 / 2	0 2 3 4 21 22	VFC 1 VFC & HOIST VFC 1 & DC BRAK. VFC & FLY.START V/f CHARACTERISTICS V/f CHARACTERISTIC & DC BRAKING	
71_			Standstill current function 1 / 2			
710 / 711		8576 / 8577	Standstill current function 1 / 2	0 ... 50% I _{Mot}		
72_			Setpoint stop function 1 / 2			
720 / 723		8578 / 8581	Setpoint stop function 1 / 2	Off On	OFF ON	
721 / 724		8579 / 8582	Stop setpoint 1 / 2	0 ... 30 ... 500 [rpm]		
722 / 725		8580 / 8583	Start offset 1 / 2	0 ... 30 ... 500 [rpm]		
73_			Brake function 1 / 2			
731 / 734		8749 / 8750	Brake release time 1 / 2	0 ... 2 [s]		
732 / 735		8585 / 8587	Brake application time 1 / 2	0 ... 2 [s]		
76_			Manual operation			
760		8798	Lockout run/stop keys	Off On	OFF ON	
8_			Unit functions (on FBG only parameter set 1)			
80_			Setup			
800		–	Short menu	long short		
802		8594	Factory setting	no Hours ALL	0 / NO 1 / STANDARD 2 / DELIVERY STATUS	
803		8595	Parameter lock	Off On	OFF ON	
804		8596	Reset statistics data		NO ERROR MEMORY	



Startup Parameter list

No.	FBG	Index dec.	Name	Range / factory setting		Value after startup
				Display	MOVITOOLS® MotionStudio	
81_			Serial communication			
810	A-Z ↔	8597	RS-485 address	0 ... 99		
811		8598	RS-485 group address	100 ... 199		
812		8599	RS-485 remote timeout	0 ... 650 [s]		
82_			Brake operation 1 / 2			
820 / 821		8607 / 8608	4-quadrant operation 1 / 2	Off On	OFF ON	
83_			Error responses			
830	A-Z ↔	8609	Response /EXT. ERROR	2 4 7	IMMEDIATE STOP/FAULT STOP/FAULT STOP/WARNING	
84_						
840		8617	Manual reset		YES NO	
86_			Modulation 1 / 2			
860 / 861	A-Z ↔	8620 / 8621	PWM frequency 1 / 2	4 8 12 16	4 kHz 8 kHz 12 kHz 16 kHz	
862 / 863	A-Z ↔	8751 / 8752	PWM fix 1 / 2	on off	ON OFF	
87_			Fieldbus parameter setting			
870		8304	Setpoint description PO1		NO FUNCTION (factory setting P872) SPEED (factory setting P871) MAX. SPEED RAMP CONTROL WORD 1 (factory setting P870) SPEED [%] PI CTRL SETPOINT	
871		8305	Setpoint description PO2			
872		8306	Setpoint description PO3			
873		8307	Actual value description PI1		NO FUNCTION SPEED (factory setting P874) OUTPUT CURRENT (factory setting P875) ACTIVE CURRENT STATUS WORD 1 (factory setting P873) SPEED [%] IPOS PI-DATA PI CTRL [%]	
874		8308	Actual value description PI2			
875		8309	Actual value description PI3			
876		8622	PO data enable		OFF ON	



No.	FBG	Index dec.	Name	Range / factory setting		Value after startup
				Display	MOVITOOLS® MotionStudio	
88_			Serial communication SBus			
881	abc ↔	8600	SBus address	0 ... 63		
882		8601	SBus group address	0 ... 63		
883	A-Z ↔	8602	SBus timeout delay	0 ... 650 [s]		
884	A-Z ↔	8603	SBus baud rate	125 250 500 1000	125 kBaud 250 kbaud 500 kBaud 1000 kbaud	



10 Operation and service

10.1 Device information

10.1.1 Error memory

The inverter stores the error message in fault memory P080. The inverter does not save a new error until the error message has been acknowledged. The local operating panel shows the most recent error. Whenever double errors occur, the value stored in P080 does not correspond to the value displayed on the operating panel. This is an example of what happens with F-07 DC link overvoltage followed by F34 Ramp timeout.

The inverter stores the following information when a malfunction occurs:

- Error which has occurred
- Status of the binary inputs / binary outputs
- Operating status of the inverter
- Inverter status
- Heat sink temperature
- Speed
- Output current
- Active current
- Unit utilization
- DC link voltage

10.1.2 Switch-off responses

There are 3 switch-off responses depending on the error:

Response	Description
Immediate stop	This fault response causes immediate locking of the output stage with simultaneous control of the brake output so that an existing brake is applied. The "fault message" is set and the "ready message" is revoked. This fault status can only be exited by an explicit fault reset.
Stop	This fault response causes a stop at the set stop ramp. This fault stop is subject to time monitoring. If the drive does not reach the start / stop speed within a specified time period, the unit jumps to the fault state, the output stage is inhibited and an existing brake is applied. The fault message "F34 Ramp timeout" is generated. The original fault message is overwritten. If the drive reaches the start / stop speed, the unit jumps to the fault message, the brake is applied and the output stage is inhibited. The "fault message" is set and the "ready message" is revoked. This status can only be exited by an explicit fault reset.
Timeout (warning)	The shutdown response causes a stop at the set rapid stop ramp. The stop is subject to time monitoring as for the "fault stop". If the drive reaches the start / stop speed, the unit jumps to the warning state, the brake is applied and the output stage is inhibited. The "fault message" is set and the "ready message" remains set. An explicit fault reset is not possible. The fault is reset when communication is made again or the timeout is set to 0 s.



10.1.3 Reset basic unit

An error message can be acknowledged by:

- Reset via input terminals with an appropriately assigned binary input (DIØØ, DIØ2...DIØ5). Factory setting for DIØØ is error reset.

10.1.4 Reset keypad

An error message can be acknowledged by:

- Manual reset on the keypad (STOP/RESET key).

The STOP/RESET key has priority over a terminal enable or an enable via the interface.

The STOP/RESET key can be used for performing a reset after an error has occurred with a programmed error response. A reset inhibits the drive. To enable the drive, press the RUN key.

10.1.5 Reset interface

An error message can be acknowledged by:

- Manual reset in MOVITOOLS® (*P840 Manual reset = YES* or in status display of reset button).

10.1.6 Timeout active

If the inverter is controlled via a communication interface (RS-485 or SBus) and the mains power was switched off and back on again, then the enable remains ineffective until the inverter once again receives valid data via the interface, which is monitored with a timeout.

10.1.7 Current limit

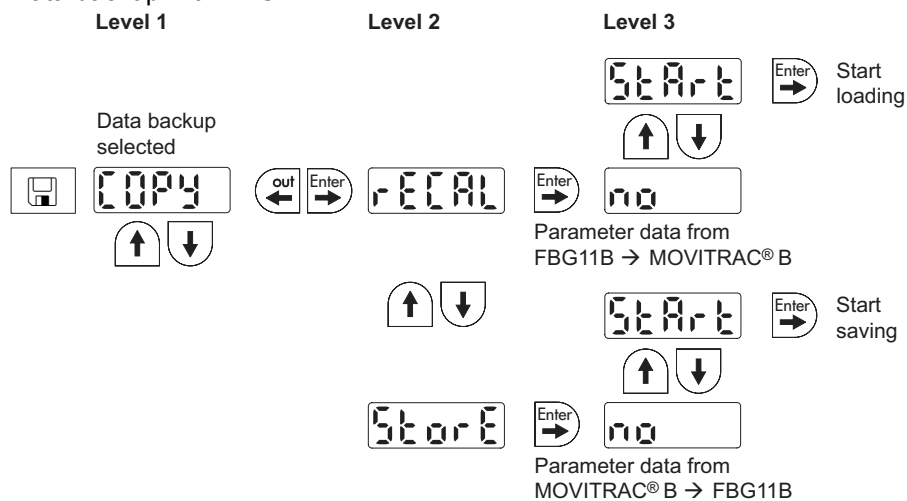
The operation LED will start flashing green when the current limit is reached.



10.2 Data backup with FBG11B

Use the FBG11B keypad to download parameter data from the MOVITRAC® B to the keypad or copy from the keypad to the MOVITRAC® B.

Data backup with FBG11B





10.3 List of errors (F-00 ... F-97)

No.	Designation	Response	Possible cause	Measure
00	No error			
01	Over-current	Immediate switch-off with inhibit	- Short circuit output - Output switching - Motor too large - Faulty output stage	- Rectify the short circuit - Switching with inhibited output stage only - Connect a smaller motor - Consult SEW Service if the error still cannot be reset
03	Ground fault	Immediate switch-off with inhibit	- Ground fault in motor - Ground fault in inverter - Ground fault in the motor supply lead - Overcurrent (see F-01)	- Replace motor - Replace MOVITRAC® B - Eliminate ground fault - See F-01
04	Brake chopper	Immediate switch-off with inhibit	- Too much regenerative power - Braking resistor circuit interrupted - Short circuit in the braking resistor circuit - Brake resistor has too high resistance - Brake chopper defective - Ground fault	- Extend deceleration ramps - Check supply cable to the braking resistor - Rectify the short circuit - Check technical data of braking resistor - Replace MOVITRAC® B - Eliminate ground fault
06	Phase failure in supply system (only applies to 3-phase inverter)	Immediate switch-off with inhibit	- Phase failure - Supply voltage too low	- Check the supply system lead - Check the supply voltage
07	DC link overvoltage	Immediate switch-off with inhibit	- DC link voltage too high - Ground fault	- Extend deceleration ramps - Check supply cable to the braking resistor - Check technical data of braking resistor - Eliminate ground fault
08	Speed monitoring	Immediate switch-off with inhibit	Current controller works at the set limit due to: - Mechanical overload - Phase failure in supply system - Phase failure in motor Maximum speed for VFC operating modes exceeded	- Reduce load - Increase deceleration time setting P501 - Check current limitation - Extend deceleration ramps - Check mains phases - Check motor cable and motor - Reduce maximum speed
10	ILLOP	Stop with inhibit	- Wrong command during command execution - Incorrect conditions during command execution. - Function does not exist / is not implemented in the inverter	- Check the program - Check program run - Use another function
11	Overtemperature	Stop with inhibit	Thermal overload of inverter	- Reduce load and / or ensure adequate cooling - If a braking resistor is integrated in the heat sink: Install braking resistor externally



Operation and service

List of errors (F-00 ... F-97)

No.	Designation	Response	Possible cause	Measure
17-24	System error	Immediate switch-off with inhibit	Malfunction of inverter electronics, possibly due to EMC influence	Check grounding and shielding and improve, if necessary. Contact SEW Service for advice if this reoccurs.
25	EEPROM	Stop with inhibit	Error when accessing EEPROM	Activate factory settings, perform reset and reset parameters. Contact SEW Service for advice if this error reoccurs.
26	External terminal	programmable	Read external error signal via programmable input	Eliminate specific cause of error; reprogram terminal if necessary.
31	TF trip	Stop with inhibit	- Motor too hot, TF sensor has tripped - TF sensor of motor not connected or connected incorrectly - Connection of MOVITRAC® B and TF on motor interrupted	- Let motor cool off and reset error - Check connections/links between MOVITRAC® B and TF.
32	Index overflow	Emergency stop	Programming principles violated which leads to system-internal stack overflow.	Check user program and correct it
34	Ramp timeout	Immediate switch-off with inhibit	- Set ramp time exceeded. - If you remove the inhibit and the drive exceeds the stop ramp time t13 by a certain time, the inverter will signal F34.	- Extend the ramp time - Extend the stop ramp time
37	Watchdog timer	Immediate switch-off with inhibit	Error in system software sequence	Check grounding and shielding and improve, if necessary. Contact SEW Service for advice if this reoccurs.
38	System software	Immediate switch-off with inhibit	System error	Check grounding and shielding and improve, if necessary. Contact SEW Service for advice if this reoccurs.
43	RS-485 timeout	Stop without inhibit ¹⁾	Connection between inverter and PC interrupted.	Check connection between inverter and PC.
44	Unit utilization	Immediate switch-off with inhibit	Unit utilization (Ixt value) exceeded	- Decrease power output - Extend ramps - If these points are not possible: Use a larger inverter
45	Initialization	Immediate switch-off with inhibit	Error during initialization	Contact SEW Service for advice.
46	System bus 2 timeout	Stop without inhibit	Error during communication via system bus	Check system bus connection
47	System bus 1 timeout	Stop without inhibit	Error during communication via system bus	Check system bus connection
77	Control word	–	System error	Contact SEW Service for advice.



No.	Designation	Response	Possible cause	Measure
81	Start condition	Immediate switch-off with inhibit	Only in "VFC hoist" operating mode: The motor could not be supplied with the correct amount of current during the pre-magnetizing time: - Rated motor power too small in relation to rated inverter power. - Motor cable cross-section too small	- Check connection between inverter and motor - Check startup data and perform new startup, if necessary. - Check cross-section of motor cable and increase if necessary.
82	Open output	Immediate switch-off with inhibit	Only in "VFC hoist" operating mode: 2 or all output phases interrupted - Rated motor power too small in relation to rated inverter power	- Check connection between inverter and motor - Check startup data and perform new startup, if necessary.
84	UL motor protection	Stop with inhibit	Motor utilization too high.	- Check P345/346 I_N-U_L monitoring - Reduce load - Extend ramps - Long pause times
94	EEPROM checksum	Immediate switch-off with inhibit	Defective EEPROM	Contact SEW Service.
97	Copy error	Immediate switch-off with inhibit	- Parameter module is removed during copying process - Switching off/on during copying process	Prior to confirming the error: Load factory setting or complete data set from parameter module

1) No reset required, error message disappears after communication is reestablished

10.4 Return codes (r-19 ... r-38)

Return codes MOVITRAC® B:

No.	Designation	Meaning
19	Parameter lock activated	Parameters cannot be changed
20	Factory settings being reactivated	Parameters cannot be changed
28	Controller inhibit required	Controller inhibit required
29	Invalid value for parameter.	- Invalid value for parameter. - FBG manual operation selection invalid as PC is in active manual operation.
32	Enable	You cannot perform this function in ENABLED status
34	Error in sequence	- Fault when saving in FBG11B. - Startup did not occur. Perform FBG startup with MotionStudio or select a new motor.
38	FBG07B incorrect data set	Stored data set does not match the unit



10.5 Status displays

10.5.1 Keypad

If the status is "Drive enabled," the display will show the calculated actual speed.

Status	Display
Drive "Controller inhibit"	oFF
Drive "No enable"	StoP
Drive "Enable"	8888 (Actual speed)
Factory setting	SEt (Set)
Standstill current	dc
24 V operation	24U

10.5.2 LED flash codes

The LED on the front of the unit signals the following states:

Status	Display (optional with FBG)	Color	Flash code
"ENABLE"	Speed	Green	Constant light
"ENABLE" at current limit	Speed	Green	Rapid flashing
"CURRENT AT STANDSTILL"	dc	Green	Slow flashing
"NO ENABLE"	Stop	Yellow	Constant light
"FACTORY SETTING"	SEt	Yellow	Rapid flashing
"CONTROL.INHIBIT"	oFF	Yellow	Rapid flashing
"24 V operation"	24U	Yellow	Slow flashing
FBG manual operation active or inverter stopped using "stop" button	FBG manual operation symbol or "stop" is flashing	Yellow	On long, off briefly
Timeout	Errors 43 / 46 / 47	Green / yellow	Flashing
Copy	Error 97	Red/yellow	Flashing
System error	Errors 10 / 17 ... 24 / 25 / 32 / 37 / 38 / 45 / 77 / 94	Red	Constant light
Overvoltage / phase failure	Errors 4 / 6 / 7	Red	Slow flashing
Overload	Errors 1 / 3 / 11 / 44 / 84	Red	Rapid flashing
Monitoring	Errors 8 / 26 / 34 / 81 / 82	Red	2 x flashing
TF motor protection	Errors 31 / 84	Red	3 x flashing



10.6 Unit status codes

Use status word 1 to determine the unit status code.

Code	Meaning
0x0	Not ready
0x1	Controller inhibit
0x2	No enable
0x3	Standstill current active, no enable
0x4	Enable
0x8	Factory setting is active

10.7 SEW Electronics service

10.7.1 Hotline

Call the Drive Service Hotline to talk to an SEW-EURODRIVE service specialist on 365 days a year, 24 hours a day.

Simply dial the prefix **01805** and then enter the key combination **SEWHELP**. Or simply dial **018057394357**.

10.7.2 Repair service

Please contact the **SEW Electronics Service** if you can not rectify a fault.

Please always specify the unit status code number when you contact the SEW electronics service so that our service personnel can assist you more effectively.

Please provide the following information when sending the unit in for repair:
Serial number (→ nameplate)
Unit Designation
Short description of application (application, control via terminals or serial)
Connected motor (motor voltage, star or delta connection)
Nature of the error
Accompanying circumstances
Your own presumptions as to what has happened
Unusual events preceding the problem



10.8 Long term storage

If the unit is being stored for a long time, connect it to the mains voltage for at least 5 minutes every 2 years. Else, the unit's service life may be shortened.

Handling electrolytic capacitors after long storage periods

All electrolytic capacitors can be stored deenergized without losing performance for at least two years. They can be loaded with rated voltage during this period.

After being stored for longer than two years, the connection response to high initial remaining currents is significant. After storage for two years, installed electrolytic capacitors are regenerated after one hour of interference-free operation of the connection (with maximum rated voltage) and can then be stored again.

Forming Process

SEW-EURODRIVE recommends forming the electrolytic capacitors slowly to avoid excess gas formation within the capacitor.

If a unit is formed internally, voltage should be conducted via a transformer to enable a slow and steady increase of voltage. Voltage should first be set at 0 V and then increased to the first forming voltage.

The following forming levels with respective dwell times are recommended:

- 70 % $V_{\text{rated_max}}$: 15 minutes
- 85 % $V_{\text{rated_max}}$: 15 minutes
- 100 % $V_{\text{rated_max}}$: 1 hour



Index

0...9

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A

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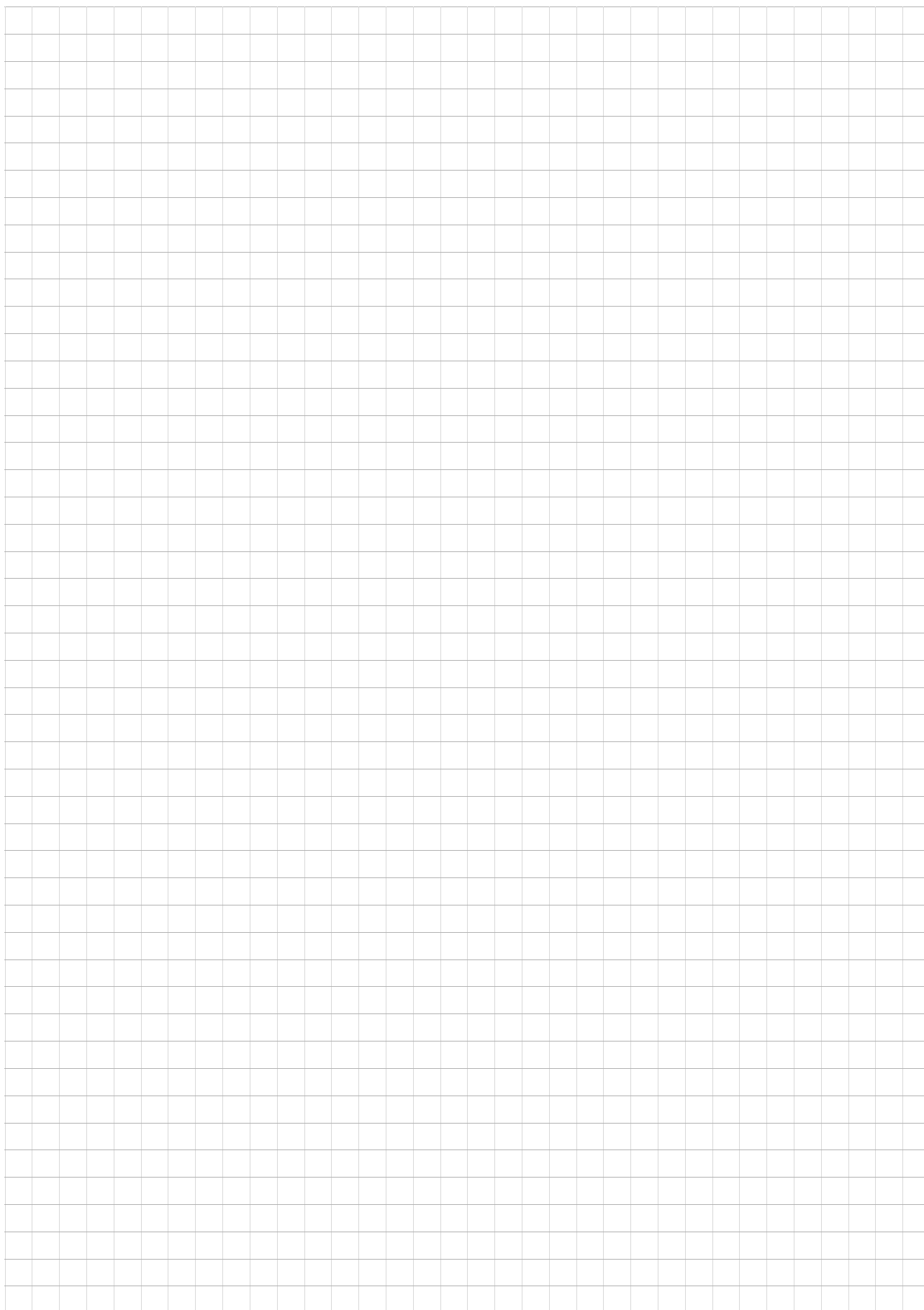
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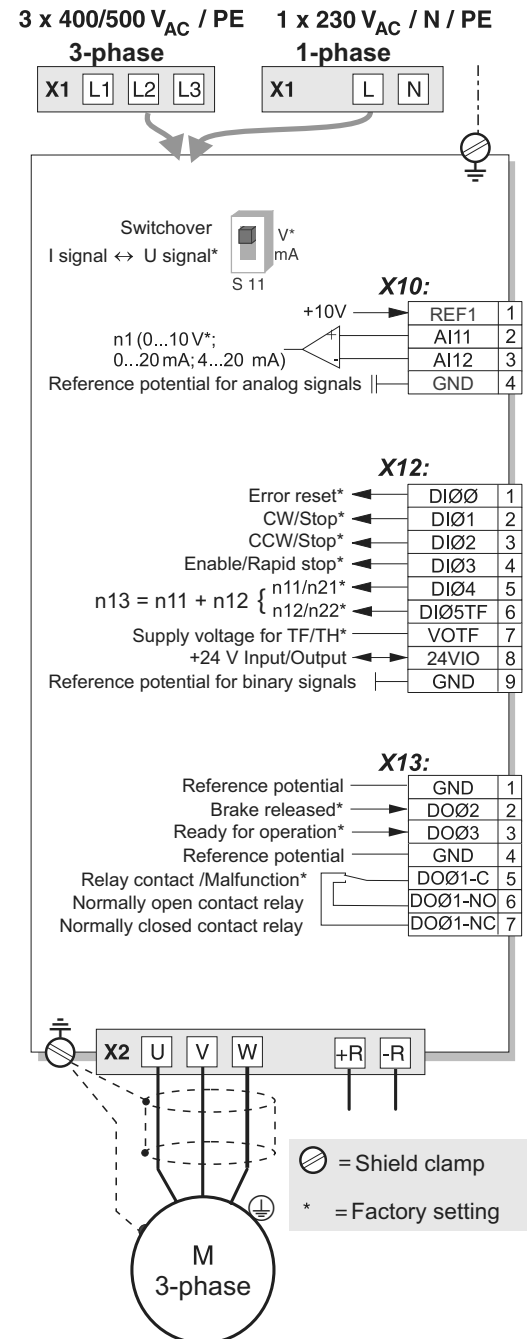


Startup: Brief description

The frequency inverter MOVITRAC® B can be connected directly to a motor of the same power. For example: A 1.5 kW motor can be connected directly to a MC07B0015.

Procedure

1. Connect the motor to the MOVITRAC® B (terminal X2).
2. You have the option of connecting a braking resistor (terminal X2).
3. The following signal terminals must be controlled with your control system:
 - Enable DI03
 - As required: CW/STOP or CCW/ STOP
 - Setpoint:
 - Analog input X10 and/or
 - DI04 = n11 = 150 rpm and/or
 - DI05 = n12 = 750 rpm and/or
 - DI04 + DI05 = n13 = 1500 rpm
 - For brake motors: DO02 = brake control system using brake rectifiers
4. You have the option of connecting the following signal terminals:
 - DI00 = error reset
 - DO01 = /malfunction (designed as a relay contact)
 - DO03 = ready
5. Check the controller for required functionality.
6. Connect the frequency inverter to the mains (X1).



Notes

Signal terminal functions and setpoint settings can be modified using the FBG11B keypad or a PC. A PC connection requires the FSC11B front option or one of the following interface adapters: UWS21A / UWS11A / USB11A.

The MOVITRAC® B frequency inverter should only be operated in strict observance of the detailed operating instructions!

How we're driving the world

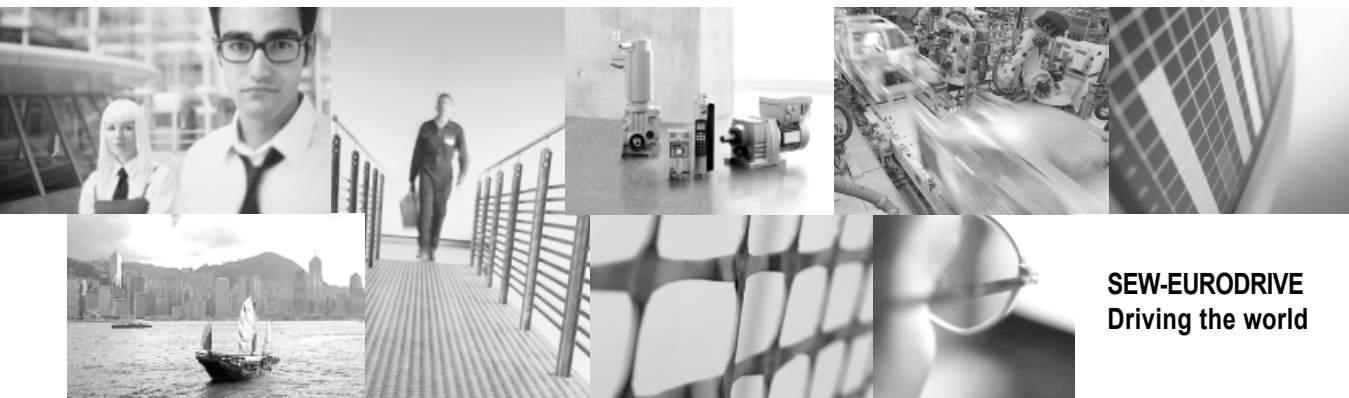
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