











MOVITRAC® B

EA3A000

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1 Important notes

1.1 Explanation of pictograms

Always follow the safety and warning notes in this publication.



Hazard

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



Warning

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



Caution

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



Note

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



Documentation reference

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



You must adhere to the operating instructions to ensure:

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

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

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



1.2 Designated use

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

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

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

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

1.2.1 Operational environment

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

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

1.3 Waste disposal

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





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

2.1 MOVITRAC® B – compact, versatile and universal

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

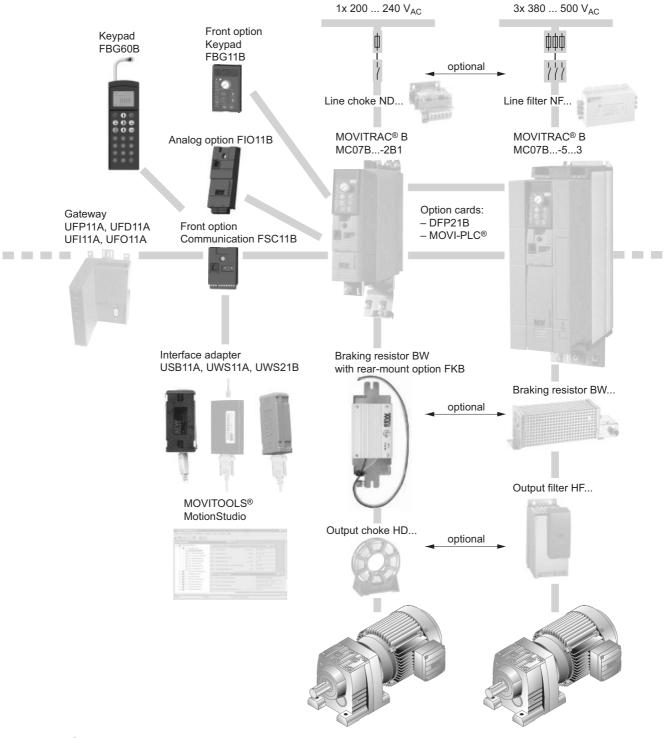
Dive electronics in asynchronous AC motors are distinguished between different applications, such as standard motors for simple applications, e.g. materials handling, and application inverters for more complex technological applications, e.g. positioning and handling applications. Distinguishing between units facilitates scaling to diverse applications while staying within a certain budget.

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



MOVITRAC® B system overview

MOVITRAC® B system overview 2.2



MOVITOOLS® MotionStudio software

Interface adapter / USB11A

Gateways for PROFIBUS

- DeviceNet
- **INTERBUS**
- CANopen

Option cards for

- PROFIBUS fieldbus interface
- MOVI-PLC® control

Line choke

Line filter

Braking resistor

Output choke

Output filter

FBG11B / FBG60 B keypad FSC11B communication Analog module FIO11B



System description MOVITRAC® B The units at a glance



2.3 The units at a glance

| Power supply connection | Motor power | Rated output current | MOVITRAC® B type | Size | |
|-------------------------|-------------------|----------------------|-----------------------------|------|--|
| | 0.25 kW / 0.4 HP | AC 1.7 A | MC07B 0003 -2B1-4-00 | 0XS | |
| | 0.37 kW / 0.5 HP | AC 2.5 A | MC07B 0004 -2B1-4-00 | 0/2 | |
| | 0.55 kW / 0.75 HP | AC 3.3 A | MC07B 0005 -2B1-4-00 | 0S | |
| 230 V 1-phase | 0.75 kW / 1.0 HP | AC 4.2 A | MC07 B0008 -2B1-4-00 | 05 | |
| | 1.1 kW / 1.5 HP | AC 5.7 A | MC07B 0011 -2B1-4-00 | | |
| | 1.5 kW / 2.0 HP | AC 7.3 A | MC07B 0015 -2B1-4-00 | 0L | |
| | 2.2 kW / 3.0 HP | AC 8.6 A | MC07B 0022 -2B1-4-00 | | |
| | 0.25 kW / 0.4 HP | AC 1.0 A | MC07B 0003 -5A3-4-00 | 0XS | |
| | 0.37 kW / 0.5 HP | AC 1.6 A | MC07B 0004 -5A3-4-00 | 0.00 | |
| | 0.55 kW / 0.75 HP | AC 2.0 A | MC07B 0005 -5A3-4-00 | | |
| | 0.75 kW / 1.0 HP | AC 2.4 A | MC07B 0008 -5A3-4-00 | 08 | |
| | 1.1 kW / 1.5 HP | AC 3.1 A | MC07B 0011 -5A3-4-00 | | |
| | 1.5 kW / 2.0 HP | AC 4.0 A | MC07B 0015 -5A3-4-00 | | |
| | 2.2 kW / 3.0 HP | AC 5.5 A | MC07B 0022 -5A3-4-00 | | |
| | 3.0 kW / 4.0 HP | AC 7.0 A | MC07B 0030 -5A3-4-00 | 0L | |
| 400 V 3-phase | 4.0 kW / 5.0 HP | AC 8.6 A | MC07B 0040 -5A3-4-00 | | |
| | 5.5 kW / 7.5 HP | AC 12.5 | MC07B 0055 -5A3-4-00 | 2S | |
| | 7.5 kW / 10 HP | AC 16.0 | MC07B 0075 -5A3-4-00 | 23 | |
| | 11 kW / 15 HP | AC 24.0 | MC07B 0110 -5A3-4-00 | 2 | |
| | 15 kW / 20 HP | AC 32.0 | MC07B 0150 -503-4-00 | | |
| | 22 kW / 30 HP | AC 46.0 | MC07B 0220 -503-4-00 | 3 | |
| | 30 kW / 40 HP | AC 60.0 | MC07B 0300 -503-4-00 | | |
| | 37 kW / 50 HP | AC 65.7 | MC07B 0370 -503-4-00 | 4 | |
| | 45 kW / 60 HP | AC 80.1 | MC07B 0450 -503-4-00 | 4 | |

Size 2S ... 4 in preparation



Functions / features

2.4 Functions / features

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

2.4.1 Unit properties

- Large voltage range:
 - 230 V units 1-phase for a voltage range of AC 200 ... 240 V, 50/60 Hz
 - 400/500 V units for the voltage range 3 × AC 380 ... 500 V, 50/60 Hz
- Overload capacity: 125 % I_N continuous duty

150 % I_N for maximum 60 s

Maximum 200 % breakaway torque

- Rated operation up to ambient temperature $\vartheta = 50^{\circ}$ C.
- Speed range 0 ... 5500 rpm.
- · Frequency range:
 - VFC: 0 ... 150 Hz
 - V/f: 0 ... 600 Hz
- 4-quadrant capability due to the integrated brake chopper.
- Compact unit design for minimum control cabinet space requirement and optimum utilization of control cabinet volume.
- Integrated EMC line filter to maintain the specified class limits (according to EN 55011) on the line side.
 - 1-phase connection: Class A / B
 - 3-phase connection: Class A
- Programmable inputs / outputs
 - 1 analog input
 - 6 binary inputs
 - 3 binary outputs, including 1 relay output
- Voltage supply and evaluation for TF (PTC temperature sensor) integrated for monitoring the motor temperature.
- Integrated evaluation of TH for monitoring the temperature of the motor.
- Optional keypad for displaying setpoints and setting parameters
 - 9 LEDs for displaying selected symbols
 - 6 keys for operation
 - 1 setpoint generator for speed specification
 - Parameter set storage / data backup
- Braking resistor can be installed as an option for size 0.



Functions / features



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

2.4.2 Control

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





Functions / features

2.4.3 Setpoint technology

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

2.4.4 Optional communication / operation

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



MOVITOOLS® MotionStudio



2.5 MOVITOOLS® MotionStudio

The MOVITOOLS® MotionStudio program includes:

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

The MOVITRAC® B has the following functions:

- · Parameter setting
- Visualization / diagnostics
- Startup

2.5.1 SCOPE

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

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

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

- Save
- · Meta data
- Print

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

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





Technical data

CE marking, UL approval and C-Tick

3 Technical data

3.1 CE marking, UL approval and C-Tick

3.1.1 CE marking

Low voltage directive

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

Electromagnetic compatibility (EMC)



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

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

3.1.2 UL approval



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

3.1.3 C-Tick



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





3.2 General technical data

The following technical data applies to all MOVITRAC $^{\circledR}$ B frequency inverters, irrespective of size and power:

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

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





Technical dataMOVITRAC® B electronics data

3.3 MOVITRAC® B electronics data

| Function | Terminal | Designa- tion | Default | Data |
|---|--|--|---|---|
| Setpoint input (differential input) | X10:1 X10:2 X10:3 X10:4 | REF1 Al11 (+) Al12 (0) GND | | $\begin{array}{l} 0 \; \; +10 \; V \; (R_i > 200 \; k\Omega) \\ 0 \; \; 20 \; mA \; / \; 4 \; \; 20 \; mA \; (R_i = 250 \; \Omega) \\ \text{Resolution 10 Bit, sample cycle 1 ms} \\ \text{GND = Reference potential for binary and analog} \\ \text{signals, PE potential} \end{array}$ |
| Binary inputs | X12:1 X12:2 X12:3 X12:4 X12:5 X12.6 | DI00 DI01 DI02 DI03 DI04 DI05TF | Error reset CW/Stop CCW/Stop Enable/Stop n11/n21 n12/n22 | Ri = 3 k Ω , I _E = 10 mA, sample cycle 5 ms, PLC compatible Signal level according to EN 61131-2 type 1 or 3: • +11 +30 V \rightarrow 1 / contact made • -3 +5 V \rightarrow 0 / contact open • X12:2 / DI01 with fixed assignment CW/Stop • X12:5 / DI04 can be used as frequency input • X12:6 / DI05 can be used as TF input |
| Supply voltage for TF | X12:7 | VOTF | | Special characteristics for TF according to DIN EN60947-8 |
| Auxiliary supply output / External voltage supply | X12:8 | 24VIO | | Auxiliary supply output: V = 24V DC, current carrying capacity = 50 mA External voltage supply: V = 24V DC -15 % / +20 % acc. to EN 61131-2 |
| Reference terminal | X12:9 | GND | | Reference potential for binary and analog signals, PE potential |
| Binary outputs | X13:1 X13:2 X13:3 X13:4 | GND DO02 DO03 GND | Brake released Ready for opera- tion | PLC compatible, response time 5 ms, I _{max} DO02 = 150 mA, I _{max} DO03 = 50 mA, short-circuit proof, protected against external voltage up to 30 V GND = Reference potential for binary and analog signals, PE potential |
| Relay output | X13:5 X13:6 X13:7 | DO01-C DO01-NO DO01-NC | | Shared relay contact NO contact NC contact Load capacity: V _{max} = 30 V, I _{max} = 800 mA |
| Safety contact (from BG2S / in preparation) | X17:1 X17:2 X17:3 X17:4 | Reserved | | |
| Terminal response times | Binary inp | ut and output | terminals are upda | ted every 5 ms |
| Max. cable cross- section | 1.5 mm ² (A | AWG15) witho AWG17) with | out conductor end s conductor end slee | sleeves eves |





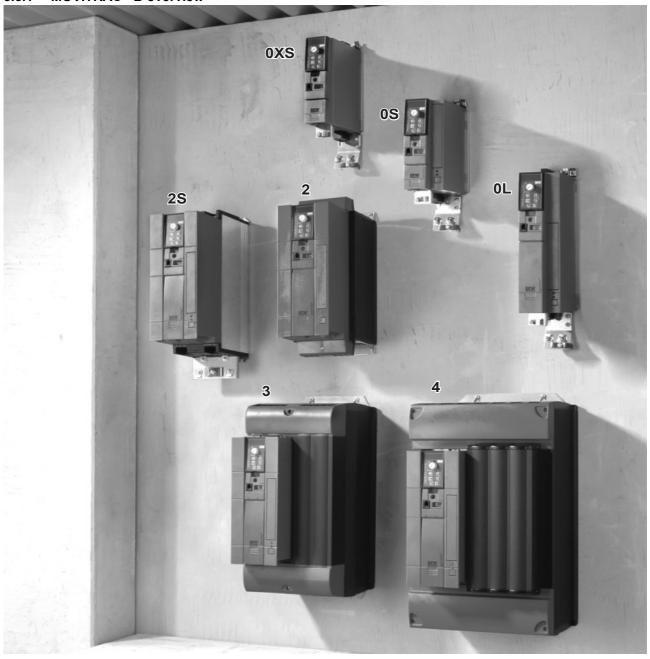
3.4 Electronics data communication interface FSC11B

| Function | Terminal | Designation | Data |
|-------------------|---|---|--|
| System bus (SBus) | X46:1 X46:2 X46:3 X46:4 X46:5 X46:6 X46:7 | SC11: SBus high SC12: SBus low GND: Reference potential SC21: SBus high SC22: SBus low GND: Reference potential 24VIO: Auxiliary power supply / external voltage supply | CAN bus according to CAN specification 2.0, parts A and B, transmission technology according to ISO 11898, max. 64 stations, terminating resistor (120 Ω) can be activated using DIP switches Terminal cross-section: 1.5 mm² (AWG15) without conductor end sleeves 1.0 mm² (AWG17) with conductor end sleeves |
| RS-485 interface | X45:H X45:L X45:A | ST11: RS-485+ ST12: RS-485– GND: Reference potential | EIA standard, 9.6 kBaud, maximum 32 stations Maximum cable length 200 m Dynamic terminating resistor with fixed installation Terminal cross-section: – 1.5 mm² (AWG15) without conductor end sleeves – 1.0 mm² (AWG17) with conductor end sleeves |
| Service interface | X44 RJ10 | | Only for service purposes, exclusively for point-to-point connection Maximum cable length 3 m (10 ft) |



3.5 MOVITRAC® B technical data

3.5.1 MOVITRAC® B overview



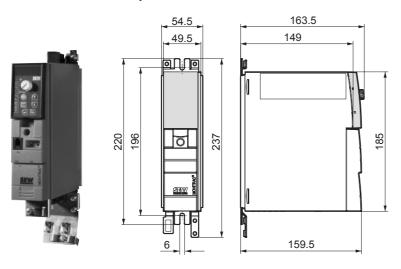
| 230 V / 1-phase power supply connection | | | | | | | | | |
|---|-------------------------|---------------------------|-----------------------------------|--|--|--|--|--|--|
| Size | 0XS | 08 | 0L | | | | | | |
| Power [kW / HP] | 0.25/ 0.4 0.37 / 0.5 | 0.55 / 0.75 0.75 / 1.0 | 1.1/ 1.5 1.5 / 2.0 2.2/ 3.0 | | | | | | |

| 400 / 500 V / 3-phase power supply connection | | | | | | | | |
|---|--------------------------|--|----------------------------------|----------------------|---------|-------------------------------|--------------------|--|
| Size | 0XS | 08 | 0L | 28 | 2 | 3 | 4 | |
| Power [kW / HP] | 0.25 / 0.4 0.37 / 0.5 | 0.55 / 0.75 0.75 / 1.0 1.1/ 1.5 1.5 / 2.0 | 2.2/ 3.0 3.0/ 4.0 4.0/ 5.0 | 5.5/ 7.5 7.5 / 10 | 11 / 15 | 15 / 20 22 / 30 30 / 40 | 37 / 50 45 / 60 | |





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

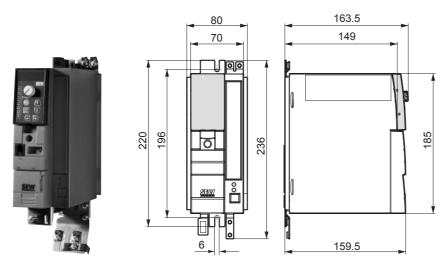


| MOVITRAC® MC07B (1-phase supply system) | 0003-2B1-4-00 | 0004-2B1-4-00 | | |
|--|--|---|--------------------|--|
| Part number | 828 491 1 | 828 493 8 | | |
| INPUT | | | | |
| Permitted rated supply voltage | 1 × AC 230 V V _{Mains} = AC 200 V – 10 % AC 240 V + 10 % | | | |
| Rated supply frequency | f _N | 50 / 60 H | Hz ± 5 % | |
| Rated mains current 1-phase with V _{Mains} = AC 230 V | | AC 4.3 A | AC 6.1 A | |
| OUTPUT | | | | |
| Output voltage | U _A | 3 × 0 | V _{Mains} | |
| Recommended motor power under constant load (with V _{Mains} = AC 230 V) | P _{Mot} | 0.25 kW 0.4 HP | 0.37 kW 0.5 HP | |
| Rated output current with V _{Mains} = AC 230 V | I _N | AC 1.7 A | AC 2.5 A | |
| Minimum braking resistor value (4-Q operation) | R _{BW_min} | | | |
| GENERAL INFORMATION | | | | |
| Power loss at I _N | P _V | 30 W | 35 W | |
| Current limitation | | 150 % I _N for maximum 60 seconds | | |
| Connections | | Terminals 4 mm² / AWG12 | | |
| Dimensions | $W \times H \times D$ | 55 × 185 × 163 mm / 2.0 × 7.3 × 6.4 in | | |
| Weight | m | 1.3 kg / 2.9 lbs. | | |



Technical dataMOVITRAC® B technical data

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

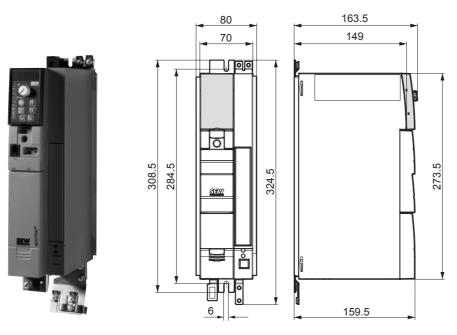


| MOVITRAC® MC07B (1-phase supply system) | | 0005-2B1-4-00 | 0008-2B1-4-00 | | | | |
|--|---------------------|--|----------------------|--|--|--|--|
| Part number | 828 494 6 | 828 495 4 | | | | | |
| INPUT | | | | | | | |
| Permitted rated supply voltage | V _N | 1 × AC 230 V V _{Mains} = AC 200 V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





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

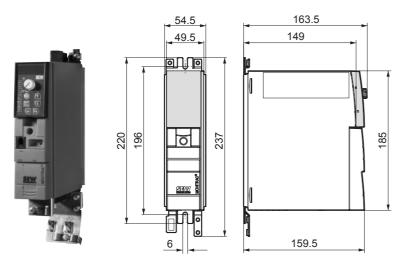


| MOVITRAC® MC07B (1-phase supply system | 0011-2B1-4-00 | 0015-2B1-4-00 | 0022-2B1-4-00 | |
|--|---------------------|---|---------------------------------|------------------|
| Part number | 828 496 2 | 828 497 0 | 828 498 9 | |
| INPUT | | | | |
| Permitted rated supply voltage V_N $1 \times AC$ $V_{Mains}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



Technical dataMOVITRAC® B technical data

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

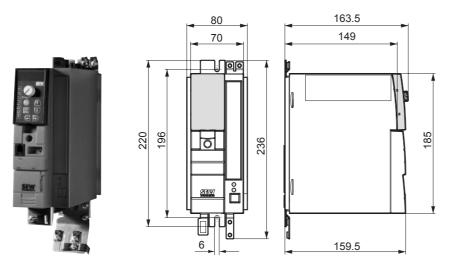


| MOVITRAC® MC07BB (3-phase supply system | 0003-5A3-4-00 | 0004-5A3-4-00 | | | | | |
|--|---------------------|--|--------------------|--|--|--|--|
| Part number | 828 515 2 | 828 516 0 | | | | | |
| INPUT | | | | | | | |
| Permitted rated supply voltage | V _N | 3 × AC 400 V V _{Mains} = AC 380 V –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





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

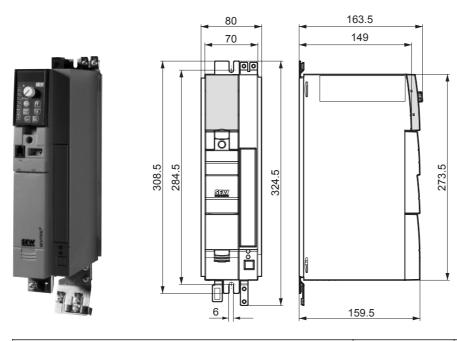


| MOVITRAC® MC07B (3-phase supply system) | | 0005-5A3- 4-00 | 0008-5A3- 4-00 | 0011-5A3- 4-00 | 0015-5A3- 4-00 | |
|--|---------------------|---|--|-------------------|-------------------|--|
| Part number | 828 517 9 | 828 518 7 | 828 519 5 | 828 520 9 | | |
| INPUT | | | | | | |
| Permitted rated supply voltage | V _N | V _{Mains} = | 3 × AC 400 V V _{Mains} = AC 380 V – 10 % AC 500 V + 10 % | | | |
| Rated supply frequency | f _N | | 50 / 60 H | Hz ± 5 % | | |
| Rated mains current 3-phase with V _{Mains} = AC 400 V | | AC 1.8 A | AC 2.2 A | AC 2.8 A | AC 3.6 A | |
| OUTPUT | | | | | | |
| Output voltage | U _A | 3 × 0 V _{Mains} | | | | |
| Recommended motor power under constant load (with V _{Mains} = AC 400 V) | P _{Mot} | | | 1.5 kW 2.0 HP | | |
| Rated output current with V _{Mains} = AC 400 V | I _N | AC 2.0 A | AC 2.4 A | AC 3.1 A | AC 4.0 A | |
| Minimum permitted braking resistor value (4-Q operation) | R _{BW_min} | 68 Ω | | | | |
| GENERAL INFORMATION | | | | | | |
| Power loss at I _N | | 42 W | 48 W | 58 W | 74 W | |
| Current limitation | | 150 % I _N for maximum 60 seconds | | nds | | |
| Connections | Terminals | 4 mm ² / AWG12 | | | | |
| Dimensions | W×H×D | 80 × 185 × 163 mm / 3.1 × 7.3 × 6.4 in | | | 6.4 in | |
| Weight | m | 1.5 kg / 3.3 lbs. | | | | |



Technical dataMOVITRAC® B technical data

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

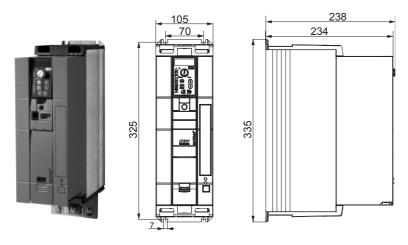


| MOVITRAC® MC07B (3-phase supply system) | | 0022-5A3-4-00 | 0030-5A3-4-00 | 0040-5A3-4-00 |
|--|---------------------|--|------------------|---------------|
| Part number | 828 521 7 | 828 522 5 | 828 523 3 | |
| INPUT | | | | |
| Permitted rated supply voltage V _N | | 3 × AC 400 V V _{Mains} = AC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





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



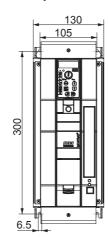
| MOVITRAC® MV07B (3-phase supply system) | | 0055-5A3-4-00 | 0075-5A3-4-00 | |
|--|------------------|--|-------------------------|--|
| Part number | 828 524 1 | 828 526 8 | | |
| INPUT | | | | |
| Permitted rated supply voltage V _N | | 3 × AC 400 V V _{Mains} = AC 380 V – 10 % AC 500 V + 10 % | |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

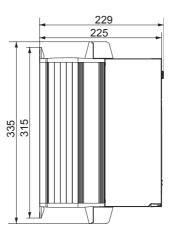


Technical dataMOVITRAC® B technical data

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







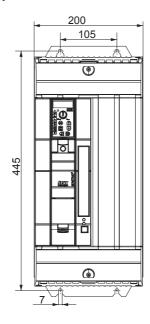
| MOVITRAC® MC07B (3-phase supply system) | | 0110-5A3-4-00 | | |
|--|---------------------|--|--|--|
| Part number | | 828 527 6 | | |
| INPUT | | | | |
| Permitted rated supply voltage | V _N | 3 × AC 400 V V _{Mains} = AC 380 V – 10 % AC 500 V + 10 % | | |
| Rated supply frequency | f _N | 50 / 60 Hz ± 5 % | | |
| Rated mains current 3-phase with V _{Mains} = AC 400 V | | AC 21.6 A | | |
| OUTPUT | | | | |
| Output voltage | U _A | 3 × 0 V _{Mains} | | |
| Recommended motor power under constant load (with V _{Mains} = AC 400 V) | P _{Mot} | 11 kW 15 HP | | |
| Rated output current with V _{Mains} = AC 400 V | I _N | AC 24 A | | |
| Minimum permitted braking resistor value (4-Q operation) | R _{BW_min} | | | |
| GENERAL INFORMATION | | | | |
| Power loss at I _N | P _V | 400 W | | |
| Current limitation | | 150 % I _N for maximum 60 seconds | | |
| Connections | Terminals | 4 mm ² / AWG12 | | |
| Dimensions | W×H×D | 130 × 335 × 229 mm / 5.1 × 13.2 × 9.0 in | | |
| Weight | m | 6.6 kg / 14.6 lbs. | | |

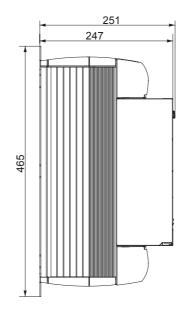




3.5.10 AC 400 / 500 V / 3-phase / size 3 / 15 ... 30 kW / 20 ... 40 HP





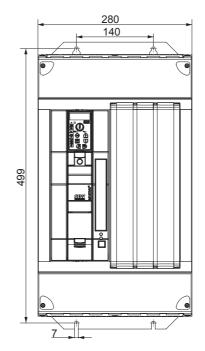


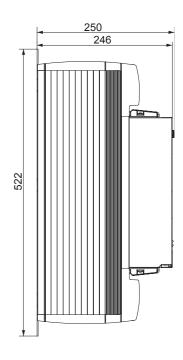
| MOVITRAC® MC07B (3-phase supply system) | | 0150-503-4-00 | 0220-503-4-00 | 0300-503-4-00 |
|--|------------------|--|---------------------------|---------------------------|
| Part number | | 828 528 4 | 828 529 2 | 828 530 6 |
| INPUT | | | | |
| Permitted rated supply voltage V _N | | 3 × AC 400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



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







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





3.6 FBG11B keypad front option

Part number

1820 635 2

Functions

- Process values and status displays
- Error memory and error reset queries
- · Displaying and setting parameters
- Data backup and parameter set transfer
- Convenient startup menu for SEW and non-SEW motors
- Manual control of MOVITRAC® B

Features

- 5-digit, 7-segment display / 6 keys / 8 icons / speed control module
- · Choice of short or long menu
- Can be plugged onto the inverter (during operation)
- Enclosure IP20 (EN 60529)





Technical data FSC11B communication module

3.7 FSC11B communication module

Part number

1820 716 2

Functions

• Communication with PLC / MOVITRAC® B / PC

• Operation / parameter settings / service (PC)

Features

• RS-485 (one interface): Plug-in terminals and service interface (RJ10 socket)

• CAN-based system bus (SBus) (plug-in terminals)



| Function | Terminal | Designation | Data |
|-------------------|---|---|--|
| System bus (SBus) | X46:1 X46:2 X46:3 X46:4 X46:5 X46:6 X46:7 | SC11: SBus high SC12: SBus low GND: Reference potential SC21: SBus high SC22: SBus low GND: Reference potential 24VIO: Auxiliary power supply / external voltage supply | CAN bus to CAN specification 2.0, parts A and B, transmission technology to ISO 11898, max. 64 stations, terminating resistor (120 Ω) can be activated using DIP switches Terminal cross-section: 1.5 mm² (AWG15) without conductor end sleeves 1.0 mm² (AWG17) with conductor end sleeves |
| RS-485 interface | X45:H X45:L X45:⊥ | ST11: RS-485+ ST12: RS-485– GND: Reference potential | EIA standard, 9.6 kBaud, max. 32 stations Maximum cable length 200 m Dynamic terminating resistor with fixed installation Terminal cross-section: – 1.5 mm² (AWG15) without conductor end sleeves – 1.0 mm² (AWG17) with conductor end sleeves |
| Service interface | X44 RJ10 | | Only for service purposes, exclusively for point-to-point connection Maximum cable length 3 m (10 ft) |



DBG60B keypad (in preparation)



3.8 DBG60B keypad (in preparation)

3.8.1 Description

The basic version of $MOVITRAC^{\$}$ does not have a DBG60B keypad and can be upgraded to include the keypad as an option.

| Keypad | | Language | Part number |
|--|-------------------------------------|--|-------------|
| | DBG60B-01 | DE / EN / FR / IT / ES / PT / NL (German / English / French / Italian / Spanish / Portuguese / Dutch) | 1 820 403 1 |
| | DBG60B-02 | DE / EN / FR / FI / SV / DA / TR (German / English / French / Finnish / Swedish / Danish / Turkish) | 1 820 405 8 |
| Post of the second of the seco | DBG60B-03 | DE / EN / FR / RU / PL / CS (German / English / French / Russian / Polish / Czech) | 1 820 406 6 |
| | DBG60B-04 | DE / EN / FR / ZH (German / English / French / Chinese) | 1 820 850 9 |
| | Door installation set ¹⁾ | Description (= scope of delivery) | Part number |
| | DBM60B | Housing for DBG60B (IP65) DKG60B extension cable, length 5 m | 824 853 2 |
| 1 2 3 | Extension cable | Description (= scope of delivery) | Part number |
| 4 5 6 7 8 9 4 0 . | DKG60B | Length 5 m 4-core, shielded cable (AWG26) | 817 583 7 |

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

3.8.2 Functions

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





Technical data

DBG60B keypad (in preparation)

3.8.3 Features

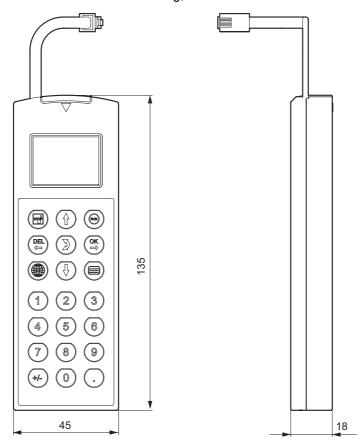
- Illuminated text display, choice of 7 languages
- Keypad with 21 keys
- Can be connected via extension cable DKG60B (5 m)
- Enclosure IP40 (EN 60529)



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

3.8.4 DBG60B dimension drawing

DBG60B dimension drawing, dimensions in mm

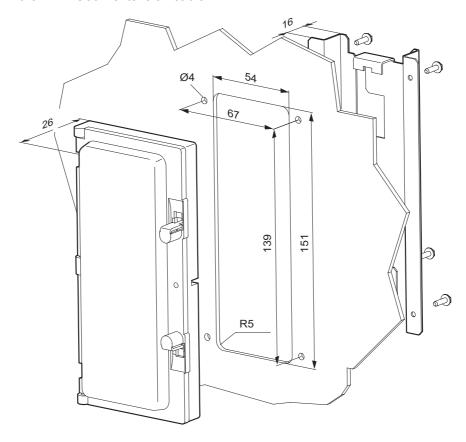






3.8.5 DBG60B housing imension drawing

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





Technical data

Analog module FIO11B (in preparation)

3.9 Analog module FIO11B (in preparation)

Part number 1820 637 9

3.9.1 Description

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

- Setpoint input
- Analog output
- · RS-485 interface



3.9.2 Electronics data

| Function | Terminal | Designation | Data |
|--|-------------------------|--|--|
| Setpoint input | X40:1 X40:2 | Al2: Voltage input GND: Reference potential | $-10 \dots +10 \text{ V}$ R _i > 200 kΩ 10 bit resolution Sampling interval 5ms |
| Analog output / alternative as current output or voltage output | X40:3 X40:4 X40:5 | GND: Reference potential AOV1: Voltage output AOC1: Current output | 0 +10 V / I _{max} = 2 mA 0 (4) 20 mA 10 bit resolution Sampling interval 5ms Short-circuit proof and protected against external voltage up to 30 V |
| RS-485 interface | X45:H X45:L X45:⊥ | ST11: RS-485+ ST12: RS-485– GND: Reference potential | EIA standard, 9.6 kBaud, max. 32 stations Maximum cable length 200 m Dynamic terminating resistor with fixed installation Terminal cross-section: – 1.5 mm² (AWG15) without conductor end sleeves – 1.0 mm² (AWG17) with conductor end sleeves |
| Service interface | X44 RJ10 | | Only for service purposes, exclusively for point-to-point connection Maximum cable length 3 m (10 ft) |





UWS11A interface adapter for communication

Part number 822 689 X The FSC11B is required for connecting the UWS11A.

The UWS11A option converts RS-232 signals, for example from the PC, into RS-485 signals. Description

These RS-485 signals can then be routed to the RS-485 interface of the MOVITRAC® B.

The UWS11A option requires a 24V DC voltage supply (I_{max} = DC 100 mA).

RS-232 interface The connection between UWS11A and PC is made using a commercially available serial interface cable

(shielded!)

RS-485 interface Use the RS485 interface of the UWS11A to network up to 32 MOVITRAC® B units for communication

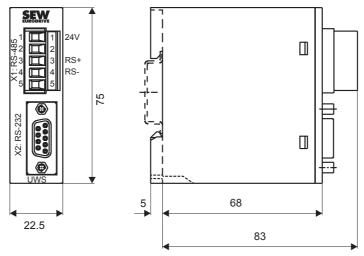
(max. cable length 200 m total). Do not connect external terminating resistors because dynamic termi-

nating resistors are already installed!

Permitted cable cross-section: One core per terminal 0.20...2.5 mm² (AWG 24...12)

Two cores per terminal 0.20...1 mm² (AWG 24...17)

Dimension drawing



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

UWS21B interface adapter for service purposes 3.11

18204562 The FSC11B is required for connecting the UWS21B. Part number

The UWS21B option converts RS-232 signals, for example from the PC, into RS-485 signals. Description

These RS-485 signals can then be routed to the interface of the MOVITRAC® B.

RS-232 interface The connection between UWS21A and PC is made using a commercially available serial interface cable

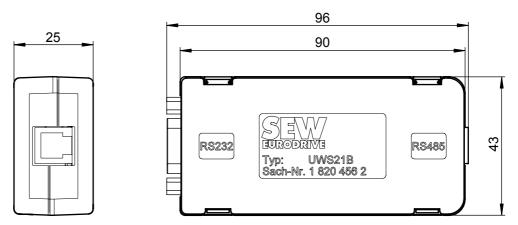
RS-485 interface UWS21A and MOVITRAC® B are connected using a serial interface cable with RJ10 connectors.

Scope of delivery

The scope of delivery for the UWS21B option includes:

- UWS21B unit
- Serial interface cable with 9-pin sub D socket and 9-pin sub D connector to connect the UWS21B option to the PC.
- Serial interface cable with two RJ10 connectors to connect UWS21B and MOVITRAC® B
- CD-ROM with drivers and MOVITOOLS® MotionStudio

UWS21B dimension drawing





Technical data

USB11A interface adapters for service purposes

3.12 USB11A interface adapters for service purposes

Part number

824 831 1

The FSC11B is required for connecting the USB11A.

Description

Option USB11A enables a PC or laptop with a USB interface to be connected to the Xterminal interface of

the MOVIDRIVE® unit. The USB11A interface adapter supports USB1.1 and USB2.0.

The USB11A interface adapter supports USB1.1 and USB2.0.

RS-232 interface

The connection between USB11A and PC is made using a commercial standard USB cable type USB A-B

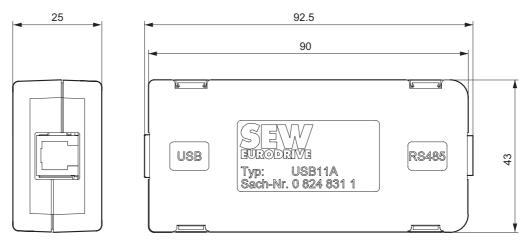
(shielded!).

Scope of delivery

The scope of delivery for the USB11A option includes:

- USB11A unit
- USB connection cable type USB A-B to connect PC to USB11A
- Serial interface cable with two RJ10 connectors to connect MOVITRAC® B and USB11A.
- CD-ROM with drivers and MOVITOOLS® MotionStudio.

USB11A dimension drawing





3.13 Braking resistors, BW series

3.13.1 General information

Braking resistor types

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

3.13.2 PTC braking resistors

Observe the following points for the PTC braking resistors:

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

| Braking resistor type | BW2 | BW4 | | |
|------------------------------------|----------------|----------------|--|--|
| Part number | 800 622 9 | 800 624 5 | | |
| Resistance value R _{BW} | | 87.5 Ω ±10 % | | |
| Connection | Conductor | end sleeves | | |
| Ambient temperature ϑ _A | −25 °C +155 °C | −25 °C +135 °C | | |
| For MOVITRAC® B | 400/500 V | 230 V | | |



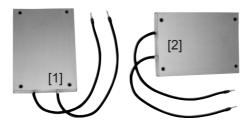
Technical dataBraking resistors, BW series

3.13.3 Flat-design

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

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

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



230 V

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

400 / 500 V

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





3.13.4 Wire resistors and grid resistors

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

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

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

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

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

230 V

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

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



Technical dataBraking resistors, BW series

400 V

| Туре | 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 | | |
| BWT part number | 1820 419 8 | 1820 133 4 | 1820 417 1 | 1820 134 2 | 1820 084 2 | 1820 135 0 | | |
| 100 % CDF 50 % CDF 25 % CDF 12 % CDF 6 % CDF | 0.6 kW 1.1 kW 1.9 kW 3.6 kW 5.7 kW | 0.8 kW 1.4 kW 2.6 kW 4.8 kW 7.6 kW | 1.2 kW 2.2 kW 3.8 kW 6.7 kW 10 kW ¹⁾ | 1.2 kW 2.2 kW 3.8 kW 7.2 kW 11 kW | 2.0 kW 3.8 kW 6.4 kW 12 kW 19 kW | 4.0 kW 7.6 kW 12.8 kW 20 kW ¹⁾ 20 kW ¹⁾ | | |
| Resistance | 100 Ω ±10 % | 68 Ω | ±10 % | 47 Ω ±10 % | | | | |
| Trip current I _F | 2.4 A _{RMS} | 3.4 A _{RMS} | 4.2 A _{RMS} | 5 A _{RMS} | 6.5 A _{RMS} | 9.2 A _{RMS} | | |
| Connections | Ceramic terminals 2.5 mm ² (AWG12) | | | | | | | |
| Design | Wire resistor | | | | | | | |
| For MOVITRAC® B | | 0015 0040 | | | 0055 / 0075 | | | |

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

| Туре | BW039-012 | BW039-026 | BW039-050 | BW018-015 | BW018-035 | BW018-075 | | |
|--|---|--|---|---|---|--|--|--|
| Part number | 821 689 4 | - | _ | 821 684 3 | _ | - | | |
| BWT part number | 1820 1369 | 1820 415 5 | 1820 137 7 | 1820 416 3 | 1820 138 5 | 1820 139 3 | | |
| 100 % CDF 50 % CDF 25 % CDF 12 % CDF 6 % CDF | 1.2 kW 2.1 kW 3.8 kW 7.0 kW 11.4 kW | 2.6 kW 4.6 kW 8.3 kW 15.3 kW 24.0 kW ¹⁾ | 5.0 kW 8.5 kW 15.0 kW 24.0 kW ¹⁾ 24.0 kW ¹⁾ | 1.5 kW 2.5 kW 4.5 kW 6.7 kW 11.4 kW | 3.5 kW 5.9 kW 10.5 kW 15.7 kW 26.6 kW | 7.5 kW 12.7 kW 22.5 kW 33.7 kW 52.2 kW ¹⁾ | | |
| Resistance | 39 Ω | ±10 % | 39 Ω ±10 % | 18 Ω ±10 % | | | | |
| Trip current I _F | 5.5 A _{RMS} | 8.1 A _{RMS} | 11.3 A _{RMS} | 9.1 A _{RMS} | 13.9 A _{RMS} | 20.4 A _{RMS} | | |
| Connections | | Ceramic terminals 2.5 mm ² (AWG12) | | | | | | |
| Design | Wire r | Wire resistor Grid resistor | | | | | | |
| For MOVITRAC® B | 01 | 110 | 0110 0150 / 0220 | | | | | |

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

| Туре | BW915 | BW012-025 BW012-050 BW012-100 | | BW0106 | BW206 | | | |
|--|--|---|---|---|--|--|--|--|
| Part number | _ | 821 680 0 | _ | _ | _ | _ | | |
| BWT part number | 1820 413 9 | 1820 414 7 | 1820 140 7 | 1820 141 5 | 1820 083 4 | 1820 412 0 | | |
| 100 % CDF 50 % CDF 25 % CDF 12 % CDF 6 % CDF | 16 kW 27 kW 45 kW ¹⁾ 45 kW ¹⁾ | 2.5 kW 4.2 kW 7.5 kW 11.2 kW 19.0 kW | 5.0 kW 8.5 kW 15.0 kW 22.5 kW 38.0 kW | 10 kW 17 kW 30 kW 45 kW 56 kW ¹⁾ | 13.5 kW 23 kW 40 kW 61 kW 102 kW | 18 kW 30.6 kW 54 kW 81 kW 136.8 kW | | |
| Resistance | 15 Ω ±10 % | | 12 Ω ±10 % | 1 | 6 Ω ±10 % | | | |
| Trip current I _F | 32.6 A _{RMS} | 14.4 A _{RMS} | 20.4 A _{RMS} | 28.8 A _{RMS} | 47.4 A _{RMS} | 54.7 A _{RMS} | | |
| Connections | M8 stud | Ceramic terminals 2.5 mm ² (AWG12) M8 stud | | | | | | |
| Design | | Grid resistor | | | | | | |
| For MOVITRAC® B | 0220 | 0300 0370 / 0450 | | | | | | |

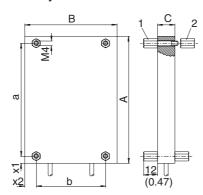
¹⁾ Physical power limit due to DC link voltage and resistance value.



3.13.5 Dimensions of BW Braking Resistors

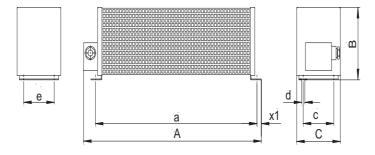
Flat-design

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



| Туре | Main dimensions [mm (in)] | | | F | | Weight | | |
|------------------------|---------------------------|----------|----------|-----------|----------|---------|----------|-----------|
| | Α | В | С | а | b/c/e | x1 | x2 | [kg (lb)] |
| BW072-003 BW027-003 | 110 (4.3) | 80 (3.2) | 15 (0.6) | 98 (3.9) | 60 (2.4) | 6 (0.2) | 10 (0.4) | 0.3(0.7) |
| BW072-005 BW027-005 | 216 (8.5) | 80 (3.2) | 15 (0.6) | 204 (8.0) | 60 (2.4) | 6 (0.2) | 10 (0.4) | 0.6(1.3) |

Wire resistors

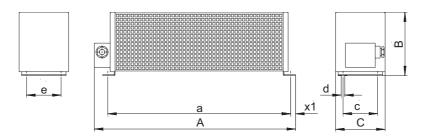


| Туре | N | Main dimensions [mm (in)] | | | Fa | stening part | s [mm (in) |] | Weight |
|-----------|------------|---------------------------|-----------|------------|------------|--------------|------------|-----------|-------------|
| | Α | A BWT | В | С | а | b/c/e | x 1 | d | [kg (lb)] |
| BW027-006 | 486 (19.1) | - | 120 (4.7) | 92 (3.6) | 426 (16.8) | 64 (2.5) | 10 (0.4) | 5.8(0.2) | 2.2 (4.9) |
| BW027-012 | 486 (19.1) | - | 120 (4.7) | 185 (7.3) | 426 (16.8) | 150 (5.9) | 10 (0.4) | 5.8(0.2) | 4.3 (9.5) |
| BW100-006 | 486 (19.1) | 486 (19.1) | 120 (4.7) | 92 (3.6) | 426 (16.8) | 64 (2.5) | 10 (0.4) | 5.8 (0.2) | 2.2 (4.9) |
| BW168 | 365 (14.4) | 406 (16.0) | 120 (4.7) | 185 (7.3) | 326 (12.8) | 150 (5.9) | 10 (0.4) | 5.8 (0.2) | 3.6 (8.0) |
| BW268 | 465 (18.3) | 486 (19.1) | 120 (4.7) | 185 (7.3) | 426 (16.8) | 150 (5.9) | 10 (0.4) | 5.8 (0.2) | 4.3 (9.5) |
| BW147 | 465 (18.3) | 486 (19.1) | 120 (4.7) | 185 (7.3) | 426 (16.8) | 150 (5.9) | 10 (0.4) | 5.8 (0.2) | 4.3 (9.5) |
| BW247 | 665 (16.2) | 686 (27.0) | 120 (4.7) | 185 (7.3) | 626 (24.7) | 150 (5.9) | 10 (0.4) | 5.8 (0.2) | 6.1 (13.5) |
| BW347 | 670 (26.4) | 750 (29.5) | 145 (5.7) | 340 (13.4) | 630 (24.8) | 300 (11.8) | 10 (0.4) | 5.8 (0.2) | 13.2 (29.1) |
| BW039-003 | 286 (11.3) | - | 120 (4.7) | 92 (3.6) | 226 (8.9) | 64 (2.5) | 10 (0.4) | 5.8 (0.2) | 1.5 (3.3) |
| BW039-006 | 486 (23.1) | _ | 120 (4.7) | 92 (3.6) | 426 (16.8) | 150 (5.9) | 10 (0.4) | 5.8 (0.2) | 2.2 (4.9) |
| BW039-012 | 486 (19.1) | 486 (19.1) | 120 (4.7) | 185 (7.3) | 426 (16.8) | 150 (5.9) | 10 (0.4) | 5.8 (0.2) | 4.3 (9.5) |
| BW039-026 | - | 586 (23.1) | 120 (4.7) | 275 (10.8) | 530 (20.9) | 240 (9.5) | 10 (0.4) | 5.8 (0.2) | 7.5 (16.6) |



Technical dataBraking resistors, BW series

Grid resistors



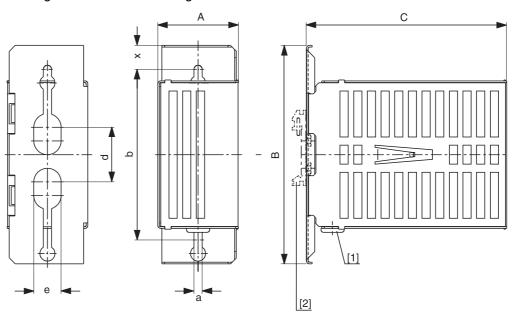
| Туре | N | lain dimensi | ons [mm (in |)] | F | Weight | | | |
|----------------------------|------------|--------------|-------------|------------|------------|------------|----------|------------|------------|
| | Α | A BWT | В | С | а | b/c/e | x1 | d | [kg (lb)] |
| BW012-025-P ¹⁾ | 295 (11.6) | - | 260 (10.2) | 490 (19.3) | 270 (10.6) | 380 (15.0) | _ | 10.5 (0.4) | 9.0(19.8) |
| BW012-050 | - | 395 (15.5) | 260 (10.2) | 490 (19.3) | 370 (14.6) | 380 (15.0) | _ | 10.5 (0.4) | 12 (26.5) |
| BW012-100 | - | 595 (23.4) | 260 (10.2) | 490 (19.3) | 570 (22.4) | 380 (15.0) | _ | 10.5 (0.4) | 21 (46.3) |
| BW018-015-/P ²⁾ | 600 (23.6) | - | 120 (4.7) | 92 (3.6) | 540 (21.3) | 64 (2.5) | 10 (0.4) | 5.8 (0.2) | 4.0(8.8) |
| BW018-035 | - | 295 (11.6) | 260 (10.2) | 490 (19.3) | 270 (10.6) | 380 (15.0) | _ | 10.5 (0.4) | 9.0 (19.8) |
| BW018-075 | - | 595 (23.4) | 260 (10.2) | 490 (19.3) | 570 (22.4) | 380 (15.0) | _ | 10.5 (0.4) | 21 (46.3) |
| BW039-050 | _ | 395 (15.6) | 260 (10.2) | 490 (19.3) | 370 (14.6) | 380 (15.0) | 10 (0.4) | 10.5 (0.4) | 12 (26.5) |
| BW915 | - | 795 (31.3) | 260 (10.2) | 490 (19.3) | 770 (30.3) | 380 (15.0) | _ | 10.5 (0.4) | 26 (57.3) |
| BW106 | - | 795 (31.3) | 260 (10.2) | 490 (19.3) | 770 (30.3) | 380 (15.0) | _ | 10.5 (0.4) | 32 (70.5) |
| BW206 | _ | 995 (39.2) | 260 (10.2) | 490 (19.3) | 970 (38.2) | 380 (15.0) | _ | 10.5 (0.4) | 43 (94.8) |

- 1) D = 355 mm (14.0 in)
- 2) BW..-P: A = 620 mm (24.4 in)



3.14 Touch guard BS

Touch guard dimension drawing:



- [1] Grommet[2] Support rail mounting

| Туре | Main dimensions [mm (in)] | | | Main dimensions [mm (in)] Mounting dimensions [mm (in)] | | | | | |
|--------|---------------------------|-----------|-----------|---|----------|----------|---------|------------|--|
| | Α | В | ВС | | d | е | а | x | |
| BS-003 | 60 (2.4) | 160 (6.3) | 146 (5.8) | 125 (4.9) | 40 (1.6) | 20 (0.8) | 6 (0.2) | 17.5 (0.7) | |
| BS-005 | 60 (2.4) | 160 (6.3) | 252 (9.9) | 125 (4.9) | 40 (1.6) | 20 (0.8) | 6 (0.2) | 17.5 (0.7) | |

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

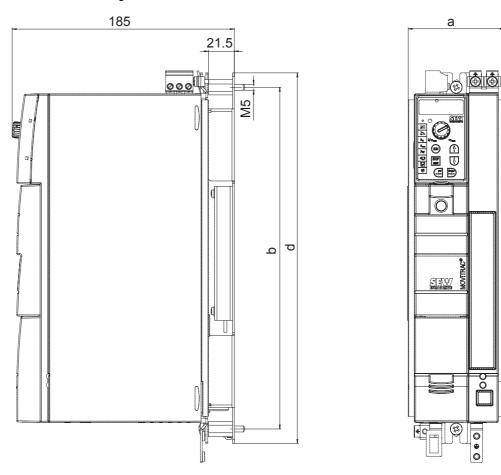


3.15 Submounting of flat-design resistors FKB

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

| Туре | Part number | Size | Braking resistor | |
|--------|-------------|------|------------------|------------|
| | | | 230 V | 400/500 V |
| FKB11B | 1820 728 6 | 0XS | BW4 | BW2 |
| FKB12B | 1820 729 4 | 0S | BW027-003 | BW072-003 |
| FKB13B | 1820 730 8 | 0L | BVV027-003 | BVV072-003 |

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



| MOVITRAC® B size | а | b | d |
|------------------|----|-------|-------|
| 0XS | 55 | 196 | 220 |
| 0\$ | 80 | 196 | 220 |
| 0L | 80 | 284.5 | 308.5 |

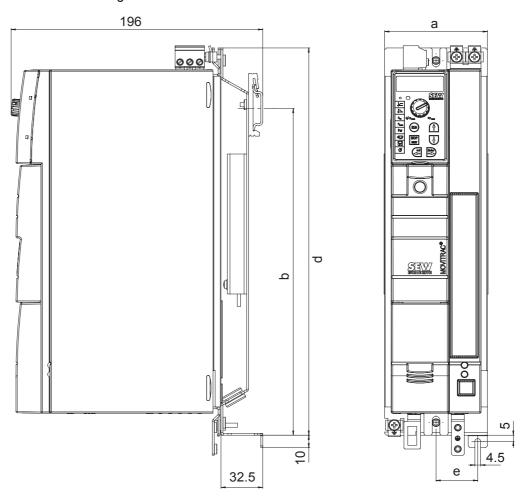


3.16 Support rail mounting FHS

The FHS is used for support rail mounting of MOVITRAC $^{\rm B}$ B frequency inverters and for the submounting of flat-design resistors.

| Туре | 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 | DVV027-003 | DVVU12-003 | |

Dimension drawing:



| MOVITRAC® B size | а | b | d | е |
|------------------|----|-------|-------|------|
| 0XS | 55 | 171.5 | 220 | 7.5 |
| 0S | 80 | 171.5 | 220 | 32.5 |
| 0L | 80 | 260.3 | 308.5 | 32.5 |





3.17 Line chokes ND

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

| Line choke type | ND 010-301 | ND 020-151 | ND 027-123 | ND 035-073 | | | |
|------------------------------|---------------------------|-----------------------------------|------------|-------------|--|--|--|
| Part number | 826 972 6 | 826 973 4 | 825 771 X | 825 772 8 | | | |
| Rated voltage V _N | 1 x AC 23 | 0 V ±10 % | 3 x AC 380 | 500 V ±10 % | | | |
| Rated current I _N | AC 10 A | AC 20 A | AC 27 A | AC 35 A | | | |
| Power loss at I _N | 6 W | 10 W | 35 W | 35 W | | | |
| Inductance L _N | 3 mH | 1.5 mH | 1.2 mH | 0.7 mH | | | |
| Terminal strip | 4 mm ² (AWG10) | 10 mm ² (AWG8) | | | | | |
| Suitable for MOVITRAC® B | | | | | | | |
| 1-phase 230 V | 0004 0008 | 0011 0022 0004 0022 ¹⁾ | | | | | |

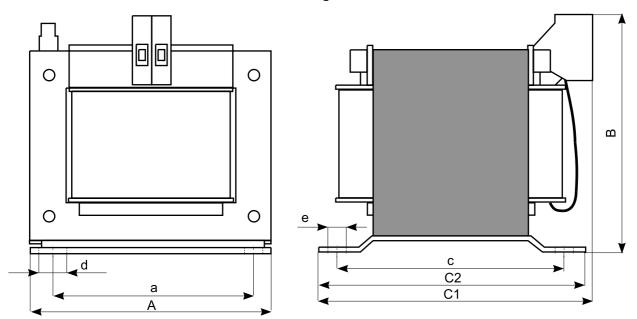
1) For connecting several 1-phase inverters to a 3-phase line choke.

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



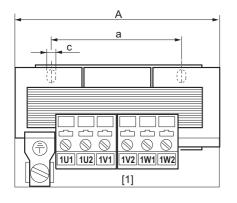


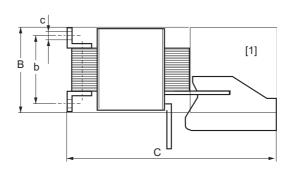
3.17.1 ND 010-301 / ND 020-151dimension drawing



| Туре | Main dimensions [mm (in)] | | | Mounting dimensions [mm (in)] | | | | Weight | |
|------------|---------------------------|-----------|----------|-------------------------------|----------|----------|-----------|-----------|-----------|
| | Α | В | C1 | C2 | а | С | d | е | [kg (lb)] |
| ND 010-301 | 90 (3.5) | 100 (3.9) | 80 (3.2) | 70 (2.8) | 64 (2.5) | 52 (2.1) | 4.4 (0.2) | 7.4 (0.3) | 1.4 (3.1) |
| ND 020-151 | 90 (3.5) | 100 (3.9) | 90 (3.6) | 70 (2.8) | 64 (2.5) | 52 (2.1) | 4.4 (0.2) | 7.4 (0.3) | 1.4 (3.1) |

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





[1] = Space for touch-safe terminal strips

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



Technical data Line filter NF

3.17.3 Several inverters on one line choke

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

3.18 Line filter NF

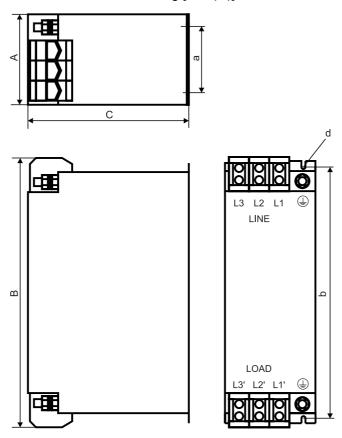
The line filter suppresses interference emissions on the line side of inverters. The ambient temperature range is $-25 \dots +45 \text{ C}$. The enclosure is IP20 (EN 60529).

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

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



Line filter dimension drawing [mm (in)]:



| Line filter | Main dimensions | | | | | |
|-------------|-----------------|------------|-----------|--|--|--|
| type | Α | В | С | | | |
| NF009-503 | EE (0.0) | 195 (7.7) | | | | |
| NF014-503 | 55 (2.2) | 225 (8.9) | 80 (3.2) | | | |
| NF018-503 | 50 (2.0) | 255 (10.0) | | | | |
| NF035-503 | 60 (2.4) | 275 (10.8) | | | | |
| NF048-503 | 60 (2.4) | 315 (12.4) | 100 (3.9) | | | |
| NF063-503 | 00 (2.5) | 260 (10.2) | | | | |
| NF085-503 | 90 (3.5) | 320 (12.6) | 140 (5.5) | | | |
| NF115-503 | 100 (3.9) | 330 (13.0) | 155 (6.1) | | | |

| Line filter Mounting of | | limensions | Hole dimension | PE connection | Weight |
|-------------------------|----------|------------|----------------|---------------|------------|
| type | а | b | d | PE connection | kg (lb) |
| NF009-503 | | 180 (7.1) | | | 0.8(1.8) |
| NF014-503 | 20 (0.8) | 210 (8.3) | 5.5 (0.2) | M5 | 0.9 (2.0) |
| NF018-503 | ı | 240 (9.4) | | | 1.1(2.4) |
| NF035-503 | 30 (1.2) | 255 (10.0) | | | 1.7(3.7) |
| NF048-503 | 30 (1.2) | 295 (11.6) | | M6 | 2.1(4.6) |
| NF063-503 | 60 (2.4) | 235 (9.3) | | IVIO | 2.4 (5.3) |
| NF085-503 | 00 (2.4) | 255 (40.0) | 6.5 (0.3) | M8 | 3.5 (7.7) |
| NF115-503 | 65 (2.6) | 255 (10.0) | | M10 | 4.8(10.6) |



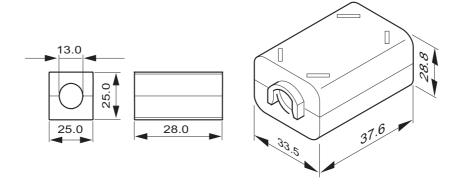
Technical dataFoldable ferrites

3.19 Foldable ferrites

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

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

Foldable ferrites dimension drawing:





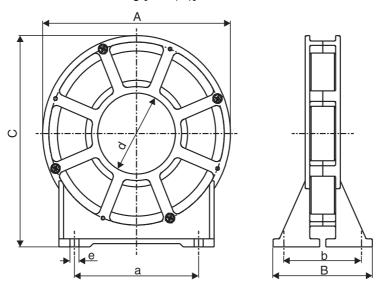


3.20 HD series output chokes

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

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

HD dimension drawing [mm (in)]:



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

Technical dataOutput filter HF

3.21 Output filter HF

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

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

Output filters attenuate interference emission via unshielded motor lines.

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

The voltage drop is as follows:

with 400 V / 50 Hz: < 6.5 %

with 500 V/ 50 Hz: < 4 %

with 400 V/ 60 Hz: < 7.5 %

with 500 V/ 60 Hz: < 5 %

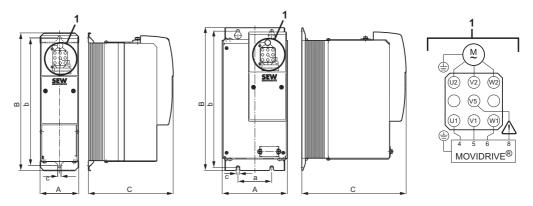
| Туре | | HF008-503 | HF015- | 503 | HF02 | 2-503 | HF | 030-503 | HF040-503 |
|----------------------|--------------------------|---------------------|---|-----------------------------|---|--|-----------------------|------------------------------|------------------------|
| Part number | | 826 029 X | 826 03 | 03 | 826 031 1 | | 82 | 26 032 X | 826 311 6 |
| Rated | 400 V | AC 2.5 A | AC 4 | AC 4 A | | 6 A | - | AC 8 A | AC 10 A |
| throughput current | 500 V | AC 2 A | AC 3 | A | AC | 5 A | , | AC 6 A | AC 8 A |
| Power loss | • | 25 W | 35 W | 1 | 55 | W | | 65 W | 90 W |
| Connections | | | M4 terminal studs: 0.5 6 mm ² (AWG20 10) | | | | | | |
| Weight | | 3.1 kg (6.8 lbs) | | | 4.4 kg (| (9.7 lbs) | | | 10.8 kg (23.8 lbs.) |
| Suitable for N | //OVITRA | .C® B | | | | | | | |
| 100 % I _N | | 0005/0008 | 0011/00 |)15 | 00 | 22 | | 0030 | 0040 |
| 125 % I _N | | 0005 | 0008/0 | 11 | 00 | 15 | | 0022 | 0030 |
| Туре | | HF055-503 | HF075-503 | HF45 | 50-503 | HF023- | 403 | HF033-40 | 3 HF047-403 |
| Part number | | 826 312 4 | 826 313 2 | 826 | 948 3 | 825 78 | 4 1 | 825 785 X | 825 786 8 |
| Rated | 400 V | AC 12 A | AC 16 A | AC | 90 A | AC 23 | 3 A | AC 33 A | AC 47 A |
| throughput current | 500 V | AC 10 A | AC 13 A | AC | 72 A | AC 19 |) A | AC 26 A | AC 38 A |
| Power loss | | 115 W | 135 W | 40 | 0 W | 90 V | V | 120 W | 200 W |
| Connections | | 10 mm ² | (AWG8) | | 35 mm ² (AWG2) 25 mm ² (A | | 5 mm ² (AW | G4) | |
| Weight | | 10.8 kg (| 23.8 lbs.) | 8 lbs.) 32 kg (70.6 lbs) | | 15.9 kg 16.5 kg) (35.0 lbs) (36.3 lbs) | | 23.0 kg (50.6 lbs) | |
| Suitable for N | Suitable for MOVITRAC® B | | | | | | | | |
| 100 % I _N | | 0055 | 0075 | 0370 | / 0450 | 0110 |) | 0150 / 0300 ¹⁾ | 0220 |
| 125 % I _N | | 0040 | 0055 | 0300 . | 0450 | 007 | 5 | 0110 / 0220 ¹⁾ | 0150 |

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





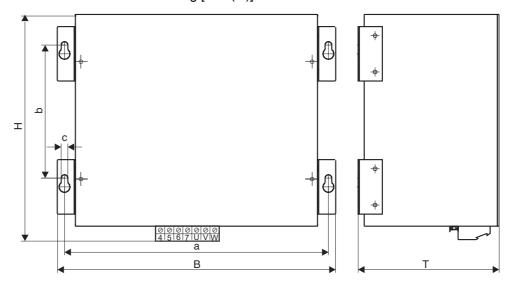
HF...-503 dimension drawing [mm (in)]:



| Туре | Main dimensions | | | |
|-----------------------------|-----------------|------------|-----------|--|
| | Α | В | С | |
| HF008 / 015 / 022 / 030-503 | 80 (3.2) | 286 (11.3) | 176 (6.9) | |
| HF040 / 055-503 | 135 (5.3) | 296 (11.7) | 216 (8.5) | |

| Туре | Mounting dimensions | | Hole dimension | Ventil cleara | lation ances |
|-----------------------------|---------------------|------------|----------------|------------------|-----------------|
| | а | b | С | Тор | below |
| HF008 / 015 / 022 / 030-503 | | 265 (10.4) | 7 (0.28) | 100 (3.9) | 100 (3.9) |
| HF040 / 055-503 | 70 (2.8) | 283 (11.1) | 7 (0.28) | 100 (3.9) | 100 (3.9) |

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



Only the mounting position shown in the dimension drawing is permitted

| Output filter | Main dimensions | | | | | |
|---------------|-----------------|-------------|------------|--|--|--|
| type | w | Н | D | | | |
| HF450-503 | 465 (18.31) | 385 (15.16) | 240 (9.45) | | | |

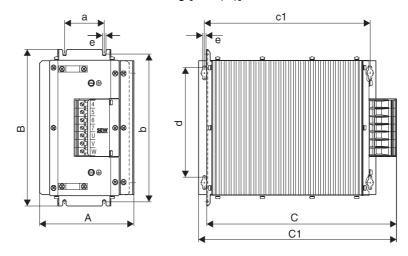
| Output filter | Mounting dimensions | | | | entilation earances | |
|---------------|------------------------|------------|------------|------------|------------------------|--|
| type | а | b | С | Тор | below | |
| HF450-503 | 436 (17.17) | 220 (8.66) | 8.5 (0.33) | 100 (3.94) | 100 (3.94) | |





Technical dataOutput filter HF

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



| Туре | Main dimensions | | | Standard i | nstallation |
|-----------|-----------------|------------|------------------------|------------|-------------|
| | Α | В | | b | а |
| HF023-403 | 145 (5.7) | 284 (11.2) | 365/390 | 268 (10.6) | 60 (2.4) |
| HF033-403 | 143 (3.7) | 204 (11.2) | (14.4/15.4) | 200 (10.0) | 00 (2.4) |
| HF047-403 | 190 (7.5) | 300 (11.8) | 385/400 (15.2/15.6) | 284 (11.2) | 80 (3.2) |

| Туре | Horizontal mounting position | | Hole dimension | Ven | tilation clearar | ices |
|-----------|------------------------------|------------|----------------|----------|------------------|-----------|
| | d | c1 | е | at side | top | below |
| HF023-403 | | | | | | |
| HF033-403 | 210 (8.3) | 334 (13.2) | 6.5 (0.3) | 30 (1.2) | 150 (5.9) | 150 (5.9) |
| HF047-403 | | | | | | |



3.22 Fieldbus gateways

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

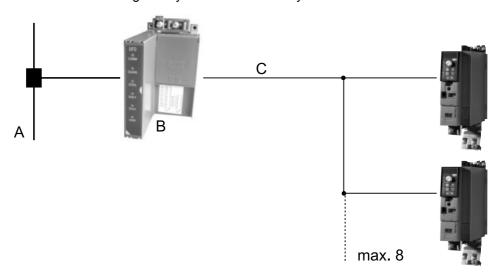
PROFIBUS (part number: 823 896 0)
DeviceNet (part number: 823 897 9)
INTERBUS (part number: 823 898 7)
CANopen (part number: 824 096 5)



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

3.22.1 Theory of operation

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



A = Fieldbus

B = Gateway

C = SBus

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

Technical data

PROFIBUS DFP21B fieldbus interface (in preparation)

3.23 PROFIBUS DFP21B fieldbus interface (in preparation)

3.23.1 Description

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

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

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

3.23.2 Electronics data

| DFP21B option | | |
|---|-----------------------------|--|
| DFP 21B | Protocol option | PROFIBUS-DP and DP-V1 acc. to IEC 61158 |
| RUN BUS FAULT | Baud rate | Automatic detection of baud rate from 9.6 kbaud to 12 Mbaud |
| X45 X46 | Connection technology | 9-pole sub D connector, pin assignment to IEC 61158 |
| | Bus termination | Not integrated, implement using suitable PROFIBUS connector with terminating resistors that can be activated |
| A los | Station address | 1 125, adjustable via DIP switches |
| A LA | Name of the GSD file | SEW_6009.GSD |
| | DP ident. number | 6009 _{hex} (24585 _{dec}) |
| ATE | Max. number of process data | 8 x 3 process data |





3.24 MOVI-PLC®

3.24.1 Unit types

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

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

3.24.2 Description

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

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

3.24.3 Electronics data

MOVI-PLC® basic DHP11B electronics data:

| DHP 11B | Status displays | LEDs for voltage supply of the I/O, firmware, program, PROFIBUS, system buses |
|--|-----------------------|--|
| © ПП 0 © ПП 0 © ПП 0 © ПП 0 © ПП 0 © ПП 0 | Fieldbus | PROFIBUS DP and DPV1 acc. to IEC 61158 Automatic detection of baud rate from 9.6 kbaud to 12 Mbaud Bus connection implemented with suitable connector GSD file SEW_6007.GSD DP ident. number 6007 _{hex} (24579 _{dec}) Maximum 32 process data |
| Onno Onno Onno Onno | System bus | 2 system buses (CAN) for control of 12 inverters and CANopen I/O modules CAN layer 2 (SCOM cyclic, acyclic) or via the SEW-MOVILINK® protocol. Baud rate: 125 kBaud 1 MBaud External bus termination Address range: 0 127 |
| 96X | Engineering | Via RS-485, PROFIBUS and the system buses |
| | Panel operation | Via RS-485 and CAN 2 (in preparation) |
| 20 21 21 22 23 24 25 26 | Connection technology | PROFIBUS: 9-pole sub D connector according to IEC 61158 System buses and I/O: plug-in terminals RS-485: RJ10 |
| 25 2 | Binary inputs | |
| PEX | Memory | Program: 512 kByteData: 128 kByte24 kByte |
| | Tools for startup | MOVITOOLS® MotionStudio with integrated PLC editor (Programming languages IL, SD, LD, FBP, CFC, SFC; libraries to optimize control of the inverters). |



Explanation of the parameters

4 Parameters

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

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

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

4.1 Explanation of the parameters

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

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

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



Choice in short or long menu



Choice in short menu



Selection via symbol on keypad



Select in the FBG motor startup

| No. | FBG | Name | Description |
|-----|----------|---|---|
| 0 | | Display values | |
| 00_ | | Process values | |
| 000 | | Speed (signed) [rpm] | Resolution 1 rpm. The displayed speed is the calculated actual speed. |
| 002 | | Frequency (signed) [Hz] | Output frequency of the inverter. |
| 004 | | Output current (amount) [% I _N] | Apparent current in the range 0 200 % of the rated unit current. |
| 005 | | Active current (signed) [% I] | Active current in the range 0 200 % of the rated unit current. The display value is positive when torque is in positive sense of rotation; negative when torque is in negative sense of rotation. |
| 800 | A-Z ↔ | DC link voltage [V] | DC link voltage. |
| 009 | | Output current [A] | Apparent current at the inverter output, displayed in AC A. |
| 01_ | | Status displays | |
| 010 | | Inverter status | Status of the unit output stage: INHIBITED ENABLED |





| No. | FBG | Name | Description |
|------------|----------|---|---|
| 011 | | Operating status | The following operating statuses are available: |
| 012 | | Error status | Error number and error in plain text. |
| 013 | | Current parameter set | Parameter set 1 or 2. |
| 014 | A-Z ↔ | Heat sink temperature [°C] | Heat sink temperature of the inverter. |
| 02_ | | Analog setpoints | |
| 020 | | Analog input Al1 [V] | Voltage 0 + 10 V at analog input Al1. When S11 = ON and <i>P112 Al1</i> operating mode: • = NMAX, 0 20 mA: Display 0 5 V = 0 20 mA • = NMAX, 4 20 mA: Display 1 5 V = 4 20 mA |
| 03_ | | Binary inputs | |
| 030 | | Binary input DI00 | Status of binary input DI00 (Error reset = factory setting) |
| 031 | | Binary input DI01 | Status of binary input DI01 (CW/STOP= fixed assignment) |
| 032 | | Binary input DI02 | Status of binary input DI02 (CCW/STOP = factory setting) |
| 033 | | Binary input DI03 | Status of binary input DI03 (ENABLE = factory setting) |
| 034 | | Binary input DI04 | Status of binary input DI04 (n11/n21 = factory setting) |
| 035 | | Binary input DI05 | Status of binary input DI05 (n12/n22 = factory setting) |
| 039 | | Binary inputs DI00 DI05 | Collective display of binary inputs. |
| 05_ | | Binary outputs | |
| 051 | | Binary output DO01 | Status of binary output DO01 (/FAULT = factory setting) |
| 052 | | Binary output DO02 | Status of binary output DO02 (BRAKE RELEASED = factory setting) |
| 053 | | Binary output DO03 | Status of binary output DO03 (READY FOR OPERATION = factory setting) |
| 059 | | Binary outputs DO01 DO03 | Collective display of binary outputs. |
| 07_ | | Unit data | |
| 070 | | Unit type | The unit type is displayed, e.g. MC07B0008-2B1 |
| 071 | | Rated output current [A] | The rated unit current is displayed in [A] |
| 076 | | Firmware basic unit | Part number and firmware version |
| 08_ | | Error memory | |
| 080 084 | A-Z | Error t-0 Error t-4 (keypad: error t-0 only) | The unit saves the following information when an error occurs. MOVITOOLS® MotionStudio can display this information if required: P036/P053 Status of binary inputs / binary outputs P013 Current parameter set P011 Operating status of the inverter P010 Inverter status P014 Heat sink temperature P000 Speed P004 Output current P005 Active current Unit utilization P008 DC link voltage |



| No. | FBG | Name | Description |
|-----|----------|----------------------------|--|
| 09_ | | Bus diagnostics | |
| 094 | A-Z ↔ | PO 1 Setpoint [hex] | Process data output word 1, setpoint |
| 095 | A-Z ↔ | PO 2 Setpoint [hex] | Process data output word 2, setpoint |
| 096 | A-Z | PO 3 Setpoint [hex] | Process data output word 3, setpoint |
| 097 | | PI 1 Actual value [hex] | Process data input word 1, actual value |
| 098 | | PI 2 Actual value [hex] | Process data input word 2, actual value |
| 099 | | PI 3 Actual value [hex] | Process data input word 3, actual value |
| 1 | | Setpoints / ramp generator | rs |
| 10_ | | Setpoint selection | |
| 100 | abc | Setpoint source | The setpoint is provided by the analog input or the fixed setpoints. The unit processes the fixed setpoints according to their value. The speed is limited by the maximum set speed P302 / P312 for an open circuit. 5 10 V setpoint results in CW rotation, 0 5 V setpoint results in CCW rotation. You can not use the analog input Al1 for this operating mode as a current input. 1 / UNIPOL./FIX.SETPT The setpoint is provided by the analog input or the fixed setpoints. The unit processes the fixed setpoints according to their value. The binary inputs specify the direction of rotation. 2 / RS-485 The setpoint is provided by the RS-485 interface. The sign of the setpoint determines the direction of rotation. 4 / MOTOR POTENTIOMETER Set the setpoint using appropriately programmed terminals Motor pot. up and Motor pot. down. The motor potentiometer is a virtual potentiometer that does not correspond to the setpoint potentiometer on the unit. 6 / FIX.SETPT + Al1 The setpoint is calculated by adding together the selected fixed setpoint and analog input Al1. The binary inputs specify the direction of rotation. Furthermore, P112 Al1 operating mode applies. 7 / FIX.SETPT * Al1 The value at the analog input Al1 serves as an evaluation factor for the selected fixed setpoint (0 10 V = 0 100 %). If no fixed setpoint is selected, n _{min} applies. The binary inputs specify the direction of rotation. 10 / SBus The system bus specifies the setpoint. The sign of the setpoint determines the direction of rotation. |





| No. | FBG | Name | Description |
|-----|-----|-----------------------|---|
| 100 | abc | Setpoint source | 11 / Frequency input The frequency at binary input DI04 specifies the setpoint. The value is set using parameter <i>P102 Frequency scaling</i> . You can influence the value with <i>P110 AI1 scaling</i> . The following parameters are included in the scaling if the PI controller is activated: • <i>P254 PI actual value scaling</i> • <i>P255 PI actual value offset</i> The pulse duty factor (pulse width of the high and low signal) should be about 1 : 1. The factor determines the rising edge and the falling edge of the input signal. Use P102 Frequency scaling to determine at which input frequency the system setpoint 100 % is reached. The reference of the system setpoint is set via P112 Al1 Operating mode. The direction of rotation is set via the binary inputs CW/STOP and CCW/STOP. |
| | | | Frequency scaling Minimum response time (delay) Resolution Frequency input 25 65 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 |
| | | | Setpoint cascade |
| | | | DI04 F P102 P102 P102 |
| | | | P302: Maximum speed in rpm P110: Gain 0.1 1 10 P102: Frequency scaling 1 120 kHz P112: Operating mode setpoint |
| | | | Example: A setpoint generator with the value range 1 50 kHz is to set the motor speed of 301500 rpm. Set the following parameters for this: P102 Frequency scaling: 50 kHz P112 Operating mode setpoint: 3000 rpm P110 Setpoint scaling P110: 0.5 |
| 101 | abc | Control signal source | The binary inputs determine the control. 1 / RS-485 The RS-485 interface and the binary inputs determine the control. 3 / SBus The system bus and the binary inputs determine the control. 4 / 3-WIRE CONTROL The 3-wire control principle determines the control. In this case, the enable and direction of rotation signals will respond edge-controlled. • Connect start key CW with contact to binary input "CW/Stop." • Connect start key CCW with contact to binary input "CCW/Stop." • Connect stop key with normally open input "Enable/Stop." If you connect CW and CCW at the same time, the drive decelerates with downwards ramp P131 / P141. If the 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. The unit stores a start edge if you stop the drive with the stop button. If you then press the RUN key, the unit will enable the drive immediately. |





| No. | FBG | Name | Description |
|-----|-----------------|------------------------------------|---|
| | | Control source 3-WIRE CONTRO | DL |
| | | X12:2 | X12: |
| | | X12.2 | |
| | | X12:3 "0" | X12:2 = CW/Stop X12:3 = CCW/Stop X12:4 = Enable/Stop X10 = Setpoint input AI |
| | | X12:4 | f _A = Output frequency f ₀ = Start/stop frequency CW = Clockwise |
| | | 10V X10 5V | CCW = Counterclockwise t11 [1] = t11 UP t11 [2] = t11 DOWN |
| | | 0V | x10: R11 t13 = Stop ramp |
| | | f _A [Hz] 50 t11 11 [2] | 111 11 |
| | | f ₀ 0 25 t11 [1] 50 CCW | J ₁₁₃ |
| 102 | A-Z ← | Frequency scaling | Setting range 0.1 10 120.00 [kHz] |
| 11_ | | Analog input 1 (0 +10 V) | |
| 110 | A-Z ↔ | Al1 scaling | Setting range: 0.1 1 +10. Is used to define the slope of the setpoint characteristic curve. If you set the scaling to the value "1", then the input voltage V = 10 V at the analog input corresponds to the operating mode of the analog input (P112). This is the speed 3000 rpm or the set maximum speed (P302). |
| | | | 3000 rpm———————————————————————————————————— |
| | | | / n _{max} 10 2/ 1 |
| | | | 0.5 |
| | | | 0.1 |
| | | | 10 V |
| | | | Slope of the setpoint characteristic curve With a unipolar setpoint source, you can only use the 1st quadrant. Negative setpoint entries then create the setpoint zero. P110 Al1 scaling has no effect if you set the current input operating mode. You set the current input operating mode by setting P112 Al1 to NMAX, 0-20 mA or NMAX, 4-20 mA. |
| | | | operating mode by Setting F 112 ATT to NIMAX, 0-20 IIIA OF NIMAX, 4-20 IIIA. |





| No. | FBG | Name | Description |
|-----|--------|---|---|
| 112 | abc ↔ | Al1 operating mode Safety against open circuit is only available in operating mode 4 20 mA. | 0 / 3000 1/min (0 10 V) Voltage input with reference 3000 rpm (0 10 V = 0 3000 rpm). You can adapt the characteristic curve with <i>Al1 scaling</i> . Switch S11 = V 1 / N-MAX (0 10 V) Voltage input with reference n _{max} (0 10 V = 0 n _{max}). You can adapt the characteristic curve with <i>Al1 scaling</i> . Switch S11 = V. 2 / U-Off., N-MAX Voltage input with reference n _{max} . The characteristic curve can be adapted with <i>P113 Al1</i> voltage offset. <i>P110 Al1 scaling</i> and <i>P114 Al1 speed offset</i> are ineffective. 5 / N-MAX (0 20 mA) Current input 0 20 mA = 0 n _{max} . <i>P110 Al1 scaling</i> is ineffective. Switch S11 = mA. |
| 113 | A-Z | Al1 Setpoint voltage offset | Setting range: –10 V 0 +10 V The point where the setpoint characteristic passes through zero can be moved along the V _E axis. P302/P312 Reference point for positive offset Reference point for negative offset P302/P312 0V 1V 2V 3V 4V 5V 6V 7V 8V 9V 10V |
| 12_ | | Setpoint generator of the FBG1 | 1 keypad |
| 121 | abc ↔ | Addition setpoint generator of the keypad | O / OFF The unit does not take into account the value from the setpoint generator of the FBG11 keypad. 1 / ON The value from the setpoint generator of the FBG11 keypad is added to any set setpoint source bipolar / fixed setpoint, unipolar / fixed setpoint, RS-485 / fixed setpoint, frequency input / fixed setpoint or SBus / fixed setpoint. The addition also affects fixed setpoints. 2 / ON (WITHOUT FSP) The value from the setpoint generator of the FBG11 keypad is added to any set setpoint source bipolar / fixed setpoint, unipolar / fixed setpoint, RS-485 / fixed setpoint, frequency input / fixed setpoint or SBus / fixed setpoint. The addition does not act on fixed setpoints. |



| No. | FBG | Name | Description |
|-----------|----------|--|---|
| 122 | abc | FBG manual operation | Setting the setpoint with the setpoint generator of the FBG11 keypad in FBG manual mode. 0 / UNIPOL. CW Adjustable speed: 0 + n _{max} 1 / UNIPOL. CCW Adjustable speed: 0 n _{max} 2 / BIPOLAR CW + CCW Adjustable speed: - n _{max} + n _{max} |
| 13_ / 14_ | | Speed ramps 1 / 2 | |
| | | | 00 rpm. Ramps t11 / t21 up and t11 / t21 down are effective when the setpoint is e enable is withdrawn by pressing the STOP/RESET key or via the terminals. |
| 130 / 140 | × | Ramp t11 / t21up | Setting range 0 2 2000 [s]; Acceleration ramp |
| 131 / 141 | K | Ramp t11 / t21 down | Setting range 0 2 2000 [s]; Deceleration ramp |
| 136 / 146 | Y | Stop ramp t13 / t23 up = down | Setting range 0 2 20 [s]; Stop ramp when switching to the NO ENABLE operating status |
| 15_ | | Motor Potentiometer (see <i>P100</i> The ramp times refer to a setpoin | |
| 150 | A-Z ↔ | Ramp t3 (motor potentiometer) | Setting range 0.2 20 50 [s] The ramp takes effect when the <i>Motor pot. up</i> and <i>Motor pot. down</i> terminal functions are used. |
| 152 | A-Z ↔ | Save last setpoint | The inverter starts with n _{min} : After power off and on After revoking the enable You must set <i>P152 Save last setpoint</i> = <i>OFF</i> if you are using the motor potentiometer for continuous speed control. Otherwise, after approx. 100,000 storage operations, the error message F25 EEPROM will appear. Store only after setpoint change. On / ON The inverter starts with the last motor potentiometer setpoint to have been set: After power off and on After revoking the enable |
| 16_ / 17_ | | Fixed setpoints 1 / 2 | |
| CHANGE | activate | | uts DI02 DI05 with the arguments n11/n21 / n12/n22 and FIXED SETP. fixed setpoints n13/n23 by assigning the functions n11/n21 and n12/n22 to inputs. |
| 160 / 170 | ~ | Internal setpoint n11 / n21 PI controller activated | Setting range –5000 150 5000 [rpm] Setting range 0 3 100 [%] (see sec. "Project planning / PI controller") |
| 161 / 171 | Y | Internal setpoint n12 / n22 PI controller activated | Setting range –5000 750 5000 [rpm] Setting range 0 15 100 [%] (see sec. "Project planning / PI controller") |
| 162 / 172 | ~ | Internal setpoint n13 / n23 PI controller activated | Setting range –5000 1500 5000 [rpm] Setting range 0 30 100 [%] (see sec. "Project planning / PI controller") |



Parameters Explanation of the parameters



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



Explanation of the parameters

| No. | FBG | Name | Description |
|-----------|-----|------------------------|-------------|
| 32_ / 33_ | | Motor adjustment 1 / 2 | |

Use function P320 / P330 Automatic adjustment 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 P322 / P332 IxR adjustment and P321 / P 331 Boost. The inverter thereby determines a basic setting which is suitable for many applications. The values are saved in volatile memory.

- The motor is not calibrated if:
 P320 / P330 Automatic adjustment = OFF.
- VFC & Flying start operating mode is active.
- The set Premagnetization time is more than 30 ms shorter than the Premagnetization time calculated during startup.

If you deactivate automatic adjustment, the values measured last will be not be saved in volatile memory.

The factory setting of parameters 321 ... 324 / 331 ... 334 depends on the motor.

| | , | | |
|-----------|-----------------|-------------------------------------|--|
| 320 / 330 | A-Z ↔ | Auto adjustment 1 / 2 | off / OFF No automatic adjustment: The inverter does not calibrate the motor. on / ON Automatic adjustment: The inverter measures the motor when changing to the ENABLE operating mode. |
| 321 / 331 | A-Z ← | Boost 1 / 2 | Setting range 0 100 [%] Manual setting is usually not required. In exceptional cases, manual setting may be necessary to increase the breakaway torque. In this case set to max. 10 %. |
| 322 / 332 | A-Z ← | IxR adjustment 1 / 2 | Setting range 0 100 [%] The inverter sets the value automatically when P320 / P330 Automatic adjustment = ON. Manual alterations to individual controller parameters are reserved for optimization by specialists. |
| 323 / 333 | A-Z ← | Premagnetization time 1 / 2 | Setting range 0 2 [s] Premagnetization builds a magnetic field in the motor when you enable the inverter. |
| 324 / 334 | A-Z ↔ | Slip compensation 1 / 2 | Setting range 0 50 [rpm] Slip compensation increases the speed accuracy of the motor. Enter the rated slip of the connected motor as a manual entry. Do not enter a value more than 20 % different from the rated slip in order to compensate for fluctuations between various motors. The slip compensation is designed for a ratio smaller than 10 of load moment of inertia to motor moment of inertia. If the ratio is larger and the drive vibrates, then slip compensation must be reduced and even be set to 0 if necessary. |
| 325 | A-Z ↔ | No-load damping | on / ON off / OFF No-load damping is used when the motor tends to be instable under no load conditions. |
| 345 / 346 | A-Z → | I _N -UL monitoring 1 / 2 | Setting range 0.1 500 A The function cannot be deactivated. The factory setting depends on the rated power of the MOVITRAC® B and will be added to the rated current of the SEW motor with the same rating. At 150 % rated motor current, the inverter switches off after 5 minutes. At 500 % rated motor current, the inverter switches off after 20 seconds. |





| No. | FBG | Name | Description |
|-----------|-----------------|-----------------------------------|---|
| 4 | | Reference signals | |
| | | | and signaling certain operating states. All signals of parameter group 4 can be nverter has signaled <i>Ready</i> after switch-on and there is no error display. |
| 40_ | | Speed reference signal | |
| | | | The inverter issues the signal "1" at P403 if the speed is less than or greater than the set reference speed. |
| | | | n [rpm] |
| | | | n _{ref} P401 |
| | | | |
| | | | -n _{ref} |
| | | | P403: Inl > n _{ref} 1 + P402 + P403: Inl > n _{ref} 1 + P403: Inl > n _r |
| | | | 0 t |
| | | | P403: InI < n _{ref} 1 |
| | | | Speed reference message |
| 400 | A-Z ← | Speed reference value | Setting range 0 750 5000 [rpm] |
| 401 | A-Z → | Hysteresis | Setting range 0 100 500 [rpm] |
| 402 | A-Z → | Delay time | Setting range 0 1 9 [s] |
| 403 | A-Z ← | Signal = "1" if: | 0 / n < n _{ref} 1 / n > n _{ref} |
| 45_ | | PI controller reference signal (s | see sec. "Project planning / PI controller / Reference signal") |
| These par | ameters | determine whether and how the Pl | reference signal responds |
| 450 | A-Z ← | PI actual value reference | 0.0 100.0 [%] |
| 451 | A-Z → | Signal = "1" if: | 0 / Pl actual value < Pl reference 1 / Pl actual value > Pl reference |
| 5 | | Monitoring functions | |
| 50_ | | Speed monitoring 1 / 2 | |
| | did not | | t only with adequate torque. If the inverter reaches <i>P303 Current limit</i> , this is onitoring is triggered if the inverter exceeds the current limit for longer than set in |
| 500 / 502 | A-Z ↔ | Speed monitoring 1 / 2 | off / OFF on / MOT&GENERATOR function of speed monitoring in motor and regenerative operation of the motor |
| 501 / 503 | A-Z → | Delay time 1 / 2 | Setting range 0 1 10 [s] The set current limit can be reached briefly during acceleration, deceleration, or load peaks. You prevent the speed monitoring from responding too sensitively by setting the delay time. The monitoring responds when the current limit for the duration of the delay time is reached. |



| No. | FBG | Name | | Description | | |
|---|--|--|---|--|---|----------------------------|
| 6 | | Terminal assig | ınment | | | |
| 60_ | | Binary inputs (DI01 fixed assignment with CW/STOP) | | | | |
| Effect at 0: NO FUN | ICTION: | | 0 signal | | 1 signal – | Effective in: No enable |
| 1: ENABLE 2: CW/STC 3: CCW/ST 4: n11/n21 5: n12/n22 | E/STOP: DP: TOP: | | Stop at P136 stop Stop at P131 ram Stop at P131 ram | p down | Enable Enable CW Enable CCW | no no no no no |
| 6: FIXED S 7: PARAMI 9: MOTOR 10: MOTO 11: /EXT. E 12: ERROJ 20: ACCEF 26: TF SIG 30: /CONT Fixed setp n11/n21 = n11/n21 = | SETP. SI ETER S POT. UI RPOT. I ERROR: R RESE T SETF GNAL (D TR. INHII DOINTS O and n' 0 and n' 0 and n' | ET 2 DOWN: T: POINT: 105 only): BIT: 12/n22 = 0: 12/n22 = 0: 12/n22 = 1: | n11/n n12/n | edge 0 to 1 in motor nal setpoints only 21 | Fixed setpoints n21/n22 Parameter set 2 Increase setpoint Decrease setpoint - Accept setpoint No signal Enable | |
| n11/n21 = | abc | 12/n22 = 1: Binary input DI | n13/n 02 | Factory setting: CCV | W/STOP | |
| 602 | abc | Binary input DI | 03 | Factory setting: ENA | ABLE | |
| 603 | abc | Binary input DI | 04 | Factory setting: n11/ | n21 | |
| 604 | abc | Binary input DI | 05 | Factory setting: n12/ | /n22 | |
| 608 | abc | Binary input DI | 00 | Factory setting: ERR | ROR RESET | |
| 62_ | | Binary outputs | (only use binary o | output DO02 for contro | olling the brake rectifier) | |
| Effect at 0 signal - Collective fault signa 1: /FAULT: Collective fault signa 2: READY FOR OPERATION: 3: OUTPUT STAGE ON: 4: ROTATING FIELD ON: 5: BRAKE RELEASED: BRAKE RELEASED: 9: SPEED REFERENCE: 11: SP/ACT.VAL.COMP. 23: PI ACTUAL VALUE REF.: 0 signal - Collective fault signa Not ready for operating 1: Sprace of the properties | | Unit enabled at Rotating field Brake released 3) $n < n_{ref} / n > n_{ref}$ $n = n_{set}$ | nd motor energized | the set threshold | | |
| 620 | abc | Binary output D | 0001 | Factory setting: /FAL | JLT | |
| 621 | abc | Binary output D | 0002 | Factory setting: BRA | KE RELEASED | |
| 622 | abc | Binary output D | 0003 | Factory setting: WIT | HOUT FUNCTION | |





| No. | FBG | Name | Description |
|-----|-----|-------------------|-------------|
| 7 | | Control functions | |

All settings with regard to the fundamental control properties of the inverter are defined within parameter group 7__. The parameter group comprises functions which the inverter automatically executes when they are activated.

70_ Operating mode 1 / 2

This parameter is used to set the basic operating mode of the inverter. Setting at the keypad.

VFC / V/f CHARACTER: Default setting for asynchronous motors. Suitable for general applications, such as conveyor belts, trolleys, and hoists with counterweight.

VFC & HOIST: The hoist function automatically provides all functions necessary for operating an unbalanced hoist. In particular for safety reasons, activate monitoring functions that can prevent the drive from starting. Monitoring functions:

- · Monitor the output current during the premagnetization phase
- Avoid sag when the brake is released

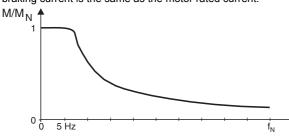
The unit detects the following incorrect configurations and displays them with the following errors:

- 2 or 3-phase motor phase interruption: F82 = Output open
- Premagnetization time too short or incorrect motor/inverter combination: F81 = Error start condition
- Motor phase failure due to active speed monitoring P500/501: F08 = Error n-monitoring

Important

- The control must be designed so that the direction of rotation of the drive can only be changed when it is at a standstill.
- SEW-EURODRIVE strongly recommends activating speed monitoring.
- Prerequisites for correct performance of the hoist function: motor brake controlled by the inverter.

VFC & DC BRAK. / V/f CHARACTERISTIC & DC BRAKING: DC braking means the asynchronous motor brakes by using current injection. The motor brakes without braking resistor on the inverter. The following figure shows the braking torque profile when the braking current is the same as the motor rated current.

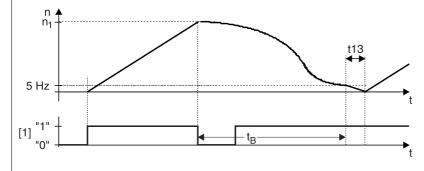


During braking, the inverter injects a constant current with a rotating-field frequency of 5 Hz. The braking torque equals 0 at a standstill. A greater braking torque acts at a slower speed; the braking torque drops as the speed increases. The braking time and consequently the duration of the braking current depends on the load connected to the motor. DC braking stops at a rotating-field frequency of 5 Hz. The motor stops along the stop ramp. Motor rated current is used for the current injection. In all cases, the inverter limits the current to max. 125% I_N. See "Brake function" for information about the brake control system.

Important:

It is not possible to enable a directed stop or to observe a certain ramp using DC braking. The main purpose of DC braking is to drastically reduce the time the motors need for coasting to a halt.

The following graphic shows the braking profile.



 n_1 = Set speed [1] = Enable t_{13} = Stop ramp t_B = Braking phase



Explanation of the parameters

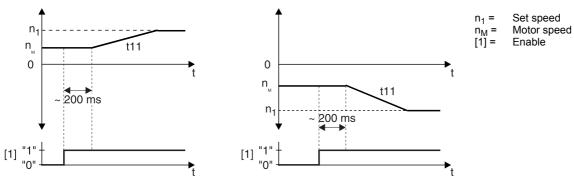
No. FBG Name Description

VFC & FLYING START (in preparation): The flying start function lets you synchronize the inverter to an already running motor. In particular used with drives that are not braked actively, which run on for a long time or which are turned by a flowing medium, e.g. pumps and fans. The maximum flying start time is approx. 200 ms.

P320 Automatic adjustment is deactivated in the FLYING START operating mode. It is important that the IxR value P322 (stator resistance) is set correctly to ensure that the flying start function is performed properly.

Startup of an SEW motor: The IxR value is set for an SEW motor at operating temperature. This value has to be reduced if flying start takes place with a cold motor.

The IxR value is measured at startup when a non-SEW motor is started up with MOVITOOLS®.



The flying start function does not function if an output filter is connected to the inverter. **Important:**

Do not use the flying start function in hoist applications.

| 700 / 701 | Operating mode 1 | 2 / VFC & HOIST (field-oriented control mode for hoist applications, can only be set in MOVITOOLS®) 3 / VFC & DC BRAK. (field-oriented control mode with DC braking) 4 / VFC & FLYING START (field-oriented control mode with flying start function) (in preparation) 21 / V/f Character (voltage / frequency controlled mode) |
|-----------|------------------|---|
| | | 22 / V/f CHARACTÈRISTIC & DC BRÁKING (voltage / frequency controlled mode with DC braking) |
| 71_ | | |

With activated standstill current function, the inverter injects a current in the motor at standstill. This allows the inverter to fulfill the following functions:

- When the ambient temperature of the motor is low, the standstill current prevents the risk of condensation and freezing (in particular of the disc brake). Set the amount of current in such a way that the motor does not overheat.
 Recommendation: The motor housing should be hand-hot.
- With activated standstill current, you can start the motor without Premagnetization. Recommendation: Set to 45 ... 50 % with hoists

You can deactivate the standstill current function by P710 = 0. Set the standstill current in % of the rated motor current. The standstill current cannot exceed the current limit (P303).

You can switch off the standstill current with /CONTROLLER INHIBIT = 0.

When the standstill current function is activated, the output stage remains enabled even in the "No enable" status to inject the motor standstill current.

The standstill current is not switched off by pressing the stop/reset key.

You have to set the function of an input terminal to controller inhibit to activate the standstill current function. Else the output stage will be energized directly.

710 / 711 A-Z Standstill current function 1 / 2 0 ... 50% I_{Mot}





| No. | FBG | Name | Description |
|-----------|-----------------|---|---|
| 72_ | | | |
| | | | the inverter automatically depending on the main setpoint. The inverter is magnetization and brake control. It is important that you also enable the drive via |
| 720 / 723 | A-Z ← | Setpoint stop function 1 / 2 | off / OFF on / ON |
| 721 / 724 | A-Z → | Stop setpoint 1 / 2 | 0 30 500 [rpm] |
| 722 / 725 | A-Z → | Start offset 1 / 2 | 0 30 500 [rpm] |
| 73_ | | binary output which has the assign control system. The brake is always applied wh | |
| | | Enable "0" | Pre-magnetization time Post-magnetization time |
| | | r n _{Sel} | Brake application time |
| | | n _{start-stop} 0 | ,————————————————————————————————————— |
| | | /BRAKE "1" | |
| | | Output stage on "1" "0" | · |
| | | Rotating field on "1" "0" | |
| 731 / 734 | A-Z ↔ | Brake release time 1 / 2 | Setting range 0 2 [s] This parameter determines how long the motor will remain at a standstill after expiry of the premagnetization time and how much time the brake has to release. |
| 732 / 735 | A-Z ↔ | Brake application time 1 / 2 | Setting range 0 2 [s] Serves to set the time required for application of the mechanical brake. This parameter prevents a sagging of the drive especially in hoists. |
| 76_ | | Manual operation | |
| 760 | A-Z ↔ | Lockout run/stop keys (see Startup / External setpoint selection) | off / OFF (RUN/STOP keys are activated and can be used for starting and stopping the motor) on / ON (RUN/STOP keys are locked and therefore do not function) |





Explanation of the parameters

| No. | FBG | Name | Description |
|-------------------------------|-----|-------------------------------|---|
| 8 | | Unit functions | |
| 80_ | | Setup | |
| Short menu (with keypad only) | | Short menu (with keypad only) | long short Use P800 to switch from the factory setting short menu to the detailed parameter menu. |

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

Selecting DELIVERY STATE also resets the parameters listed above.

The statistical data must be reset separately using P804 Reset statistic 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. Store the set values using MOVITOOLS® before you activate the factory setting. Once the factory setting function has been used, you must adapt the parameter values and terminal assignments in accordance with the requirements.

| 802 Factory setting no (do not restore factory setting) Hrs (restore factory settings) All (delivery status) | |
|--|--|
|--|--|

Setting *P803 Parameter lock* = *ON* enables you to prevent any changes to parameters. This does not apply to P840 Manual reset and P803 itself. The parameter lock makes sense, for example, after the MOVITRAC[®] B settings have been optimized. You can enable parameter changes again by setting *P803 Parameter lock* = *OFF*.The parameter lock also affects parameter changes via the RS-485 and SBus interfaces.

| 000 | | Danasa tan Iarah | ST LOFE (all proposed and and he absenced) |
|-----|-----|------------------|---|
| 803 | A-Z | | off / OFF (all parameters can be changed) |
| | | | on / ON (You can change P803 and P840 only) |
| | | | , , , |

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

| 804 | | Reset statistics data | NO (no reset is performed) ERROR MEMORY (the content of the error memory is reset) |
|-----|----------|-----------------------------|---|
| 81_ | | Serial communication – Do r | not change these parameters while an IPOS program is running. |
| 810 | A-Z ↔ | RS-485 address | Setting range 0 99 P810 sets the address of the MOVITRAC® B for communication via the serial interface. On delivery, the MOVITRAC® B address is always 0. SEW-EURODRIVE recommends not using address 0, in order to prevent data transfer collisions when serial communication is used with several inverters. |
| 811 | | RS-485 group address | Setting range 100 199 |
| 812 | | RS-485 Remote timeout | Setting range 0 650 [s] |
| 82_ | | Brake operation 1 / 2 | |

P820/P821 switches 4-quadrant operation off/on. 4-quadrant operation is possible if a braking resistor is connected to the MOVITRAC® B. P820 / P821 must be set to OFF if there is no braking resistor connected to MOVITRAC® B, which means regenerative operation is not possible. In this operating mode, the MOVITRAC® B unit attempts to extend the deceleration ramp. As a result, the generated power is not too great and the DC link voltage remains below the switch-off threshold.

If the regenerative power is too great despite the extended deceleration ramps, then MOVITRAC® B may switch off with the F07 DC link overvoltage error. In this case you have to extend the deceleration ramps manually (P131).

Therefore, do not set unrealistic short deceleration ramps!

The unit reacts with error message F34 Ramp/timeout if the ramp is set too short and the ramp which can actually be achieved is significantly longer than the set value.

| 820 / 821 4-quadrant operation 1 / 2 | off / OFF on / ON |
|--------------------------------------|-------------------|
|--------------------------------------|-------------------|



Parameters

Explanation of the parameters



| No. | FBG | Name | Description |
|---|---|--|---|
| 83_ | | Error responses | |
| The EXT. I by input te | FAULT fa | ault can only be triggered when the rogrammed to /EXT. ERROR. | inverter status is ENABLED. P830 programs the error response that is triggered |
| 830 | A-Z ↔ | Response /EXT. ERROR | 2 / IMM. STOP/FAULT The inverter performs an emergency stop with an error message. The inverter inhibits the output stage and the brake is applied. The inverter revokes the ready signal and sets the programmed error output. A restart is only possible after an error reset has been performed during which the inverter is reinitialized. 4 / STOP/FAULT The inverter brakes the drive using the specified stop ramp (P136). The inverter uses DC braking in 2-quadrant mode. Once the stop speed is reached, the inverter inhibits the output stage and the brake is applied. The error is signaled immediately. The inverter revokes the ready signal and sets the programmed error output. A restart is only possible after an error |
| | | | reset has been performed during which the inverter is reinitialized. 7 / STOP/WARNING The error response corresponds to STOP/FAULT, except the inverter does not revoke the ready signal and the error output is set. |
| 84_ | | Reset behavior | |
| 840 | | Manual reset Parameter P840 corresponds to the STOP/RESET key. | YES MOVITRAC® B resets the existing error. P840 automatically reverts to NO after the reset. The motor immediately restarts to the specified setpoint if all required signals are present after the reset has been performed. Activating the manual reset does not have any effect if there is no error present. NO No reset. |
| 86_ | | Modulation 1 / 2 | |
| | | he nominal clock frequency at the i ending on the unit utilization. | nverter output. If P862 / P863 is OFF then the clock frequency can vary |
| 860 / 861 | A-Z ↔ | PWM frequency 1 / 2 | 4 kHz 8 kHz 12 kHz 16 kHz |
| 862 / 863 | A-Z ↔ | PWM fix 1 / 2 | on / ON (no independent variation of the clock frequency by the inverter) off / OFF (autonomous variation of the switching frequency by the inverter depending on the utilization) |
| 87_ | | Fieldbus parameter settings (re | fer to the MOVITRAC® B Communication manual for more information) |
| MOVITRA The follow NO FUNC SPEED: MAX. SPE RAMP: CONTROL SPEED [% PI CTRL S | C [®] B ca ing proc TION: :ED: _ WORD []: | n allocate the appropriate setpoints ess output assignments are available The content of the Speed setpoint en Maximum speed Ramp time for se Control signals for Selection of a spout of the Speed Setpoint en Maximum speed Ramp time for se Control signals for Selection of a spout of the Speed Selection of the Sp | ole: e process output data word is ignored. ntry in rpm. (P302). tpoint selection (P130 / P131). or start/stop, etc. eed setpoint in % of P302. oint |
| 870 | | Setpoint description PO1 | Factory setting: CONTROL WORD 1 |
| 871 | | Setpoint description PO2 | Factory setting: SPEED |
| 872 | | Setpoint description PO3 | Factory setting: NO FUNCTION |





Parameters

Explanation of the parameters

No. FBG Name Description

Use P873 \dots P875 can be used to determine the content of the process input data word PI1 \dots PI3. This definition is necessary so MOVITRAC® B can allocate the appropriate actual values.

The following process input assignments are available:

NO FUNCTION: The content of the process input data word is 0000_{hex} Momentary actual speed value in rpm.

SPEED:

ACTIVE CURRENT: Momentary active current of the inverter in % of IN **OUTPUT CURRENT:** Momentary output current of the inverter in % of IN STATUS WORD 1: Status information of the inverter.

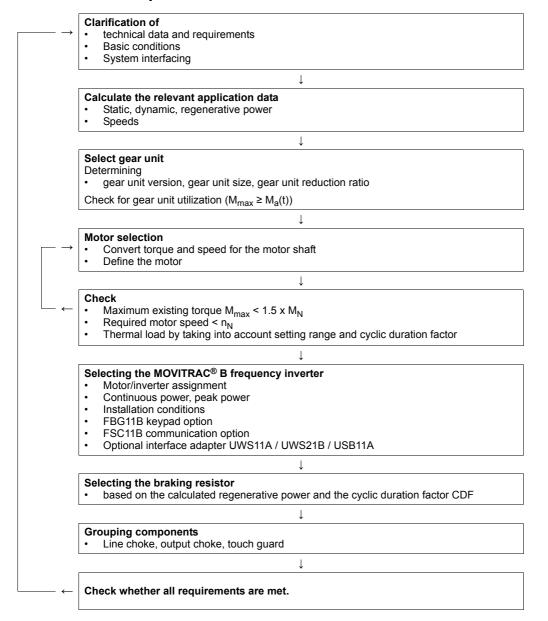
SPEED [%]:
IPOS PI DATA: Current actual speed value in % of P302. IPOS Process input data.

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





5.1 Schematic procedure







Project planningOptions for standard applications

5.2 Options for standard applications

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

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

| | | Braking | g resistor | | | |
|------------------|------|---------------------|-------------------|--------------|-------------|--|
| Type MC0 |)7B | Horizontal movement | Vertical movement | Output choke | Line filter | |
| | 0004 | BW027-003 | BW027-003 | HD002 | | |
| | 0005 | BW027-003 | BW027-003 | HD002 | | |
| 230 V | 8000 | BW027-003 | BW027-003 | HD002 | late and a | |
| 1-phase | 0011 | BW027-005 | BW039-003 | HD002 | Integrated | |
| | 0015 | BW039-003 | BW027-006 | HD002 | | |
| | 0022 | BW027-006 | BW027-012 | HD002 | | |
| | 0005 | BW072-003 | BW072-003 | HD002 | | |
| | 8000 | BW072-003 | BW072-005 | HD002 | | |
| | 0011 | BW072-005 | BW072-006 | HD002 | | |
| | 0015 | BW100-006 | BW072-006 | HD002 | | |
| | 0022 | BW100-006 | BW168 | HD002 | late and a | |
| | 0030 | BW100-006 | BW268 | HD001 | Integrated | |
| | 0040 | BW168 | BW268 | HD001 | | |
| 400 V 3-phase | 0055 | BW268 | BW247 | HD001 | | |
| o pridoc | 0075 | BW147 | BW039-050 | HD001 | | |
| | 0110 | BW247 | BW039-050 | HD001 | | |
| | 0150 | BW018-035 | BW039-050 | HD003 | NF035-503 | |
| | 0220 | BW012-050 | BW018-075 | HD003 | NF048-503 | |
| | 0300 | BW018-075 | BW012-100 | HD003 | NF063-503 | |
| | 0370 | BW012-100 | BW106 | HD003 | NF085-503 | |
| | 0450 | BW012-100 | BW206 | HD003 | NF085-503 | |

5.3 Description of applications

5.3.1 Project planning for trolleys

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





5.3.2 Project planning for hoists

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

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

Thermal considerations

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

Starting torque

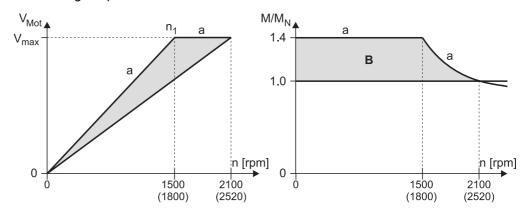
The motor requires the highest operating torque in the event of acceleration with maximum load and the **upwards** hoisting direction.

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

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

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

Hoist voltage / speed characteristic curve



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

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

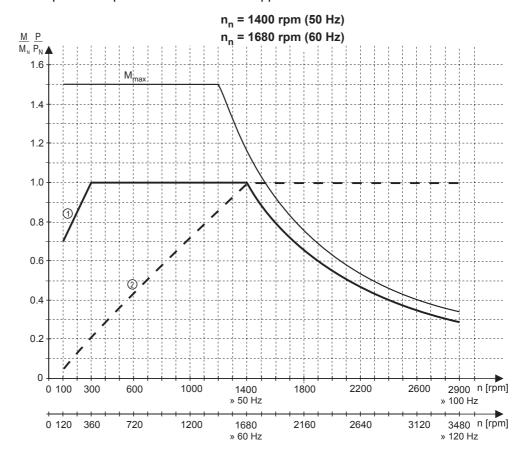
- S1 (100 % CDF): Select the motor power of the next higher motor type than the selected inverter power, e.g. for lengthy upwards travel or continuous elevators.
- S3 (40 % CDF): Select the motor power according to the selected inverter power.

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



Speed-torque characteristics 5.4

The speed / torque characteristic curve appears as follows:



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





5.5 Select motor

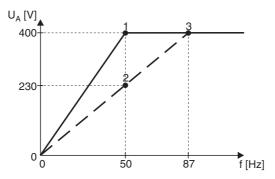
5.5.1 Basic recommendations

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

5.5.2 Voltage / frequency characteristics

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

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



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

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

5.5.3 Dynamic applications

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

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

- Current limit P303
- Slip compensation P324

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



5.5.4 Inverter / motor combinations

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

| MOVITRAC® B: | Rated | | SEW | motor | |
|----------------------|----------------------|---------|---------|----------|----------|
| Speed [rpm] at 50 Hz | power P _N | 3000 | 1500 | 1000 | 750 |
| Speed [rpm] at 60 Hz | | 3600 | 1800 | 1200 | 900 |
| MC07B00034-00 | 0.25 kW | DFR63M2 | DFR63L4 | DT71D6 | DT80N8 |
| MC07B00044-00 | 0.37 kW | DFR63L2 | DT71D4 | DT80K6 | DT90S8 |
| MC07B00054-00 | 0.55 kW | DT71D2 | DT80K4 | DT80N6 | DT90L8 |
| MC07B00084-00 | 0.75 kW | DT80K2 | DT80N4 | DT90S6 | DV100M8 |
| MC07B00114-00 | 1.1 kW | DT80N2 | DT90S4 | DT90L6 | DV100L8 |
| MC07B00154-00 | 1.5 kW | DT90S2 | DT90L4 | DV100M6 | DV112M8 |
| MC07B00224-00 | 2.2 kW | DT90L2 | DV100M4 | DV112M6 | DV132S8 |
| MC07B00304-00 | 3.0 kW | DV100M2 | DV100L4 | DV132S6 | DV132M8 |
| MC07B00404-00 | 4.0 kW | DV112M2 | DV112M4 | DV132M6 | DV132ML8 |
| MC07B00554-00 | 5.5 kW | DV132S2 | DV132S4 | DV132ML6 | DV160M8 |
| MC07B00754-00 | 7.5 kW | DV132M2 | DV132M4 | DV160M6 | DV160L8 |
| MC07B01104-00 | 11 kW | DV160M2 | DV160M4 | DV160L6 | DV180L8 |
| MC07B01504-00 | 15 kW | DV160L2 | DV160L4 | DV180L6 | DV200L8 |
| MC07B02204-00 | 22 kW | DV180L2 | DV180L4 | DV200L6 | _ |
| MC07B03004-00 | 30 kW | _ | DV200L4 | - | _ |
| MC07B03704-00 | 37 kW | _ | DV225S4 | DV250M6 | _ |
| MC07B04504-00 | 45 kW | _ | DV225M4 | DV280S6 | _ |





5.6 Overload capacity

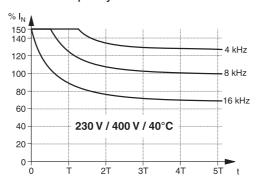
MOVITRAC® B frequency inverters permanently calculate the load on the inverter output stage (unit utilization). They can output the maximum possible power in every operating status.

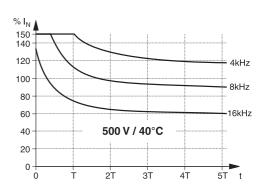
The permitted continuous output current depends on:

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

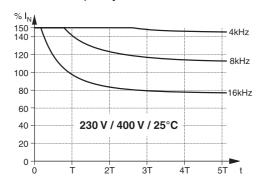
If a PWM frequency > 4 kHz is set and "P862/P863 PWM fix 1 / 2" is set to off, the inverter automatically reduces the PWM frequency in the event of a unit overload. The inverter reacts to a higher than permitted load by outputting the "F44 Unit utilization" fault message and an immediate switch-off.

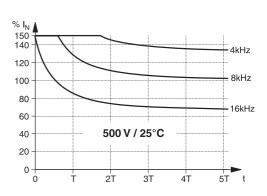
Overload capacity at 40 °C





Overload capacity at 25 °C





| Size | 0XS | 0S < 1.5 kW | 0S 1.5 kW | 0L | 28 | 2 | 3 | 4 |
|---------|-----|-------------|-----------|----|----|---|---|---|
| T (min) | 20 | 20 | 8 | 8 | 4 | 6 | 4 | 9 |



Load capacity of the units at low output frequencies

5.7 Load capacity of the units at low output frequencies

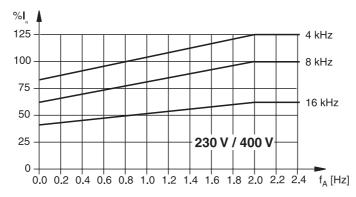
The thermal model in MOVITRAC® B implements dynamic limiting of the maximum output current. Consequently, the thermal model only permits less than 100 % output current at output frequencies less than 2 Hz if the capacity utilization is high.

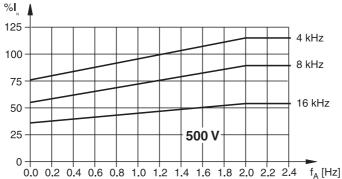
In such operating states, configure the average output current of the inverter to max. 70 % of the rated inverter current.



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

Guaranteed continuous currents depending on the output frequency:







5.8 Selecting the braking resistor



High voltage

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

Cable length

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

Parallel connection

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

Peak braking power

The peak 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:

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

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

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

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

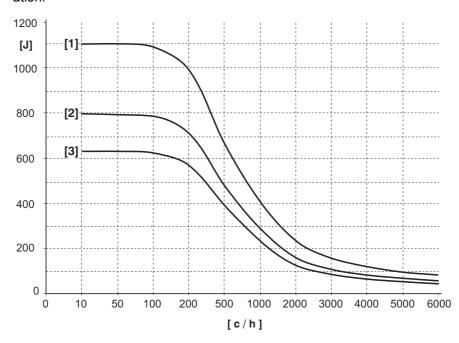
| Resistance [Ω] | Peak breaking | power [KW] |
|-----------------------|-------------------|-------------|
| | 400 / 500 V units | 230 V units |
| 100 | 9.4 | - |
| 72 | 13.0 | - |
| 68 | 13.8 | - |
| 47 | 20.0 | - |
| 39 | 24.0 | - |
| 27 | 34.8 | 8.7 |
| 18 | 52.2 | - |
| 15 | 62.7 | - |
| 12 | 78.4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

Selecting the braking resistor

5.8.1 Power diagrams

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

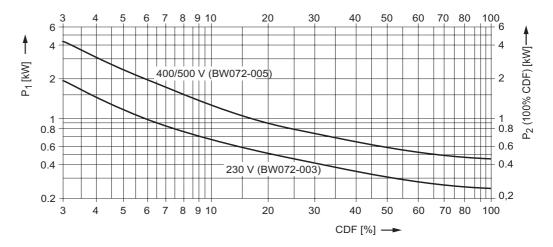
Load capacity of PTC braking resistors The following diagram shows the load capacity of the braking resistors per brake appliation:



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

Flat-design power diagram

Power diagram for flat-design braking resistors:



P₁ = Short-term power

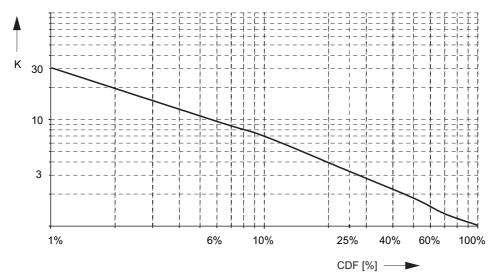
2 = Continuous power

CDF = Cyclic duration factor of the braking resistor



Overload factor for wire resistors

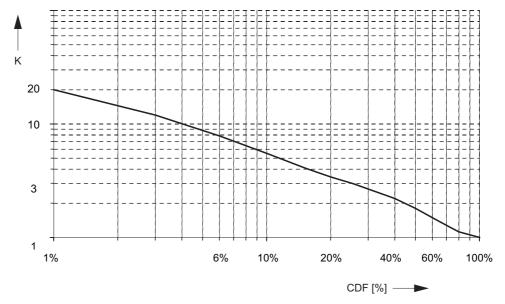
Overload factor depending on cycle duration factor for wire resistors:



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

Overload factor for grid resistors

Overload factor depending on cycle duration factor for grid resistors:



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



Project planning Selecting the braking resistor

Calculation example

Given:

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

Required:

· BW.. braking resistor

Procedure

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

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

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

· Results:

100 % CDF power for wire resistors: 685 W.100 % CDF power for grid resistors: 856 W.

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

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





5.9 Brake connection

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

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



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

5.9.1 Switching off the brake rectifier

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

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

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

All hoist applications

5.9.2 Activating the brake

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



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

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

5.9.3 Brake parameters



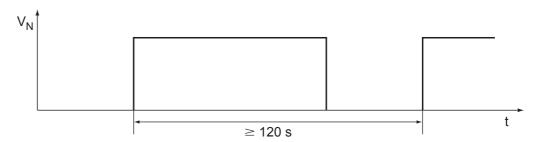
The brake parameters are adapted to the brake activation arrangement shown in the wiring diagram. If the values set for the brake release and application times are too short, e.g. for long response times in the brake control system, hoists, for example, may sag.

5.10 Input contactor

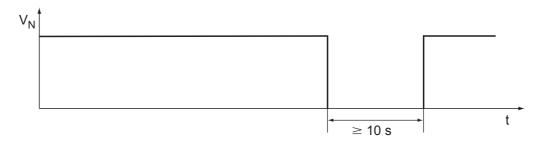
• Only use supply system contactors in utilization category AC-3 (EN 60947-4-1).

Mains activations

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



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



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





5.11 Mains lead and motor cable

5.11.1 Permitted voltage supply systems

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

5.11.2 Line protection and core cross-section

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

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

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

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

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

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



Project planningMains lead and motor cable

Recommendation for standard installation

| MOVITRA | MOVITRAC® B 230 V | | 0004 | 0005 | 8000 | 0011 | 0015 | 0022 | | | |
|-------------|--|--|-----------|------|--------------------------------------|---------------------------|------|------|--|--|--|
| 1-phase | Line protection | C16 ¹⁾ / gL16 | K16 | | C32 ²⁾ / gL25 / K25 / D20 | | | | | | |
| | Supply system lead 1.5 mm ² / AWG16 | | | | | 4 mm ² / AWG12 | | | | | |
| | PE conductor | 2 x 1.5 mm ² / | 2 x AWG16 | | 2 x 4 mm ² / 2 x AWG12 | | | | | | |
| Motor cab | le | 1.5 mm ² / AW | /G16 | | 1.5 mm ² / AWG16 | | | | | | |
| Unit termin | nal cross-section er section | Disconnectable terminal strip 4 mm ² conductor end sleeve DIN 46228 | | | | | | | | | |

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

| MOVITRA | MOVITRAC® B 400 / 500 V | | 0004 | 0005 | 8000 | 0011 | 0015 | 0022 | 0030 | 0040 | | | |
|--|-------------------------|--|----------------------------|------|------|------|--|------|------|------|--|--|--|
| 3-phase | Line protection | 10 A | | | | | 16 A | | | | | | |
| | Supply system lead | 1.5 mm ² / | .5 mm ² / AWG16 | | | | | | | | | | |
| | PE conductor | 2 x 1.5 mm | 1 ² / 2 x AW(| G16 | | | 2 x 1.5 mm ² / 2 x AWG16 1 x 10 mm ² / 1 x AWG8 | | | | | | |
| Motor cable |) | 1.5 mm ² / AWG16 | | | | | | | | | | | |
| Unit terminal cross-section of the power section | | Disconnectable terminal strip 4 mm ² conductor end sleeve DIN 46228 | | | | | | | | | | | |

| MOVITRA | C [®] B 400 / 500 V | 0055 | 0075 | 0110 | 0150 | 0220 | 0300 | 0370 | 0450 |
|--|------------------------------|---|--|---|---|--|---|--------------------|--------------------|
| 3-phase | Line protection | 16 A | 16 A | 25 A | 35 A | 50 A | 63 A | 80 A | 100 A |
| | Supply system lead | 1.5 mm ² | 1.5 mm ² | 4 mm ² | 6 mm ² | 10 mm ² | 16 mm ² | 25 mm ² | 35 mm ² |
| | PE conductor | 2 x 1.5 mm ² 1 x 10 mm ² | 2 x 1.5 mm ² 1 x 10 mm ² | 2 x 4 mm ² 1 x 10 mm ² | 2 x 6 mm ² 1 x 10 mm ² | 1 x 10 mm ² | 1 x 16 mm ² | | 2 |
| Motor cab | e | 1.5 mm ² | 2.5 mm ² | 4 mm ² | 6 mm ² | 10 mm ² | 16 mm ² | 25 mm ² | 35 mm ² |
| Unit terminal cross-section of the power section | | v 4 mm² condu | M4 screw and washer assembly with terminal clip 4 mm² conductor end sleeve DIN 46228 6 mm² crimp cable connector DIN 46234 | | | and washer as with washer nax. 25 mm ² able lug DIN 46 | Bolt M10 with nut max. 70 mm² crimp cable connector DIN 36235 | | |



Project planningMains lead and motor cable



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

| MOVITRAC® B 400 / 500 V | 0003 | 0004 | 0005 | 8000 | 0011 | 0014 | 0015 | 0022 | 0030 | 0040 | | | | |
|--|---|------|------|------|------|------|------|------|------|------|--|--|--|--|
| Size | 0 | 0 | | | | | | | 1 | | | | | |
| Fuses F11/F12/F13 I _N | | 6 A | | | | | | 15 A | | | | | | |
| Supply system lead L1/L2/L3 | AWG14 AWG14 | | | | | | G14 | | | | | | | |
| PE conductor | AWG14 | | | | | | | AW | G14 | | | | | |
| Motor feeder U/V/W | AWG14 | | | | | | AW | G14 | | | | | | |
| Unit terminal cross-section of the power section | of Separable terminal strip Separable term AWG10 conductor end sleeve AWG10 conductor | | | | | | | | | | | | | |

| MOVITRAC® B 400 / 500 V | 0055 | 0075 | 0110 | 0150 | 0220 | 0300 | | | |
|--|------|--|-------|------|-----------------------------|------|--|--|--|
| Size | | 2 | | 3 | | | | | |
| Fuses F11/F12/F13 I _N | 20 | Α | 30 A | 40 A | 60 A | 80 A | | | |
| Supply system lead L1/L2/L3 | AW | G12 | AWG10 | AWG8 | AWG6 | AWG4 | | | |
| PE conductor | AW | G12 | AWG10 | AW | AWG8 | | | | |
| Motor feeder U/V/W | AW | G12 | AWG10 | AWG8 | AWG8 AWG6 | | | | |
| Unit terminal cross-section of the power section | AWG1 | vasher assembly 0 conductor end 0 crimp cable co | | | ly with washer connector | | | | |

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



Mains lead and motor cable

5.11.3 Motor line length

The maximum motor line length depends on:

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

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

| MOVITRAC® B: | | Permitted maximum motor feeder length in m (ft) | | | | | | | | |
|------------------|--|---|--|--|---|--|--|--|--|--|
| Size | | | 0XS / 0S / 0L | 28 | 2/3/4 | | | | | |
| Voltage | | V _{mains} = 3 x AC 400 V | V _{mains} = 1 x AC 230 V or V _{Mains} = 3 x AC 500 V or 3 × AC 400 V (125 % I _N) | 400 / | 500 V | | | | | |
| Shielded cable | 4 kHz ¹⁾ 8 kHz 12 kHz 16 kHz | 100 (330) 70 (231) 50 (165) 40 (132) | 50 (165) 35 (116) 25 (83) 25 (83) | 300 (990) 250 (825) 200 (660) 150 (495) | 400 (1320) 300 (990) 250 (825) 200 (660) | | | | | |
| Unshielded cable | 4 kHz ¹⁾ 8 kHz 12 kHz 16 kHz | 200 (660) 140 (462) 100 (330) 80 (264) | 100 (330) 70 (231) 50 (165) 50 (165) | 900 (2970) 750 (2475) 600 (1980) 450 (1485) | 1200 (3960) 900 (2970) 750 (2475) 600 (1980) | | | | | |

1) Standard setting



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



Project planningMains lead and motor cable



5.11.4 Voltage drop

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

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

| Cable cross- | | | | | | | L | oad wi | th I [A] | = | | | | | | |
|---------------------|-----|-----|------|------|----------|---------------|----------|--------|----------|--------|---------|-------------------|------|-----|-----|-----|
| section | 4 | 6 | 8 | 10 | 13 | 16 | 20 | 25 | 30 | 40 | 50 | 63 | 80 | 100 | 125 | 150 |
| Copper | | • | | Vol | ltage dr | op Δ U | [V] with | length | = 100 | m (330 | ft) and | 0 = 70 | °C | | | |
| 1.5 mm ² | 5.3 | 8 | 10.6 | 13.3 | 17.3 | 21.3 | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) |
| 2.5 mm ² | 3.2 | 4.8 | 6.4 | 8.1 | 10.4 | 12.8 | 16 | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) |
| 4 mm ² | 1.9 | 2.8 | 3.8 | 4.7 | 6.5 | 8.0 | 10 | 12.5 | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) |
| 6 mm ² | | | | | 4.4 | 5.3 | 6.4 | 8.3 | 9.9 | 1) | 1) | 1) | 1) | 1) | 1) | 1) |
| 10 mm ² | | | | | | 3.2 | 4.0 | 5.0 | 6.0 | 8.2 | 10.2 | 1) | 1) | 1) | 1) | 1) |
| 16 mm ² | | | | | | | | 3.3 | 3.9 | 5.2 | 6.5 | 7.9 | 10.0 | 1) | 1) | 1) |
| 25 mm ² | | | | | | | | | 2.5 | 3.3 | 4.1 | 5.1 | 6.4 | 8.0 | 1) | 1) |
| 35 mm ² | | | | | | | | | | | 2.9 | 3.6 | 4.6 | 5.7 | 7.2 | 8.6 |
| 50 mm ² | | | | | | | | | | | | | | 4.0 | 5.0 | 6.0 |

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

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

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



Multi-motor drive / group drive

5.12 Multi-motor drive / group drive



Switch the frequency inverter output with inhibited output stage only.

5.12.1 Motor currents

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

5.12.2 Motor line

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

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

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

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

N = Number of motors connected in parallel

5.12.3 Motor size

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

5.12.4 Output filter

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





5.13 Line chokes

5.13.1 1-phase

Use is optional under the following circumstances:

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

Use is required under the following circumstances:

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

5.13.2 3-phase

Use is optional to support the overvoltage protection.

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

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

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

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

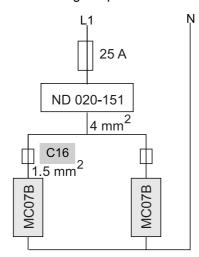


Line chokes

Example: Two 1-phase inverters on one 1-phase line choke 2 MOVITRAC® MC07B0008-2B1 units (0.75 kW) are connected to one line choke ND 020-151. The inverters have a rated current of 9.9 A.

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

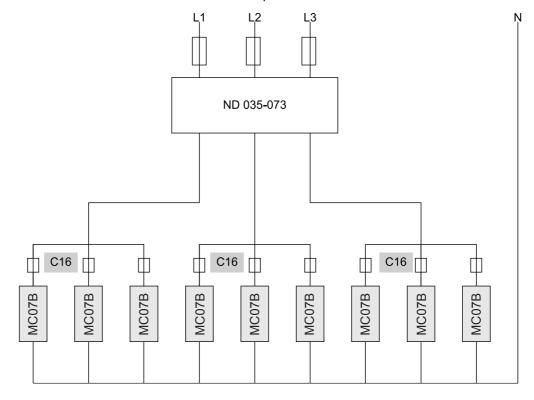
Connecting 2 1-phase inverters to one 1-phase line choke



Example: Nine 1-phase inverters on one 3-phase line choke 9 MOVITRAC $^{\otimes}$ MC07B-0008-2B1-00 units (0.75 kW) are connected to a 3-phase line choke ND 035-073. The inverters have a rated current of 9.9 A.

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

Connection of several inverters on one 3-phase line choke







5.14 Electromagnetic compatibility (EMC)

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

5.14.1 Interference immunity

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

5.14.2 Interference emission

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

Limit value class

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

| Limit value class | | Input s | Output side | | | | |
|-------------------|-----------------|----------------------------------|-------------------|-------------------|---------------------|----------------------|--|
| Size | | 0 | 0 2 3 / 4 | | 0 | 2S 4 | |
| Voltage | | 230 V | 230 V 400 / 500 V | | | | |
| Α | | No additional filtering re | quired | | | HD output | |
| В | Cable conducted | No additional filtering required | NF line filter | NF line filter | Shielded motor line | choke or shielded | |
| | | Foldable ferrites ¹⁾ | ilitei | | | motor line | |

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

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

5.14.3 Connection

Observe the "Installation" section for EMC compliant connection.





HF... output filter type

5.14.4 Reducing earth-leakage currents (size 0 only)

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

The earth leakage currents are mainly determined by:

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

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

5.14.5 IT systems



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

5.15 HF... output filter type

5.15.1 Important notes

Observe the following instructions when using output filters:

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





5.15.2 Installation, connection and operation



- Install output filters next to the corresponding inverter. Leave a ventilation space of at least 100 mm below and above the output filter. No clearance is required on the sides.
- Limit the connection cable between the inverter and output filter to the absolute minimum length required. Maximum 1 m with an unshielded cable and 10 m for a shielded cable.



- An unshielded motor line is sufficient when using an output filter. Note the following instructions when you are using an output filter together with a shielded motor line:
 - The maximum permitted length of the motor line for operation without V_{DC} link connection is 20 m.
 - $\,-\,$ Operation with $V_{DC}\,$ link connection is required if the motor line is longer than 20 m.
 - Observe the notes "Operation with V₇ link" on the next page.
- The rated through current of the output filter must be higher than or equal to the output current of the inverter. Note whether the projected output current of the inverter is 100 % I_N (= rated output current) or 125 % I_N (= continuous output current).
- Several motors can be connected to one output filter when operating a motor group from one inverter. The sum of the rated motor currents must not exceed the rated through current of the output filter.
- It is possible to connect two output filters of the same type to one inverter output to increase the rated through current. All like connections must be connected in parallel on the output filters.
- Considerable noise (magnetostriction) may occur in the output filter especially if operating with f_{PWM} = 4 kHz. In environments susceptible to noise, SEW-EURO-DRIVE recommends operation with f_{PWM} = 12 kHz (or 16 kHz) and V_{DC} link connection. Observe the notes regarding V_{DC} link connection.
- When the inverter is operated with f_{PWM} = 4 or 8 kHz, the output filter connection V5 (with HF...-503) or 7 (with HF...-403) must **not** be connected (no V_{DC} link connection).

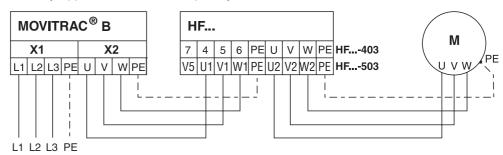


HF... output filter type

5.15.3 V_{DC} link connection

Operation without V_{DC} link connection:

Only approved for PWM frequency 4 kHz or 8 kHz.





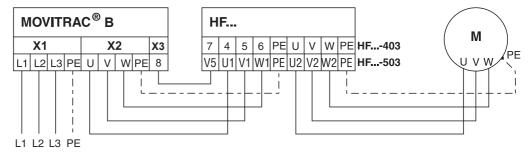
Operation with V_{DC} link connection (from 5.5 kW)

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

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

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

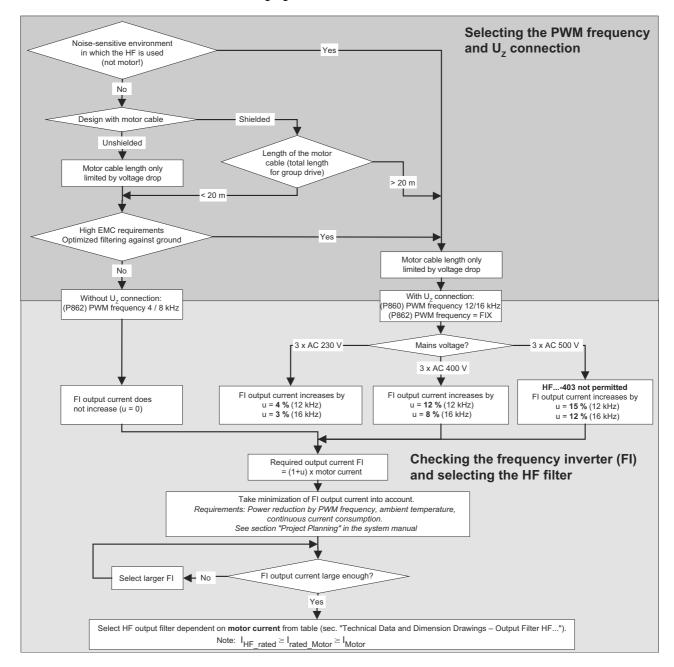
The increased power requirement causes an additional load on the inverter. Take this aspect into account during project planning of the drive. Failure to comply with this aspect may cause the inverter to shut down due to overload.







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





Electronics cables and signal generation

5.16 Electronics cables and signal generation

5.16.1 Cable type

The electronic terminals are suitable for:

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

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

5.16.2 0 V cables

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

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

5.16.3 Coupling relays

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

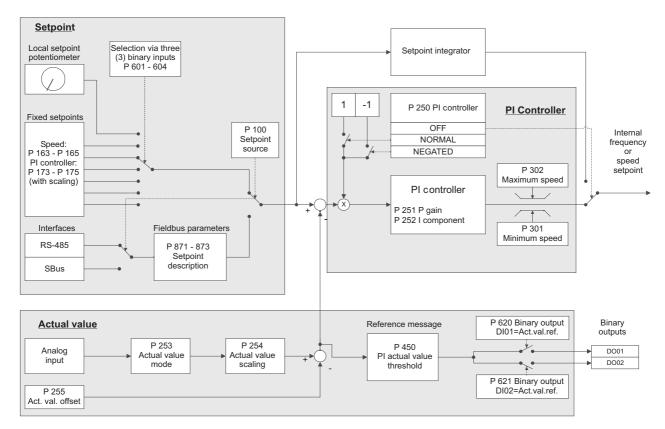




5.17 PI controller

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

Structural diagram showing installation of the PI controller



Connect the actual value from the sensor (temperature, pressure, etc.) to analog input Al1. You can scale the actual value up or down and assign an offset value, thereby adapting it to the working range of the PI controller.

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

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

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





PI controller

5.17.1 Parameter settings

Activating the PI controller

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

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

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

| P 250 | PI controller | Off |
|-------|---------------|----------|
| | | Normal |
| | | Inverted |

Controller parameters

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

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

5.17.2 Setpoint selection

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

• **UNIPOL**./**FIX.SETPT**: The setpoint set using the local setpoint potentiometer applies until one of the following fixed setpoints is selected:

P163/164/165 Setpoint n11/12/13 scales PI controller [0 ... 100 %] step width: 0.1 % P173/174/175 Setpoint n21/22/23 scales PI controller [0 ... 100 %] step width: 0.1 %

- RS-485
- SBus: Specify the setpoint and set it using the following bus parameters: P870/871/872 Setpoint description PO1/PO2/PO3 [PI controller setpoint [%]] PO1/PO2/PO3 = $0 2^{14} = 0 \dots 100\%$ PI controller setpoint

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

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





5.17.3 Actual value acquisition

The unipolar input Al1 is the actual value input.

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

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

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

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

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

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

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

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

```
P873 Actual value description PI1 [PI controller [%]]
P874 Actual value description PI2 [PI controller [%]]
P875 Actual value description PI3 [PI controller [%]]
PI1 = 0 ... 2<sup>14</sup> = 0 ... 100% PI controller setpoint
PI2 = 0 ... 2<sup>14</sup> = 0 ... 100% PI controller setpoint
PI3 = 0 ... 2<sup>14</sup> = 0 ... 100% PI controller setpoint
```

5.17.4 Reference signal

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

```
P450 PI actual value threshold 0 ... 100 [%] 0.1%
P451 Signal = "1" if: PI actual value < PI reference
PI actual value > PI reference
```

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

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



Project planning Application examples

5.17.5 Inverter control

You can determine the direction of rotation by using terminal assigned to "CW/Stop" and "CCW/Stop."

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

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

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

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

5.18 Application examples

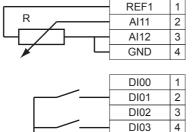
All application examples presented here assume that the unit has been started up correctly in accordance with the "Startup" section.

5.18.1 External setpoint potentiometer

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

Connect an external setpoint potentiometer as follows:

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





5

6 7

8

9

DI04 DI05TF

VOTF 24VIO

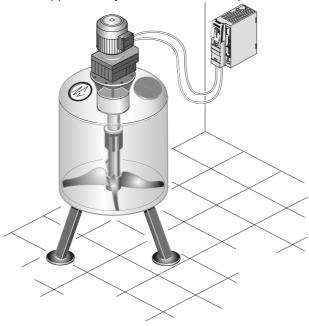
GND

X10:



5.18.2 Speed-controlled agitator

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



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

Parameter

Adapt the following parameters for the agitator:

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



5.18.3 Positioning a trolley

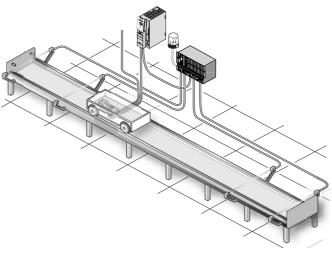
Principle

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

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

Install a braking resistor.

Perform a startup for the VFC operating mode.



Terminals

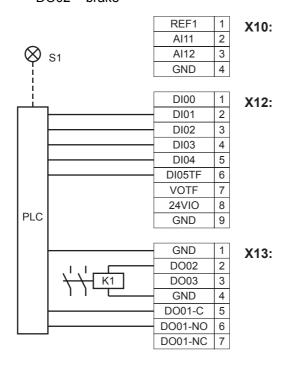
Rapid speed: DI04 = 1 and DI05 = 1
 Creep speed: DI04 = 1 and DI05 = 0





Assignment of the electronics terminal strip with

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



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

X12:2: Clockwise direction of rotation X12:6: Creep speed/rapid speed

X12:3: Counterclockwise direction of rotation X12:8: 24 V

X12:4: Start/Stop X13:6: No malfunction X12:5: Rapid speed X13:2: Brake released

Parameters

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

| P130 Ramp t11 up | P601 Binary input DI02: CCW/Stop |
|--------------------|----------------------------------|
| P131 Ramp t11 down | P602 Binary input DI03: Enable |
| P136 Stop ramp t13 | P603 Binary input DI04: n11/n21 |
| P160 n11 | P604 Binary input DI05: n12/n22 |
| P162 n13 | P620 Binary output DO01: Fault |

P301 n_{min} P621 Binary output D002: Brake released

P302 n_{max} P736 Braking time

P303 Current limit P820 4-quadrant operation: ON

P320 Automatic adjustment: ON P830 Response EXT. FAULT: Stop/Fault

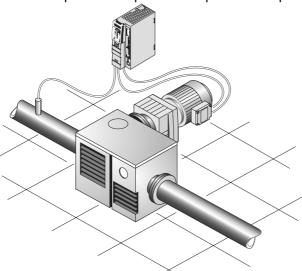
P323 Premagnetization P860 PWM frequency



5.18.4 Pressure control

Principle

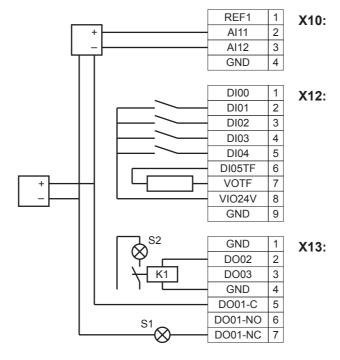
In this application, the inverter controls the water pressure in a pipe system. The PI controller installed in MOVITRAC® B is used for this purpose. P163 "PI controller internal setpoint n11" specifies the pressure setpoint.



Connection

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

Connection pressure control:





Use the following signals and components for pressure control:

X12:2: Clockwise rotation S1: Fault

X12:3: Start/Stop button S2: Pressure reached

X12:4: Required pressure X12:5: Reset button

P255 PI actual value offset

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

Use Reset and Enable for controlling the machine.

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

Parameters

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

P163 n11 PI-controller internal setpoint P450 PI actual value threshold

P250 PI controller P451 Signal = "1" if: PI actual value / PI reference

P251 P-gain P601 Binary input DI02: Enable
P252 I-component P602 Binary input DI03: n11
P253 PI actual value mode P603 Binary input DI04: Error reset
P254 PI actual value scaling P604 Binary input DI05: TF error

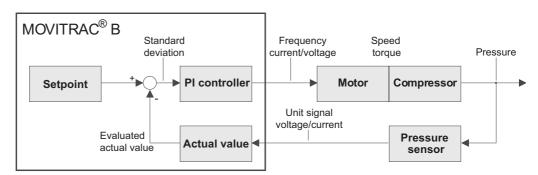
P301 Minimum speed P621 Binary output D002: PI ACT.VALUE REF.
P302 Maximum speed P830 Error response: Immediate stop/Fault

P620 Binary output DO01: Fault

P303 Current limit P860 PWM frequency

5.18.5 PI controller

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





6 Safety notes

6.1 Installation and startup

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

The unit must be grounded as a protective measure.

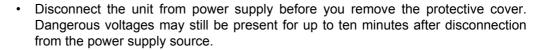
Overcurrent protection devices are a necessary protection device.

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





6.2 Operation and service





- The unit has IP00 enclosure with the protective cover removed. Dangerous voltages
 are present at all subassemblies except for the control electronics. The unit must be
 closed during operation.
- When the unit switch is in the ON position, dangerous voltages are present at the
 output terminals as well as any connected cables and motor terminals. Dangerous
 voltages may even occur if the unit is inhibited and the motor is at standstill.
- The unit may not necessarily be free from any voltages even if the displays are no longer illuminated.



- Safety functions of the unit or mechanical blocking may result in a motor standstill.
 Removing the cause of this problem or performing a reset can result in the drive restarting on its own. If, for safety reasons, this is not permitted for the driven machine, disconnect the unit from the mains before correcting the fault.
- · Switch the frequency inverter output with inhibited output stage only.
- Ensure a minimum time of 120 s between two mains activations for AC 230 V / 1-phase units.
- Observe a minimum switch-off time of 10 s for 3-phase units.



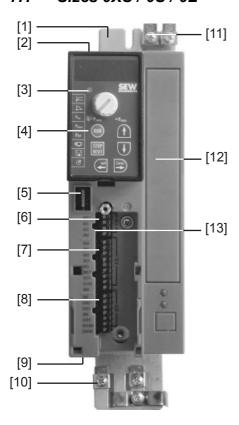
Risk of burns

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



Unit design 7

Sizes 0XS / 0S / 0L 7.1

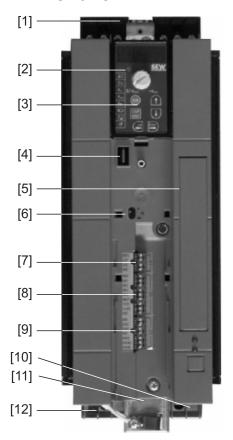


- [1] [2]
- Fixing strap X1: Power supply connection: 3-phase: L1 / L2 / L3

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



7.2 Size 2S / 2



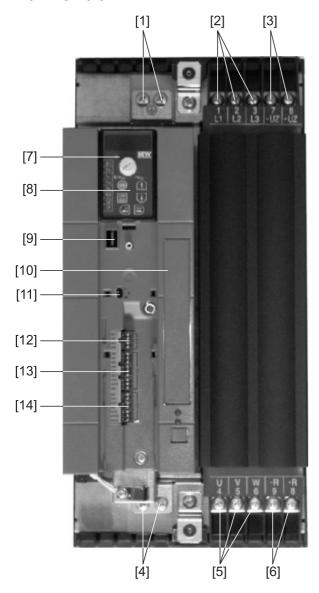
- X1: Mains connection 3-phase: L1 / L2 / L3 / PE screw Status LED (visible without optional keypad)
 Optional keypad

- Connection for optional communication / analog module
- Option card slot
 Switch S11 for V-mA toggle analog input
 X10: Analog input
 X12: Binary inputs
- [1] [2] [3] [4] [5] [6] [7] [8] [9] [10] [11] [12]
- X13: Binary outputs
- X2: Motor connection U / V / W / PE screw
- Space for power shield clamp
 X3: Braking resistor connection R+ / R- / PE

Unit design Size 3



7.3 Size 3



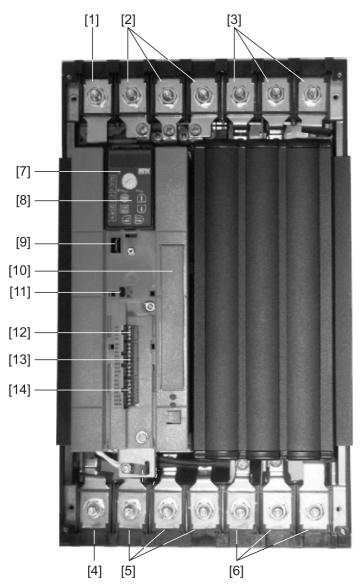
- X2: PE connection
- X1: Mains connection 3-phase: L1 (1) / L2 (2) / L3 (3)
 X4: DC link circuit connection (not used)
 X2: PE connection

- X2: PE connection
 X2: Motor connection U (4) / V (5) / W (6)
 X3: Braking resistor connection R+ (8) / R- (9) and PE connection
 Status LED (visible without optional keypad)
 Optional keypad
 Connection for optional communication / analog module

- [1] [2] [3] [4] [5] [6] [7] [8] [9] [10]
- Option card slot
- [11] [12] [13] [14] Switch S11 for V-mA toggle analog input
- X10: Analog input X12: Binary inputs X13: Binary outputs



7.4 Size 4



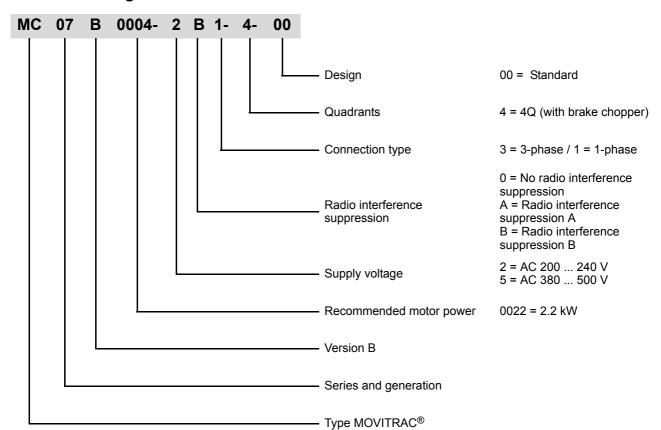
- X2: PE connection
- [1] [2] [3] [4] [5] [6] [7] [8] [9] [10] X1: Mains connection 3-phase: L1 (1) / L2 (2) / L3 (3)
 X4: DC link circuit connection (not used)
 X2: PE connection

- X2: Motor connection U (4) / V (5) / W (6)
 X3: Braking resistor connection R+ (8) / R- (9) and PE connection
 Status LED (visible without optional keypad)
 Optional keypad

- Connection for optional communication / analog module
- Option card slot
- Switch S11 for V-mA toggle analog input

- [11] [12] [13] [14] X10: Analog input X12: Binary inputs X13: Binary outputs

7.5 Unit designation





8 Installation

8.1 Installation notes



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

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



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



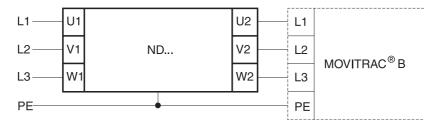


| Switched inductances | Use suppressors to suppress interference on contactors, relays, solenoid valves, etc. The minimum distance to the inverter must be 150 mm. |
|----------------------|--|
| Line filter | MOVITRAC® B frequency inverters have an integrated line filter as standard. They comply with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

8.2 Installation of the optional power components

8.2.1 ND... series line chokes

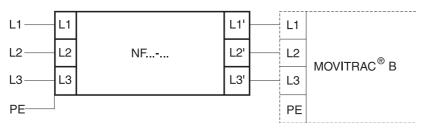
ND... series connecting line choke



Installation Installation of the optional power components

8.2.2 NF... series line filters

NF... connecting line filter

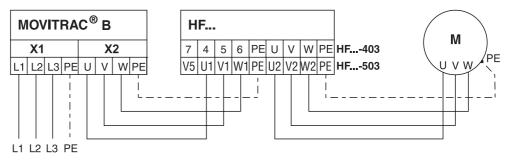


8.2.3 HF... series output filters



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

Connecting HF...-... output filters





8.3 UL compliant installation

Please note the following points for UL compliant installation:

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

8.3.1 Maximum values / fuses

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

| 230 V units | Max. supply current | Max. supply voltage | Fuses |
|--------------------|---------------------|---------------------|--------------|
| 0005 / 0008 | AC 5000 A | AC 240 V | 15 A / 250 V |
| 0011 / 0015 / 0022 | AC 5000 A | AC 240 V | 30 A / 250 V |

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

Installation



Scope of delivery and installation of loose items

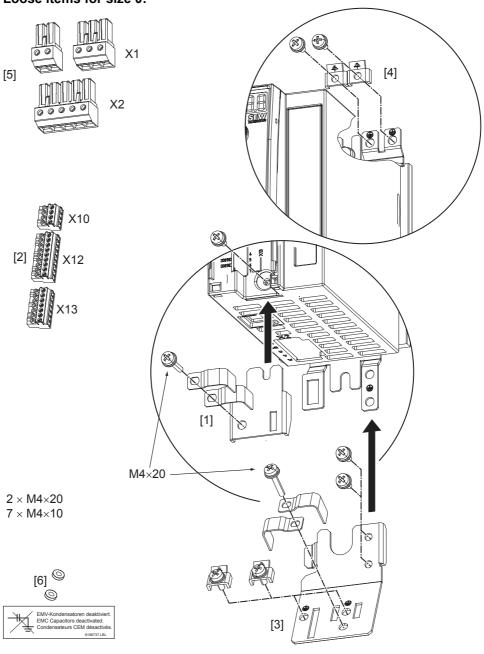
8.4 Scope of delivery and installation of loose items

8.4.1 Scope of delivery, included loose

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

| Scope of delivery of loose items for size | | | | |
|--|--|---|---|-------------|
| 0XS / 0S / 0L | 28 | 2 | 3 | 4 |
| Shield plate for electronics cables with clamps and screws [1] 3 connectors for electronics terminals [2] | | | | |
| Grounding terminals with screws [4] | | | _ | _ |
| Shield plate for power connection with clamps and screws [3] Connector for mains (2 or 3-pole) and | Touch guard Shield plate for power connection with screw | | _ | - |
| motor [5] • Plastic insulations with sticker [6] | Fixing straps | - | _ | Touch guard |

Loose items for size 0:



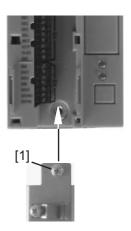


Installation

8.4.2 Installation of electronics shield clamps (all sizes)

 $\mathsf{MOVITRAC}^{\circledR}$ B includes an electronics shield clamp with retaining screw as standard. Install the electronics shield clamp as follows:

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



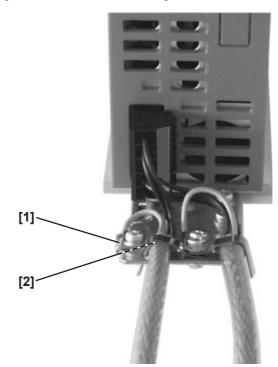
8.4.3 Power shield clamp

Size 0

A power shield clamp with 2 retaining screws is supplied as standard with MOVITRAC $^{\otimes}$ B size 0. Mount this power shield clamp together with the two retaining screws.







[2] Shield clamp

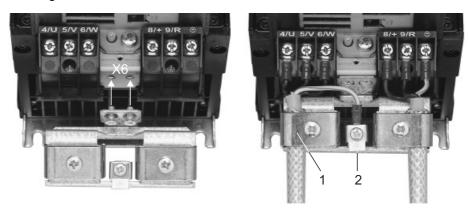
1

Installation

Scope of delivery and installation of loose items

Size 2S / 2

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



[1] Shield clamp

[2] PE connection

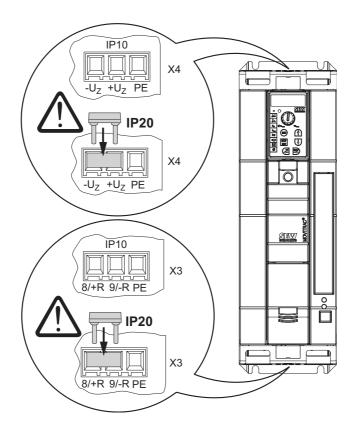
Power shield clamps provide you with a very convenient way of installing the shield for the motor and brake cables. Install the shield and PE conductor as shown in the figures.



8.4.4 Touch guard installation

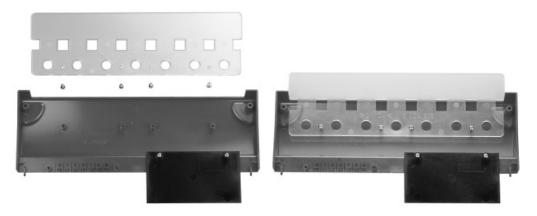
Size 2S

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



Size 4

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



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

Installation Deactivate the EMC capacitors (size 0 only)

8.4.5 Installation of Cold Plate

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

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

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

8.5 Deactivate the EMC capacitors (size 0 only)

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

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



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

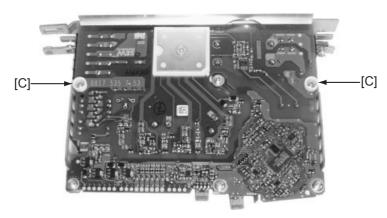




Installation

Deactivate the EMC capacitors:





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

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

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



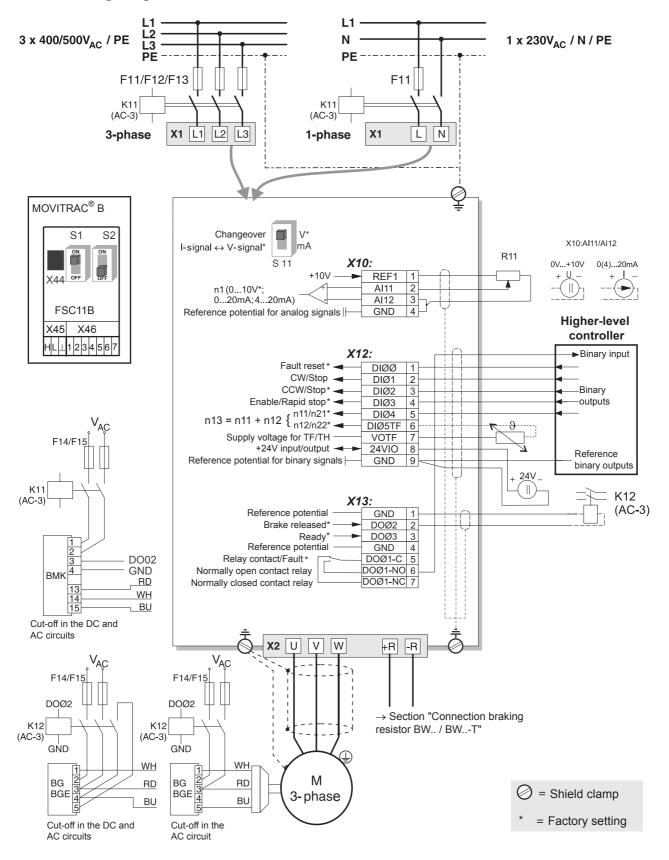
IT systems

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

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

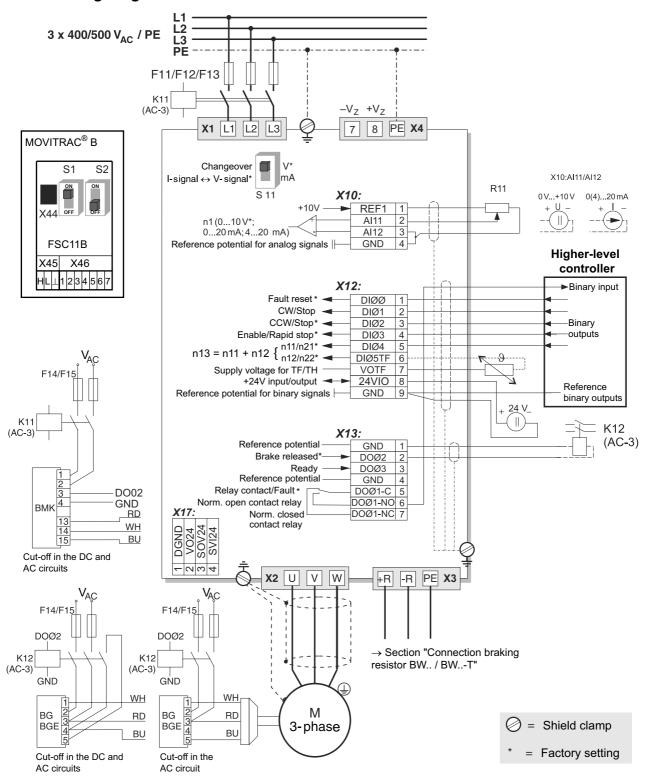
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8.6 Wiring diagram 230 V 0.37 ... 2.2 kW / 400 V 0.55 ... 4.0 kW



Installation

8.7 Wiring diagram 400 V 5.5 ... 45 kW



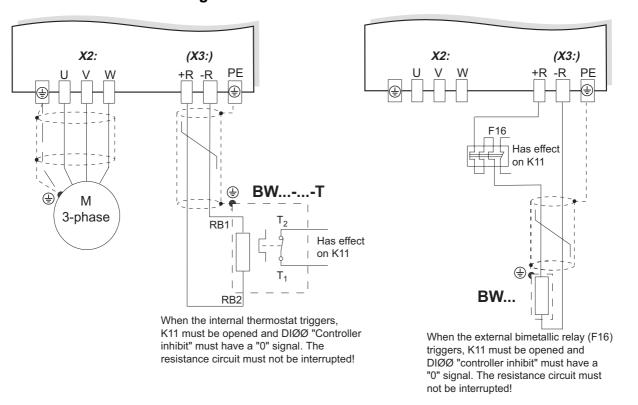
Installation TF thermistors and TH thermostats

8.8 TF thermistors and TH thermostats

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

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

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



Overload protection for braking resistors BW:

| | Overload protection | | |
|-----------------------|---------------------|---|---------------------------------|
| Braking resistor type | Design specified | Internal thermostat (T) | External bimetallic relay (F16) |
| BW | _ | _ | Required |
| BWT ¹⁾ | _ | One of the two options (internal thermostat / external bimetallic relay) is required. | |
| BW003 / BW005 | Adequate | _ | Permitted |

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





8.10 Connection of the brake rectifier



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

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

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

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

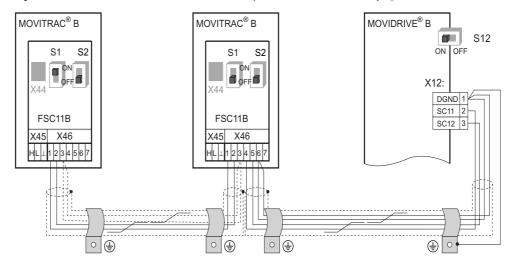
If the brake rectifier is installed in the control cabinet, route the connecting leads between the brake rectifier and the brake separately from other power cables. Routing together with other cables is only permitted if the other cables are shielded.

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

8.11 System bus (SBus) installation

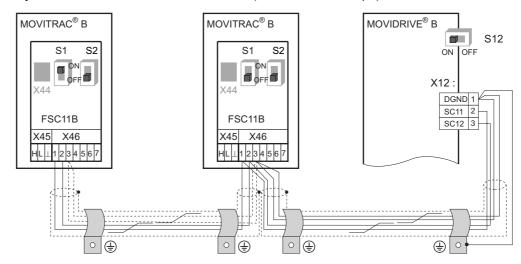
Max. 64 CAN bus stations can be addressed using the system bus (SBus). Use a repeater after 20 or 30 stations, depending on the length of the cables and the cable capacity. The SBus supports transmission technology compliant with ISO 11898.

System bus connection MOVITRAC® B (different terminal strips)



Installation System bus (SBus) installation

System bus connection MOVITRAC® B (same terminal strips)



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

GND = System bus reference (X46:6)

SC22 = System bus (X46:5)

SC21 = System bus (X46:4)

GND = System bus reference (X46:3)

SC12 = System bus (X46:2) SC11 = System bus (X46:1)

S1 = System bus terminating resistor

S2 = OFF (reserved)

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

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

Cable specification

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

Suitable cables include CAN bus or DeviceNet cables.

Shielding

- Connect the shield to the electronics shield clamp on the inverter or master controller and make sure it is connected over a wide area at both ends.
- There is no need for a ground connection for a connection between MOVITRAC® B and gateways with shielded cables.
- The permitted total cable length depends on the baud rate setting of the SBus (P884):

Line length

125 kBaud: 320 m
 250 kBaud: 160 m
 500 kBaud: 80 m
 1000 kBaud: 40 m

· You must use shielded cables.

Terminating resistor



- Switch on the system bus terminating resistor (S1 = ON) at the start and end of the system bus connection. Switch off the terminating resistor on the other units (S1 = OFF).
- Potential displacement •
- There must not be any potential displacement between the units connected with the SBus. Take suitable measures to avoid potential displacement, such as connecting the unit ground connectors using a separate cable.

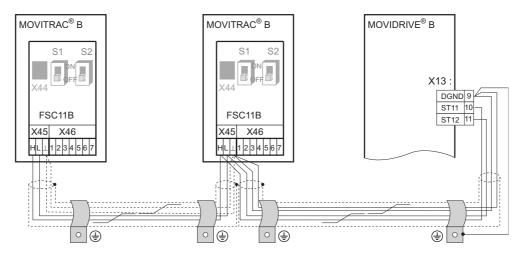




8.12 RS-485 interface installation

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

MOVITRAC® B RS-485 connection



GND = RS-485 reference (X45:ground)

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

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

Cable specification

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

For example, the following cable is suitable:

- BELDEN (www.belden.com), data cable type 3107A
- Shielding
- Connect the shield to the electronics shield clamp on the inverter or higher-level controller and make sure it is connected over a wide area at both ends.
- Cable length
- The permitted total cable length is 200 m.
- You must use shielded cables.

Terminating resistor

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



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

Startup Startup: Brief description

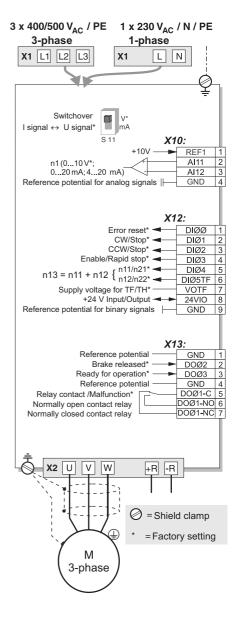
9 Startup

9.1 Startup: Brief description

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

9.1.1 Procedure

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



9.1.2 Notes

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

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





9.2 General startup instructions



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

9.2.1 Prerequisite

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

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

9.3 Preliminary work and resources basic unit

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

9.4 Preliminary work and resources for MOVITRAC® B with keypad

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



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





9.5 Optional keypad

Key arrangement and symbols on keypad:



9.5.1 Keypad functions

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

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



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



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

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

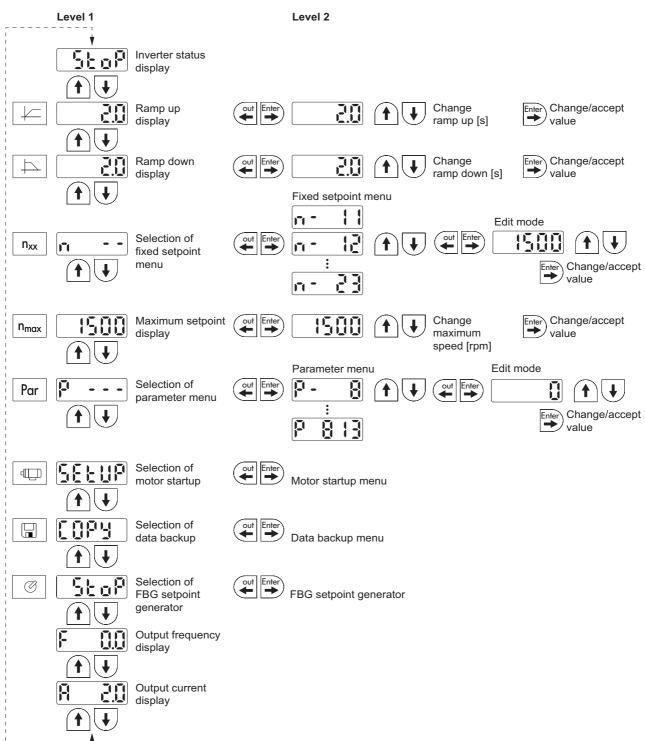


If you stop the drive with the STOP/RESET key, the display Stop flashes. This signal indicates you have to enable the drive using the "RUN" key.





9.6 Basic operation of the FBG11 keypad



Startup Basic operation of the FBG11 keypad

9.6.1 Menu system

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

Changing parameters

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

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

9.6.2 Status displays

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

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

9.6.3 Error display

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

9.6.4 Warnings

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





9.7 FBG setpoint generator and external setpoint selection

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

External setpoint selection

Control via

- Terminals
- Serial interface
- Setpoint potentiometer connected to Al11/Al12

9.7.1 FBG setpoint generator

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

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

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

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

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

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

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

Removing the FBG11B keypad will trigger a stop response.

9.7.2 External setpoint selection

Set direction of rotation

You can specify the set direction of rotation:

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





Startup

FBG setpoint generator and external setpoint selection

Set speed

You can specify the set speed:

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

Direction of rotation enable with RS-485 or SBus Unipolar setpoint sources:

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

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

Bipolar setpoint sources:

BIPOL./FIX.SETPT RS485 SBus

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





9.8 Startup with the FBG keypad

Level 1 Level 2 Level 3 Motor selection SEEUP out Enter Notor (SEW motor / non-SEW motor) <u>UFdc</u> Select operating mode: – VF = voltage/frequency controlled mode - VFdc = VF with DC braking out Enter WF Edo - VFC = field-oriented control mode – VFCdc = VFC with DC braking - FLY = VFC with flying start function) (in preparation) - hoiSt = VFC for hoist applications ho, 56 Power in [KW] out Enter 0.3 $HP = kW \times 1.33$ out Enter 4[[[Motor voltage [V] out Enter 50 Rated motor frequency [Hz] Rated motor speed Rated motor current [A] applies only to startup ŧ of non-SEW motors Motor=noSEW) cos phi out applies only to startup of non-SEW motors out Enter Number of motors for out Enter multi-motor drives



9.8.1 Activating startup

Requirements:

• Drive "No enable": Stop

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

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

9.8.2 V/f

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

9.8.3 VFC

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

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

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

9.8.4 Startup multi-motor drive

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

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





9.8.5 Startup of group drives

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

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

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



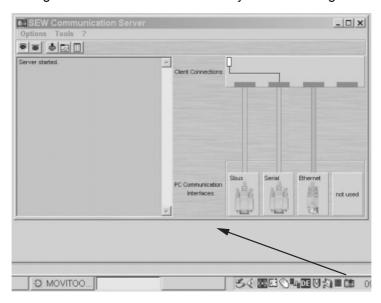
The parameter settings apply to all connected motors.

9.9 Startup with PC and MOVITOOLS® MotionStudio

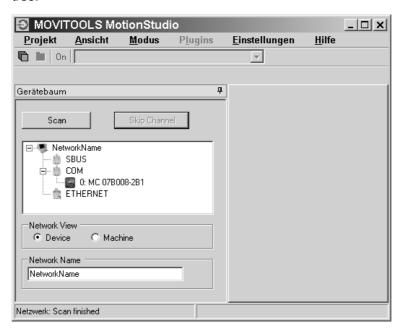
Start MOVITOOLS® MotionStudio in the Windows start menu:

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

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



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



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





9.10 Starting the motor

9.10.1 Analog setpoints

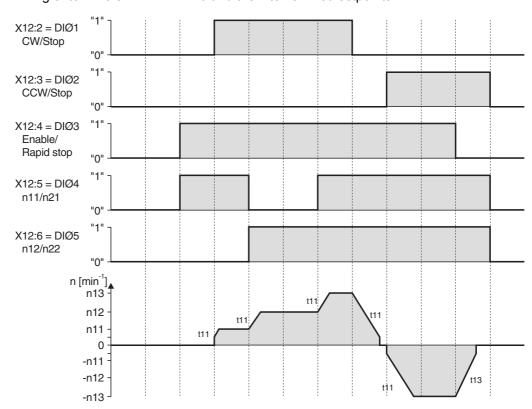
If you want to operate the drive with analog setpoints, use the table below to ensure that, when the "UNIPOL/FIX.SETPT" setpoint (P100) is selected, the correct signals are placed on the terminals X12:2 ... X12:4 (DIØ1 ... DIØ3).

| Terminal | X10:2/3 | X12:2 | X12:3 | X12:4 |
|------------------------------|--------------|-----------------|------------------|----------------|
| Function | Analog input | CW/Stop DI01 | CCW/Stop DI02 | Enable DI03 |
| /No enable | Х | X | Х | 0 |
| Enable and stop | Х | 0 | 0 | 1 |
| CW 50 % of n _{max} | 5 V | 1 | 0 | 1 |
| CW n _{max} | 10 V | 1 | 0 | 1 |
| CCW 50 % of n _{max} | 5 V | 0 | 1 | 1 |
| CCW n _{max} | 10 V | 0 | 1 | 1 |

$$X = any / 0 = low / 1 = high$$

9.10.2 Fixed setpoints

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



DI04 / n11 and DI05 / n12 active simultaneously results in n13.

Default values: $n11 = 150 \text{ min}^{-1} / n12 = 750 \text{ min}^{-1} / n13 = 1500 \text{ min}^{-1}$



9.11 Parameter list

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



Choice in long menu



Choice in short or long menu



Selection via symbol on keypad



Select in the FBG motor startup

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

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

| No. | FBG | Index | Name | Range / | actory setting Val | | |
|-----|----------|-------|------------------------------|---------------|---|---------------|--|
| | | dec. | | Display | MOVITOOLS® MotionStudio | after startup | |
| 03_ | | | Binary inputs | Binary inputs | | | |
| 030 | | | Binary input DI00 | | Error reset | | |
| 031 | | 8335 | Binary input DI01 | | CW/STOP (fixed assignment) | | |
| 032 | | 8336 | Binary input DI02 | | CCW/STOP | | |
| 033 | | 8337 | Binary input DI03 | | ENABLE/RAP.STOP | | |
| 034 | | 8338 | Binary input DI04 | | n11/n21 | | |
| 035 | | 8339 | Binary input DI05 | | n12/n22 | | |
| 039 | | 8334 | Binary inputs DI00 DI05 | | Binary display | | |
| 05_ | | | Binary outputs | - | | <u> </u> | |
| 051 | | 8350 | Binary output DO01 | | /FAULT | | |
| 052 | | 8351 | Binary output DO02 | | BRAKE RELEASED | | |
| 053 | | 8916 | Binary output DO03 | | READY FOR OPERATION | | |
| 059 | | 8349 | Binary outputs DO01, DO02 | | Binary display | | |
| 07_ | | | Unit data | | | | |
| 070 | | 8301 | Unit type | | [Text] | | |
| 071 | | 8361 | Rated output current | | [A] | | |
| 076 | | 8300 | Firmware basic unit | | [Part number and version] | | |
| 08_ | | | Error memory | 1 | | | |
| 080 | A-Z ↔ | | Error t-0 | Fault code | Background information for previous errors. | | |
| 09_ | | | Bus diagnostics | - | 1 | | |
| 094 | A-Z ↔ | 8455 | PO1 setpoint | | [hex] | | |
| 095 | A-Z ↔ | 8456 | PO2 setpoint | | [hex] | | |
| 096 | A-Z ↔ | 8457 | PO3 setpoint | | [hex] | | |
| 097 | | 8458 | PI1 actual value | | [hex] | | |
| 098 | | 8459 | PI2 actual value | | [hex] | | |
| 099 | | 8460 | PI3 actual value | | [hex] | | |



| No. | FBG | Index | Name | Range / factory setting | | Value |
|-----------|-----------------|----------------|-----------------------------|----------------------------|---|---------------|
| | | dec. | | Display | MOVITOOLS® MotionStudio | after startup |
| 1 | | | Setpoints / Ramp | generator | s (on FBG only parameter set 1) | |
| 10_ | | | Setpoint selection | 1 | | |
| 100 | abc | 8461 | Setpoint source | 0 1 2 4 6 7 | BIPOL./FIX.SETPT: UNIPOL./FIX.SETPT RS-485 MOTOR POTENTIOMETER FIX.SETPT. + AI1 FIX.SETPT * AI1 | |
| 101 | abc | 8462 | Control signal source | 0 1 3 4 | TERMINALS RS-485 SBus 3-WIRE CONTROL | |
| 102 | A-Z ↔ | 8840 | Frequency scaling | Setting ra | ange 0.1 10 120.00 [kHz] | |
| 11_ | | | Analog Input 1 (0 | 11 V) | | , |
| 110 | abc | 8463 | Al1 scaling | 0.1 1 | . 10 | |
| 112 | abc | 8465 | Al1 operating mode | 0 1 2 5 6 | 0-10 V / 3000 rpm N-MAX (0 – 10 V) V-Off., N-MAX N-MAX (0 – 20 mA) N-MAX (4 – 20 mA) | |
| 113 | A-Z ↔ | 8466 | Setpoint voltage offset | –10 V | 0 +10 V | |
| 12_ | | | Speed ramps 1 / 2 | | | |
| 121 | abc | 8811 | Addition setpoint generator | 0 1 2 | OFF ON ON EXCEPT FSP | |
| 122 | abc | 8799 | FBG manual operation | 0 1 2 | UNIPOLAR CW UNIPOLAR CCW BIPOLAR CW + CCW | |
| 13_ / 14_ | | | Setpoint generato | r of the FI | BG keypad | 1 |
| 130 / 140 | ~ | 8807 / 9264 | Ramp t11 / t21up | 0.1 2 | 2000 [s] | |
| 131 / 141 | ~ | 8808 / 9265 | Ramp t11 / t21 down | 0.1 2 | 2000 [s] | |
| 136 / 146 | A-Z ↔ | 8476 / 8484 | Stop ramp t13 / t23 | 0.1 2 | 20 [s] | |
| 15_ | | | Motor potentiome | ter | | |
| 150 | A-Z ← | 8809 | Ramp t3 up = down | 0.2 20 | 50 [s] | |
| 152 | A-Z ↔ | 8488 | Save last setpoint | off on | OFF ON | |





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



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





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



| No. | FBG | Index dec. | Name | Range / f | factory setting MOVITOOLS [®] MotionStudio | Value after startup |
|-----------|----------|----------------|------------------------------|---|--|---------------------------|
| 81_ | | | Serial communica | ation | | |
| 810 | A-Z ↔ | 8597 | RS-485 address | 0 99 | | |
| 811 | | 8598 | RS-485 group address | 100 19 | 9 | |
| 812 | | 8599 | RS-485 remote timeout | 0 650 | [s] | |
| 82_ | | | Brake operation 1 | / 2 | | |
| 820 / 821 | 4 | 8607 / 8608 | 4-quadrant operation 1 / 2 | Off On | OFF ON | |
| 83_ | | | Error responses | | | |
| 830 | A-Z ↔ | 8609 | Response /EXT. ERROR | 2 4 7 | IMMEDIATE STOP/FAULT STOP/WARNING | |
| 84_ | | | | | | |
| 840 | | 8617 | Manual reset | | YES NO | |
| 86_ | | | Modulation 1 / 2 | 1 | | |
| 860 / 861 | A-Z ↔ | 8620 / 8621 | PWM frequency 1 / 2 | 4 8 12 16 | 4 kHz 8 kHz 12 kHz 16 kHz | |
| 862 / 863 | A-Z ↔ | 8751 / 8752 | PWM fix 1 / 2 | on off | ON OFF | |
| 87_ | | | Fieldbus paramet | er setting | | |
| 870 | | 8304 | Setpoint description PO1 | | NO FUNCTION (factory setting P872) SPEED (factory setting P871) | |
| 871 | | 8305 | Setpoint description PO2 | | MAX. SPEED RAMP CONTROL WORD 1 (factory setting P870) | |
| 872 | | 8306 | Setpoint description PO3 | | SPEED [%] PI CTRL SETPOINT | |
| 873 | | 8307 | Actual value description PI1 | | NO FUNCTION SPEED (factory setting P874) | |
| 874 | | 8308 | Actual value description PI2 | OUTPUT CURRENT (factory setting P875) ACTIVE CURRENT STATUS WORD 1 (factory setting P873) | | |
| 875 | | 8309 | Actual value description PI3 | | SPEED [%] IPOS PI-DATA PI CTRL [%] | |
| 876 | | 8622 | PO data enable | | OFF ON | |



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

10 Operation and service

10.1 Device information

10.1.1 Error memory

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

The inverter stores the following information when a malfunction occurs:

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

10.1.2 Switch-off responses

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

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





10.1.3 Reset basic unit

An error message can be acknowledged by:

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

10.1.4 Reset keypad

An error message can be acknowledged by:

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

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

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

10.1.5 Reset interface

An error message can be acknowledged by:

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

10.1.6 Timeout active

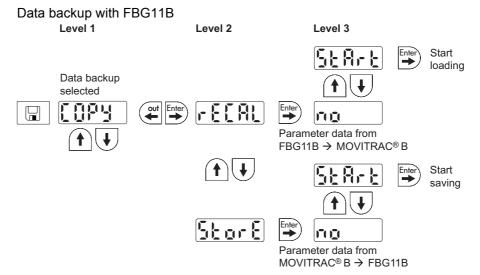
If the inverter is controlled via a communication interface (RS-485 or SBus) and the mains power was switched off and back on again, then the enable remains ineffective until the inverter once again receives valid data via the interface, which is monitored with a timeout.

10.1.7 Current limit

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

10.2 Data backup with FBG11B

Use the FBG11B keypad to download parameter data from the MOVITRAC $^{\$}$ B to the keypad or copy from the keypad to the MOVITRAC $^{\$}$ B.





Operation and service List of errors (F-00 ... F-97)



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

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



Operation and service List of errors (F-00 ... F-97)

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



Operation and service Return codes (r-19 ... r-38)



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

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

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

Return codes MOVITRAC® B:

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



10.5 Status displays

10.5.1 Keypad

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

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

10.5.2 LED flash codes

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

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





10.6 Unit status codes

Use status word 1 to determine the unit status code.

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

10.7 SEW Electronics service

10.7.1 Hotline

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

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

10.7.2 Repair service

Please contact the SEW Electronics Serviceif you can not rectify a fault.

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

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

10.8 Long term storage

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

Handling electrolytic capacitors after long storage periods

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

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

Forming Process

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

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

The following forming levels with respective dwell times are recommended:

70 % V_{rated max}: 15 minutes

85 % V_{rated max}: 15 minutes

100 % V_{rated_max}: 1 hour





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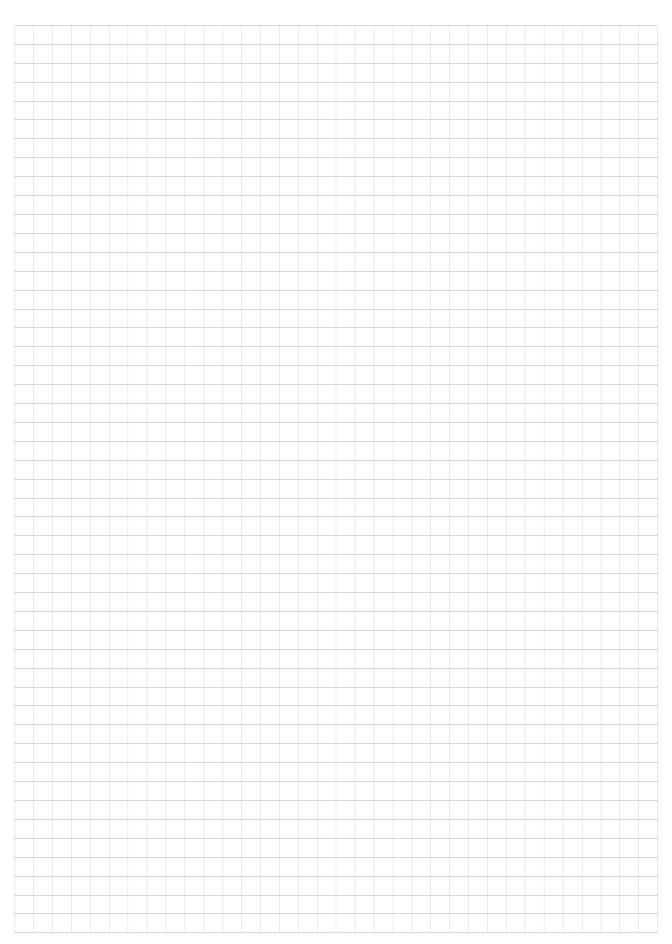


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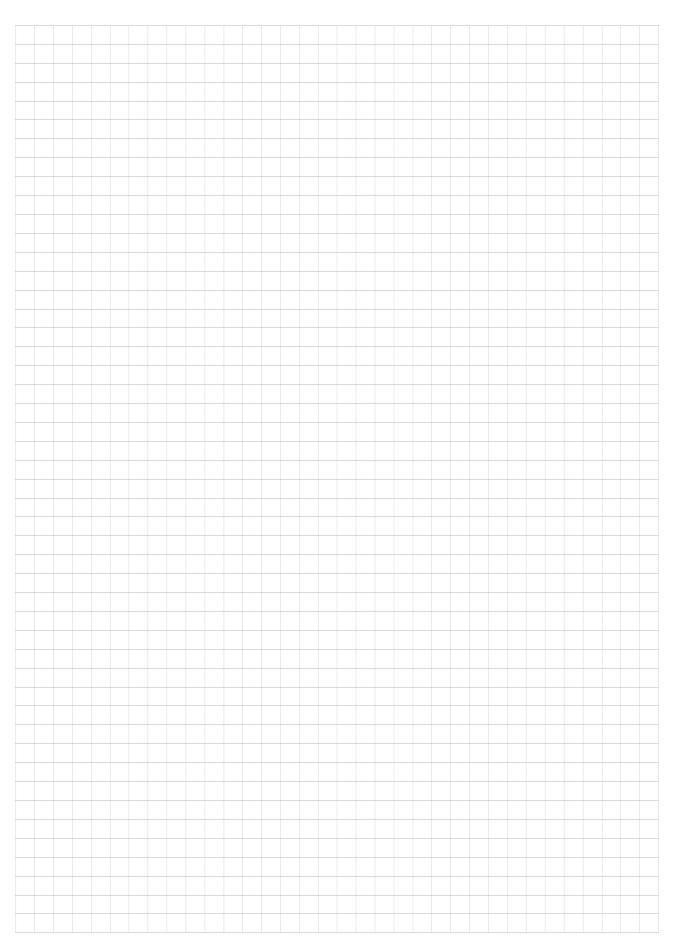
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Startup: Brief description

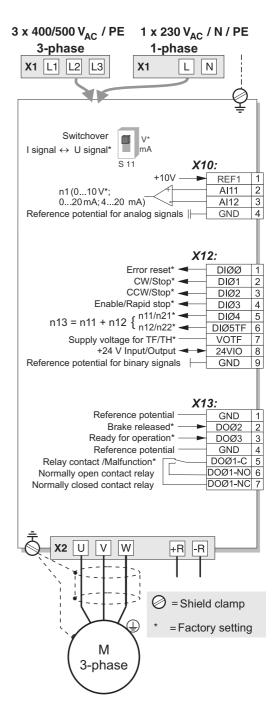


Startup: Brief description

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

Procedure

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



Notes

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

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

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