



**SEW  
EURODRIVE**



## **MOVITRAC® B**

Edition 02/2008  
16601211 / EN

**System Manual**

## Color code system for catalogs and system manuals

Our catalogs and system manuals are identified by a color code system at the back to make it easier to work with these publications. The short designation of the publication is indicated as well. In this way you can immediately recognize the publication even if it is standing on a shelf together with other publications. The following overview shows an exemplary assignment of colors to product groups and products.

### Mechanics

<b>DR-GM 2008</b>	<b>GSE1 2008</b>	<b>GSE2 2008</b>	<b>GK 2008</b>
DR gearmotors	Synchronous servo gearmotors	Asynchronous servo gearmotors	Gear units

### Electromechanics

<b>MOT1 2008</b>	<b>MOT2 2008</b>
DR series AC motors	DT/DV/CT/CV series AC motors

### Explosion-proof drives

<b>EXG 2008</b>	<b>EXS 2008</b>	<b>EXM 2008</b>
Explosion-proof gearmotors	Explosion-proof servo gearmotors	Explosion-proof motors

### Control cabinet inverters, control technology and HMI

<b>MDX 2008</b>	<b>MC 2008</b>	<b>MX 2008</b>	<b>PLC 2008</b>	<b>HMI 2008</b>
MOVIDRIVE®	MOVITRAC®	MOVIAxis®	MOVI-PLC®	DOP11B®

### Decentralized technology

<b>MM 2008</b>	<b>DI 2007</b>	<b>MG 2008</b>
MOVIMOT® gearmotors	Decentralized installation	MOVIGEAR®

### Industrial gear units

<b>IGX1 2008</b>	<b>IGX2 2008</b>
X series horizontal industrial gear units	X series vertical industrial gear units



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## 1 Important Notes

### 1.1 Structure of the safety notes

The safety notes in these operating instructions are structured as follows:

Symbol	SIGNAL WORD!
	<p>! <b>SIGNAL WORD!</b></p> <p>Nature and source of hazard.</p> <p>Possible consequence(s) if disregarded.</p> <ul style="list-style-type: none"> <li>• Measure(s) to avoid the hazard.</li> </ul>

Symbol	Signal word	Meaning	Consequences if disregarded
<p>Example:</p> General hazard	! HAZARD!	Imminent hazard	Severe or fatal injuries
	! WARNING!	Possible hazardous situation	Severe or fatal injuries
	! CAUTION!	Possible hazardous situation	Minor injuries
	STOP!	Possible damage to property	Damage to the drive system or its environment
	NOTE	Useful information or tip. Simplifies handling of the drive system.	

### 1.2 Rights to claim under warranty

Adhering to the operating instructions is a prerequisite for fault-free operation and the fulfillment of any right to claim under warranty. Read the operating instructions before you start working with the unit.

Make sure that the operating instructions are available to persons responsible for the system and its operation, as well as to persons who work independently on the unit.

### 1.3 Exclusion of liability

You must comply with the information contained in these operating instructions to ensure safe operation of frequency inverters and to achieve the specified product characteristics and performance requirements. SEW-EURODRIVE assumes no liability for injury to persons or damage to equipment or property resulting from non-observance of these operating instructions. In such cases, any liability for defects is excluded.



## 2 Safety Notes

The following basic safety notes are intended to prevent injury to persons and damage to property. The operator must ensure that the basic safety notes are read and observed. Make sure that persons responsible for the system and its operation, as well as persons who work independently on the unit, have read through the operating instructions carefully and understood them. If you are unclear about any of the information in this documentation, or if you require further information, please contact SEW-EURODRIVE.

### 2.1 General information

Never install or start up damaged products. Submit a complaint to the shipping company immediately in the event of damage.

During operation, drives with this type of enclosure may have live, uninsulated, and sometimes moving or rotating parts as well as hot surfaces.

Removing covers without authorization, improper use as well as incorrect installation or operation may result in severe injuries to persons or damage to property.

Refer to the documentation for additional information.

### 2.2 Target group

**Only a qualified electrician** is authorized to transport, install, startup or service the units (observe IEC 60364 or CENELEC HD 384 or DIN VDE 0100 and IEC 60664 or DIN VDE 0110 as well as national accident prevention guidelines).

Qualified electricians in the context of these basic safety notes are persons familiar with installation, assembly, startup and operation of the product who possess the required qualifications.

Any activities regarding transportation, storage, operation, and disposal must be carried out by persons who have been instructed appropriately.

### 2.3 Designated use

Frequency inverters are components intended for installation in electrical systems or machines.

In case of installation in machines, startup of the drive inverters (meaning the start of proper use) is prohibited until it is determined that the machine meets the requirements stipulated in the EC Directive 98/37/EC (machine directive); observe EN 60204.

Startup (i.e. the start of designated use) is only permitted under observance of the EMC (2004/108/EC) directive.



The frequency inverters comply with the requirements of the Low Voltage Directive 2006/95/EC. The harmonized standards of the EN 61800-5-1/DIN VDE T105 series in connection with EN 60439-1/VDE 0660 part 500 and EN 60146/VDE 0558 are applied to these frequency inverters.

Technical data and information on the connection requirements are provided on the nameplate and in the documentation; these must be observed under all circumstances.

### 2.3.1 Safety functions

Frequency inverters from SEW-EURODRIVE may not perform any safety functions unless the inverters are subordinate to other safety systems. Use higher-level safety systems to ensure protection of equipment and personnel.

When using the "Safe stop" function, you must observe the following publications:

- MOVITRAC® B / Safe Disconnection – Conditions
- MOVITRAC® B / Safe Disconnection – Applications

## 2.4 Transportation, storage

You must observe the notes on transportation, storage and proper handling. Observe the climatic conditions as stated in the section "General technical data".

## 2.5 Installation

The units must be installed and cooled according to the regulations and specifications in the corresponding documentation.

Protect the frequency inverters from excessive strain. Ensure that components are not deformed and/or insulation spaces are maintained, particularly during transportation. Avoid contact with electronic components and contacts.

Frequency inverters contain components that can easily be damaged by electrostatic energy and improper handling. Prevent mechanical damage or destruction of electric components (may pose health risk).

The following applications are prohibited unless the unit is explicitly designed for such use:

- Use in potentially explosive areas
- Use in areas exposed to harmful oils, acids, gases, vapors, dust, radiation, etc.
- Use in non-stationary applications which are subject to mechanical vibration and impact loads in excess of the requirements in EN 61800-5-1.



## **2.6 Electrical connection**

Observe the applicable national accident prevention guidelines when working on live frequency inverters (e.g. BGV A3).

Electrical installation is to be carried out in compliance with pertinent regulations (e.g. cable cross sections, fusing, protective conductor connection). Additional information is contained in the documentation.

You will find notes on EMC-compliant installation, such as shielding, grounding, the arrangement of filters and the routing of lines, in the documentation of the frequency inverters. Always observe these instructions, even for frequency inverters bearing the CE marking. The manufacturer of the system or machine is responsible for maintaining the limits established by EMC legislation.

Protective measures and protection devices must comply with the regulations in force (e.g. EN 60204 or EN 61800-5-1).

Required preventive measure: grounding the unit.

## **2.7 Safe disconnection**

The unit meets all requirements for safe disconnection of power and electronic connections in accordance with EN 61800-5-1. All connected circuits must also satisfy the requirements for safe disconnection.

## **2.8 Operation**

Systems with integrated frequency inverters must be equipped with additional monitoring and protection devices, as applicable, according to the relevant safety guidelines and regulations, such as legislation governing technical equipment, accident prevention regulations, etc. Changes to frequency inverters using the operating software are permitted.

Do not touch live components or power connections immediately after disconnecting the frequency inverters from the supply voltage because there may still be some charged capacitors. Note the respective labels on the frequency inverter.

Keep all covers and doors closed during operation.

The fact that the status LED and other display elements are no longer illuminated does not indicate that the unit has been disconnected from the mains and no longer carries any voltage.

Mechanical blocking or safety functions inside the unit may result in the motor coming to a standstill. Eliminating the cause of the problem or performing a reset may result in the drive re-starting automatically. If, for safety reasons, this is not permitted for the driven machine, disconnect the unit from the mains before correcting the fault.

<i>kVA</i>	<i>n</i>
<i>f</i>	
<i>i</i>	
<i>P</i>	<i>Hz</i>

## System Description MOVITRAC® B

MOVITRAC® B – compact, versatile and universal

### 3 System Description MOVITRAC® B



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

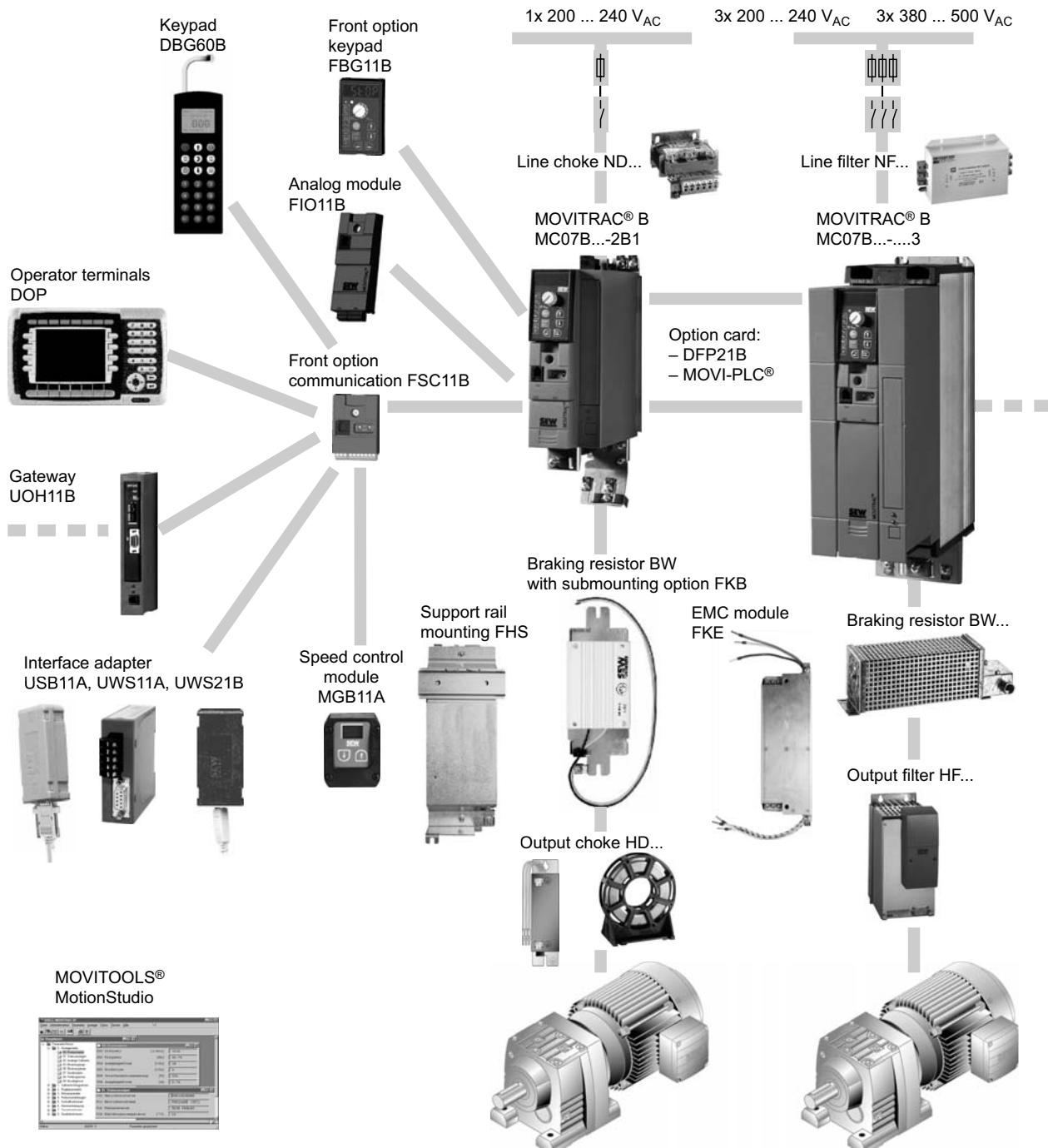
#### 3.1 MOVITRAC® B – compact, versatile and universal

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

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

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

### 3.2 System overview MOVITRAC® B



#### Power supply connection

- ND line choke
- NF line filter

#### Power connection

- HF output filter
- HD output choke

#### BW braking resistor

#### Front options

- FBG11B keypad
- FIO11B analog module
- FSC11B communication for connecting (only one option possible):
  - DBG60B keypad
  - Gateway UFx / UOH
  - UWS/USB interface adapter
  - SBUS / RS-485
  - DOP operator terminals
  - MBG11A speed control module

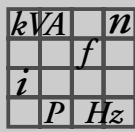
#### Option cards

- PROFIBUS
- MOVI-PLC® controller

#### Installation

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

MOVITOOLS® MotionStudio software



## System Description MOVITRAC® B

### The units at a glance

#### 3.3 The units at a glance

Power supply connection	Motor power	Rated output current	MOVITRAC® B type	Size
230 V 1-phase	0.25 kW / 0.34 HP	AC 1.7 A	MC07B0003-2B1-4-00	0XS
	0.37 kW / 0.50 HP	AC 2.5 A	MC07B0004-2B1-4-00	
	0.55 kW / 0.74 HP	AC 3.3 A	MC07B0005-2B1-4-00	0S
	0.75 kW / 1.0 HP	AC 4.2 A	MC07B0008-2B1-4-00	
	1.1 kW / 1.5 HP	AC 5.7 A	MC07B0011-2B1-4-00	0L
	1.5 kW / 2.0 HP	AC 7.3 A	MC07B0015-2B1-4-00	
	2.2 kW / 3.0 HP	AC 8.6 A	MC07B0022-2B1-4-00	
230 V 3-phase	0.25 kW / 0.34 HP	AC 1.7 A	MC07B0003-2A3-4-00	0XS
	0.37 kW / 0.50 HP	AC 2.5 A	MC07B0004-2A3-4-00	
	0.55 kW / 0.74 HP	AC 3.3 A	MC07B0005-2A3-4-00	0S
	0.75 kW / 1.0 HP	AC 4.2 A	MC07B0008-2A3-4-00	
	1.1 kW / 1.5 HP	AC 5.7 A	MC07B0011-2A3-4-00	0L
	1.5 kW / 2.0 HP	AC 7.3 A	MC07B0015-2A3-4-00	
	2.2 kW / 3.0 HP	AC 8.6 A	MC07B0022-2A3-4-00	
	3.7 kW / 5.0 HP	AC 14.5 A	MC07B0037-2A3-4-00	1
	5.5 kW / 7.4 HP	AC 22 A	MC07B0055-2A3-4-00	2
	7.5 kW / 10 HP	AC 29 A	MC07B0075-2A3-4-00	
	11 kW / 15 HP	AC 42 A	MC07B0110-203-4-00	3
	15 kW / 20 HP	AC 54 A	MC07B0150-203-4-00	
	22 kW / 30 HP	AC 80 A	MC07B0220-203-4-00	4
	30 kW / 40 HP	AC 95 A	MC07B0300-203-4-00	
400 V 3-phase	0.25 kW / 0.34 HP	AC 1.0 A	MC07B0003-5A3-4-00	0XS
	0.37 kW / 0.50 HP	AC 1.6 A	MC07B0004-5A3-4-00	
	0.55 kW / 0.74 HP	AC 2.0 A	MC07B0005-5A3-4-00/S0	0S
	0.75 kW / 1.0 HP	AC 2.4 A	MC07B0008-5A3-4-00/S0	
	1.1 kW / 1.5 HP	AC 3.1 A	MC07B0011-5A3-4-00/S0	
	1.5 kW / 2.0 HP	AC 4.0 A	MC07B0015-5A3-4-00/S0	
	2.2 kW / 3.0 HP	AC 5.5 A	MC07B0022-5A3-4-00/S0	0L
	3.0 kW / 4.0 HP	AC 7.0 A	MC07B0030-5A3-4-00/S0	
	4.0 kW / 5.4 HP	AC 9.5 A	MC07B0040-5A3-4-00/S0	
	5.5 kW / 7.4 HP	AC 12.5 A	MC07B0055-5A3-4-00	
	7.5 kW / 10 HP	AC 16.0 A	MC07B0075-5A3-4-00	2S
	11 kW / 15 HP	AC 24.0 A	MC07B0110-5A3-4-00	
	15 kW / 20 HP	AC 32.0 A	MC07B0150-503-4-00	
	22 kW / 30 HP	AC 46.0 A	MC07B0220-503-4-00	3
	30 kW / 40 HP	AC 60.0 A	MC07B0300-503-4-00	
	37 kW / 50 HP	AC 73.0 A	MC07B0370-503-4-00	
	45 kW / 60 HP	AC 89.0 A	MC07B0450-503-4-00	4
	55 kW / 74 HP	AC 105 A	MC07B0550-503-4-00	
	75 kW / 100 HP	AC 130 A	MC07B0750-503-4-00	5

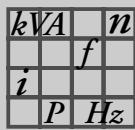


### 3.4 Functions / features

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

#### 3.4.1 Unit properties

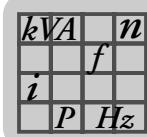
- Wide voltage range:
  - 230 V units for the voltage range 1 × AC 200 ... 240 V, 50/60 Hz
  - 230 V units for the voltage range 3 × AC 200 ... 240 V, 50/60 Hz
  - 400/500 V units for the voltage range 3 × AC 380 ... 500 V, 50/60 Hz
- Overload capacity: 125 %  $I_N$  continuous duty  
150 %  $I_N$  for at least 60 s  
Maximum 200 % breakaway torque (BG0)
- Rated operation up to an ambient temperature  $\vartheta = 50^\circ\text{C}$  ( $122^\circ\text{F}$ ), operation up to an ambient temperature  $\vartheta = 60^\circ\text{C}$  ( $140^\circ\text{F}$ ) possible with current reduction.
- Speed range 0 ... 5500 rpm.
- Output frequency range:
  - VFC: 0 ... 150 Hz
  - V/f: 0 ... 600 Hz
- 4-quadrant capability due to the integrated brake chopper.
- Compact unit design for minimum control cabinet space requirement and optimum utilization of control cabinet volume.
- Units with the "Safe stop" function:
  - Unit variant (...-S0): 3 × AC 380 ... 500 V, 0.55 ... 4.0 kW (0.74 ... 5.4 HP)
  - Standard unit: 3 × AC 380 ... 500 V, 5.5 ... 75 kW (7.4 ... 100 HP)
- Integrated EMC line filter to maintain the specified limit classes on the line side / C1/C2 to EN 61800-3:
  - Sizes 0 ... 2: C2 without further measures
  - Sizes 0 ... 5: C1 with corresponding filters / folding ferrites
- Configurable inputs / outputs
  - 1 analog input
  - 6 binary inputs
  - 3 binary outputs, including 1 relay output
  - Optional: 1 additional analog input / 1 additional analog output
- Voltage supply and evaluation for TF (PTC temperature sensor) integrated for monitoring the motor temperature.
- Integrated evaluation of TH for monitoring the temperature of the motor.



- Integrated keypad for displaying setpoints and setting parameters
  - 5-digit 7-segment display
  - 9 LEDs for displaying the selected symbols
  - 6 keys for operation
  - 1 setpoint generator for speed specification
  - Parameter set data backup
- Braking resistor can be sub-mounted as an option for size 0.
- Separable signal terminals.
- Size 0:
  - Separable power terminals and signal terminals
  - EMC capacitor can be insulated for reduced earth-leakage currents and operation in IT network.
  - "Cold Plate" installation possible.
  - Long motor cable length
- Up to size 2S: Operation on MDR regenerative power supply unit possible (see MOVIDRIVE® B documentation).

#### 3.4.2 Control

- V/f control or VFC control mode.
- Automatic brake rectifier control by the inverter.
- Standstill current function for:
  - Rapid start
  - Heating current for preventing condensation in the motor at low temperatures
- Flying start function for synchronizing the inverter to the running motor.
- Hoist capability.
- DC braking to decelerate the motor in 1Q mode.
- Slip compensation for high stationary speed accuracy.
- Motor stall protection by sliding current limitation in the field weakening range
- Two complete motor parameter sets
- Factory setting can be restored.
- Parameter lock for protection against changes to parameters.
- Protective functions for protection against
  - Overcurrent
  - Ground fault
  - Overload
  - Overtemperature of the inverter
  - Overtemperature of the motor (TF/TH)



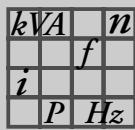
- Speed monitoring and monitoring of the motor and regenerative limit power.
- 5 fault memories with all relevant operating data at the moment of the fault.
- Standardized operation, parameter setting and identical unit connection technology across all units in the MOVITRAC® B range.
- Configurable signal range monitoring (speed).
- Energy-saving function for optimizing the magnetization current automatically.

#### 3.4.3 Setpoint technology

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

#### 3.4.4 Optional communication / operation

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



### 3.5 **MOVITOOLS® MotionStudio**

The MOVITOOLS® MotionStudio program includes:

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

The MOVITRAC® B has the following functions:

- Startup
- Parameter setting
- Visualization / diagnostics

#### 3.5.1 SCOPE

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

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

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

- Save
- Meta data
- Print

The online help functions enable you to quickly get familiar with how to use SCOPE.

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

## 4 Technical Data

### 4.1 CE marking, UL approval and C-Tick

#### 4.1.1 CE-marking

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



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

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

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

#### 4.1.2 UL approval / CSA / GOST-R certificate / C-Tick



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

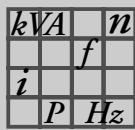
- 230 V / single-phase
- 230 V / 3-phase
- 400/500 V / 3-phase (0.25 ... 45 kW / 0.34 ... 60 HP)



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

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

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



#### 4.2 General technical data

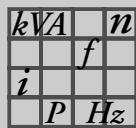
The following technical data applies to all MOVITRAC® B frequency inverters independent of size and power.

MOVITRAC® B	All sizes
Interference immunity	Complies with EN 61800-3
Interference emission with EMC-compliant installation	According to limit value class <sup>1)</sup> <ul style="list-style-type: none"> <li>Sizes 0 ... 2: C2 without further measures</li> <li>Sizes 0 ... 5: C1 with corresponding filters / folding ferrites</li> </ul> C1/C2 to EN 61800-3
Leakage current	> 3.5 mA
Ambient temperature $\vartheta_A$ (up to 60 °C (140 °F) with current reduction)	<ul style="list-style-type: none"> <li><b>230 V, 0.25 ... 2.2 kW (0.34 ... 3.0 HP) / 400/500 V, 0.25 ... 4.0 kW (0.34 ... 5.4 HP)</b>  <b>With overload capacity</b> (max. 150% for 60 s):  <math>I_D = 100 \% I_N / f_{PWM} = 4 \text{ kHz}</math>: -10 °C ... +40 °C (14 °F ... 104 °F)  <b>Without high overload capacity:</b>  <math>I_D = 100 \% I_N / f_{PWM} = 4 \text{ kHz}</math>: -10 °C ... +50 °C (14 °F ... 122 °F)  <math>I_D = 100 \% I_N / f_{PWM} = 8 \text{ kHz}</math>: -10 °C ... +40 °C (14 °F ... 104 °F)  <math>I_D = 125 \% I_N / f_{PWM} = 4 \text{ kHz}</math>: -10 °C ... +40 °C (14 °F ... 104 °F)           </li> <li><b>3 x 230 V, 3.7 ... 30 kW (5.0 ... 40 HP) / 400/500 V, 5.5 ... 75 kW (7.4 ... 100 HP)</b>  <b>With overload capacity</b> (max. 150% for 60 s):  <math>I_D = 100 \% I_N / f_{PWM} = 4 \text{ kHz}</math>: 0 °C ... +40 °C (32 °F ... 104 °F)  <b>Without overload capacity:</b>  <math>I_D = 100 \% I_N / f_{PWM} = 4 \text{ kHz}</math>: 0 °C ... +50 °C (32 °F ... 122 °F)  <math>I_D = 100 \% I_N / f_{PWM} = 8 \text{ kHz}</math>: 0 °C ... +40 °C (32 °F ... 104 °F)  <math>I_D = 125 \% I_N / f_{PWM} = 4 \text{ kHz}</math>: 0 °C ... +40 °C (32 °F ... 104 °F)           </li> <li>Mounting plate with "cold plate" &lt; 70°C (+158 °F)</li> </ul>
Derating ambient temperature (current reduction)	2.5 % $I_N$ per K at 40 °C ... 50 °C (104 °C ... 122 °F) 3 % $I_N$ per K at 50 °C ... 60 °C (122 °F ... 140 °F)
Climate class	EN 60721-3-3, class 3K3
Storage temperature Transportation temperature	-25 °C ... +75 °C (-13 °F ... 167 °F) -25 °C ... +75 °C (-13 °F ... 167 °F)
Cooling type	Self-cooling: 230 V: ≤ 0.75 kW (1.0 HP) 400/500 V: ≤ 1.1 kW (1.5 HP) Forced cooling: 230 V: ≥ 1.1 kW (1.5 HP) (temperature controlled fan, 400/500 V: ≥ 1.5 kW (3.0 HP)) Response threshold 45 °C (113 °F)
Degree of protection EN 60529 (NEMA1)	Sizes 0 ... 3: IP20 Sizes 4 ... 5 power connections: <ul style="list-style-type: none"> <li>IP00</li> <li>With the supplied Plexiglas cover mounted and mounted shrinking tube (not supplied) IP10</li> </ul>
Operating mode	Continuous duty
Overvoltage category	III according to IEC 60664-1 (VDE 0110-1)
Mains voltage tolerance	EN 50160: ±10 %
Pollution class	2 according to IEC 60664-1 (VDE 0110-1)



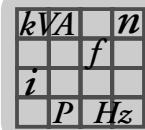
<b>MOVITRAC® B</b>	<b>All sizes</b>
Installation altitude	<p>Up to <math>h \leq 1000</math> m (3281 ft) without restrictions.</p> <p>At <math>h \geq 1000</math> m (3281 ft), the following restrictions apply:</p> <ul style="list-style-type: none"> <li>• from 1,000 m (3281 ft) to max. 4000 m (13120 ft):           <ul style="list-style-type: none"> <li>– <math>I_N</math> reduction by 1% per 100 m (328 ft)</li> </ul> </li> <li>• from 2000 m (6562 ft) to max. 4000 m (13120 ft):           <ul style="list-style-type: none"> <li>– AC 230 V units: Reduction of the rated mains voltage <math>V_{\text{supply}}</math> by AC 3 V per 100 m (328 ft)</li> <li>– AC 500 V units: Reduction of the rated mains voltage <math>V_{\text{supply}}</math> by AC 6 V per 100 m (328 ft)</li> </ul> </li> </ul> <p>Over 2000 m (6562 ft) only overvoltage class 2, external measures are required for overvoltage class 3. Overvoltage classes according to DIN VDE 0110-1.</p>
Dimensioning	According to DIN ISO 276-v
Size 0: Restrictions for continuous duty with 125 % $I_N$	<ul style="list-style-type: none"> <li>• Maximum ambient temperature <math>\vartheta_A</math>: 40 °C (104 °F)</li> <li>• Maximum rated mains voltage <math>V_{\text{supply}}</math>: 400 V</li> <li>• No DIN rail mounting / submounting resistor</li> <li>• With 1 × 230 V: Provide line choke ND</li> </ul>

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



### 4.3 MOVITRAC® B electronics data

Function	Terminal	Designa-tion	Default	Data
Setpoint input <sup>1)</sup> (differential input)	X10:1 X10:2 X10:3  X10:4	REF1 AI11 (+) AI12 (-)  GND		+10 V, $R_{L\min} = 3 \text{ k}\Omega$ 0 ... +10 V ( $R_i > 200 \text{ k}\Omega$ ) 0 ... 20 mA / 4 ... 20 mA ( $R_i = 250 \Omega$ ), 10 bit resolution, sampling time 1 ms GND = Reference potential for binary and analog signals, PE potential
Binary inputs	X12:1 X12:2 X12:3 X12:4 X12:5 X12:6	DI00 DI01 DI02 DI03 DI04 DI05TF	Fault reset CW/stop CCW/stop Enable/stop n11/n21 n12/n22	$R_i = 3 \text{ k}\Omega$ , $I_E = 10 \text{ mA}$ , sampling time 5 ms, PLC compatible Signal level according to EN 61131-2 type 1 or 3: <ul style="list-style-type: none"> <li>• +11 ... +30 V → 1 / contact made</li> <li>• -3 ... +5 V → 0 / contact open</li> <li>• X12:2 / DI01 with fixed assignment CW/Stop</li> <li>• X12:5 / DI04 can be used as frequency input</li> <li>• X12:6 / DI05 can be used as TF input</li> </ul>
Supply voltage for TF	X12:7	VOTF		Special characteristics for TF according to DIN EN 60947-8 / trigger value 3 kΩ
Auxiliary voltage output / external voltage supply <sup>2)</sup>	X12:8	24VIO		Auxiliary supply output: V = DC 24 V, current carrying capacity $I_{\max} = 50 \text{ mA}$ External voltage supply: V = DC 24 V -15 % / +20 % to EN 61131-2 See section Project planning/external DC 24 V voltage supply.
Reference terminal	X12:9	GND		Reference potential for binary and analog signals, PE potential
Binary outputs	X13:1 X13:2 X13:3 X13:4	GND DO02 DO03 GND	Brake released Ready	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: $V_{\max} = 30 \text{ V}$ , $I_{\max} = 800 \text{ mA}$



Function	Terminal	Designa-tion	Default	Data					
Safety contact	X17:1	DGND: Reference potential for X17:3							
	X17:2	VO24: : $V_{OUT} = DC\ 24\ V$ , only to supply X17:4 of the same unit; it <b>cannot be used</b> to supply other units.							
	X17:3	SOV24: Reference potential for DC+24 V input "Safe stop" (safety contact)							
	X17:4	SVI24: DC+24 V input "Safe stop" (safety contact)							
	Permitted cable cross section		One core per terminal: 0.08...1.5 mm <sup>2</sup> (AWG 28...16) Two cores per terminal: 0.25 ... 1.0 mm <sup>2</sup> (AWG 23...17)						
	Power consumption X17:4		Size 0: 3 W Size 1: 5 W Size 2, 2S: 6 W Size 3: 7.5 W Size 4: 8 W Size 5: 10 W						
	Input capacitance X17:4		Size 0: 27 µF Sizes 1..0.5: 270 µF						
Time for restart Time to inhibit output stage		$t_A = 200\ ms$ $t_S = 200\ ms$							
Signal level		DC +19.2 V...+30 V = "1" = Contact closed DC -30 V...+5 V = "0" = Contact open							
Terminal response times	Binary input and output terminals are updated every 5 ms								
Max. cable cross-section	1.5 mm <sup>2</sup> (AWG15) without conductor end sleeves 1.0 mm <sup>2</sup> (AWG17) with conductor end sleeves								

- 1) If the setpoint input is not used, it should be set to GND. Otherwise a measured input voltage of -1 V ... +1 V is set.
- 2) The MC07B...-S0 unit type must always be supplied with external voltage.

#### 4.3.1 DC 24 V power demand for 24 V backup mode

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

- 1) FBG11B, FSC11B (UWS11A/USB11A) included. Take account of the additional load of the binary inputs with 2.4 W per 100 mA.
- 2) Fieldbus options are: DFP21B, DFD11B, DFE11B, ...
- 3) These options must always be externally supplied.

<i>kVA</i>	<i>n</i>
<i>i</i>	<i>f</i>
<i>P</i>	<i>Hz</i>

## Technical Data

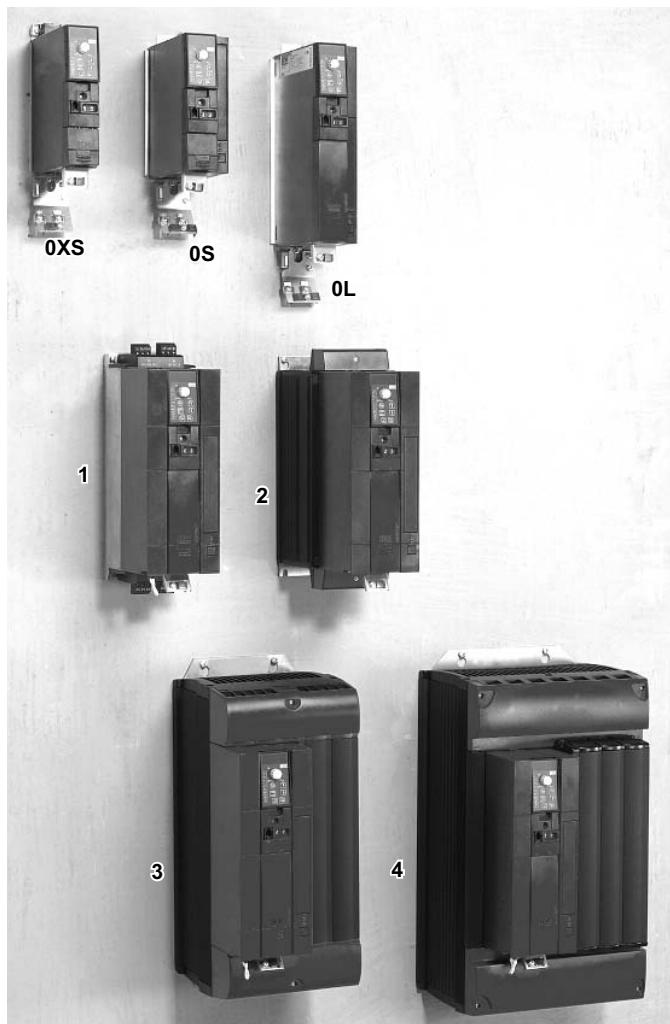
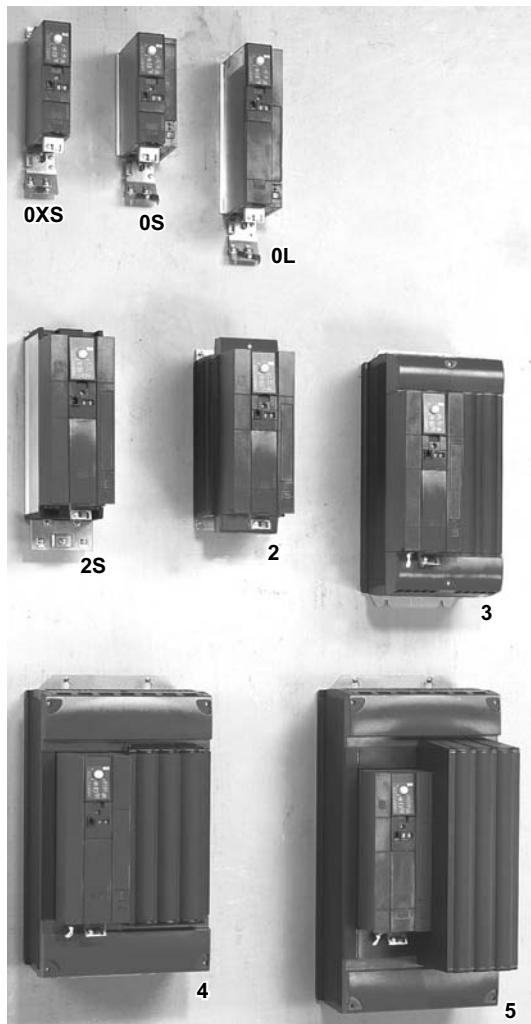
### Technical data of MOVITRAC® B

#### 4.4 Technical data of MOVITRAC® B

##### 4.4.1 Overview MOVITRAC® B

400 / 500 V

230 V



#### Power supply connection 400 / 500 V / 3-phase

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

#### Power supply connection 230 V / 1-phase

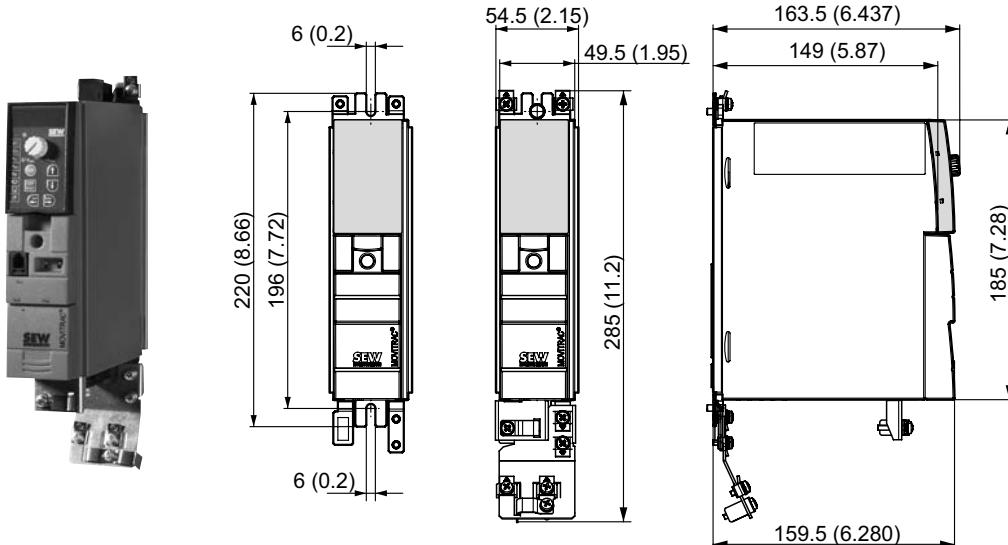
Size	0XS	0S	0L
Power [kW / HP]	0.25 / 0.34 0.37 / 0.50	0.55 / 0.74 0.75 / 1.0	1.1 / 1.5 1.5 / 2.0 2.2 / 3.0

#### Power supply connection 230 V / 3-phase

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

<i>kVA</i>	<i>n</i>
<i>i</i>	<i>f</i>
<i>P</i>	<i>Hz</i>

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



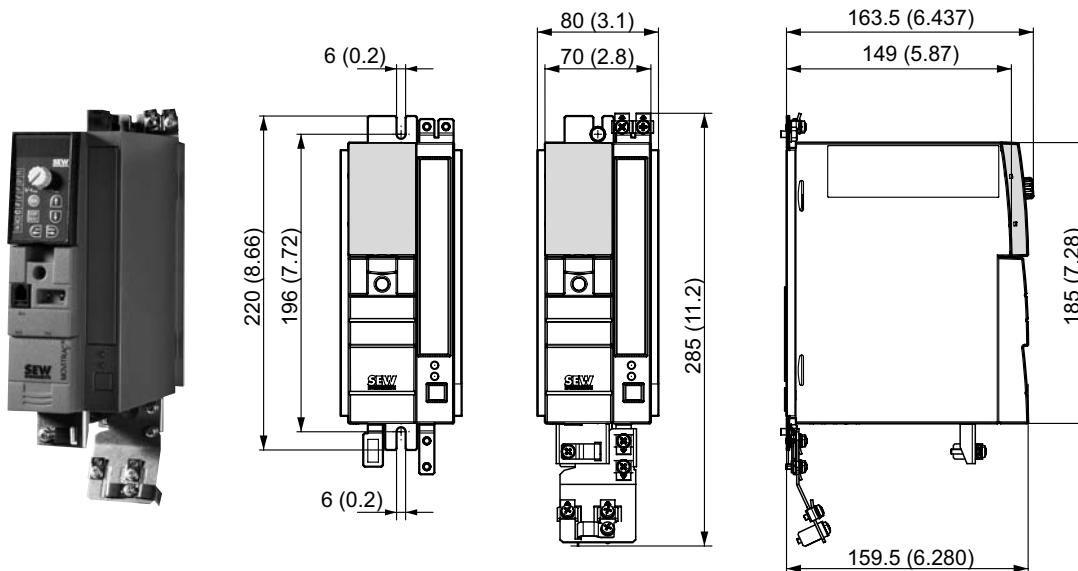
MOVITRAC® MC07BB (3-phase supply system)		0003-5A3-4-00	0004-5A3-4-00
Part number		828 515 2	828 516 0
<b>INPUT</b>			
Rated mains voltage	$V_{\text{supply}}$	$3 \times \text{AC } 380 \dots 500 \text{ V}$	
Rated mains frequency	$f_{\text{supply}}$	$50 / 60 \text{ Hz} \pm 5\%$	
Rated mains current, 100 % operation	$I_{\text{supply}}$	AC 0.9 A	AC 1.4 A
Rated mains current, 125 % operation	$I_{\text{supply } 125}$	AC 1.1 A	AC 1.8 A
<b>OUTPUT</b>			
Output voltage	$U_A$	$3 \times 0 \dots V_{\text{supply}}$	
Recommended motor power 100 % operation	$P_{\text{Mot}}$	0.25 kW / 0.34 HP	0.37 kW / 0.50 HP
Recommended motor power 125 % operation	$P_{\text{Mot } 125}$	0.37 kW / 0.50 HP	0.55 kW / 0.74 HP
Rated output current 100 % operation	$I_N$	AC 1.0 A	AC 1.6 A
Rated output current 125 % operation	$I_{N \ 125}$	AC 1.3 A	AC 2.0 A
Apparent output power 100 % operation	$S_N$	0.7 kVA	1.1 kVA
Apparent output power 125 % operation	$S_{N \ 125}$	0.9 kVA	1.4 kVA
Minimum permitted braking resistance value (4 quadrant operation)	$R_{BW\_min}$	68 Ω	
<b>GENERAL INFORMATION</b>			
Power loss 100 % operation	$P_V$	30 W	35 W
Power loss 125 % operation	$P_{V \ 125}$	35 W	40 W
Current limitation		150 % $I_N$ for at least 60 seconds	
Terminal cross section / tightening torque	Terminals	$4 \text{ mm}^2 / \text{AWG}12 / 0.5 \text{ Nm} / 4 \text{ lb in}$	
Dimensions	$W \times H \times D$	$54.5 \times 185 \times 163.5 \text{ mm} / 2.15 \times 7.28 \times 6.437 \text{ in}$	
Weight	m	1.3 kg / 2.9 lb	

<i>kVA</i>	<i>n</i>
<i>i</i>	<i>f</i>
<i>P</i>	<i>Hz</i>

## Technical Data

### Technical data of MOVITRAC® B

#### 4.4.3 AC 400 / 500 V / 3-phase / size 0S / 0.55 ... 1.5 kW / 0.74 ... 2.0 HP

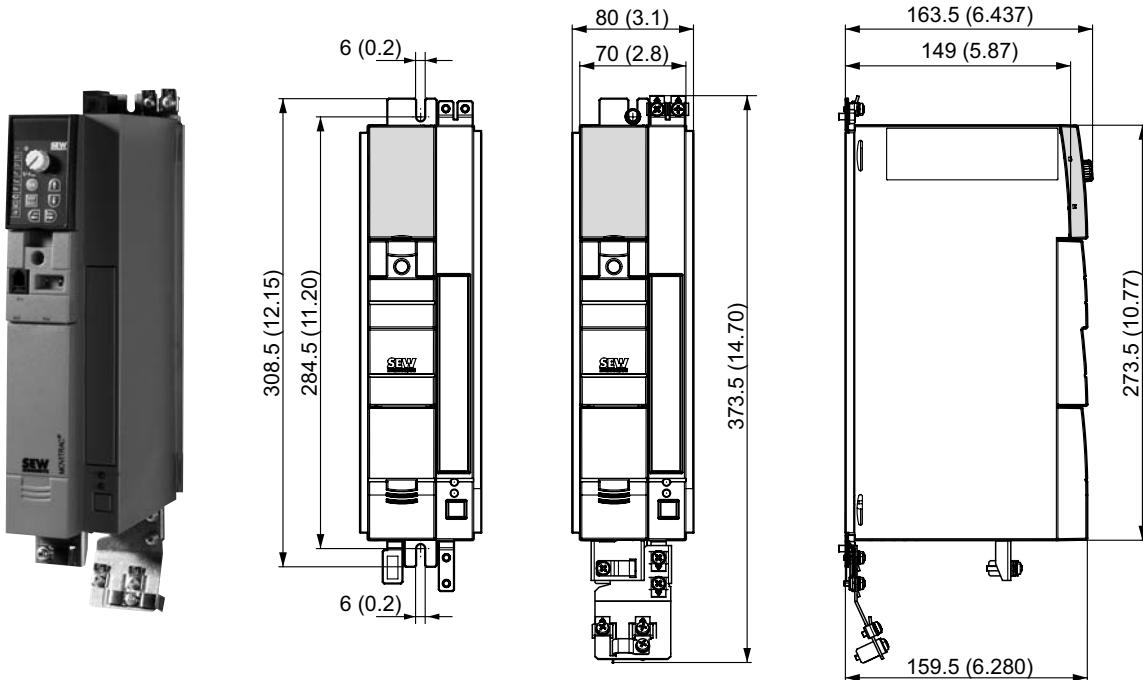


MOVITRAC® MC07B (3-phase supply system)	0005-5A3-4-x0	0008-5A3-4-x0	0011-5A3-4-x0	0015-5A3-4-x0
Part number, standard unit (-00)	828 517 9	828 518 7	828 519 5	828 520 9
Part number "Safe stop" (-S0) <sup>1)</sup>	828 995 6	828 996 4	828 997 2	828 998 0
<b>INPUT</b>				
Rated mains voltage	V <sub>supply</sub>	3 × AC 380 ... 500 V		
Rated mains frequency	f <sub>supply</sub>	50 / 60 Hz ± 5%		
Rated mains current, 100 % operation	I <sub>supply</sub>	AC 1.8 A	AC 2.2 A	AC 2.8 A
Rated mains current, 125 % operation	I <sub>supply 125</sub>	AC 2.3 A	AC 2.6 A	AC 3.5 A
<b>OUTPUT</b>				
Output voltage	U <sub>A</sub>	3 × 0 ... V <sub>supply</sub>		
Recommended motor power 100 % operation	P <sub>Mot</sub>	0.55 kW / 0.74 HP	0.75 kW / 1.0 HP	1.1 kW / 1.5 HP
Recommended motor power 125 % operation	P <sub>Mot 125</sub>	0.75 kW / 1.0 HP	1.1 kW / 1.5 HP	1.5 kW / 2.0 HP
Rated output current 100 % operation	I <sub>N</sub>	AC 2.0 A	AC 2.4 A	AC 3.1 A
Rated output current 125 % operation	I <sub>N 125</sub>	AC 2.5 A	AC 3.0 A	AC 5.0 A
Apparent output power 100 % operation	S <sub>N</sub>	1.4 kVA	1.7 kVA	2.1 kVA
Apparent output power 125 % operation	S <sub>N 125</sub>	1.7 kVA	2.1 kVA	2.7 kVA
Minimum permitted braking resistance value (4 quadrant operation)	R <sub>BW_min</sub>	68 Ω		
<b>GENERAL INFORMATION</b>				
Power loss 100 % operation	P <sub>V</sub>	40 W	45 W	50 W
Power loss 125 % operation	P <sub>V 125</sub>	45 W	50 W	60 W
Current limitation		150 % I <sub>N</sub> for at least 60 seconds		
Terminal cross section / tightening torque	Terminals	4 mm <sup>2</sup> / AWG12 / 0.5 Nm / 4 lb in		
Dimensions	W × H × D	80 × 185 × 163.5 mm / 3.1 × 7.28 × 6.437 in		
Weight	m	1.5 kg / 3.3 lb		

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

<i>kVA</i>	<i>n</i>
<i>i</i>	<i>f</i>
<i>P</i>	<i>Hz</i>

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



MOVITRAC® MC07B (3-phase supply system)		0022-5A3-4-x0	0030-5A3-4-x0	0040-5A3-4-x0
Part number, standard unit (-00)		828 521 7	828 522 5	828 523 3
Part number "Safe stop" (-S0) <sup>1)</sup>		828 999 9	829 000 8	829 001 6
<b>INPUT</b>				
Rated mains voltage	$V_{\text{supply}}$	$3 \times \text{AC } 380 \dots 500 \text{ V}$		
Rated mains frequency	$f_{\text{supply}}$	$50 / 60 \text{ Hz} \pm 5\%$		
Rated mains current, 100 % operation	$I_{\text{supply}}$	AC 5.0 A	AC 6.3 A	AC 8.6 A
Rated mains current, 125 % operation	$I_{\text{supply } 125}$	AC 6.2 A	AC 7.9 A	AC 10.7 A
<b>OUTPUT</b>				
Output voltage	$U_A$	$3 \times 0 \dots V_{\text{supply}}$		
Recommended motor power 100 % operation	$P_{\text{Mot}}$	2.2 kW / 3.0 HP	3.0 kW / 4.0 HP	4.0 kW / 5.4 HP
Recommended motor power 125 % operation	$P_{\text{Mot } 125}$	3.0 kW / 4.0 HP	4.0 kW / 5.4 HP	5.5 kW / 7.4 HP
Rated output current 100 % operation	$I_N$	AC 5.5 A	AC 7.0 A	AC 9.5 A
Rated output current 125 % operation	$I_{N \text{ 125}}$	AC 6.9 A	AC 8.8 A	AC 11.9 A
Apparent output power 100 % operation	$S_N$	3.8 kVA	4.8 kVA	6.6 kVA
Apparent output power 125 % operation	$S_{N \text{ 125}}$	4.8 kVA	6.1 kVA	8.2 kVA
Minimum permitted braking resistance value (4 quadrant operation)	$R_{BW\_min}$	68 Ω		
<b>GENERAL INFORMATION</b>				
Power loss 100 % operation	$P_V$	80 W	95 W	125 W
Power loss 125 % operation	$P_{V \text{ 125}}$	95 W	120 W	180 W
Current limitation		150 % $I_N$ for at least 60 seconds		
Terminal cross section / tightening torque	Terminals	$4 \text{ mm}^2 / \text{AWG}12 / 0.5 \text{ Nm} / 4 \text{ lb in}$		
Dimensions	$W \times H \times D$	$80 \times 273.5 \times 163.5 \text{ mm} / 3.1 \times 10.77 \times 6.437 \text{ in}$		
Weight	m	2.1 kg / 4.6 lb		

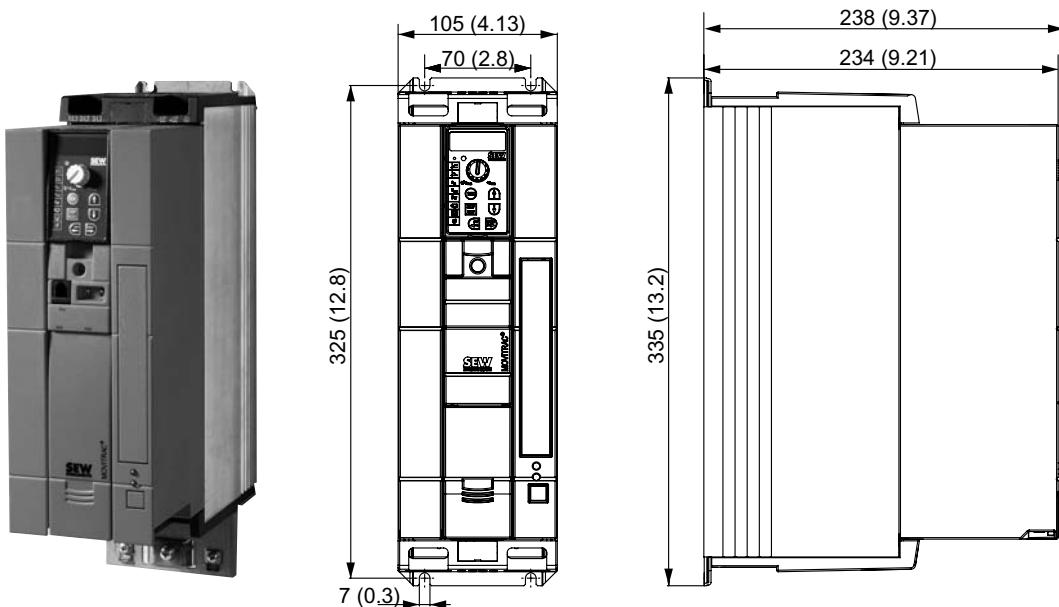
1) The MC07B...-S0 unit type must always be supplied with external voltage.

<i>kVA</i>	<i>n</i>
<i>i</i>	<i>f</i>
<i>P</i>	<i>Hz</i>

## Technical Data

### Technical data of MOVITRAC® B

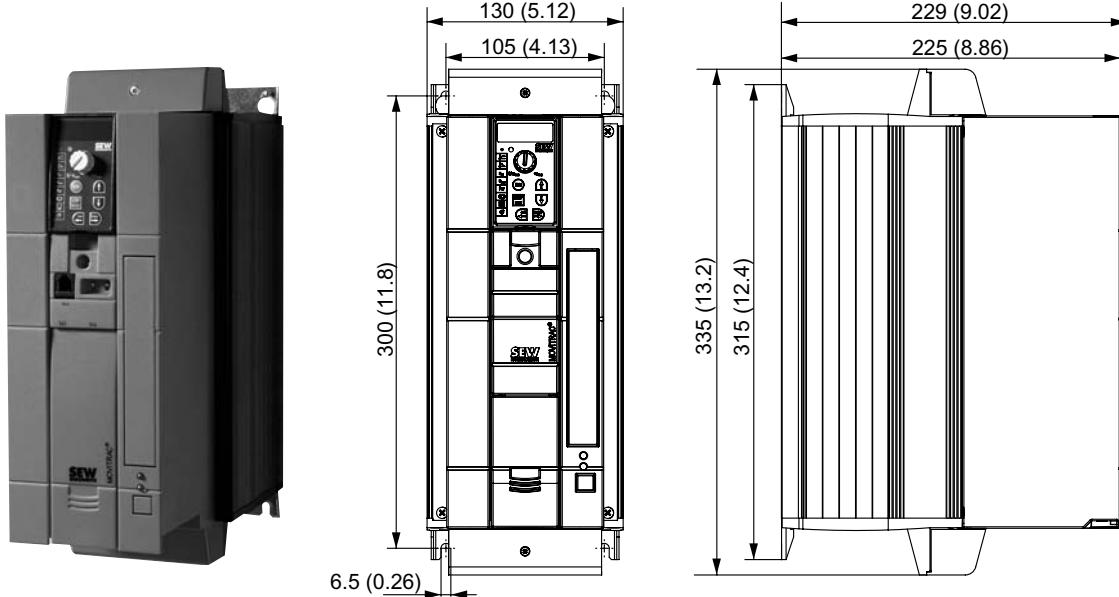
#### 4.4.5 AC 400 / 500 V / 3-phase / size 2S / 5.5 ... 7.5 kW / 7.4 ... 10 HP



<b>MOVITRAC® MC07B (3-phase supply system)</b>		<b>0055-5A3-4-00</b>	<b>0075-5A3-4-00</b>
<b>Part number</b>		<b>828 524 1</b>	<b>828 526 8</b>
<b>INPUT</b>			
Rated mains voltage	$V_{\text{supply}}$	$3 \times \text{AC } 380 \dots 500 \text{ V}$	
Rated mains frequency	$f_{\text{supply}}$	$50 / 60 \text{ Hz} \pm 5\%$	
Rated mains current, 100 % operation	$I_{\text{supply}}$	AC 11.3 A	AC 14.4 A
Rated mains current, 125 % operation	$I_{\text{supply } 125}$	AC 14.1 A	AC 18.0 A
<b>OUTPUT</b>			
Output voltage	$U_A$	$3 \times 0 \dots V_{\text{supply}}$	
Recommended motor power 100 % operation	$P_{\text{Mot}}$	5.5 kW / 7.4 HP	7.5 kW / 10 HP
Recommended motor power 125 % operation	$P_{\text{Mot } 125}$	7.5 kW / 10 HP	11 kW / 15 HP
Rated output current 100 % operation	$I_N$	AC 12.5 A	AC 16 A
Rated output current 125 % operation	$I_{N \ 125}$	AC 15.6 A	AC 20 A
Apparent output power 100 % operation	$S_N$	8.7 kVA	11.1 kVA
Apparent output power 125 % operation	$S_{N \ 125}$	10.8 kVA	13.9 kVA
Minimum permitted braking resistance value (4 quadrant operation)	$R_{BW\_min}$	47 Ω	
<b>GENERAL INFORMATION</b>			
Power loss 100 % operation	$P_V$	220 W	290 W
Power loss 125 % operation	$P_{V \ 125}$	290 W	370 W
Current limitation		150 % $I_N$ for at least 60 seconds	
Terminal cross section / tightening torque	Terminals	4 mm <sup>2</sup> / AWG12 / 1.5 Nm / 13 lb	
Dimensions	$W \times H \times D$	105 × 335 × 238 mm / 4.13 × 13.2 × 9.37 in	
Weight	m	5.0 kg / 11 lb	

<i>kVA</i>	<i>n</i>
<i>i</i>	<i>f</i>
<i>P</i>	<i>Hz</i>

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



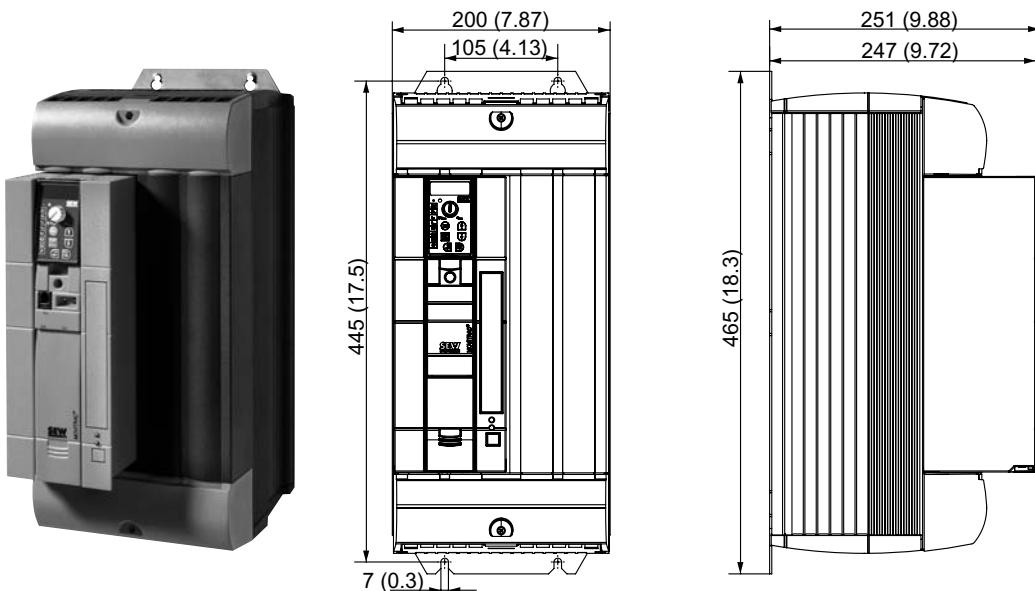
<b>MOVITRAC® MC07B (3-phase supply system)</b>		<b>0110-5A3-4-00</b>
<b>Part number</b>		<b>828 527 6</b>
<b>INPUT</b>		
Rated mains voltage	$V_{\text{supply}}$	3 × AC 380 ... 500 V
Rated mains frequency	$f_{\text{supply}}$	50 / 60 Hz ± 5%
Rated mains current, 100 % operation	$I_{\text{supply}}$	AC 21.6 A
Rated mains current, 125 % operation	$I_{\text{supply} \ 125}$	AC 27.0 A
<b>OUTPUT</b>		
Output voltage	$U_A$	3 × 0 ... $V_{\text{supply}}$
Recommended motor power 100 % operation	$P_{\text{Mot}}$	11 kW / 15 HP
Recommended motor power 125 % operation	$P_{\text{Mot} \ 125}$	15 kW / 20 HP
Rated output current 100 % operation	$I_N$	AC 24 A
Rated output current 125 % operation	$I_{N \ 125}$	AC 30 A
Apparent output power 100 % operation	$S_N$	16.6 kVA
Apparent output power 125 % operation	$S_{N \ 125}$	20.8 kVA
Minimum permitted braking resistance value (4 quadrant operation)	$R_{BW\_min}$	22 Ω
<b>GENERAL INFORMATION</b>		
Power loss 100 % operation	$P_V$	400 W
Power loss 125 % operation	$P_{V \ 125}$	500 W
Current limitation		150 % $I_N$ for at least 60 seconds
Terminal cross section / tightening torque	Terminals	4 mm² / AWG12 / 1.5 Nm / 5.90 kg in
Dimensions	$W \times H \times D$	130 × 335 × 229 mm / 5.12 × 13.2 × 9.02 in
Weight	m	6.6 kg / 15 lb

<i>kVA</i>	<i>n</i>
<i>i</i>	<i>f</i>
<i>P</i>	<i>Hz</i>

## Technical Data

### Technical data of MOVITRAC® B

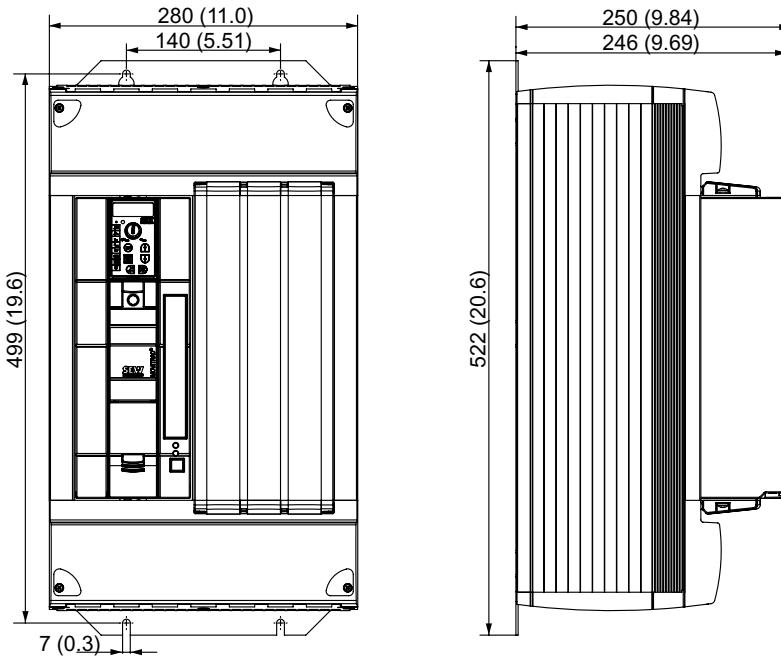
#### 4.4.7 AC 400 / 500 V / 3-phase / size 3 / 15 ... 30 kW / 20 ... 40 HP



MOVITRAC® MC07B (3-phase supply system)		0150-503-4-00 828 528 4	0220-503-4-00 828 529 2	0300-503-4-00 828 530 6
<b>INPUT</b>				
Rated mains voltage	$V_{\text{supply}}$	$3 \times \text{AC } 380 \dots 500 \text{ V}$		
Rated mains frequency	$f_{\text{supply}}$	$50 / 60 \text{ Hz} \pm 5\%$		
Rated mains current, 100 % operation	$I_{\text{supply}}$	AC 28.8 A	AC 41.4 A	AC 54.0 A
Rated mains current, 125 % operation	$I_{\text{supply } 125}$	AC 36.0 A	AC 51.7 A	AC 67.5 A
<b>OUTPUT</b>				
Output voltage	$U_A$	$3 \times 0 \dots V_{\text{supply}}$		
Recommended motor power 100 % operation	$P_{\text{Mot}}$	15 kW / 20 HP	22 kW / 30 HP	30 kW / 40 HP
Recommended motor power 125 % operation	$P_{\text{Mot } 125}$	22 kW / 30 HP	30 kW / 40 HP	37 kW / 50 HP
Rated output current 100 % operation	$I_N$	AC 32 A	AC 46 A	AC 60 A
Rated output current 125 % operation	$I_{N \text{ 125}}$	AC 40 A	AC 57.5 A	AC 75 A
Apparent output power 100 % operation	$S_N$	22.2 kVA	31.9 kVA	41.6 kVA
Apparent output power 125 % operation	$S_{N \text{ 125}}$	27.7 kVA	39.8 kVA	52.0 kVA
Minimum permitted braking resistance value (4 quadrant operation)	$R_{BW\_min}$	15 $\Omega$		12 $\Omega$
<b>GENERAL INFORMATION</b>				
Power loss 100 % operation	$P_V$	550 W	750 W	950 W
Power loss 125 % operation	$P_{V \text{ 125}}$	690 W	940 W	1250 W
Current limitation		150 % $I_N$ for at least 60 seconds		
Terminal cross section / tightening torque	Terminals	6 mm <sup>2</sup> / AWG10	10 mm <sup>2</sup> / AWG8	16 mm <sup>2</sup> / AWG6
		3.5 Nm / 31 lb in		
Dimensions	$W \times H \times D$	200 × 465 × 251 mm / 7.87 × 18.3 × 9.88 in		
Weight	m	15 kg / 33 lb		

<i>kVA</i>	<i>n</i>
<i>i</i>	<i>f</i>
<i>P</i>	<i>Hz</i>

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



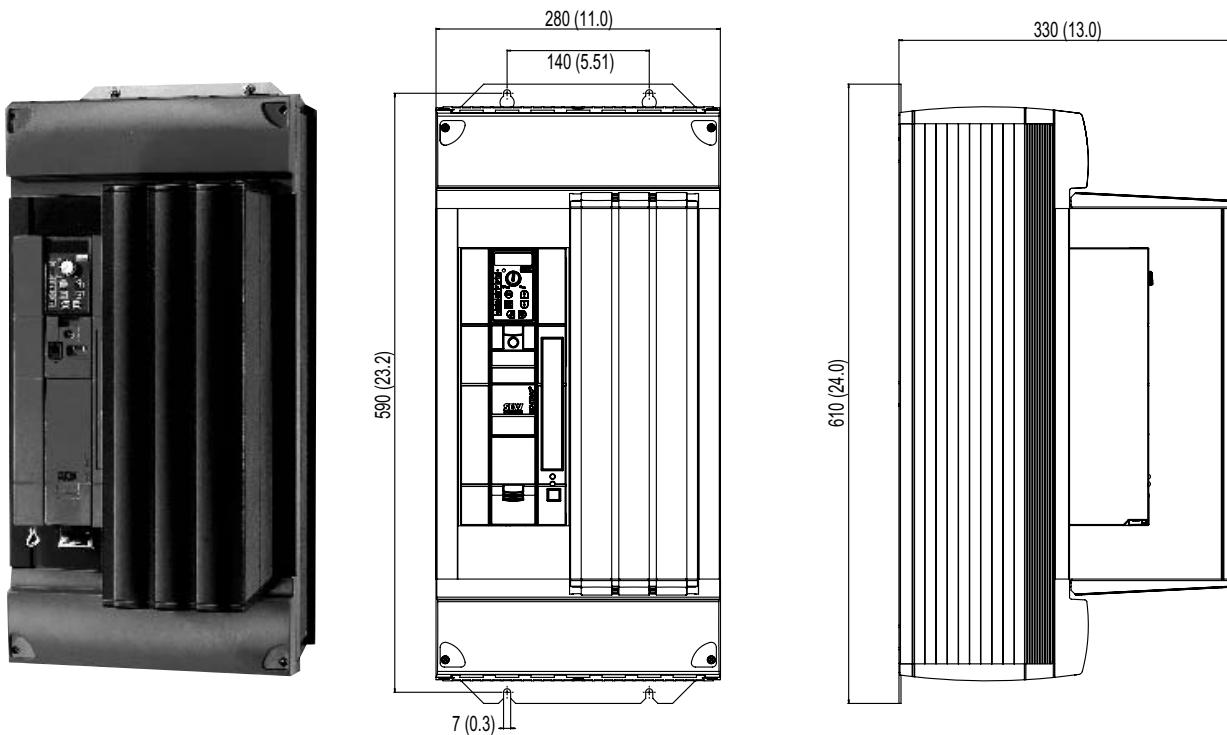
MOVITRAC® MC07B (3-phase supply system)		0370-503-4-00	0450-503-4-00
Part number		828 531 4	828 532 2
<b>INPUT</b>			
Rated mains voltage	$V_{\text{supply}}$	3 × AC 380 ... 500 V	
Rated mains frequency	$f_{\text{supply}}$	50 / 60 Hz ± 5%	
Rated mains current, 100 % operation	$I_{\text{supply}}$	AC 65.7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

<i>kVA</i>	<i>n</i>
<i>i</i>	<i>f</i>
<i>P</i>	<i>Hz</i>

## Technical Data

### Technical data of MOVITRAC® B

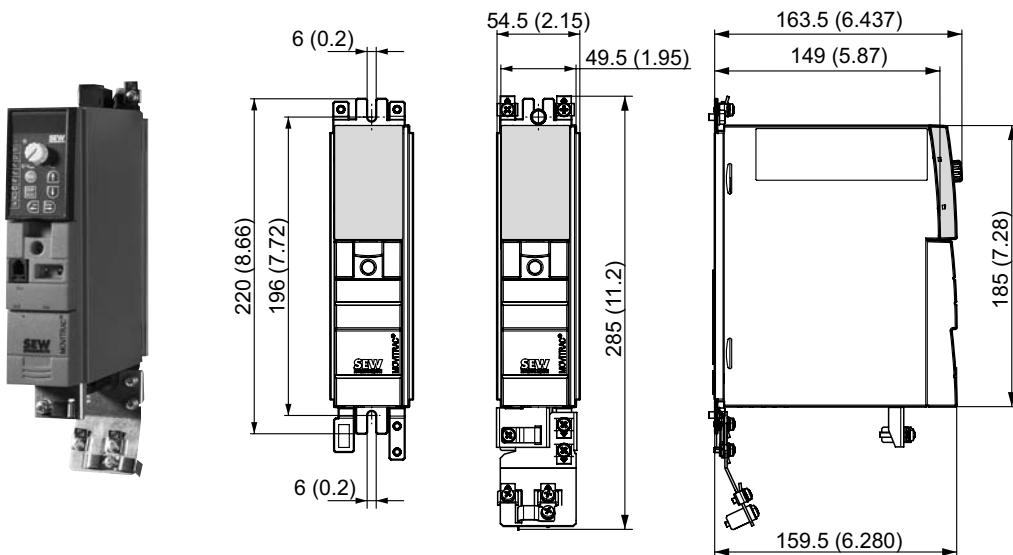
#### 4.4.9 AC 400 / 500 V / 3-phase / size 5 / 55 ... 75 kW / 74 ... 100 HP



<b>MOVITRAC® MC07B (3-phase supply system)</b>		<b>0550-503-4-00</b>	<b>0750-503-4-00</b>
<b>Part number</b>		<b>829 527 1</b>	<b>829 529 8</b>
<b>INPUT</b>			
Rated mains voltage	$V_{\text{supply}}$	$3 \times \text{AC } 380 \dots 500 \text{ V}$	
Rated mains frequency	$f_{\text{supply}}$	$50 / 60 \text{ Hz} \pm 5\%$	
Rated mains current, 100 % operation	$I_{\text{supply}}$	AC 94.5 A	AC 117 A
Rated mains current, 125 % operation	$I_{\text{supply } 125}$	AC 118.1 A	AC 146.3 A
<b>OUTPUT</b>			
Output voltage	$U_A$	$3 \times 0 \dots V_{\text{supply}}$	
Recommended motor power 100 % operation	$P_{\text{Mot}}$	55 kW / 74 HP	75 kW / 100 HP
Recommended motor power 125 % operation	$P_{\text{Mot } 125}$	75 kW / 100 HP	90 kW / 120 HP
Rated output current 100 % operation	$I_N$	AC 105 A	AC 130 A
Rated output current 125 % operation	$I_{N \ 125}$	AC 131 A	AC 162 A
Apparent output power 100 % operation	$S_N$	73.5 kVA	91.0 kVA
Apparent output power 125 % operation	$S_{N \ 125}$	90.8 kVA	112.2 kVA
Minimum permitted braking resistance value (4 quadrant operation)	$R_{BW\_min}$	6 Ω	4 Ω
<b>GENERAL INFORMATION</b>			
Power loss 100 % operation	$P_V$	1700 W	2000 W
Power loss 125 % operation	$P_{V \ 125}$	2020 W	2300 W
Current limitation		150 % $I_N$ for at least 60 seconds	
Terminal cross section / tightening torque	Terminals	35 mm <sup>2</sup> / AWG2	50 mm <sup>2</sup> / AWG0
		14 Nm / 120 lb in	
Dimensions	$W \times H \times D$	280 × 610 × 330 mm / 11.0 × 24.0 × 13.0 in	
Weight	m	35 kg / 77 lb	

<i>kVA</i>	<i>n</i>
<i>i</i>	<i>f</i>
<i>P</i>	<i>Hz</i>

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



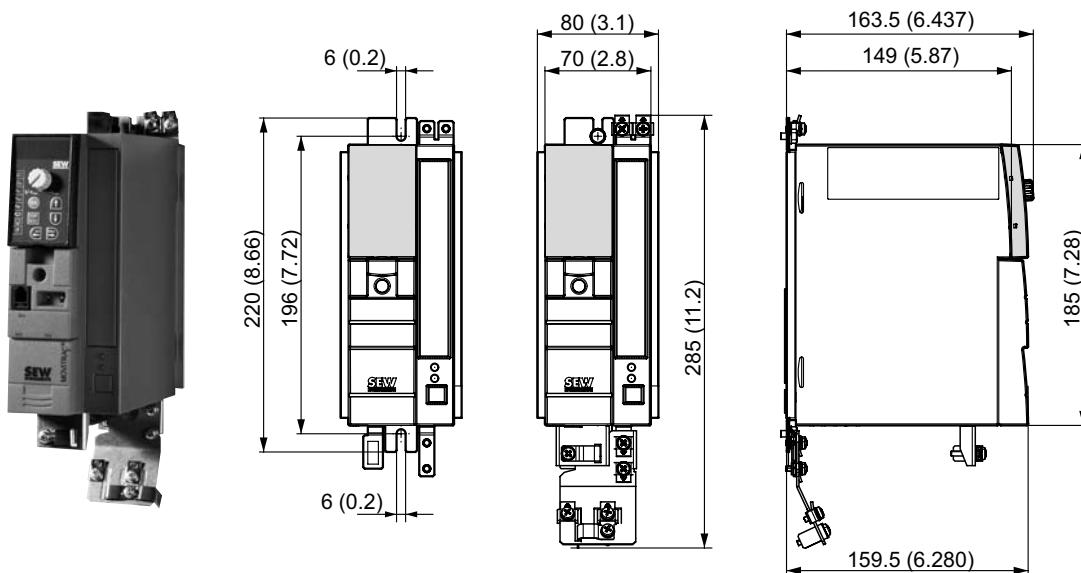
MOVITRAC® MC07B (1-phase supply system)		0003-2B1-4-00	0004-2B1-4-00
Part number		828 491 1	828 493 8
<b>INPUT</b>			
Rated mains voltage	$V_{\text{supply}}$	1 × AC 200 ... 240 V	
Rated mains frequency	$f_{\text{supply}}$	50 / 60 Hz ± 5%	
Rated mains current, 100 % operation	$I_{\text{supply}}$	AC 4.3 A	AC 6.1 A
Rated mains current, 125 % operation	$I_{\text{supply} \ 125}$	AC 5.5 A	AC 7.5 A
<b>OUTPUT</b>			
Output voltage	$U_A$	$3 \times 0 \dots V_{\text{supply}}$	
Recommended motor power 100 % operation	$P_{\text{Mot}}$	0.25 kW / 0.34 HP	0.37 kW / 0.50 HP
Recommended motor power 125 % operation	$P_{\text{Mot} \ 125}$	0.37 kW / 0.50 HP	0.55 kW / 0.74 HP
Rated output current 100 % operation	$I_N$	AC 1.7 A	AC 2.5 A
Rated output current 125 % operation	$I_{N \ 125}$	AC 2.1 A	AC 3.1 A
Apparent output power 100 % operation	$S_N$	0.7 kVA	1.0 kVA
Apparent output power 125 % operation	$S_{N \ 125}$	0.9 kVA	1.3 kVA
Minimum permitted braking resistance value (4 quadrant operation)	$R_{BW\_min}$	27 Ω	
<b>GENERAL INFORMATION</b>			
Power loss 100 % operation	$P_V$	30 W	35 W
Power loss 125 % operation	$P_{V \ 125}$	35 W	45 W
Current limitation		150 % $I_N$ for at least 60 seconds	
Terminal cross section / tightening torque	Terminals	4 mm² / AWG12 / 0.5 Nm / 4 lb in	
Dimensions	$W \times H \times D$	54.5 × 185 × 163.5 mm / 2.15 × 7.28 × 6.437 in	
Weight	m	1.3 kg / 2.9 lb	

<i>kVA</i>	<i>n</i>
<i>i</i>	<i>f</i>
<i>P</i>	<i>Hz</i>

## Technical Data

### Technical data of MOVITRAC® B

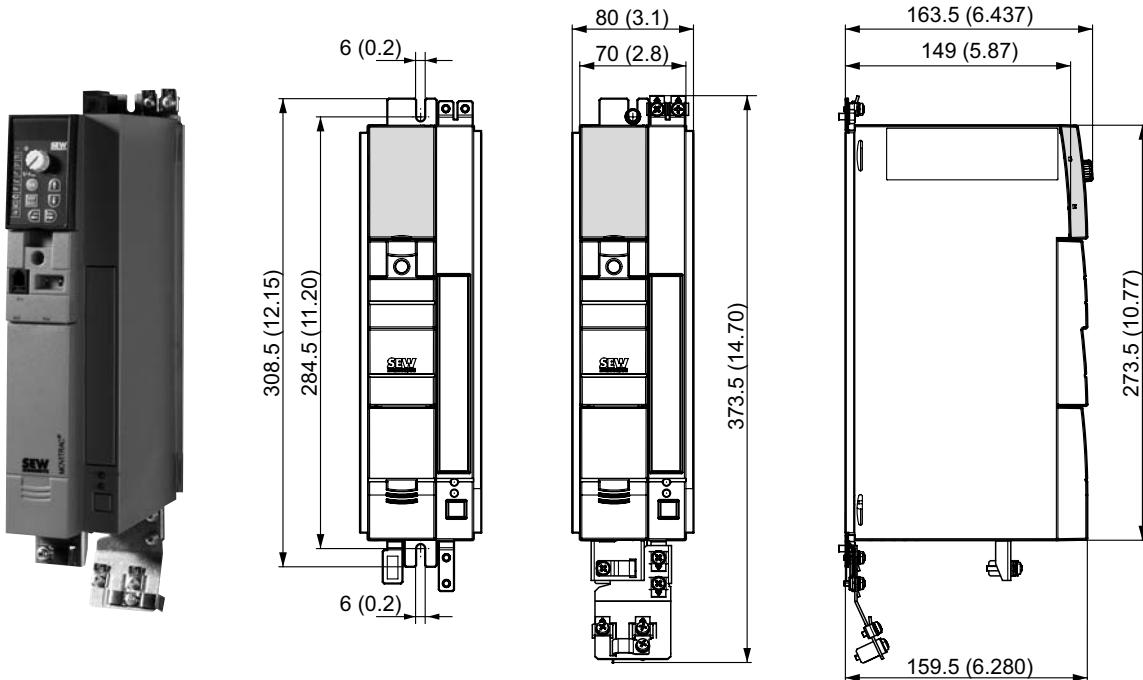
#### 4.4.11 AC 230 V / 1-phase / size 0S / 0.55 ... 0.75 kW / 0.74 ... 1.0 HP



MOVITRAC® MC07B (1-phase supply system)		0005-2B1-4-00	0008-2B1-4-00
Part number		828 494 6	828 495 4
INPUT			
Rated mains voltage	$V_{\text{supply}}$	1 × AC 200 ... 240 V	
Rated mains frequency	$f_{\text{supply}}$	50 / 60 Hz ± 5%	
Rated mains current, 100 % operation	$I_{\text{supply}}$	AC 8.5 A	AC 9.9 A
Rated mains current, 125 % operation	$I_{\text{supply} \ 125}$	AC 10.2 A	AC 11.8 A
OUTPUT			
Output voltage	$U_A$	$3 \times 0 \dots V_{\text{supply}}$	
Recommended motor power 100 % operation	$P_{\text{Mot}}$	0.55 kW / 0.74 HP	0.75 kW / 1.0 HP
Recommended motor power 125 % operation	$P_{\text{Mot} \ 125}$	0.75 kW / 1.0 HP	1.1 kW / 1.5 HP
Rated output current 100 % operation	$I_N$	AC 3.3 A	AC 4.2 A
Rated output current 125 % operation	$I_{N \ 125}$	AC 4.1 A	AC 5.3 A
Apparent output power 100 % operation	$S_N$	1.4 kVA	1.7 kVA
Apparent output power 125 % operation	$S_{N \ 125}$	1.7 kVA	2.1 kVA
Minimum permitted braking resistance value (4 quadrant operation)	$R_{BW\_min}$	27 Ω	
GENERAL INFORMATION			
Power loss 100 % operation	$P_V$	45 W	50 W
Power loss 125 % operation	$P_{V \ 125}$	50 W	65 W
Current limitation		150 % $I_N$ for at least 60 seconds	
Terminal cross section / tightening torque	Terminals	4 mm² / AWG12 / 0.5 Nm / 4 lb in	
Dimensions	$W \times H \times D$	80 × 185 × 163.5 mm / 3.1 × 7.28 × 6.437 in	
Weight	m	1.5 kg / 3.3 lb	

<i>kVA</i>	<i>n</i>
<i>i</i>	<i>f</i>
<i>P</i>	<i>Hz</i>

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



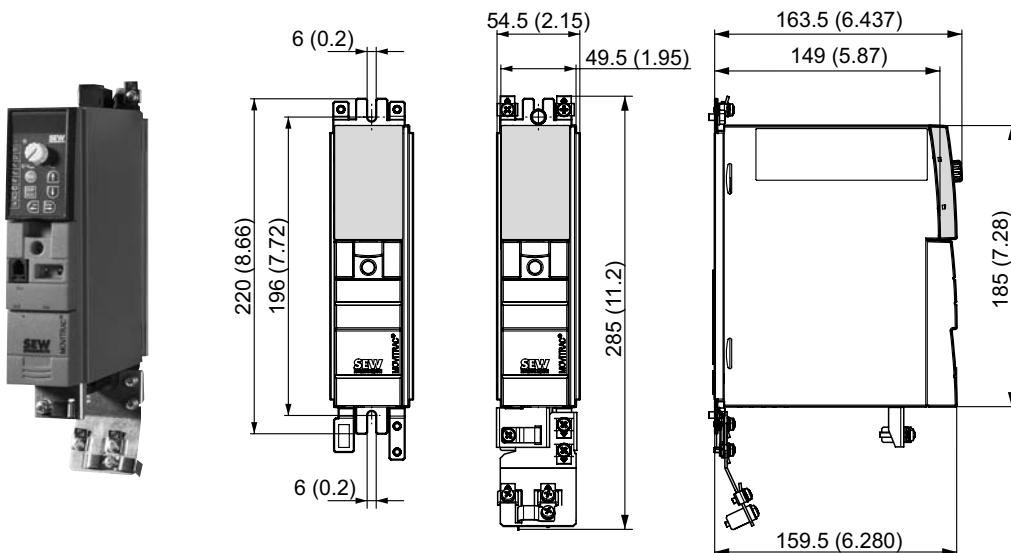
MOVITRAC® MC07B (1-phase supply system)		0011-2B1-4-00	0015-2B1-4-00	0022-2B1-4-00
Part number		828 496 2	828 497 0	828 498 9
<b>INPUT</b>				
Rated mains voltage	$V_{\text{supply}}$	1 × AC 200 ... 240 V		
Rated mains frequency	$f_{\text{supply}}$	50 / 60 Hz ± 5%		
Rated mains current, 100 % operation	$I_{\text{supply}}$	AC 13.4 A	AC 16.7 A	AC 19.7 A
Rated mains current, 125 % operation	$I_{\text{supply} \ 125}$	AC 16.8 A	AC 20.7 A	AC 24.3 A
<b>OUTPUT</b>				
Output voltage	$U_A$	3 × 0 ... $V_{\text{supply}}$		
Recommended motor power 100 % operation	$P_{\text{Mot}}$	1.1 kW / 1.5 HP	1.5 kW / 2.0 HP	2.2 kW / 3.0 HP
Recommended motor power 125 % operation	$P_{\text{Mot} \ 125}$	1.5 kW / 2.0 HP	2.2 kW / 3.0 HP	3.0 kW / 4.0 HP
Rated output current 100 % operation	$I_N$	AC 5.7 A	AC 7.3 A	AC 8.6 A
Rated output current 125 % operation	$I_{N \ 125}$	AC 7.1 A	AC 9.1 A	AC 10.8 A
Apparent output power 100 % operation	$S_N$	2.3 kVA	3.0 kVA	3.5 kVA
Apparent output power 125 % operation	$S_{N \ 125}$	2.9 kVA	3.7 kVA	4.3 kVA
Minimum permitted braking resistance value (4 quadrant operation)	$R_{BW\_min}$	27 Ω		
<b>GENERAL INFORMATION</b>				
Power loss 100 % operation	$P_V$	70 W	90 W	105 W
Power loss 125 % operation	$P_{V \ 125}$	90 W	110 W	132 W
Current limitation		150 % $I_N$ for at least 60 seconds		
Terminal cross section / tightening torque	Terminals	4 mm² / AWG12 / 0.5 Nm / 4 lb in		
Dimensions	$W \times H \times D$	80 × 273.5 × 163.5 mm / 3.1 × 10.77 × 6.437 in		
Weight	m	2.2 kg / 4.9 lb		

<i>kVA</i>	<i>n</i>
<i>f</i>	
<i>i</i>	
<i>P</i>	<i>Hz</i>

## Technical Data

### Technical data of MOVITRAC® B

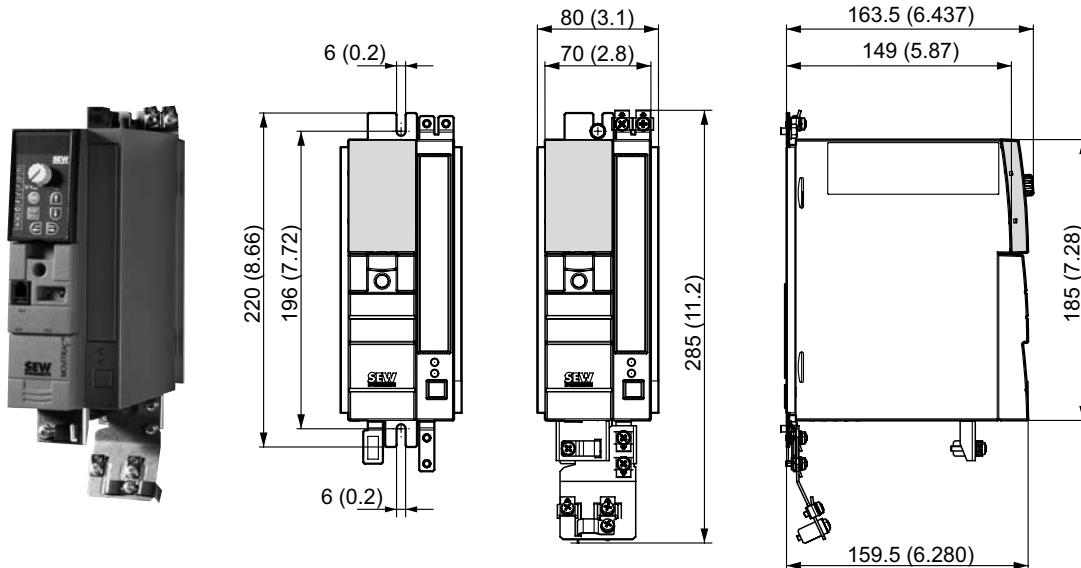
#### 4.4.13 AC 230 V / 3-phase / size 0XS / 0.25 ... 0.37 kW / 0.34 ... 0.50 HP



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

<i>kVA</i>	<i>n</i>
<i>i</i>	<i>f</i>
<i>P</i>	<i>Hz</i>

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



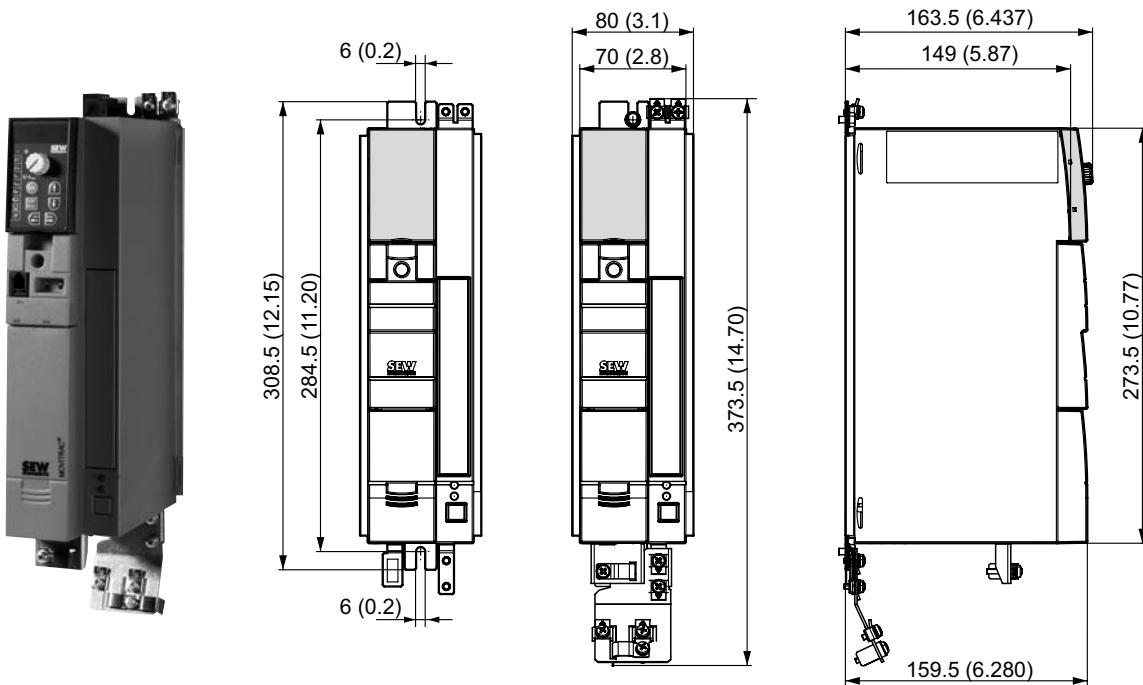
MOVITRAC® MC07B (3-phase supply system)		0005-2A3-4-00	0008-2A3-4-00
Part number		828 501 2	828 502 0
INPUT			
Rated mains voltage	$V_{\text{supply}}$	3 × AC 200 ... 240 V	
Rated mains frequency	$f_{\text{supply}}$	50 / 60 Hz ± 5%	
Rated mains current, 100 % operation	$I_{\text{supply}}$	AC 2.8 A	AC 3.3 A
Rated mains current, 125 % operation	$I_{\text{supply} \ 125}$	AC 3.4 A	AC 4.1 A
OUTPUT			
Output voltage	$U_A$	3 × 0 ... $V_{\text{supply}}$	
Recommended motor power 100 % operation	$P_{\text{Mot}}$	0.55 kW / 0.74 HP	0.75 kW / 1.0 HP
Recommended motor power 125 % operation	$P_{\text{Mot} \ 125}$	0.75 kW / 1.0 HP	1.1 kW / 1.5 HP
Rated output current 100 % operation	$I_N$	AC 3.3 A	AC 4.2 A
Rated output current 125 % operation	$I_{N \ 125}$	AC 4.1 A	AC 5.3 A
Apparent output power 100 % operation	$S_N$	1.4 kVA	1.7 kVA
Apparent output power 125 % operation	$S_{N \ 125}$	1.7 kVA	2.1 kVA
Minimum permitted braking resistance value (4 quadrant operation)	$R_{BW\_min}$	27 Ω	
GENERAL INFORMATION			
Power loss 100 % operation	$P_V$	50 W	60 W
Power loss 125 % operation	$P_{V \ 125}$	60 W	75 W
Current limitation		150 % $I_N$ for at least 60 seconds	
Terminal cross section / tightening torque	Terminals	4 mm² / AWG12 / 0.5 Nm / 4 lb in	
Dimensions	$W \times H \times D$	80 × 185 × 163.5 mm / 3.1 × 7.28 × 6.437 in	
Weight	m	1.5 kg / 3.3 lb	

<i>kVA</i>	<i>n</i>
<i>i</i>	<i>f</i>
<i>P</i>	<i>Hz</i>

## Technical Data

### Technical data of MOVITRAC® B

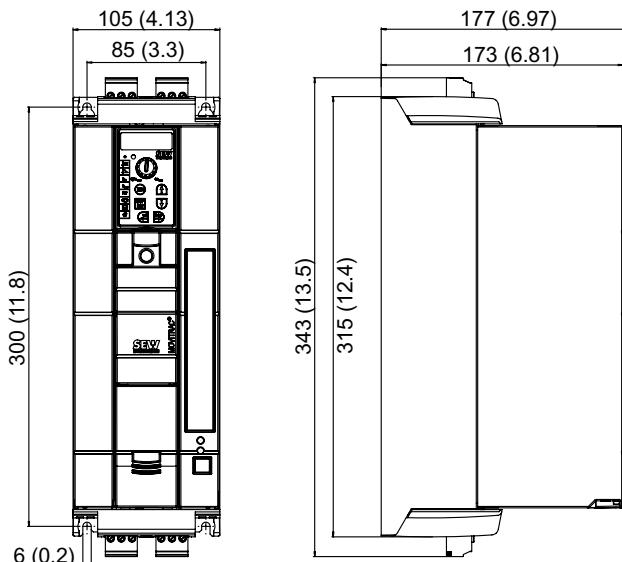
#### 4.4.15 AC 230 V / 3-phase / size 0L / 1.1 ... 2.2 kW / 1.5 ... 3.0 HP



MOVITRAC® MC07B (3-phase supply system)		0011-2A3-4-00 828 503 9	0015-2A3-4-00 828 504 7	0022-2A3-4-00 828 505 5
<b>INPUT</b>				
Rated mains voltage	$V_{\text{supply}}$	3 × AC 200 ... 240 V		
Rated mains frequency	$f_{\text{supply}}$	50 / 60 Hz ± 5%		
Rated mains current, 100 % operation	$I_{\text{supply}}$	AC 5.1 A	AC 6.4 A	AC 7.6 A
Rated mains current, 125 % operation	$I_{\text{supply} \ 125}$	AC 6.3 A	AC 7.9 A	AC 9.5 A
<b>OUTPUT</b>				
Output voltage	$U_A$	3 × 0 ... $V_{\text{supply}}$		
Recommended motor power 100 % operation	$P_{\text{Mot}}$	1.1 kW / 1.5 HP	1.5 kW / 2.0 HP	2.2 kW / 3.0 HP
Recommended motor power 125 % operation	$P_{\text{Mot} \ 125}$	1.5 kW / 2.0 HP	2.2 kW / 3.0 HP	3.0 kW / 4.0 HP
Rated output current 100 % operation	$I_N$	AC 5.7 A	AC 7.3 A	AC 8.6 A
Rated output current 125 % operation	$I_{N \ 125}$	AC 7.1 A	AC 9.1 A	AC 10.8 A
Apparent output power 100 % operation	$S_N$	2.3 kVA	3.0 kVA	3.5 kVA
Apparent output power 125 % operation	$S_{N \ 125}$	2.9 kVA	3.7 kVA	4.3 kVA
Minimum permitted braking resistance value (4 quadrant operation)	$R_{BW\_min}$	27 Ω		
<b>GENERAL INFORMATION</b>				
Power loss 100 % operation	$P_V$	75 W	90 W	105 W
Power loss 125 % operation	$P_{V \ 125}$	90 W	110 W	140 W
Current limitation		150 % $I_N$ for at least 60 seconds		
Terminal cross section / tightening torque	Terminals	4 mm² / AWG12 / 0.5 Nm / 4 lb in		
Dimensions	$W \times H \times D$	80 × 273.5 × 163.5 mm / 3.1 × 10.77 × 6.437 in		
Weight	m	2.2 kg / 4.9 lb		

<i>kVA</i>	<i>n</i>
<i>i</i>	<i>f</i>
<i>P</i>	<i>Hz</i>

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



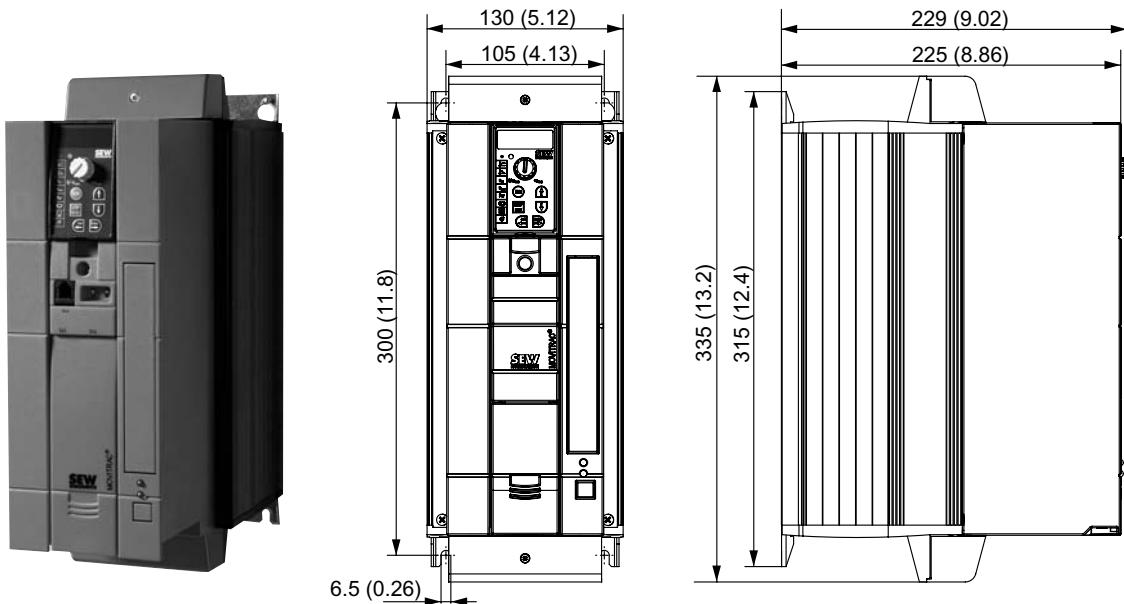
<b>MOVITRAC® MC07B (3-phase supply system)</b>		<b>0037-2A3-4-00</b>
Part number		<b>828 506 3</b>
<b>INPUT</b>		
Rated mains voltage	$V_{\text{supply}}$	3 × AC 200 ... 240 V
Rated mains frequency	$f_{\text{supply}}$	50 / 60 Hz ± 5%
Rated mains current, 100 % operation	$I_{\text{supply}}$	AC 12.9 A
Rated mains current, 125 % operation	$I_{\text{supply} \ 125}$	AC 16.1 A
<b>OUTPUT</b>		
Output voltage	$U_A$	3 × 0 ... $V_{\text{supply}}$
Recommended motor power 100 % operation	$P_{\text{Mot}}$	3.7 kW / 5.0 HP
Recommended motor power 125 % operation	$P_{\text{Mot} \ 125}$	5.5 kW / 7.4 HP
Rated output current 100 % operation	$I_N$	AC 14.5 A
Rated output current 125 % operation	$I_{N \ 125}$	AC 18.1 A
Apparent output power 100 % operation	$S_N$	5.8 kVA
Apparent output power 125 % operation	$S_{N \ 125}$	7.3 kVA
Minimum permitted braking resistance value (4 quadrant operation)	$R_{BW\_min}$	27 Ω
<b>GENERAL INFORMATION</b>		
Power loss 100 % operation	$P_V$	210 W
Power loss 125 % operation	$P_{V \ 125}$	270 W
Current limitation		150 % $I_N$ for at least 60 seconds
Terminal cross section / tightening torque	Terminals	4 mm² / AWG12 / 0.5 Nm / 4 lb in
Dimensions	$W \times H \times D$	105 × 315 × 173 mm / 4.13 × 12.4 × 6.81 in
Weight	m	3.5 kg / 7.7 lb

<i>kVA</i>	<i>n</i>
<i>i</i>	<i>f</i>
<i>P</i>	<i>Hz</i>

## Technical Data

### Technical data of MOVITRAC® B

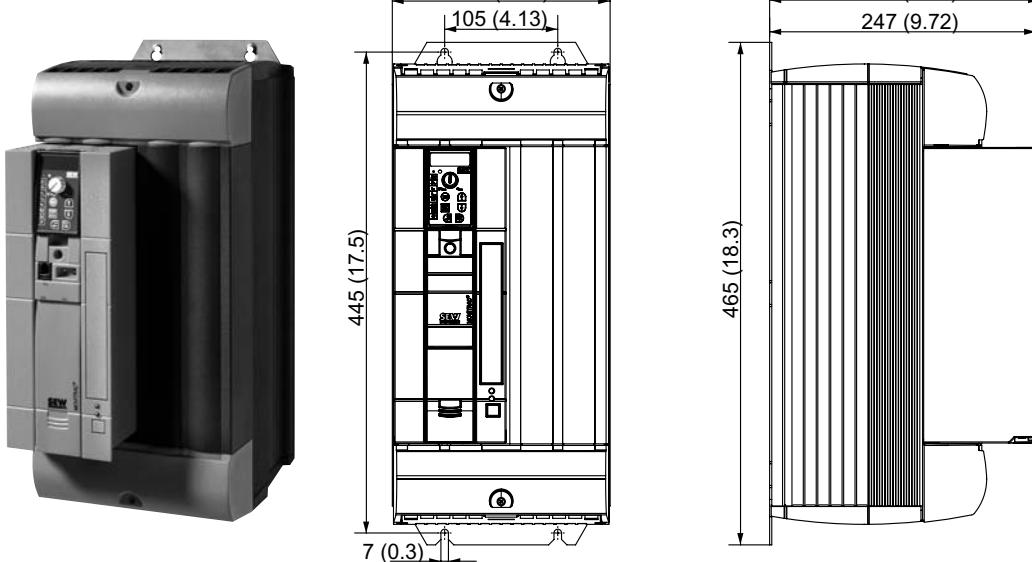
#### 4.4.17 AC 230 V / 3-phase / size 2 / 5.5 ... 7.5 kW / 7.4 ... 10 HP



MOVITRAC® MC07B (3-phase supply system)		0055-2A3-4-00 828 507 1	0075-2A3-4-00 828 509 8
<b>INPUT</b>			
Rated mains voltage	$V_{\text{supply}}$	3 × AC 200 ... 240 V	
Rated mains frequency	$f_{\text{supply}}$	50 / 60 Hz ± 5%	
Rated mains current, 100 % operation	$I_{\text{supply}}$	AC 19.5 A	AC 27.4 A
Rated mains current, 125 % operation	$I_{\text{supply} \ 125}$	AC 24.4 A	AC 34.3 A
<b>OUTPUT</b>			
Output voltage	$U_A$	3 × 0 ... $V_{\text{supply}}$	
Recommended motor power 100 % operation	$P_{\text{Mot}}$	5.5 kW / 7.4 HP	7.5 kW / 10 HP
Recommended motor power 125 % operation	$P_{\text{Mot} \ 125}$	AC 7.5 kW (10 HP)	11 kW / 15 HP
Rated output current 100 % operation	$I_N$	AC 22 A	AC 29 A
Rated output current 125 % operation	$I_{N \ 125}$	AC 27.5 A	AC 36.3 A
Apparent output power 100 % operation	$S_N$	8.8 kVA	11.6 kVA
Apparent output power 125 % operation	$S_{N \ 125}$	11.0 kVA	14.5 kVA
Minimum permitted braking resistance value (4 quadrant operation)	$R_{BW\_min}$	12 Ω	
<b>GENERAL INFORMATION</b>			
Power loss 100 % operation	$P_V$	300 W	380 W
Power loss 125 % operation	$P_{V \ 125}$	375 W	475 W
Current limitation		150 % $I_N$ for at least 60 seconds	
Terminal cross section / tightening torque	Terminals	4 mm² / AWG12 / 1.5 Nm / 13 lb in	
Dimensions	$W \times H \times D$	130 × 335 × 229 mm / 5.12 × 13.2 × 9.02 in	
Weight	m	6.6 kg / 15 lb	

<i>kVA</i>	<i>n</i>
<i>i</i>	<i>f</i>
<i>P</i>	<i>Hz</i>

## 4.4.18 AC 230 V / 3-phase / size 3 / 11 ... 15 kW / 15 ... 20 HP



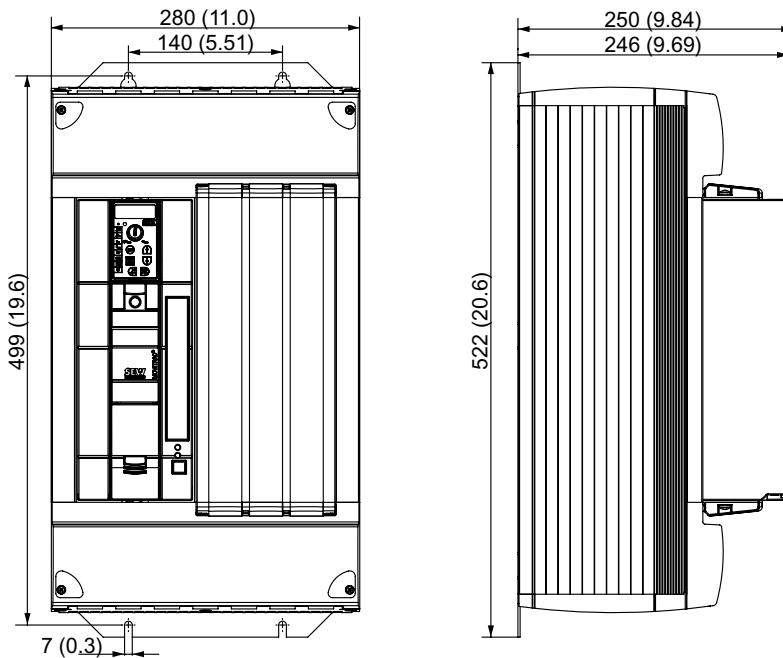
MOVITRAC® MC07B (3-phase supply system)		0110-203-4-00	0150-203-4-00
Part number		828 510 1	828 512 8
<b>INPUT</b>			
Rated mains voltage	$V_{\text{supply}}$	$3 \times \text{AC } 200 \dots 240 \text{ V}$	
Rated mains frequency	$f_{\text{supply}}$	$50 / 60 \text{ Hz} \pm 5\%$	
Rated mains current, 100 % operation	$I_{\text{supply}}$	AC 40.0 A	AC 48.6 A
Rated mains current, 125 % operation	$I_{\text{supply } 125}$	AC 50.0 A	AC 60.8 A
<b>OUTPUT</b>			
Output voltage	$U_A$	$3 \times 0 \dots V_{\text{supply}}$	
Recommended motor power 100 % operation	$P_{\text{Mot}}$	11 kW / 15 HP	15 kW / 20 HP
Recommended motor power 125 % operation	$P_{\text{Mot } 125}$	15 kW / 20 HP	22 kW / 30 HP
Rated output current 100 % operation	$I_N$	AC 42 A	AC 54 A
Rated output current 125 % operation	$I_{N \ 125}$	AC 52.5 A	AC 67.5 A
Apparent output power 100 % operation	$S_N$	16.8 kVA	21.6 kVA
Apparent output power 125 % operation	$S_{N \ 125}$	21.0 kVA	26.9 kVA
Minimum permitted braking resistance value (4 quadrant operation)	$R_{BW\_min}$	7.5 Ω	5.6 Ω
<b>GENERAL INFORMATION</b>			
Power loss 100 % operation	$P_V$	580 W	720 W
Power loss 125 % operation	$P_{V \ 125}$	720 W	900 W
Current limitation		150 % $I_N$ for at least 60 seconds	
Terminal cross section / tightening torque	Terminals	6 mm <sup>2</sup> / AWG10	10 mm <sup>2</sup> / AWG8
		3.5 Nm / 31 lb in	
Dimensions	$W \times H \times D$	200 × 465 × 251 mm / 7.87 × 18.3 × 9.88 in	
Weight	m	15 kg / 33 lb	

<i>kVA</i>	<i>n</i>
<i>i</i>	<i>f</i>
<i>P</i>	<i>Hz</i>

## Technical Data

### Technical data of MOVITRAC® B

#### 4.4.19 AC 230 V / 3-phase / size 4 / 22 ... 30 kW / 30 ... 40 HP



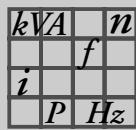
MOVITRAC® MC07B (3-phase supply system)		0220-203-4-00 828 513 6	0300-203-4-00 828 514 4
<b>INPUT</b>			
Rated mains voltage	$V_{\text{supply}}$	3 × AC 200 ... 240 V	
Rated mains frequency	$f_{\text{supply}}$	50 / 60 Hz ± 5%	
Rated mains current, 100 % operation	$I_{\text{supply}}$	AC 72 A	AC 86 A
Rated mains current, 125 % operation	$I_{\text{supply} \ 125}$	AC 90 A	AC 107 A
<b>OUTPUT</b>			
Output voltage	$U_A$	3 × 0 ... $V_{\text{supply}}$	
Recommended motor power 100 % operation	$P_{\text{Mot}}$	22 kW / 30 HP	30 kW / 40 HP
Recommended motor power 125 % operation	$P_{\text{Mot} \ 125}$	30 kW / 40 HP	37 kW / 50 HP
Rated output current 100 % operation	$I_N$	AC 80 A	AC 95 A
Rated output current 125 % operation	$I_{N \ 125}$	AC 100 A	AC 118.8 A
Apparent output power 100 % operation	$S_N$	31.9 kVA	37.9 kVA
Apparent output power 125 % operation	$S_{N \ 125}$	39.9 kVA	47.4 kVA
Minimum permitted braking resistance value (4 quadrant operation)	$R_{BW\_min}$	3 Ω	
<b>GENERAL INFORMATION</b>			
Power loss 100 % operation	$P_V$	1100 W	1300 W
Power loss 125 % operation	$P_{V \ 125}$	1400 W	1700 W
Current limitation		150 % $I_N$ for at least 60 seconds	
Terminal cross section / tightening torque	Terminals	25 mm <sup>2</sup> / AWG4 14 Nm / 120 lb in	35 mm <sup>2</sup> / AWG2
Dimensions	$W \times H \times D$	280 × 522 × 250 mm / 11.0 × 20.6 × 9.84 in	
Weight	m	27 kg / 60 lb	

#### 4.5 Front option FBG11B keypad

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

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

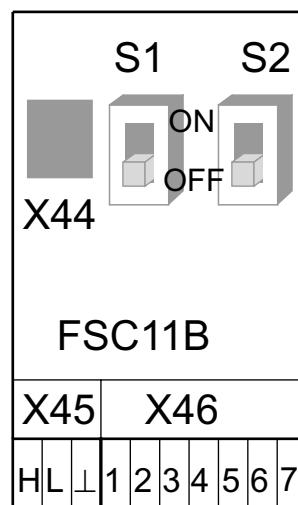
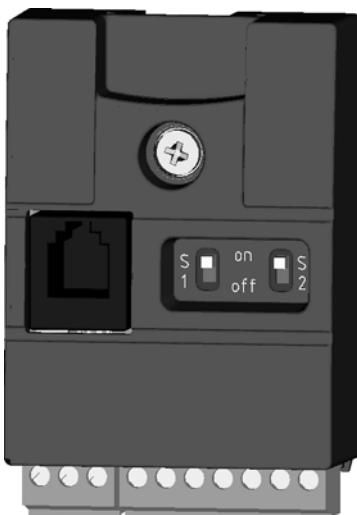




#### 4.6 FSC11B communication module

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

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



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

## 4.7 FIO11B analog module

Part number 1820 637 9

### 4.7.1 Description

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

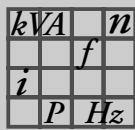
- Setpoint input
- Analog output
- RS-485 interface
- The options FIO11B and FSC11B are mounted on the same fastening place and therefore cannot be used simultaneously.



### 4.7.2 Electronics data FIO11B analog module

Function	Terminal	Designation	Data
Setpoint input <sup>1)</sup>	X40:1 X40:2	AI2: Voltage input GND: Reference potential	-10 ... +10 V $R_i > 40 \text{ k}\Omega$ Resolution 10 bit Sampling time 5 ms
Analog output/ alternative as cur- rent output or volt- age output	X40:3 X40:4 X40:5	GND: Reference potential AOV1: Voltage output AOC1: Current output	0 ... +10 V / $I_{\max} = 2 \text{ mA}$ 0 (4) ... 20 mA Resolution 10 bit Sampling time 5 ms Short-circuit proof, protected against external voltage up to 30 V Load impedance $R_L \leq 750 \Omega$
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 (656 ft) Dynamic terminating resistor with fixed installation Terminal cross-section: – 1.5 mm <sup>2</sup> (AWG15) without conductor end sleeves – 1.0 mm <sup>2</sup> (AWG17) with conductor end sleeves Connection: Only for service purposes, exclusively for point-to-point connection Maximum cable length 5 m (20 ft)
	X44 RJ10	Service interface	

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



## 4.8 **DBG60B keypad**

### 4.8.1 Description

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

Keypad	Language	Part number
	<b>DBG60B-01</b> DE/EN/FR/IT/ES/PT/NL (German / English / French / Italian / Spanish / Portuguese / Dutch)	1 820 403 1
<b>DBG60B-02</b>	DE / EN / FR / FI / SV / DA / TR (German / English / French / Finnish / Swedish / Danish / Turkish)	1 820 405 8
<b>DBG60B-03</b>	DE/EN/FR/RU/PL/CS (German / English / French / Russian / Polish / Czech)	1 820 406 6
<b>DBG60B-04</b>	DE / EN / FR / ZH (German / English / French / Chinese)	1 820 850 9
<b>Door installation set<sup>1)</sup></b>	<b>Description (= scope of delivery)</b>	<b>Part number</b>
<b>DBM60B</b>	<ul style="list-style-type: none"> <li>Housing for DBG60B (IP65)</li> <li>DKG60B extension cable, length 5 m (20 ft)</li> </ul>	824 853 2
<b>Extension cables</b>	<b>Description (= scope of delivery)</b>	<b>Part number</b>
<b>DKG60B</b>	<ul style="list-style-type: none"> <li>5 m long (20 ft)</li> <li>4-core, shielded cable (AWG26)</li> </ul>	817 583 7

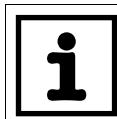
1) The DBG60B keypad is not included in the scope of delivery and must be ordered separately.

### 4.8.2 Functions

- Display process values and status
- Status displays of the binary inputs / outputs
- Error memory and error reset queries
- Option to display and set the operating parameters and service parameters
- Data backup and transfer of parameter sets to other MOVITRAC® B units.
- User-friendly startup menu
- Manual control for MOVITRAC® B
- The FSC11B front option or FIO11B is required for connection

#### 4.8.3 Features

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

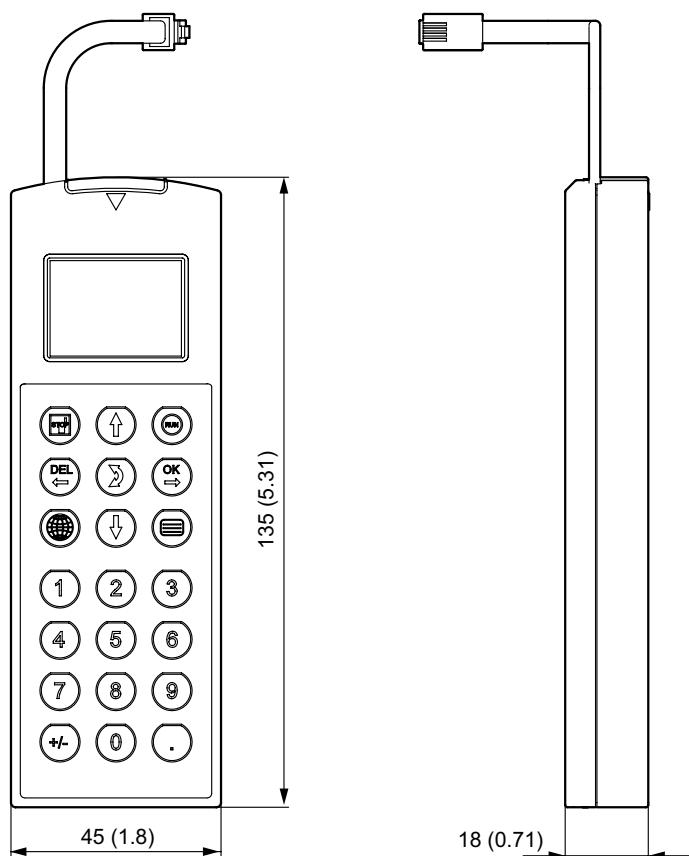


#### NOTE

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

#### 4.8.4 Dimension drawing for DBG60B

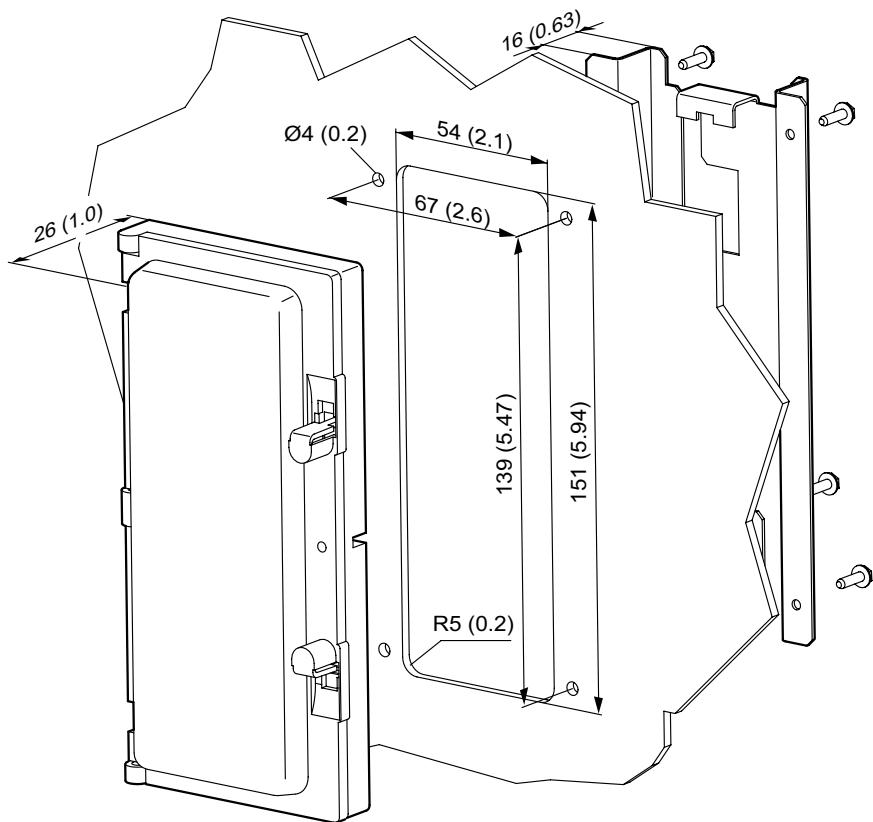
DBG60B dimension drawing, dimensions in mm



<i>kVA</i>	<i>n</i>
<i>f</i>	
<i>i</i>	
<i>P</i>	<i>Hz</i>

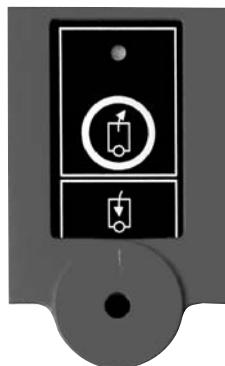
**4.8.5 DBG60B housing dimension drawing**

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



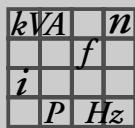
#### 4.9 Parameter module UBP11A

Part number: 823 933 9



##### Functional description:

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



#### 4.10 MBG11A setpoint control module

##### Functional description:

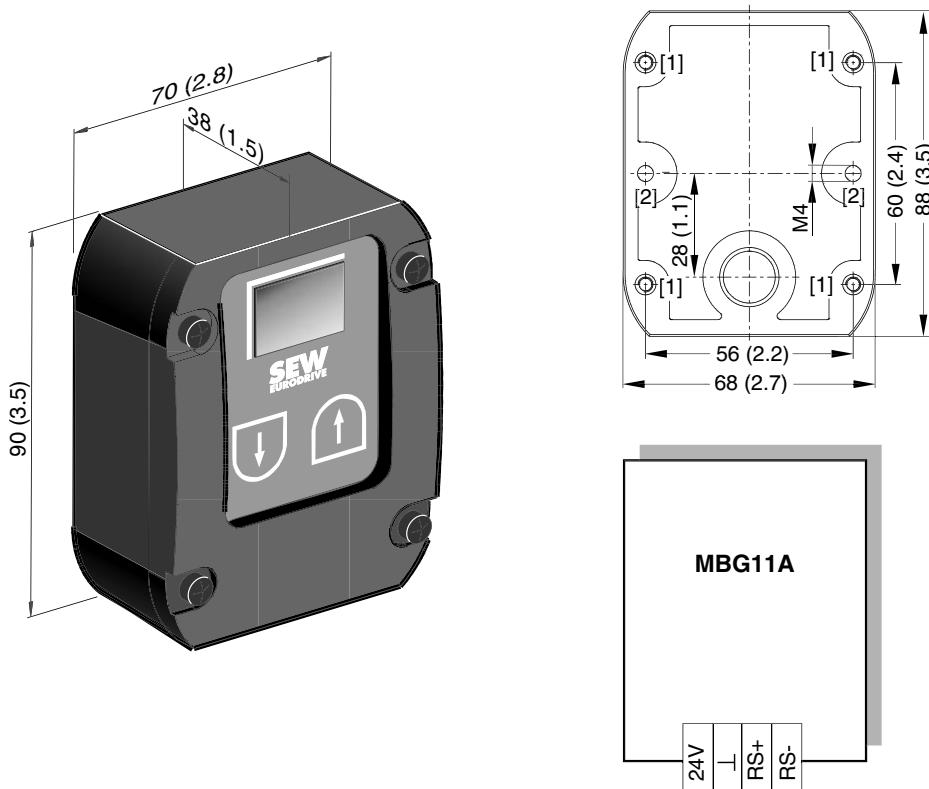
- The MBG11A setpoint control module has 2 keys and a display. They make it possible to adjust the speed remotely in the range from -100 %... +100 %  $f_{\max}$  (potentiometer  $f_1$ ).
- Up to 31 MOVITRAC® B units can be controlled at the same time (broadcasting).
- The MBG11A setpoint control module requires the front option FSC11B or FIO11B.

##### Technical data:

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

1) with integrated dynamic terminating resistor

##### Dimensions and connection assignment:



[1] Tapped hole on the rear

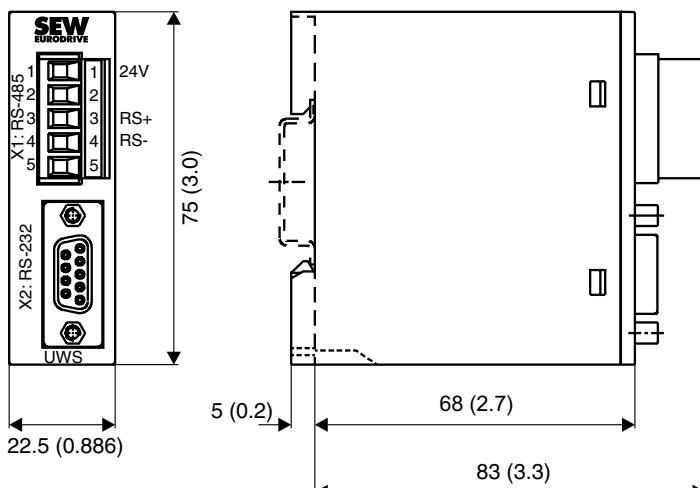
[2] Retaining holes for M4 screws

<i>kVA</i>	<i>n</i>
<i>i</i>	<i>f</i>
<i>P</i>	<i>Hz</i>

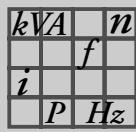
#### 4.11 UWS11A interface adapter RS-232 / RS-485 for mounting rail

Part number	822 689 X	The FSC11B or FIO11B is required for connecting the UWS11A.
Ambient temperature	0 ... 40 °C (32 ... 104 °F)	
Degree of protection	IP20	
Description		The UWS11A option converts RS-232 signals, for example from the PC, into RS-485 signals. These RS-485 signals can then be routed to the RS-485 interface of the MOVITRAC® B.
RS-232 interface		The UWS11A option requires a DC 24 V voltage supply ( $I_{max} = DC 100 \text{ mA}$ ). The connection between UWS11A and PC is made using a commercially available serial interface cable (shielded!).
RS-485 interface		You can use the RS485 interface of the UWS11A to network up to 32 MOVITRAC® B units for communication (max. total cable length 200 m (656 ft)). Do not connect external terminating resistors because dynamic terminating resistors are already installed.
	Permitted cable cross-section:	One core per terminal 0.20...2.5 mm <sup>2</sup> (AWG 24...12) 2 cores per terminal 0.20...1 mm <sup>2</sup> (AWG 24...17)

Dimension drawing



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



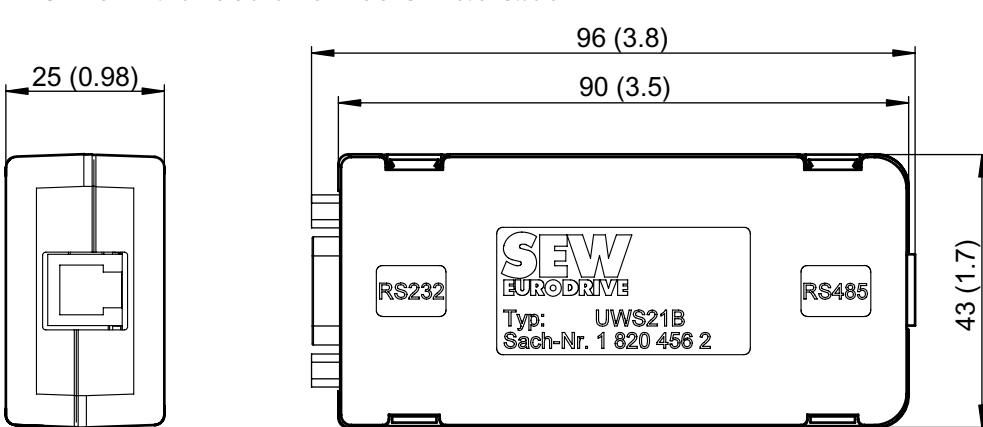
## Technical Data

### UWS21B interface adapter RS-232/RS-485

#### 4.12 UWS21B interface adapter RS-232/RS-485

Part number	18204562	The FSC11B or FIO11B is required for connecting the UWS21B.
Ambient temperature	0...40 °C (32...104 °F)	
Degree of protection	IP20	
Description	The UWS21B option converts RS-232 signals, for example from the PC, into RS-485 signals. These RS-485 signals can then be routed to the interface of the MOVITRAC® B.	
RS-232 interface	The connection between UWS21B and PC connection is made using a standard serial interface cable (shielded!).	
RS-485 interface	The connection between UWS21B and MOVITRAC® B is made using a serial interface cable with RJ10 plugs.	
Scope of delivery	The scope of delivery for the UWS21B option includes: <ul style="list-style-type: none"> <li>• UWS21B unit</li> <li>• Serial interface cable with 9-pin sub D socket and 9-pin sub D connector to connect the UWS21B option to the PC.</li> <li>• Serial interface cable with two RJ10 plugs to connect UWS21B and MOVITRAC® B.</li> <li>• CD-ROM with drivers and MOVITOOLS® MotionStudio</li> </ul>	

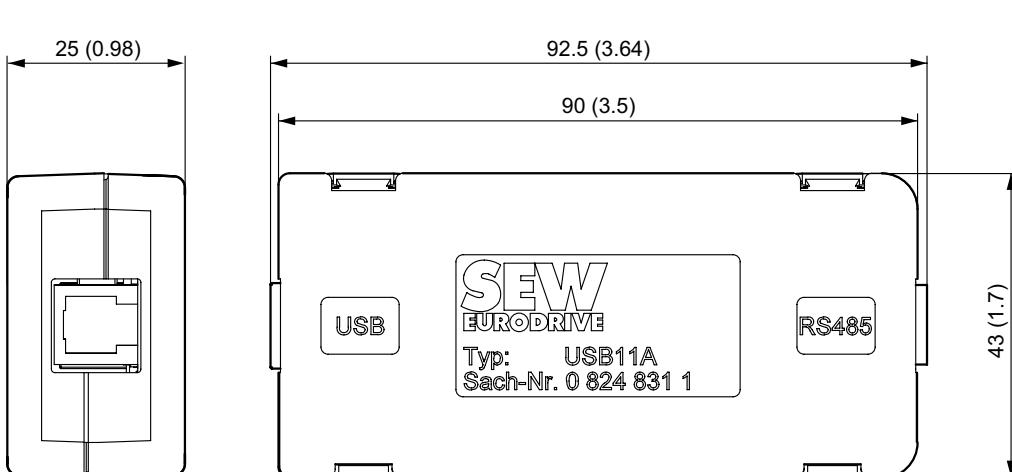
UWS21B dimension drawing



#### 4.13 USB11A interface adapter USB/RS-485

Part number	824 831 1	The FSC11B or FIO11B is required for connecting the USB11A.
Ambient temperature	0...40 °C (32...104 °F)	
Degree of protection	IP20	
Description	The USB11A option is used to connect a PC or laptop with USB interface to the X44 interface of the MOVITRAC® unit. The USB11A interface adapter supports USB1.1 and USB2.0.	
USB interface	The connection between USB11A and PC is made using a standard USB cable type USB A-B (shielded!).	
Scope of delivery	The scope of delivery for the USB11A option includes: <ul style="list-style-type: none"> <li>• USB11A unit</li> <li>• USB connection cable type USB A-B to connect USB11A to PC.</li> <li>• Serial interface cable with two RJ10 connectors to connect MOVITRAC® B and USB11A.</li> <li>• CD-ROM with drivers and MOVITOOLS® MotionStudio.</li> </ul>	

USB11A dimension drawing



## 4.14 BW series braking resistors

### 4.14.1 General information

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

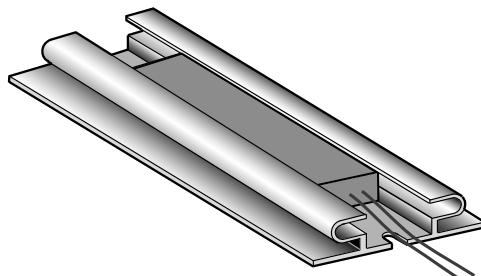
The resistor surfaces will heat up under a load of  $P_N$ . Make sure that you select an installation site that will accommodate these high temperatures. As a rule, braking resistors are therefore mounted on the control cabinet roof.

Provide for a load derating of 4 % per 10 K from an ambient temperature of 45 °C (118 °F). Do not exceed the maximum ambient temperature of 80 °C (176 °F). Note the maximum permissible temperature of other components (e.g. MOVITRAC® B) when installing in the control cabinet.

### 4.14.2 PTC braking resistors

Observe the following points for the PTC braking resistors:

- 4-quadrant operation is recommended for applications in which the level of regenerative energy is low.
- The resistor protects itself (reversible) against regenerative overload by changing abruptly to high resistance and no longer consuming any more energy.
- The inverter then switches off and signals a brake chopper fault (fault code 04).



Assignment of the PTC braking resistors:

Braking resistor type	BW1	BW2	BW3	BW4
Part number	800 621 0	800 622 9	800 623 7	800 624 5
Ambient temperature $\vartheta_A$	-25 °C ... +60 °C (-13 °F ... 140 °F)			
For MOVITRAC® B	0003 / 0004 (400/500 V)		0003 / 0004 (230 V)	

<i>kVA</i>	<i>n</i>
<i>i</i>	<i>f</i>
<i>P</i>	<i>Hz</i>

## Technical Data

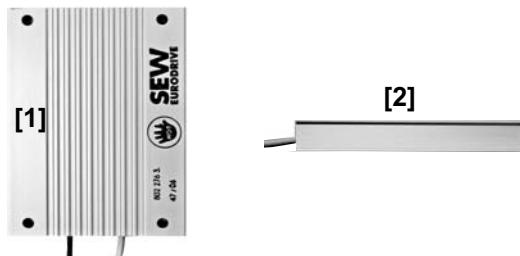
### BW series braking resistors

#### 4.14.3 Flat design

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

- With support rail mounting FHS or submounting FKB under the heat sink. 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 mounting rail using a BS touch guard.

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



230 V

Braking resistor type	BW027-003	BW027-005
Part number	826 949 1	826 950 5
100 % cdf	230 W	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	1.0 A	1.4 A
Ambient temperature $\vartheta_A$	-20 °C ... +45 °C (-4 °F ... 113 °F)	
For MOVITRAC® B 230 V	0003 ... 0022	0003 ... 0022

400 / 500 V

Braking resistor type	BW072-003	BW072-005
Part number	826 058 3	826 060 5
100 % cdf	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	0.6 A	1.0 A
Ambient temperature $\vartheta_A$	-20 °C ... +45 °C (-4 °F ... 113 °F)	
For MOVITRAC® B 400/500 V	0003 ... 0040	0003 ... 0040

<i>kVA</i>	<i>n</i>
<i>i</i>	<i>f</i>
<i>P</i>	<i>Hz</i>

#### 4.14.4 Wire resistors and grid resistors

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

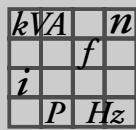
SEW-EURODRIVE recommends also protecting the wire and grid resistors against overload using a bimetallic relay with trip characteristics of trip class 10 or 10A (in accordance with EN 60947-4-1). Set the trip current to the value  $I_F$  (→ following tables).

Do not use electronic or electromagnetic fuses because these can be triggered even in case of short-term excess currents that are still within the tolerance range.

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

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

The performance data listed in the following tables indicate the load capacity of the braking resistors depending on their cyclic duration factor. The cyclic duration factor cdf of the braking resistor is indicated in % and is based on a cycle duration of  $\leq 120$  s.



## Technical Data

### BW series braking resistors

230 V

Type	<b>BW027-006</b>	<b>BW027-012</b>	<b>BW018-015</b>	<b>BW018-035</b>	<b>BW018-075</b>	<b>BW012-025</b>	<b>BW012-050</b>	<b>BW012-100</b>				
Part number	822 422 6	822 423 4	–	–	–	821 680 0	–	–				
Type BW..-T part number	–	–	1820 416 3	1820 138 5	1820 139 3	–	1820 140 7	1820 141 5				
Type BW..-P part number	–	–	–	–	–	1820 414 7	–	–				
100 % cdf	0.6 kW	1.2 kW	1.5 kW	3.5 kW	7.5 kW	2.5 kW	5.0 kW	10 kW				
50 % cdf	1.2 kW	2.3 kW	2.5 kW	5.9 kW	12.7 kW	4.2 kW	8.5 kW	17 kW				
25 % cdf	2.0 kW	5.0 kW	4.5 kW	10.5 kW	22.5 kW	7.5 kW	15.0 kW	19.2 kW <sup>1)</sup>				
12 % cdf	3.5 kW	7.5 kW	6.7 kW	15.7 kW	25.6 kW <sup>1)</sup>	11.2 kW	19.2 kW <sup>1)</sup>	19.2 kW <sup>1)</sup>				
6 % cdf	6.0 kW	8.5 kW <sup>1)</sup>	11.4 kW	25.6 kW <sup>1)</sup>	25.6 kW <sup>1)</sup>	19.0 kW	19.2 kW <sup>1)</sup>	19.2 kW <sup>1)</sup>				
Resistance	27 Ω ±10%		18 Ω ±10%			12 Ω ±10%						
Trip current I <sub>F</sub>	4.7 A <sub>RMS</sub>	6.7 A <sub>RMS</sub>	4.0 A <sub>RMS</sub>	8.1 A <sub>RMS</sub>	14 A <sub>RMS</sub>	10 A <sub>RMS</sub>	19 A <sub>RMS</sub>	27 A <sub>RMS</sub>				
Connections	Ceramic terminals 2.5 mm <sup>2</sup> (AWG12)				M8 stud							
Tightening torque	0.5 Nm / 4 lb in		6 Nm / 50 lb in									
Design	Wire resistor		Grid resistor									
For MOVITRAC® B	0015 ... 0022		2 x parallel with 0110			0055 / 0075						

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

Type	<b>BW039-003</b>	<b>BW039-006</b>	<b>BW039-012</b>	<b>BW039-026</b>	<b>BW915</b>	<b>BW106</b>	<b>BW206</b>
Part number	821 687 8	821 688 6	821 689 4	–	–	–	–
Type BW..-T part number	–	–	1820 136 9	1820 415 5	1820 413 9	1820 083 4	1820 412 0
100 % cdf	0.3 kW	0.6 kW	1.2 kW	2.6 kW	16.0 kW	13 kW	18 kW
50 % cdf	0.5 kW	1.1 kW	2.1 kW	4.6 kW	27.0 kW	24 kW	32 kW
25 % cdf	1.0 kW	1.9 kW	3.8 kW	5.9 kW <sup>1)</sup>	30.7 kW <sup>1)</sup>	38.4 kW <sup>1)</sup>	38.4 kW <sup>1)</sup>
12 % cdf	1.7 kW	3.5 kW	5.9 kW <sup>1)</sup>	5.9 kW <sup>1)</sup>	30.7 kW <sup>1)</sup>	38.4 kW <sup>1)</sup>	38.4 kW <sup>1)</sup>
6 % cdf	2.8 kW	5.7 kW	5.9 kW <sup>1)</sup>	5.9 kW <sup>1)</sup>	30.7 kW <sup>1)</sup>	38.4 kW <sup>1)</sup>	38.4 kW <sup>1)</sup>
Resistance	39 Ω ±10%				15 Ω ±10%	6 Ω ±10%	
Trip current I <sub>F</sub>	2.8 A <sub>RMS</sub>	3.9 A <sub>RMS</sub>	5.5 A <sub>RMS</sub>	8.1 A <sub>RMS</sub>	28 A <sub>RMS</sub>	38 A <sub>RMS</sub>	42 A <sub>RMS</sub>
Connections	Ceramic terminals 2.5 mm <sup>2</sup> (AWG12)				M8 stud		
Tightening torque	0.5 Nm / 4 lb in				6 Nm / 50 lb in		
Design	Wire resistor				Grid resistor		
For MOVITRAC® B	0015 ... 0022				2 x parallel with 0110	0150 / 2 x parallel with 0220/0300	

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

400 V

Type	BW100-006	BW168	BW268	BW147	BW247	BW347		
Part number	821 701 7	820,604 X	820 715 1	820 713 5	820 714 3	820 798 4		
Type BW..-T part number	1820 419 8	1820 133 4	1820 417 1	1820 134 2	1820 084 2	1820 135 0		
100 % cdf	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 <sup>1)</sup>		
6 % cdf	5.7 kW	7.6 kW	10 kW <sup>1)</sup>	11 kW	19 kW	20 kW <sup>1)</sup>		
Resistance	100 Ω ±10%	68 Ω ±10%		47 Ω ±10%				
Trip current I <sub>F</sub>	2.4 A <sub>RMS</sub>	3.4 A <sub>RMS</sub>	4.2 A <sub>RMS</sub>	5 A <sub>RMS</sub>	6.5 A <sub>RMS</sub>	9.2 A <sub>RMS</sub>		
Connections	Ceramic terminals 2.5 mm <sup>2</sup> (AWG12)				Ceramic terminals 10 mm <sup>2</sup> (AWG8)			
Tightening torque	0.5 Nm / 4 lb in				1.6 Nm / 14 lb in			
Design	Wire resistor							
For MOVITRAC® B	0015 ... 0040			0055 / 0075				

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

Type	BW039-012	BW039-026	BW039-050	BW018-015	BW018-035	BW018-075
Part number	821 689 4	–	–	821 684 3	–	–
Type BW..-T part number	1820 1369	1820 415 5	1820 137 7	–	1820 138 5	1820 139 3
Type BW..-P part number	–	–	–	1820 416 3	–	–
100 % cdf	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 <sup>1)</sup>	6.7 kW	15.7 kW	33.7 kW
6 % cdf	11.4 kW	24.0 kW <sup>1)</sup>	24.0 kW <sup>1)</sup>	11.4 kW	26.6 kW	52.2 kW <sup>1)</sup>
Resistance	39 Ω ±10%			18 Ω ±10%		
Trip current I <sub>F</sub>	5.5 A <sub>RMS</sub>	8.1 A <sub>RMS</sub>	11.3 A <sub>RMS</sub>	9.1 A <sub>RMS</sub>	13.9 A <sub>RMS</sub>	20.4 A <sub>RMS</sub>
Connections	Ceramic terminals 2.5 mm <sup>2</sup> (AWG12)		M8 stud	Ceramic terminals 2.5 mm <sup>2</sup> (AWG12)		M8 stud
Tightening torque	0.5 Nm / 4 lb in		6 Nm / 50 lb in	1.0 Nm / 8.9 lb in		6 Nm / 50 lb in
Design	Wire resistor		Grid resistor			
For MOVITRAC® B	0110		0110	0150 / 0220		

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

Type	BW915	BW012-025	BW012-050	BW012-100	BW0106	BW206
Part number	–	821 680 0	–	–	–	–
Type BW..-T part number	1820 413 9	–	1820 140 7	1820 141 5	1820 083 4	1820 412 0
Type BW..-P part number	–	1820 414 7	–	–	–	–
100 % cdf	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 <sup>1)</sup>	7.5 kW	15.0 kW	30 kW	40 kW	54 kW
12 % cdf	45 kW <sup>1)</sup>	11.2 kW	22.5 kW	45 kW	61 kW	81 kW
6 % cdf	45 kW <sup>1)</sup>	19.0 kW	38.0 kW	56 kW <sup>1)</sup>	102 kW	136.8 kW
Resistance	15 Ω ±10%	12 Ω ±10%			6 Ω ±10%	
Trip current I <sub>F</sub>	32.6 A <sub>RMS</sub>	14.4 A <sub>RMS</sub>	20.4 A <sub>RMS</sub>	28.8 A <sub>RMS</sub>	47.4 A <sub>RMS</sub>	54.7 A <sub>RMS</sub>
Connections	M8 stud					
Tightening torque	6 Nm / 50 lb in					
Design	Grid resistor					
For MOVITRAC® B	0220	0300			0370 ... 0750	

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

<i>kVA</i>	<i>n</i>
<i>i</i>	<i>f</i>
<i>P</i>	<i>Hz</i>

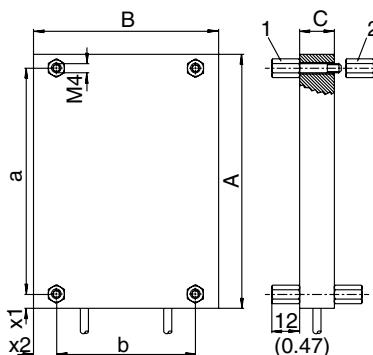
## Technical Data

### BW series braking resistors

#### 4.14.5 Dimensions of BW braking resistors

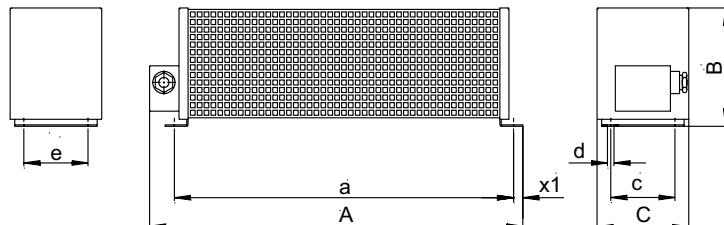
##### Flat-design

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



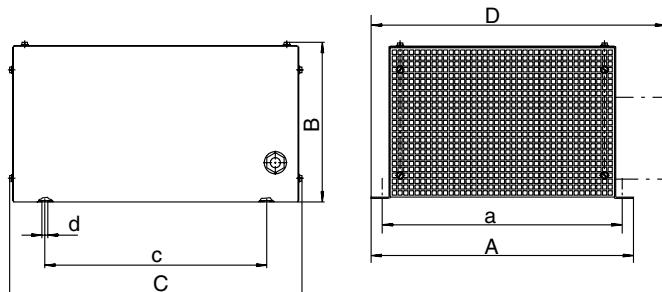
Type	Main dimensions [mm (in)]			Fastening parts [mm (in)]				Weight [kg (lb)]
	A	B	C	a	b/c/e	x1	x2	
BW072-003	110 (4.33)	80 (3.1)	15 (0.59)	98 (3.9)	60 (2.4)	6 (0.2)	10 (0.39)	0.3 (0.7)
BW027-003								
BW072-005	216 (8.50)	80 (3.1)	15 (0.59)	204 (8.03)	60 (2.4)	6 (0.2)	10 (0.39)	0.6 (1)
BW027-005								

##### 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 (4.72)	92 (3.6)	426 (16.8)	64 (2.5)	10 (0.39)	5.8 (0.23)	2.2 (4.9)
BW027-012	486 (19.1)	–	120 (4.72)	185 (7.28)	426 (16.8)	150 (5.91)	10 (0.39)	5.8 (0.23)	4.3 (9.5)
BW100-006 (-T)	486 (19.1)	486 (19.1)	120 (4.72)	92 (3.6)	426 (16.8)	64 (2.5)	10 (0.39)	5.8 (0.23)	2.2 (4.9)
BW168 (-T)	365 (14.4)	406 (16.0)	120 (4.72)	185 (7.28)	326 (12.8)	150 (5.91)	10 (0.39)	5.8 (0.23)	3.6 (7.9)
BW268 (-T)	465 (18.3)	486 (19.1)	120 (4.72)	185 (7.28)	426 (16.8)	150 (5.91)	10 (0.39)	5.8 (0.23)	4.3 (9.5)
BW147 (-T)	465 (18.3)	486 (19.1)	120 (4.72)	185 (7.28)	426 (16.8)	150 (5.91)	10 (0.39)	5.8 (0.23)	4.3 (9.5)
BW247 (-T)	665 (26.2)	686 (27.0)	120 (4.72)	185 (7.28)	626 (24.6)	150 (5.91)	10 (0.39)	5.8 (0.23)	6.1 (13)
BW347 (-T)	670 (26.4)	750 (29.5)	145 (5.71)	340 (13.4)	630 (24.8)	300 (11.8)	10 (0.39)	5.8 (0.23)	13.2 (29.1)
BW039-003	286 (11.3)	–	120 (4.72)	92 (3.6)	226 (8.9)	64 (2.5)	10 (0.39)	5.8 (0.23)	1.5 (3.3)
BW039-006	486 (23.1)	–	120 (4.72)	92 (3.6)	426 (16.8)	150 (5.91)	10 (0.39)	5.8 (0.23)	2.2 (4.9)
BW039-012 (-T)	486 (19.1)	486 (19.1)	120 (4.72)	185 (7.28)	426 (16.8)	150 (5.91)	10 (0.39)	5.8 (0.23)	4.3 (9.5)
BW039-026-T	–	586 (23.1)	120 (4.72)	275 (10.8)	530 (20.9)	240 (9.45)	10 (0.39)	5.8 (0.23)	7.5 (17)

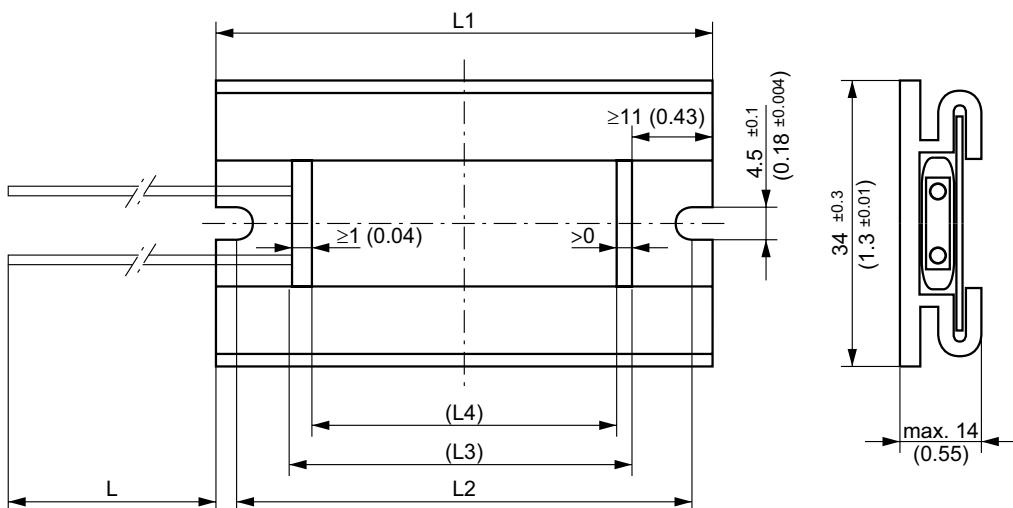
Grid resistors



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	295 (11.6)	–	260 (10.2)	490 (19.3)	270 (10.6)	380 (15.0)	–	10.5 (0.413)	8.0 (18)
BW012-025-P <sup>1)</sup>	295 (11.6)	–	260 (10.2)	490 (19.3)	270 (10.6)	380 (15.0)	–	10.5 (0.413)	8.0 (18)
BW012-050-T	–	395 (15.6)	260 (10.2)	490 (19.3)	370 (14.6)	380 (15.0)	–	10.5 (0.413)	12 (26)
BW012-100-T	–	595 (23.4)	260 (10.2)	490 (19.3)	570 (22.4)	380 (15.0)	–	10.5 (0.413)	21 (46)
BW018-015	600 (23.6)	–	120 (4.72)	92 (3.6)	540 (21.3)	64 (2.5)	10 (0.39)	5.8 (0.23)	4.0 (8.8)
BW018-015-P	620 (24.4)	–	120 (4.72)	92 (3.6)	540 (21.3)	64 (2.5)	10 (0.39)	5.8 (0.23)	4.0 (8.8)
BW018-035-T	–	295 (11.6)	260 (10.2)	490 (19.3)	270 (10.6)	380 (15.0)	–	10.5 (0.413)	9.0 (20)
BW018-075-T	–	595 (23.4)	260 (10.2)	490 (19.3)	570 (22.4)	380 (15.0)	–	10.5 (0.413)	21 (46)
BW039-050-T	–	395 (15.6)	260 (10.2)	490 (19.3)	370 (14.6)	380 (15.0)	10 (0.39)	10.5 (0.413)	12 (26)
BW915-T	–	795 (31.3)	260 (10.2)	490 (19.3)	770 (30.3)	380 (15.0)	–	10.5 (0.413)	26 (57)
BW106-T	–	795 (31.3)	260 (10.2)	490 (19.3)	770 (30.3)	380 (15.0)	–	10.5 (0.413)	32 (71)
BW206-T	–	995 (39.2)	260 (10.2)	490 (19.3)	970 (38.2)	380 (15.0)	–	10.5 (0.413)	43 (95)

1) D = 355 mm (14.0 in)

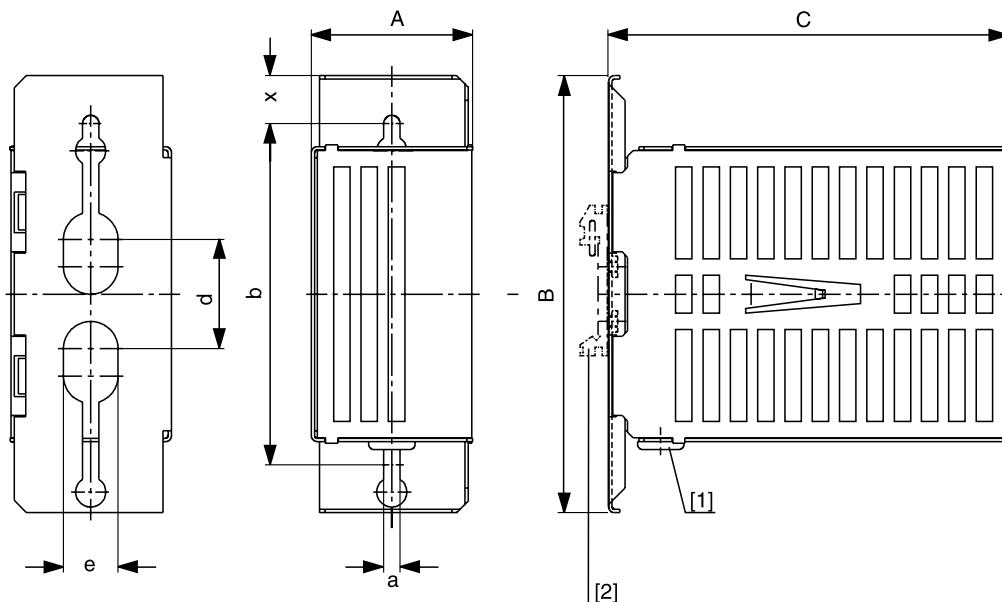
PTC braking  
resistors



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

#### 4.15 Touch guard BS

Touch guard dimension drawing:



[1] Grommet

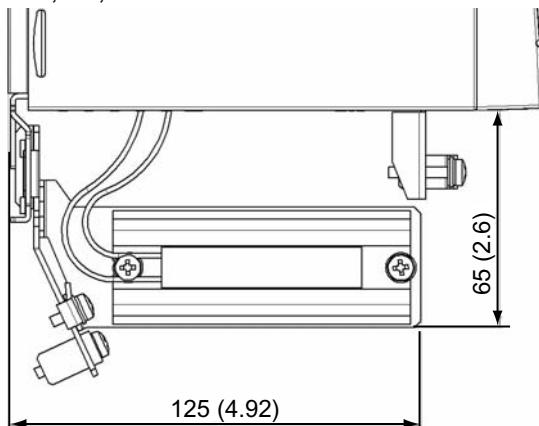
[2] Support rail mounting

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

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

#### 4.16 Mounting PTC braking resistors FKB10B

For sizes 0XS, 0S, 0L



<i>kVA</i>	<i>n</i>
<i>i</i>	<i>f</i>
<i>P</i>	<i>Hz</i>

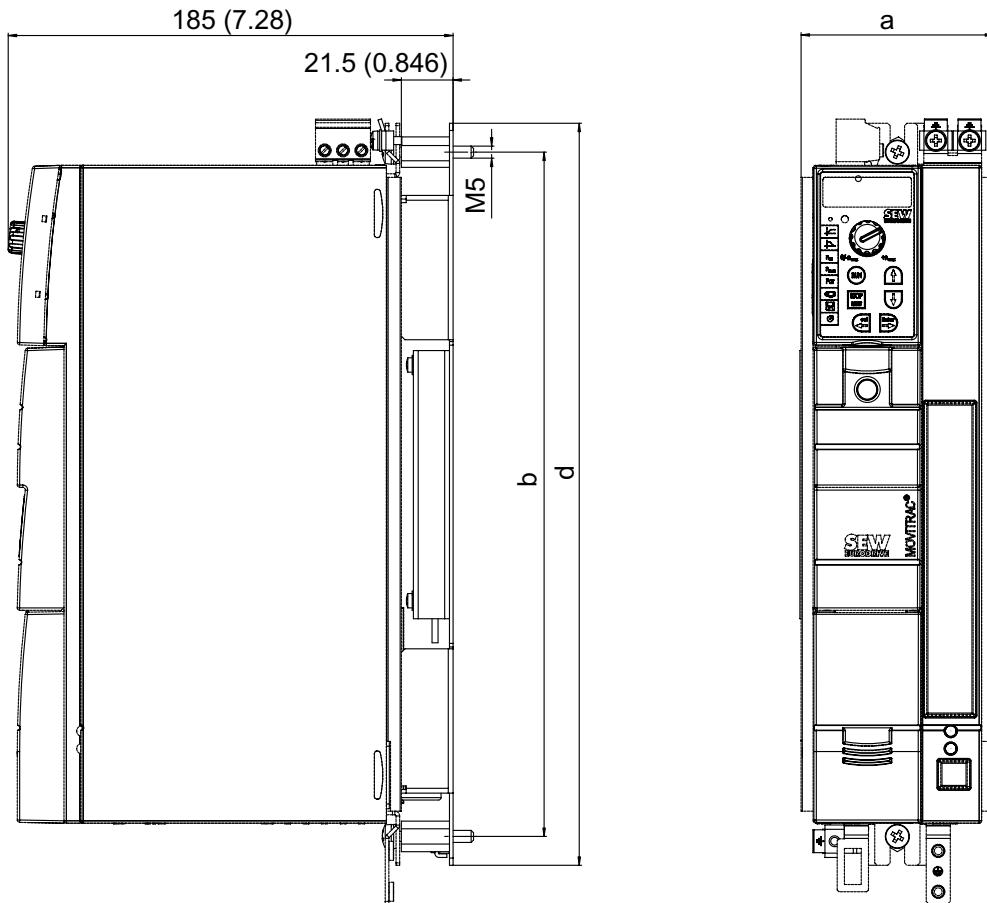
#### 4.17 Submounting FKB11/12/13B flat-design resistors

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

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

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

Dimension drawing:



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

<i>kVA</i>	<i>n</i>
<i>i</i>	<i>f</i>
<i>P</i>	<i>Hz</i>

## Technical Data

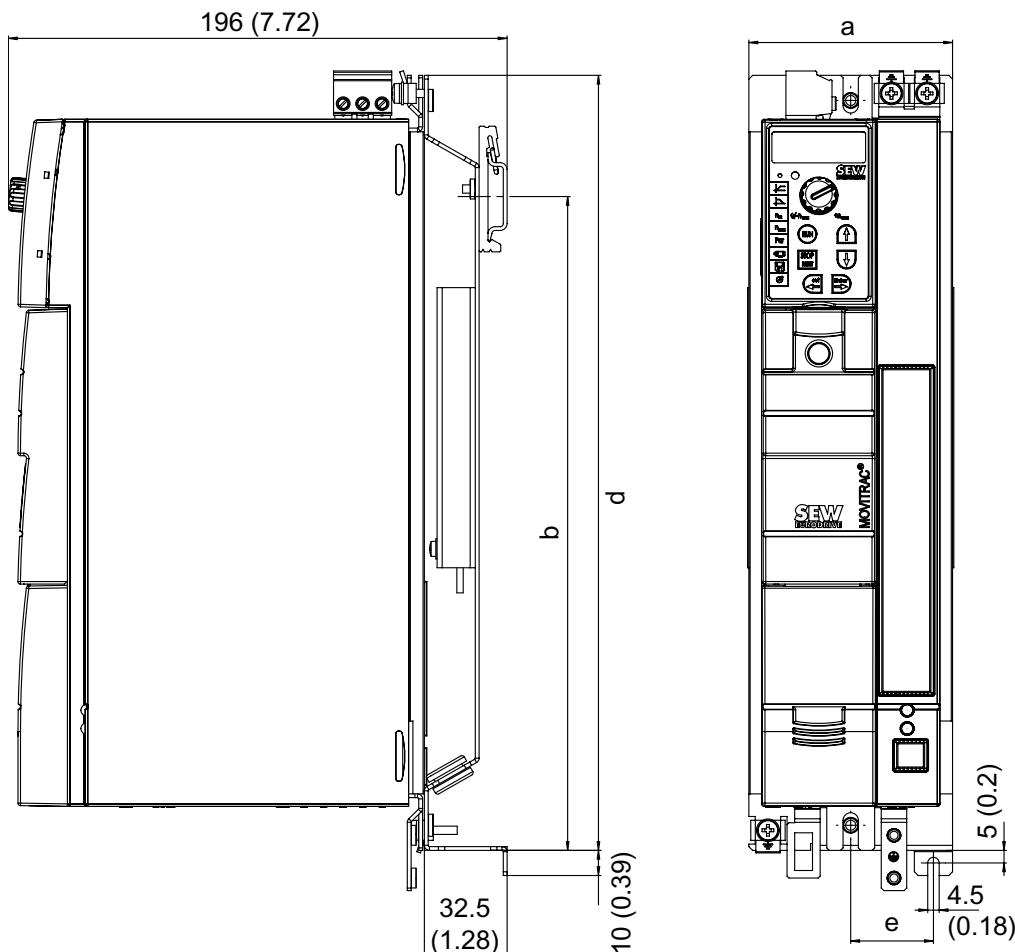
### Support rail mounting FHS11B/12B/13B

#### 4.18 Support rail mounting FHS11B/12B/13B

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

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

Dimension drawing:



MOVITRAC® B size	a	b	d	e
0XS	55 (2.2)	171.5 (6.752)	220 (8.66)	7.5 (0.30)
0S	80 (3.1)	171.5 (6.752)	220 (8.66)	32.5 (1.28)
0L	80 (3.1)	260.3 (10.25)	308.5 (12.15)	32.5 (1.28)

## 4.19 Line chokes ND

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

Line choke type	ND 010-301	ND 020-151
Part number	826 972 6	826 973 4
Rated voltage $V_N$	1 x AC 230 V ±10 %	
Rated current $I_N$	AC 10 A	AC 20 A
Power loss at $I_N P_V$	6 W	10 W
Inductance $L_N$	3 mH	1.5 mH
Terminal strip	4 mm <sup>2</sup> (AWG10)	10 mm <sup>2</sup> (AWG8)
Tightening torque	0.6 Nm / 5 lb in	1.5 Nm / 13 lb in
Suitable for MOVITRAC® B		
1-phase 230 V	0003 ... 0008	0011 ... 0022

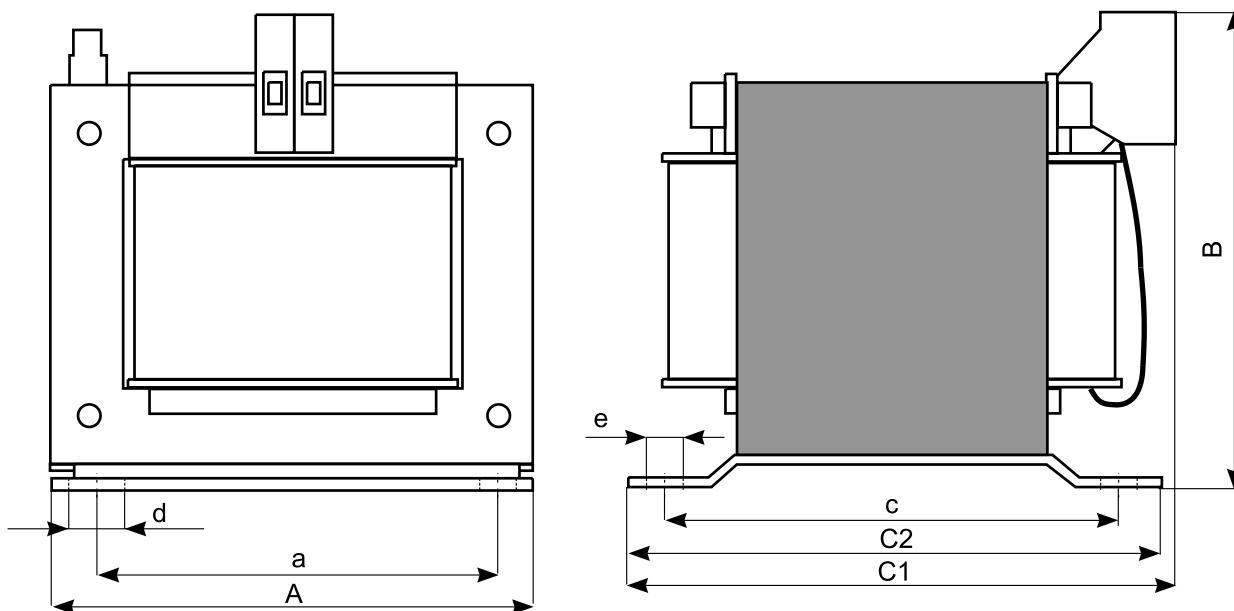
Line choke type	ND 020-013	ND045-013	ND085-013	ND150-013
Part number	826 012 5	826 013 3	826 014 1	825 548 2
Rated voltage $V_N$	3 x AC 380 ... 500 V ± 10 %			
Rated current $I_N$	AC 20 A	AC 45 A	AC 85 A	AC 150 A
Power loss at $I_N P_V$	10 W	15 W	25 W	65 W
Inductance $L_N$	0.1 mH			
Terminal strip	4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

<i>kVA</i>	<i>n</i>
<i>i</i>	<i>f</i>
<i>P</i>	<i>Hz</i>

## Technical Data

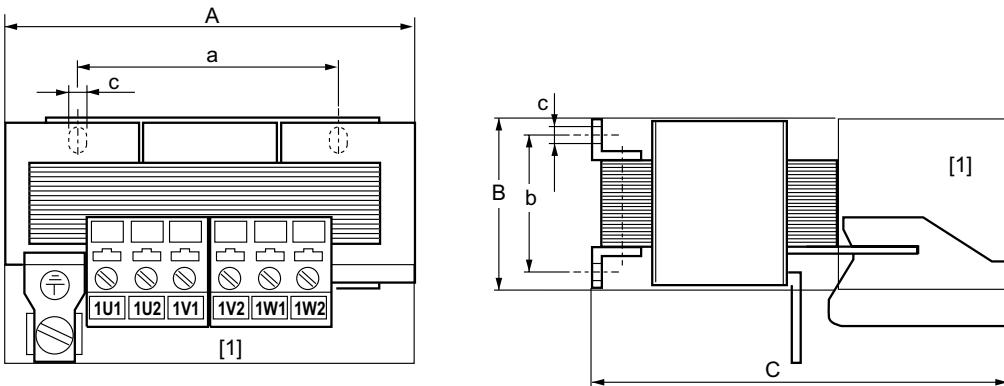
### Line chokes ND

#### 4.19.1 Dimension drawing for ND 010-301 / ND 020-151



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

#### 4.19.2 Dimension drawing for ND 020-013 / ND 045-013 / ND 085-013 / ND 150-013



[1] = Space for touch-safe terminal strips

Type	Main dimensions [mm (in)]			Mounting dimensions [mm (in)]			Weight [kg (lb)]
	A	B	C	a	b	d/e	
ND 020-013	85 (3.3)	60 (2.4)	120 (4.72)	50 (2.0)	31 (1.2)	5 - 10 (0.2 - 0.39)	0.5 (1)
ND 045-013	125 (4.92)	95 (3.7)	170 (6.69)	84 (3.3)	55 ... 75 (2.2 ... 3.0)	6 (0.2)	2.5 (5.5)
ND 085-013	185 (7.28)	115 (4.53)	235 (9.25)	136 (5.35)	56 (2.2)	7 (0.3)	8 (20)
ND 150-013	257 (10.1)	145 (5.71)	230 (9.06)	170 (6.69)	77 (3.0)	8 (0.3)	17 (37)

## 4.20 NF line filter

The line filter suppresses interference emissions on the line side of inverters. The ambient temperature range is –25 ... +45 °C (–13 ... 113 °F). The degree of protection is IP20 (EN 60529). NF line filters have cRUus approval independent of the MOVITRAC® B.

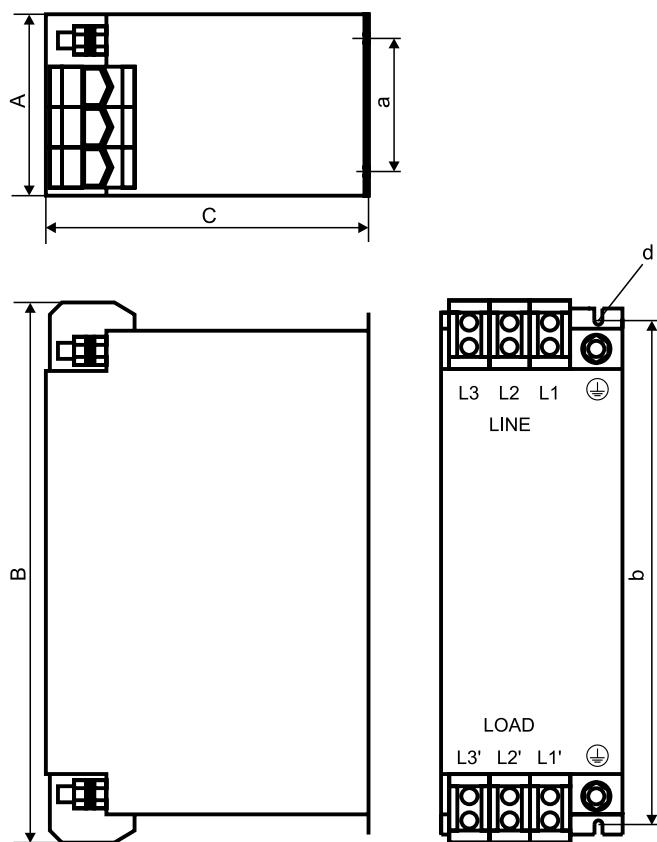
Type	NF009-503	NF014-503	NF018-503	NF035-503	NF048-503
Part number	827 412 6	827 116 X	827 413 4	827 128 3	827 117 8
Rated current	AC 9 A	AC 14 A	AC 18 A	AC 35 A	AC 48 A
Power loss	6 W	9 W	12 W	15 W	22 W
Earth-leakage current	≤ 25 mA	≤ 25 mA	≤ 25 mA	≤ 25 mA	≤ 40 mA
Connections PE screw	4 mm <sup>2</sup> (AWG10) M5			10 mm <sup>2</sup> (AWG8) M5/M6	
Tightening torque	0.6 ... 0.8 Nm / 5 ... 7 lb in			1.8 Nm / 16 lb in	
Suitable for MOVITRAC® B					
3 x 400/ 500 V	100 % I <sub>N</sub> 125 % I <sub>N</sub>	0003 ... 0040 0003 ... 0030	0055 / 0075 0040 / 0055	– 0075	0110 / 0150 0110 0150
3 x 230 V	100 % I <sub>N</sub> 125 % I <sub>N</sub>	0015 / 0022 0015	0037 0022	– 0037	0055 / 0075 0055 / 0075 –

Type	NF063-503	NF085-503	NF115-503	NF150-503
Part number	827 414 2	827 415 0	827 416 9	827 417 7
Rated current	AC 63 A	AC 85 A	AC 115 A	AC 150 A
Power loss	30 W	35 W	60 W	90 W
Earth-leakage current	≤ 30 mA	≤ 30 mA	≤ 30 mA	≤ 30 mA
Connections PE screw	16 mm <sup>2</sup> (AWG6) M6	35 mm <sup>2</sup> (AWG2) M8	50 mm <sup>2</sup> (AWG1/0) M10	50 mm <sup>2</sup> (AWG1/0) M10
Tightening torque	3 Nm / 30 lb in		3.7 Nm / 33 lb in	
Suitable for MOVITRAC® B				
3 x 400/ 500 V	100 % I <sub>N</sub> 125 % I <sub>N</sub>	0300 0220	0370 / 0450 0300 / 0370	0550 0450 0550 / 0750
3 x 230 V	100 % I <sub>N</sub> 125 % I <sub>N</sub>	0150 0110 / 0150	0220 –	0300 0220 / 0300 –

<i>kVA</i>	<i>n</i>
<i>f</i>	
<i>i</i>	
<i>P</i>	<i>Hz</i>

## Technical Data NF line filter

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



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

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

## 4.21 ULF11A folding ferrites

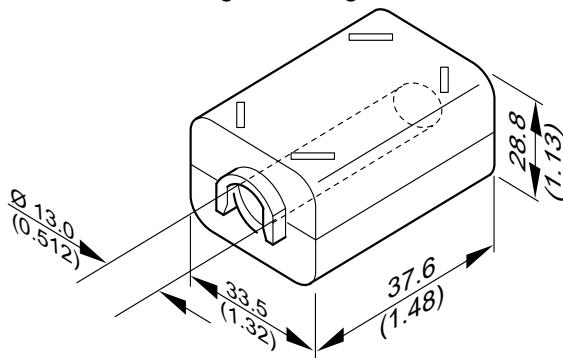
Folding ferrites are used to reduce interference emitted from the mains cable. Only use folding ferrites with single-phase units.

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

Technical data:

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

Dimension drawing for folding ferrites:



## 4.22 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 output choke
Part number	813 325 5	813 557 6	813 558 4
Max. power loss $P_{V\max}$	15 W	8 W	30 W
Weight	0.5 kg (1 lb)	0.2 kg (0.4 lb)	1.1 kg (2.4 lb)
For cable cross sections	1.5 ... 16 mm <sup>2</sup> AWG16 ... 6	≤ 1.5 mm <sup>2</sup> ≤ AWG16	≥ 16 mm <sup>2</sup> ≥ AWG6

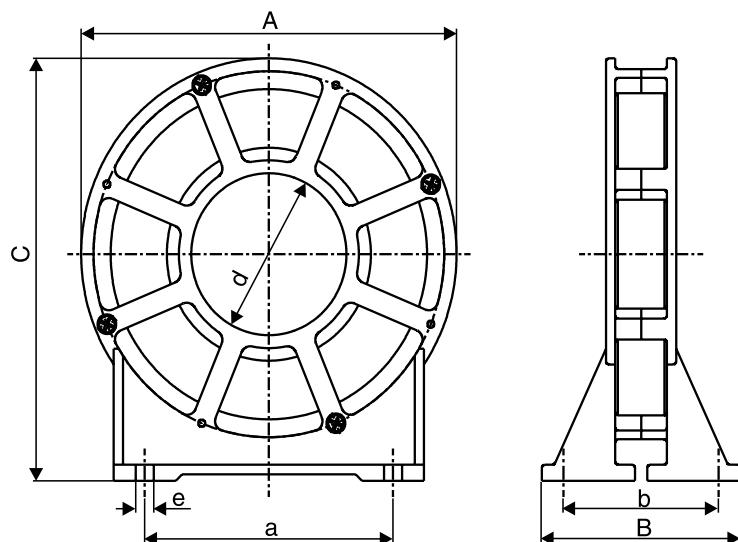
Output choke type	HD012	HD100	HD101
Part number	1821 217 4	829 837 8	829 838 6
Rated current		AC 12 A	
Power loss (at rated current)	11 W	20 W	
Ambient temperature		-10 °C ... +60 °C (+14 ... 140 °F) Derating 3 % $I_N$ at 40 °C ... 60 °C (113 ... 140 °F)	
Degree of protection			IP20
Mains and the motor connection	≤ 4 mm <sup>2</sup> ≤ AWG12	Screw terminals 4 mm <sup>2</sup> (AWG 10)	
Inverter connection		Cables with conductor end sleeves	
Weight	0.55 kg (1.2 lb)	0.40 kg (0.88 lb)	0.48 kg (1.1 lb)
Can be sub-mounted for sizes		0S	0L
for MOVITRAC® B ...-5A3		0005 / 0008 / 0011 / 0015	0022 / 0030 / 0040
for MOVITRAC® B ...-2A3		0005 / 0008	0011 / 0015 / 0022

<i>kVA</i>	<i>n</i>
<i>i</i>	<i>f</i>
<i>P</i>	<i>Hz</i>

## Technical Data

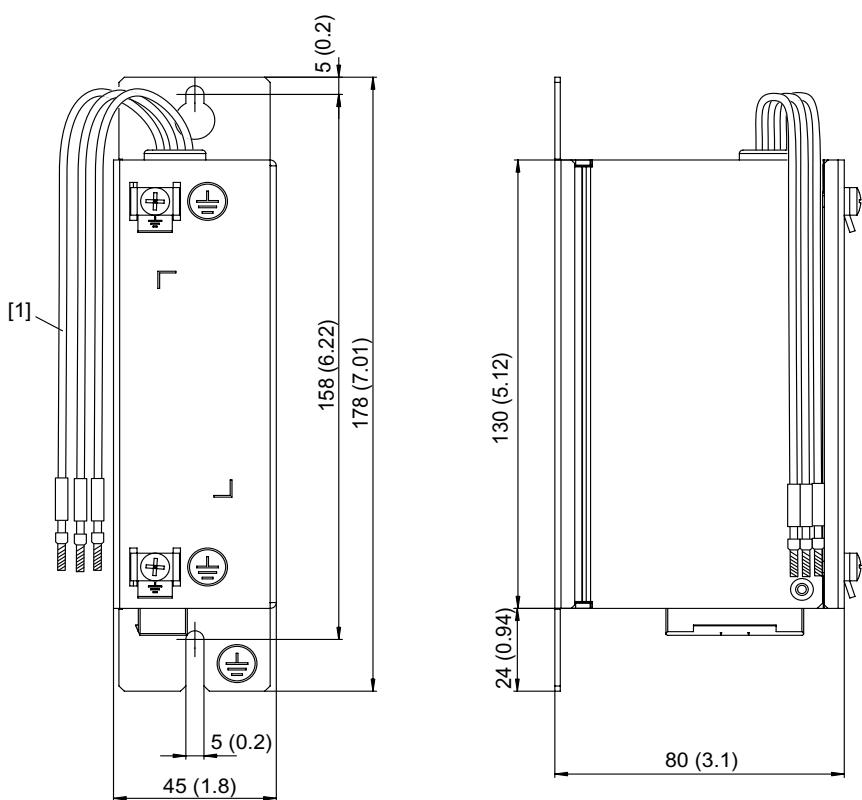
### HD series output chokes

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



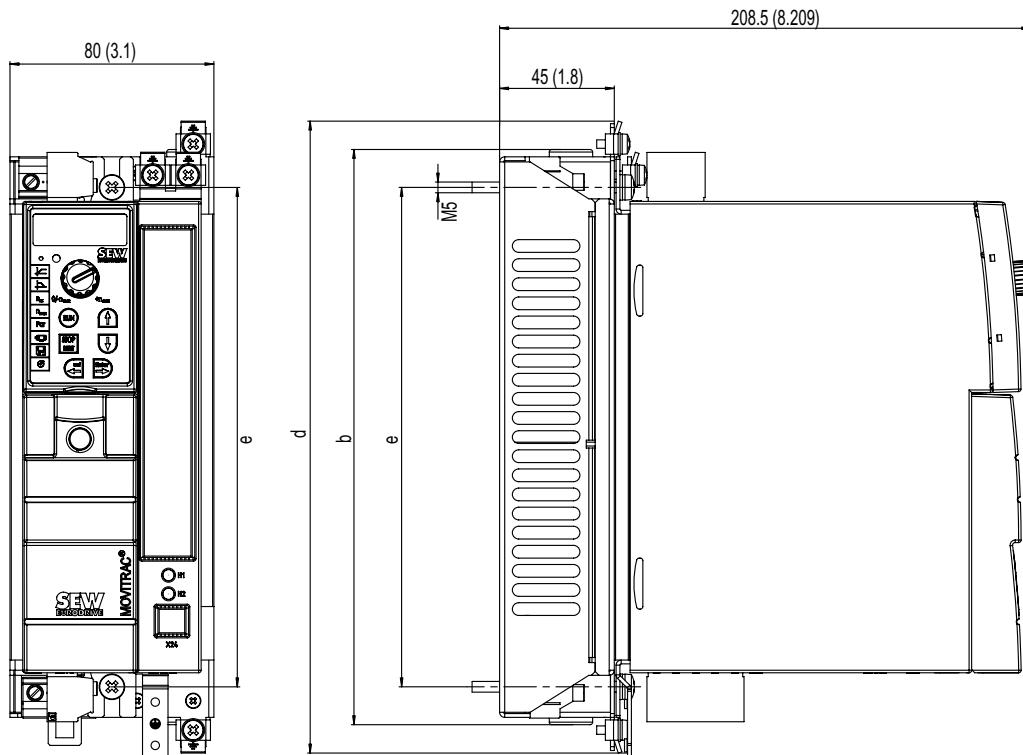
Output choke type	Main dimensions			Installation dimensions		Inside diameter d	Hole dimension e
	A	B	C	a	b		
HD001	121 (4.76)	64 (2.5)	131 (5.16)	80 (3.1)	50 (2.0)	50 (2.0)	5.8 (0.23)
HD002	66 (2.6)	49 (1.9)	73 (2.9)	44 (1.7)	38 (1.5)	23 (0.91)	5.8 (0.23)
HD003 output choke	170 (6.69)	64 (2.5)	185 (7.28)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

Dimension drawing for HD012



[1] Length = 100 mm (3.94 in)

Dimension drawing for HD100 / HD101:



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

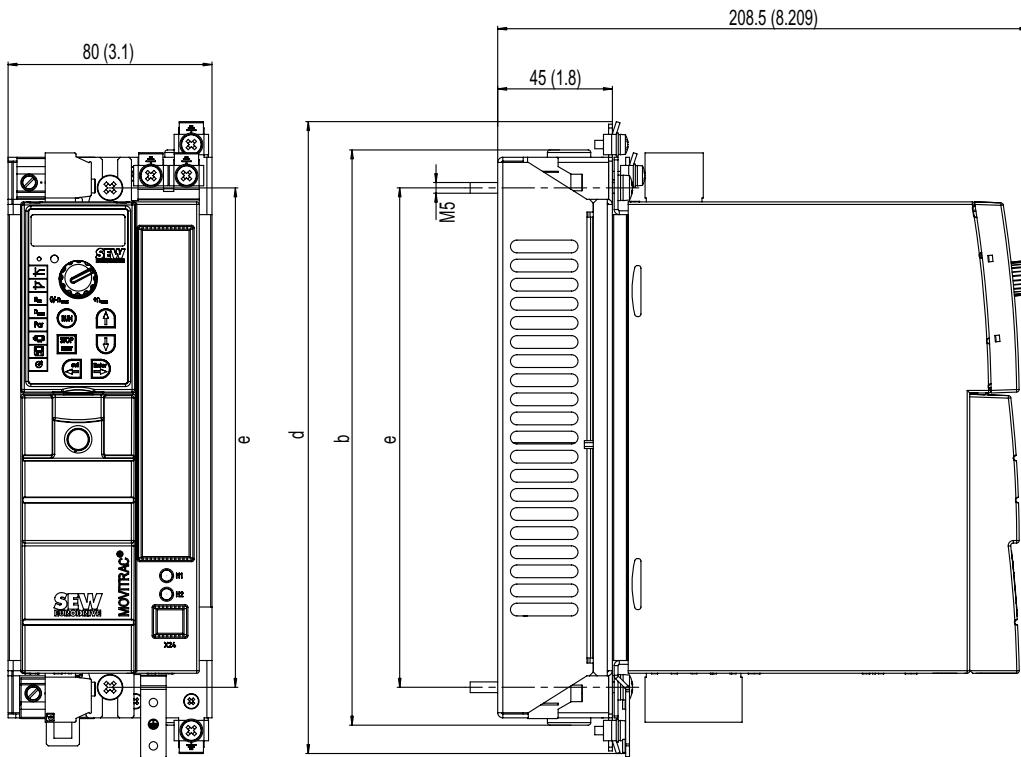


#### 4.23 EMC-module FKE12B/13B

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

Type	FKE12B	FKE13B
Part number	829 590 5	829 591 3
Rated voltage	3 × AC 230 ... 500 V	
Voltage drop in the filter (at rated current)	< 1 %	
Rated current	AC 12 A	
Power loss (at rated current)	20 W	
Ambient temperature	-10 °C ... +60 °C (+14 ... 140 °F) Derating 3 % $I_N$ at 40 °C ... 60 °C (113 ... 140 °F)	
Degree of protection	IP20	
Mains and the motor connection	Screw terminals 4 mm <sup>2</sup> (AWG 10)	
Inverter connection	Cables with conductor end sleeves	
Weight	0.40 kg (0.88 lb)	0.48 kg (1.1 lb)
Can be sub-mounted for sizes	0S	0L
for MOVITRAC® B ...-5A3	0005 / 0008 / 0011 / 0015	0022 / 0030 / 0040
for MOVITRAC® B ...-2A3	0005 / 0008	0011 / 0015 / 0022

Dimension drawing:



EMC module	MOVITRAC® B	b	d	e
FKE12B	Size 0S	226 (8.90)	248 (9.76)	196 (7.72)
FKE13B	Size 0L	314.5 (12.38)	336.5 (13.25)	284.5 (11.20)

## 4.24 HF output filter

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

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

<b>NOTE</b>	
Do not use output filters in hoists because of the voltage drop in the filter!	

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

Output filters attenuate interference emission via unshielded motor lines.

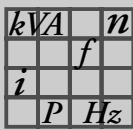
The ambient temperature is 0 ... +45 °C (32 ... 113 °F) (reduction: 3 % per K up to max. 60 °C (140 °F)).

Output filter type	HF008-503 <sup>1)</sup>	HF015-503 <sup>1)</sup>	HF022-503 <sup>1)</sup>	HF030-503 <sup>1)</sup>	HF040-503 <sup>1)</sup>	HF055-503 <sup>1)</sup>					
Part number	826 029 X	826 030 3	826 031 1	826 032 X	826 311 6	826 312 4					
Rated voltage $V_N$	3 × AC 200 V –10 % ... 3 × AC 500 V +10 %, 50/60 Hz <sup>2)</sup>										
Earth-leakage current at $I_N \Delta I$	0 mA										
Power loss at $I_N P_V$	25 W	35 W	55 W	65 W	90 W	115 W					
Degree of protection (EN 60529)	IP20										
Connections / tightening torque	M4 terminal stud 1.6 Nm ± 20 % / 14 lb in ± 20 %										
Weight	3.1 kg (6.8 lb)	4.4 kg (9.7 lb)			10.8 kg (23.8 lb)						
<b>Assignment to AC 400/500 V units</b>											
Voltage drop at $I_N \Delta U$	< 6.5 % (7.5 %) at AC 400 V / < 4 % (5 %) at AC 500 V and $f_{Amax} = 50$ Hz (60 Hz)										
Rated throughput current <sup>3)</sup> $I_N$ 400 V at $V_{supply} = 3 \times AC 400$ V	AC 2.5 A	AC 4 A	AC 6 A	AC 8 A	AC 10 A	AC 12 A					
Rated throughput current <sup>3)</sup> $I_N$ 500 V at $V_{supply} = 3 \times AC 500$ V	AC 2 A	AC 3 A	AC 5 A	AC 6 A	AC 8 A	AC 10 A					
Rated operation (100 %) <sup>3)</sup>	0003 ... 0011	0015	0022	0030	0040	0055					
Increased power (125 %) <sup>3)</sup>	0003 ... 0005	0008/0011	0015	0022	0030	0040					
<b>Assignment to AC 230 V units</b>											
Voltage drop at $I_N \Delta U$	-	< 18.5 % (19 %) at AC 230 V with $f_{Amax} = 50$ Hz (60 Hz)									
Rated throughput current <sup>3)</sup> $I_N$ 230 V at $V_{supply} = AC 230$ V	AC 4.3 A	AC 6.5 A	AC 10.8 A	AC 13 A	AC 17.3 A	AC 22 A					
Nennbetrieb (100 %) <sup>3)</sup>	0003 ... 0008	0011	0015/0022	-	0037	0055					
Increased power (125 %) <sup>3)</sup>	0003 ... 0005	0008	0011 ... 0022	-	-	0037					

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

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

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

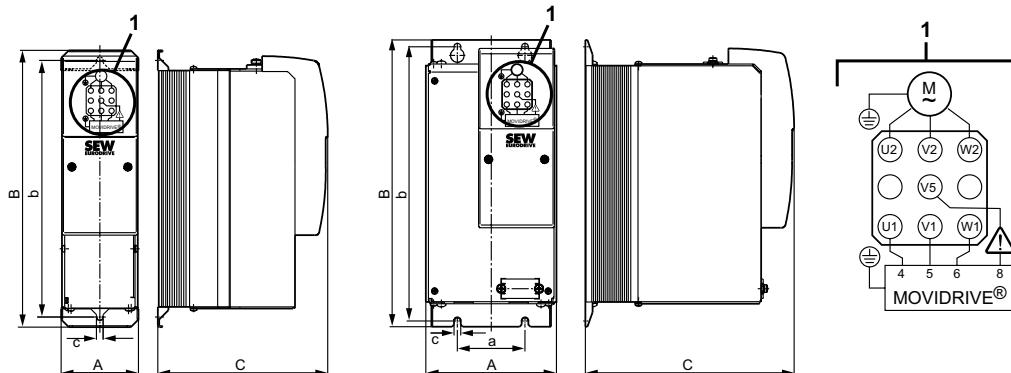


## Technical Data HF output filter

Output filter type	HF075-503 <sup>1)</sup>	HF023-403 <sup>1)</sup>	HF033-403 <sup>1)</sup>	HF047-403 <sup>1)</sup>	HF450-503
Part number	826 313 2	825 784 1	825 785 X	825 786 8	826 948 3
Rated voltage $V_N$	$3 \times AC\ 200\ V - -10\ \% ... 3 \times AC\ 500\ V +10\ %, 50/60\ Hz^2)$				
Earth-leakage current at $U_N$ $\Delta I$	0 mA				
Power loss at $I_N$ $P_V$	135 W	90 W	120 W	200 W	400 W
Degree of protection (EN 60529)	IP 20	IP20			IP 10
Connections / tightening torque	M4 terminal stud 1.6 Nm ± 20 % / 14 lb in ± 20 %	35 mm <sup>2</sup> (AWG 2) 3.2 Nm / 28 lb in			
Weight	10.8 kg (23.8 lb)	15.9 kg (35.1 lb)	16.5 kg (36.4 lb)	23 kg (51 lb)	32 kg (71 lb)
<b>Assignment to AC 400/500 V units</b>					
Voltage drop at $I_N$ $\Delta U$	< 6.5 % (7.5 %) at AC 400 V / < 4 % (5 %) at AC 500 V and $f_{Amax} = 50\ Hz$ (60 Hz)				
Rated throughput current <sup>3)</sup> $I_{N\ 400\ V}$ at $V_{supply} = 3 \times AC\ 400\ V$	AC 16 A	AC 23 A	AC 33 A	AC 47 A	AC 90 A
Rated throughput current <sup>3)</sup> $I_{N\ 500\ V}$ at $V_{supply} = 3 \times AC\ 500\ V$	AC 13 A	AC 19 A	AC 26 A	AC 38 A	AC 72 A
Rated operation (100 %) <sup>3)</sup>	0075	0110	0150/0300 <sup>4)</sup>	0220	0370/0450/ 0550 <sup>4)</sup> /0750 <sup>4)</sup>
Increased power (125 %) <sup>3)</sup>	0055	0075	0110/0220 <sup>4)</sup>	0150	0300/0370/ 0450/0550 <sup>4)</sup> / 0750 <sup>4)</sup>
<b>Assignment to AC 230 V units</b>					
Voltage drop at $I_N$ $\Delta U$	< 18.5 % (19 %) at AC 230 V with $f_{Amax} = 50\ Hz$ (60 Hz)				
Rated throughput current <sup>3)</sup> $I_{N\ 230\ V}$ at $V_{supply} = AC\ 230\ V$	AC 29 A	AC 42 A	AC 56.5 A	AC 82.6 A	AC 156 A
Rated operation (100 %) <sup>3)</sup>	0075	0110	0150/0300 <sup>4)</sup>	0220	0300
Increased power (125 %) <sup>3)</sup>	0055	0075	0110/0220 <sup>4)</sup>	0150	0220/0300

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

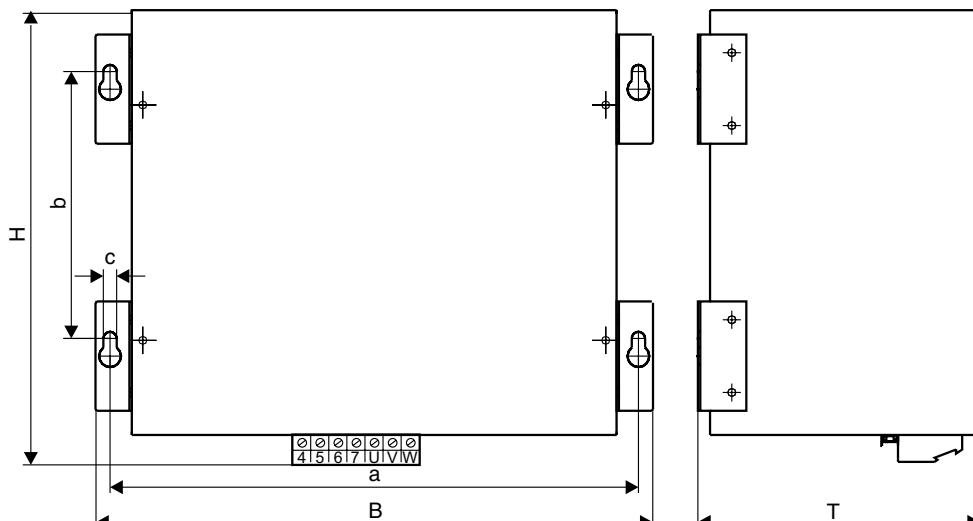
HF...-503 dimension drawing [mm (in)]:



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

Type	Installation dimensions		Hole dimension c	Ventilation clearances	
	a	b		Top	Bottom
HF008 / 015 / 022 / 030-503	—	265 (10.4)	7 (0.3)	100 (3.94)	100 (3.94)
HF040 / 055 / 075-503	70 (2.8)	283 (11.1)	7 (0.3)	100 (3.94)	100 (3.94)

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



Only the mounting position shown in the dimension drawing is permitted

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

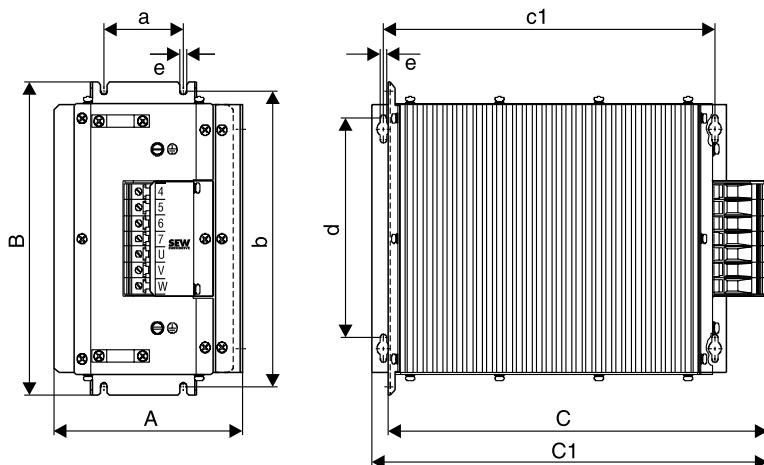
Output filter type	Installation dimensions		Hole dimen- sion c	Ventilation clearances	
	a	b		Top	Bottom
HF450-503	436 (17.2)	220 (8.66)	8.5 (0.33)	100 (3.94)	100 (3.94)

<i>kVA</i>	<i>n</i>
<i>f</i>	
<i>i</i>	
<i>P</i>	<i>Hz</i>

## Technical Data

### HF output filter

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



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

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

## 4.25 Fieldbus connection

### 4.25.1 Fieldbus gateways

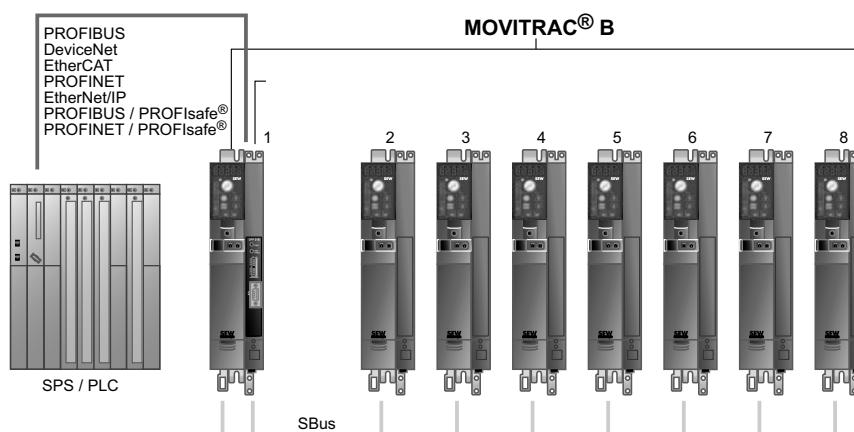
The fieldbus gateways convert standard fieldbuses into the SEW SBus. This means that up to 8 inverters can be triggered using one gateway.

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

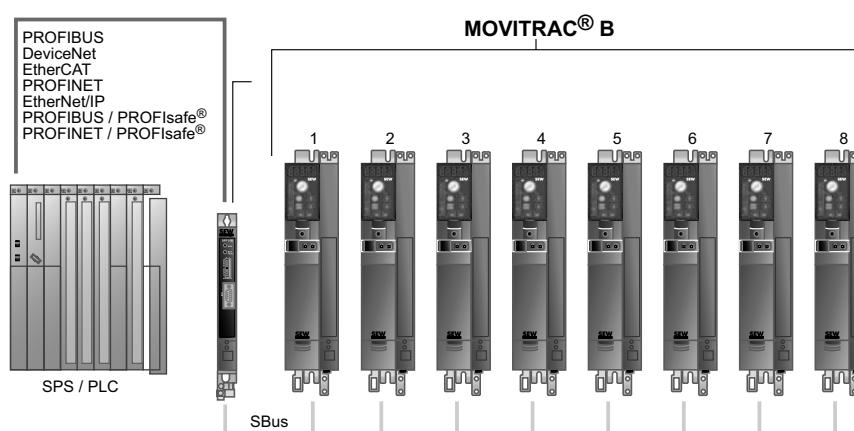
In general, you can also connect and operate other SEW units (such as MOVIDRIVE® inverters) using the SBus.

There are two different versions of gateway functionality:

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



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



	<b>NOTE</b> If a fieldbus interface is factory-installed in MOVITRAC® B, then SBus address P881 is already factory set to "1". In MOVITRAC® B without fieldbus interface, SBus address P881 is factory set to "0".
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## Technical Data

### Fieldbus connection

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

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

1) Integration in inverter not for size 0XS.

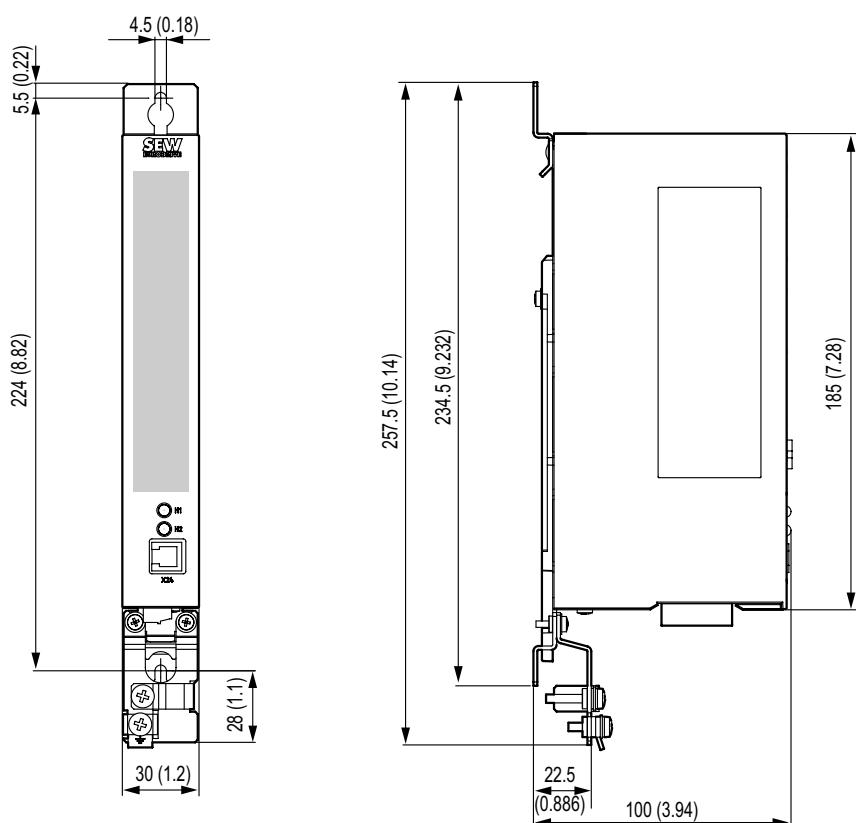
MOVITRAC® B must be supplied with DC 24 V at terminals X12.8 and X12.9 when it supplies the gateways.

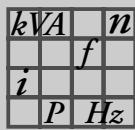
### Theory of operation

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

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

Dimension drawing  
for UOH





#### 4.25.2 Fieldbus interface DFP21B for PROFIBUS

##### Description

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

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

##### Electronics data

DFP21B option		
<b>DFP21B</b>	<b>External voltage supply via X26</b>	U = DC 24 V (-15 %, +20 %) I <sub>max</sub> = DC 200 mA P <sub>max</sub> = 3.4 W
<b>RUN</b>	<b>PROFIBUS protocol options</b>	PROFIBUS DP and DP-V1 acc. to IEC 61158
<b>BUS FAULT</b>	<b>Automatic baud rate detection</b>	9.6 kBaud ... 12 MBaud
	<b>Connection technology</b>	<ul style="list-style-type: none"> <li>Via 9-pin sub D connector</li> <li>Pin assignment acc. to IEC 61158</li> </ul>
	<b>Bus termination</b>	Not integrated, must be implemented using suitable PROFIBUS connector with switchable terminating resistors.
	<b>Station address</b>	1 ... 125, adjustable via DIP switches
	<b>Name of the GSD file</b>	SEW_6009.GSD
	<b>DP ident number</b>	6009 <sub>hex</sub> = 24585 <sub>dec</sub>
	<b>Application-specific parameter-setting data (Set-Prm-User-Data)</b>	<ul style="list-style-type: none"> <li>Length: 3 bytes</li> <li>Hex parameter setting 00,00,00</li> </ul>
	<b>DP configurations for DDLM_Chk_Cfg</b>	See publication "Fieldbus Interface DFP21B PROFIBUS DP-V1".
	<b>Diagnostics data</b>	<ul style="list-style-type: none"> <li>Standard diagnostics: 6 bytes</li> </ul>

#### 4.25.3 Fieldbus Interface DFD11B for DeviceNet

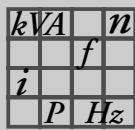
##### Description

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

Refer to the publication "DFD11B DeviceNet Fieldbus Interface" for installation.

##### Electronics data

DFD11B option	
	<b>External voltage supply via X26</b> U = DC 24 V (-15 %, +20 %) $I_{max} = DC\ 200\ mA$ $P_{max} = 3.4\ W$
<b>Communication protocol</b>	Master/slave connection set according to DeviceNet specification version 2.0
<b>Number of process data words</b>	Can be set using DIP switch: <ul style="list-style-type: none"> <li>• 1 ... 24 process data words with polled I/O</li> <li>• 1 ... 4 process data words with bit-strobe I/O</li> </ul>
<b>Baud rate</b>	125, 250 or 500 kbaud, can be set using DIP switch
<b>Bus cable length</b>	For thick cable according to DeviceNet specification 2.0 appendix B: <ul style="list-style-type: none"> <li>• 500 m (1640 ft) with 125 kBaud</li> <li>• 250 m (820 ft) with 250 kBaud</li> <li>• 100 m (656 ft) with 500 kBaud</li> </ul>
<b>Transmission level</b>	ISO 11 98 - 24 V
<b>Connection technology</b>	<ul style="list-style-type: none"> <li>• 5-pin Phoenix-Kombicon terminal</li> <li>• Pin assignment according to DeviceNet specification</li> </ul>
<b>MAC ID</b>	0 ... 63, can be set using DIP switch Max. 64 stations
<b>Supported services</b>	<ul style="list-style-type: none"> <li>• Polled I/O</li> <li>• Bit-strobe I/O</li> <li>• Explicit messages: <ul style="list-style-type: none"> <li>- Get_Attribute_Single</li> <li>- Set_Attribute_Single</li> <li>- Reset</li> <li>- Allocate_MS_Connection_Set</li> <li>- Release_MS_Connection_Set</li> </ul> </li> </ul>
<b>EDS file name</b>	SEW_GATEWAY_DFD11B.eds



#### 4.25.4 Fieldbus interface DFE24B for EtherCAT

*Description*

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

Refer to the publication "DFE24B EtherCAT Fieldbus Interface" for installation.

*Electronics data*

<b>DFE24B option</b>	
	<b>External voltage supply via X26</b> U = DC 24 V (-15 %, +20 %) $I_{max} = DC\ 200\ mA$ $P_{max} = 3.4\ W$
<b>Standards</b>	IEC 61158, IEC 61784-2
<b>Baud rate</b>	100 Mbaud full duplex
<b>Connection technology</b>	2 × RJ45 (8x8 modular jack)
<b>Bus termination</b>	Not integrated because bus termination is automatically activated.
<b>OSI Layer 1/2</b>	Ethernet II
<b>Station address</b>	Setting via EtherCAT master (→ Display with P093)
<b>Name of the XML file</b>	SEW_DFE24B.xml
<b>Vendor ID</b>	0x59 (CANopenVendor ID)
<b>EtherCAT services</b>	<ul style="list-style-type: none"> <li>• CoE (CANopen over EtherCAT)</li> <li>• VoE (Simple MOVILINK protocol over EtherCAT)</li> </ul>

#### 4.25.5 Fieldbus interface DFE32B for PROFINET IO RT

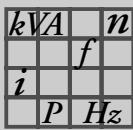
##### Description

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

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

##### Electronics data

DFE32B option	
	<b>External voltage supply via X26</b> U = DC 24 V (-15 %, +20 %) $I_{\max} = \text{DC } 200 \text{ mA}$ $P_{\max} = 3.4 \text{ W}$
	<b>Application protocols</b> <ul style="list-style-type: none"> <li>• <b>PROFINET IO</b> (Ethernet frames with frame identification 8892<sub>hex</sub>) to control and set parameters for the inverter.</li> <li>• <b>HTTP</b> (Hypertext Transfer Protocol) for diagnostics using a Web browser.</li> <li>• <b>SMLP</b> (Simple Movilink Protocol), protocol used by MOVITOOLS® MotionStudio.</li> </ul>
	<b>Port numbers used</b> <ul style="list-style-type: none"> <li>• 300 (SMLP)</li> <li>• 80 (HTTP)</li> </ul>
	<b>Ethernet services</b> <ul style="list-style-type: none"> <li>• ARP</li> <li>• ICMP (Ping)</li> </ul>
	<b>OSI Layer 1/2</b> Ethernet II
	<b>Baud rate</b> 100 Mbaud in full duplex process
	<b>Connection technology</b> 2 x RJ45 with internal switch and auto crossing
	<b>Addressing</b> 4 byte IP address or MAC-ID (00:0F:69:xx:xx:xx)
	<b>Manufacturer ID (vendor ID)</b> 010A <sub>hex</sub>
	<b>GSD file name</b> GSML-V2.1-SEW-DFE-DFS-2Ports-YYYYMMTT.xml



#### 4.25.6 DFE33B fieldbus interface for EtherNet/IP

##### Description

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

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

##### Electronics data

DFE33B option	
	<b>External voltage supply via X26</b> U = DC 24 V (-15 %, +20 %) $I_{max} = DC\ 200\ mA$ $P_{max} = 3.4\ W$
	<b>Application protocols</b> <ul style="list-style-type: none"> <li><b>EtherNet/IP</b> (Industrial Protocol) to control and set parameters for the inverter.</li> <li><b>HTTP</b> (Hypertext Transfer Protocol) for diagnostics using a Web browser.</li> <li><b>SMLP</b> (Simple Movilink Protocol), protocol used by MOVITOOLS® MotionStudio.</li> <li><b>DHCP</b> (Dynamic Host Configuration Protocol) to assign address parameter automatically.</li> </ul>
	<b>Port numbers used</b> <ul style="list-style-type: none"> <li>44818 (EtherNet/IP TCP)</li> <li>2222 (EtherNet/IP UDP)</li> <li>300 (SMLP)</li> <li>80 (HTTP)</li> <li>67 / 88 (DHCP)</li> </ul>
	<b>Ethernet services</b> <ul style="list-style-type: none"> <li>ARP</li> <li>ICMP (Ping)</li> </ul>
	<b>ISO/OSI Layer 1/2</b> <b>ISO/OSI Layer 3/4</b> Ethernet II TCP/IP and UDP/IP
	<b>Baud rate</b> 10 / 100 MBaud
	<b>Connection technology</b> 2 x RJ45 with internal switch and auto crossing
	<b>Addressing</b> 4 byte IP address or MAC-ID (00:0F:69:xx:xx:xx)
	<b>Manufacturer ID (vendor ID)</b> 013B <sub>hex</sub>
	<b>EDS file name</b> SEW_GATEWAY_DFE33B.eds

#### 4.25.7 Fieldbus interface DFS11B for PROFIBUS / PROFIsafe®

##### Description

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

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

##### Electronics data

DFS11B option		
	<b>External voltage supply via X26</b>	U = DC 24 V (-15 %, +20 %) $I_{max}$ = DC 200 mA $P_{max}$ = 3.4 W
	<b>PROFIBUS protocol options</b>	PROFIBUS DP and DP-V1 acc. to IEC 61158
	<b>Automatic baud rate detection</b>	9.6 kBaud ... 12 MBaud
	<b>Connection technology</b>	<ul style="list-style-type: none"> <li>Via 9-pin sub D connector</li> <li>Pin assignment acc. to IEC 61158</li> </ul>
	<b>Bus termination</b>	Not integrated, must be implemented using suitable PROFIBUS connector with switchable terminating resistors.
	<b>Station address</b>	1 ... 125, adjustable via DIP switches
	<b>F address</b>	1 ... 1022, adjustable via DIP switches
	<b>Name of the GSD file</b>	SEW_6009.GSD
	<b>DP ident number</b>	6009 <sub>hex</sub> = 24585 <sub>dec</sub>
	<b>Application-specific parameter-setting data (Set-Prm-User-Data)</b>	<ul style="list-style-type: none"> <li>Length: 3 bytes</li> <li>Hex parameter setting 00,00,00</li> </ul>
	<b>DP configurations for DDLM_Chk_Cfg</b>	See publication "DFS11B PROFIBUS DP-V1 with PROFIsafe® Fieldbus Interface".
	<b>Diagnostics data</b>	<ul style="list-style-type: none"> <li>Standard diagnostics: 6 bytes</li> </ul>

	<b>NOTE</b>
	<p>Safety-oriented applications are implemented using PROFIsafe® interfaces.</p> <p>Refer to the publication "DFS11B PROFIBUS DP-V1 with PROFIsafe® Fieldbus Interface" for installation.</p>



#### 4.25.8 Fieldbus interface DFS21B for PROFINET / PROFIsafe®

##### Description

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

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

##### Electronics data

DFS21B option	
	<b>External voltage supply via X26</b> U = DC 24 V (-15 %, +20 %) $I_{max} = DC\ 200\ mA$ $P_{max} = 3.4\ W$
	<b>Application protocols</b> <ul style="list-style-type: none"> <li>• <b>PROFINET IO</b> (Ethernet frames with frame identification 8892<sub>hex</sub>) to control and set parameters for the inverter.</li> <li>• <b>HTTP</b> (Hypertext Transfer Protocol) for diagnostics using a Web browser.</li> <li>• <b>SMLP</b> (Simple Movilink Protocol), protocol used by MOVITOOLS® MotionStudio.</li> </ul>
	<b>Port numbers used</b> <ul style="list-style-type: none"> <li>• 300 (SMLP)</li> <li>• 80 (HTTP)</li> </ul>
	<b>Ethernet services</b> <ul style="list-style-type: none"> <li>• ARP</li> <li>• ICMP (Ping)</li> </ul>
	<b>OSI Layer 1/2</b> Ethernet II
	<b>Baud rate</b> 100 Mbaud in full duplex process
	<b>Connection technology</b> 2 x RJ45 with internal switch and auto crossing
	<b>Addressing</b> 4 byte IP address or MAC-ID (00:0F:69:xx:xx:xx)
	<b>F address</b> 1 ... 1022, adjustable via DIP switches
	<b>Manufacturer ID (vendor ID)</b> 010A <sub>hex</sub>
	<b>GSD file name</b> GSML-V2.1-SEW-DFE-DFS-2Ports-YYYYMMTT.xml

	<b>NOTE</b> Safety-oriented applications are implemented using PROFIsafe® interfaces. Refer to the publication "DF21B PROFINET with PROFIsafe® Fieldbus Interface" for installation.
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## 4.26 MOVI-PLC®

### 4.26.1 Unit versions

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

MOVI-PLC® unit type:		Description
MOVI-PLC® basic	DHP11B-T0	MOVI-PLC® basic controller
	DHP11B-T1 <sup>1)</sup>	Application version I includes the functions electronic cam and synchronous operation in addition to the T0 version.
	DHP11B-T2 <sup>1)</sup>	Application version II includes, for example, handling in addition to the T1 version.
MOVI-PLC® advanced	DHE41B	Functionality of MOVI-PLC® basic, but also enormous power reserves and high-speed interfaces.

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

### 4.26.2 Description

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

The DHP11B option is integrated ex works (not in size 0XS) or supplied in a separate UOH housing. Only SEW EURODRIVE can carry out an expansion of the unit with this option.

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



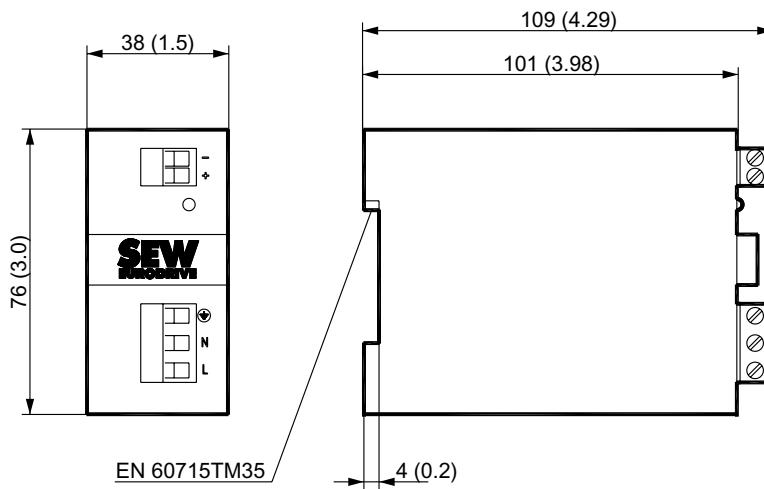
#### 4.26.3 Electronics data

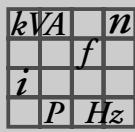
Electronics data of MOVI-PLC® basic DHP11B:

	Status display	LEDs for <ul style="list-style-type: none"> <li>• Voltage supply I/O</li> <li>• Firmware</li> <li>• Program</li> <li>• PROFIBUS</li> <li>• System buses</li> </ul>
	Fieldbus	<ul style="list-style-type: none"> <li>• PROFIBUS DP and DPV1 to IEC 61158</li> <li>• Automatic detection of baud rate from 9.6 kbaud to 12 Mbaud</li> <li>• Implement bus connection with suitable connector</li> <li>• GSD file SEW_6007.GSD</li> <li>• DP ident. number 6007<sub>hex</sub> (24579<sub>dec</sub>)</li> <li>• Maximum 32 process data</li> </ul>
	System bus	<ul style="list-style-type: none"> <li>• 2 system buses (CAN) for control of 12 inverters and CANopen I/O modules</li> <li>• CAN layer 2 (SCOM cyclic, acyclic) or via the SEW MOVILINK® protocol</li> <li>• Baud rate: 125 kBaud ... 1 MBaud</li> <li>• External bus terminator</li> <li>• Address range: 0 ... 127</li> </ul>
	Engineering	Via RS-485, PROFIBUS and the system buses
	Panel operation	Via RS-485 and CAN 2 (in preparation)
	Connection technology	<ul style="list-style-type: none"> <li>• PROFIBUS: 9-pole sub-D connector according to IEC 61158</li> <li>• System buses and I/Os: plug-in terminals</li> <li>• RS-485: RJ10</li> </ul>
	Binary inputs/outputs	8 I/Os to IEC 61131-2; can be configured as inputs or outputs, 5 of which are interrupt-capable.
	Memory	<ul style="list-style-type: none"> <li>• Program: 512 kByte</li> <li>• Data: 128 kByte</li> <li>• Retain: 24 kByte</li> </ul>
	Tools for startup	<ul style="list-style-type: none"> <li>• Programming languages               <ul style="list-style-type: none"> <li>– STL</li> <li>– ST</li> <li>– LD</li> <li>– FUP</li> <li>– CFC</li> <li>– AS</li> </ul> </li> <li>• Libraries for optimized inverter control</li> </ul>

#### 4.27 UWU52A switched-mode power supply

UWU52A switched-mode power supply	
Part number	188 181 7
Input voltage	1 × AC 110 V ... AC 240 V
Voltage range	AC 95 ... 265 V, DC 110 ... 300 V
Frequency	50/60 Hz
Maximum no-load current	AC 40 mA
Rated input current at 1 × AC 110 V	AC 1.04 A
at 1 × AC 230 V	AC 0.63 A
Output voltage	DC 24 V (-1 % / +3 %)
Rated output current at 40 °C	DC 2.5 A
at 55 °C	DC 2.0 A
Residual ripple	< 50 mV <sub>eff</sub>
Interference voltage	< 120 mV <sub>SS</sub>
Power loss	< 5.5 W
Weight	0.23 kg (0.51 lb)
Working temperature	0 ... +55 °C (+32 ... +131 °F) (condensation not permitted)
Degree of protection	IP20 (EN 60529)
Protection class	I
Connection	Screw terminals for cable cross sections 0.20 ... 2.5 mm <sup>2</sup> (AWG24 ... AWG13)





## Parameters

### Explanation of the parameters

## 5 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
- With the MOVITOOLS® MotionStudio program on a PC via the RS-485 interface
- Copy the parameters using the keypad

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

### 5.1 Explanation of the parameters

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

The parameters for motor startup are described in the section "Startup with the FGB keypad".

You can select the parameters on the FBG11B keypad as follows:

	Selection in the FBG11B long menu
	Selection in the FBG11B short and long menus
	Direct selection in the FBG11B keypad and in the FBG11B long menu
	Selection within FGB motor startup

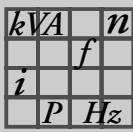
The following symbols explain the parameters:

	These parameters are switch-selectable and available in parameter sets 1 and 2.
	These parameters can only be changed with INHIBITED inverter status (= output stage at high resistance).
	The startup function automatically changes this parameter.

No.	FBG	Name	Description
0_	<b>Display values</b>		
00_	<b>Process values</b>		
000		Speed (signed) [rpm]	The displayed speed is the calculated actual speed.
001		User display for DBG11B	The user display is defined by the following parameters: <ul style="list-style-type: none"> <li>• P850 Scaling factor numerator</li> <li>• P851 Scaling factor denominator</li> <li>• P852 User-defined unit</li> </ul>
002		Frequency (signed) [Hz]	Output frequency of the inverter.
004		Output current (amount) [% I <sub>N</sub> ]	Apparent current of the rated unit current.
005		Active current (signed) [% I <sub>N</sub> ]	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, and negative when torque is in negative sense of rotation.
008		DC link voltage [V]	DC link voltage.



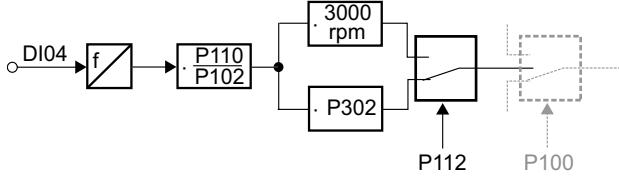
No.	FBG	Name	Description	
009		Output current [A]	Apparent current at the inverter output, displayed in AC A.	
01_		<b>Status displays</b>		
010		Inverter status	Status of the unit output stage: • INHIBITED • ENABLED	
011		Operating status	The following operating states are available: • 24 V OPERATION • CONTROLLER INHIBIT • NO ENABLE • CURRENT AT STANDSTILL • ENABLE • FACTORY SETTING • ERROR • SAFE STOP	
012		Error status	Fault number and fault in plain text.	
013		Current parameter set	Parameter set 1 or 2.	
014		Heat sink temperature [°C]	Heat sink temperature of the inverter.	
02_		<b>Analog setpoints</b>		
020		Analog input AI1 [V]	Voltage 0 ... +10 V at analog input AI1. When S11 = ON and <i>P112 AI1 operating mode</i> : • = NMAX, 0 ... 20 mA: Display 0 ... 10 V → 0 ... 20 mA • = NMAX, 4 ... 20 mA: Display 2 ... 10 V → 4 ... 20 mA	
021		Analog input AI2 (optional)	Unit: [V] Voltage (-10 V ... +10 V)	
03_		<b>Binary inputs</b>		
030		Binary input DI00	Status of binary input DI00 (Fault 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_		<b>Binary outputs</b>		
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_		<b>Unit data</b>		
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	
077		DBG firmware	Part number and firmware version	

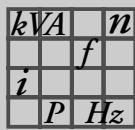


## Parameters

### Explanation of the parameters

No.	FBG	Name	Description
08_		<b>Fault memory</b>	
080 ... 084	Long	Fault t-0 ... Fault t-4 (FBG11B keypad: fault t-0 only)	The unit saves the following information when an error occurs. MOVITOOLS® MotionStudio can display this information if required: <ul style="list-style-type: none"><li>• P036/P053 Status of binary inputs/binary outputs</li><li>• P013 Current parameter set</li><li>• P011 Operating status of the inverter</li><li>• P010 Inverter status</li><li>• P014 Heat sink temperature</li><li>• P000 Speed</li><li>• P004 Output current</li><li>• P005 Active current</li><li>• Unit utilization</li><li>• P008 DC link voltage</li></ul>
09_		<b>Bus diagnostics</b>	
094	Long	PO 1 Setpoint [hex]	Process data output word 1, setpoint
095	Long	PO 2 Setpoint [hex]	Process data output word 2, setpoint
096		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_		<b>Setpoints/ramp generators</b>	
10_		<b>Setpoint selection/frequency input</b>	
100	Short 	Setpoint source	<p>0 / Bipolar / Fixed setpoint 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 in the event of a wire breakage.</p> <p>1 / Unipolar / Fixed setpoint The setpoint is provided by the analog input or the fixed setpoints. The unit processes the fixed setpoints <b>according to their value</b>. The binary inputs specify the direction of rotation.</p> <p>2 / RS-485 / Fixed setpoint The setpoint is provided by the RS-485 interface. The sign of the setpoint determines the direction of rotation.</p> <p>4 / Motor potentiometer / Fixed setpoint Set the setpoint by programming the terminals <i>Motor potentiometer up</i> and <i>Motor potentiometer down</i> accordingly. The motor potentiometer is a virtual potentiometer that does not correspond to the setpoint potentiometer on the unit.</p> <p>6 / Fixed setpoint + AI1 The setpoint is calculated by adding the selected fixed setpoint and analog input AI1. The binary inputs specify the direction of rotation. Furthermore, <i>P112 AI1 operation mode</i> applies.</p> <p>7 / Fixed setpoint * 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, <math>n_{min}</math> applies. The binary inputs specify the direction of rotation.</p> <p>8 / MASTER SBus1 In master/slave mode, the setpoint is provided by the master via system bus 1. See P75x master/slave function.</p> <p>9 / MASTER RS-485 The setpoint is provided by the master in master/slave mode via the RS-485 interface. See P75x master/slave function.</p> <p>10 / SBus 1 / Fixed setpoint The system bus specifies the setpoint. The sign of the setpoint determines the direction of rotation.</p>

No.	FBG	Name	Description																		
100		Setpoint source	<p>11 / Frequency setpoint input / Fixed setpoint  The frequency at binary input DI04 specifies the setpoint. Set the value with the <i>P102 Frequency scaling</i> parameter. 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:</p> <ul style="list-style-type: none"> <li>• <i>P254 PI actual value scaling</i></li> <li>• <i>P255 PI actual value offset</i></li> </ul> <p>The optimum pulse duty factor (pulse width of the high and low signal) should be 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.</p> <table> <tr> <td>Frequency scaling</td> <td>Minimum response time</td> <td>Resolution</td> </tr> <tr> <td>(delay)</td> <td></td> <td>Frequency input</td> </tr> <tr> <td>25 ... 120 kHz</td> <td>20 ms</td> <td>50 Hz</td> </tr> <tr> <td>12.5 ... 24.99 kHz</td> <td>40 ms</td> <td>25 Hz</td> </tr> <tr> <td>10 ... 12.49 kHz</td> <td>60 ms</td> <td>16.7 Hz</td> </tr> <tr> <td>1 ... 9.99 kHz</td> <td>500 ms</td> <td>2 Hz</td> </tr> </table> <p><b>Setpoint cascade</b></p>  <p>P302: Maximum speed in rpm  P110: Gain 0.1 ... 1 ... 10  P102: Frequency scaling 1 ... 120 kHz  P112: Operation mode setpoint</p> <p><b>Example:</b>  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:</p> <ul style="list-style-type: none"> <li>• P102 Frequency scaling: 50 kHz</li> <li>• P112 Operation mode setpoint: 3000 rpm</li> <li>• Setpoint scaling P110: 0.5</li> </ul> <p>14 / Bipolar AI2 / Fixed setpoint  The setpoint is provided by the optional analog input AI2 or the fixed setpoints. The unit processes the fixed setpoints according to their value.</p>	Frequency scaling	Minimum response time	Resolution	(delay)		Frequency input	25 ... 120 kHz	20 ms	50 Hz	12.5 ... 24.99 kHz	40 ms	25 Hz	10 ... 12.49 kHz	60 ms	16.7 Hz	1 ... 9.99 kHz	500 ms	2 Hz
Frequency scaling	Minimum response time	Resolution																			
(delay)		Frequency input																			
25 ... 120 kHz	20 ms	50 Hz																			
12.5 ... 24.99 kHz	40 ms	25 Hz																			
10 ... 12.49 kHz	60 ms	16.7 Hz																			
1 ... 9.99 kHz	500 ms	2 Hz																			



## Parameters

### Explanation of the parameters

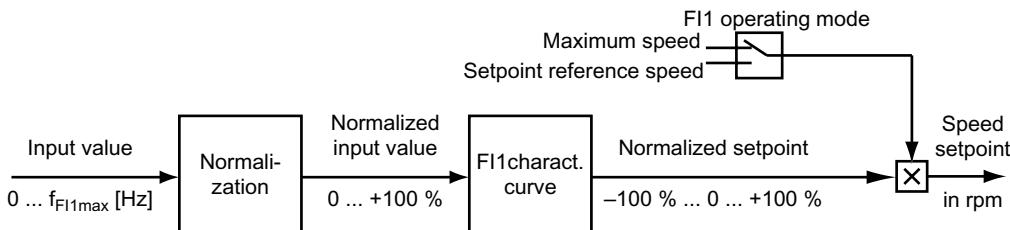
No.	FBG	Name	Description
101	Short 	Control signal source	<p><b>0 / Terminals</b> The binary inputs determine the control.</p> <p><b>1 / RS-485</b> The RS-485 interface and the binary inputs determine the control.</p> <p><b>3 / SBus</b> The system bus and the binary inputs determine the control.</p> <p><b>4 / 3-Wire Control</b> The 3-wire control principle determines the control. In this case, the enable and direction of rotation signals will respond edge-controlled.</p> <ul style="list-style-type: none"> <li>• Connect start key CW with contact to binary input "CW/Stop".</li> <li>• Connect start key CCW with contact to binary input "CCW/Stop".</li> <li>• Connect stop key with normally open input "Enable/Stop".</li> </ul> <p>If you connect CW and CCW at the same time, the drive decelerates with downwards ramp P131/P141.</p> <p>If the 3-WIRE CONTROL 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.</p> <p>The unit stores a start edge if you stop the drive using the stop button. If you then press the RUN key, the unit will enable the drive immediately.</p>
		Control source 3-WIRE CONTROL	<p>X12:2 = CW/Stop X12:3 = CCW/Stop X12:4 = Enable/Stop X10 = Setpoint input AI <math>f_A</math> = Output frequency <math>f_0</math> = Start/Stop frequency CW = Clockwise CCW = Counterclockwise <math>t_{11} [1]</math> = <math>t_{11}</math> UP <math>t_{11} [2]</math> = <math>t_{11}</math> DOWN <math>t_{13}</math> = Stop ramp</p>
102	Long 	Frequency scaling $f_{FI1max}$	Setting range: 0.1 ... 10 ... 120.00 [kHz]

<i>kVA</i>	<i>n</i>
<i>i</i>	<i>P</i>
	<i>Hz</i>

No.	FBG	Name	Description
103	<b>Lon6</b>	FI1 reference	0 / $n_{max}$ 1 / $n_{reference}$
104		Setpoint reference speed $n_{reference}$ for frequency input FI1 and analog inputs AI1 and AI2	Setting range: 0 ... <b>3000</b> ... 6000 rpm
105		Wire breakage detection	Wire breakage detection is only available in operating mode 4 ... 20 mA. 0 / No response 2 / Immediate 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 fault output. A restart is only possible after a fault reset has been performed during which the inverter is reinitialized. 4 / Rapid stop / Fault The inverter brakes the drive at the specified stop ramp (P136/P146). The inverter brakes with DC braking in 2-quadrant operation. Once the stop speed is reached, the inverter inhibits the output stage and the brake is applied. The fault is signaled immediately. The inverter revokes the ready signal and sets the programmed fault output. A restart is only possible after a fault reset has been performed during which the inverter is reinitialized. <b>7 / Rapid stop / Warning</b> The fault response corresponds to STOP/FAULT, except the inverter does not revoke the ready signal and the fault output is set.

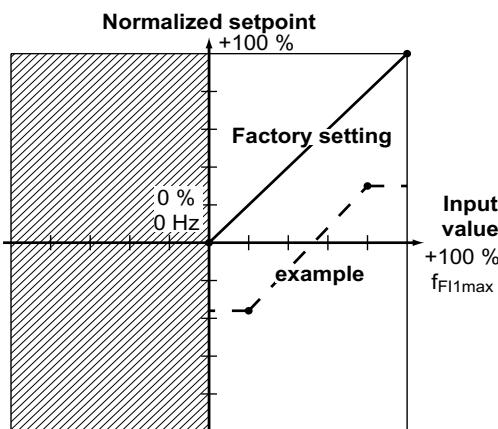
## Frequency input FI1 characteristic curve

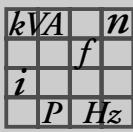
The frequency input can be configured using a characteristic curve:



106	<b>Lon6</b>	FI1 characteristic curve x1	Setting range: <b>0</b> ... 100 %
107		FI1 characteristic curve y1	Setting range: -100 % ... <b>0</b> ... +100 %
108		FI1 characteristic curve x2	Setting range: 0 ... <b>100</b> %
109		FI1 characteristic curve y2	Setting range: -100 ... 0 ... <b>+100</b> %

A 2-point characteristic curve is described by the coordinates x1/y1 and x2/y2, with which the FI1 frequency input is evaluated.

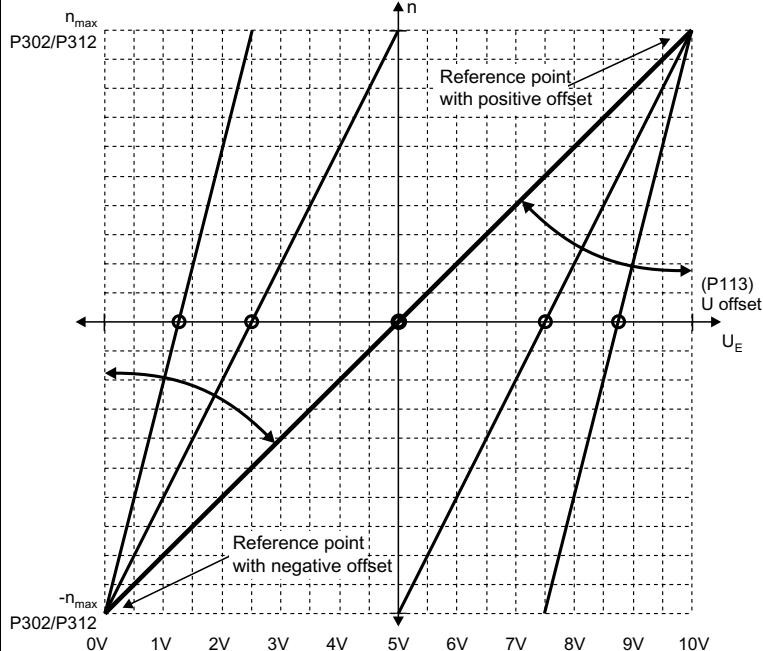
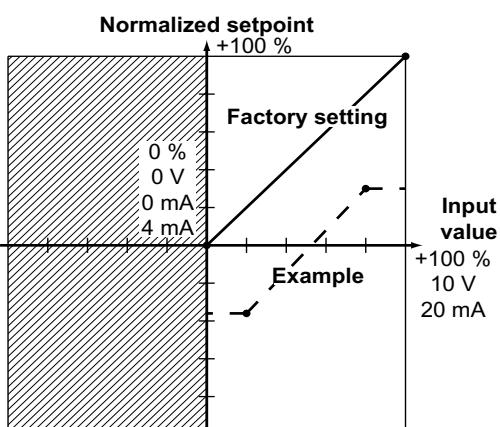


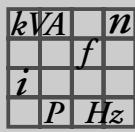


## Parameters

### Explanation of the parameters

No.	FBG	Name	Description
11_		Analog input 1 (0 ... +10 V)	<p>The analog input can be configured using a characteristic curve.</p>
110		AI1 scaling (up to firmware .12)	<p>Setting range: 0.1 ... 1 ... +10.</p> <p>Is used to define the slope of the setpoint characteristic curve. If you set the scaling to the value "1", then the input voltage <math>V_1 = 10 \text{ V}</math> 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).</p> <p><i>Slope of the setpoint characteristic curve</i></p> <p>You can only use the first quadrant with a unipolar setpoint source. Negative setpoint selections create the setpoint zero. <b>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.</b></p>
112		AI1 Operating mode	<p><b>1 / 10 V, reference maximum speed</b> Voltage input with reference <math>n_{\max}</math> (<math>0 \dots 10 \text{ V} = 0 \dots n_{\max}</math>). You can adjust the characteristic curve with <i>AI1 scaling</i>. Switch S11 = V.</p> <p><b>5 / 0 ... 20 mA, reference maximum speed</b> Current input <math>0 \dots 20 \text{ mA} = 0 \dots n_{\max}</math>. <i>P110 AI1 Scaling</i> has no effect. Switch S11 = mA.</p> <p><b>6 / 4 ... 20 mA, reference maximum speed</b> Current input <math>4 \dots 20 \text{ mA} = 0 \dots n_{\max}</math>. <i>P110 AI1 Scaling</i> has no effect. Switch S11 = mA.</p> <p><b>7 / 0 ... 10 V, n-reference</b> <b>8 / 0 ... 20 mA, n-reference</b> <b>9 / 4 ... 20 mA, n-reference</b></p>

No.	FBG	Name	Description
113	Short 	AI1 voltage offset (up to firmware 12)	<p>Setting range: <b>-10 V ... 0 ... +10 V</b> The zero passage of the setpoint characteristic curve can be moved along the <math>U_E</math> axis.</p> 
116		AI1 characteristic curve x1	Setting range: <b>0 ... 100 %</b>
117		AI1 characteristic curve y1	Setting range: <b>-100 % ... 0 ... +100 %</b>
118	Short	AI1 characteristic curve x2	Setting range: <b>0 ... 100 %</b>
119		AI1 characteristic curve y2	Setting range: <b>-100 ... 0 ... +100 %</b>
		A 2-point characteristic curve is described by the coordinates x1/y1 and x2/y2, with which the AI1 analog input is evaluated.	
			



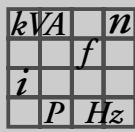
## Parameters

### Explanation of the parameters

No.	FBG	Name	Description
12_		Analog input AI2 / FBG Setpoint generator (option)	<p>Analog input AI2 is only available with the optional analog module FIO11B.</p>
120	 	AI2 operating mode	<p><b>0 / No function</b> The setpoint at AI2 is not used; the external current limitation is set to 100 %. 1 / 0 ... ±10 V + Setpoint / 100 % corresponds to <math>n_{max}</math>. The evaluated setpoint at AI2 is added to setpoint 1 (= AI1) observing the signs; the external current limitation is set to 100 % <math>I_{max}</math>. 2 / 0 ... 10 V current limit / 100 % corresponds to <math>I_{max}</math>. The input serves as external current limitation.</p>
121	 	Addition FBG setpoint control module	<p><b>0 / Off</b> The unit does not take into account the value from the setpoint generator of the FBG11 keypad. <b>1 / ON</b> 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. <b>2 / On (without fixed setpoint)</b> 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 <b>not affect fixed setpoints</b>.</p>
122	 	Direction of rotation FBG manual operation	<p>Setting the setpoint with the setpoint generator of the FBG11 keypad in FBG manual operation.</p> <p><b>0 / Unipolar CW</b> Adjustable speed: 0 ... + <math>n_{max}</math>. <b>1 / Unipolar CCW</b> Adjustable speed: 0 ... - <math>n_{max}</math>. <b>2 / Bipolar CW and CCW</b> Adjustable speed: - <math>n_{max}</math> ... + <math>n_{max}</math>.</p>

<i>kVA</i>	<i>n</i>
<i>i</i>	<i>f</i>
<i>P</i>	<i>Hz</i>

No.	FBG	Name	Description
126		AI2 characteristic curve x1	Setting range $-100\% \dots 0 \dots +100\%$ ( $-10\text{ V} \dots 0 \dots +10\text{ V}$ )
127		AI2 characteristic curve y1	Setting range $-100\% \dots 0 \dots +100\%$ ( $-n_{\max} \dots 0 \dots +n_{\max}$ / $0 \dots I_{\max}$ )
128		AI2 characteristic curve x2	Setting range $-100\% \dots 0 \dots +100\%$ ( $-10\text{ V} \dots 0 \dots +10\text{ V}$ )
129		AI2 characteristic curve y2	Setting range $-100\% \dots 0 \dots +100\%$ ( $-n_{\max} \dots 0 \dots +n_{\max}$ / $0 \dots I_{\max}$ )
			The characteristic curve is described by the coordinates x1/y1 and x2/y2, with which the analog input is evaluated.
			<p><b>Normalized setpoint</b></p>
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 / t21 up	Setting range 0 ... 2 ... 2000 [s]; Acceleration ramp
131 / 141		Ramp t11 / t21 down	Setting range 0 ... 2 ... 2000 [s]; Deceleration ramp
134 / 144		Ramp t12 / t22 up = down	<p>Setting range 0 ... 10 ... 2000 [s]</p> <p>The following applies to this ramp: UP = DOWN and CW = CCW.</p> <p>Ramps t12/t22 are activated by a binary input (<math>\rightarrow P601 \dots P608</math>), which is set to the function "Ramp switchover".</p>
135 / 145		S pattern t12 / t22 (In preparation)	<p>Setting range: 0 / 1 / 2 / 3 (0 = off, 1 = weak, 2 = medium, 3 = strong)</p> <p>The 2nd ramp (t12/ t22) of parameter sets 1 and 2 can be rounded with 3 pattern grades to achieve a smoother acceleration of the drive.</p> <p>Effect of the S pattern:</p>
136 / 146		Stop ramp t13 / t23 up = down	Setting range 0 ... 2 ... 20 [s]; stop ramp when switching to the NO ENABLE operating status

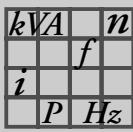


## Parameters

### Explanation of the parameters

No.	FBG	Name	Description
139 / 149	Long 1 2	Ramp monitoring 1 / 2	<p>Setting range: YES / NO</p> <p>If you set the deceleration ramps to a value that is a lot shorter than can be physically accomplished in this system, the turning drive will be stopped after expiration of the monitoring time. Such a setting will cause a fault signal and increase brake wear.</p> <p>This step also entails an increased setting of the respective ramp, if the ramp timeout definitely appears in form of a preset ramp that cannot be traveled.</p> <p>This parameter is an additional monitoring function for speed monitoring. This parameter only applies to the downwards ramp. This means the parameter can be used to monitor the downwards ramp, stop ramp or emergency stop ramp if speed monitoring is not desired.</p>
15_		<b>Motor potentiometer functionn</b> (see P100 Setpoint source)	The ramp times refer to a setpoint change of $\Delta n = 3000$ rpm.
150	Long	Ramp t3 up = down	<p>Setting range 0.2 ... 20 ... 50 [s]</p> <p>The ramp is in effect when using the terminal functions <i>Motor pot. up</i> and <i>Motor pot. down</i>.</p>
152	Long	Save last setpoint	<p><b>off / OFF</b> The inverter starts with <math>n_{min}</math>:</p> <ul style="list-style-type: none"> <li>After power off and on</li> <li>After revoking ENABLE</li> </ul> <p>If you use the motor potentiometer for permanent speed control, you will have to set P152 Save last setpoint to OFF. Otherwise, error message F25 EEPROM will appear after about 100,000 storage operations.</p> <p>Store only after setpoint change. If a fixed setpoint is deselected, the fixed setpoint will be used as motor potentiometer value.</p> <p><b>on / ON</b> The inverter starts with the last set motor potentiometer setpoint:</p> <ul style="list-style-type: none"> <li>After power off and on</li> <li>After revoking ENABLE</li> </ul> <p>If a fixed setpoint is deselected, the old motor potentiometer setpoint will be used again.</p>
16_ / 17_		<b>Fixed setpoints 1 / 2</b>	You can activate the fixed setpoints via the binary inputs DI02 ... DI05 with the arguments n11/n21 / n12/n22 and activate FIXED SETP. CHANGE (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	Setting range -5000 ... 150 ... 5000 [rpm]
161 / 171		Internal setpoint n12 / n22	Setting range -5000 ... 750 ... 5000 [rpm]
162 / 172		Internal setpoint n13 / n23	Setting range -5000 ... 1500 ... 5000 [rpm]
163 / 173		n11/n21 PI controller	Setting range 0 ... 3 ... 100 [%] (see section Project planning / PI controller)
164 / 174		n12/n22 PI controller	Setting range 0 ... 15 ... 100 [%] (see section Project planning / PI controller)
165 / 175		n13/n23 PI controller	Setting range 0 ... 30 ... 100 [%] (see section Project planning / PI controller)
2_		<b>Controller parameters</b>	
25_		<b>PI controller</b> (for an explanation of the parameters, refer to the project planning/PI-controller section)	<p>P250 PI controller Normal Inverted</p>

No.	FBG	Name	Description
250		PI controller	<b>0 / Off</b> PI controller deactivated. <b>1 / Normal</b> PI controller switched on normally. <b>2 / Inverted</b> 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 (up to firmware .12)	<b>1 / 10 V, reference maximum speed</b> 5 / 0 ... 20 mA, reference maximum speed 6 / 4 ... 20 mA, reference maximum speed 7 / 0 ... 10 V, n-reference 8 / 0 ... 20 mA, n-reference 9 / 4 ... 20 mA, n-reference
254		PI actual value scaling (up to .12)	0.1 ... 1.0 ... 10.0
255		PI actual value offset (up to .12)	0.0 ... 100.0 [%]
3__		<b>Motor parameters</b>	
Use this parameter group to adjust the inverter to the motor.			
<b>30_ / 31_</b>		<b>Limits 1 / 2</b>	
300 / 310	  	Start/stop speed 1 / 2	Setting range 0 ... 150 [rpm] If the setpoint speed is higher than the start/stop speed, the drive will be enabled with the start/stop speed. The transition to the setpoint speed is made using the active speed ramp. If the setpoint speed is lower than the start/stop speed, the setpoint will become active immediately. In the VFC & hoist operating mode, the drive is always enabled with the rated motor slip speed. During startup, the start/stop speed is set to half the rated slip speed of the connected motor. 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] Speed value, the lower limit of which 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. Caution: <ul style="list-style-type: none"> <li>The slowest speed is 15 rpm when the hoist function is active, even if <math>n_{min}</math> has been set to a lower value.</li> <li>To also enable the drive to move clear of the limit switches at low speeds, <math>n_{min}</math> is not active when drive has contacted the hardware limit switch.</li> </ul>
302 / 312	  	Maximum speed 1 / 2	Setting range 0 ... 1500 ... 5500 [rpm] No setpoint greater than the value set here can be selected. 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: <ul style="list-style-type: none"> <li>2-pole: max. 5500 rpm</li> <li>4-pole: max. 4000 rpm</li> <li>6-pole: max. 2600 rpm</li> <li>8-pole: max. 2000 rpm</li> </ul> Fault 08 <i>Speed monitoring</i> may appear if you enter higher values. When you perform a startup, the unit automatically sets the maximum speed to the transition speed.

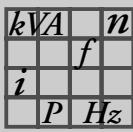


## Parameters

### Explanation of the parameters

No.	FBG	Name	Description	
303 / 313		Current limit 1 / 2	<p>Setting range 0 ... 150 [% <math>I_N</math>]            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.</p>	
32_ / 33_		<b>Motor adjustment 1 / 2</b>		
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 that is suitable for many applications. The values are saved in volatile memory.				
The motor is not calibrated if:				
<ul style="list-style-type: none"> <li>• P320/P330 Automatic adjustment = OFF.</li> <li>• VFC &amp; Flying start operating mode is active.</li> <li>• The set pre-magnetization time is more than 30 ms shorter than the pre-magnetization time calculated during startup.</li> </ul>				
If you deactivate automatic adjustment, the values measured last will not be saved in volatile memory.				
The factory setting of parameters 321 ... 324 / 331 ... 334 depends on the motor.				
320 / 330		Automatic adjustment 1 / 2	<p>off / OFF            No automatic adjustment: The inverter does not calibrate the motor.</p> <p>on / ON            Automatic adjustment: The inverter always measures the motor when changing to ENABLE operating mode.</p>	
321 / 331		Boost 1 / 2	<p>Setting range 0 ... 100 [%]            The value is calibrated during startup. The value is 0 for VFC operating modes. Usually, this parameter does not have to be set manually. In exceptional cases, manual setting may be necessary to increase the breakaway torque. In this case, set the values to max. 30% or <math>IxR</math>. One third of <math>IxR</math> is set for V/f operating modes. In exceptional cases, manual setting may be necessary to increase the breakaway torque. In this case, set the values to max. 60 % or <math>IxR</math>.</p>	
322 / 332		IxR adjustment 1 / 2	<p>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.</p>	
323 / 333		Premagnetization time 1 / 2	<p>Setting range 0 ... 2 [s]            Premagnetization builds a magnetic field in the motor when you enable the inverter.</p>	
324 / 334		Slip compensation 1 / 2	<p>Setting range 0 ... 500 [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 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.</p>	
34_		<b><math>I_N</math> UL monitoring</b>		
345 / 346		$I_N$ UL monitoring 1 / 2	<p>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.</p>	

No.	FBG	Name	Description		
4__		<b>Reference signals</b>			
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 fault.					
40_		Speed reference signal	<p>The inverter issues the signal "1" at P403 if the speed is less than or greater than the set reference speed.</p> <p>Speed reference message</p>		
400	Long	Speed reference value	Setting range 0 ... <b>750</b> ... 5000 [rpm]		
401		Hysteresis	Setting range 0 ... <b>100</b> ... 500 [rpm]		
402		Delay time	Setting range 0 ... 1 ... 9 [s]		
403		Signal = "1" when	<b>0 / n &lt; n<sub>ref</sub></b> <b>1 / n &gt; n<sub>ref</sub></b>		
43_		Current reference signal (in preparation)	<p>Signal if the output current is greater or less than the reference value.</p> <p>Current reference signal</p>		
430	Long	Current reference value	Setting range 0 ... <b>100</b> ... 150 % I <sub>N</sub>		
431		Hysteresis	Setting range 0 ... 5 ... 30 % I <sub>N</sub>		
432		Delay time	Setting range 0 ... 1 ... 9 s		
433		Signal = "1" when	<b>0 / I &lt; I<sub>ref</sub></b> <b>1 / I &gt; I<sub>ref</sub></b>		



## Parameters

### Explanation of the parameters

No.	FBG	Name	Description
44_		<b>I<sub>max</sub> signal</b> (in preparation)	
			Signal if the inverter has reached the current limitation.
440		Hysteresis	Setting range 0 ... 5 ... 50 % I <sub>N</sub>
441		Delay time	Setting range 0 ... 1 ... 9 s
442	L <sub>on</sub> &B	Signal = "1" when	0 / I < I <sub>max</sub> 1 / I > I <sub>max</sub>
45_		<b>PI controller reference signal</b> (see project planning/PI controller/reference signal)	

These parameters determine whether and how the PI reference signal responds

450		PI actual value reference	0.0 ... 100.0 [%]
451	L <sub>on</sub> &B	Signal = "1" when	0 / PI Actual value < PI Ref 1 / PI Actual value > PI Ref

### 5\_ Monitoring functions

### 50\_ Speed monitoring 1 / 2

The drive reaches the speed specified by the setpoint only with adequate torque. When the inverter reaches *P303 Current limit* it assumes that it does not reach the required speed. Speed monitoring responds when the inverter exceeds the current limit for longer than *P501 delay time*.

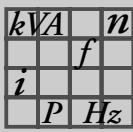
500 / 502		Speed monitoring 1 / 2	off / OFF on / Motor / regenerative Function of speed monitoring in motor and regenerative operation of the motor
501 / 503	1 / 2	Delay time 1 / 2	Setting range 0 ... 1 ... 10 [s] The set current limit can be reached briefly during acceleration, deceleration, or load peaks. You prevent the speed monitoring from responding too sensitively by setting the delay time. Monitoring responds when the current limit is reached for the duration of the delay time.
54_	<b>Gear unit/motor monitoring</b> (in preparation)		

These parameters are used to set the response to be triggered in the event of a motor or gear unit problem. The binary inputs have to be set accordingly for this purpose. Fault responses are triggered in the *Controller inhibit* or *No enable* inverter states.

The binary input signals are filtered with a time constant of 10 s. This means the signal has to be present for at least 10 s.

Response	Description
No response	Neither a fault is displayed nor a fault response occurs. The fault which is signaled is completely ignored.
Display error	The fault is displayed and the fault output is set (if programmed). The unit has no other fault responses. The fault can be reset.
Immediate stop / fault	The inverter performs an immediate switch-off and a fault is signaled. The output stage is inhibited and the brake is applied. The ready signal is revoked and the error output is set, if programmed. A restart is only possible after the fault has been reset during which the inverter is reinitialized.
Rapid stop / fault	The drive is braked with the set stop ramp t13/t23. Once the stop speed is reached, the output stage is inhibited and the brake is applied. The fault is signaled immediately. The ready signal is revoked and the error output is set, if programmed. A restart is only possible after the fault has been reset during which the inverter is reinitialized.
Rapid stop / warning	The drive is braked with the set stop ramp t13/t23. Once the stop speed is reached, the output stage is inhibited and the brake applied. The fault is signaled immediately. The fault is signaled via the terminal, if programmed. The ready signal is not revoked. The drive restarts without unit re-initialization if the error is rectified by an internal procedure or by an error reset.

No.	FBG	Name	Description
540	Long	Response to drive vibration / warning	Factory setting: Display error Once the drive vibration sensor signals a warning, the inverter will respond with the set response.
541		Response to drive vibration / fault	Factory setting: Rapid stop / warning Once the drive vibration sensor signals a fault, the inverter will respond with the set response.
542		Response to oil aging / warning	Factory setting: Display error Once the oil aging sensor signals a warning, the inverter will respond with the set response.
543		Response to oil aging / fault	Factory setting: Display error Once the oil aging sensor signals a fault, the inverter will respond with the set response.
544		Oil aging / overtemperature	Factory setting: Display error Once the oil aging sensor signals overtemperature, the inverter will respond with the set response.
545		Oil aging / ready signal	Factory setting: Display error Once the oil aging sensor signals ready, the inverter will respond with the set response.
549		Response to brake wear	Factory setting: Display error Once the brake wear sensor signals a fault, the inverter will respond with the set response.
6_		<b>Terminal assignment</b>	
60_		<b>Binary inputs (DI01 with fixed assignment to CW/STOP)</b>	
<b>Effect of</b>		<b>0 signal</b>	<b>1 signal</b>
0: No function:		–	–
1: Enable / Stop:		Stop at P136 Stop ramp	Enable
2: CW / stop:		Stop at P131 Ramp down	Enable CW
3: CCW / stop:		Stop at P131 Rampe down	Enable CCW
4: n11 / n21			no
5: n12 / n22			no
6: Fixed setpoint switchover:		Fixed setpoints n11/n12/n13	yes
7: Parameter set switchover:		Parameter set 1	yes
8: Ramp switchover:		t11/t21 active	yes
9: Motor potentiometer up:		–	Increase setpoint
10: Motor potentiometer down:		–	Decrease setpoint
11: /External fault:		External fault	–
12: Fault reset:		Reset on positive edge 0 to 1	yes
19: Free-running slave:		Master-slave mode	yes
20: Setpoint acceptance active:		Do not accept	Accept setpoint
26: TF signal (DI05 only):		Motor overtemperature	No signal
27: Vibration / warning		Sensor signals warning	Sensor does not signal warning
28: Vibration / fault		Sensor signals fault	Sensor does not signal fault
29: Brake wear		Brake is worn	Brake OK
30: /Controller inhibit:		Inhibited	Enable
33: Oil aging / warning		Sensor signals warning	Sensor does not signal warning
34: Oil aging / fault		Sensor signals fault	Sensor does not signal fault
35: Oil aging / overtemperature		Sensor signals overtemperature	Sensor does not signal overtemperature
36: Oil aging / ready		Sensor not ready	Sensor ready
<b>Fixed setpoints</b>			
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	Short	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: Fault reset

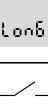
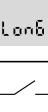
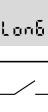
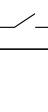
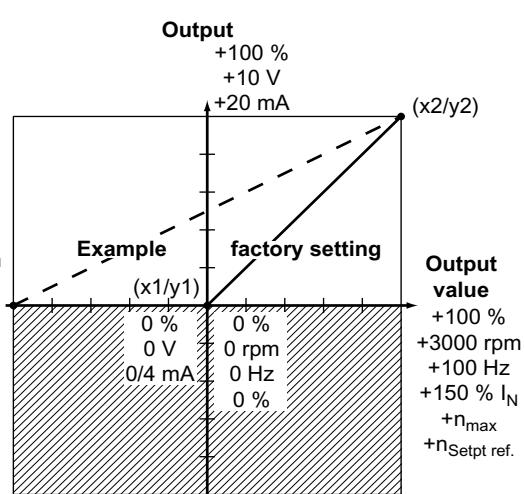


## Parameters

### Explanation of the parameters

No.	FBG	Name	Description
62_		<b>Binary outputs</b> (for controlling the brake rectifier use only binary output DO02)	
		<b>Effect of</b>	<b>0 signal</b> <b>1 signal</b>
0: No function:		–	–
1: /Fault:		Collective fault signal	–
2: Ready:		Not ready	ready
3: Output stage on:		Unit inhibited	Unit enabled and motor is energized
4: Rotating field on:		No rotating field	Rotating field
5: Brake released:		Brake applied	Brake released (not with DO03)
8: Parameter set:		1 active	2 active
9: Speed reference signal:		$n > n_{ref} / n < n_{ref}$ (P403)	$n < n_{ref} / n > n_{ref}$ (P403) $n = n_{ref}$
11: Set/actual value comparison signal:		$n \neq n_{setp}$	
12: Current reference signal:		$I > I_{ref} / I < I_{ref}$ (P433)	$I < I_{ref} / I > I_{ref}$ (P433)
13: Imax signal:		$I < I_{max} / I = I_{max}$ (P442)	$I = I_{max} / I < I_{max}$ (P442)
21: IPOS output:		–	Depends on IPOS program
22: /IPOS fault:		IPOS fault signal	–
23: PI ACTUAL VALUE REF.:		–	PI controller actual value has exceeded the set threshold
24: Ex-e current limit active (in preparation)			
27: Safe stop: The display "Safe stop" is <b>not safety-related</b> and must not be used as a safety function.			
30: /xt warning (in preparation)		Normal operation	$I_{xt} > 115\%$
31: /xt fault (in preparation)		Normal operation	$I_{xt} > 125\%$
620		Binary output DO01	Factory setting: /FAULT
621	Short	Binary output DO02	Factory setting: BRAKE RELEASED
622		Binary output DO03	Factory setting: READY (selection 5 (BRAKE RELEASED) not possible)
64_		<b>Analog outputs AO1 (optional)</b>	
		Analog output AO1 is only available with the optional analog module FIO11B	
		<p>Output value 100 % =</p> <p>–3000 ... 0 ... 3000 rpm –100 ... 0 ... 100 Hz 0 ... 100 % = 0 ... 150 % <math>I_N</math> = 0 ... 150 % unit utilization</p> <pre> graph LR     A[Output value 100 % = -3000 ... 0 ... 3000 rpm -100 ... 0 ... 100 Hz 0 ... 100 % = 0 ... 150 % I_N = 0 ... 150 % unit utilization] --&gt; B[Normalization]     B -- obtained output value --&gt; C[AO1 characteristic curve]     C -- Output --&gt; D[0 ... 10 V 0 / 4 ... 20 mA]   </pre>	

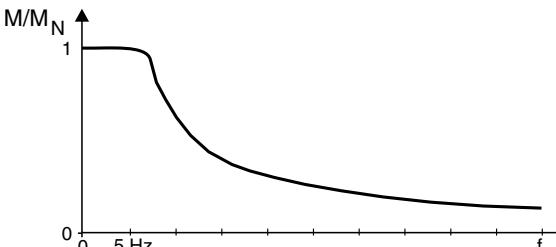
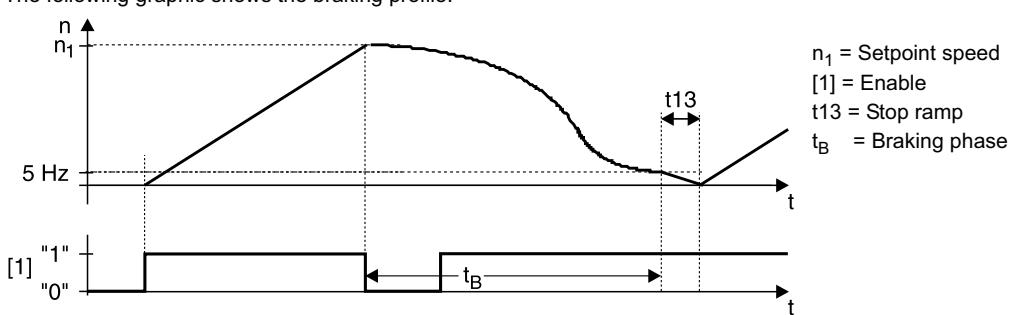
<i>kVA</i>	<i>n</i>
<i>i</i>	
<i>P</i>	<i>Hz</i>

No.	FBG	Name	Description
640		Analog output AO1	<p><b>0 / No function</b>            The value 0 % evaluated by the characteristic curve is displayed.</p> <p>1 / Ramp generator input (amount) / 100 % corresponds to 3000 rpm            Setpoint speed at the input of the internal ramp generator</p> <p>2 / Setpoint speed (amount) / 100 % corresponds to 3000 rpm            Valid setpoint speed (output ramp generator or correcting variable of the higher-level controller)</p> <p>3 / Actual speed (amount) / 100 % corresponds to 3000 rpm</p> <p>4 / Actual frequency (amount) / 100 % corresponds to 100 Hz            Rotating field frequency</p> <p>5 / Output current (amount) / 100 % corresponds to 150 % <math>I_{rated}</math>            Apparent current</p> <p>6 / Apparent current (amount) / 100 % corresponds to 150 % <math>I_{rated}</math>            Current unit utilization</p> <p>7 / Unit utilization / 100 % corresponds to 150 % unit utilization</p> <p>11 / Actual speed (signed) / ±100 % corresponds to ±3000 rpm</p> <p>12 / Actual frequency (signed) / ±100 % corresponds to ±100 Hz            Rotating field frequency</p>
641		AO1 reference (as of firmware .13)	<p><b>0 / 3000 rpm , 100 Hz, 150 %</b></p> <p>1 / <math>n_{max}</math></p> <p>2 / <math>n_{set\ reference}</math></p>
642		AO1 Operating mode	<p><b>0 / No function</b>            Output: Always 0 V or 0 mA</p> <p>2 / 0 ... 20 mA/100 % corresponds to 20 mA</p> <p>3 / 4 ... 20 mA/100 % corresponds to 20 mA</p> <p>4 / 0 ... 10 V/100 % corresponds to 10 V</p>
646		AO1 Characteristic curve x1	<p>-100 % ... 0 ... +100 %            -3000 rpm ... 0 ... +3000 rpm            -100 Hz ... 0 ... 100 Hz            0 ... 100 % <math>I_N</math>            0 ... 100 % = 0 ... 150 % unit utilization</p>
647		AO1 Characteristic curve y1	0 ... 100 %
648		AO1 Characteristic curve x2	<p>-100 % ... 0 ... +100 %            -3000 rpm ... 0 ... +3000 rpm            -100 Hz ... 0 ... 100 Hz            0 ... 100 % <math>I_N</math>            0 ... 100 % = 0 ... 150 % unit utilization</p>
649		AO1 Characteristic curve y2	0 ... 100 %
		The characteristic curve is described by the coordinates x1/y1 and x2/y2, with which the analog output is evaluated.	
			

<i>kVA</i>	<i>n</i>
<i>i</i>	<i>f</i>
<i>P</i>	<i>Hz</i>

## Parameters

### Explanation of the parameters

No.	FBG	Name	Description
7_		<b>Control functions</b>	All settings with regard to the fundamental control properties of the inverter are defined within parameter group 7_. This parameter group comprises functions which the inverter automatically executes when they are activated.
70_		<b>Operating mode 1 / 2</b>	This parameter is used to set the basic operating mode of the inverter. Setting on the keypad.  <b>VFC / V/f characteristic curve:</b> Default setting for asynchronous motors. Suitable for general applications, such as conveyor belts, trolleys, and hoists with counterweight.
		<b>VFC &amp; hoist:</b>	The hoist function automatically provides all functions necessary for operating an unbalanced hoist. For safety reasons, make sure to activate monitoring functions that prevent the drive from starting. Monitoring functions: <ul style="list-style-type: none"> <li>• Monitoring the output current during the premagnetization phase</li> <li>• Avoiding sag when the brake is released</li> </ul> The unit detects the following incorrect configurations and displays them with the following faults: <ul style="list-style-type: none"> <li>• 2 or 3-phase motor phase interruption: F82 = Output open</li> <li>• Premagnetization time too short or incorrect motor/inverter combination: F81 = Error start condition</li> <li>• Motor phase failure due to active speed monitoring P500/501: F08 = Fault n-monitoring</li> </ul>
		<b>Caution!</b>	<ul style="list-style-type: none"> <li>• The control must be designed in such a way that the <b>direction of rotation of the drive can only be changed when it is at a standstill</b>.</li> <li>• A single-phase motor phase failure cannot always be detected reliably.</li> <li>• SEW-EURODRIVE strongly recommends activating speed monitoring.</li> <li>• Prerequisite for correct performance of the hoist function: Motor brake controlled by the inverter.</li> <li>• Speed monitoring is set by changing parameters 500 / 502 and 501 / 503. The sagging of hoists cannot be avoided safely when monitoring is deactivated or the delay time is set too long.</li> </ul>
		<b>VFC &amp; DC braking / V/f characteristic curve &amp; DC braking:</b>	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 rated motor current.
			<p>During braking, the inverter injects a constant current with a rotating-field frequency of 5 Hz. The braking torque = 0 at 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 the motor of 5 Hz. The motor stops along the stop ramp. Rated motor current is used for the current injection. In all cases, the inverter limits the current to max. 125 %<math>I_N</math>. See "Brake function" for information about the brake control system.</p>
		<b>Caution!</b>	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.	 <p> <math>n_1</math> = Setpoint speed  [1] = Enable  <math>t_{13}</math> = Stop ramp  <math>t_B</math> = Braking phase </p>

$kVA$	$n$
$i$	$f$
$P$	$Hz$

No.	FBG	Name	Description
<b>VFC &amp; flying start function:</b> The flying start function lets you synchronize the inverter to an already running motor. This is used in particular with drives that are not braked actively, run on for a long time or are turned by a flowing medium, e.g. pumps and fans. The maximum flying start time is approx. 200 ms.			
<b>P320 Automatic adjustment is deactivated in the FLYING START operating mode.</b> It is important that the $I_{xR}$ value P322 stator resistance is set correctly to ensure that the flying start function is performed properly.			
Startup of an SEW motor: The $I_{xR}$ 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 $I_{xR}$ value is measured at startup when a non-SEW motor is started up with MOVITOOLS® MotionStudio.			
<p><math>n_1</math> = Setpoint speed <math>n_M</math> = Motor speed [1] = Enable</p>			
The flying start function does not function if an output filter is connected to the inverter.			
<b>Caution!</b> 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® MotionStudio) 3 / VFC & DC braking (field-oriented controlled mode with DC braking) 4 / VFC & flying start function (field-oriented control mode with flying start function) <b>21 / V/f characteristic curve</b> (voltage/frequency controlled mode) 22 / V/f & DC braking (voltage/frequency controlled mode with DC braking)
71_		Standstill current 1 / 2	
With activated standstill current function, the inverter injects a current in the motor at standstill. This allows the inverter to fulfill the following functions:			
<ul style="list-style-type: none"> <li>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. <b>Recommendation:</b> Motor housing should be hand hot.</li> <li>With activated standstill current, you can start the motor without premagnetization. <b>Recommendation:</b> For hoists, set to 45 ... 50 %.</li> </ul>			
You can activate the standstill current function by setting 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 by setting /CONTROLLER INHIBIT to 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 1 / 2	0 ... 50 % $I_{Mot}$
72_		Setpoint stop function 1 / 2	
Use the P720 / P723 Setpoint stop 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.			

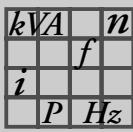
## Parameters

### Explanation of the parameters

No.	FBG	Name	Description
720 / 723	LanB	Setpoint stop function 1 / 2	<b>off / OFF</b> on / ON
721 / 724		Stop setpoint 1 / 2	0 ... 30 ... 500 [rpm]
722 / 725	1 2	Start offset 1 / 2	0 ... 30 ... 500 [rpm]
73_		<b>Brake function 1 / 2</b>	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. <b>The brake is always applied when /CONTROLLER INHIBIT = 0.</b>
			<p>The diagram shows the timing of various signals relative to each other. The 'Enable' signal starts at '0', goes to '1', then back to '0'. The 'n_setpt' signal rises from '0' to a peak and then falls. The 'n_start-stop' signal changes from '0' to '1' at the start and returns to '0' at the end. The '/BRAKE' signal is active during the 'Brake release time' and 'Brake application time'. The 'Output stage ON' and 'Rotating field ON' signals both start at '0', rise to '1' at the start, and return to '0' at the end. Vertical dashed lines indicate the boundaries of the 'Pre-magnetization time', 'Brake release time', 'Brake application time', and 'Post-magnetization time'.</p>
731 / 734	LanB	Brake release time 1 / 2	Setting range 0 ... 2 [s] This parameter determines how long the motor will remain at a standstill after expiration of the premagnetization time and how much time the brake has to release.
732 / 735	1 2	Brake application time 1 / 2	Setting range 0 ... 2 [s] You can use this parameter to set the time required for the mechanical brake to apply. This parameter prevents a sagging of the drive especially in hoists.
74_		<b>Speed skip function</b>	The skip window center and skip width are values and automatically have an effect on positive and negative setpoints when activated. The function is deactivated by setting the skip width to 0.
			<p>The diagram illustrates the Speed skip function. A main ramp curve represents the output speed. A smaller rectangular pulse is centered on the ramp, representing the skip window. The center of the window is defined by parameter P741/P743, and its width is defined by parameter P740/P742. The input to the ramp is labeled 'n-setpoint' (integrator input), and the output from the ramp is labeled 'setpoint' (integrator output).</p>
			The "Speed skip" function makes it possible to prevent the motor speed from remaining within a certain speed window. This suppresses vibration and noise, in particular in machines with pronounced mechanical resonance.
740 / 742	LanB	Skip window center 1 / 2	Setting range 0 ... 1500 ... 5000 rpm
741 / 743	1 2	Skip width 1 / 2	Setting range 0 ... 300 rpm

<i>kVA</i>	<i>n</i>
<i>i</i>	<i>f</i>
<i>P</i>	<i>Hz</i>

No.	FBG	Name	Description									
75_		<b>Master/slave function (in preparation)</b>	<p>The master-slave function allows for implementing automatical functions such as speed synchronization, shared load and torque control (slave). The RS-485 interface or the system bus interface can be used as the communication link. P100 "Setpoint source" must then be set to master SBus or master RS485. The process output data PO1 ... PO3 (P870, P871, P872) are automatically set by the firmware. A programmable terminal function, "Slave free runn." (P60_/_P61_) makes it possible to separate the slave from the master setpoint of the master and switch it to a local control mode (like control source bipolar/fixed setpoint).</p> <p>For the slave, the process data P87x are automatically assigned as follows:</p> <ul style="list-style-type: none"> <li>- PO1 = Control word 1</li> <li>- PO2 = Speed or current in M-control</li> <li>- PO3 = IPOS PO data</li> <li>- PI1 = Status word 1</li> <li>- PI2 = Speed</li> <li>- PI3: IPOS PI data</li> </ul> <p>P811 RS-485 Group address or P882 SBus Group address must be set to the same value in master and slave. For master/slave operation via RS-485 interface, set P811 RS-485 Group address to a value greater than 100. For operation via system bus (e.g. master/slave operation), the bus terminating resistors at the start and end of the system bus must be activated.</p>									
		<b>Connection check</b>	<ul style="list-style-type: none"> <li>• System bus (SBus): P883 SBus timeout interval is in effect when there is a communication link via the SBUS. If P883 SBus timeout interval = 0, there is no monitoring of data transmission via the SBUS.</li> <li>• RS-485 interface: A connection check is always in effect if the communication link takes place via the RS-485 interface; P812 RS-485 timeout interval does not have any function. The slave inverter must receive a valid RS-485 telegram within the fixed time interval of <math>t = 500</math> ms. If the time is exceeded, the slave drives are stopped at the emergency stop ramp and fault signal F43 "RS485 timeout" is issued.</li> </ul>									
		<b>Overview of functions of master/slave operation</b>	<table border="0"> <thead> <tr> <th>Speed synchronization:</th> <th>Master</th> <th>Slave</th> </tr> </thead> <tbody> <tr> <td>Master controlled</td> <td>P750 Slave setpoint: SPEED (485+SBus)</td> <td>P100 Setpoint source: MASTER SBUS</td> </tr> <tr> <td>Slave controlled</td> <td>P700 Operating mode 1: VFC VFC &amp; hoist V/f characteristic curve V/f &amp; DC braking</td> <td>MASTER RS485: P700 Operating mode 1: VFC VFC &amp; hoist V/f characteristic V/f &amp; DC braking</td> </tr> </tbody> </table>	Speed synchronization:	Master	Slave	Master controlled	P750 Slave setpoint: SPEED (485+SBus)	P100 Setpoint source: MASTER SBUS	Slave controlled	P700 Operating mode 1: VFC VFC & hoist V/f characteristic curve V/f & DC braking	MASTER RS485: P700 Operating mode 1: VFC VFC & hoist V/f characteristic V/f & DC braking
Speed synchronization:	Master	Slave										
Master controlled	P750 Slave setpoint: SPEED (485+SBus)	P100 Setpoint source: MASTER SBUS										
Slave controlled	P700 Operating mode 1: VFC VFC & hoist V/f characteristic curve V/f & DC braking	MASTER RS485: P700 Operating mode 1: VFC VFC & hoist V/f characteristic V/f & DC braking										
750	<i>Lang</i>	Slave setpoint	<p>The setpoint to be transferred to the master is set on the master. The "MASTER-SLAVE OFF" setting must be retained on the slave.</p> <ul style="list-style-type: none"> <li>• <b>MASTER-SLAVE OFF</b></li> <li>• SPEED (RS485)</li> <li>• SPEED (SBus1)</li> </ul>									
751		Scaling slave setpoint	<p>Setting range: -10 ... 0 ... 1 ... 10</p> <p>The setpoint sent from the master is multiplied by this factor which is set in the slave.</p>									
76_		<b>Manual operation</b>										
760	<i>Lang</i>	Locking RUN/STOP keys (see Startup / External setpoint selection)	<p><b>off / OFF</b> (RUN/STOP keys are activated and can be used for starting and stopping the motor)  <b>on / ON</b> (RUN/STOP keys are locked and therefore do not function)</p>									
77_		<b>Energy-saving function</b>										



## Parameters

### Explanation of the parameters

No.	FBG	Name	Description	
770		Energy-saving function	<b>off / OFF</b> on / ON	
8__		<b>Unit functions</b>		
80__		<b>Setup</b>		
800		Short menu (FBG11B only)	<b>long</b> <b>short</b> Use P800 to switch from the factory set short menu to the detailed parameter menu.	
801		Language DBG60B	Language selection only for DBG60B keypad.	

You can use P802 to reset the factory settings stored in the EEPROM for almost all parameters. You can also reset the unit to its initial delivery condition.

Selecting DELIVERY STATE also resets the parameters listed above.

Statistics data have to be reset separately with *P804 Reset statistics data*. 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. Save the set values using MOVITOOLS® MotionStudio before you restore the factory settings. 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	<b>No</b> (do not restore factory setting) Hrs / standard (restore factory setting) All / delivery status (for starting up IEC motors) NEMA / delivery status (for starting up NEMA motors)
-----	--	-----------------	--

By setting *P803 Parameter lock = ON*, you can prevent any change to the parameters. An exception are P841 Manual reset and P803 itself. The parameter lock makes sense after optimizing the settings of the MOVITRAC® B. To enable changes to parameters again, set *P803 Parameter lock = OFF*.

The parameter lock also affects parameter changes via the RS-485 and SBus interfaces.

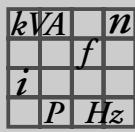
803		Parameter lock	<b>off / OFF</b> (you can change all parameters) on / ON (You can change P803 and P840 only)
-----	--	----------------	---

*P804 Reset statistic data* lets you reset the statistical data stored in the EEPROM (fault memory). These data are not affected when restoring the factory settings. The parameter automatically reverts to NO after the reset.

804		Reset statistical data	<b>No action</b> (no reset is performed) Fault memory (the content of the fault memory is reset)
805		Rated mains voltage	Setting range 50 ... 500 V
806		Copy DBG → MOVITRAC® B	<b>Yes / No</b> The parameter data in the DBG60B are transferred to MOVITRAC® B.
807		Copy MOVITRAC® B → DBG	<b>Yes / No</b> The parameter data in MOVITRAC® B are transferred to DBG60B.
808		24 V output voltage	<b>Off</b> On
809		IPOS enable	This parameter lets you activate the integrated positioning and sequence control

<i>kVA</i>	<i>n</i>
<i>i</i>	<i>f</i>
<i>P</i>	<i>Hz</i>

No.	FBG	Name	Description	
81_		<b>Serial communication.</b>		
810		RS-485 address	<p>Setting range <b>0 ... 99</b>            P810 sets the address of the MOVITRAC® B for communication via the serial interface.            MOVITRAC® B units are always set to the address 0 on delivery. To avoid problems during data exchange in serial communication with several inverters, SEW-EURODRIVE recommends that you do not use address 0.</p>	
811		RS-485 group address	Setting range <b>100 ... 199</b>	
812		RS-485 timeout interval	Setting range <b>0 ... 650 [s]</b>	
82_		<b>Brake operation 1 / 2</b>		
<p>P820/P821 lets you switch 4-quadrant operation on and off. 4-quadrant operation is possible if you connect a braking resistor to 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.</p> <p>If the regenerative power becomes too great despite the extended deceleration ramps, then MOVITRAC® B may switch off with the <i>F07 DC link overvoltage</i> fault. In this case you have to extend the deceleration ramps manually (P131).</p> <p>Therefore, do not set unreasonably short deceleration ramps!</p> <p>The unit responds with fault <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.</p>				
820 / 821		4-quadrant operation 1 / 2	off / OFF on / ON	
83_		<b>Fault responses</b>		
<p>The fault EXT. FAULT triggers ENABLED in inverter status only. P830 programs the fault response that is triggered by input terminal programmed to /EXT. FAULT.</p>				
830		Response terminal "external fault"	<p><b>2 / Immediate stop/fault</b>            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 fault output. A restart is only possible after a fault reset has been performed during which the inverter is reinitialized.</p>	
833		Response to RS-485 timeout	<p><b>4 / Rapid stop / fault</b> (factory setting for P830)            The inverter brakes the drive at the specified stop ramp (P136/P146). The inverter brakes with DC braking in 2-quadrant operation. Once the stop speed is reached, the inverter inhibits the output stage and the brake is applied. The fault is signaled immediately. The inverter revokes the ready signal and sets the programmed fault output. A restart is only possible after a fault reset has been performed during which the inverter is reinitialized.</p>	
836		Response to SBus timeout	<p><b>7 / Rapid stop / warning</b> (factory setting for 833 / 836)            The fault response corresponds to STOP/FAULT, except the inverter does not revoke the ready signal and the fault output is set.</p>	
84_		<b>Reset behavior</b>		
840		Manual reset Parameter P840 corresponds to the STOP/RESET key.	<p><b>Yes</b>            MOVITRAC® B resets the present fault. 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 fault present.</p> <p><b>No</b>            No reset.</p>	

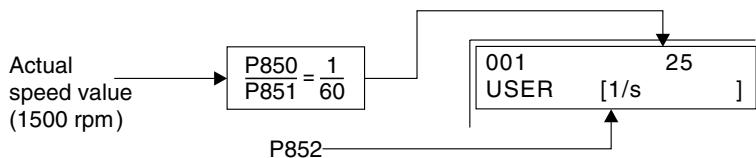


## Parameters

### Explanation of the parameters

No.	FBG	Name	Description
85_		<b>Scaling actual speed value</b>	

Scaling actual speed value defines a user-specific display parameter P001 User display. For example, the user display is to be shown in 1/s. Such a setting requires a scaling factor of 1/60. This means the numerator scaling factor has to be set to 1 and the denominator scaling factor to 60. The user-defined unit 1/s is entered in P852.



#### Scaling actual speed value (example)

850		Scaling factor numerator	Setting range 1 ... 65535
851	Long	Scaling factor denominator	Setting range 1 ... 65535
852		User travel unit	Factory setting: <b>rpm</b> Up to a maximum of eight ASCII characters; is displayed in P001 User display.
853	Long	Scaled speed FBG	0 / Speed 1 / Scaled speed
86_		<b>Modulation 1 / 2</b>	

P860/P861 lets you set the nominal cycle frequency at the inverter output. If P862/P863 is set to OFF, the cycle frequency may vary automatically depending on the unit utilization.

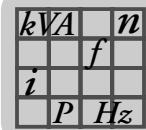
860 / 861	Long	PWM frequency 1 / 2	<b>4 kHz</b> 8 kHz 12 kHz 16 kHz
862 / 863	1 2	PWM fix 1 / 2	on / ON (no automatic change of the cycle frequency by the inverter) <b>off / OFF</b> (autonomous change of the switching frequency by the inverter depending on the utilization)
87_		<b>Process data parameter setting</b> (for more information, refer to the MOVITRAC® B Communication manual)	

Mit P870 ... P872 lets you define the content of process output data words PO1 ... PO3. This definition is necessary so MOVITRAC® B can allocate the appropriate setpoints.

The following process output assignments are available:

- |                                  |   |
|----------------------------------|---|
| 0 / No function:                 | The content of the process output data word is ignored. |
| 1 / Setpoint speed:              | Speed setpoint entry in rpm.                            |
| 5 / Max. speed:                  | Maximum speed (P302).                                   |
| 8 / Ramp:                        | Ramp time for setpoint selection (P130 / P131).         |
| 9 / Control word 1:              | Control signals for start/stop, etc.                    |
| 10 / Control word 2:             | Control signals for start/stop, etc.                    |
| 11 / Setpoint speed [%]:         | Selection of a speed setpoint in % of P302.             |
| 12 / IPOS PO data                | Specification of a 16-bit coded value for IPOSplus®     |
| 13 / PI controller setpoint [%]: | PI controller setpoint                                  |

870		Setpoint description PO1	Factory setting: Control word 1
871	Long	Setpoint description PO2	Factory setting: Speed
872		Setpoint description PO3	Factory setting: No function

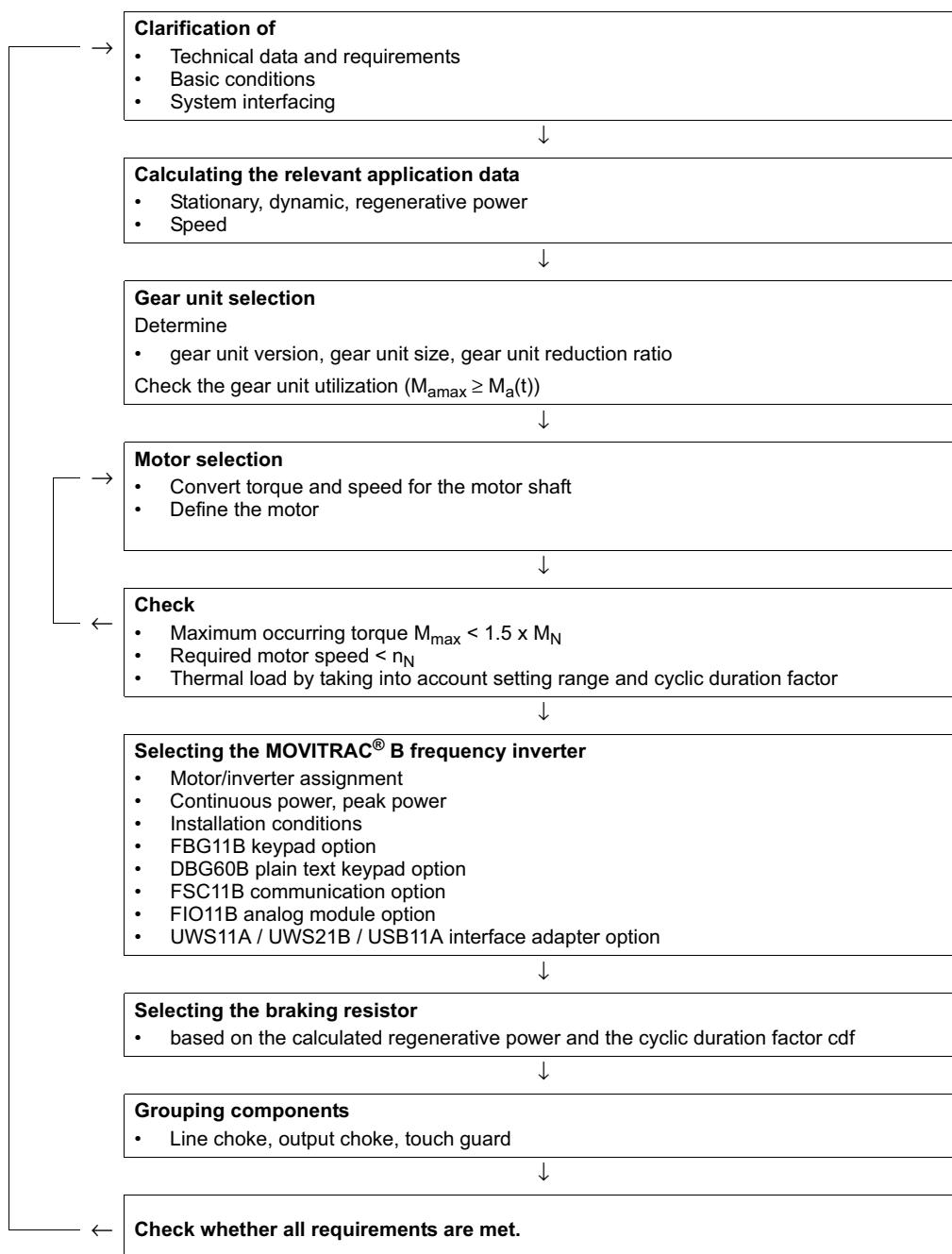


No.	FBG	Name	Description
P873 ... P875 can be used to determine the content of the process input data words PI1 ... PI3. This definition is necessary so MOVITRAC® B can allocate the appropriate actual values.			
The following PI assignments are available:			
0 / No function: The content of the process input data word is 0000 <sub>hex</sub> .			
1 / Actual speed: Momentary actual speed value in rpm.			
2 / Output current: Momentary active current of the inverter in % of I <sub>N</sub> .			
3 / Active current: Momentary output current of the inverter in % of I <sub>N</sub> .			
6 / Status word 1: Status information of the inverter.			
8 / Actual speed [%]: Momentary actual speed value in % of P302.			
9 / IPOS PI data: IPOS Process input data.			
10 / PI controller actual value [%]: Actual value of the PI controller.			
873	Long	Actual value description PI1	Factory setting: STATUS WORD 1
874		Actual value description PI2	Factory setting: SPEED
875		Actual value description PI3	Factory setting: OUTP.CURRENT
876	Long	PO data enable	<p>no / NO The last valid process output data remain in effect.</p> <p>yes / YES The process output data that was last sent from the fieldbus control become effective.</p>
88_		<b>Serial communication SBus</b>	
880	Long	SBus protocol	<p>Setting range SBus</p> <p><b>0 / MoviLink</b></p> <p>1 / CANopen</p>
881	Short	SBus address	<p>Setting range <b>0</b> ... 63</p> <p>P881 lets you set the system address of the MOVITRAC® B unit. This address enables the MOVITRAC® B to communicate, for example, with PC, PLC or MOVIDRIVE® via the system bus.</p> <p>MOVITRAC® B units are always set to the address 0 on delivery. To avoid problems during data exchange in serial communication with several inverters, SEW-EURODRIVE recommends that you do not use address 0.</p>
882		SBus group address	<p>Setting range <b>0</b> ... 63</p> <p>P882 lets you group several MOVITRAC® B units for communication via the SBUS interface. All MOVITRAC® B units with the same SBUS group address can be addressed using a multicast telegram via this address. MOVITRAC® B does not acknowledge data received via group address. For example, the SBUS group address makes it possible to send setpoint selections to a group of MOVITRAC® B inverters at the same time. An inverter with group address 0 is not assigned to a group.</p>
883	Long	SBus timeout interval	<p>Setting range <b>0</b> ... 650 [s]</p> <p>Use P883 to set the monitoring time for data transmission via the system bus. MOVITRAC® B performs the fault response Stop/fault if there is no data traffic via the system bus for the period set in P815. Data transmission via the system bus is not monitored when P883 is set to 0.</p>
884	Long	SBus baud rate	<p>Use P816 to set the transmission speed of the system bus.</p> <p>125 / 125 kBaud</p> <p>250 / 250 kBaud</p> <p><b>500 / 500 kBaud</b></p> <p>1000 / 1000 kBaud</p>
886	Long	CANopen address	<p>Setting range <b>1</b> ... <b>2</b> ... 127</p> <p>P886 is used to set the address for serial communication with the SBUS.</p>



## 6 Project Planning

### 6.1 Schematic procedure





## 6.2 Options for standard applications

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

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

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

1) Additional components are required to reach limit value class C1.



#### 6.3 Description of applications

##### 6.3.1 Project planning for trolleys

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

##### 6.3.2 Project planning for hoists

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

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

**Caution!**

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

*Thermal considerations*

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

*Starting torque*

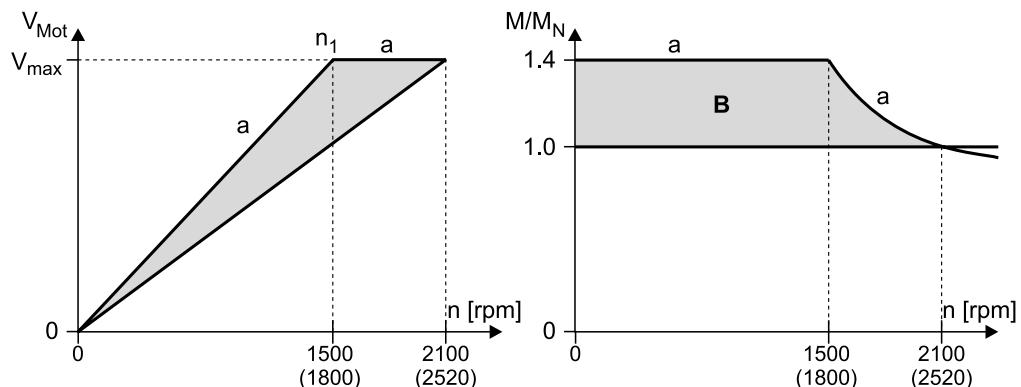
The highest operating torque is required for acceleration with maximum load in the **upwards** hoisting direction.

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

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

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

**Hoist voltage/speed characteristic curve**



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

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

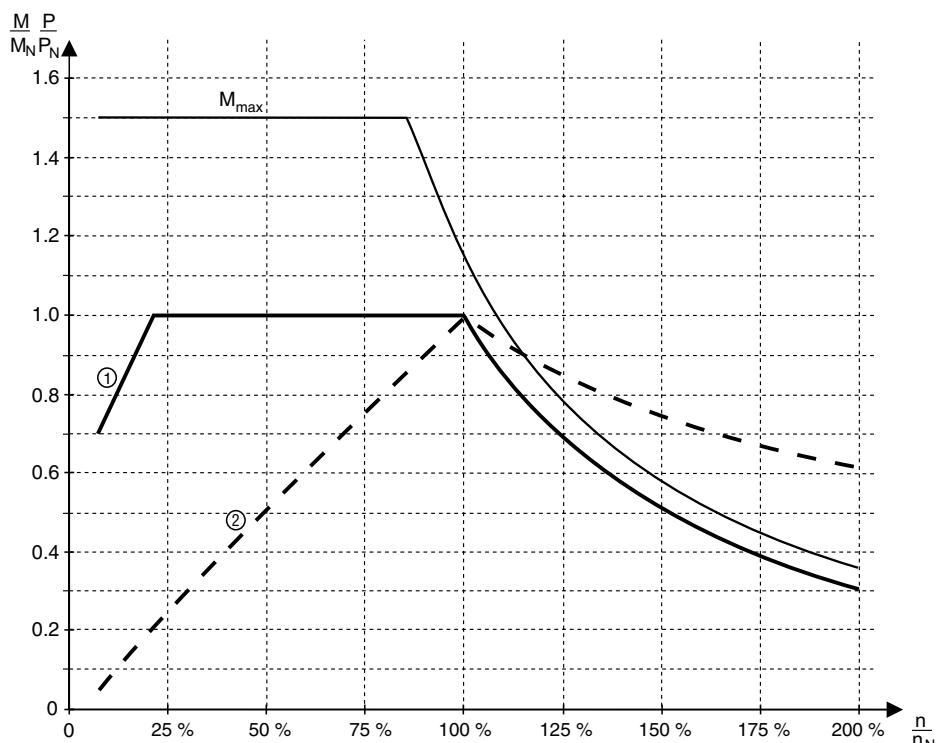


- S1 (100 % cdf): Select the motor power of the next higher motor type than the selected inverter power, e.g. for lengthy upwards travel or continuous elevators.
- S3 (40 % cdf): Select the motor power according to the selected inverter power.

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

## 6.4 Speed-torque characteristic curve

The speed-torque characteristic curve looks as follows:



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

### To characteristic curve 1:

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

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



#### 6.5 Motor selection

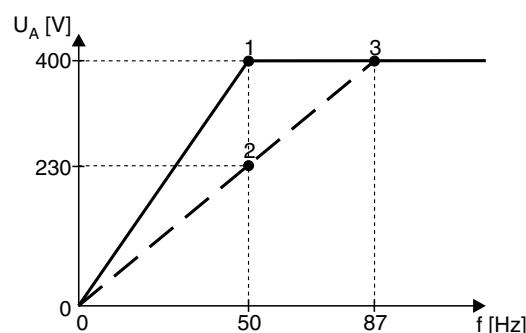
##### 6.5.1 Basic recommendations

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

##### 6.5.2 Voltage-frequency characteristic curve

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

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



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

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

##### 6.5.3 Dynamic applications

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

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

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

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



#### 6.5.4 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	Rated power $P_N$	SEW motor	
		3000	1500
		3600	1800
MC07B0003-...-4-00	0.25 kW (0.34 HP)	DFR63M2	DFR63L4
MC07B0004-...-4-00	0.37 kW (0.50 HP)	DFR63L2	DT71D4
MC07B0005-...-4-00	0.55 kW (0.74 HP)	DT71D2	DT80K4
MC07B0008-...-4-00	0.75 kW (1.0 HP)	DT80K2	DT80N4
MC07B0011-...-4-00	1.1 kW (1.5 HP)	DT80N2	DT90S4
MC07B0015-...-4-00	1.5 kW (2.0 HP)	DT90S2	DT90L4
MC07B0022-...-4-00	2.2 kW (3.0 HP)	DT90L2	DV100M4
MC07B0030-...-4-00	3.0 kW (4.0 HP)	DV100M2	DV100L4
MC07B0040-...-4-00	4.0 kW (5.4 HP)	DV112M2	DV112M4
MC07B0055-...-4-00	5.5 kW (7.4 HP)	DV132S2	DV132S4
MC07B0075-...-4-00	7.5 kW (10 HP)	DV132M2	DV132M4
MC07B0110-...-4-00	11 kW (15 HP)	DV160M2	DV160M4
MC07B0150-...-4-00	15 kW (20 HP)	DV160L2	DV160L4
MC07B0220-...-4-00	22 kW (30 HP)	DV180L2	DV180L4
MC07B0300-...-4-00	30 kW (40 HP)	–	DV200L4
MC07B0370-...-4-00	37 kW (50 HP)	–	DV225S4
MC07B0450-...-4-00	45 kW (60 HP)	–	DV225M4
MC07B0550-...-4-00	55 kW (74 HP)	–	DV250M4
MC07B0750-...-4-00	75 kW (100 HP)	–	DV280S4



#### 6.6 Overload capacity

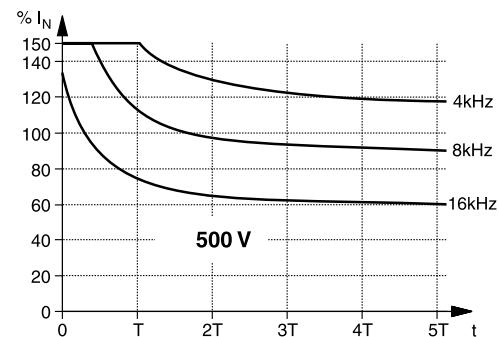
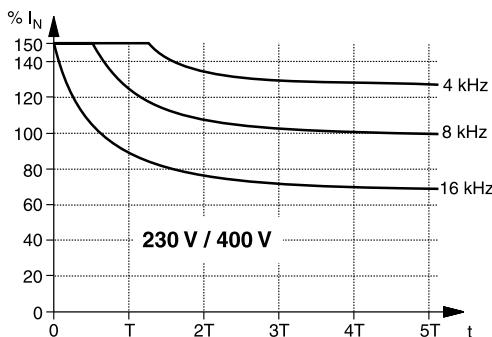
MOVITRAC® B frequency inverters permanently calculate the load on the inverter output stage (unit utilization). They can output the maximum possible power in every operating status.

The permitted continuous output current depends on:

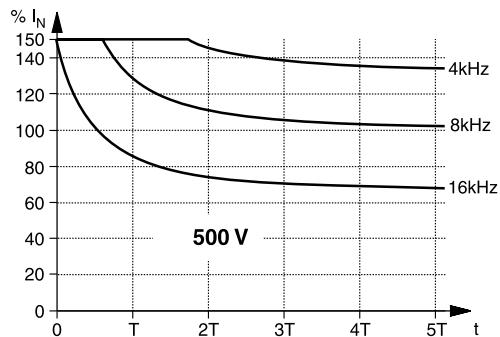
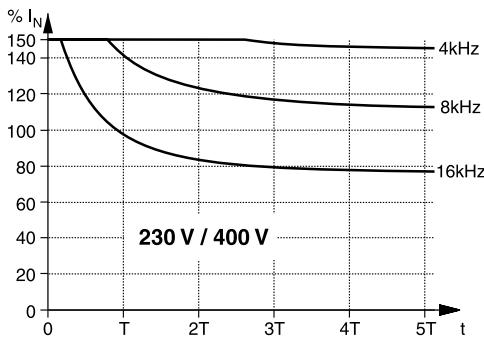
- Ambient temperature
- Heat sink temperature
- Mains voltage
- PWM frequency

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 responds to a higher than permitted load by issuing the "F44 Unit utilization" error message and an immediate switch-off.

#### Overload capacity at 40 °C (104 °F)



#### Overload capacity at 25 °C (77 °F)



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



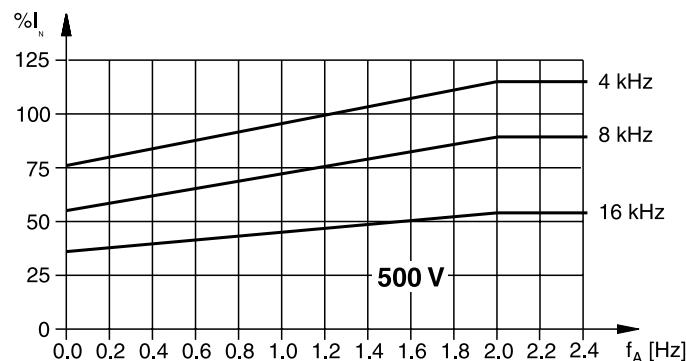
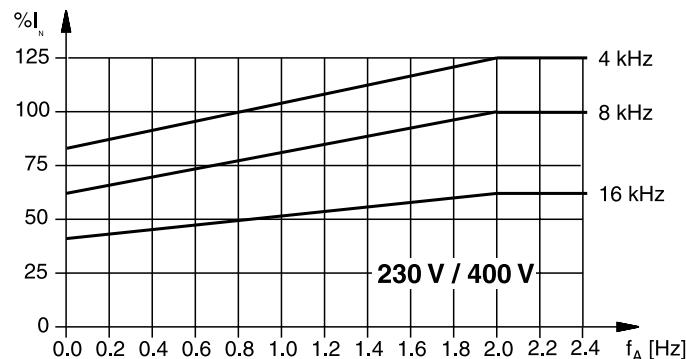
## 6.7 Load capacity of the units at low output frequencies

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.

	<b>NOTE</b> The output frequency of the inverter is comprised of the rotational frequency (speed) and the slip frequency.
--	--

Guaranteed continuous currents depending on the output frequency:





## 6.8 Selecting the braking resistor

 <b>HAZARD!</b>
<p>The supply cables to the braking resistor carry a <b>high DC voltage (ca. DC 900 V)</b>. Severe or fatal injuries from electric shock.</p> <ul style="list-style-type: none"> <li>• The braking resistor cables must be suitable for this high DC voltage.</li> <li>• Install the braking resistor cables according to the regulations.</li> </ul>

 <b>WARNING!</b>
<p>The surfaces of the braking resistors get very hot when the braking resistors are loaded with <math>P_{\text{rated}}</math>.</p> <p>Risk of burns and fire.</p> <ul style="list-style-type: none"> <li>• Choose a suitable installation location. Braking resistors are usually mounted on top of the control cabinet.</li> <li>• Do not touch the braking resistors.</li> </ul>

	<b>NOTES</b> <ul style="list-style-type: none"> <li>• The data applies to BW..., BW...-T and BW...-P braking resistors.</li> <li>• For BW..., BW...-T and BW...-P braking resistors, plan for a load derating of 4% per 10 K from an ambient temperature of 45 °C (113 °F). Do not exceed the maximum ambient temperature of 80 °C (176 °F).</li> <li>• The overload factor of the BW..-T and BW...-P braking resistors is limited by using an integrated temperature relay:           <ul style="list-style-type: none"> <li>– BW...-T up to overload factor 12</li> <li>– BW...-P up to overload factor 40</li> </ul> </li> <li>• The <b>maximum permitted line length</b> between MOVITRAC® and braking resistor is <b>100 m (328 ft)</b>.</li> </ul>
--	--

### • Parallel connection

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

### • Peak braking power

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

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

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

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

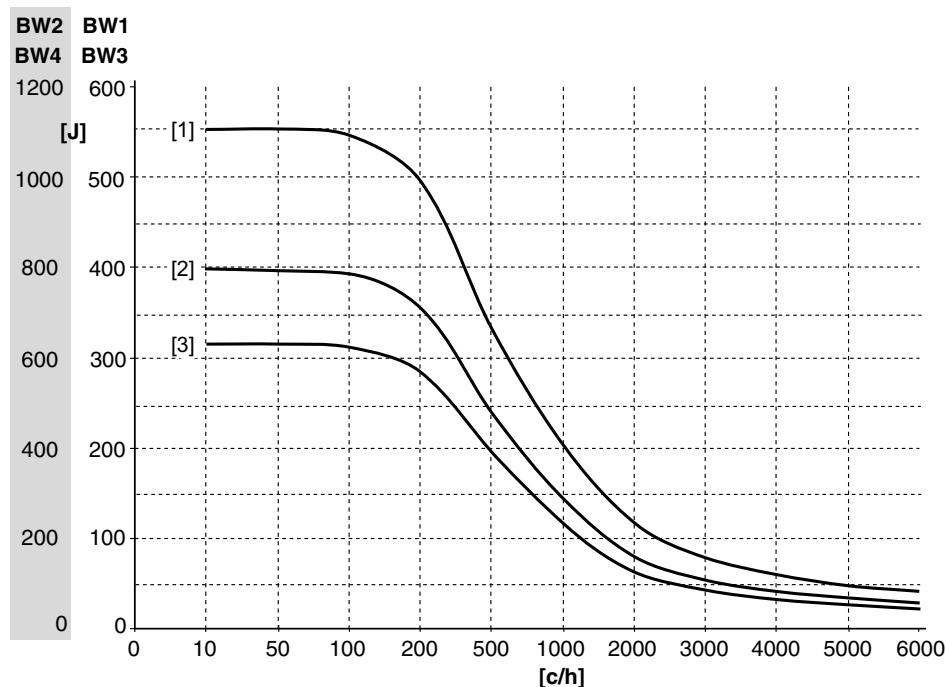


The following table lists the peak braking power levels that are possible for the different resistance values.

Resistance [Ω]	Peak braking 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

### 6.8.1 Load capacity of PTC braking resistors

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



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



#### *Calculation example*

Given:

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

Approach:

Calculating energy from the power of the brake ramp:

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

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

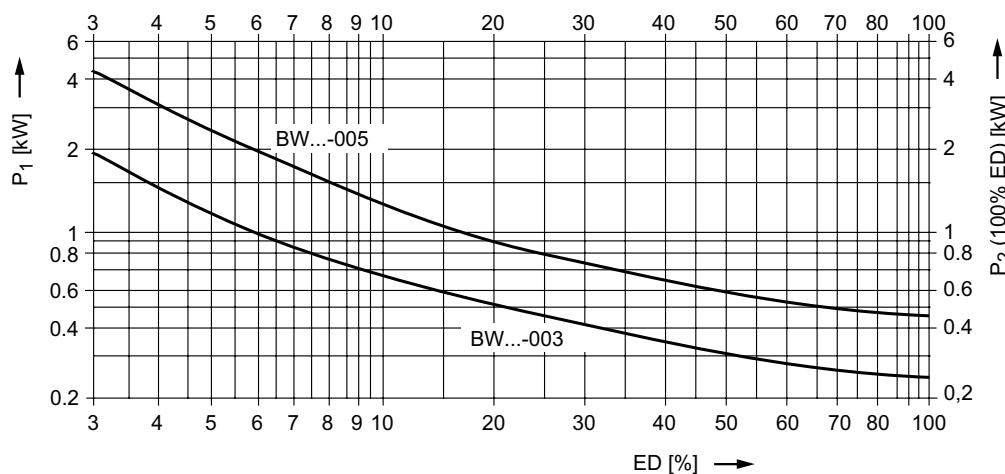
The diagram allows a power of 580 J with a 0.2 s brake ramp at 200 cycles per hour. In this case, the required 500 J can be dissipated with BW2/BW 4.

#### **6.8.2 Load capacity flat design, wire resistors, grid resistors**

In braking operations within the cycle duration  $T_D$  (standard:  $T_D \leq 120 \text{ s}$ ), the cdf braking power can be used to determine the resulting continuous resistor dissipation (100 % cdf power) by means of the power diagrams. The right-hand y axis shows 100 % cdf power. Observe the conditional peak braking power due to the DC link voltage when determining the load capacity.

#### *Flat-design power diagram*

Power diagram for flat-design braking resistors:



$P_1$  = Short-term power

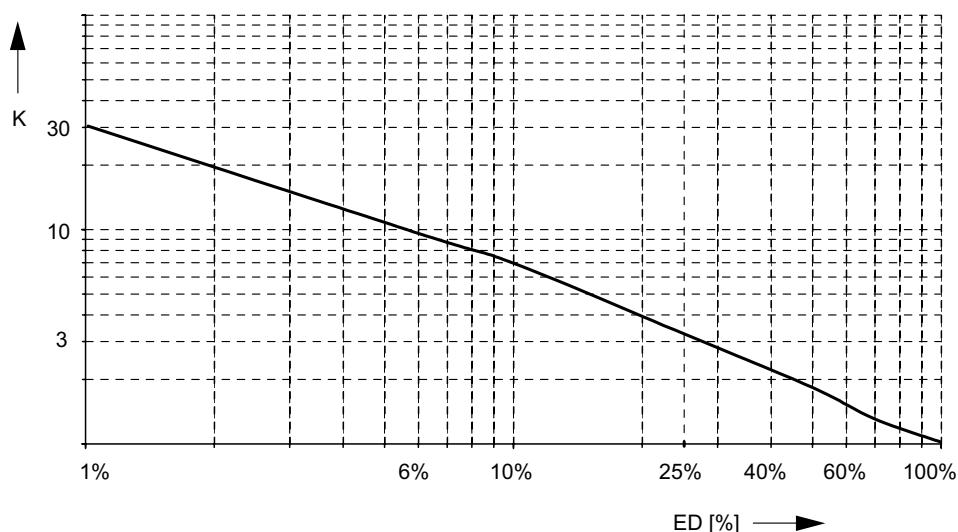
$P_2$  = Continuous power

cdf = cyclic duration factor of the braking resistor



*Overload factor for  
wire resistors*

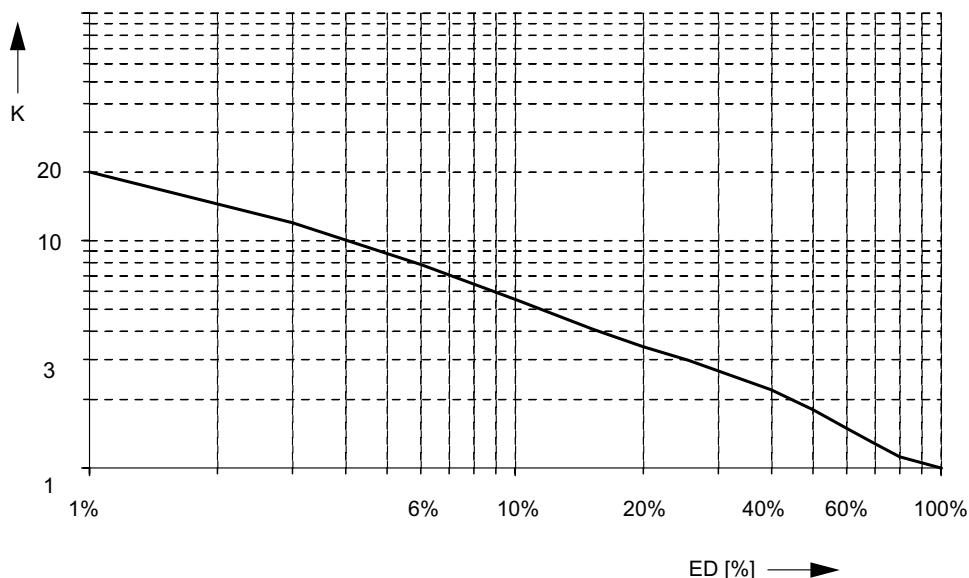
Overload factor dependent on the cycle duration factor for wire resistors:



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

*Overload factor for  
grid resistors*

Overload factor depending on cycle duration factor for grid resistors:



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



#### *Calculation example*

Given:

- Peak braking power 13 kW
- Average braking power 6.5 kW
- Cyclic duration factor cdf 6 %

Required:

- BW.. braking resistor

#### *Procedure*

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

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

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

- Results:

100 % cdf power for wire resistors: 685 W.

100 % cdf power for grid resistors: 856 W.

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

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

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

## 6.9 Connecting AC brakemotors

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

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

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



### 6.9.1 Brake rectifier

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

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

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

- All hoist applications

### 6.9.2 Activating the brake

Always activate the brake via binary output DO02 "/Brake": do not use the PLC.

The binary output DO02 "/Brake" is configured as an output for operating a relay with free-wheeling diode and a control voltage of DC +24 V / max. 150 mA / 3.6 W. A power contactor can be controlled directly with a DC 24 V coil voltage or the BMK brake rectifier. This power contactor is used to switch the brake.

The startup function in the FBG11B keypad and in the MotionStudio software sets the brake parameters for the 2-pole and 4-pole motors from SEW-EURODRIVE. The brake parameters (P73\_) must be set manually in the case of SEW-EURODRIVE motors with a higher number of poles and non-SEW motors.

### 6.9.3 Brake parameters

	<b>NOTE</b>
	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.

## 6.10 Mains and motor connection

### 6.10.1 Permitted voltage supply systems

	<b>NOTE</b>
	<ul style="list-style-type: none"> <li>• <b>Voltage supply systems with grounded star point</b> MOVITRAC® B is intended for operation on TN and TT systems with directly grounded star point.</li> <li>• <b>Voltage supply systems with non-grounded star point</b> Operation on mains systems with a non-grounded star point (for example IT power systems) is also permitted. SEW recommends using an earth-leakage monitor for this according to the PCM (pulse code measuring) principle. Using such devices prevents the earth-leakage monitor from mis-tripping due to the ground capacitance of the inverter.</li> <li>• <b>External conductor grounded voltage supply systems</b> Operate the inverters on supply systems with a maximum phase-to-earth voltage of AC 300 V only.</li> </ul>



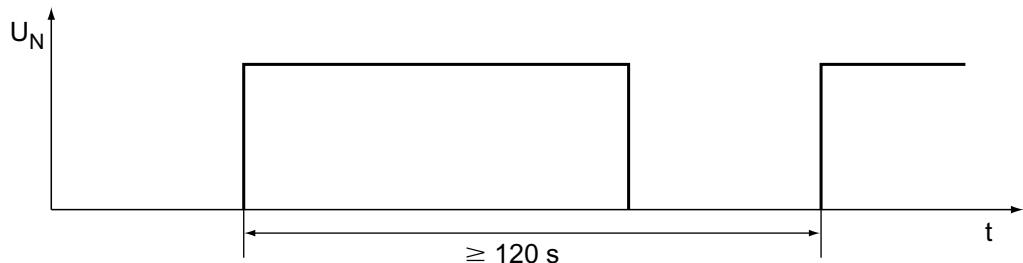
#### 6.10.2 Mains contactors and input fuses

##### *Input contactor*

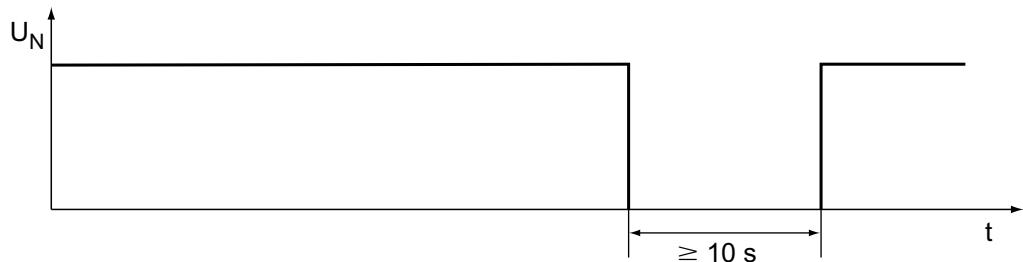
- Only use input contactors of utilization category AC-3 (EN 60947-4-1).

##### **Mains activations**

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



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



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

##### *Input fuses*

##### **Fusing types:**

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



### 6.10.3 Line protection and core cross section

Comply with the regulations of the specific country and for the specific machine regarding fusing and selecting. If required, also adhere to the notes on **UL compliant installation**.

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

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

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

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

Cable cross section [mm <sup>2</sup> ]	Smallest bending space [mm]		
	1	2	3
10 ... 16	40	-	-
25	50	-	-
35	65	-	-
50	125	125	180
70	150	150	190
95	180	180	205
120	205	205	230
150	255	255	280
185	305	305	330

#### *Recommendation for standard installation, metric*

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

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



## Project Planning

### Mains and motor connection

<b>MOVITRAC® B 3 × 230 V</b>	<b>0037</b>	<b>0055</b>	<b>0075</b>	<b>0110</b>	<b>0150</b>	<b>0220</b>	<b>0300</b>
<b>Fuses F11/F12/F13 I<sub>N</sub></b>	25 A	25 A	35 A	50 A	63 A	80 A	100 A
<b>Supply system cable L1/L2/L3</b>	4 mm <sup>2</sup>	4 mm <sup>2</sup>	6 mm <sup>2</sup>	10 mm <sup>2</sup>	16 mm <sup>2</sup>	25 mm <sup>2</sup>	35 mm <sup>2</sup>
<b>PE conductor</b>	2 × 4 mm <sup>2</sup> 1 × 10 mm <sup>2</sup>	2 × 4 mm <sup>2</sup> 1 × 10 mm <sup>2</sup>	2 × 6 mm <sup>2</sup> 1 × 10 mm <sup>2</sup>	1 × 10 mm <sup>2</sup>	1 × 16 mm <sup>2</sup>	1 × 16 mm <sup>2</sup>	1 × 16 mm <sup>2</sup>
<b>Motor cable U/V/W</b>	4 mm <sup>2</sup>	4 mm <sup>2</sup>	6 mm <sup>2</sup>	10 mm <sup>2</sup>	16 mm <sup>2</sup>	25 mm <sup>2</sup>	35 mm <sup>2</sup>
<b>Unit terminal cross section of the power section</b>	Separable terminal strip 4 mm <sup>2</sup> conductor end sleeve DIN 46228	M4 screw and washer assembly with terminal clip 4 mm <sup>2</sup> conductor end sleeve DIN 46228 6 mm <sup>2</sup> crimp cable lug DIN 46234	M6 screw and washer assembly with washer max. 25 mm <sup>2</sup> Crimp cable lug DIN 46234		M10 bolt with nut max. 70 mm <sup>2</sup> Press cable lug DIN 46235		

<b>MOVITRAC® B 400 / 500 V</b>	<b>0003</b>	<b>0004</b>	<b>0005</b>	<b>0008</b>	<b>0011</b>	<b>0015</b>	<b>0022</b>	<b>0030</b>	<b>0040</b>	<b>0055</b>	<b>0075</b>			
3-phase	Line protection	10 A				16 A				16 A	16 A			
	Supply system lead	1.5 mm <sup>2</sup>						1.5 mm <sup>2</sup>		1.5 mm <sup>2</sup>				
	PE conductor	2 × 1.5 mm <sup>2</sup>			2 × 1.5 mm <sup>2</sup> 1 × 10 mm <sup>2</sup>			2 × 1.5 mm <sup>2</sup> 1 × 10 mm <sup>2</sup>	2 × 1.5 mm <sup>2</sup> 1 × 10 mm <sup>2</sup>					
Motor lead		1.5 mm <sup>2</sup>						1.5 mm <sup>2</sup>		2.5 mm <sup>2</sup>				
Unit terminal cross section of the power section		Disconnectable terminal strip 4 mm <sup>2</sup> conductor end sleeve DIN 46228						M4 screw and washer assembly with terminal clip 4 mm <sup>2</sup> conductor end sleeve DIN 46228		M4 screw and washer assembly with washer max. 25 mm <sup>2</sup> Crimp cable lug DIN 46234				

<b>MOVITRAC® B 400 / 500 V</b>	<b>0110</b>			<b>0150</b>	<b>0220</b>	<b>0300</b>
3-phase	Line protection	25 A			35 A	50 A
	Supply system lead	4 mm <sup>2</sup>			6 mm <sup>2</sup>	10 mm <sup>2</sup>
	PE conductor	2 × 4 mm <sup>2</sup> 1 × 10 mm <sup>2</sup>			2 × 6 mm <sup>2</sup> 1 × 10 mm <sup>2</sup>	1 × 10 mm <sup>2</sup>
Motor lead		4 mm <sup>2</sup>			6 mm <sup>2</sup>	10 mm <sup>2</sup>
Unit terminal cross section of the power section		M4 screw and washer assembly with terminal clip 4 mm <sup>2</sup> conductor end sleeve DIN 46228 6 mm <sup>2</sup> crimp cable lug DIN 46234			M6 screw and washer assembly with washer max. 25 mm <sup>2</sup> Crimp cable lug DIN 46234	

<b>MOVITRAC® B 400 / 500 V</b>	<b>0370</b>	<b>0450</b>	<b>0550</b>	<b>0750</b>
3-phase	Line protection	80 A	100 A	100 A
	Supply system lead	25 mm <sup>2</sup>	35 mm <sup>2</sup>	35 mm <sup>2</sup>
	PE conductor	1 × 16 mm <sup>2</sup>		
Motor lead		25 mm <sup>2</sup>	35 mm <sup>2</sup>	35 mm <sup>2</sup>
Unit terminal cross section of the power section		Bolt M10 with nut max. 70 mm <sup>2</sup> crimp cable connector DIN 36235		



Recommendation for standard installation, USA NEC

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

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

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

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

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

<b>MOVITRAC® B 400 / 500 V</b>		<b>0055</b>	<b>0075</b>	<b>0110</b>	<b>0150</b>	<b>0220</b>	<b>0300</b>
<b>Size</b>		2			3		
<b>Fuses F11/F12/F13 I<sub>N</sub></b>		20 A			30 A		
<b>Supply system cable L1/L2/L3</b>		AWG12			AWG10		
<b>PE conductor</b>		AWG12			AWG10		
<b>Motor cable U/V/W</b>		AWG12			AWG10		
<b>Unit terminal cross section of the power section</b>		M4 screw and washer assembly with terminal clip AWG10 conductor end sleeve AWG10 crimp cable lug			M6 screw and washer assembly with washer max. AWG4 crimp cable lug		



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

#### 6.10.4 Motor cable length

The maximum motor cable length depends on:

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

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

MOVITRAC® B		Permitted maximum motor cable length in m (ft)			
Size	Voltage V <sub>mains</sub>	0XS / 0S / 0L		2S 0055	2S 0075 / 2 / 3 / 4 / 5
		3 AC 400 V 3 AC 230 V 1 AC 230 V	3 AC 500 V 3 AC 400 V (125 % I <sub>N</sub> )	3 AC 230 V 3 AC 400/500 V	
Shielded cable	4 kHz <sup>1)</sup>	100 (328)	50 (160)	300 (984)	400 (1310)
	8 kHz	70 (230)	35 (110)	250 (820)	300 (984)
	12 kHz	50 (160)	25 (82)	200 (656)	250 (820)
	16 kHz	40 (130)	25 (82)	150 (492)	200 (656)
Unshielded cable	4 kHz <sup>1)</sup>	200 (656)	100 (328)	900 (2950)	1200 (3937)
	8 kHz	140 (459)	70 (230)	750 (2460)	900 (2950)
	12 kHz	100 (328)	50 (160)	600 (1970)	750 (2460)
	16 kHz	80 (2640)	50 (160)	450 (1480)	600 (1970)

1) Standard setting

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



### 6.10.5 Voltage drop

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

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

Cable cross section	Load with I [A] =															
	4	6	8	10	13	16	20	25	30	40	50	63	80	100	125	150
<b>Copper</b>	Voltage drop $\Delta U$ [V] with length = 100 m (328 ft) and $\vartheta = 70^\circ\text{C}$ ( $158^\circ\text{F}$ )															
1.5 mm <sup>2</sup>	5.3	8	10.6	13.3	17.3	21.3	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)
2.5 mm <sup>2</sup>	3.2	4.8	6.4	8.1	10.4	12.8	16	1)	1)	1)	1)	1)	1)	1)	1)	1)
4 mm <sup>2</sup>	1.9	2.8	3.8	4.7	6.5	8.0	10	12.5	1)	1)	1)	1)	1)	1)	1)	1)
6 mm <sup>2</sup>					4.4	5.3	6.4	8.3	9.9	1)	1)	1)	1)	1)	1)	1)
10 mm <sup>2</sup>						3.2	4.0	5.0	6.0	8.2	10.2	1)	1)	1)	1)	1)
16 mm <sup>2</sup>								3.3	3.9	5.2	6.5	7.9	10.0	1)	1)	1)
25 mm <sup>2</sup>									2.5	3.3	4.1	5.1	6.4	8.0	1)	1)
35 mm <sup>2</sup>										2.9	3.6	4.6	5.7	7.2	8.6	
50 mm <sup>2</sup>													4.0	5.0	6.0	

1) Loading 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
<b>Copper</b>	Voltage drop $\Delta U$ [V] with length = 100 m (328 ft) and $\vartheta = 70^\circ\text{C}$ ( $158^\circ\text{F}$ )															
<b>AWG16</b>	7.0	10.5	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)
<b>AWG14</b>	4.2	6.3	8.4	10.5	13.6	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)
<b>AWG12</b>	2.6	3.9	5.2	6.4	8.4	10.3	12.9	1)	1)	1)	1)	1)	1)	1)	1)	1)
<b>AWG10</b>					5.6	6.9	8.7	10.8	13.0	1)	1)	1)	1)	1)	1)	1)
<b>AWG8</b>						4.5	5.6	7.0	8.4	11.2	1)	1)	1)	1)	1)	1)
<b>AWG6</b>								4.3	5.1	6.9	8.6	10.8	13.7	1)	1)	1)
<b>AWG4</b>									3.2	4.3	5.4	6.8	8.7	10.8	13.5	1)
<b>AWG3</b>									2.6	3.4	4.3	5.1	6.9	8.6	10.7	12.8
<b>AWG2</b>											3.4	4.2	5.4	6.8	8.5	10.2
<b>AWG1</b>												3.4	4.3	5.4	6.8	8.1
<b>AWG1/0</b>												2.6	3.4	4.3	5.4	6.8
<b>AWG2/0</b>													2.7	3.4	4.3	5.1

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



## 6.11 Multi-motor drive/group drive

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

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

### 6.11.1 Motor currents

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

### 6.11.2 Motor cable

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

$$I_{\text{total}} = \frac{I_{\text{max}}}{n}$$

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

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

n = Number of motors connected in parallel

### 6.11.3 Motor size

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

### 6.11.4 Output filter

For groups with more than 3 ... 4 motors, SEW-EURODRIVE recommends to use an HF output filter. An output filter HF... is required if the maximum motor cable length ( $I_{\text{max}}$ ) given in the table is exceeded. This may be the case in large groups (n) or when there are long motor cable lengths connected in parallel ( $I_{\text{tot}}$ ). In this case, it is the voltage drop on the motor cable that limits the maximum motor cable length, not the limit value in the table. The total of the rated motor currents must not exceed the rated through-current of the output filter.



## 6.12 Line chokes

### 6.12.1 1-phase

Use is required under the following circumstances:

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

Use is optional in the following instances:

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

### 6.12.2 3-phase

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

Use is optional for supporting overvoltage protection.

## 6.13 Electromagnetic compatibility EMC

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

Following the relationship between new and old limit classes:

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



### 6.13.1 Interference immunity

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

### 6.13.2 Interference emission

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

#### Limit value class

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

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

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

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

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

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

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



### 6.13.3 Connection

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

### 6.13.4 IT systems

	<b>NOTES</b>
	<ul style="list-style-type: none"><li>• No EMC limits are specified for interference emission in voltage supply systems without an NF earthed star point (IT systems). The efficiency of line filters is severely limited.</li><li>• In size 0, you can deactivate the suppression capacitors. See the section "Installation / Installation for IT systems".</li><li>• It is important that you deactivate the suppression capacitors when using earth-leakage monitors with pulse code measurement.</li></ul>

### 6.13.5 Inverter-caused leakage currents

Earth-leakage currents  $\geq 3.5$  mA may occur during normal operation.

Earth leakage currents are determined mainly by:

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

#### Reducing earth-leakage currents (size 0 only)

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

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

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



## 6.14 HF output filters

### 6.14.1 Important notes

Observe the following instructions when using output filters:

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

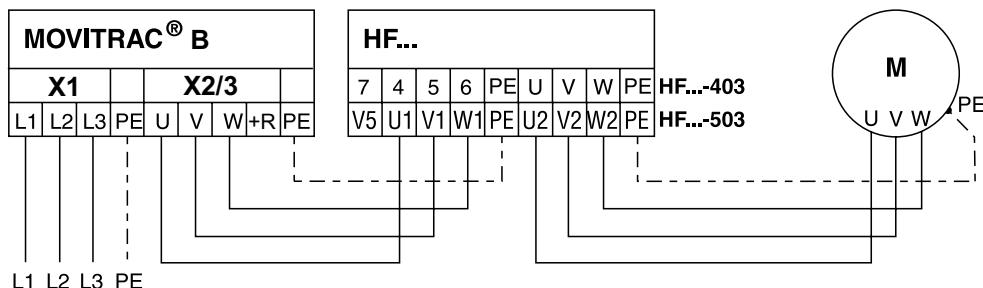
### 6.14.2 Installation, connection and operation

	NOTES
	<ul style="list-style-type: none"> <li>• Install output filters next to the corresponding inverter. Leave a ventilation space of at least 100 mm (3.94 in) below and above the output filter. No clearance is required on the sides.</li> <li>• Limit the connection cable between inverter and output filter to the absolutely necessary length. Maximum 1 m (3 ft) with unshielded cable, 10 m (33 ft) with shielded cable.</li> <li>• An unshielded motor line is sufficient when using an output filter. Note the following instructions when you use an <b>output filter</b> together with a <b>shielded motor cable</b>: <ul style="list-style-type: none"> <li>– The maximum permitted length of the motor cable for operation without <math>V_{DC}</math> link connection is 20 m (66 ft).</li> <li>– Operation with <math>V_{DC}</math> link connection is required if the motor cable is longer than 20 m (66 ft).</li> <li>– Observe the notes "Operation with <math>V_{DC}</math> link connection" on the next page.</li> </ul> </li> <li>• 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 % <math>I_N</math> (= rated output current) or 125 % <math>I_N</math> (= continuous output current).</li> <li>• Several motors can be connected together to one output filter when operating a motor group from one inverter. The total value of the rated motor currents must not exceed the rated throughput current of the output filter.</li> <li>• It is possible to connect two output filters of the same type to one inverter output to increase the rated through current. To do this, connect all like connections to the output filters in parallel.</li> <li>• Considerable noise (magnetostriction) may occur in the output filter especially if operating with <math>f_{PWM} = 4</math> kHz. In environments susceptible to noise, SEW-EURODRIVE recommends operation with <math>f_{PWM} = 12</math> kHz (or 16 kHz) and <math>V_{DC}</math> link connection. Observe the notes regarding <math>V_{DC}</math> link connection.</li> <li>• When the inverter is operated with <math>f_{PWM} = 4</math> or 8 kHz, the output filter connection V5 (with HF...-503) or 7 (with HF...-403) must <b>not</b> be connected (no <math>V_{DC}</math> link connection).</li> <li>• Do not make a <math>V_{DClink}</math> connection when using size 0XS units.</li> </ul>

### 6.14.3 U<sub>Z</sub> link

#### Operation without V<sub>DC</sub> link connection:

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



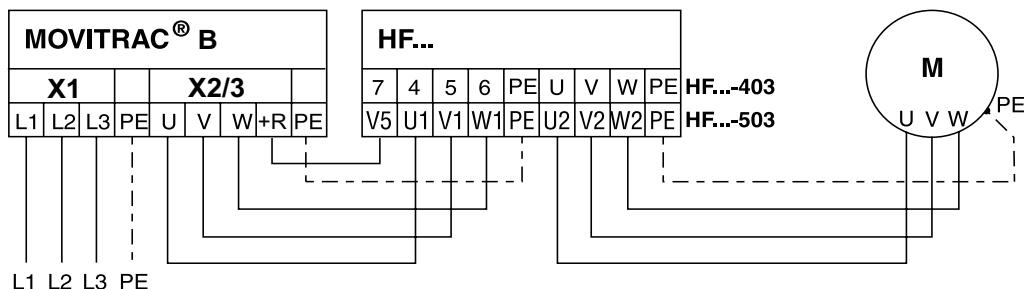
#### Operation with V<sub>DClink</sub> connection:

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

NOTES	
<ul style="list-style-type: none"> <li>Optimized grounded filter effect.</li> <li>Improved filter effect in the low-frequency range (<math>\leq 150</math> kHz).</li> <li>Approved only for PWM frequency 12 kHz or 16 kHz. Note that increased losses (= power reduction) occur in the inverter when operating with 12 kHz or 16 kHz.</li> <li>Set PMW fix = on; the inverter must not be able to reduce the PWM frequency automatically</li> <li>Strictly observe the following for HF...-403: V<sub>DC</sub> link connection only permitted if V<sub>mains</sub> <math>\leq</math> AC 400 V, not with V<sub>mains</sub> = AC 500 V.</li> <li>The V<sub>DClink</sub> 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.</li> </ul>	

f <sub>PWM</sub>	U <sub>mains</sub> = 3 x AC 230 V	U <sub>mains</sub> = 3 x AC 400 V	U <sub>mains</sub> = 3 x AC 500 V
12 kHz	4 %	12 %	15 %
16 kHz	3 %	8 %	12 %

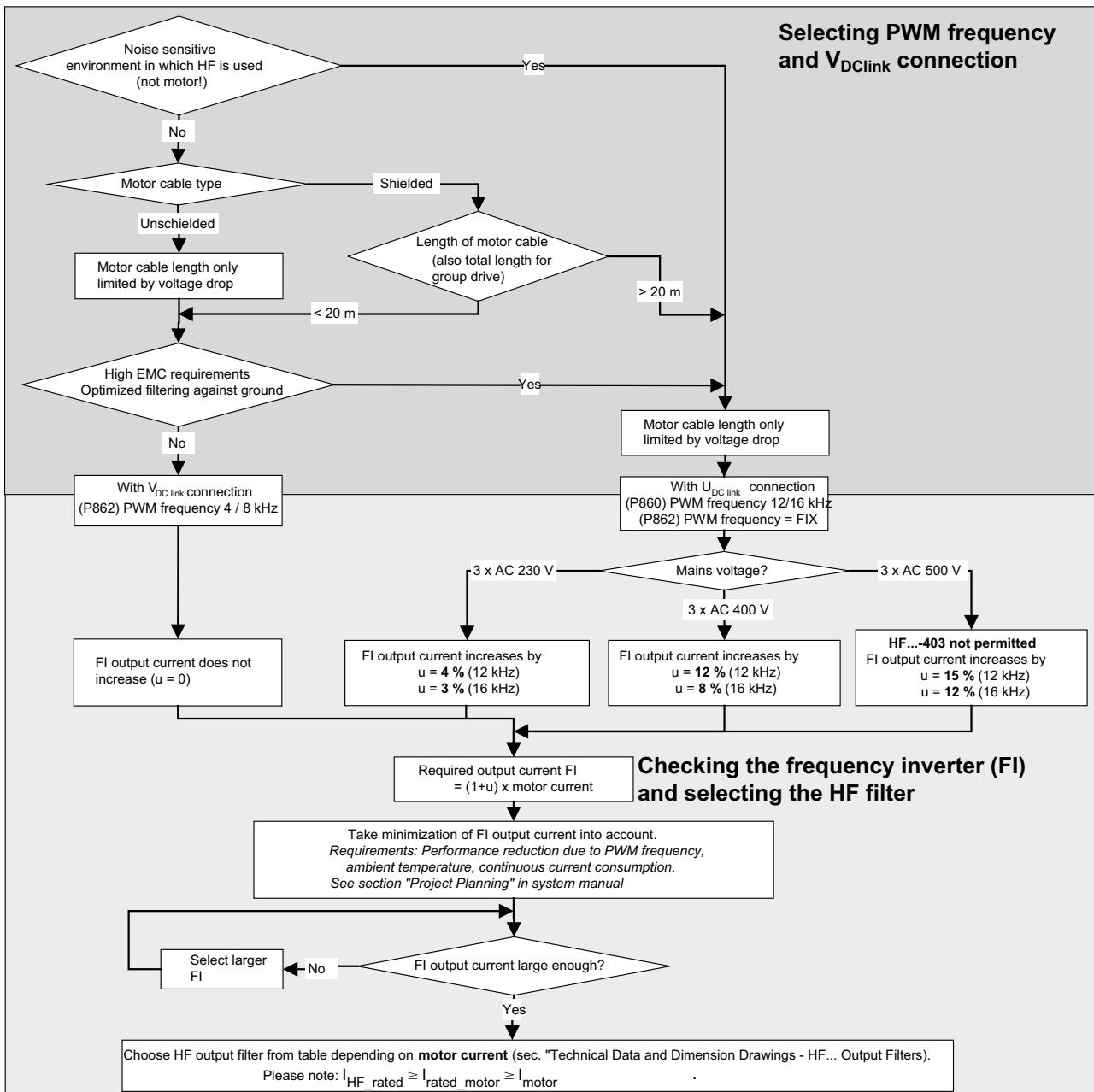
The increased power requirement causes an additional load on the inverter. Take this aspect into account during project planning of the drive. Failure to comply with this aspect may cause the inverter to shut down due to overload.



NOTE	
	No V <sub>DClink</sub> connection is possible with size 0XS units.



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





## 6.15 Electronics cables and signal generation

### 6.15.1 Cable type

The electronic terminals are suitable for:

- Cross sections up to 1.5 mm<sup>2</sup> (AWG16) without conductor end sleeves
- Cross sections up to 1.0 mm<sup>2</sup> (AWG17) with conductor end sleeves

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

### 6.15.2 0 V cables

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

- Install the units in adjacent control cabinet compartments rather than distributing them widely.
- Lay the 0 V cables with at least 1 mm<sup>2</sup> (AWG17) cross section from a central point to each individual unit by the shortest possible route.

### 6.15.3 Coupling relays

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

## 6.16 External voltage supply DC 24 V

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

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

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

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



DC 24 V power demand of MOVITRAC® B:

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

- 1) FBG11B, FSC11B (UWS11A/USB11A) included. Take account of the additional load of the binary inputs with 2.4 W per 100 mA.
- 2) Fieldbus options are: DFP21B, DFD11B, DFE11B, ...
- 3) These options must always be externally supplied.



#### NOTES

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

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

#### 6.16.1 Example

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

Calculating the total power demand:

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

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



## 6.17 Parameter set switchover

This function is used to operate two motors on one inverter using two different parameter sets.

The parameter set is switched over via binary input or fieldbus. A binary input must be programmed to the "Parameter set switchover" function (→ P60\_ /P61\_) for this purpose. You can then change from parameter set 1 to 2 and vice versa in INHIBITED inverter status.

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

	<b>NOTE</b>
	A changeover contactor should be provided for each of the two motor cables when two motors are operated alternately on the same inverter with the parameter set switchover function in use. Only switch changeover contactors when the unit is inhibited!



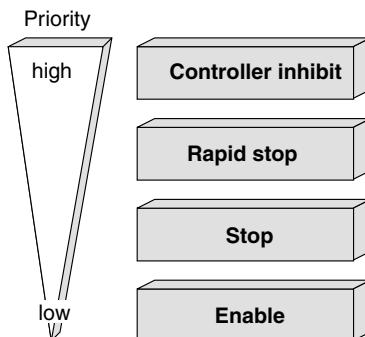
## Project Planning

Priority of the operating statuses and interrelation between control signals

### 6.18 Priority of the operating statuses and interrelation between control signals

#### 6.18.1 Priority of operating states

The following illustration shows the priority of operating states:



#### 6.18.2 Interrelation between control signals

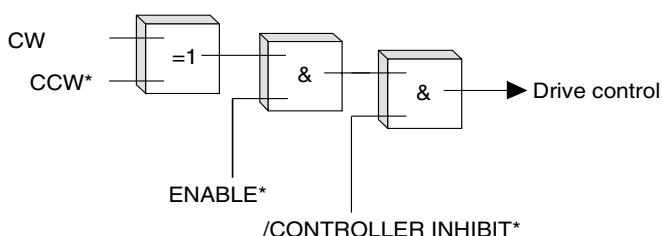
The following table shows the interrelation between control signals. "CW/Stop" is programmed to binary input DI01 and cannot be changed. The other control signals are only in effect if a binary input is programmed to this function (→ parameter P60\_).

/Controller inhibit	Binary input is programmed to			Inverter status
	Enable/ Rapid stop	CW/stop (DI01)	CCW/stop	
"0"	1)	1)	1)	Inhibited
"1"	"0"	2)	2)	
"1"	"1"	"1"	"0"	CW enabled
"1"	"1"	"0"	"1"	CCW enabled

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

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

Linking control signals:



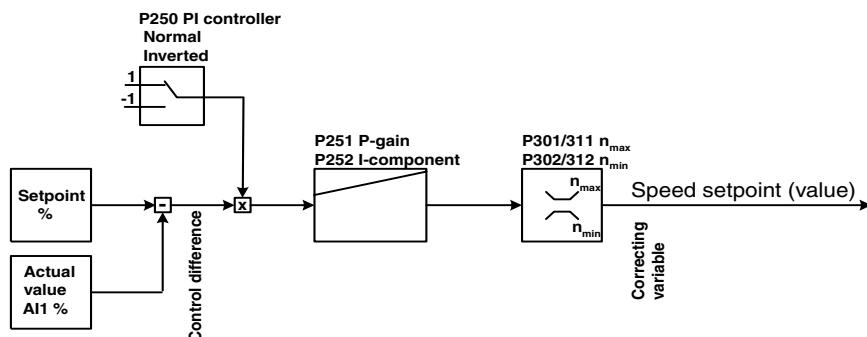
\* If a binary input is programmed to this function.



## 6.19 PI controller

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

Structural diagram showing installation of the PI controller



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

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

The correcting variable of the PI controller is a speed setpoint limited to a minimum and maximum speed (*P301=Minimum speed1* and *P302=Maximum speed1*). The setting of the speed ramp times has no effect when the PI controller is active.

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

### 6.19.1 Parameterization

#### Activating the PI controller

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

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

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

P 250	PI controller	<b>Off</b>
		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]	Bereich:	Step width:
			0	I-component OFF
			0.01 ... 0.99	0.01
			1.0 ... 9.9	0.1
			10 ... 99	1
			100 ... 2000	10



### 6.19.2 Setpoint selection

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

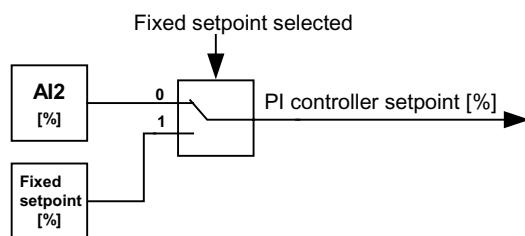
- **Unipolar / Fixed setpoint:** The setpoint zero applies as long as no setpoint is selected. The FBG setpoint control module can be added to setpoint zero or a fixed setpoint using P121.

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

P173/174/175 Setpoint n21/22/23 scales PI controller [0... 100 %] step width: 0.1 %

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

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

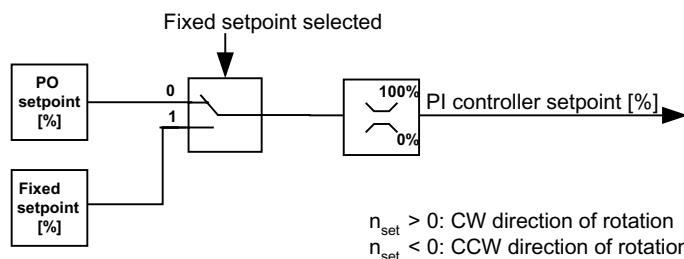


- **RS-485/fixed setpoint**
- **SBus 1 / Fixed setpoint:** Specify the setpoint and set it using the following bus parameters:

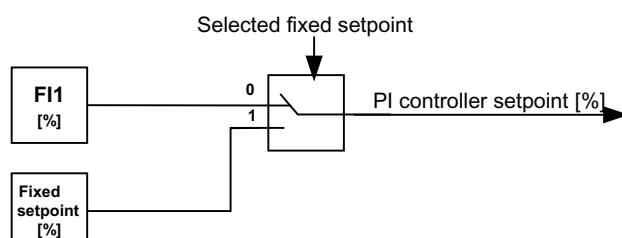
P870/871/872 Setpoint description PO1/PO2/PO3 [PI controller setpoint [%]]

PO1/PO2/PO3 = 0 ... 2<sup>14</sup> = 0 ... 100 % PI-controller setpoint

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



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





### 6.19.3 Actual value detection

The unipolar input AI1 is the actual value input.

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

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

### 6.19.4 Reference message

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

P450	PI actual value reference	<b>0 ... 100 [%]</b>	Step width:	0.1 %
P451	Signal = "1" when	PI actual value < PI reference		
		PI actual value > PI reference		

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

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

### 6.19.5 Inverter control

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

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

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

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

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



### 6.20 Application examples

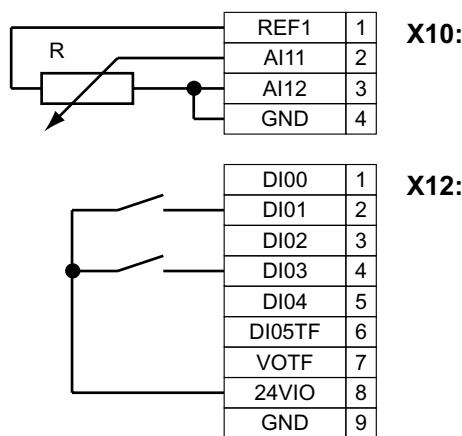
All application examples presented here assume that the unit has been started up correctly in accordance with the "Startup" section.

#### 6.20.1 External setpoint potentiometer

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

Connect an external setpoint potentiometer as follows:

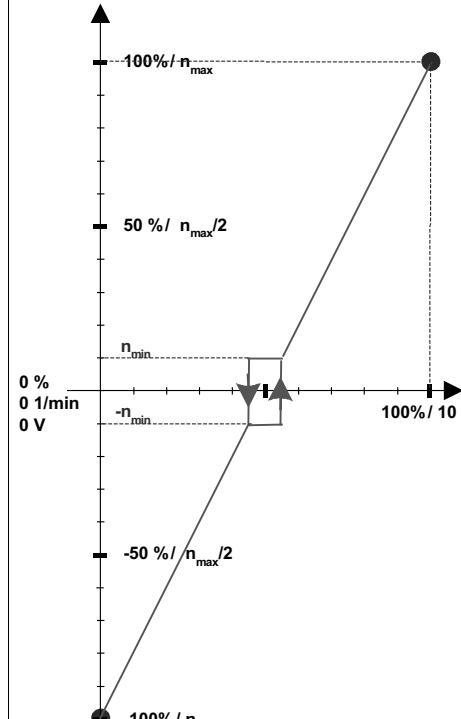
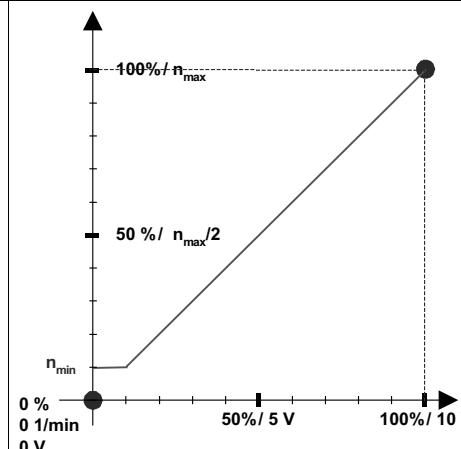
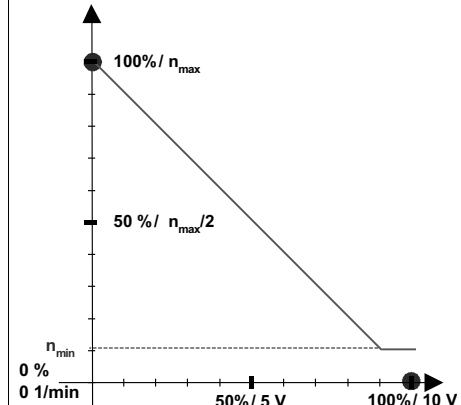
The resistance value of the external setpoint potentiometer R must be  $\geq 3\text{ k}\Omega$ .



#### 6.20.2 Setpoint value processing

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

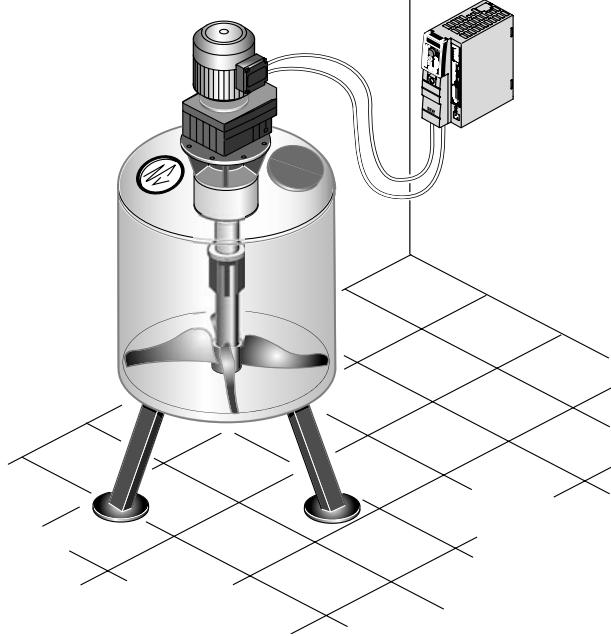
Setpoint source	X1 P116 Y1 P117	X2 P118 Y2 P119	U <sub>AI1</sub>	Setpoint speed	Diagram
Bipolar	0 % 100 %	100 % 100 %	0 V 5 V 10 V	n <sub>min</sub> 50 % n <sub>max</sub> n <sub>max</sub>	

Setpoint source	X1 P116 Y1 P117	X2 P118 Y2 P119	U <sub>AI1</sub>	Setpoint speed	Diagram
Bipolar	0 % -100 %	100 % 100 %	0 V 5 V 10 V	-n <sub>max</sub> -n <sub>min</sub> / +n <sub>min</sub> +n <sub>max</sub>	
Unipolar	0 % 100 %	100 % 100 %	0 V 5 V 10 V	n <sub>min</sub> 50 % n <sub>max</sub> n <sub>max</sub>	
Unipolar	0 % 0 %	100 % 0 %	0 V 5 V 10 V	n <sub>max</sub> 50 % n <sub>max</sub> n <sub>min</sub>	



### 6.20.3 Speed-controlled agitator

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



The keypad is used to control:

- Reset
- Start
- Stop
- Speed control.

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

#### Parameters

Adapt the following parameters for the agitator:

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



#### 6.20.4 Positioning a trolley

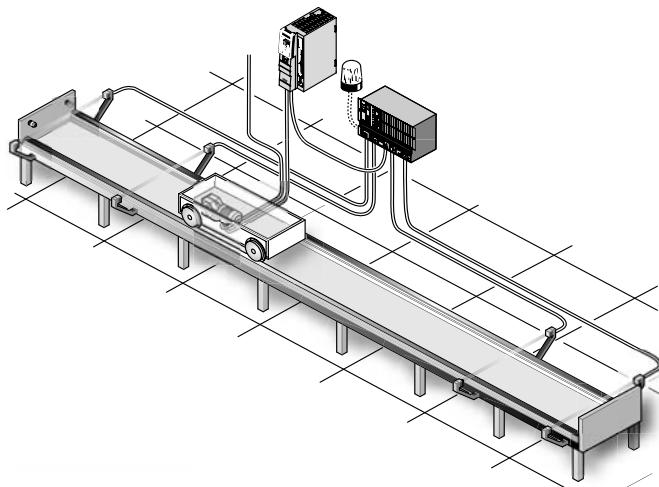
##### Principle

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

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

Install a braking resistor.

Perform a startup for the VFC operating mode.





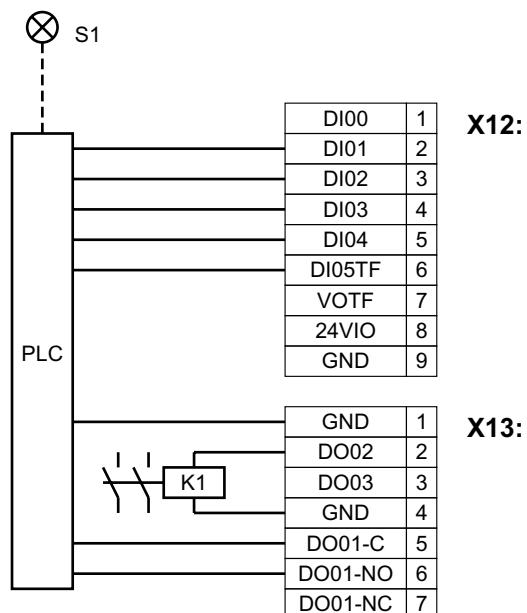
## Project Planning Application examples

### Terminals

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

Assign the electronics terminal strip with

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



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

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

- X12:2: Clockwise direction of rotation  
 X12:3: Counterclockwise direction of rotation  
 X12:4: Start/Stop  
 X12:5: Rapid speed

- X12:6: Slow speed/rapid speed  
 X12:8: 24 V  
 X13:6: No malfunction  
 X13:2: Brake released

### Parameters

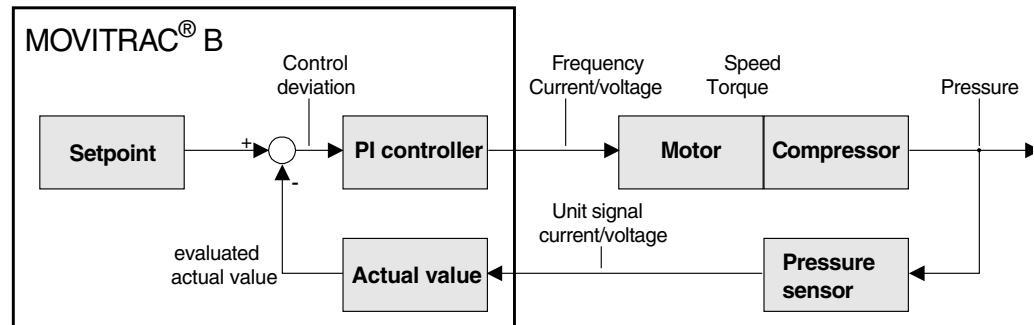
The following parameters are relevant for this application. Check whether you can leave all factory setting values unchanged.

- P601 Binary input DI02: CCW/stop  
 P602 Binary input DI03: Enable  
 P603 Binary input DI04: n11/n21

- P604 Binary input DI05: n12/n22  
 P620 Binary output DO01: Malfunction  
 P621 Binary output DO02: Brake released

#### 6.20.5 PI controller

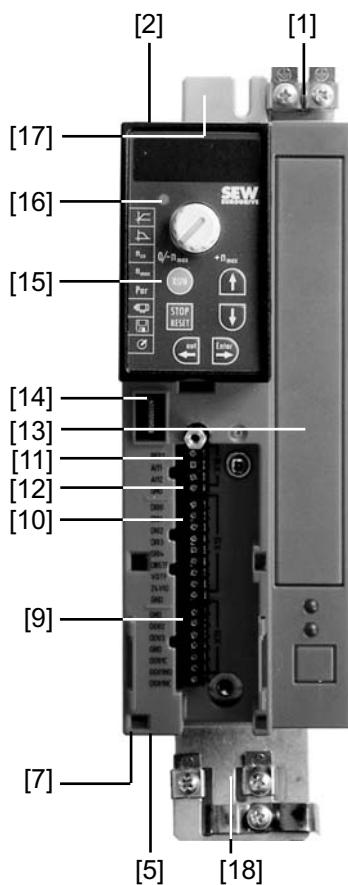
Following a diagram showing the basic structure of the control system with a PI controller, taking the example of a pressure control system.





## 7 Unit design

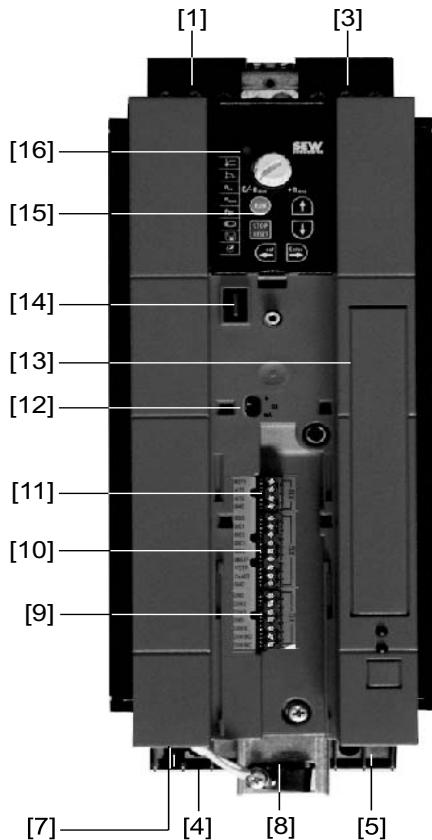
### 7.1 Size 0XS / 0S / 0L



- [1] PE connection
- [2] X1: Power supply connection:  
3-phase: L1 / L2 / L3  
1-phase: L / N
- [5] X2: Motor connection U / V / W / Brake connection +R / -R
- [7] X17: Safety contact for safe stop (only MC07B...-S0: sizes 0S / 0L, 400 / 500 V)
- [9] X13: Binary outputs
- [10] X12: Binary inputs
- [11] X10: Analog input
- [12] Switch S11 for V-mA toggle analog input  
(in sizes 0XS and 0S behind removable connector)
- [13] Option card slot (cannot be retrofitted / not for BG0XS)
- [14] Connection for optional communication / analog module
- [15] Optional keypad
- [16] Status LED (visible without optional keypad)
- [17] Fixing strap
- [18] Shield plate for motor cable, fixing strap underneath



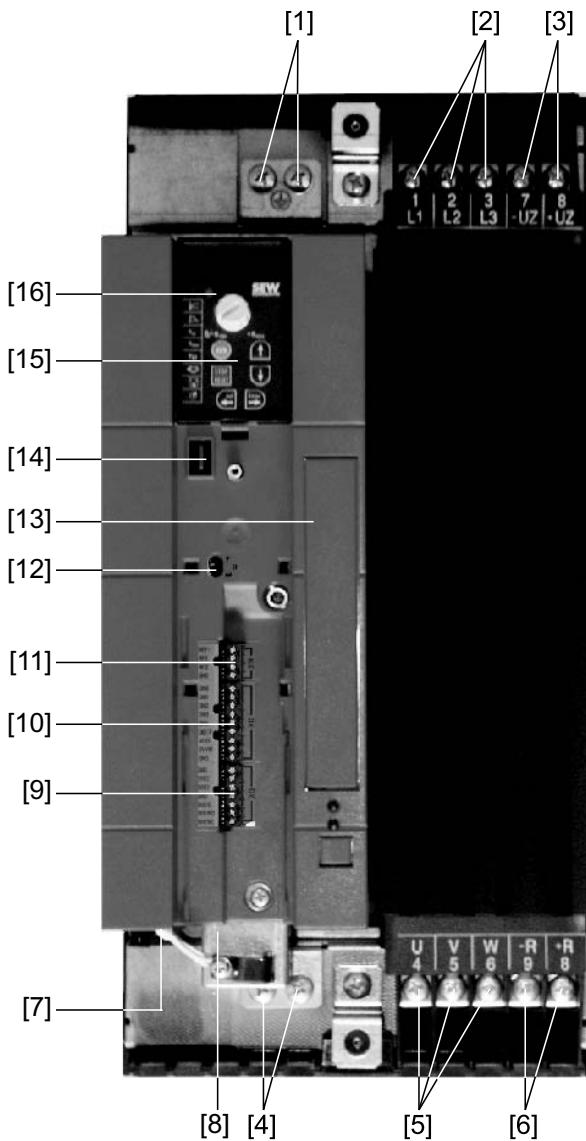
## 7.2 Size 1 / 2S / 2



- [1] X1: Power supply connection 3-phase: L1 / L2 / L3 / PE screw
- [3] X4: DC link connection -U<sub>Z</sub> / +U<sub>Z</sub>
- [4] X2: Motor connection U / V / W / PE screw
- [5] X3: Braking resistor connection R+ / R- / PE
- [7] X17: Safety contact for safe stop (only 400 / 500 V)
- [8] Electronics shield clamp
- [9] X13: Binary outputs
- [10] X12: Binary inputs
- [11] X10: Analog input
- [12] Switch S11 for V-mA toggle analog input
- [13] Option card slot
- [14] Connection for optional communication / analog module
- [15] Optional keypad
- [16] Status LED (visible without optional keypad)



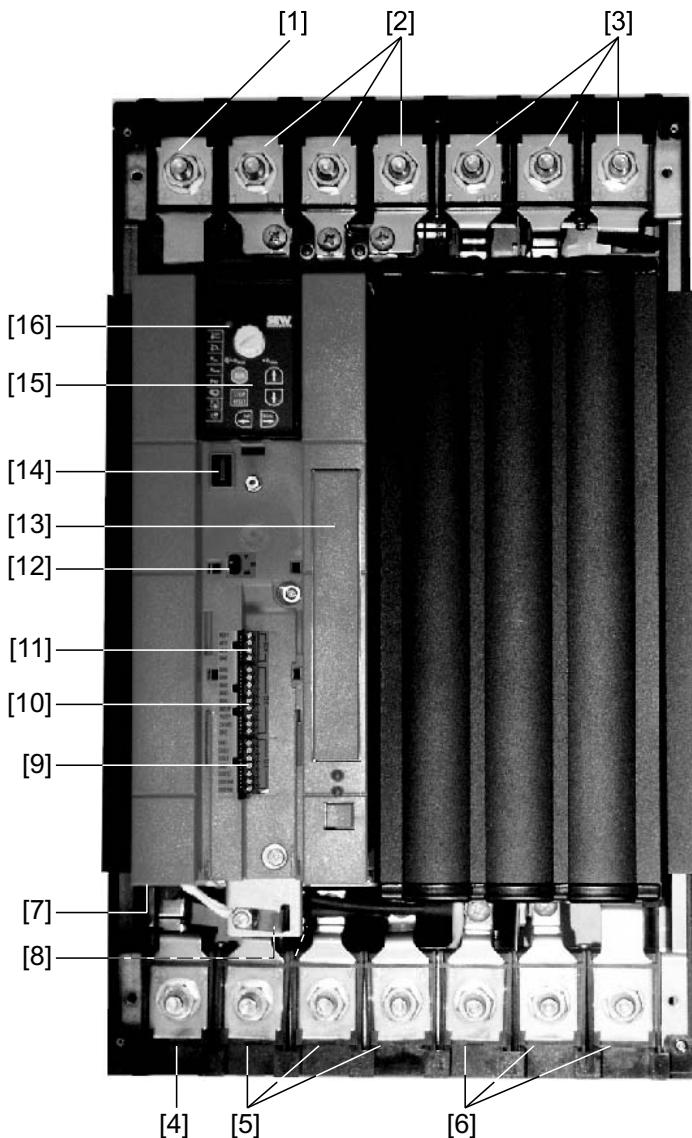
### 7.3 Size 3



- [1] X2: PE connection
- [2] X1: Power supply connection 3-phase: 1/L1 / 2/L2 / 3/L3
- [3] X4: DC link connection –U<sub>Z</sub> / +U<sub>Z</sub>
- [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] X17: Safety contact for safe stop (only 400 / 500 V)
- [8] Electronics shield clamp
- [9] X13: Binary outputs
- [10] X12: Binary inputs
- [11] X10: Analog input
- [12] Switch S11 for V-mA toggle analog input
- [13] Option card slot
- [14] Connection for optional communication / analog module
- [15] Optional keypad
- [16] Status LED (visible without optional keypad)



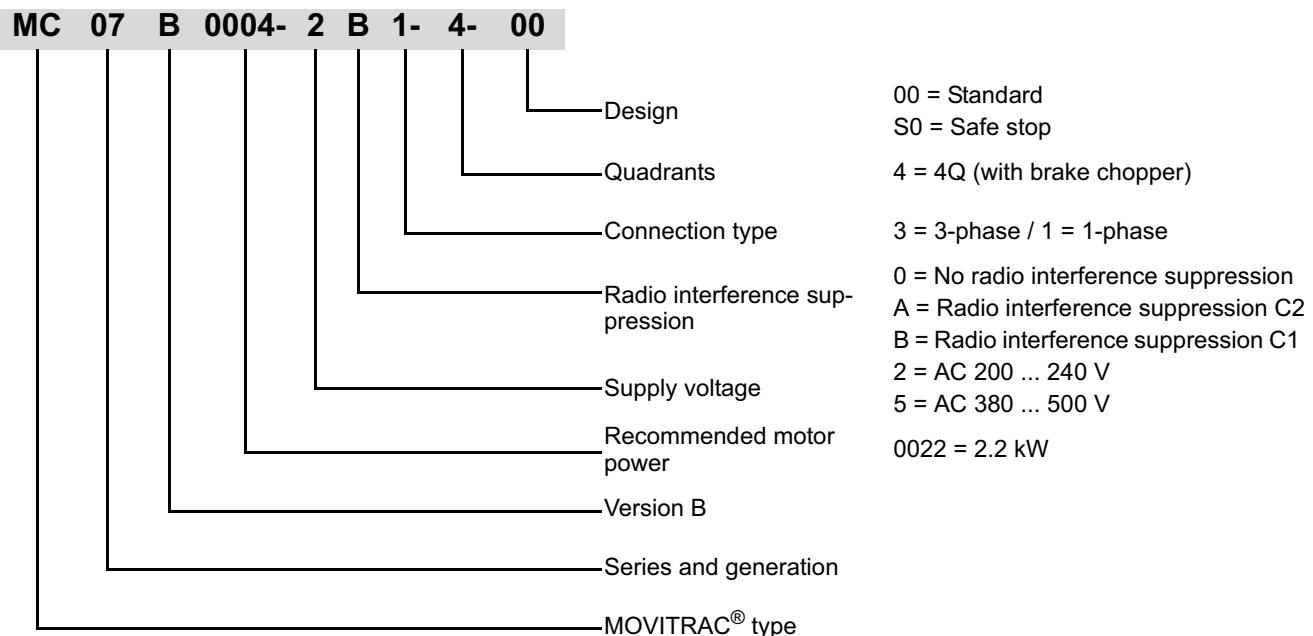
#### 7.4 Size 4 / 5



- [1] X2: PE connection
- [2] X1: Power supply connection 3-phase: 1/L1 / 2/L2 / 3/L3
- [3] X4: DC link connection  $-U_Z$  /  $+U_Z$  and PE connection
- [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] X17: Safety contact for safe stop (only 400 / 500 V)
- [8] Electronics shield clamp
- [9] X13: Binary outputs
- [10] X12: Binary inputs
- [11] X10: Analog input
- [12] Switch S11 for V-mA toggle analog input
- [13] Option card slot
- [14] Connection for optional communication / analog module
- [15] Optional keypad
- [16] Status LED (visible without optional keypad)



### 7.5 Unit designation / nameplate



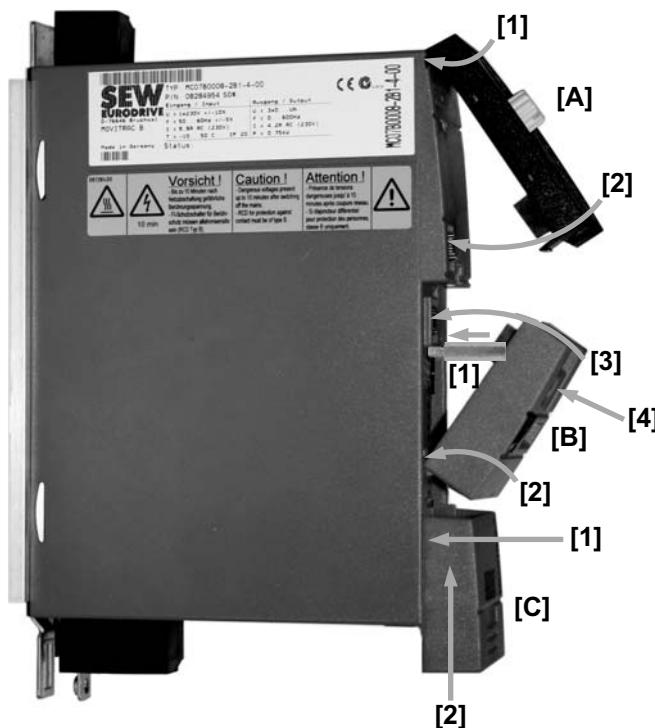


## 8 Installation

### 8.1 Installation notes

	<b>NOTE</b> Comply with the safety notes during installation.
---	--

#### 8.1.1 Mounting the front options



Observe the following sequence when mounting the front options:

- To mount the FBG11B [A] keypad, first insert it on top of the housing [1]. Next, press the socket on the keypad onto the connector of the unit [2].
- For the FSC11B communication module and the FIO11B analog module [B], insert the spacer bolt first for size 0 [1].

Insert the FSC11B communication module and the FIO11B module [B] first at the bottom of the housing [2] before pressing the socket of the front option onto the connector of the unit [3].

Finally secure the front option using the screw on the unit [4].

- To install the cover [C], first place it onto the unit approximately 5 mm away from the final position [1]. Next, move it upwards [2].

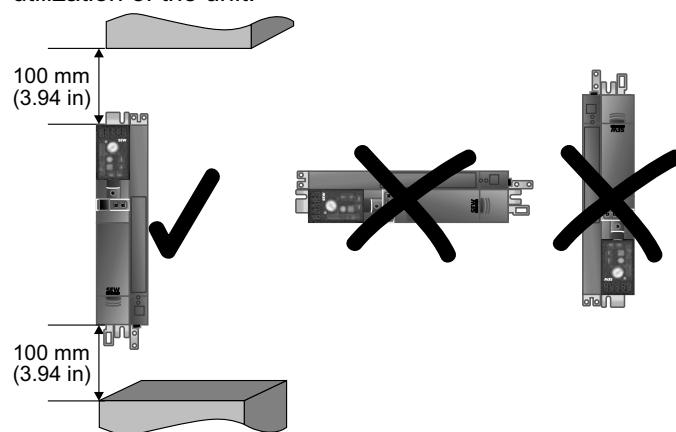


### 8.1.2 Recommended tools

- Use a screwdriver with a 2.5 mm wide blade for connecting the electronics terminal strip X10 / X12 / X13.

### 8.1.3 Minimum clearance and mounting position

- Leave **100 mm (3.94 in) clearance at the top and bottom** of the housing for optimum cooling. There is no need for clearance at the sides. You can line up the units directly next to one another. It is important that air circulation is not impeded by cables and other installation material. 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.
- Proper heat dissipation of the rear side of the heat sink improves the thermal utilization of the unit.



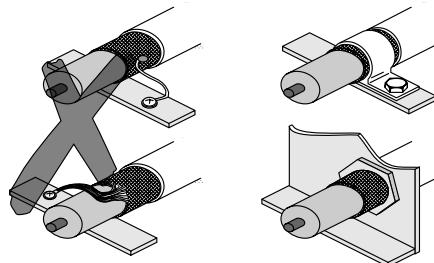
### 8.1.4 Separate cable ducts

- Route power leads and electronics leads in separate cable ducts.



### **8.1.5 EMC-compliant installation**

- All cables except for the supply system lead must be **shielded**. For the motor cable, you can use the HD.. option (output choke) instead of the shielding to meet the interference emission limit values.
  - When using shielded motor cables, e.g. prefabricated motor cables from SEW-EURODRIVE, you must keep the **unshielded conductors between the shield and connection terminal of the inverter as short as possible**.



- Apply the **shield by the shortest possible route and make sure it is grounded over a wide area at both ends**. If using double-shielded cables, ground the outer shield on the inverter end and the inner shield at the other end.
  - You can also use **earthed sheet-metal ducts or metal pipes** to **shield the cables. Route the power and control cables separately**.
  - Provide **high frequency compatible grounding** for the **inverter** and **all additional units** (wide area metal-on-metal contact between the unit housing and ground, e.g. unpainted control cabinet mounting panel).

## 8.1.6 IT systems

- SEW recommends using **earth-leakage monitors with a pulse code measuring process in voltage supply systems with a non-earthed star point (IT systems)**. 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 Deactivating EMC capacitors (size 0 only) (see page 174)).

### 8.1.7 Contactor

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

## 8.1.8 Cross sections

- Supply system lead: **Cross section according to rated input current  $I_{\text{mains}}$**  at rated load.  
Motor lead: **Cross section according to rated output current  $I_N$**   
Electronics cables:
    - Maximum 1.5 mm<sup>2</sup> (AWG16) without conductor end sleeves<sup>1)</sup>
    - Maximum 1.0 mm<sup>2</sup> (AWG17) with conductor end sleeves

1) Fine wired cables may not be installed without conductor end sleeves.



#### 8.1.9 Cable lengths for individual drives

- The cable lengths depend on the PWM frequency. The permitted motor cable lengths are listed in the "Project Planning" section of the MOVITRAC® B system manual.

#### 8.1.10 Unit output

- Only connect an **ohmic/inductive load (motor)**, do not connect a capacitive load!

#### 8.1.11 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 **BW..-T** braking resistors, you can connect the **integrated thermostat using a 2-core, shielded cable** as an alternative to a bimetallic relay.
- **Flat-type braking resistors** have internal thermal overload protection (fuse which cannot be replaced). Install the **flat-type braking resistors** together with the appropriate **touch guard**.



### 8.1.12 Installing the braking resistor

- The supply cables to the braking resistors carry a high voltage (approx. DC 900 V) during rated operation.
- The surfaces of the braking resistors get very hot when the braking resistors are loaded with  $P_{\text{rated}}$ . Choose a suitable installation location. Braking resistors are usually mounted on the control cabinet roof.

### 8.1.13 Binary outputs

- The **binary outputs** are **short-circuit proof** and **protected against external voltage to 30 V**. Higher external voltages can destroy the binary outputs.

### 8.1.14 Interference emission

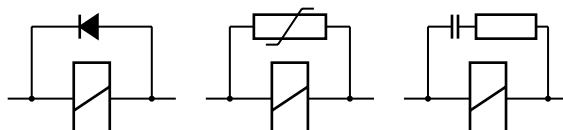
- Use shielded motor cables or HD output chokes for EMC compliant installation.

### 8.1.15 Switched inductances

	<b>NOTE</b>
The minimum distance of switched inductances to the inverter must be at least 150 mm (5.91 in).	

- Use suppressors to suppress interference on
  - contactors
  - relays
  - solenoid valves

Suppressors are, for example, diodes, varistors, or RC elements:



Do not connect any suppressors directly on MOVITRAC® B. Connect suppressors as closely as possible to the inductance.

### 8.1.16 Line filters

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:

- Single-phase connection: **C1** cable conducted
- Three-phase connection: **C2**

No EMC limits are specified for interference emission in voltage supply systems without an earthed star point (IT system). The efficiency of line filters is severely limited.



### 8.1.17 Line protection and earth-leakage circuit breaker

- Install the **fuses at the beginning of the mains cable** behind the supply bus junction (→ Basic unit wiring diagram).
- SEW-EURODRIVE recommends that you do not use earth-leakage circuit breakers. However, if an earth-leakage circuit breaker is stipulated for direct or indirect protection against contact, observe the **following note in accordance with EN 61800-5-1**:

	<b>WARNING!</b>
	<p>Wrong type of earth-leakage circuit breaker installed. Severe or fatal injuries.</p> <p>MOVITRAC® can cause direct current in the protective earth. In cases where an earth-leakage circuit breaker is used for protection against direct or indirect contact, only install a type B earth-leakage circuit breaker on the <b>power supply end of the MOVITRAC unit</b>.</p>

### 8.1.18 PE mains connection (→ EN 61800-5-1)

Earth-leakage currents  $\geq 3.5 \text{ mA}$  may occur during normal operation. To meet the requirements of EN 61800-5-1 observe the following:

- Supply system lead  $< 10 \text{ mm}^2$  (**AWG7**):
  - Route a second PE conductor with the same cross section as the supply system lead in parallel to the protective earth via separate terminals, or
  - use a copper protective earth conductor with a cross section of  $10 \text{ mm}^2$  (AWG7)
- Supply system cable  $10 \text{ mm}^2 \dots 16 \text{ mm}^2$  (**AWG7 ... AWG5**):
  - Copper protective earth conductor with the cross section of the supply system lead.
- Supply system cable  $16 \text{ mm}^2 \dots 35 \text{ mm}^2$  (**AWG5 ... AWG2**):
  - Copper protective earth conductor with a cross section of  $16 \text{ mm}^2$  (AWG5)
- Supply system lead  $> 35 \text{ mm}^2$  (**AWG2**):
  - Copper protective earth conductor with half the cross section of the supply system lead.

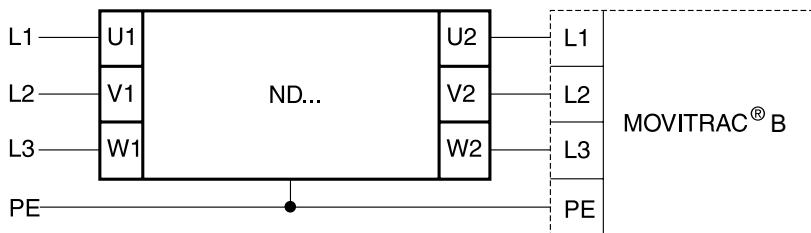


## 8.2 *Installing the optional power components*

When **more than five 3-phase units or more than one 1-phase unit** are connected to a **supply system contactor** designed for the total current: Connect a **line choke** for limiting the inrush current.

### 8.2.1 ND line choke

ND ... series line choke connection



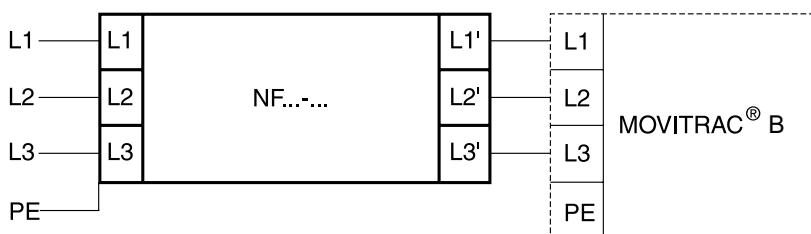
### 8.2.2 NF line filter

- The NF.. line filter can be used to maintain the limit value class C1/B for MOVITRAC® B units sizes 0 to 4.

	<b>STOP!</b> Possible damage to property Do not switch between the line filter and MOVITRAC®. • Consequences if disregarded: Damage to the input level.
--	--

- Install the **line filter close to the inverter** but outside the minimum clearance for cooling.
- Restrict the **cable between the line filter and the inverter to the absolute minimum length required**, and never more than 400 mm (15.7 in). Unshielded, twisted cables are sufficient. Also use unshielded cables as the supply system lead.

Connecting NF.... line filters





## Installation

### Installing the optional power components

#### 8.2.3 ULF11A foldable ferrites

Place the supply system cable (L and N) in the foldable ferrite and press the foldable ferrites together until they snap in place.

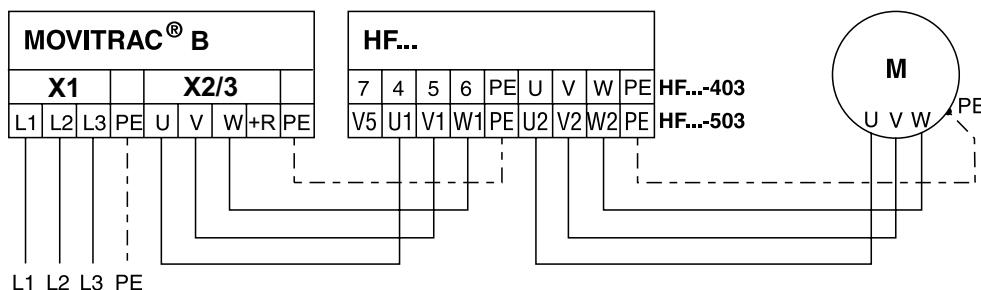
Compliance with EMC limit class C1 has been tested on a specified test setup. Compliance with class C1 for signal interference is achieved by the proper installation of the foldable ferrites ULF11A.

#### 8.2.4 HF output filter

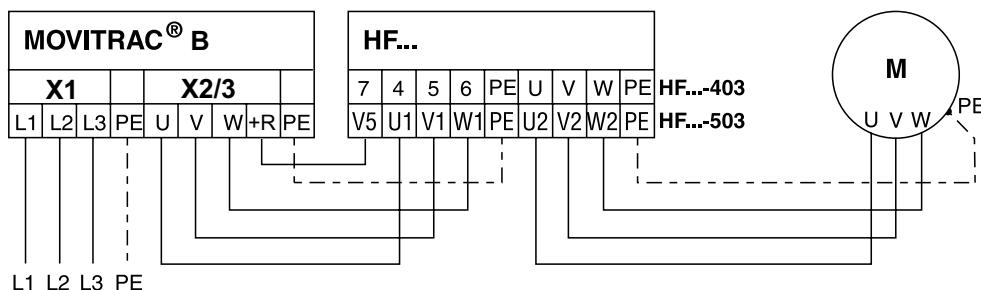
	<b>NOTE</b>
	<ul style="list-style-type: none"> <li>Install output filters next to the corresponding inverter. Leave a ventilation space of at least 100 mm (3.94 in) below and above the output filter. No clearance is required on the sides.</li> </ul>

- Limit the connection cable between inverter and output filter to the absolutely necessary length. Maximum 1 m/3 ft with unshielded cable, 10 m/33 ft with shielded cable.
- 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.
- Two identical output filters can be connected in parallel to one inverter output to double the rated throughput 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.
- No  $V_{DC}$  link connection is permitted for size 0XS units.

HF output filter connection without  $V_{DC}$  link connection (PWM frequency only 4 or 8 kHz)



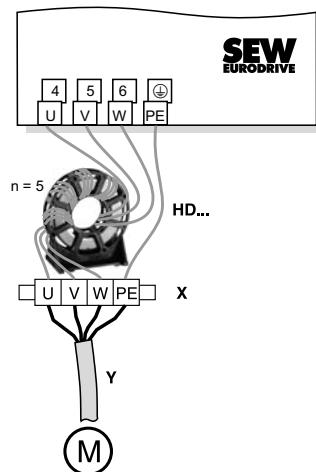
HF output filter connection without  $V_{DC}$  link connection (PWM frequency only 12 or 16 kHz)





### 8.2.5 HD output choke

- Install the output choke close to MOVITRAC® B **outside the minimum clearance**.
- Always route all three phases (**not PE**) together through the output choke.
- If the cable is shielded, do **not** route the shield through the output choke.



When using 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.

- Installing HD012 output choke:

Install output choke under the corresponding inverter. Leave a ventilation space of at least 100 mm (3.94 in) below and above the output choke. Provide a clearance of 10 mm (0.39 in) on each side.

Three alternative connection options are provided for connecting the protective earth. You can connect the PE line of the motor cable directly on the frequency inverter.

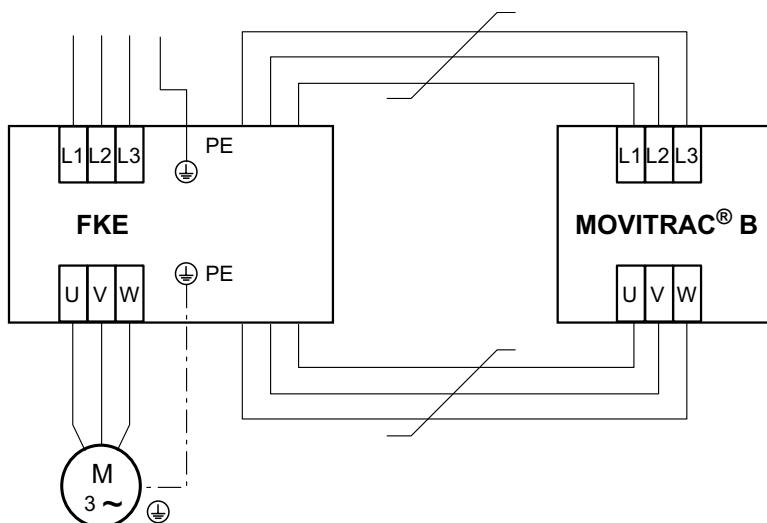


#### 8.2.6 FKE12B / FKE13B EMC-modules

Use the supplied screws to mount the EMC module together with the MOVITRAC® B frequency inverter onto the conductive mounting surface in the control cabinet.

The connections U / V / W are labeled U / V / W and have to be connected accordingly.

The connections L1 / L2 / L3 (brown / orange / white) can be connected in any order.



#### 8.2.7 PTC braking resistors BW1 / BW3 with FKB10B

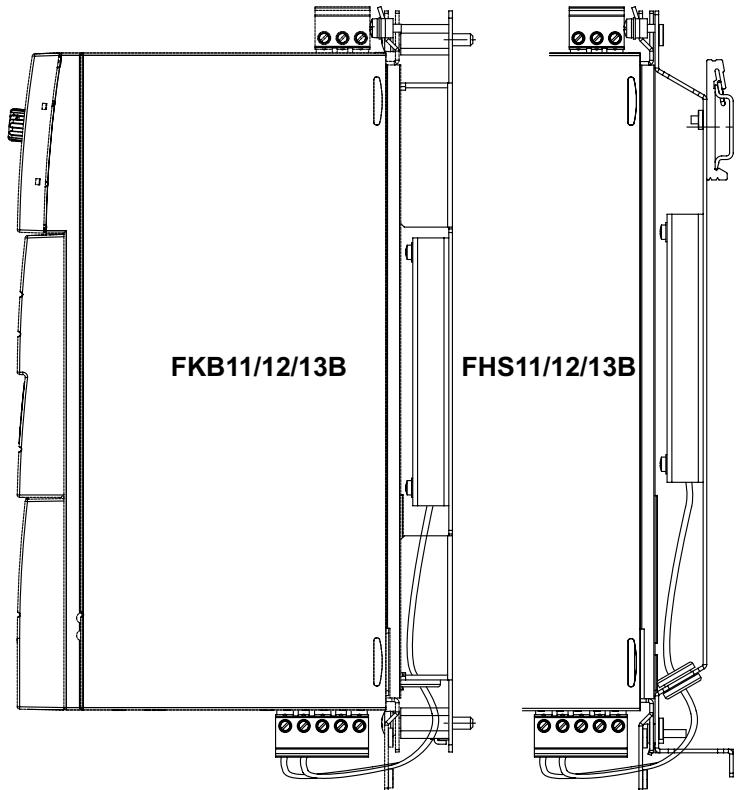
BW1 and BW3 PTC braking resistors can be mounted to the shield plate underneath the inverter using the angle bracket FDB10B, part number 18216218 available as option.





#### 8.2.8 Flat-design resistors with FKB11/12/13B and FHS11/12/13B

Flat-design resistors can be mounted between inverter and control cabinet with FKB11/12/13B or FHS11/12/13B.



### 8.3 UL compliant installation

Please note the following points for UL compliant installation:

- Use only copper cables with the following temperature ranges as connection cables:
  - MOVITRAC® B 0003 ... 0300: temperature range 60/75 °C (140/167 °F)
  - MOVITRAC® B 0370 and 0450: temperature range 75 °C (167 °F)
- Necessary tightening torques of MOVITRAC® B power terminals: See installation notes.
- Operate the 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.
- MOVITRAC® B frequency inverters are 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:

<b>230 V units / 1-phase</b>	<b>Max. mains current</b>	<b>Max. mains voltage</b>	<b>Fuses</b>
0003 / 0004 / 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

<b>230 V units / 3-phase</b>	<b>Max. mains current</b>	<b>Max. mains voltage</b>	<b>Fuses</b>
0003 / 0004 / 0005 / 0008	AC 5000 A	AC 240 V	15 A / 250 V
0011 / 0015 / 0022	AC 5000 A	AC 240 V	20 A / 250 V
0037	AC 5000 A	AC 240 V	30 A / 250 V
0055 / 0075	AC 5000 A	AC 240 V	110 A / 250 V
0110	AC 5000 A	AC 240 V	175 A / 250 V
0150	AC 5000 A	AC 240 V	225 A / 250 V
0220 / 0300	AC 10000 A	AC 240 V	350 A / 250 V

<b>400 / 500 V units</b>	<b>Max. mains current</b>	<b>Max. mains voltage</b>	<b>Fuses</b>
0003 / 0004 / 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
0550 / 0750	AC 10000 A	AC 500 V	500 A / 600 V



#### NOTES

- Only use tested units with a **limited output voltage** ( $V_{max} = DC 30 V$ ) and **limited output current** ( $I \leq 8 A$ ) as an **external DC 24 V voltage source**.
- **UL certification does not apply to operation in voltage supply systems with a non-grounded star point (IT systems).**



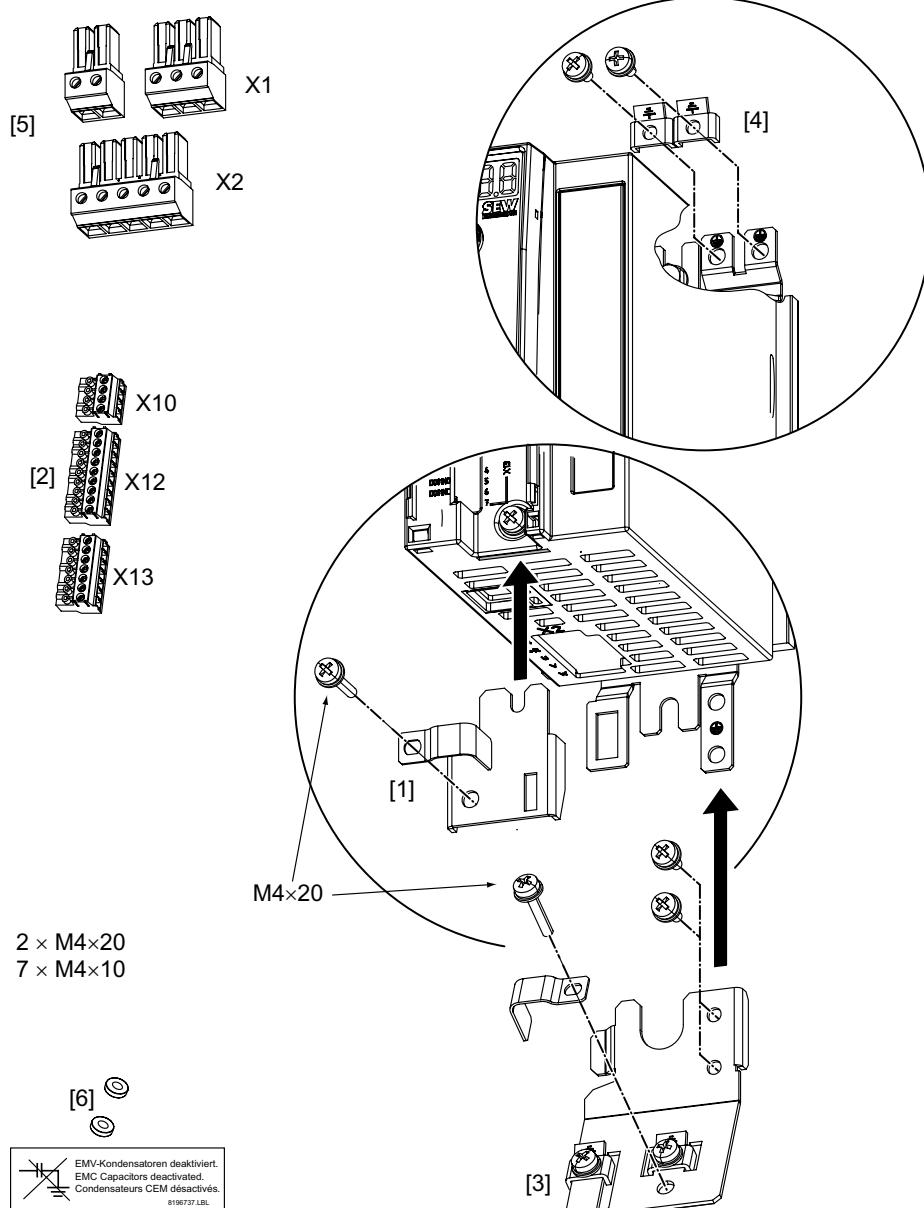
## 8.4 Scope of delivery and installation of loose items

### 8.4.1 Scope of delivery of loose items

The scope of delivery includes a bag for loose items. Its contents depends on the inverter size.

Scope of delivery of loose items for size					
0XS / 0S / 0L	1	2S	2	3	4 / 5
• Shield plate for control electronics with clamps and screws [1]					
• 3 connectors for electronics terminals [2]					
• Grounding terminals with screws [4]			-	-	
• Shield plate for the power section with clamps and screws [3]	• Shield plate for the power section without screws	• Touch guard	-	-	
• Connector for mains (2 or 3-pole) and motor [5]		• Shield plate for the power section with screws			
• Plastic insulations with stickers [6]	• Fixing straps		-	-	• Touch guard

Loose items for size 0:





## Installation

Scope of delivery and installation of loose items

### 8.4.2 Installing shield plate for control electronics (all sizes)

MOVITRAC® B includes a shield plate for the control electronics with a retaining screw as standard. Install the shield plate for control electronics as follows:

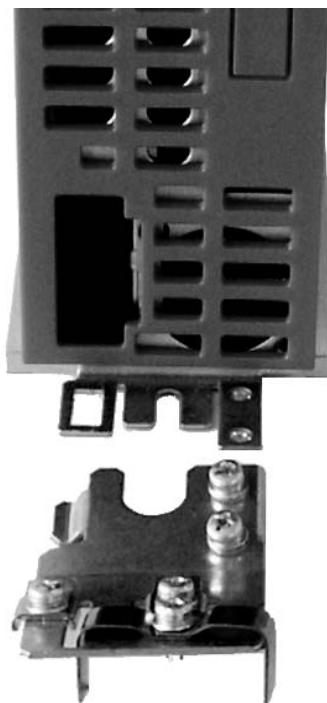
1. Loosen the screw first [1].
2. Push the shield clamp through the slot in the plastic housing.
3. Fasten the shield clamp.



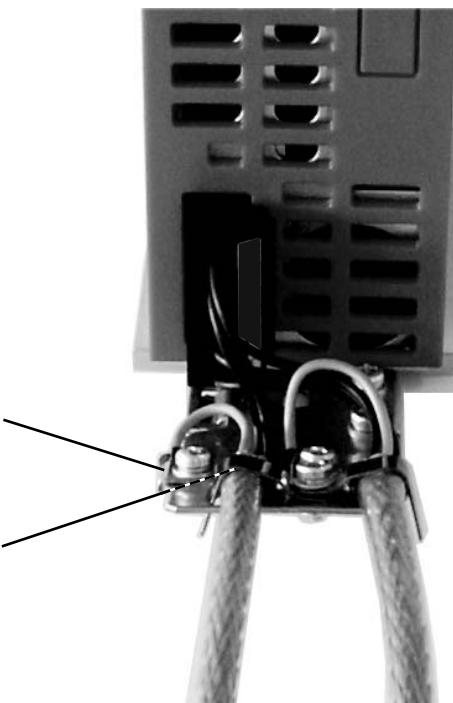
### 8.4.3 Installing shield plate for power section

Size 0

A power shield plate for the power section with 2 retaining screws is supplied as standard with MOVITRAC® size 0. Mount the shield plate for the power section using the two retaining screws.



[1] PE connection

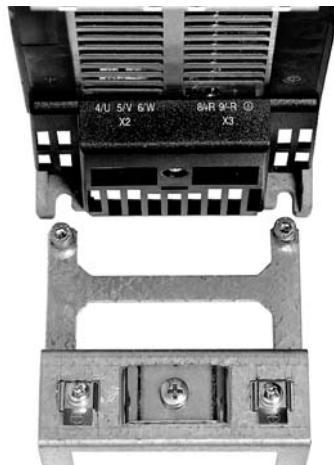


[2] Shield plate

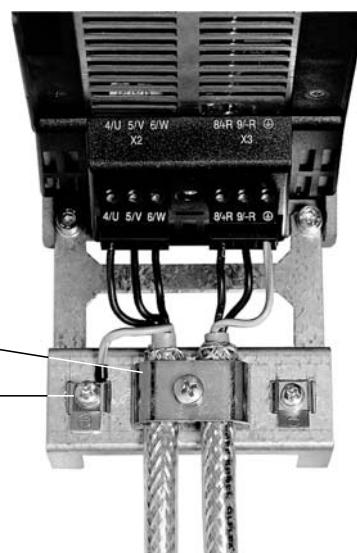


## Size 1

SEW-EURODRIVE supplies a shield plate for the power section as standard with MOVITRAC® B size 1. Mount the shield plate for the power section using the unit's two retaining screws.



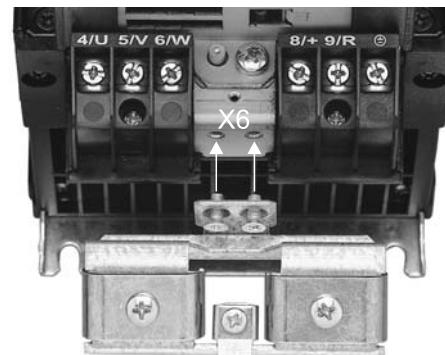
[1] Shield clamp



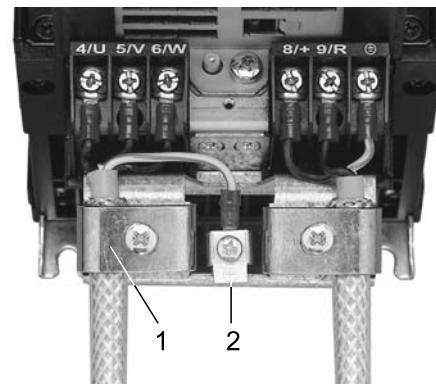
[2] PE connection

## Sizes 2S / 2

SEW-EURODRIVE supplies a shield plate for the power section with two retaining screws as standard with MOVITRAC® B sizes 2S / 2. Mount the shield plate for the power section using the two retaining screws. The illustration shows size 2.



[1] Shield clamp



[2] PE connection

The shield plate for the power section provides you with a very convenient way of installing the shield for the motor and brake cables. Apply the shield and PE conductor as shown in the figures.

## Sizes 3 ... 5

With MOVITRAC® B sizes 3 ... 5, no shield plates are supplied for the power section. Use commercially available shield clamps for installing the shielding of motor and brake cables. Apply the shield as closely as possible to the inverter.



## Installation

Scope of delivery and installation of loose items

### 8.4.4 Installing the touch guard



#### HAZARD!

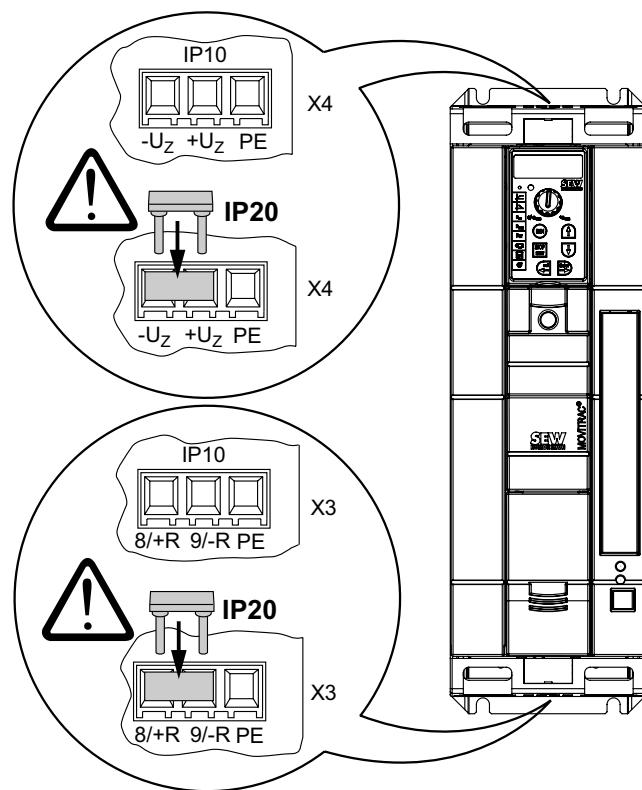
Uncovered power connections.

Severe or fatal injuries from electric shock.

- Install the touch guard according to the regulations.
- Never start the unit if the touch guard is not installed.

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 degree of protection IP10. When the touch guard is installed, the unit has degree of protection IP20.

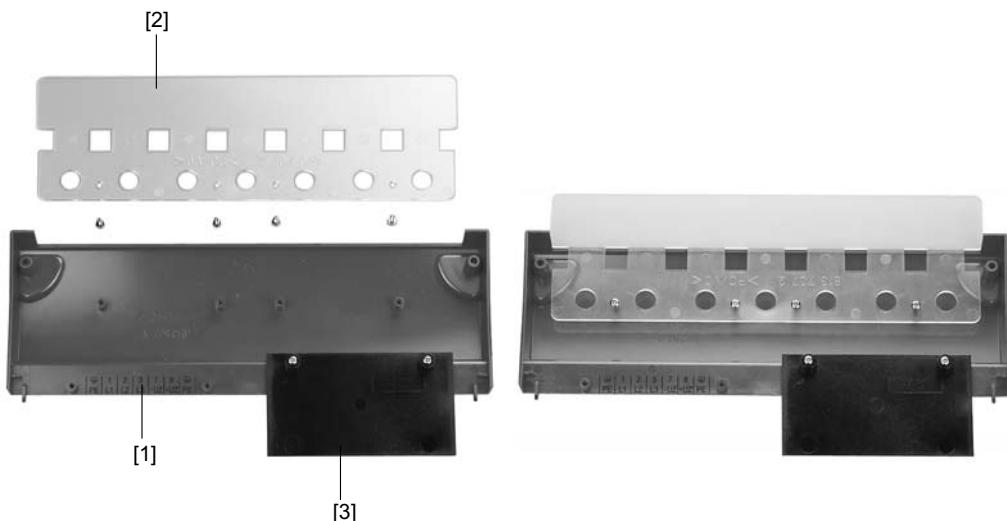




## Sizes 4 / 5

Two touch guards with 8 retaining screws are supplied as standard with MOVITRAC® sizes 4 / 5. Install the touch guard on both covers of the power section terminals.

Touch guard for MOVITRAC® B sizes 4 / 5:



The touch guard comprises the following parts:

- [1] Cover plate
- [2] Connection plate
- [3] Screen (only for size 4)

The MOVITRAC® B unit sizes 4 / 5 can only achieve degree of protection IP10 when the following conditions are met:

- Touch guard is fully installed
- The shrink tubing is installed on all power terminals (X1, X2, X3, X4)

**NOTE**

If the above conditions are not met, MOVITRAC® units sizes 4 and 5 have degree of protection IP00.



### 8.5 *Installing 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.). This can be useful, for example, in restricted installation spaces. When adhering to the usual installation notes (40 °C (104 °F) / 100 mm (3.94 in) space above and below), cold-plate technology is not necessary.

A good thermal connection to the cooler is important for safe operation of 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 (0.0002 in).
- Connect cooler and cooling plate with all necessary screw connections.
- The mounting plate must not exceed 70 °C (158 °F) during operation. This must be ensured by the cooling medium.
- Cold plate installation is not possible with FHS or FKB.

### 8.6 *Deactivating EMC capacitors (size 0 only)*

Only electricians are allowed to convert the unit. Once converted, the unit must be marked with the sticker provided in the accessory bag.

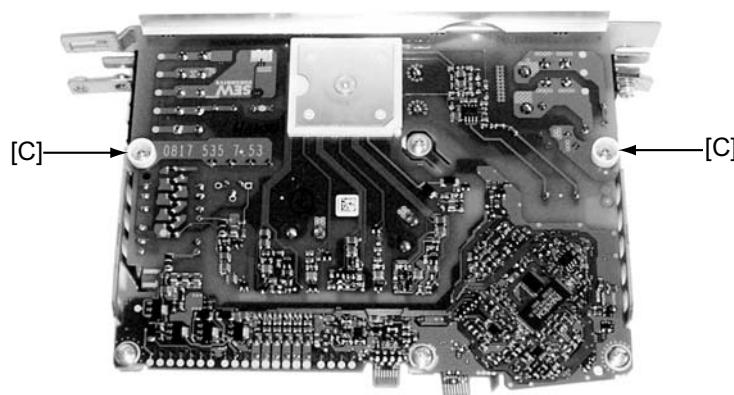
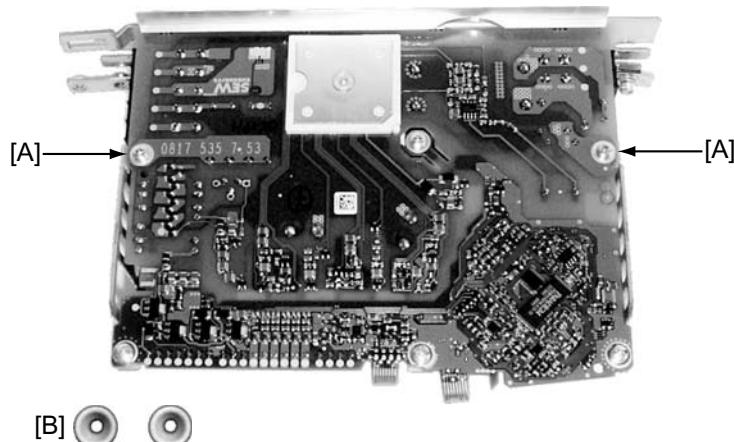
	<b>HAZARD!</b> Severe or fatal injuries from electric shock. <ul style="list-style-type: none"> <li>• Disconnect the inverter from the power. Switch off the DC 24 V and the line voltage.</li> <li>• Wait 10 seconds.</li> <li>• Ensure that the unit is de-energized.</li> <li>• Take appropriate measures to avoid electrostatic charges (use discharge strap, conductive shoes, etc.) before removing the cover.</li> <li>• Touch only the unit frame and heat sink. Do not touch any electronic components.</li> </ul>
---	---

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

1. 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.



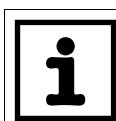
2. Remove the two screws [A] securing the circuit board.
3. Install the screws in the plastic insulations provided [B].
4. Fasten screws to the unit [C].
5. Close the unit.
6. Attach the sticker provided to the unit.



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 cable and its length and the motor used.

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



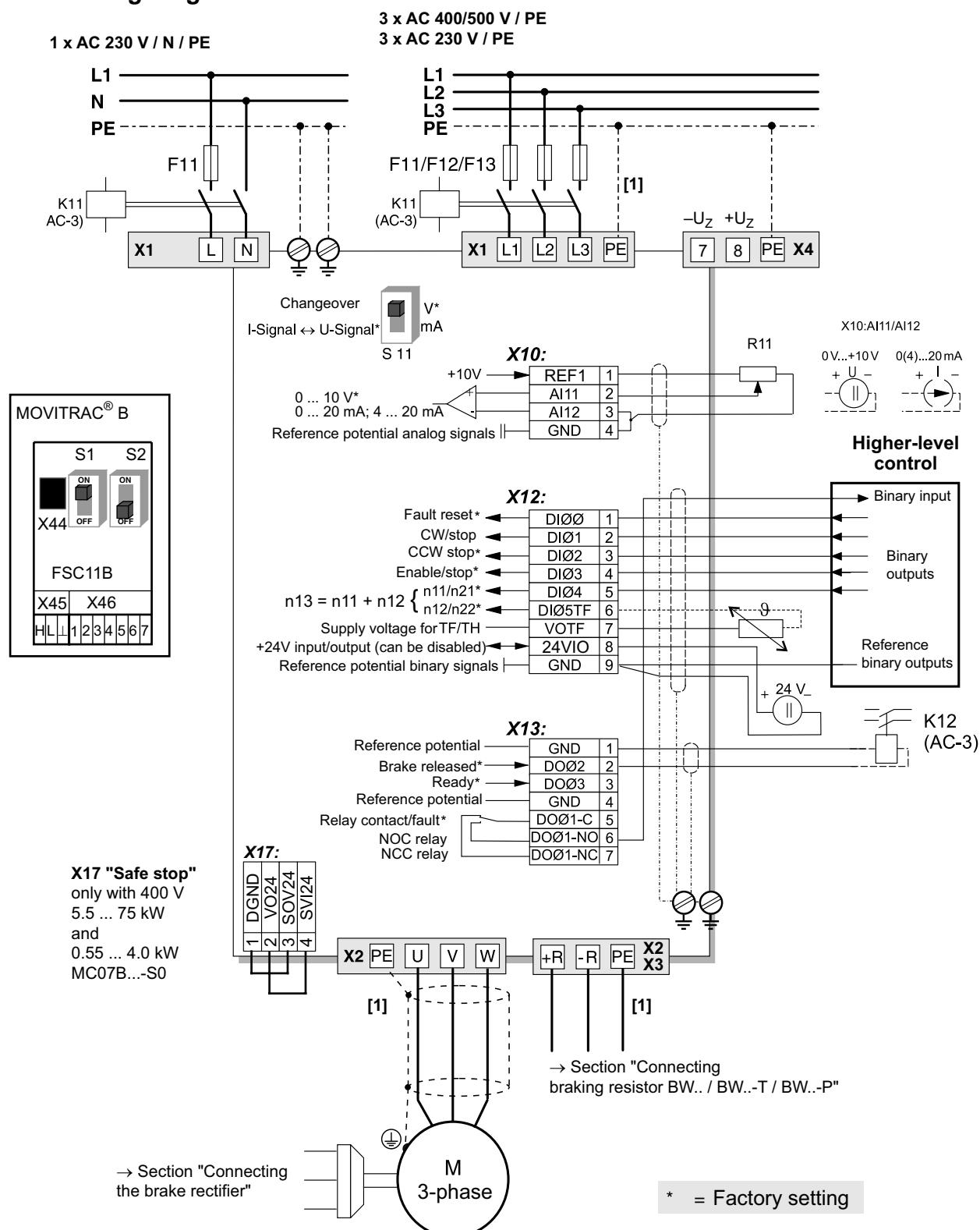
**NOTE**

**IT systems**

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



## 8.7 Wiring diagram



[1] In sizes 1, 2S, and 2, there is no PE connection next to the power supply connection terminals and motor connection terminals [X1]/[X2]. In this case, use the PE terminal next to the DC link connection [X4].

From size 3 onwards, there are two additional PE terminals.

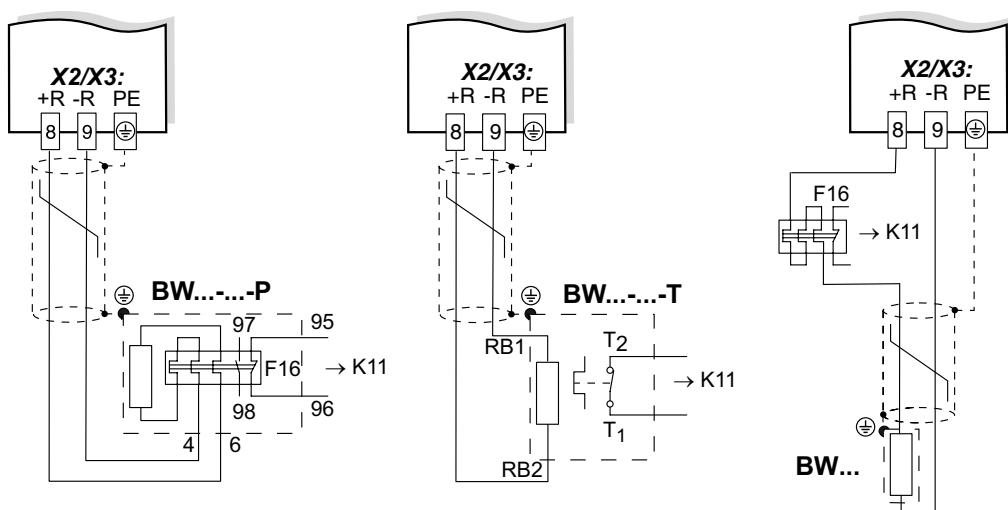


## 8.8 TF thermistor and TH bimetallic switch

The winding temperature is monitored using TF thermistors or TH bimetallic switches. 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 signal. The temperature will then be monitored by MOVITRAC®, no additional monitoring unit is required.

A connection can also be made to 24VIO and a binary output when using TH bimetallic switches. Set the binary input to /External fault.

## 8.9 Connecting braking resistors BW.. / BW..-T / BW..-P to X3 / X2



A terminal must be set to "/Controller inhibit". K11 must be opened and "/Controller inhibit" must receive a "0" signal in the following cases:

- BW...-P: The auxiliary contact trips
- BW...-T: The internal temperature switch trips
- BW...: The external bimetallic relay F16 trips

The resistor circuit must not be interrupted.

### Overload protection for braking resistors BW:

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

1) Permitted installation: On horizontal or vertical surfaces with brackets at the bottom and perforated sheets at top and bottom. **Not permitted:** On vertical surfaces with brackets at the top, right or left.



### 8.10 Connecting the brake rectifier

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

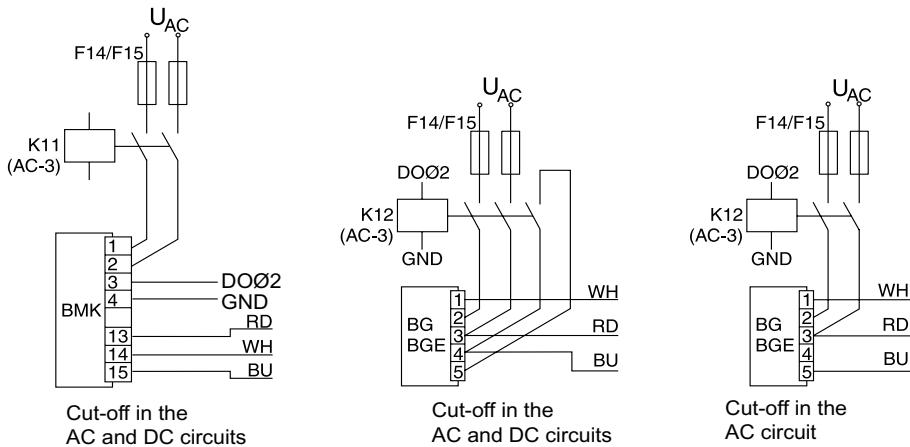
Use contactors of utilization category AC-3 for K11 and K12 only.

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.

Wiring diagrams

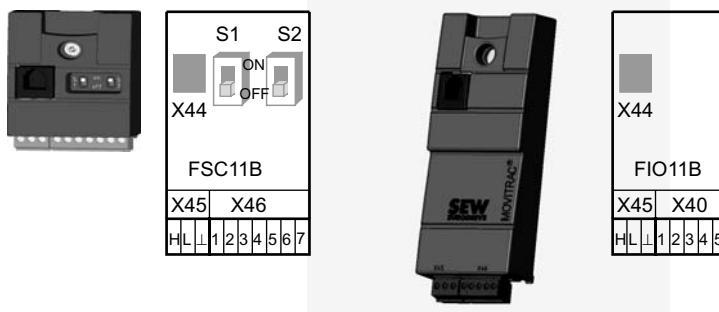


Note the corresponding connection regulations for brakes without BG/BGE or BME. Refer to the SEW publication "Drive Engineering - Practical Implementation: SEW Disc Brakes" for more information.



## 8.11 Installing FSC11B / FIO11B

You can enhance the basic units with the FSC11B and FIO11B modules.



Connection/unit	FIO11B	FSC11B
RS-485 service interface X44	Yes	Yes
RS-485 terminal connection X45	Yes	Yes
SBus connection X46	No	Yes
Analog input/output X40	Yes	No

### 8.11.1 Mounting and installation on FSC11B/FIO11B

Always attach the option to the unit with the screw that is included. For size 0, mount the spacer bolt first. The bolt is already installed in sizes 1 and higher. Fitting the screw secures the high-frequency EMC connection between the basic unit and the option.

Function	Termin-al	Description	Data	FSC11B	FIO11B
Service interface	X44	Via RJ10 plug connector	Only for service purposes Maximum cable length 3 m (10 ft)	Yes	Yes
RS-485 interface	X45:H	ST11: RS-485+		Yes	Yes
	X45:L	ST12: RS-485-			
	X45:⊥	GND: Reference potential			
System bus	X46:1	SC11: SBUS high	CAN bus to CAN specification 2.0, parts A and B Max. 64 stations Terminating resistor 120 Ω can be activated via DIP switch	Yes	No
	X46:2	SC12: SBUS low			
	X46:3	GND: Reference potential			
	X46:4	SC21: SBUS high			
	X46:5	SC22: SBUS low			
	X46:6	GND: Reference potential			
DC 24 V	X46:7	24VIO: Auxiliary voltage / external voltage supply		Yes	No
Analog input	X40:1	AI2: Voltage input	-10 ... +10 V $R_i > 40 \text{ k}\Omega$ Resolution 10 bit Sampling time 5 ms	No	Yes
	X40:2	GND: Reference potential			



## Installation

### Installing FSC11B / FIO11B

Function	Terminal	Description	Data	FSC11B	FIO11B
Analog output	X40:3	GND: Reference potential	0 ... +10 V $I_{max} = 2 \text{ mA}$	No	Yes
	X40:4	AOV1: Voltage output	0 (4) ... 20 mA		
	X40:5	AOI1: Current output	Resolution 10 bit Sampling time 5 ms Short-circuit proof, protected against external voltage up to 30 V		

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

#### 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 mm<sup>2</sup> (AWG 23 ... AWG 18)
    - Cable resistance 120 Ω at 1 MHz
    - Capacitance per unit length ≤ 40 pF/m at 1 kHz
- Suitable cables include CAN bus or DeviceNet cables.

#### Connecting the shield

- 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 connections between MOVITRAC® B and gateways, or MOVITRAC® B and MÖVITRAC® B with shielded cables. A 2-core cable is permitted in this case.
- When connecting MOVIDRIVE® B and MOVITRAC® B, be aware that the electrical isolation is eliminated between the reference potential DGND and ground in MOVIDRIVE® B.

	<p><b>STOP!</b></p> <p>Potential displacement</p> <p>Possible consequences include malfunctions that could lead to irreparable damage to the unit.</p> <ul style="list-style-type: none"> <li>• There must not be any potential displacement between the connected units. Take appropriate measures to avoid potential displacement, such as connecting the unit ground connectors using a separate cable.</li> </ul>
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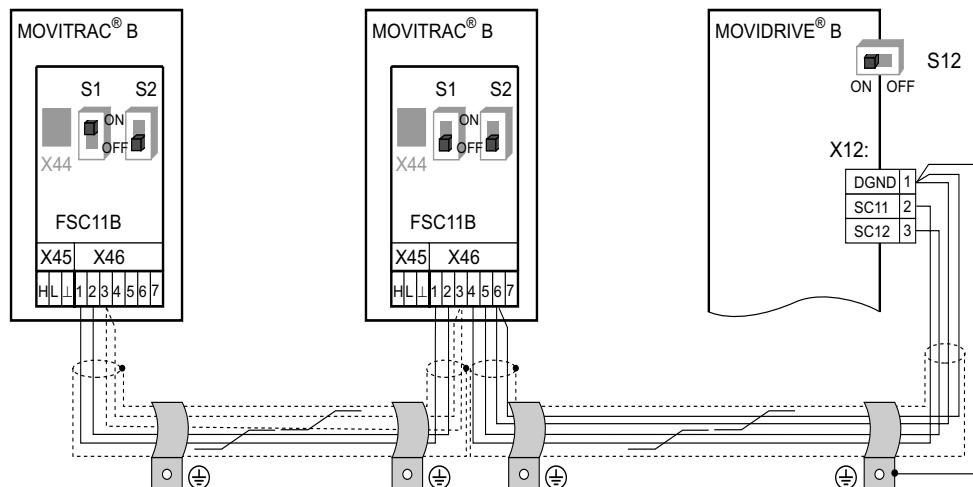


### 8.11.2 Installing the system bus (SBus) to FSC11B

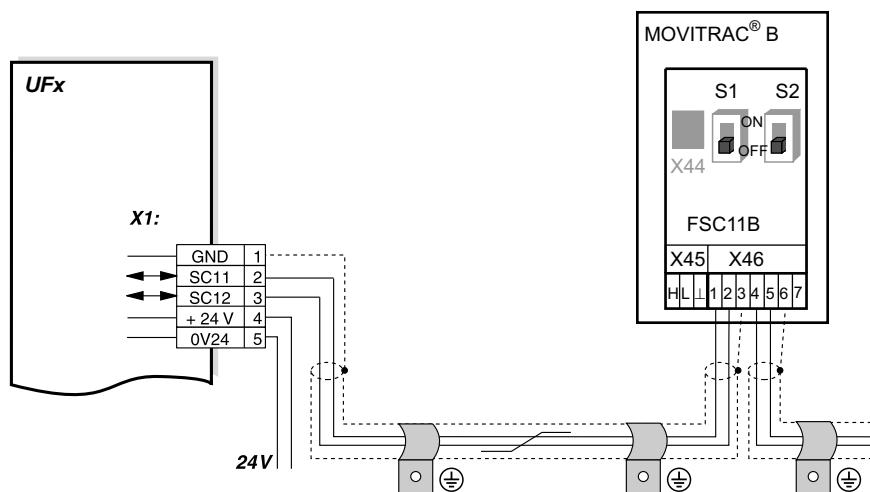
Max. 64 CAN bus nodes can be addressed via the system bus (SBus). The SBus supports transmission technology compliant with ISO 11898.

S1	S2	SC11/SC12	SC21/SC22
Off	Off	CAN1	CAN1
On	Off	CAN1 concluded	-
X	On	Reserved	

MOVITRAC® B system bus connection



System bus connection MOVITRAC® B with UFx

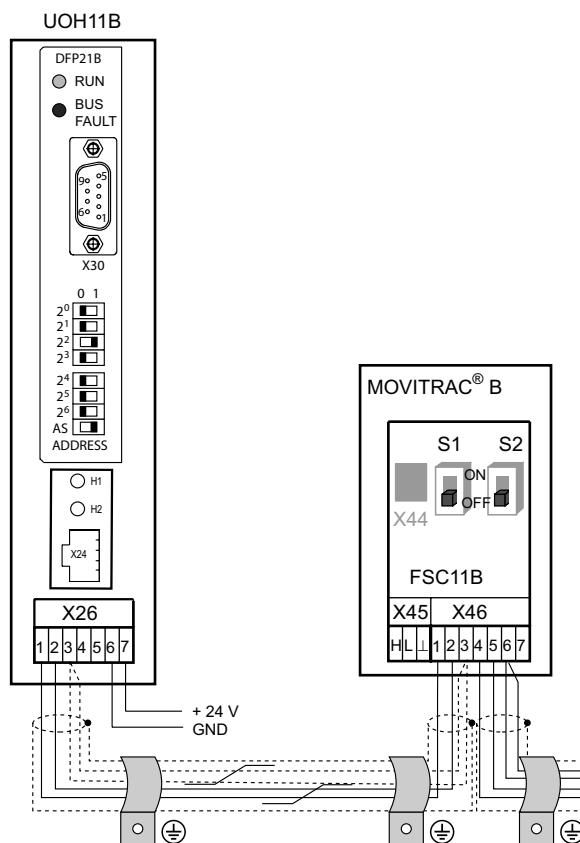




## Installation

### Installing FSC11B / FIO11B

System bus connection MOVITRAC® B with DFx/UOH11B gateways or DFx integrated in MOVITRAC® B



#### Line length

- The permitted total cable length depends on the baud rate setting of the SBus (P884):
  - 125 kBaud: 320 m (1050 ft)
  - 250 kBaud: 160 m (525 ft)
  - 500 kBaud: 80 m (260 ft)**
  - 1000 kBaud: 40 m (130 ft)
- You must use shielded cables.

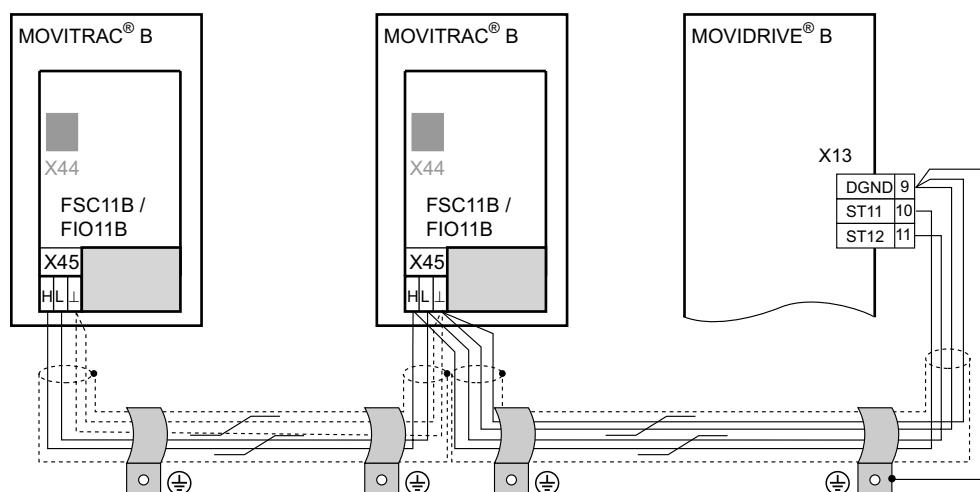
	<b>NOTE</b> Terminating resistor: Switch on the system bus terminating resistor (S1 = ON) at the start and end of the system bus connection. Switch off the terminating resistor on the units in between (S1 = OFF). Certain units have a permanently integrated terminating resistor that cannot be switched off. This is the case for UFx and DFx/UOH. These gateways form the end of the physical line. <b>Do not connect any external terminating resistors.</b>
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### 8.11.3 Installing RS-485 interface to FSC11B

The RS-485 interface can be used for connecting max. 32 MOVITRAC® units or 31 MOVITRAC® units and a higher-level controller (PLC).

MOVITRAC® B RS-485 connection



#### Cable length

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

NOTE
Terminating resistor: Dynamic terminating resistors are installed. <b>Do not connect any external terminating resistors.</b>

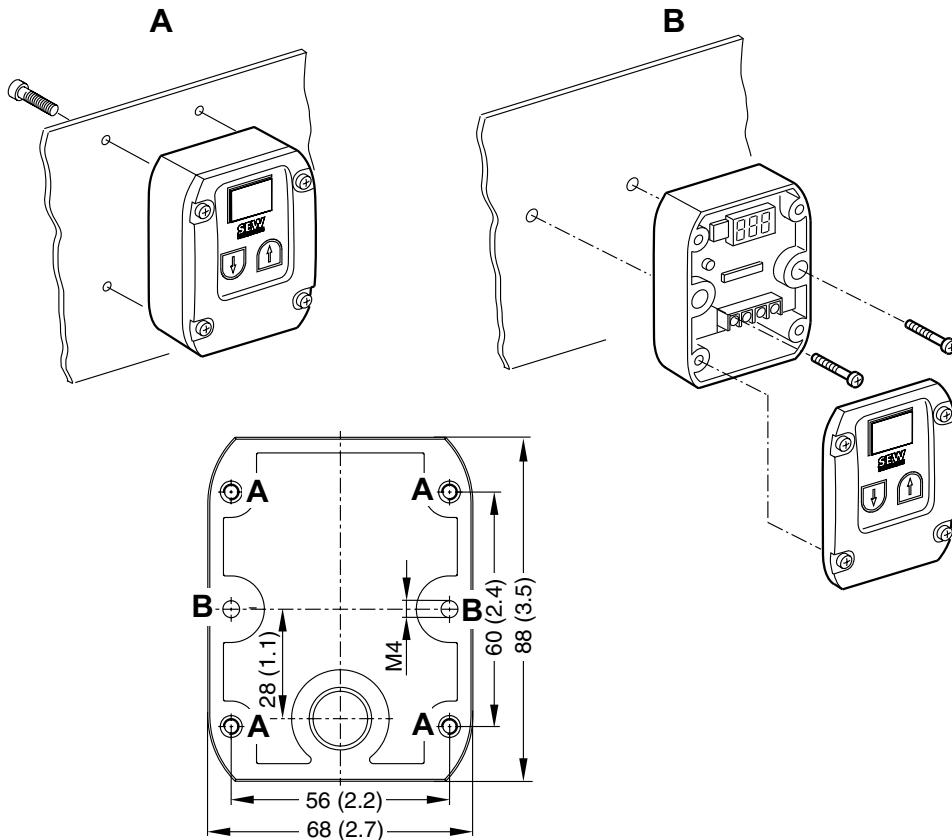
### 8.11.4 Wiring analog module FIO11B

Bipolar analog input AI2	Unipolar analog input AI2	Current analog output AOC1	Voltage analog output AOV1
		<p><math>R_L \leq 750 \Omega</math></p>	

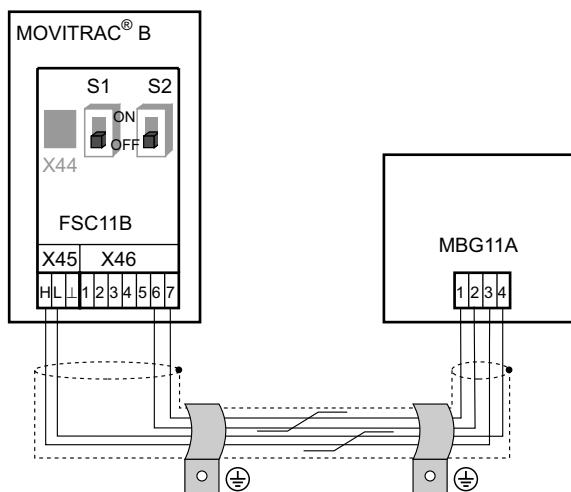


### 8.12 Installing MBG11A speed control module

- Mounting A from the rear using 4 tapped holes.
- Mounting B from the front using 2 retaining holes



#### 8.12.1 Connection





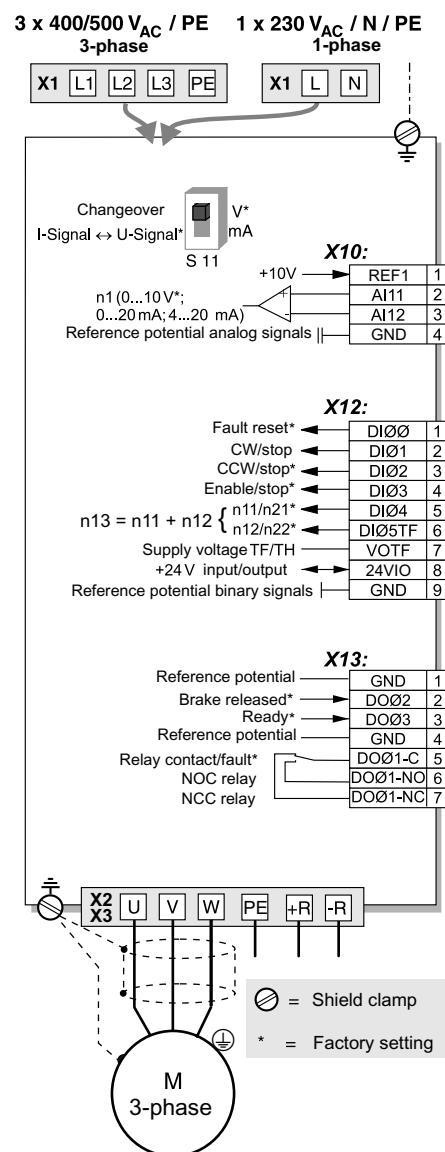
## 9 Startup

### 9.1 Brief description of the startup process

The MOVITRAC® B frequency inverter can be connected directly to a motor of the same power. For example: A 1.5 kW (2.0 HP) motor can be connected directly to a MC07B0015.

#### 9.1.1 Procedure

1. Connect the motor to MOVITRAC® B (terminal X2).
2. You have the option of connecting a braking resistor (terminal X2/X3).
3. The following signal terminals must be controlled with your control system:
  - Enable DI $\emptyset$ 3
  - As required CW/Stop DI $\emptyset$ 1 or CCW/Stop DI $\emptyset$ 2
  - Setpoint:
    - Analog input X10 and/or
    - DI $\emptyset$ 4 = n11 = 150 rpm or/and
    - DI $\emptyset$ 5 = n12 = 750 rpm or/and
    - DI $\emptyset$ 4 + DI $\emptyset$ 5 = n13 = 1500 rpm
  - For brakemotors:  
DO $\emptyset$ 2 = Brake control using brake rectifiers
4. You have the option of connecting the following signal terminals:
  - DI $\emptyset$ 0 = Fault reset
  - DO $\emptyset$ 1 = /Fault (designed as relay contact)
  - DO $\emptyset$ 3 = Ready
5. Check the controller for the 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: UWS21B / UWS11A / USB11A.

	<b>NOTE</b>
	The MOVITRAC® B frequency inverter must only be operated in strict observance of the detailed operating instructions.



#### 9.2 General startup instructions

	<b>HAZARD!</b>
	<p>Uncovered power connections. Severe or fatal injuries from electric shock.</p> <ul style="list-style-type: none"><li>• Install the touch guard according to the regulations.</li><li>• Never start the unit if the touch guard is not installed.</li></ul>

##### 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.

##### 9.2.2 Hoist applications

	<b>HAZARD!</b>
	<p>Risk of fatal injury if the hoist falls. Severe or fatal injuries.</p> <p>MOVITRAC® B may not be used as a safety device in hoist applications.</p> <ul style="list-style-type: none"><li>• Use monitoring systems or mechanical protection devices to ensure safety.</li></ul>



### 9.3 Preliminary work and resources

- Check the installation.

	<b>HAZARD!</b> Risk of crushing if the motor starts up unintentionally. Severe or fatal injuries. <ul style="list-style-type: none"><li>• Ensure that the motor cannot start inadvertently, for example, by removing the electronics terminal block X13.</li><li>• Additional safety precautions must be taken depending on the application, such as monitoring systems or mechanical protection devices, to avoid injury to people and damage to machinery.</li></ul>
--	--

#### 9.3.1 Preliminary work and resources on the MOVITRAC® B basic unit

- Connect the supply system and the motor.
- Connect the signal terminals.
- Switch on the power supply system.

#### 9.3.2 Preliminary work and resources on MOVITRAC® B with keypad

- Connect the supply system and the motor. **Do not connect signal terminals!**
- Switch on the power supply system.
- The 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.

	<b>NOTE</b> The inverter automatically changes parameter values once you perform a startup.
--	--



## Startup Optional keypad FBG11B

### 9.4 Optional keypad FBG11B

Key arrangement and symbols on keypad:



#### 9.4.1 Keypad functions

The UP/DOWN and ENTER/OUT buttons are used for navigating through the module is used for setpoint specification.

	Use UP/DOWN to select symbols and change 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.

	<b>NOTE</b>
	After switching off the power supply, press the STOP key to revoke the lock.

The STOP/RESET key can be used for performing a reset after a fault has occurred with a programmed error response. The drive is then inhibited and must be enabled using the RUN key. You can deactivate the STOP function with parameter 760 using FBG11B.

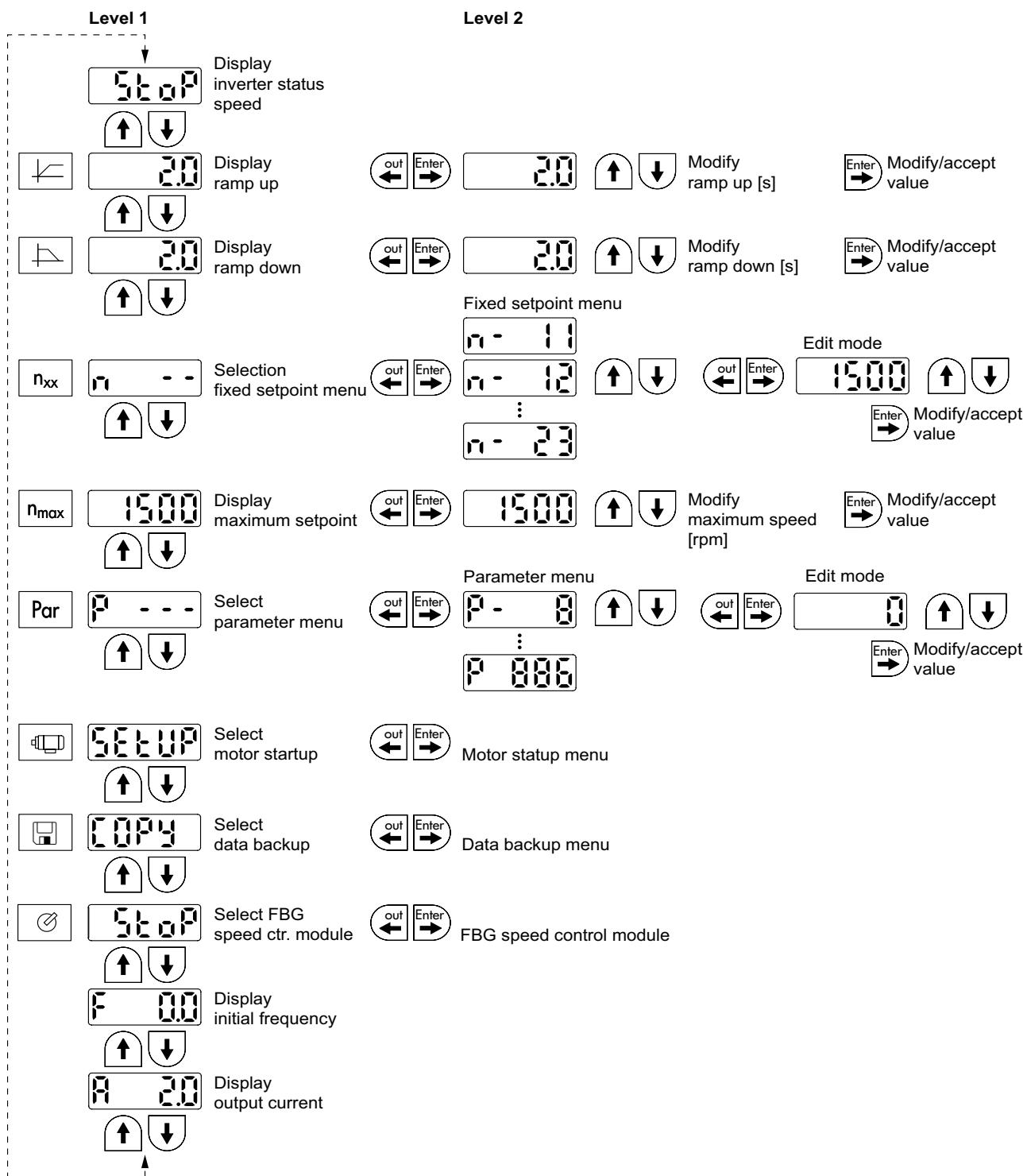


If you stop the drive with the STOP/RESET key, the display `Stop` is flashing. This signal indicates you have to enable the drive using the "RUN" key.

After copying the parameter set in MOVITRAC® B, the unit is also stopped.



## 9.5 Basic operation of the FBG11B keypad





#### 9.5.1 Menu system

The LED integrated in the symbol lights up when you select a symbol. If a symbol only represents display values, the current display value appears immediately on the display.

#### 9.5.2 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. When pressing the ENTER key again, the value becomes active and the LED does not flash any longer.

#### 9.5.3 Status display

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

#### 9.5.4 Fault display

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

#### 9.5.5 Warnings

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

#### 9.5.6 Parameter menu change short ↔ long

Using parameter P800, you can switch back and forth between short menu and long menu. The parameter description and parameter list indicates which parameters are accessible via short and long menu.



## 9.6 Manual operation with FBG11B speed control module

**FBG11B speed control module of the keypad** (local manual operation): LED  flashes

The only relevant parameters in "FBG speed control module" operating mode are:

- *P122 Direction of rotation FBG manual operation*
- "RUN" and "STOP/RESET" keys
- Speed control module

When the FBG speed control module is activated, the symbol flashes.

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

After a fault, a reset can be performed using the "STOP/RESET" button via the terminal or the interface. After a reset, the "manual speed control module" 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 parameter *P760 Locking RUN/STOP keys* does not have any effect in "manual speed control module" operating mode.

Removing the FBG11B keypad will trigger a stop response.



## 9.7 External setpoint selection

### External setpoint selection

Control via

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

#### 9.7.1 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*

#### 9.7.2 Setpoint speed

You can specify the set speed:

- Speed control module if *P121 Addition FBG speed control module* is set to ON
- *P100 Setpoint source*
  - Fixed setpoints
  - Fixed setpoints with analog input
  - Process data word from SBus or RS-485
  - Motor potentiometer

#### 9.7.3 Direction of rotation enable with RS-485 or SBus

Unipolar setpoint sources:

Unipolar/fixed setpoint  
Motor potentiometer/fixed setpoint  
Fixed setpoint + AI1  
Fixed setpoint\* + AI1  
Frequency setpoint input/fixed setpoint

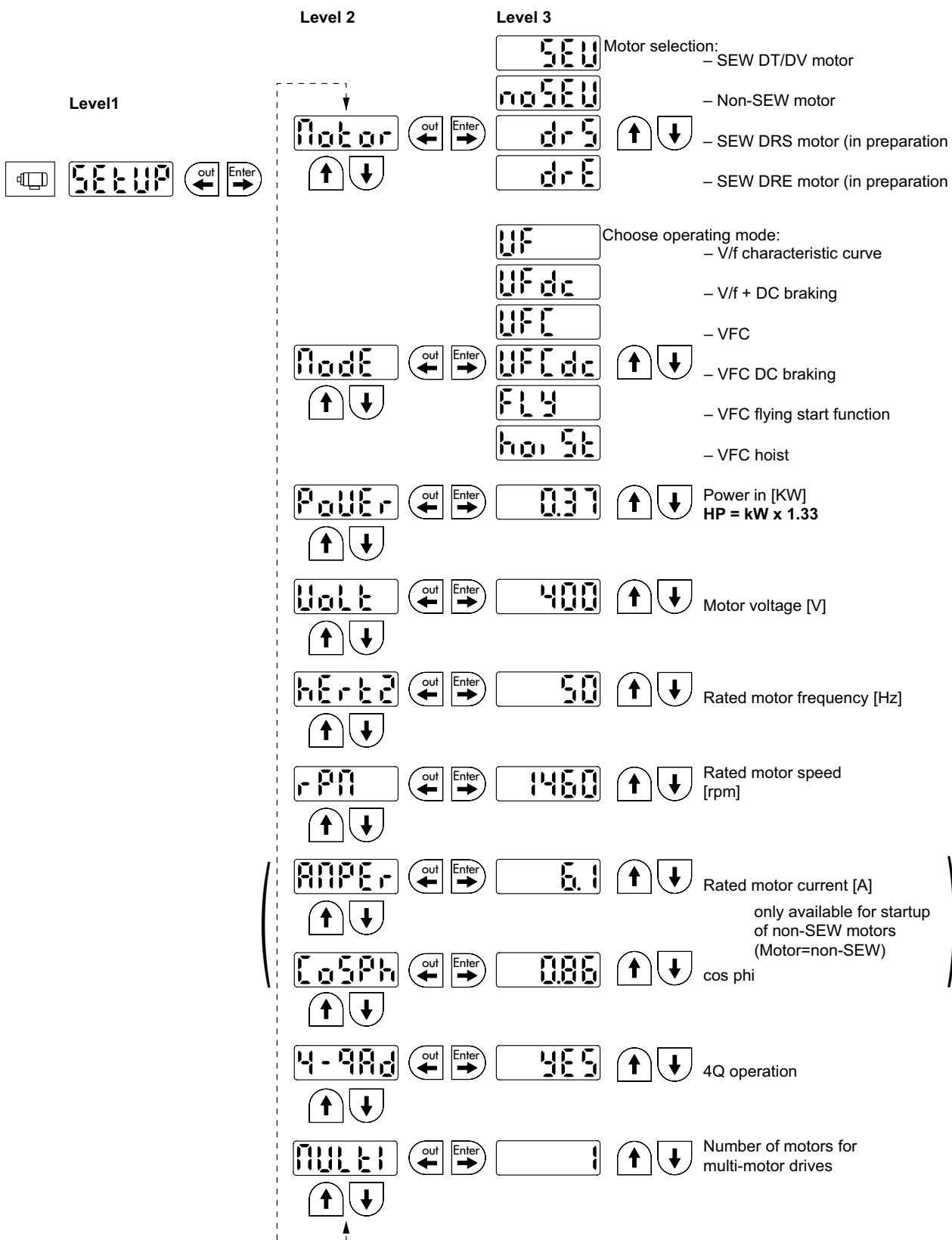
The direction of rotation is set with the CW or CCW terminals.

Bipolar setpoint sources:

Bipolar/fixed setpoint  
RS-485/fixed setpoint  
SBus 1/fixed setpoint

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

## 9.8 Startup using the FBG11B keypad





## Startup

### Startup using the FBG11B keypad

#### 9.8.1 Required data

The following data is required to ensure startup is successful:

- Motor type (SEW or non-SEW motor)
- Motor data
  - Rated voltage and rated frequency
  - Additionally for non-SEW motors: Rated current, rated power, rated factor  $\cos \varphi$ , and rated speed.
- Rated mains voltage

#### 9.8.2 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 button.

You can then perform the startup only with motor parameter set 1.

	<b>NOTE!</b>
The SEW motor startup is designed for 4-pole motors. It may be useful to startup 2-pole or 6-pole SEW motors as non-SEW motors.	

#### 9.8.3 V/f

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

#### 9.8.4 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

For this purpose, you will have to choose the VFC or VFC & DC brake operating modes from P-01 at startup.



### 9.8.5 Startup of multi-motor drive

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

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.

### 9.8.6 Startup of group drives

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

You can operate a group of asynchronous motors on one inverter in V/f characteristic curve 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 limitation P303/313 to 1.5 times the total current of all motors
- Set  $I_{\text{rated}}$  UL monitoring P345/346 to the total current of the connected motors. Implement motor protection individually.

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

	<b>NOTE!</b>
	The parameter settings apply to all connected motors.

## 9.9 Startup with DBG60B

### 9.9.1 Required data

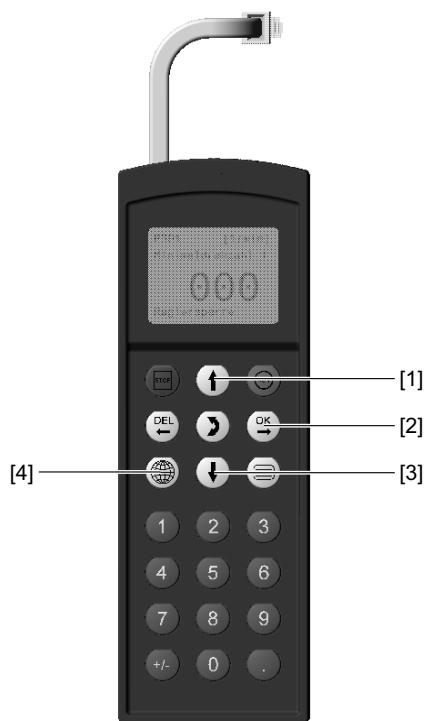
The following data is required to ensure startup is successful:

- Motor type (SEW or non-SEW motor)
- Motor data
  - Rated voltage and rated frequency
  - Additionally for non-SEW motors: Rated current, rated power, rated factor  $\cos \varphi$ , and rated speed.
- Rated mains voltage



### 9.9.2 Selecting a language

The figure below shows the keys for selecting the language.

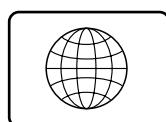


- |     |              |                                  |
|-----|--------------|----------------------------------|
| [1] | ↑ key        | Move up to the next menu item    |
| [2] | OK key       | Confirm entry                    |
| [3] | ↓ key        | Move down to the next menu item  |
| [4] | Language key | A list of languages is displayed |

The following text appears on the display when the keypad is switched on for the first time or after activating the start mode:

SEW  
EURODRIVE

The symbol for language selection then appears on the display.



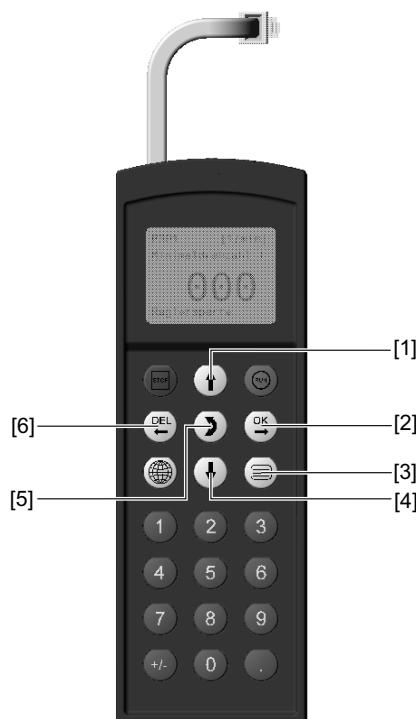
Proceed as follows to select the language:

- Press the language key. A list of languages is displayed on the screen.
- Choose the desired language using the ↑ / ↓ keys.
- Confirm your language selection by pressing the OK key. The basic display is now shown in your chosen language.



### 9.9.3 Startup

The figure below shows the keys required for startup.



- |     |             |   |
|-----|-------------|---|
| [1] | ↑ key       | Move up to the next menu item             |
| [2] | OK key      | Confirm entry                             |
| [3] | Context key | Activate the context menu                 |
| [4] | ↓ key       | Move down to the next menu item           |
| [5] | ↔ key       | Change the menu, display mode ↔ edit mode |
| [6] | DEL key     | Cancel or abort startup                   |

### 9.9.4 Startup procedure

1. Enter "0" signal at terminal X12:2 (DIØ1 "/CW/STOP), e.g. by disconnecting X13 the electronics terminal block.

0.00rpm  
0.000Amp  
CONTROLLER INHIBIT

2. Press the context key to activate the context menu.

**PARAMETER MODE**  
**VARIABLE MODE**  
**BASIC VIEW**

3. Scroll down with the ↓ key until you have selected the menu option "STARTUP".

**MANUAL MODE**  
**STARTUP**  
**COPY TO DBG**  
**COPY TO MDX**



## Startup

### Startup with DBG60B

4. To startup, select the OK key. The first parameter appears. The flashing cursor under the parameter number indicates that the keypad is in display mode.
  - Use the  $\leftrightarrow$  key to switch to edit mode. The flashing cursor disappears.
  - Use the  $\uparrow$  or  $\downarrow$  key to select "PARAMETER SET 1" or "PARAMETER SET 2".
  - Press the OK key to confirm your selection.
  - Use the  $\leftrightarrow$  key to switch back to display mode. The flashing cursor appears again.
  - Use the  $\uparrow$  key to choose the next parameter.

STARTUP  
PREPARE FOR STAR-TUP

5. Set the motor type.

C00\*STARTUP  
**PARAMETER SET 1**  
PARAMETER SET 2

C22\*MOTORS  
SINGLE MOTOR  
IDENT. MOTORS  
DIFFERENT MOTORS

6. Select the operating mode you require. Use the  $\uparrow$  key to choose the next parameter.  
VFC operating mode is required for activating the flying start or hoist function.

C01\*OPER. MODE 1  
STANDARD V/f  
**VFC1**

- a. When selecting STANDARD V/f operating mode:

C28\*DC BRAKING  
NO  
YES

- b. When selecting VFC operating mode:

C36\*OPER.MODE  
SPEED CONTROL  
HOIST  
DC BRAKING  
FLYING START

7. Select the motor type. If a 2 or 4-pole SEW motor is connected, select the correct motor from the list. If a non-SEW motor or an SEW motor with more than four poles is connected, select "NON-SEW MOTOR" from the list.  
Use the  $\uparrow$  key to choose the next parameter.

C02\*MOTOR TYPE 1  
DT71D2  
**DT71D4**  
DT80K2

C02\*MOTOR TYPE 1  
**NON-SEW MOTOR**  
DT63K4/DR63S4



8. Enter the rated motor voltage for the selected connection type according to the value specified on the nameplate.

C03\* V  
RATED MOT. VOLT 1  
+400.000

Example: Nameplate 230 Δ / 400 ↗ 50 Hz  
↗ connection → enter "400 V".

Δ connection/transition point at 50 Hz → enter "230 V".

Δ connection, transition point at 87 Hz → Also enter 230 V.  
However, set parameter P302 "MAXIMUM SPEED 1" to the value for 87 Hz after startup first. Then start the drive.

Example: Nameplate 400 Δ / 690 ↗ 50 Hz

Only Δ connection possible → enter "400 V".

↗ connection is not possible.

Use the ↑ key to choose the next parameter.

9. Enter the rated frequency specified on the motor nameplate.

C04\* Hz  
RATED MOT. FREQ. 1  
+50.000

Example: 230 Δ / 400 ↗ 50 Hz  
Enter "50 Hz" in ↗ and Δ connection.

Use the ↑ key to choose the next parameter.

#### FOR SEW MOTORS

10. The motor values are stored for SEW 2 and 4-pole motors and need not be entered.

C47\*4-Q OPERATION  
NO  
YES

#### FOR NON-SEW MOTORS

10. Enter the following motor nameplate data:
- C10\* Rated motor current, connection type ↗ or Δ .
  - C11\* rated motor power
  - C12\* power factor cos φ
  - C13\* rated motor speed

C47\*4-Q OPERATION  
NO  
YES

11. Enter the rated power supply voltage (C05\* for SEW motor, C14\* for non-SEW motor).

C05\* V  
RAT. MAINS VOLT. 1  
+400.000

11. Start the calculation for the startup data by choosing "YES".  
The process lasts a few seconds.

C06\*CALCULATION  
NO  
YES

#### FOR SEW MOTORS

12. The calculation is performed. After calculation, the next menu item appears automatically.

C06\*SAVE  
NO  
YES



## Startup

### Startup with DBG60B

#### FOR NON-SEW MOTORS

12. For non-SEW motors, a calibration process is required to perform the calculation:
- When prompted, apply a "1" signal to terminal X12:2 (DI01 "/CW/STOP").
  - Apply a "0" signal to terminal X12:2 again after the calibration is complete.
  - After calculation, the next menu item appears automatically.

13. Set "SAVE" to "YES". The data (motor parameters) are copied to the non-volatile memory of MOVITRAC®.

DATA IS  
BEING COPIED...

14. The startup procedure is now complete. Use the DEL key to return to the context menu.

MANUAL MODE  
**STARTUP**  
COPY TO DBG  
COPY TO MC07B

15. Use the ↓ key to scroll down until the menu item "EXIT" is selected.

UNIT SETTINGS  
**EXIT**

16. Confirm your selection by pressing OK. The basic display appears.

0.00rpm  
0.000Amp  
CONTROLLER INHIBIT



#### HAZARD!

Parameter settings incorrect due to unsuitable data sets.

Severe or fatal injury.

Make sure that the data set you copy is suitable for the application.

- Enter any parameter settings which differ from the factory settings in the parameter list.
- In the case of non-SEW motors, set the correct brake application time (P732 / P735).
- Observe the notes for starting the motor in the section "Starting the Motor".
- With Δ connection and transition point at 87 Hz, set parameter P302/312 "Maximum speed ½" to the value for 87 Hz.



### 9.9.5 Setting parameters

Proceed in the following order to set the parameters:

- Use the context key to call up the context menu. In the context menu, select the "PARAMETER MODE" menu item. Press the OK key to confirm your selection. The flashing cursor under the parameter number indicates that the keypad is in parameter mode.
- Use the  $\leftrightarrow$  key to switch to edit mode. The flashing cursor disappears.
- Using the  $\uparrow$  or  $\downarrow$  key, you can select or set the correct parameter value.
- Press the OK key to confirm the selection or setting.
- Use the  $\leftrightarrow$  key to switch back to parameter mode again. The flashing cursor appears again.
- Use the  $\uparrow$  key to choose the next parameter.

### 9.9.6 Manual operation

The inverter can be controlled using the DBG60B keypad in manual operation (Context menu → Manual operation). The 7-segment display on the unit shows "H" during manual operation.

The binary inputs will be without any functions for the duration of manual operation, with the exception of a /Controller inhibit. A binary input "/Controller inhibit" must be assigned a "1" signal to enable the drive to be started in manual operation.

The direction of rotation is not determined by the "CW/stop" or "CCW/stop" binary inputs. Instead, you select the direction of rotation using the DBG60B keypad.

- Enter the required speed and then the direction of rotation (+ = CW/- = CCW) using the sign key (+/-).

Manual operation remains active when the power supply is switched off and on; however, the inverter is then inhibited.

- Use the "Run" key to enable and start the inverter at  $n_{min}$  in the selected direction of rotation. The speed is increased and decreased using the  $\uparrow$  and  $\downarrow$  keys.

	<b>NOTE</b>
The signals at the binary inputs take effect as soon as manual operation is finished. A binary input /Controller inhibit does not have to be switched from "1" to "0" and back to "1". The drive can start according to the signals at the binary inputs and the setpoint sources.	

	<b>HAZARD!</b>
<p>Risk of crushing if the motor starts up unintentionally. Severe or fatal injuries.</p> <ul style="list-style-type: none"><li>• Ensure that the motor cannot start inadvertently, for example, by removing the electronics terminal block X13.</li><li>• Additional safety precautions must be taken depending on the application to avoid injury to people and damage to machinery.</li></ul>	



## Startup

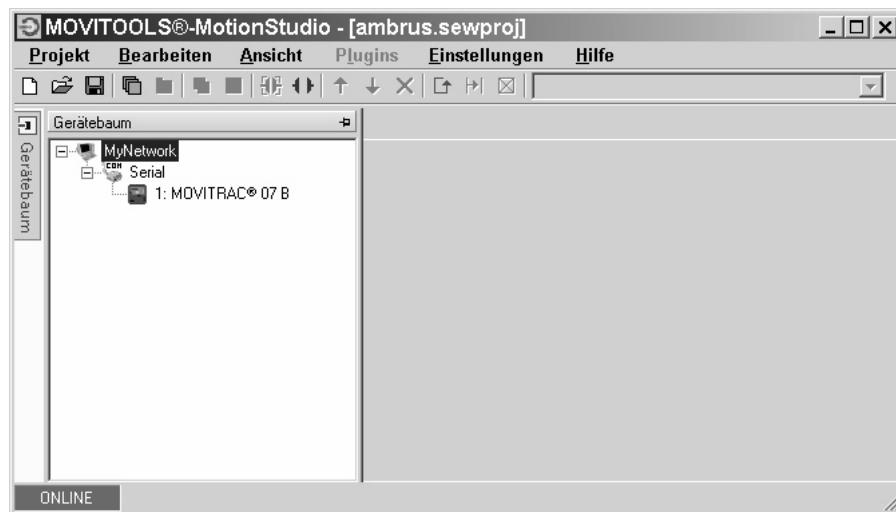
Startup with PC and MOVITOOLS® MotionStudio

### 9.10 Startup with PC and MOVITOOLS® MotionStudio

Start MOVITOOLS® MotionStudio in the Windows start menu:

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

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



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

### 9.11 Startup for MBG11A speed control module

You cannot simultaneously establish communication between MOVITRAC® B / MBG11A and MOVITRAC® B / PC.

The MBG11A can simultaneously specify a setpoint for up to 31 MOVITRAC® B units.

#### 9.11.1 Parameter settings

The following parameters have to be set in MOVITRAC® B other than the factory setting. When you use a FBG11B for setting the parameters, set the values indicated in parenthesis:

- P100: RS 485 (2)
- P101: RS 485 (1)
- P871: Set PA2 to "Speed [%]", then P876 PA data enable to "Yes".

The speed is now displayed:  $-100\% \dots 100\%$  correspond to  $-n_{max} \dots n_{max}$ .

#### 9.11.2 Input terminals

The following input terminals must be connected with 24 V:

- DI01 CW/Stop: positive + negative direction of rotation are possible by selecting the +/- sign on the MBG11A.
- DI03 Enable/Stop



### 9.11.3 Settings for process data word

If you do not change the PO2 process data word, you can also use the MBG11B. In this case, the conversion is 1 % = 32 rpm. The results from the relationship 4000 hex = 100 % speed. Refer to the following tables for the respective value.

PO2 = Speed (standard parameter setting P871 = speed)

Percent	Hex	Decimal	Speed
1 %	A4 hex	164 dec	32
10 %	666 hex	1638 dec	328
25 %	1000 hex	4096 dec	819.2
33 %	1555 hex	5461 dec	1092.3
50 %	2000 hex	8192 dec	1638.4
75 %	3000 hex	12288 dec	2457.6
100 %	4000 hex	16384 dec	3276.8

PA2 = Speed [%] (changed parameter setting P871 = speed [%])

Percent	Hex	Decimal	Speed
1 %	A4 hex	164 dec	n_max / 100
10 %	666 hex	1638 dec	n_max / 10
25 %	1000 hex	4096 dec	n_max / 4
33 %	1555 hex	5461 dec	n_max / 3
50 %	2000 hex	8192 dec	n_max / 2
75 %	3000 hex	12288 dec	n_max / 1.333
100 %	4000 hex	16384 dec	n_max

## 9.12 Starting up pumps and fans of non-SEW motors

Due to the physical conditions of the application, it is recommended that you adjust the following parameters when operating pumps and fans, and non-SEW motors:

- Operation of the drive in the V/F characteristic curve operating mode; Parameter 700 / 701 = V/f characteristic curve (21)
- Disable automatic adjustment; Parameter 320 / 330 = Off (0)
- Set IxR adjustment to 0; Parameter 322 / 332 = 0
- Set boost to 0; Parameter 321 / 331 = 0
- Minimize slip compensation and set to 0 if required; Parameter 324 / 334
- Increase ramp times; Parameters 130 / 140 and 131 / 141

Deactivating the slip compensation might require that you specify a higher setpoint speed to achieve the required air/volume flow.



## Startup

### Starting the motor

#### 9.13 Starting the motor

##### 9.13.1 Analog setpoint specification

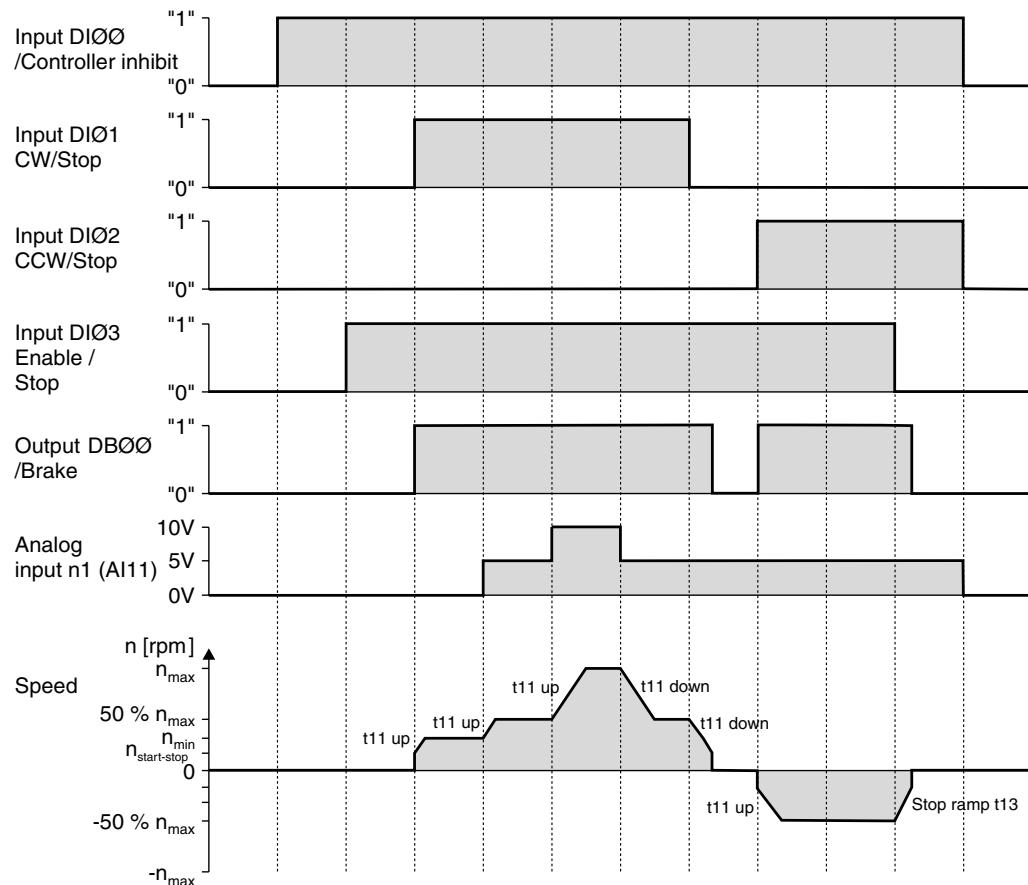
The following table shows which signals must be present on terminals X11:2 (AI1) and X12:1 ... X12:4 (DIØØ ... DIØ3) when the "unipolar/fixed setpoint" setpoint is selected (P100), in order to operate the drive with an analog setpoint entry.

Function	X11:2 (AI11) Analog input n1	X12:1 (DIØØ) /Control- ler inhibit <sup>1)</sup>	X12:2 (DIØ1) CW/stop	X12:3 (DIØ2) CCW/ stop	X12:4 (DIØ3) Enable/ stop	X12:5 (DIØ4) n11/n21	X12:6 (DIØ5) n12/n22
Controller inhibit	X	0	X	X	X	0	0
Stop	X	1	X	X	0	0	0
Enable and stop	X	1	0	0	1	0	0
Clock- wise at 50 % n <sub>max</sub>	5 V	1	1	0	1	0	0
Clock- wise with n <sub>max</sub>	10 V	1	1	0	1	0	0
Counter- clockwise with 50 % n <sub>max</sub>	5 V	1	0	1	1	0	0
Counter- clockwise with n <sub>max</sub>	10 V	1	0	1	1	0	0

1) No default setting



The following travel cycle shows by way of example how the motor is started with the assignment of terminals X12:1 ... X12:4 and analog setpoints. Binary output X10:3 (DBØØ "Brake") is used for switching brake contactor K12.



**NOTE**

The motor is not energized in the event of controller inhibit. A motor without brake will coast to standstill.



## Startup

### Starting the motor

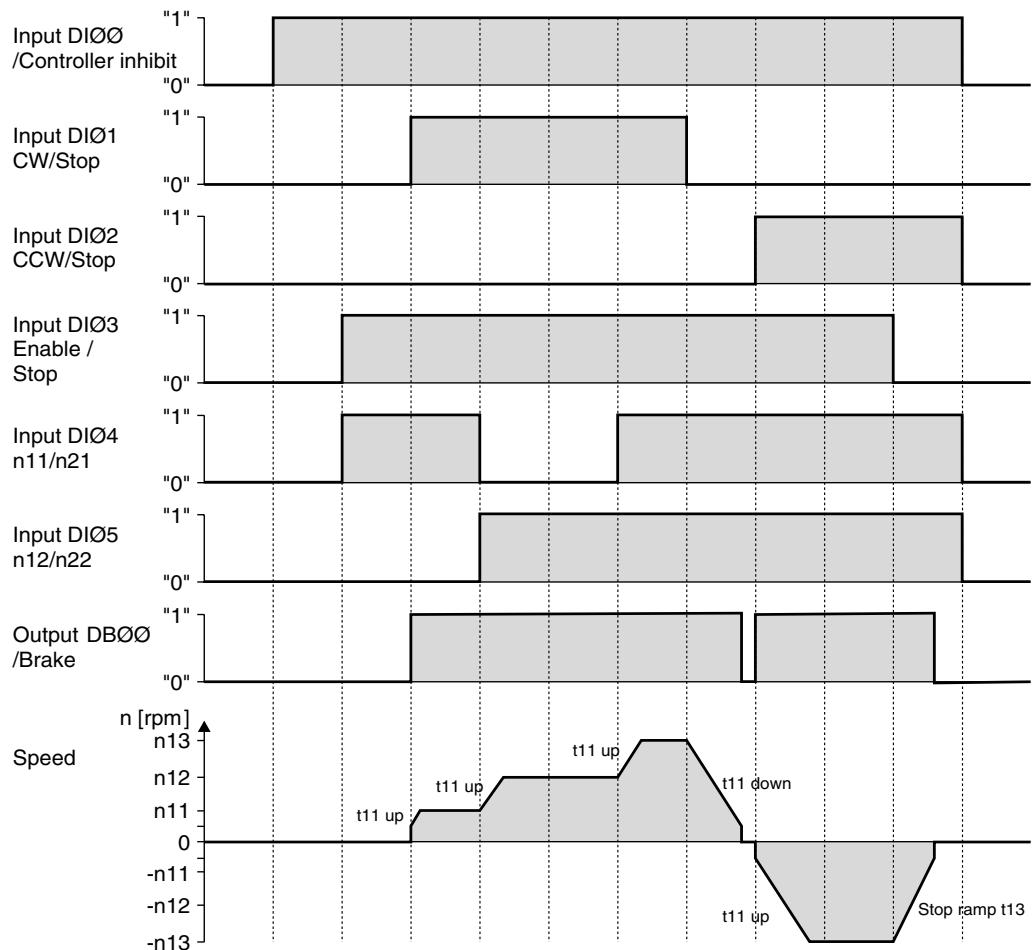
#### 9.13.2 Fixed setpoints

The following table shows which signals must be present on terminals X12:1 ... X12:6 (DIØØ ... DIØ5) when the "unipolar/fixed setpoint" setpoint is selected (P100), in order to operate the drive with the fixed setpoints.

Function	X12:1 (DIØØ) /Controller inhibit	X12:2 (DIØ1) CW/stop	X12:3 (DIØ2) CCW/stop	X12:4 (DIØ3) Enable/stop	X12:5 (DIØ4) n11/n21	X12:6 (DIØ5) n12/n22
Controller inhibit	0	X	X	X	X	X
Stop	1	X	X	0	X	X
Enable and stop	1	0	0	1	X	X
CW operation with n11	1	1	0	1	1	0
CW operation with n12	1	1	0	1	0	1
CW operation with n13	1	1	0	1	1	1
CCW operation with n11	1	0	1	1	1	0



The following travel cycle shows by way of example how the drive is started with the assignment of terminals X12:1 ... X12:6 and the internal fixed setpoints. Binary output X10:3 (DBØØ "/Brake") is used for switching brake contactor K12.



**NOTE**

The motor is not energized in the event of controller inhibit. A motor without brake will coast to standstill.



### 9.14 Parameter list

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

	Selection in long menu
	Selection in short or long menu
	Selection using symbol on keypad and in long menu
	Selection within FGB motor startup

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

No.	FBG	Index dec.	Name	Range / factory setting Display	MOVITOOLS® MotionStudio	Value after startup
<b>0_</b>			<b>Display values (read only)</b>			
<b>00_</b>			<b>Process values</b>			
000		8318	Speed (signed)		[rpm]	
001		8501	User display for DBG11B		[Text]	
002		8319	Frequency (signed)		[Hz]	
004		8321	Output current (amount)		[% I <sub>N</sub> ]	
005		8322	Active current (signed)		[% I <sub>N</sub> ]	
008		8325	DC link voltage		[V]	
009		8326	Output current		[A]	
<b>01_</b>			<b>Status displays</b>			
010		8310	Inverter status		[Text]	
011		8310	Operating status		[Text]	
012		8310	Fault status		[Text]	
013		8310	Current parameter set		Current parameter set	
014		8327	Heat sink temperature		[°C]	
<b>02_</b>			<b>Analog setpoints</b>			
020		8331	Analog input AI1		[V]	
021		8332	Analog input AI2 (optional)		[V]	
<b>03_</b>			<b>Binary inputs</b>			
030		8844	Binary input DI00		<b>Fault reset</b>	
031		8335	Binary input DI01		CW / STOP (fixed assignment)	
032		8336	Binary input DI02		<b>CCW/stop</b>	
033		8337	Binary input DI03		<b>Enable/stop</b>	
034		8338	Binary input DI04		<b>n11/n21</b>	
035		8339	Binary input DI05		<b>n12/n22</b>	



No.	FBG	Index dec.	Name	Range / factory setting	Value after startup		
				Display MOVITOOLS® MotionStudio			
039		8334 <small>Long</small>	Binary inputs DI00 ... DI05		Collective display of binary inputs		
<b>05_</b>			<b>Binary outputs</b>				
051		8349	Binary output DO01		/Fault		
052		8349	Binary output DO02		Brake released		
053		8349	Binary output DO03		Ready		
059		8349 <small>Long</small>	Binary outputs DO01 ... DO03		Collective display of binary outputs		
<b>07_</b>			<b>Unit data</b>				
070		8301	Unit type	[Text]			
071		8361	Rated output current	[A]			
076		8300	Firmware basic unit	[Part number and version]			
077		–	DBG firmware	Only in DBG60B			
<b>08_</b>			<b>Fault memory</b>				
080 ... 084		8366 ... 8370 <small>Long</small>	Fault t-0 ... t-4	Fault code	Background information for previous faults.		
<b>09_</b>			<b>Bus diagnostics</b>				
094		8455	PO1 setpoint	[hex]			
095		8456	PO2 setpoint	[hex]			
096		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_			<b>Setpoints / ramp generators</b> (on FBG only parameter set 1)				
10_			<b>Setpoint selection / frequency input</b>				
100	Short	8461	Setpoint source	0 <b>1</b> 2 4 6 7 8 9 10 11 14	Bipolar/fixed setpoint <b>Unipolar/fixed setpoint</b> RS-485/fixed setpoint Motor potentiometer/fixed setpoint Fixed setpoint + AI1 Fixed setpoint* + AI1 MASTER SBus1 MASTER RS-485 SBus 1/fixed setpoint Frequency setpoint input / Fixed setpoint Bipolar AI2 / Fixed setpoint		
101			Control signal source	0 1 3 4	<b>Terminals</b> RS-485 SBus 1 3-wire control		
102			8840	Frequency scaling	0.1 ... <b>10</b> ... 120.00 [kHz]		
103			10247.15	FI1 reference	0 1	<b>n<sub>max</sub></b> n <sub>reference</sub>	
104			10247.10	Setpoint reference speed n <sub>ref</sub>	0 ... <b>3000</b> ... 6000 rpm		
105			10416.1	Wire breakage detection	0 2 4 7	No response Immediate stop / fault Rapid stop / fault <b>Rapid stop / warning</b>	
106			10247.11	FI1 char.curve x1	0 ... 100 %		
107			10247.12	FI1 char. curve y1	-100 % ... 0 ... +100 %		
108			10247.13	FI1 char.curve x2	0 ... <b>100</b> %		
109			10247.14	FI1 char. curve y2	-100 % ... 0 ... <b>+100</b> %		
11_			<b>Analog input 1 (0 ... 10 V)</b>				
110	Long	8463	AI1 scaling	0.1 ... 1 ... 10			
112			8465	AI1 Operating mode	1 5 6 7 8 9	<b>10 V, reference maximum speed</b> 0 - 20 mA, reference maximum speed 4 - 20 mA, reference maximum speed 0 - 10 V, n-reference 0 - 20 mA, n-reference 4 - 20 mA, n-reference	
113			8466	AI1 voltage offset	-10 V ... 0 ... +10 V		
116			10247.6	AI1 characteristic curve x1	0 ... 100 %		
117			10247.7	AI1 characteristic curve y1	-100 % ... 0 ... +100 %		
118			10247.8	AI1 characteristic curve x2	0 ... <b>100</b> %		
119			10247.9	AI1 characteristic curve y2	-100 % ... 0 ... <b>+100</b> %		



No.	FBG	Index dec.	Name	Range / factory setting	Value after startup		
			Display	MOVITOOLS® MotionStudio			
<b>12_</b>			<b>Analog input AI2 / FBG speed control module (option)</b>				
120	Lang6	8469	AI2 operating mode	0 1 2	<b>No function</b> 0 ... ±10 V + Setpoint 0 ... 10 V current limitation		
121		8811	Addition FBG setpoint control module	0 1 2	<b>Off</b> On On (without fixed setpoint)		
122		8799	Direction of rotation FBG manual operation	0 1 2	<b>Unipolar CW</b> Unipolar CCW Bipolar CW and CCW		
126	Lang6	10247.1	AI2 char. curve x1	-100 % ... 0 ... +100 % (-10 V ... 0 ... +10 V)			
127		10247.2	AI2 char. curve y1	-100 % ... 0 ... +100 % (-n <sub>max</sub> ... 0 ... +n <sub>max</sub> / 0 ... I <sub>max</sub> )			
128		10247.3	AI2 char. curve x2	-100 % ... 0 ... +100 % (-10 V ... 0 ... +10 V)			
129		10247.4	AI2 char. curve y2	-100 % ... 0 ... +100 % (-n <sub>max</sub> ... 0 ... +n <sub>max</sub> / 0 ... I <sub>max</sub> )			
<b>13_ / 14_</b>			<b>Speed ramps 1 / 2</b>				
130 / 140	Lang6	8807 / 9264	Ramp t11 / t21 up	0.1 ... 2 ... 2000 [s]			
131 / 141		8808 / 9265	Ramp t11 / t21 down	0.1 ... 2 ... 2000 [s]			
134 / 144	Lang6	8474 / 8482	Ramp t12 / t22	0.1 ... 10 ... 2000 [s]			
135 / 145		8475 / 8483	S pattern t23/t22	0 1 2 3	<b>Off</b> Weak Medium Strong		
136 / 146		8476 / 8484	Stop ramp t13 / t23	0.1 ... 2 ... 20 [s]			
139 / 149		8928 / 8929	Ramp monitoring 1 / 2	0 1	<b>YES</b> NO		
<b>15_</b>			<b>Motor potentiometer function</b>				
150	Lang6	8809	Ramp t3 up = down	0.2 ... 20 ... 50 [s]			
152		8488	Save last setpoint	Off On	Off On		
<b>16_ / 17_</b>			<b>Fixed setpoints</b>				
160 / 170	Lang6	8489 / 8492	Internal setpoint n11 / n21	0 ... 150 ... 5000 [rpm]			
161 / 171		8490 / 8493	Internal setpoint n12 / n22	0 ... 750 ... 5000 [rpm]			
162 / 172		8491 / 8494	Internal setpoint n13 / n23	0 ... 1500 ... 5000 [rpm]			
163 / 173		8814 / 8817	n11/n21 PI controller	0 ... 3 ... 100 [%]			
164 / 174		8815 / 8818	n12/n22 PI controller	0 ... 15 ... 100 [%]			
165 / 175		8816 / 8819	n13/n23 PI controller	0 ... 30 ... 100 [%]			



## Startup Parameter list

No.	FBG	Index dec.	Name	Range / factory setting	Display	MOVITOOLS® MotionStudio	Value after startup		
<b>2_</b>			<b>Controller parameters</b>						
<b>25_</b>			<b>PI controller</b>						
250	Lang6	8800	PI controller	<b>0</b> 1 2	<b>Off</b> Normal Inverted				
251		8801	P-gain	0 ... 1 ... 64					
252		8802	I-component	0 ... 1 ... 2000 [s]					
253		8465	PI actual value mode	<b>1</b> 5 6 7 8 9	<b>10 V, reference maximum speed</b> 0 - 20 mA, reference maximum speed 4 - 20 mA, reference maximum speed 0 - 10 V, n-reference 0 - 20 mA, n-reference 4 - 20 mA, n-reference				
254		8463	PI actual value scaling	0.1 ... 1.0 ... 10.0					
255		8812	PI actual value offset	<b>0.0</b> ... 100.0 [%]					
<b>3_</b>			<b>Motor parameters</b> (on FBG only parameter set 1)						
<b>30_ / 31_</b>			<b>Limits 1 / 2</b>						
300 / 310	Lang6	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 <sub>N</sub> ]					
<b>32_ / 33_</b>			<b>Motor adjustment 1 / 2</b>						
320 / 330	Lang6	8523 / 8528	Automatic adjustment 1 / 2	<b>Off</b> <b>On</b>	<b>Off</b> <b>On</b>				
321 / 331		8524 / 8529	Boost 1 / 2	0 ... 100 [%]					
322 / 332		8525 / 8530	I <sub>xR</sub> compensation 1 / 2	0 ... 100 [%]					
323 / 333		8526 / 8531	Pre-magnetization time 1 / 2	0 ... 2 [s]					
324 / 334		8527 / 8532	Slip compensation 1 / 2	0 ... 500 [rpm]					
<b>34_</b>			<b>I<sub>N</sub> UL monitoring</b>						
345 / 346	Lang6	9114 / 9115	I <sub>N</sub> UL monitoring 1 / 2	0.1 ... 500 A					



No.	FBG	Index dec.	Name	Range / factory setting	Display	MOVITOOLS® MotionStudio	Value after startup		
4_			<b>Reference signals</b>						
40_			<b>Speed reference signal</b>						
400	Long	8539	Speed reference value	0 ... 750 ... 5000 [rpm]					
401		8540	Hysteresis	0 ... 100 ... +500 [rpm]					
402		8541	Delay time	0 ... 1 ... 9 [s]					
403		8542	Signal = "1" when	0 1	n < n <sub>ref</sub> n > n <sub>ref</sub>				
43_			<b>Current reference signal</b>						
430	Long	8550	Current reference value	0 ... 100 ... 150 % I <sub>N</sub>					
431		8551	Hysteresis	0 ... 5 ... 30 % I <sub>N</sub>					
432		8552	Delay time	0 ... 1 ... 9 s					
433		8553	Signal = "1" when	0 1	I < I <sub>ref</sub> I > I <sub>ref</sub>				
44_			<b>I<sub>max</sub> signal</b>						
440	Long	8554	Hysteresis	0 ... 5 ... 50 % I <sub>N</sub>					
441		8555	Delay time	0 ... 1 ... 9 s					
442		8556	Signal = "1" when	0 1	I < I <sub>max</sub> I > I <sub>max</sub>				
45_			<b>PI controller reference signal</b>						
450	Long	8813	PI actual value reference						
451		8796	Signal = "1" when	0 1	PI Actual value < PI ref <b>PI Actual value &gt; PI ref</b>				
5_			<b>Monitoring parameters (on FBG only parameter set 1)</b>						
50_			<b>Speed monitoring 1 / 2</b>						
500 / 502	Long	8557 / 8559	Speed monitoring 1 / 2	0 3	Off Motor / regenerative				
501 / 503		8558 / 8560	Delay time 1 / 2	0 ... 1 ... 10 [s]					
54_			<b>Gear unit/motor monitoring</b>						
540	Long	9284	Response to drive vibration / warning		Factory setting: Display fault				
541		9285	Response to drive vibration / fault		Factory setting: Rapid stop / warning				
542		9286	Response to oil aging / fault		Factory setting: Display fault				
543		9287	Response to oil aging / warning		Factory setting: Display fault				
544		9288	Oil aging / over-temperature		Factory setting: Display fault				
545		9289	Oil aging / ready signal		Factory setting: Display fault				
549		9290	Response to brake wear		Factory setting: Display fault				



## Startup

### Parameter list

No.	FBG	Index dec.	Name	Range / factory setting Display	MOVITOOLS® MotionStudio	Value after startup		
<b>6_</b>			<b>Terminal assignment</b>					
<b>60_</b>			<b>Binary inputs</b>					
601	Short	8336	Binary input DI02 assignment		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 setpoint switchover 7: Parameter set switchover 8: Ramp switchover 9: Motor potentiometer up 10: Motor potentiometer down 11: /External fault 12: Fault reset (factory setting DI00) 19: Slave free running 20: Setpoint acceptance active 26: TF signal (only with DI05) 27: Vibration/warning 28: Vibration/fault 29: Brake wear 30: Controller inhibit 33: Oil aging/warning 34: Oil aging/fault 35: Oil aging / overtemperature 36: Oil aging/ready			
602		8337	Binary input DI03 assignment					
603		8338	Binary input DI04 assignment					
604		8339	Binary input DI05 assignment					
608		8844	Binary input DI00 assignment					
<b>62_</b>			<b>Binary outputs</b>					
620	Short	8350	Binary output DO01 assignment		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 / not with DO03) 8: Parameter set 9: Speed reference signal 11: Comparison message setpoint-actual value 12: Current reference signal 13: Imax signal 21: IPOS output 22: /IPOS fault 23: PI controller actual value reference 24: Ex-e current limit active (in preparation) 27: Safe stop 30: Ixt warning 31: Ixt fault			
621		8351	Binary output DO02 assignment					
622		8916	Binary output DO03 assignment					



No.	FBG	Index dec.	Name	Range / factory setting	Display	MOVITOOLS® MotionStudio	Value after startup					
<b>64_</b>			<b>Analog outputs AO1 (optional)</b>									
640	Lang6	8568	Analog output AO1	0	<b>No function</b>							
				1	Ramp generator input							
				2	Setpoint speed							
				3	Actual speed							
				4	Actual frequency							
				5	Output current							
				6	Active current							
				7	Unit utilization							
				11	Actual speed (signed)							
				12	Actual frequency (signed)							
641				10248.5	AO1 reference	0 <b>3000 rpm , 100 Hz, 150 %</b> 1 $n_{max}$ 2 $n_{set}$ reference						
642				8570	AO1 Operating mode	0 <b>No function</b> 2 0 ... 20 mA 3 4 ... 20 mA 4 0 ... 10 V						
646	Lang6	10246.1	AO1 Characteristic curve x1	-100 % ... 0 ... +100 %								
647				0 ... 100 %								
648				-100 % ... 0 ... +100 %								
649				0 ... 100 %								
<b>7_</b>			<b>Control functions</b> (on FBG only parameter set 1)									
<b>70_</b>			<b>Operating modes 1 / 2</b>									
700 / 701	Lang6	8574 / 8575	Operating mode 1 / 2	0	VFC							
				2	VFC & hoist							
				3	VFC & DC braking							
				4	VFC & flying start function							
				21	<b>V/f characteristic curve</b>							
				22	V/f & DC braking							
<b>71_</b>			<b>Standstill current 1 / 2</b>									
710 / 711	Lang6	8576 / 8577	Standstill current 1 / 2	0 ... 50 % $I_{Mot}$								
<b>72_</b>				<b>Setpoint stop function 1 / 2</b>								
720 / 723	Lang6	8578 / 8581	Setpoint stop function 1 / 2	Off	<b>Off</b>							
				On	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]								
<b>73_</b>			<b>Brake function 1 / 2</b>									
731 / 734	Lang6	8749 / 8750	Brake release time 1 / 2	0 ... 2 [s]								
732 / 735		8585 / 8587	Brake application time 1 / 2	0 ... 2 [s]								



## Startup Parameter list

No.	FBG	Index dec.	Name	Range / factory setting	Display	MOVITOOLS® MotionStudio	Value after startup		
<b>74_</b>			<b>Speed skip function</b>						
740 / 742	Long6	8588 / 8590	Skip window center 1 / 2	0 ... 1500 ... 5000 rpm					
741 / 743		8589 / 8591	Skip width 1 / 2	0 ... 300 rpm					
<b>75_</b>			<b>Master/slave function</b>						
750	Long6	8592	Slave setpoint						
751		8593	Scaling slave set-point						
<b>76_</b>			<b>Manual operation</b>						
760	Long6	8798	Lock RUN / STOP buttons	Off On	Off On				
<b>77_</b>			<b>Energy-saving function</b>						
770	Long6	8925	Energy-saving function	Off On	Off On				
<b>8_</b>			<b>Unit function (on FBG only parameter set 1)</b>						
<b>80_</b>			<b>Setup</b>						
800	Short	—	Short menu	long short					
801		—	DBG language						
802		8594	Factory setting	no Hours ALL NEMA	0 / No 1 / Standard 2 / Delivery status 4 / NEMA delivery status				
803		8595	Parameter lock	Off On	Off On				
804		8596	Reset statistical data		<b>No action</b> Fault memory				
805		—	Rated mains voltage		50 ... 500 V				
806		—	Copy DBG → MOVITRAC® B		Yes <b>No</b>				
807		—	Copy MOVITRAC® B → DBG		Yes <b>No</b>				
808		8660	24 V output voltage		Off On				
809		10204.1	IPOS enable		Off On				
<b>81_</b>			<b>Serial communication</b>						
810	Long6	8597	RS-485 address	0 ... 99					
811		8598	RS-485 group address	100 ... 199					
812		8599	RS-485 timeout interval	0 ... 650 [s]					



No.	FBG	Index dec.	Name	Range / factory setting	Value after startup		
				Display MOVITOOLS® MotionStudio			
<b>82_</b>			<b>Brake operation 1 / 2</b>				
820 / 821		8607 / 8608	4-quadrant operation 1 / 2	Off On	Off On		
<b>83_</b>			<b>Fault responses</b>				
830		8609	Response terminal "external fault"	2 <b>4</b> 7	Immediate stop / fault <b>Rapid stop / fault (830)</b> <b>Rapid stop / warning (833 / 836)</b>		
833		8612	Response to RS-485 timeout				
836		8615	Response to SBUS timeout				
<b>84_</b>			<b>Reset behavior</b>				
840		8617	Manual reset		Yes <b>No</b>		
<b>85_</b>			<b>Scaling actual speed value</b>				
850		8747	Scaling factor numerator	1 ... 65535 (can be set with SHELL only)			
851		8748	Scaling factor denominator	1 ... 65535 (can be set with SHELL only)			
852		8772 / 8773	User travel unit	Text			
853		9312	Scaled speed FBG	0 1	<b>Speed</b> Scaled speed		
<b>86_</b>			<b>Modulation 1 / 2</b>				
860 / 861		8620 / 8621	PWM frequency 1 / 2	4 8 12 16	<b>4 kHz</b> 8 kHz 12 kHz 16 kHz		
862 / 863		8751 / 8752	PWM fix 1 / 2	On Off	On Off		
<b>87_</b>			<b>Process data parameter setting</b>				
870		8304	Setpoint description PO1		<b>No function</b> (factory setting P872) <b>Setpoint speed</b> (factory setting P871)		
871		8305	Setpoint description PO2		Max. speed Ramp		
872		8306	Setpoint description PO3		<b>Control word 1</b> (factory setting P870) Control word 2 Setpoint speed [%] IPOS PO data PI controller setpoint [%]		
873		8307	Actual value description PI1		No function <b>Actual speed</b> (factory setting P874)		
874		8308	Actual value description PI2		<b>Output current</b> (factory setting P875) Active current		
875		8309	Actual value description PI3		<b>Status word 1</b> (factory setting P873) Actual speed [%] IPOS PI-DATA PI controller actual value [%]		
876		8622	PO data enable		No <b>Yes</b>		



## Startup Parameter list

No.	FBG	Index dec.	Name	Range / factory setting	Display	MOVITOOLS® MotionStudio	Value after startup		
<b>88_</b>			<b>Serial communication SBus</b>						
880	Long6	8937	SBus protocol	<b>0 / MoviLink</b> 1 / CANopen					
881		8600	SBus address	<b>0 ... 63</b>					
882		8601	SBus group address	<b>0 ... 63</b>					
883	Long6	8602	SBus timeout interval	<b>0 ... 650 [s]</b>					
884		8603	SBus baud rate	125 250 <b>500</b> 1000	125 kbaud 250 kbaud <b>500 kbaud</b> 1 MBaud				
886		8989	CANopen address	<b>1 ... 2 ... 127</b>					



## 10 Operation

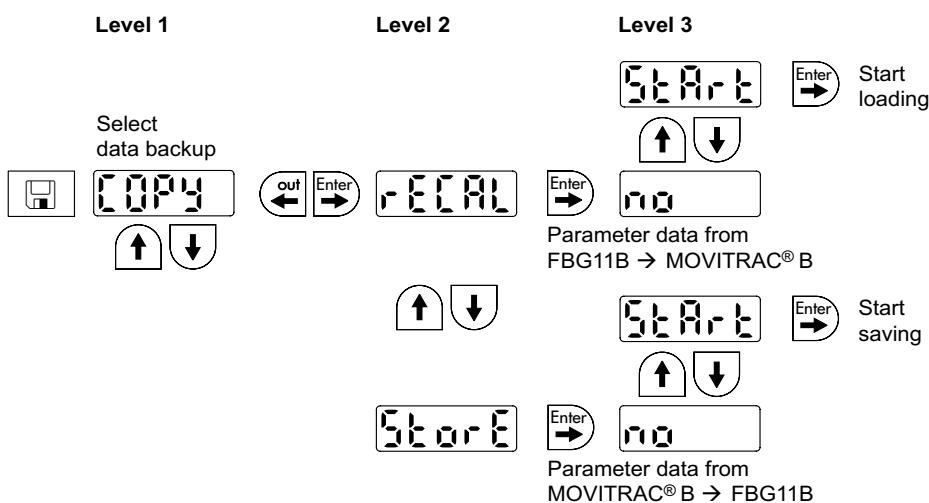
### 10.1 Data backup

#### 10.1.1 Data backup using 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.

After copying the parameters, check for accuracy.

Data backup using FBG11B



After copying data, the MOVITRAC® B is inhibited. The inhibited status is indicated by a flashing STOP in the status display. The status LED also slowly flashes yellow.

You can revoke the inhibit by taking one of the following measures:

- Pressing the RUN button on the FBG11B
- Switching the mains off, waiting 10 seconds, and switching the mains back on

#### 10.1.2 Data backup using DBG60B

Copy the parameter set from MOVITRAC® B into the DBG60B keypad. You have the following options:

- In the context menu, select the "COPY TO DBG" menu item. Confirm your selection by pressing OK. The parameter set is copied from MOVITRAC® B to DBG60B.
- In the context menu, select the "PARAMETER MODE" menu item. Select parameter P807 "MCB → DBG". The parameter set is copied from MOVITRAC® B to DBG60B.

#### 10.1.3 Data backup using UBP11A

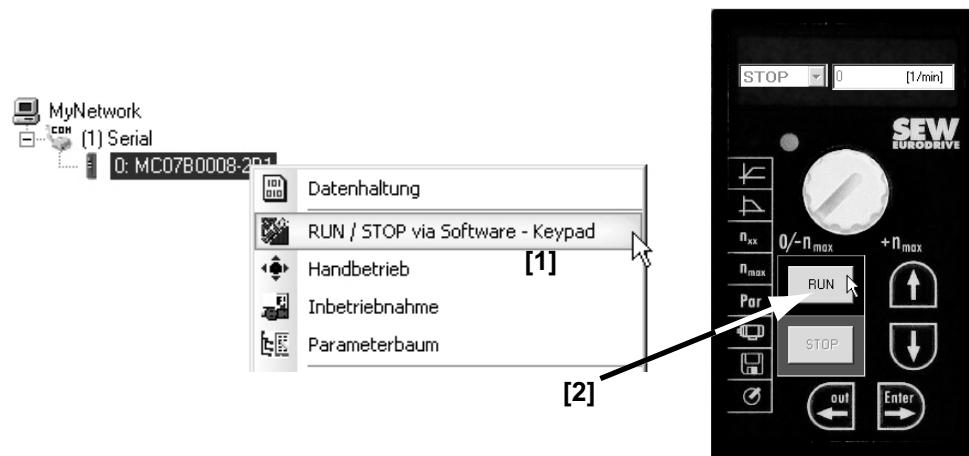
Copy the parameter set from MOVITRAC® B to the UBP11A parameter module. To do so, press the button at the lower end of the module. You need a pointed object for this purpose.



#### 10.1.4 Data backup using MOVITOOLS® MotionStudio

When you use MOVITOOLS® MotionStudio to transfer data to the MOVITRAC® B frequency inverter, you must re-enable the inverter as follows:

- Select the unit in the network.
- Right click to open the context menu.
- Select menu [RUN/STOP via software keypad] [1]
- Select [RUN] in the software keypad [2]



#### 10.2 Return codes (r-19 ... r-38)

Return codes MOVITRAC® B:

No.	Designation	Meaning
19	Parameter lock activated	Parameters cannot be changed
20	Factory setting in progress	Parameters cannot be changed
23	Option card missing	The option card required for the function is missing.
27	Option card missing	The option card required for the function is missing.
28	Controller inhibit required	Controller inhibit required
29	Invalid value for parameter.	<ul style="list-style-type: none"> <li>• Invalid value for parameter.</li> <li>• FGB manual operation selection invalid as PC is in active manual operation.</li> </ul>
32	Enable	You cannot perform this function in ENABLED status
34	Fault during execution	<ul style="list-style-type: none"> <li>• Error while saving in FBG11B.</li> <li>• Startup not performed with FBG. Perform FGB startup with MotionStudio or select a new motor.</li> </ul>
38	FBG11B incorrect data set	Stored data set does not match the unit



## 10.3 Status displays

### 10.3.1 FBG11B 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

#### *Status of binary inputs/outputs*

Parameter P039 (binary inputs) and parameter P059 (binary outputs) are adopted in the parameter menu as display parameters. The status is displayed as binary. Every binary input or output has two segments vertically on top of one another of the 7-segment display assigned to it. The upper segment lights up when the binary input or output is set, and the lower segment lights up when the binary input or output is not set. The two 7-segment displays on the right are displayed if P039 (di = binary inputs ) or P059 (do = binary outputs) are output.

Examples:

Above: Input status: DI00 = 1 / DI01 = 0 / DI02 = 1 / DI03 = 1 / DI04 = 1 / DI05 = 0

Bottom: Output status: DO01 = 1 / DO02 = 0 / DO03 = 1



#### 10.3.2 LED flash codes

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

Status	Display (optional with FBG)	LED flash code status of basic unit
"ENABLE"	Speed	Constant green light
"ENABLE" at current limit	Speed flashes	Rapid green flashing
"CURRENT AT STAND-STILL"	dc	Slow green flashing
Timeout	Errors 43 / 46 / 47	Flashing green/yellow
"NO ENABLE"	Stop	Constant yellow light
"FACTORY SETTING"	SET	Rapid yellow flashing
"CONTROL.INHIBIT"	OFF	Rapid yellow flashing
"24 V operation"	Flashing 24U	Slow yellow flashing
"SAFE STOP"	Flashing U	Slow yellow flashing
FGB manual operation active or inverter stopped using "stop" button.	FGB manual operation symbol or "stop" is flashing	Yellow on long, off briefly
Copy	Fault 97	Flashing red/yellow
System error	Errors 10 / 17 ... 24 / 25 / 32 / 37 / 38 / 45 / 77 / 80 / 94	Constant red light
Oversupply / phase failure	Errors 4 / 6 / 7	Slow red flashing
Overload	Errors 1 / 3 / 11 / 44 / 84	Rapid red flashing
Monitoring	Errors 8 / 26 / 34 / 81 / 82	2 x red flashing
Motor protection	Errors 31 / 84	3 x red flashing

	<b>WARNING!</b>
Incorrect interpretation of display U = "Safe stop" active. Severe or fatal injuries. The display U = "Safe stop" is not safety-related and must not be used as a safety function.	

#### 10.4 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



## 10.5 DBG60B keypad

### 10.5.1 Basic displays

0.00rpm 0.000Amp CONTROLLER INHIBIT	Display when /CONTROLLER INHIBIT = "0".
0.00rpm 0.000Amp NO ENABLE	Display when inverter is not enabled ("ENABLE/STOP" = "0").
950.00rpm 0.990Amp ENABLE (VFC)	Display for enabled inverter.
NOTE 6: VALUE TOO HIGH	Information message
(DEL)=Quit ERROR 9 STARTUP	Error display

### 10.5.2 Information messages

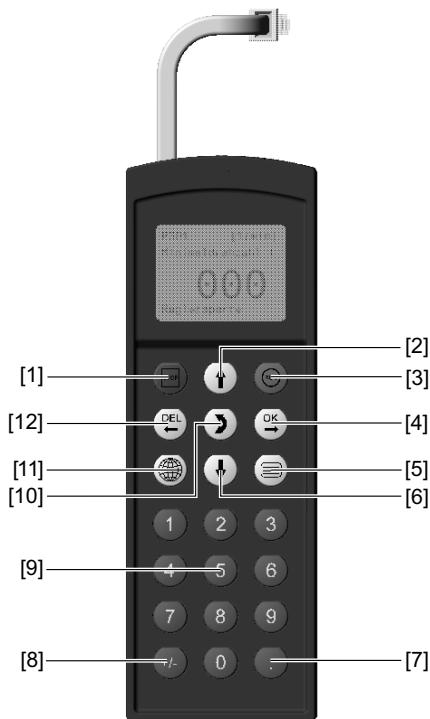
Information messages on the DBG60B (ca. 2 s in duration) or in MOVITOOLS® Motion-Studio/SHELL (message that can be acknowledged):

No.	Text DBG60B/SHELL	Description
1	ILLEGAL INDEX	Index addressed via interface not available.
2	NOT IMPLEMENT.	<ul style="list-style-type: none"> <li>Attempt to execute a function that is not implemented.</li> <li>An incorrect communication service has been selected.</li> <li>Manual operation selected via invalid interface (e.g. fieldbus).</li> </ul>
3	READ ONLY VALUE	Attempt to modify a read only value.
4	PARAM. INHIBITED	Parameter lock P803 = "ON". Parameter cannot be altered.
5	SETUP ACTIVE	Attempt to change parameters when factory setting is active.
6	VALUE TOO HIGH	Attempt to enter a value that is too high.
7	VALUE TOO LOW	Attempt to enter a value that is too low.
8	REQ. CARD MISSING	The option card required for the selected function is missing.
-		
10	ONLY VIA ST1	Manual mode must be completed using X13:ST11/ST12 (RS 485).
11	ONLY TERMINAL	Manual mode must be exited via TERMINAL (DBG60B or UWS21B).
12	NO ACCESS	Access to selected parameter denied.
13	CTRL. INHIBIT MISSING	Set terminal DIØØ "/Controller inhibit" = "0" for the selected function.
14	INVALID VALUE	Attempt to enter an invalid value.
--		
16	PARAM. NOT SAVED	Overflow of EEPROM buffer, e.g., due to cyclic write access. Parameter is saved in EEPROM and is not protected against loss following POWER OFF.
17	INVERTER ENABLED	<ul style="list-style-type: none"> <li>Parameter to be changed can only be set in the state "CONTROLLER INHIBIT".</li> <li>Attempt to change to manual mode during live operation</li> </ul>



### 10.5.3 Functions of the DBG60B keypad

*Key assignments  
for DBG60B*



[1]	Stop key	Stop
[2]	↑ key	Up arrow, moves up to the next menu item
[3]	RUN key	Start
[4]	OK key	OK, confirms the entry
[5]	Context key	Activate the context menu
[6]	↓ key	Down arrow, moves down to the next menu item
[7]	. key	Decimal point
[8]	± key	Sign reversal
[9]	Keys 0 ... 9	Digits 0...9
[10]	↔ key	Change menu
[11]	Language key	Select language
[12]	DEL key	Delete previous entry

*Copy function of  
the DBG60B*

The DBG60B keypad can be used for copying complete parameter sets from one MOVITRAC® unit to other MOVITRAC® units. Proceed as follows:

- In the context menu, select the menu item "COPY TO DBG". Confirm your selection by pressing OK.
- After the copying process has finished, plug the keypad in the other inverter.
- In the context menu, select the menu item "COPY TO MC07B". Confirm your selection by pressing OK.



*Parameter mode* Proceed as follows to set the parameters in parameter mode:

1. Press the context key to activate the context menu. The first menu item is "PARAMETER MODE".

**PARAMETER MODE**  
VARIABLE MODE  
BASIC VIEW

2. Press the OK key to start PARAMETER MODE. The first display parameter P000 "SPEED" appears. Use the ↑ or ↓ key to select main parameter groups 0 to 9.

P 000 upm  
SPEED  
+0.0  
CONTROLLER INHIBIT

3. Use the ↑ or ↓ key to select the desired main parameter group. The flashing cursor is positioned under the number of the main parameter group.

P 1.. SETPOINTS/  
RAMP GENERATORS  
CONTROLLER INHIBIT

4. Press the OK key to activate the parameter subgroup selection in the required main parameter group. The flashing cursor moves one position to the right.

P 1.. SETPOINTS/  
RAMP GENERATORS  
CONTROLLER INHIBIT

5. Use the ↑ or ↓ key to select the desired parameter subgroup. The flashing cursor is positioned under the number of the parameter subgroup.

\ 13.. SPEED  
RAMPS 1  
CONTROLLER INHIBIT

6. Press the OK key to activate the parameter selection in the required parameter subgroup. The flashing cursor moves one position to the right.

\ 13.. SPEED  
RAMPS 1  
CONTROLLER INHIBIT

7. Use the ↑ or ↓ key to select the desired parameter. The flashing cursor is positioned under the third digit of the parameter number.

\ 132 s  
T11 UP CCW  
+0.13  
CONTROLLER INHIBIT

8. Press the OK key to activate the setting mode for the selected parameter. The cursor is positioned under the parameter value.

\ 132 s  
T11 UP CCW  
+0.13  
CONTROLLER INHIBIT

9. Use the ↑ or ↓ key to set the required parameter value.

\ 132 s  
T11 UP CCW  
+0.20  
CONTROLLER INHIBIT

10. Press the OK key to confirm the setting. To exit setting mode, press the ↔ key. The flashing cursor is positioned under the third digit of the parameter number again.

\ 132 s  
T11 UP CCW  
+0.20  
CONTROLLER INHIBIT



11. Use the  $\uparrow$  or  $\downarrow$  key to select another parameter, or press the DEL key to switch to the menu of the parameter subgroups.

\ 13.. SPEED  
RAMPS 1  
  
CONTROLLER INHIBIT

12. Use the  $\uparrow$  or  $\downarrow$  key to select another parameter subgroup or press the DEL key to switch to the menu of the main parameter groups.

P 1.. SETPOINTS/  
RAMP GENERATORS  
  
CONTROLLER INHIBIT

13. Use the context key to return to the context menu.

**PARAMETER MODE**  
VARIABLE MODE  
BASIC VIEW

### User menu

The DBG60B keypad has a standard user menu containing the parameters that are used most often. The parameters in the user menu are displayed with a "\ before the parameter number ( $\rightarrow$  Sec. "Complete parameter list"). You can add or delete parameters. You can save a maximum of 50 parameter entries. The parameters are displayed in the order in which they are stored in the inverter. The parameters are not sorted automatically.

- Use the context key to call up the context menu. Select the menu item "USER MENU" and press the OK key to confirm. The user menu with the most frequently used parameters appears.

### Adding parameters to the user menu

Proceed in this order to add parameters to the user menu:

- Use the context key to call up the context menu. Select the "PARAMETER MODE" menu item.
- Select desired parameter and press the OK key to confirm.
- Use the context key to return to the context menu. In the context menu, select the menu item "ADD Pxxx". "xxx" is the parameter you selected previously. Confirm your selection by pressing OK. The selected parameter is stored in the user menu.

### Deleting parameters from the user menu

Proceed in this order to delete parameters from the user menu:

- Use the context key to call up the context menu. Select the menu item "USER MENU".
- Select the parameter that is to be deleted. Confirm your selection by pressing OK.
- Use the context key to return to the context menu. In the context menu, select the menu item "DELETE Pxxx". "xxx" is the parameter you selected previously. Confirm your selection by pressing OK. The selected parameter is deleted from the user menu.



*Initial parameter*

The wake-up parameter is the parameter that is displayed when the DBG60B is switched on. The factory setting for the wake-up parameter is the basic display. You can select which parameter should be the wake-up parameter. The following options can be used as the wake-up parameter:

- Parameter (→ Parameter mode)
- Parameter from the user menu (→ User menu)
- Basic display

Proceed as follows to save a wake-up parameter:

- First select the required parameter in parameter mode.
- In the context menu, select the menu item "XXXX INITIAL PARAM.". "XXXX" is the selected initial parameter. Confirm your selection by pressing OK.



## 11 Service / List of Faults

### 11.1 Unit information

#### 11.1.1 Fault memory

The inverter stores the error message in fault memory P080. The inverter does not save a new fault until the error message has been acknowledged. The local operating panel shows the most recent fault. Whenever double faults 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:

- Fault 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

#### 11.1.2 Switch-off responses

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

<i>Immediate switch off</i>	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 status can only be exited by an explicit fault reset.
<i>Stop</i>	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 state, 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 switch-off 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.

Behavior of the inverter when it is controlled via a communication interface (RS-485 or SBus):

- Power off and on
- Enable has no effect
- Valid data to an interface monitored with timeout
- Enable

### 11.1.3 Reset

#### *Basic unit reset*

A fault message can be acknowledged:

- Reset via input terminals with an appropriately assigned binary input (DI $\emptyset\emptyset$ , DI $\emptyset 2$ ...DI $\emptyset 5$ ). DI $\emptyset\emptyset$  is factory set to fault reset.

#### *Keypad reset*

A fault message can be acknowledged:

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

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

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

#### *Interface reset*

A fault message can be acknowledged:

- Manual reset in MOVITOOLS® MotionStudio / P840 *Manual reset = Yes*, or in the status window of the reset button.


**11.2 List of faults (F-00 ... F-113)**

No.	Designation	Response	Possible cause	Measure
00	No fault			
01	Overcurrent	Immediate switch-off with inhibit	<ul style="list-style-type: none"> <li>• Short circuit at output</li> <li>• Output switching</li> <li>• Motor too large</li> <li>• Faulty output stage</li> </ul>	<ul style="list-style-type: none"> <li>• Rectify the short circuit</li> <li>• Switching with inhibited output stage only</li> <li>• Connect a smaller motor</li> <li>• Consult SEW Service if the fault cannot be reset</li> </ul>
03	Ground fault	Immediate switch-off with inhibit	<ul style="list-style-type: none"> <li>• Ground fault in motor</li> <li>• Ground fault in inverter</li> <li>• Ground fault in the motor supply lead</li> <li>• Overcurrent (see F-01)</li> </ul>	<ul style="list-style-type: none"> <li>• Replace motor</li> <li>• Replace MOVITRAC® B</li> <li>• Eliminate ground fault</li> <li>• See F-01</li> </ul>
04	Brake chopper	Immediate switch-off with inhibit	<ul style="list-style-type: none"> <li>• Too much regenerative power</li> <li>• Braking resistor circuit interrupted</li> <li>• Short circuit in the braking resistor circuit</li> <li>• Brake resistor has too high resistance</li> <li>• Brake chopper defective</li> <li>• Ground fault</li> </ul>	<ul style="list-style-type: none"> <li>• Extend deceleration ramps</li> <li>• Check supply cable to the braking resistor</li> <li>• Rectify the short circuit</li> <li>• Check technical data of braking resistor</li> <li>• Replace MOVITRAC® B</li> <li>• Eliminate ground fault</li> </ul>
06	Mains phase failure	Immediate switch-off with inhibit (only with 3-phase inverter)	<ul style="list-style-type: none"> <li>• Phase failure</li> <li>• Supply voltage too low</li> </ul>	<ul style="list-style-type: none"> <li>• Check the supply system cable</li> <li>• Check the supply voltage</li> </ul>
07	DC link overvoltage	Immediate switch-off with inhibit	<ul style="list-style-type: none"> <li>• DC link voltage too high</li> <li>• Ground fault</li> </ul>	<ul style="list-style-type: none"> <li>• Extend deceleration ramps</li> <li>• Check supply cable to the braking resistor</li> <li>• Check technical data of braking resistor</li> <li>• Eliminate ground fault</li> </ul>
08	Speed monitoring	Immediate switch-off with inhibit	<p>Current controller works at the set limit due to:</p> <ul style="list-style-type: none"> <li>• Mechanical overload</li> <li>• Phase failure in supply system</li> <li>• Phase failure in motor</li> <li>• Maximum speed for VFC operating modes exceeded</li> </ul>	<ul style="list-style-type: none"> <li>• Reduce load</li> <li>• Check current limitation</li> <li>• Extend deceleration ramps</li> <li>• Increase set deceleration time P501<sup>1)</sup></li> <li>• Check line phases</li> <li>• Check motor cable and motor</li> <li>• Reduce maximum speed</li> </ul>
09	Startup	Immediate switch-off with inhibit	<ul style="list-style-type: none"> <li>• Inverter not started yet</li> <li>• Unknown motor selected</li> </ul>	<ul style="list-style-type: none"> <li>• Start up the inverter</li> <li>• Select another motor</li> </ul>



No.	Designation	Response	Possible cause	Measure
10	IPOS-ILLOP	Stop with inhibit With IPOS only	• Incorrect command during command execution	• Check the program
			• Incorrect conditions during command execution.	• Check program run
			• Function does not exist / is not implemented in the inverter	• Use another function
11	Over-temperature	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
17 ... 24	System malfunction	Immediate switch-off with inhibit	• Inverter electronics is faulty, possibly due to EMC influence	• Check grounding and shielding and improve, if necessary. • Contact SEW Service for advice if this fault reoccurs.
25	EEPROM	Stop with inhibit	• Error while accessing EEPROM	• Activate factory settings, perform reset and reset parameters. • Contact SEW Service for advice if this fault reoccurs.
26	External terminal	Programmable	• Read in external fault signal via programmable input.	• Eliminate respective cause; reprogram terminal if necessary.
31	TF/TH sensor tripped	Stop with inhibit	• Motor too hot, TF sensor has tripped	• Let motor cool off and reset fault
			• TF sensor of motor not connected or connected incorrectly • Connection of MOVITRAC® B and TF on motor interrupted	• Check connections / links between MOVITRAC® B and TF
32	IPOS index overflow	Stop with inhibit	• Programming principles violated leading to internal stack overflow	• Check user program and correct
34	Ramp timeout	Immediate switch-off with inhibit	• Set ramp time exceeded.	• Extend the ramp time
			• 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 stop ramp time
36	Option missing	Immediate switch-off with inhibit	• Type of option card not allowed	• Use correct option card
			• Setpoint source, control signal source or operating mode not permitted for this option card	• Set correct setpoint source. • Set correct control signal source. • Set the correct operating mode. • Check parameters P120 and P121
37	System watchdog	Immediate switch-off with inhibit	• Error during system software execution	• Check grounding and shielding and improve, if necessary. • Contact SEW Service for advice if this fault reoccurs.
38	System software	Immediate switch-off with inhibit	• System malfunction	• Check grounding and shielding and improve, if necessary. • Contact SEW Service for advice if this fault reoccurs.
43	RS-485 timeout	Stop without inhibit <sup>2)</sup>	• Connection between inverter and PC interrupted.	• Check connection between inverter and PC.



## Service / List of Faults

### List of faults (F-00 ... F-113)

No.	Designation	Response	Possible cause	Measure
44	Unit utilization	Immediate switch-off with inhibit	<ul style="list-style-type: none"> <li>Unit utilization (Ixt value) exceeded</li> </ul>	<ul style="list-style-type: none"> <li>Decrease power output</li> <li>Extend ramps</li> <li>If these points are not possible: Use a larger inverter</li> </ul>
45	Initialization	Immediate switch-off with inhibit	<ul style="list-style-type: none"> <li>Error during initialization</li> </ul>	<ul style="list-style-type: none"> <li>Contact SEW Service for advice.</li> </ul>
47	System bus 1 timeout	Stop without inhibit	<ul style="list-style-type: none"> <li>Fault during communication via system bus</li> </ul>	<ul style="list-style-type: none"> <li>Check system bus connection</li> </ul>
77	IPOS control word	Stop with inhibit	<ul style="list-style-type: none"> <li>System malfunction</li> </ul>	<ul style="list-style-type: none"> <li>Contact SEW Service for advice.</li> </ul>
80	RAM test	Immediate switch-off	Internal unit fault, RAM defective.	Contact SEW Service.
81	Start condition	Immediate switch-off with inhibit	<p><b>Only in "VFC hoist" operating mode:</b> The motor could not be supplied with the correct amount of current during the pre-magnetizing time:</p> <ul style="list-style-type: none"> <li>Rated motor power too small in relation to rated inverter power</li> <li>Motor cable cross section too small</li> </ul>	<ul style="list-style-type: none"> <li>Check connection between inverter and motor</li> <li>Check startup data and perform new startup, if necessary.</li> <li>Check cross section of motor cable and increase if necessary.</li> </ul>
82	Open output	Immediate switch-off with inhibit	<p><b>Only in "VFC hoist" operating mode:</b></p> <ul style="list-style-type: none"> <li>2 or all output phases interrupted</li> <li>Rated motor power too small in relation to rated inverter power</li> </ul>	<ul style="list-style-type: none"> <li>Check connection between inverter and motor</li> <li>Check startup data and perform new startup, if necessary.</li> </ul>
84	Motor protection	Stop with inhibit	<ul style="list-style-type: none"> <li>Motor utilization too high.</li> </ul>	<ul style="list-style-type: none"> <li>Check P345/346 <math>I_{NUL}</math> monitoring</li> <li>Reduce load</li> <li>Extend ramps</li> <li>Longer pause times</li> </ul>
94	EEPROM checksum	Immediate switch-off with inhibit	<ul style="list-style-type: none"> <li>EEPROM defective</li> </ul>	<ul style="list-style-type: none"> <li>Contact SEW Service.</li> </ul>
97	Copy fault	Immediate switch-off with inhibit	<ul style="list-style-type: none"> <li>Parameter module is removed during copying process</li> <li>Switching off/on while copying</li> </ul>	Before acknowledging the fault: <ul style="list-style-type: none"> <li>Load factory setting or complete data set from parameter module</li> </ul>
98	CRC error flash	Immediate switch-off	Internal unit fault Flash memory defective.	Send unit in for repair.
100	Vibration/warning	Display error	Vibration sensor warning ( $\rightarrow$ "DUV10A" operating instructions)	Determine cause of vibrations. Continue operation until F101 occurs.
101	Vibration error	Rapid stop	Vibration sensor reports fault	SEW-EURODRIVE recommends that you remedy the cause of the vibrations immediately
102	Oil aging/warning	Display error	Oil aging sensor warns	Schedule oil change.
103	Oil aging/fault	Display error	Oil aging sensor reports fault	SEW-EURODRIVE recommends that you change the gear unit oil immediately.
104	Oil aging/over-temperature	Display error	Oil aging sensor signals over-temperature	<ul style="list-style-type: none"> <li>Let oil cool down</li> <li>Check if the gear unit cools properly</li> </ul>



No.	Designation	Response	Possible cause	Measure
105	Oil aging / ready signal	Display error	Oil aging sensor is not ready for operation	<ul style="list-style-type: none"> <li>Check voltage supply of oil aging sensor</li> <li>Check and, if necessary, replace the oil aging sensor</li> </ul>
106	Brake wear	Display error	Brake lining worn	Replace brake lining (→ "Motors" operating instructions)
110	"Ex-e protection" fault	Stop with inhibit	Duration of operation below 5 Hz exceeded	<ul style="list-style-type: none"> <li>Check project planning</li> <li>Shorten duration of operation below 5 Hz</li> </ul>
113	Analog input open circuit	Programmable	AI1 analog input open circuit	<ul style="list-style-type: none"> <li>Check wiring</li> </ul>

- 1) Speed monitoring is set by changing parameters 500 / 502 and 501 / 503. The sagging of hoists cannot be avoided safely when monitoring is deactivated or the delay time is set too long.
- 2) No reset required, error message disappears after communication is reestablished

## 11.3 SEW electronics service

### 11.3.1 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 enter the key combination **SEWHELP**. Or just dial **018057394357**.

### 11.3.2 Sending unit in for repair

Please contact the **SEW Electronics Service** if you cannot 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.

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



## 11.4 Extended 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. Otherwise, the unit's service life may be reduced.

### Procedure when maintenance has been neglected:

Electrolytic capacitors are used in the inverters. They are subject to aging effects when deenergized. This effect can damage the electrolytic capacitors if the unit is connected using the rated voltage after a longer period of storage.

If you have not performed maintenance regularly, SEW-EURODRIVE recommends that you increase the line voltage slowly up to the maximum voltage. This can be done, for example, by using a variable transformer for which the output voltage has been set according to the following overview. SEW-EURODRIVE recommends that you increase the voltage from 0 V to the first stage after a few seconds.

SEW-EURODRIVE recommends the following stages:

AC 400/500 V units:

- Stage 1: AC 350 V for 15 minutes
- Stage 2: AC 420 V for 15 minutes
- Stage 3: AC 500 V for 1 hour

AC 230 V units:

- Stage 1: AC 170 V for 15 minutes
- Stage 2: AC 200 V for 15 minutes
- Stage 3: AC 240 V for 1 hour

After you have completed the regeneration process, the unit can be used immediately or stored again for an extended period with maintenance.



## 12 Address List

Germany			
Headquarters	Bruchsal	SEW-EURODRIVE GmbH & Co KG Ernst-Bickle-Straße 42 D-76646 Bruchsal P.O. Box Postfach 3023 • D-76642 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-1970 <a href="http://www.sew-eurodrive.de">http://www.sew-eurodrive.de</a> <a href="mailto:sew@sew-eurodrive.de">sew@sew-eurodrive.de</a>
Production			
Sales			
Service Competence Center	Central	SEW-EURODRIVE GmbH & Co KG Ernst-Bickle-Straße 1 D-76676 Graben-Neudorf	Tel. +49 7251 75-1710 Fax +49 7251 75-1711 <a href="mailto:sc-mitte@sew-eurodrive.de">sc-mitte@sew-eurodrive.de</a>
	North	SEW-EURODRIVE GmbH & Co KG Alte Ricklinger Straße 40-42 D-30823 Garbsen (near Hannover)	Tel. +49 5137 8798-30 Fax +49 5137 8798-55 <a href="mailto:sc-nord@sew-eurodrive.de">sc-nord@sew-eurodrive.de</a>
	East	SEW-EURODRIVE GmbH & Co KG Dänkritzer Weg 1 D-08393 Meerane (near Zwickau)	Tel. +49 3764 7606-0 Fax +49 3764 7606-30 <a href="mailto:sc-ost@sew-eurodrive.de">sc-ost@sew-eurodrive.de</a>
	South	SEW-EURODRIVE GmbH & Co KG Domagkstraße 5 D-85551 Kirchheim (near München)	Tel. +49 89 909552-10 Fax +49 89 909552-50 <a href="mailto:sc-sued@sew-eurodrive.de">sc-sued@sew-eurodrive.de</a>
	West	SEW-EURODRIVE GmbH & Co KG Siemensstraße 1 D-40764 Langenfeld (near Düsseldorf)	Tel. +49 2173 8507-30 Fax +49 2173 8507-55 <a href="mailto:sc-west@sew-eurodrive.de">sc-west@sew-eurodrive.de</a>
	Electronics	SEW-EURODRIVE GmbH & Co KG Ernst-Bickle-Straße 42 D-76646 Bruchsal	Tel. +49 7251 75-1780 Fax +49 7251 75-1769 <a href="mailto:sc-elektronik@sew-eurodrive.de">sc-elektronik@sew-eurodrive.de</a>
	Drive Service Hotline / 24 Hour Service		+49 180 5 SEWHELP +49 180 5 7394357
Additional addresses for service in Germany provided on request!			

France			
Production	Haguenau	SEW-USOCOME 48-54, route de Soufflenheim B. P. 20185 F-67506 Haguenau Cedex	Tel. +33 3 88 73 67 00 Fax +33 3 88 73 66 00 <a href="http://www.usocome.com">http://www.usocome.com</a> <a href="mailto:sew@usocome.com">sew@usocome.com</a>
Sales			
Service			
Production	Forbach	SEW-EUROCOME Zone Industrielle Technopôle Forbach Sud B. P. 30269 F-57604 Forbach Cedex	Tel. +33 3 87 29 38 00
Assembly	Bordeaux	SEW-USOCOME Parc d'activités de Magellan 62, avenue de Magellan - B. P. 182 F-33607 Pessac Cedex	Tel. +33 5 57 26 39 00 Fax +33 5 57 26 39 09
Sales			
Service			
Lyon		SEW-USOCOME Parc d'Affaires Roosevelt Rue Jacques Tati F-69120 Vaulx en Velin	Tel. +33 4 72 15 37 00 Fax +33 4 72 15 37 15
Paris		SEW-USOCOME Zone industrielle 2, rue Denis Papin F-77390 Verneuil l'Etang	Tel. +33 1 64 42 40 80 Fax +33 1 64 42 40 88
Additional addresses for service in France provided on request!			



## Address List

Algeria			
Sales	Alger	Réducom 16, rue des Frères Zaghoun Bellevue El-Harrach 16200 Alger	Tel. +213 21 8222-84 Fax +213 21 8222-84 <a href="mailto:reducom_sew@yahoo.fr">reducom_sew@yahoo.fr</a>
Argentina			
Assembly Sales Service	Buenos Aires	SEW EURODRIVE ARGENTINA S.A. Centro Industrial Garin, Lote 35 Ruta Panamericana Km 37,5 1619 Garin	Tel. +54 3327 4572-84 Fax +54 3327 4572-21 <a href="mailto:sewar@sew-eurodrive.com.ar">sewar@sew-eurodrive.com.ar</a> <a href="http://www.sew-eurodrive.com.ar">http://www.sew-eurodrive.com.ar</a>
Australia			
Assembly Sales Service	Melbourne	SEW-EURODRIVE PTY. LTD. 27 Beverage Drive Tullamarine, Victoria 3043	Tel. +61 3 9933-1000 Fax +61 3 9933-1003 <a href="http://www.sew-eurodrive.com.au">http://www.sew-eurodrive.com.au</a> <a href="mailto:enquires@sew-eurodrive.com.au">enquires@sew-eurodrive.com.au</a>
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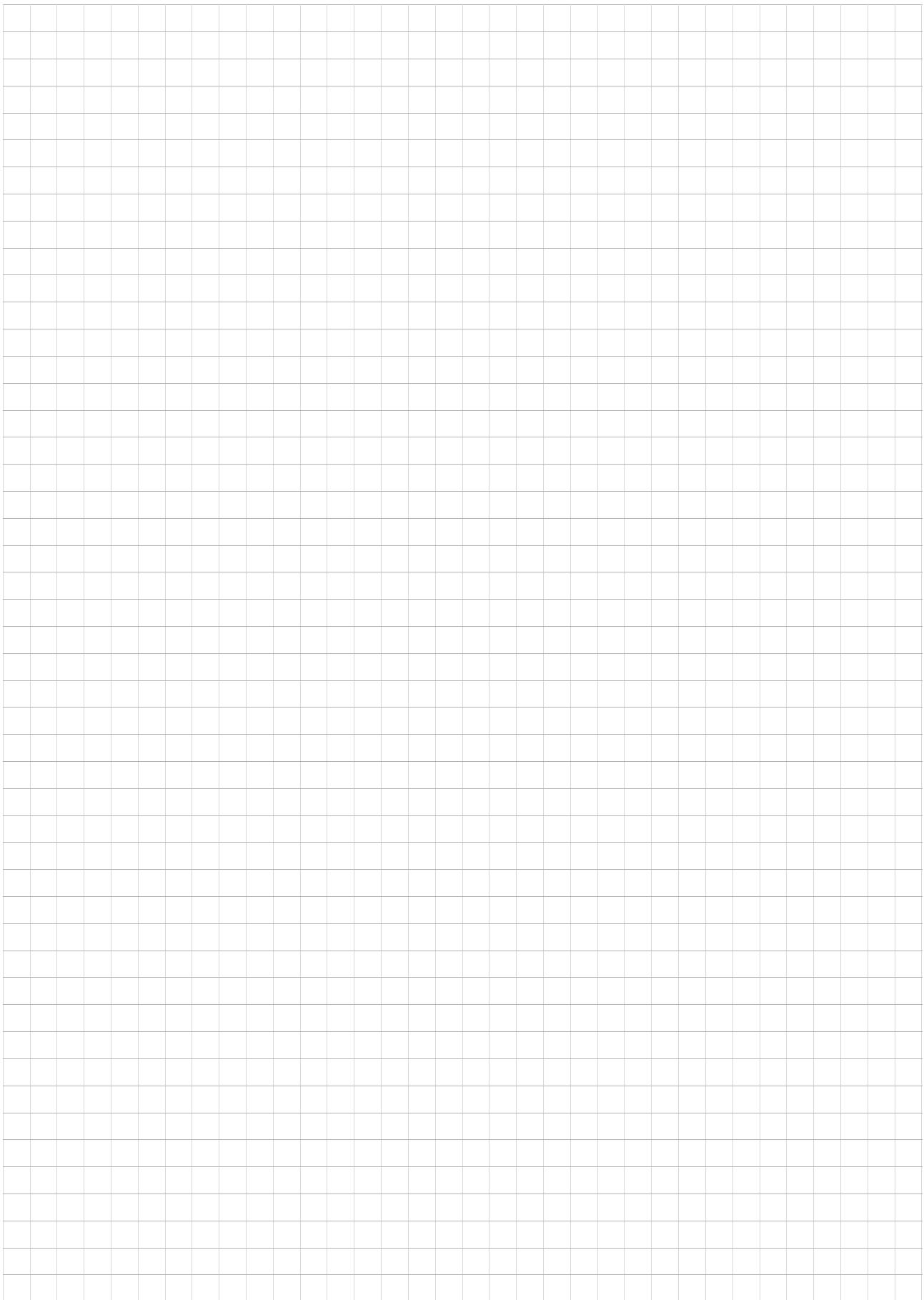
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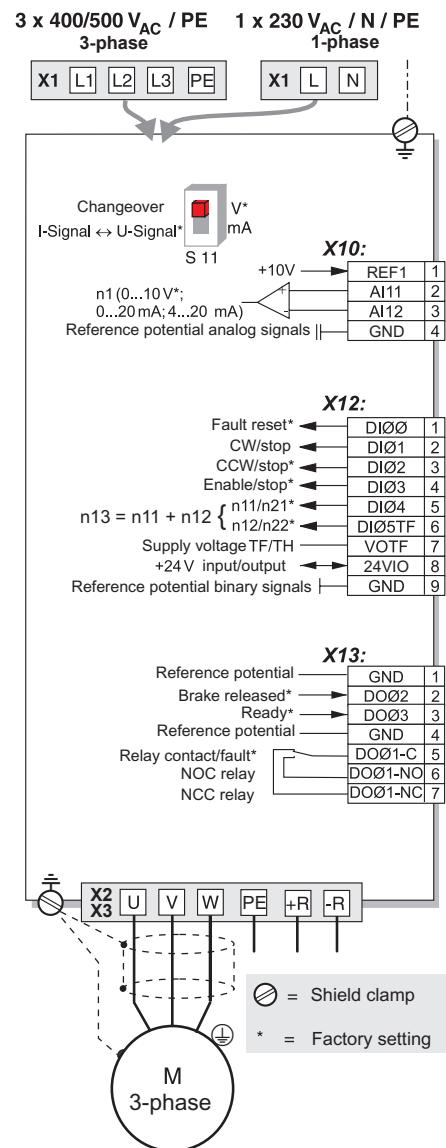


## Startup: Brief Description

The MOVITRAC® B frequency inverter can be connected directly to a motor of the same power. Example: A motor with 1.5 kW (2.0 HP) can be connected directly to a MC07B0015.

### Procedure

1. Connect the motor to MOVITRAC® B (terminal X2).
2. You have the option of connecting a braking resistor (terminal X2/X3).
3. The following signal terminals must be controlled with your control system:
  - Enable DI $\emptyset$ 3
  - As required, CW/Stop DI $\emptyset$ 1 or CCW/Stop DI $\emptyset$ 2
  - Setpoint:
    - Analog input (X10) or / and
    - DI $\emptyset$ 4 = n11 = 150 rpm or / and
    - DI $\emptyset$ 5 = n12 = 750 rpm or / and
    - DI $\emptyset$ 4 + DI $\emptyset$ 5 = n13 = 1500 rpm
  - For brakemotors:  
DO $\emptyset$ 2 = Brake control via brake rectifier
4. You have the option of connecting the following signal terminals:
  - DI $\emptyset$ 0 = Error reset
  - DO $\emptyset$ 1 = /Malfunction (designed as a relay contact)
  - DO $\emptyset$ 3 = Ready
5. Check the controller for the required functionality.
6. Connect the frequency inverter to the power supply system (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: UWS21B / UWS11A / USB11A.

	Note
	Operate the MOVITRAC® B frequency inverter only in strict observance of the detailed operating instructions!

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