



SEW
EURODRIVE

Compact Operating Instructions



MOVIFIT[®] basic





Contents

1	General information	5
1.1	Scope of this documentation.....	5
1.2	Structure of the safety notes	6
2	Safety notes	7
2.1	Preliminary information	7
2.2	General information	7
2.3	Target group	7
2.4	Designated use	8
2.5	Other applicable documentation	8
2.6	Transportation, storage	8
2.7	Installation	8
2.8	Electrical connection	9
2.9	Safe disconnection	9
2.10	Operation	9
3	Type designations.....	10
3.1	Nameplate.....	10
3.2	Type designation.....	10
4	Mechanical installation.....	11
4.1	Installation instructions.....	11
4.2	Mounting position	12
4.3	Installing MOVIFIT® basic.....	12
5	Electrical installation	13
5.1	Installation instructions.....	13
5.2	Power bus connection (line cable)	16
5.3	Motor connection	21
5.4	Control unit connection	23
5.5	Connections of MOVIFIT® basic with AS-Interface.....	24
5.6	Connections of MOVIFIT® basic with binary control	26
5.7	Connection of operator terminals LT-BG and MB-LC	28
6	Startup.....	29
6.1	Important notes on startup	29
6.2	Startup procedure for the MOVIFIT® basic inverter	30
6.3	MOVIFIT® basic motor starter – startup procedure	31
6.4	Parameterization with LT-BG keypad	33
6.5	Functions of MOVIFIT® basic with AS-Interface	36
6.6	Functions of MOVIFIT® basic with binary control	37
7	Operation	38
7.1	Operating displays of MOVIFIT® basic (LEDs).....	38
7.2	Description of the MB-LC keypad	40
7.3	Operating displays of MB-LC keypad	41
7.4	Manual operation with MB-LC keypad	42
8	Service	44
8.1	Diagnostics with LT-BG operator terminal	44



Contents

8.2	Status and error display	45
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1 General information

1.1 *Scope of this documentation*

This documentation comprises the general safety notes and a selected information about MOVIFIT® basic.

- Please note that this documentation does not replace the detailed operating instructions.
- Read the detailed operating instructions before you start working with MOVIFIT® basic.
- Observe the information, instructions and notes in the detailed operating instructions and the "AC Motors DR.71-225, 315" operating instructions. This is essential for fault-free operation of MOVIFIT® basic and fulfillment of any rights to claim under guarantee.
- All SEW-EURODRIVE's technical documentation and the detailed operating instructions for MOVIFIT® basic are available for download in PDF format from the SEW-EURODRIVE website: www.sew-eurodrive.com.



General information

Structure of the safety notes

1.2 Structure of the safety notes

1.2.1 Meaning of the signal words

The following table shows the grading and meaning of the signal words for safety notes, notes on potential risks of damage to property, and other notes.

Signal word	Meaning	Consequences if disregarded
▲ DANGER	Imminent danger	Severe or fatal injuries
▲ WARNING	Possible dangerous situation	Severe or fatal injuries
▲ CAUTION	Possible dangerous situation	Minor injuries
NOTICE	Possible damage to property	Damage to the drive system or its environment
INFORMATION	Useful information or tip: Simplifies the handling of the drive system.	

1.2.2 Structure of the section-related safety notes

Section-related safety notes do not apply to a specific action, but to several actions pertaining to one subject. The used symbols indicate either a general or a specific hazard.

This is the formal structure of a section-related safety note:



▲ SIGNAL WORD

Nature and source of danger.

Possible consequence(s) if disregarded.

- Measure(s) to avoid the danger.

1.2.3 Structure of the embedded safety notes

Embedded safety notes are directly integrated in the instructions just before the description of the dangerous action.

This is the formal structure of an embedded safety note:

- **▲ SIGNAL WORD Nature and source of danger.**

Possible consequence(s) if disregarded.

- Measure(s) to avoid the danger.



2 Safety notes

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

2.1 Preliminary information

The following safety notes are primarily concerned with the use of MOVIFIT® basic drives. If you use other SEW components, also refer to the safety notes for the respective components in the corresponding documentation.

Please also observe the supplementary safety notes in the individual sections of this documentation.

2.2 General information

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

During operation, MOVIFIT® basic drives can have live and bare parts as well as hot surfaces, depending on their enclosure.

Removing covers without authorization, improper use as well as incorrect installation or operation may result in severe injuries to persons or damage to property. Refer to the documentation for additional information.

2.3 Target group

Only qualified electricians are authorized to install, startup or service the units or correct unit faults (observing IEC 60364 or CENELEC HD 384 or DIN VDE 0100 and IEC 60664 or DIN VDE 0110 as well as national accident prevention guidelines).

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

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



2.4 Designated use

MOVIFIT® basic drives are components intended for installation in electrical systems or machines.

In case of installation in machines, startup of MOVIFIT® basic units (i.e. start of designated operation) is prohibited until it is determined that the machine meets the requirements stipulated in the Machinery Directive 2006/42/EC.

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

The MOVIFIT® basic units meet the requirements stipulated in the Low Voltage Directive 2006/95/EC. The standards given in the declaration of conformity apply to the MOVIFIT® basic units.

You must observe the technical data and information on the connection requirements as provided on the nameplate and in the documentation.

2.4.1 Safety functions

MOVIFIT® basic units may not perform safety functions.

2.4.2 Hoist applications

MOVIFIT® basic units are not designed for hoist applications.

2.5 Other applicable documentation

Note also the following documentation:

- "DR.71-225, 315 AC Motors" operating instructions

You can download or order this publication on the Internet (<http://www.sew-euro-drive.de>, under the heading "Documentation").

2.6 Transportation, storage

You must observe the notes on transportation, storage and proper handling. Comply with the requirements for climatic conditions stated in chapter "Technical Data" of the operating instructions.

2.7 Installation

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

Protect the MOVIFIT® basic units from improper strain.

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

- Use in potentially explosive atmospheres.
- Use in areas exposed to harmful oils, acids, gases, vapors, dust, radiation, etc.
- Use in non-stationary applications with strong mechanical oscillation and impact loads, as specified in the operating instructions.



2.8 Electrical connection

Perform electrical installation according to the pertinent regulations (e.g. cable cross sections, fusing, protective conductor connection). For any additional information, refer to the applicable documentation.

For notes on EMC compliant installation, such as shielding, grounding, arrangement of filters and routing of lines, refer to chapter "Installation instructions". The manufacturer of the system or machine is responsible for maintaining the limits established by EMC legislation.

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

A voltage test according to EN 61800-5-1:2007 chapter 5.2.3.2 is required for the MOVIFIT® basic drives prior to startup in order to ensure the insulation.

2.9 Safe disconnection

The MOVIFIT® basic units meet all requirements for safe disconnection of power and electronic connections in accordance with EN 61800-5-1. All connected circuits must also satisfy the requirements for safe disconnection.

2.10 Operation

Systems with integrated MOVIFIT® basic units must be equipped with additional monitoring and protection devices according to the applicable safety guidelines, such as the law governing technical equipment, accident prevention regulations, etc. Additional protective measures may be necessary for applications with increased potential risk.

Do not touch live components or power connections immediately after disconnecting MOVIFIT® basic from the supply voltage because some capacitors may still be charged. Wait at least 10 minutes after the supply voltage is switched off.

Once the supply voltages are applied to MOVIFIT® basic, the connection box must be closed, i.e. the cover must be screwed on and all the plugs must be connected.

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

Mechanical blocking or internal safety functions of the unit can cause a motor standstill. Eliminating the cause of the problem or performing a reset may result in the drive re-starting automatically. If, for safety reasons, this is not permitted for the driven machine, disconnect the unit from the supply system before correcting the error.

Caution: Danger of burns: The surface temperatures of the MOVIFIT® basic drives can exceed 60 °C during operation.



3 Type designations
3.1 Nameplate

The following figure gives an example of a nameplate of the MOVIFIT® basic inverter:



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3.2 Type designation

The following table shows the MOVIFIT® basic type designation:

MBF07A-K1-A1	
MB	Unit series MB = MOVIFIT® basic
F	Variant F = Inverter S = Motor starter
07	Motor power/variant 07 = 0.75 kW inverter 15 = 1.5 kW inverter 4R = Reversing starter 4D = Dual motor starter
K	Version K = via AS-Interface B = binary control
A	Control
1	Version
	Connection module



4 Mechanical installation

4.1 Installation instructions

4.1.1 General information



NOTICE

Loss of warranted degree of protection if the MOVIFIT® basic inverter is installed incorrectly or not at all.

Damage to the MOVIFIT® basic unit.

- If you remove the EBOX from the ABOX, you have to protect the EBOX and the ABOX from moisture and dust.

Note the following when installing the MOVIFIT® basic unit:

- Observe the general safety notes.
- Only install the MOVIFIT® basic unit on a level, low-vibration, and torsionally rigid support structure.
- Ensure sufficient clearance around the unit to allow for adequate cooling. Warm outlet air of other units must not be drawn in.
- Strictly observe all instructions as to the technical data and the permissible conditions regarding the place of installation.
- Do only use provided attachment options when mounting the drive.
- Cover the unused plug connectors with blind caps.

The degree of protection specified in the technical data only applies for a correctly installed MOVIFIT® basic unit.

4.1.2 Installation requirements

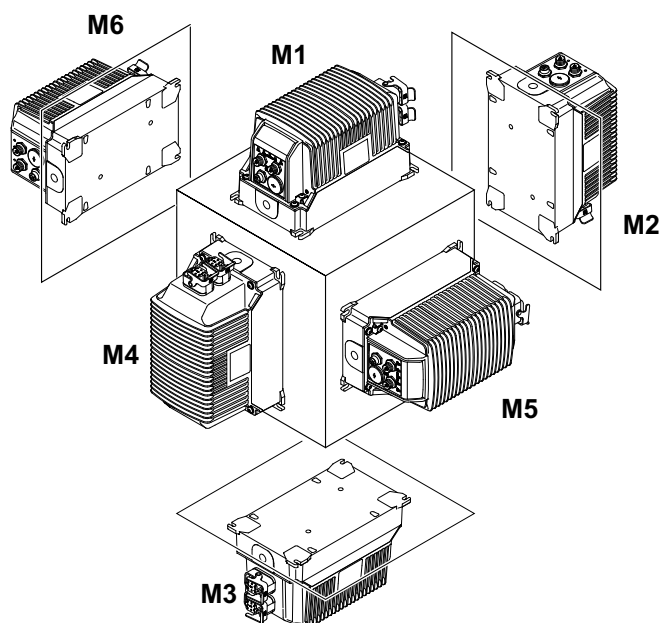
Make sure that the following requirements are met before you start installing the unit:

- The nameplate data of the MOVIFIT® basic unit match the voltage supply system
- The MOVIFIT® basic unit is undamaged (no damage caused by transportation or storage).
- Ambient temperature corresponds to the specifications in chapter "Technical Data" of the detailed operating instructions.
- The MOVIFIT® basic unit must not be installed under the following harmful ambient conditions:
 - Potentially explosive atmospheres
 - Oils
 - Acids
 - Gases
 - Vapors
 - Radiation
 - etc.



4.2 Mounting position

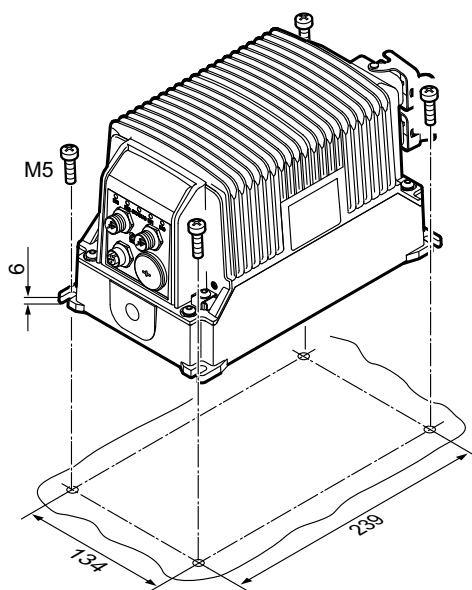
You can install the MOVIFIT® basic unit in any mounting position.



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4.3 Installing MOVIFIT® basic

Mount the MOVIFIT® basic unit with 4 screws according to the following figure:
(Tightening torque 2.0 – 2.4 Nm (18 – 21 lb.in))



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5 Electrical installation

5.1 Installation instructions

5.1.1 Residual current device



⚠ WARNING

Electric shock due to incorrect RCD type.

Severe or fatal injuries.

- MOVIFIT[®] basic can cause direct current in the protective earth conductor. When a residual current device (RCD) is used for protection against direct or indirect contact, only install a type B residual current device on the supply system end of the MOVIFIT[®] basic unit.
- Do not use a conventional RCD as a protective device. Universal current-sensitive RCDs are permitted as a protective device. During normal operation of MOVIFIT[®] basic units, leakage currents > 3.5 mA can occur.
- SEW-EURODRIVE recommends that you do not use RCDs. However, if a residual current device is stipulated for direct or indirect protection against contact, observe the above note.

5.1.2 Line contactor



NOTICE

Damage due to jogging.

Damage to the MOVIFIT[®] basic unit.

- Do not use the line contactor for jogging, but only for switching the MOVIFIT[®] basic unit on and off. In jog mode, use the control signals (AS-Interface bits or binary inputs).
- Observe a minimum switch-off time of 10 s for the line contactor.
- Use only a contactor of utilization category AC3 (EN 60947-4-1) as a line contactor.



5.1.3 Notes on PE connection



⚠ WARNING

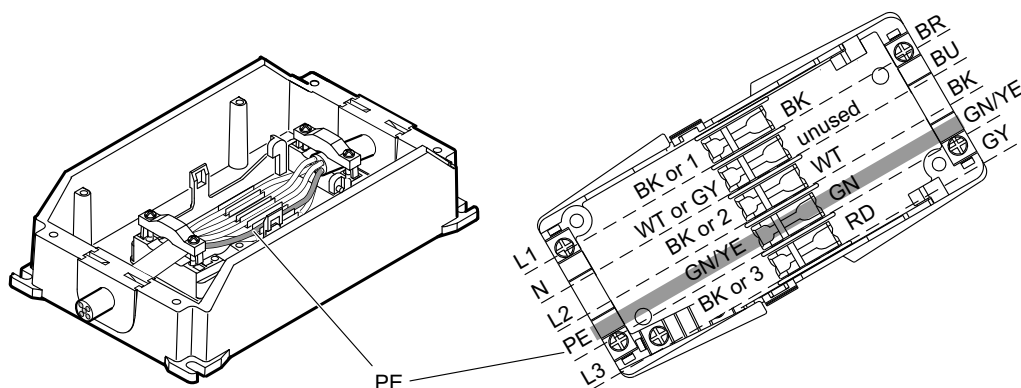
Electric shock due to incorrect connection of PE.

Severe or fatal injuries.

- Observe the following notes regarding PE connection.

PE connection in the unit

Establish a PE connection in the unit.

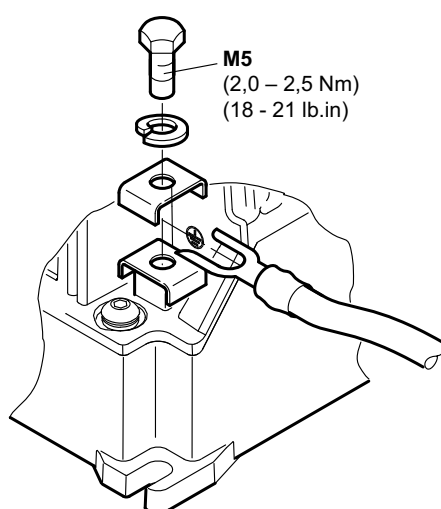


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PE connection on the outside of the housing

During normal operation of the MOVIFIT® basic inverter, earth-leakage currents ≥ 3.5 mA can occur. To meet the requirements of EN 61800-5-1, you must establish 2 PE connections.

Install a second PE conductor with a cross section of at least the cross section of the supply system cable:



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5.1.4 EMC-compliant installation



INFORMATION

This drive system is not designed for operation on a public low voltage supply system that supplies residential areas.

This is a product with restricted availability in accordance with IEC 61800-3. It may cause EMC interference. In this case, it is recommended for the operator to take suitable measures.

For detailed information on EMC compliant installation, refer to the publication "Electromagnetic Compatibility in Drive Engineering" from SEW-EURODRIVE.

With respect to the EMC regulation, frequency inverters cannot be operated as stand-alone units. Regarding EMC, they can only be evaluated when they are integrated in a drive system. Conformity is declared for a described, CE-typical drive system. These operating instructions contain further information.

5.1.5 Installation above 1000 m asl

MOVIFIT® basic units can also be operated at an altitude of 1000 – 4000 m amsl. Observe the following basic conditions:

- At heights above 1000 m amsl, the nominal continuous power is reduced due to reduced cooling => I_N reduction by 1% per 100 m.
- For heights from 2000 m to max. 4000 m amsl, observe the following notes:
 - The safe disconnection of power and electronics connections can no longer be assured above 2000 m. For safe disconnection, you have to take measures according to IEC 60664-1 / EN 61800-5-1.
 - Connect an overvoltage protection device upstream of MOVIFIT® basic to reduce overvoltages from category III to category II.

5.1.6 Protection devices

- MOVIFIT® basic drives are equipped with integrated protection devices against overload of the drive. External motor protection devices are not necessary.

5.1.7 UL compliant installation (in preparation)

UL and cUL approval for the MOVIFIT® basic unit series is in preparation.



5.2 Power bus connection (line cable)



⚠ WARNING

Electric shock due to charged capacitors.

Severe or fatal injuries.

- De-energize the MOVIFIT[®] basic drive using a suitable external cut-off device before removing the EBOX from the ABOX.
- Secure the drive against unintended re-connection to the voltage supply.
- Then wait at least for 10 minutes.



⚠ WARNING

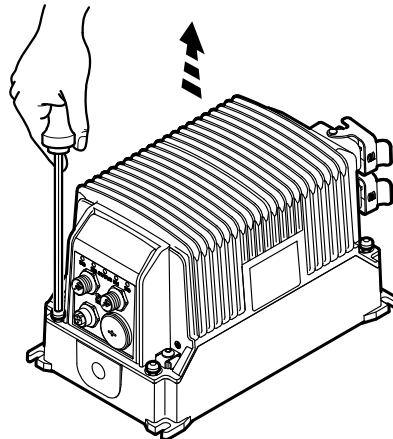
Danger of burns due to hot surfaces of the MOVIFIT[®] basic unit.

Severe injuries.

- Do not touch the MOVIFIT[®] basic until it has cooled down sufficiently.

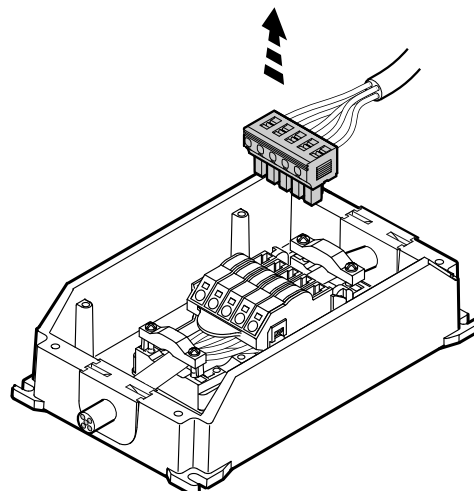
Connect the MOVIFIT[®] basic unit to the power bus (line cable) as follows.

1. Loosen the 4 screws and remove the EBOX from the ABOX.



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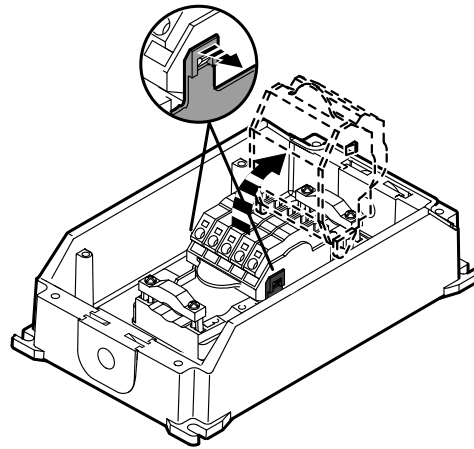
2. Remove the supply system plug connector from the FieldPower[®] contact module.



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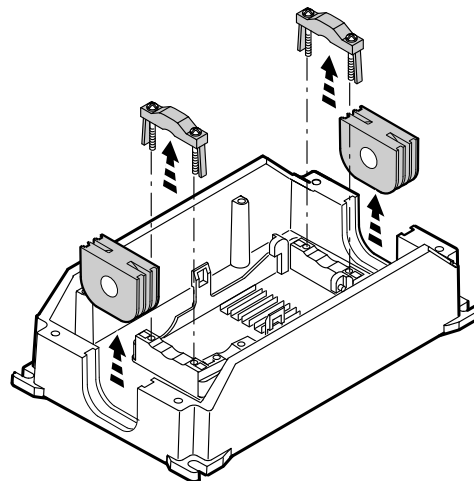


3. Pull both locking tabs to the outside and tilt up the upper part of the FieldPower® contact module.



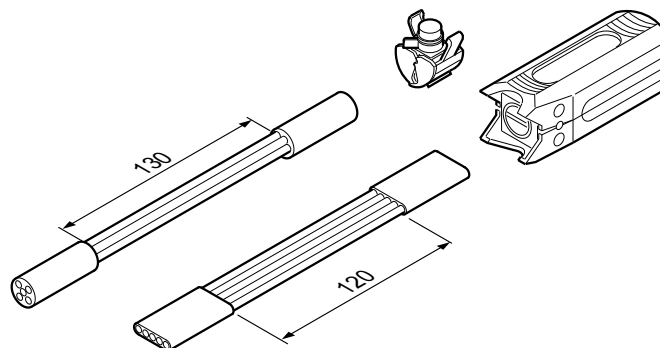
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4. Loosen the 4 screws and remove the strain relief brackets. Remove the two cable seals.



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5. Remove the sheath of the line cable with a suitable stripping tool.



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Line cable	Stripping tool	Strip length
Round cable	AM 16	130 mm
Flat cable	AMF 6/10	120 mm



Electrical installation

Power bus connection (line cable)

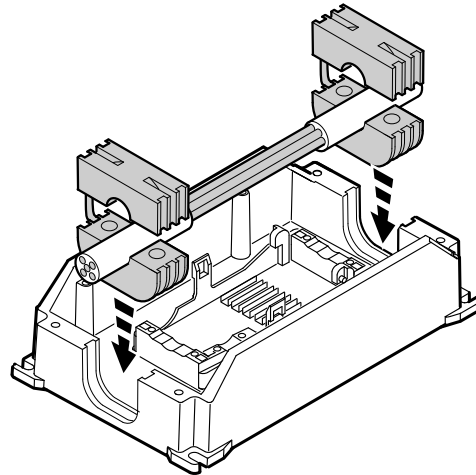
6. Fix the cable seals around the line cable.

NOTICE Ingression of moisture or dust due to incorrect cable seal.

Damage to the MOVIFIT® basic unit.

- Only use cable seals approved for the line cable diameter.

Insert the cable seals with the line cable in the recesses in the ABOX.



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7. **▲ WARNING** Risk of crushing due to wrong sense of rotation or damage due to reverse connection of phases.

Severe or fatal injuries, irreparable damage to the unit.

- Observe the following connection diagram.
- Prevent short circuits.

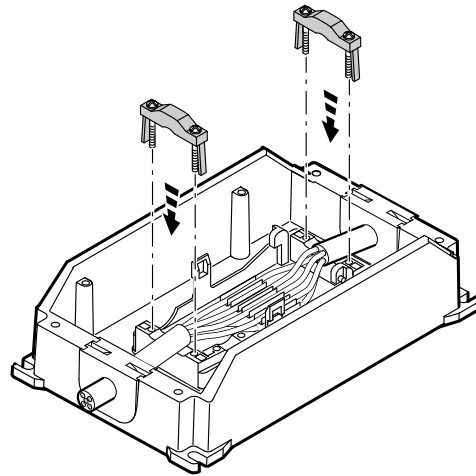
Insert the conductors of the line cable in the cable guides according to the following wiring diagram:

		Con- duc- tor	Conductor coloring / conductor marking According to:		
			IEC 60757	UL 1277 TC-ER	UL 62 STOOW
L1	L1	L1	Brown	Black or 1	Black
N	N	N	Blue	White or gray	–
L2	L2	L2	Black	Black or 2	White
PE	PE	PE	Green/yel- low	Green/yellow	Green
L3	L3	L3	Gray	Black or 3	Red

2839873803

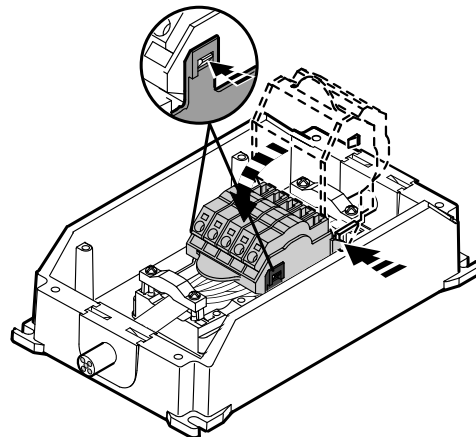


8. Screw the strain relief brackets to the ABOX and fix the line cable with the brackets (tightening torque: 0.6 Nm, 5.3 lb.in).



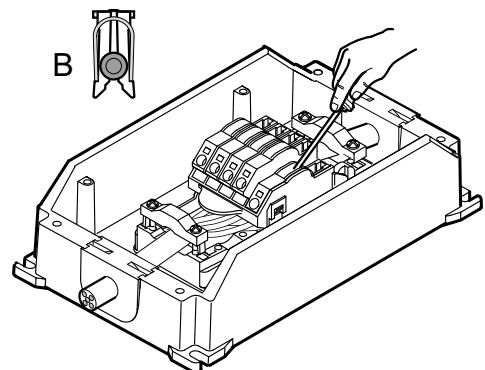
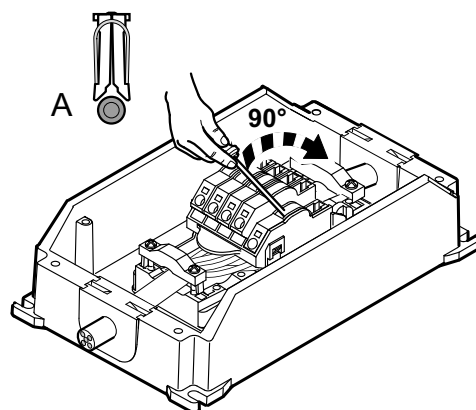
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9. Place the upper part of the contact module on the hinge hooks.
Tilt down the upper part of the contact module until it latches on both sides.



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10. Use the screwdriver (blade width 3 – 3.5 mm) to lever all contacts of the insulation displacement connector downwards.



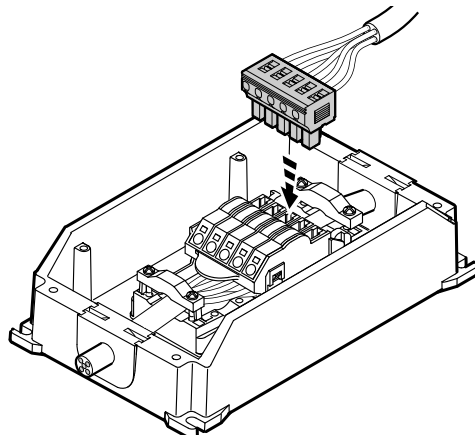
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Electrical installation

Power bus connection (line cable)

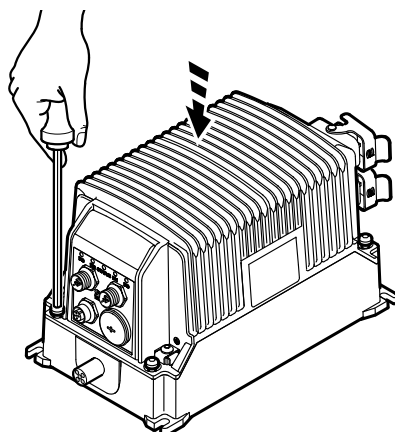
11. Plug in the line connector of the EBOX to the FieldPower® contact module.



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12. Position the EBOX on the ABOX.

Screw on the EBOX with 4 screws (tightening torque: 2 Nm, 18 lb.in).



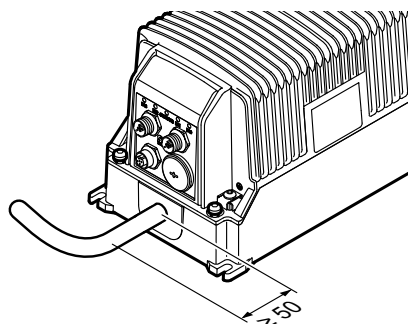
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NOTICE Ingression of moisture or dust when bending the line cable.

Damage to the MOVIFIT® basic unit.

- Do not bend the line cable for the first 50 mm from the unit.

The MOVIFIT® basic unit only meets the IP54 requirements if the line cable is not bend within 50 mm of the unit.



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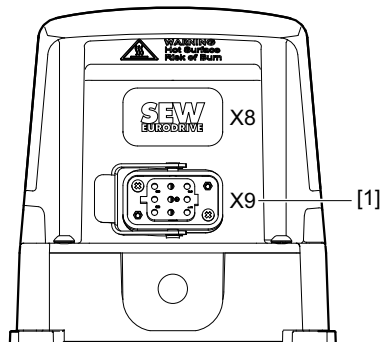
5.3 Motor connection

5.3.1 Motor connection variants

The following figure shows the motor plug connector variants for MOVIFIT® basic:

MOVIFIT® basic inverter

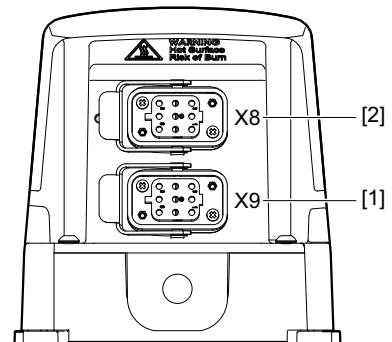
MOVIFIT® basic reversing starter



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- [1] X9 Motor connection
- [2] X8 Motor connection

MOVIFIT® basic dual motor starter



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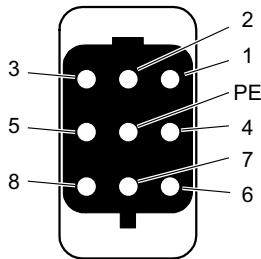


5.3.2 X9, (X8): Motor connection

The X8 plug connector is only available in conjunction with MOVIFIT® basic with dual-motor starter

Connection

The following table provides information about this connection:

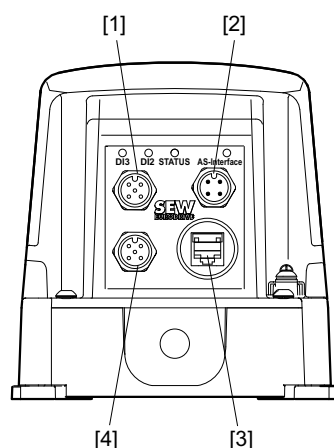
Function		
Power connection for motor with brake		
Connection type		
Q 8/0, female		
Wiring diagram		
		
2441429259		
Assignment		
No.	Name	Function
1	U	Motor phase U output
2	n. c.	Not connected
3	W	Motor phase W output
4	L1	Supply of mechanical brake (only with MOVIFIT® basic inverter)
5	n. c.	Not connected
6	L2_S	Supply of mechanical brake switched (only with MOVIFIT® basic inverter)
7	V	Motor phase V output
8	n. c.	Not connected
PE	PE	Protective earth



5.4 Control unit connection

The following figure shows the control unit variants for MOVIFIT® basic:

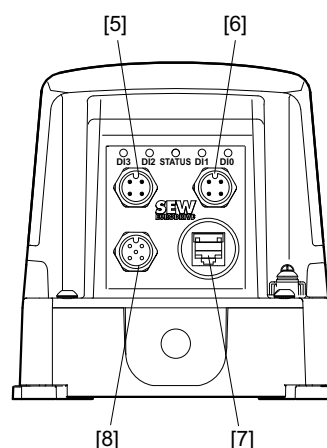
MOVIFIT® basic with AS-Interface



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- [1] X22 Binary input sensor 2
- [2] X21 AS-Interface connection
- [3] X50 Diagnostic interface
- [4] X23 Binary input sensor 3

MOVIFIT® basic with binary control



2816402955

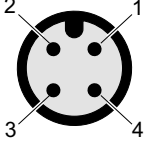
- [5] X12 Signal inputs DI2 + DI3
- [6] X11 Signal inputs DI0 + DI1
- [7] X50 Diagnostic interface
- [8] X13 Signal outputs DO0 + DO1



5.5 Connections of MOVIFIT® basic with AS-Interface

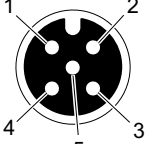
5.5.1 X21: AS-Interface connection

The following table provides information about this connection:

Function		
AS-Interface – input		
Connection type		
M12, 4-pole, male, A-coded		
Wiring diagram		
		
2384154763		
Assignment		
No.	Name	Function
1	AS-Interface +	AS-Interface +
2	n. c.	Not connected
3	AS-Interface –	AS-Interface –
4	n. c.	Not connected

5.5.2 X22: Binary input sensor 2

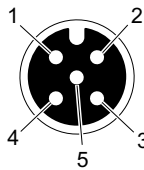
The following table provides information about this connection:

Function		
Binary input sensor 2		
Connection type		
M12, 5-pole, female, A-coded		
Wiring diagram		
		
2264816267		
Assignment		
No.	Name	Function
1	+24 V	DC 24 V output (sensor supply)
2	n. c.	Not connected
3	0V24	0V24 reference potential
4	DI2	Binary input sensor 2
5	PE	Equipotential bonding/protective earth conductor




5.5.3 X23: Binary input sensor 3

The following table provides information about this connection:

Function		
Binary input sensor 3		
Connection type		
M12, 5-pole, female, A-coded		
Wiring diagram		
		
2264816267		
Assignment		
No.	Name	Function
1	+24 V	DC 24 V output (sensor supply)
2	n. c.	Not connected
3	0V24	0V24 reference potential
4	DI3	Binary input sensor 3
5	PE	Equipotential bonding/protective earth conductor

5.5.4 X50: Diagnostic interface

The following table shows information about this connection:

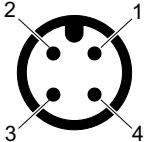
Function		
Diagnostics and programming interface		
Connection type		
RJ11 (6P6C)		
Wiring diagram		
		
3163123211		
Assignment		
No.	Name	Function
1	n. c.	Not connected
2	RS +	RS485 data line (+)
3	RS –	RS485 data line (–)
4	+24 V	DC 24 V output for keypad
5	0V24	0V24 reference potential for keypad
6	n. c.	Not connected



5.6 Connections of MOVIFIT[®] basic with binary control

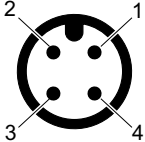
5.6.1 X11: Signal inputs 0 and 1 of MOVIFIT[®] basic

The following table provides information about this connection:

Function		
Binary inputs 0 and 1		
Connection type		
M12, 4-pole, male, A-coded		
Wiring diagram		
		
2718233355		
Assignment		
No.	Name	Function
1	n. c.	Not connected
2	DI1	Binary input 1
3	0V24	0V24 reference potential
4	DI0	Binary input 0

5.6.2 X12: Signal inputs 2 and 3 of MOVIFIT[®] basic

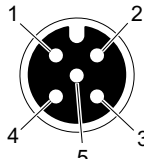
The following table provides information about this connection:

Function		
Binary inputs 2 and 3		
Connection type		
M12, 4-pole, male, A-coded		
Wiring diagram		
		
2718233355		
Assignment		
No.	Name	Function
1	n. c.	Not connected
2	DI3	Binary input 3
3	0V24	0V24 reference potential
4	DI2	Binary input 2



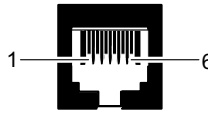
5.6.3 X13: Signal outputs 0 and 1 of MOVIFIT® basic

The following table informs about this connection:

Function		
Binary outputs 0 and 1		
Connection type		
M12, 5-pole, female, A-coded		
Wiring diagram		
		
2264816267		
Assignment		
No.	Name	Function
1	+24 V	DC 24 V output
2	DO1	Binary output 1 (manual mode) 0: MOVIFIT® basic control via control signals 1: Manual control of MOVIFIT® basic
3	0V24	0V24 reference potential
4	DO0	Binary output 0 (ready signal) 0: MOVIFIT® basic is <u>not</u> ready 1: MOVIFIT® basic is ready
5	PE	Equipotential bonding/protective earth conductor

5.6.4 X50: Diagnostic interface

The following table informs about this connection:

Function		
Diagnostics and programming interface		
Connection type		
RJ11 (6P6C)		
Wiring diagram		
		
3163123211		
Assignment		
No.	Name	Function
1	n. c.	Not connected
2	RS+	RS-485 data line (+)
3	RS –	RS-485 data cable (–)
4	+24 V	DC 24 V output for keypad
5	0V24	0V24 reference potential for keypad
6	n. c.	Not connected



Electrical installation

Connection of operator terminals LT-BG and MB-LC

5.7 Connection of operator terminals LT-BG and MB-LC

MOVIFIT® basic units are equipped with an X50 diagnostic interface (RJ11 socket).

The diagnostics interface is located in the connection block of the control unit.

You must remove the screw plug before plugging in the connector into the diagnostic interface.

▲ WARNING Danger of burns due to hot surfaces of the MOVIFIT® basic unit.

Severe injuries.

- Wait for the MOVIFIT® basic unit to cool down sufficiently before touching it.

NOTICE Loss of the ensured degree of protection if the screw plug of the diagnostic interface X50 is not installed.

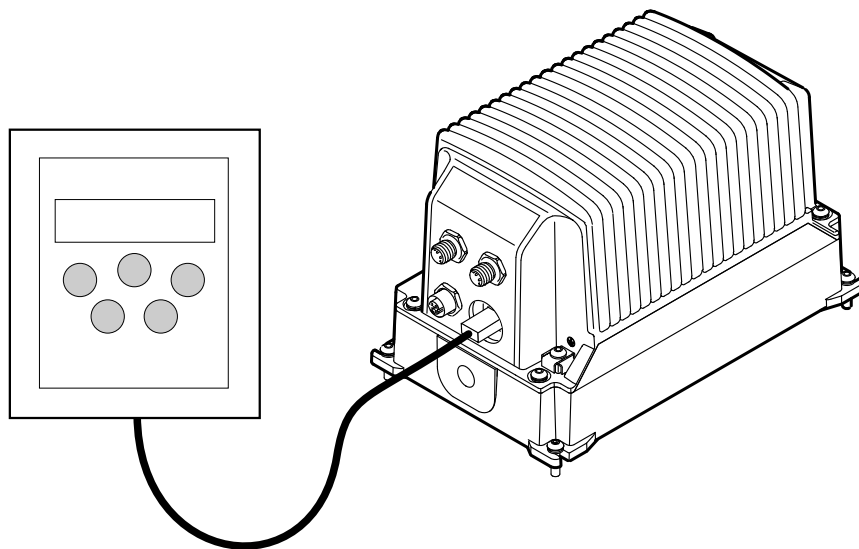
Damage to the MOVIFIT® basic unit.

- If there is no screw plug covering the diagnostic interface, you have to make sure that no moisture can ingress into the MOVIFIT® basic unit.

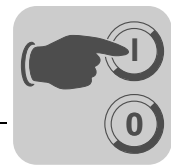
Use the cable enclosed with the operator terminal to connect the operator terminal to the MOVIFIT® basic unit.

Scope of delivery:

Type	Part number	Scope of delivery
LT-BG	1 820 864 9	<ul style="list-style-type: none"> – LT-BG operator terminal – Cable with RJ11 – RJ11 plug connectors
MB-LC	2 820 126 4	<ul style="list-style-type: none"> – MB-LC operator terminal – Cable with RJ45 – RJ11 plug connectors



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6 Startup

6.1 Important notes on startup



INFORMATION

You must comply with the general safety notes in chapter "Safety notes" during startup.



⚠ WARNING

Risk of crushing due to missing or defective protective covers.

Severe or fatal injuries.

- Install the protective covers of the plant according to the instructions, also see the operating instructions of the gear unit.
- Never start up the drive if the protective covers are not installed.



⚠ WARNING

Electric shock due to dangerous voltages in the ABOX.

Severe or fatal injuries.

- De-energize the MOVIFIT® basic unit using a suitable external cut-off device before removing the EBOX.
- Secure the MOVIFIT® basic unit against unintended re-connection to the voltage supply.
- Wait for at least 10 minutes before removing the EBOX.



⚠ WARNING

Danger of burns due to hot surfaces of the MOVIFIT® basic unit.

Severe injuries.

- Do not touch the MOVIFIT® basic until it has cooled down sufficiently.



⚠ WARNING

Unit malfunction due to incorrect unit setting.

Severe or fatal injuries.

- Observe the startup notes.
- The installation must only be carried out by qualified personnel.
- Use only settings that are consistent with the function.



INFORMATION

To ensure fault-free operation, do not disconnect or connect power or signal cables during operation.



Startup

Startup procedure for the MOVIFIT® basic inverter

6.2 Startup procedure for the MOVIFIT® basic inverter

Proceed as follows to startup the MOVIFIT® basic inverter:

1. Check the connection of the MOVIFIT® basic unit.
See chapter "Electrical Installation".
2. Make sure that the motor cannot start
e.g. by unplugging the motor connector from the MOVIFIT® basic unit.
3. Switch on the line voltage.
The "Status" LED is now illuminated.

4. Connect the LT-BG operator terminal to the MOVIFIT® basic unit.

See chapter "Connecting the operator terminals LT-BG and MB-LC" (page 28)

▲ WARNING During the auto-tune phase in vector control, the motor axis briefly rotates.

If you set the parameter *P4-02 Auto-tune* = "1", the inverter performs a calibration process (Auto-tune). The inverter releases the brake and the motor **briefly** rotates.

Severe injuries.

- During the auto-tune phase, observe a sufficient safety distance to all parts driven by the motor.

5. Set the following parameters:

Motor parameters:

For V/f control

- *P1-07* = Nominal motor voltage
- *P1-08* = Nominal motor current
- *P1-09* = Nominal motor frequency

For vector control

- *P1-07* = Nominal motor voltage
- *P1-08* = Nominal motor current
- *P1-09* = Nominal motor frequency
- *P4-01* = Control mode
- *P4-02* = Auto-tune
- *P4-05* = motor power factor

System parameters:

- *P1-03* = Acceleration ramp
- *P1-04* = Deceleration ramp
- *P1-11* = Speed n1
- *P2-02* = Speed n2
- *P2-03* = Speed n3
- *P2-04* = Speed n4

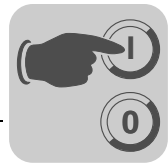
See chapter "Parameterization with LT-BG operator terminal" (page 34).

6. **NOTICE** Loss of the ensured degree of protection if the screw plug of the diagnostic interface is not installed or not installed correctly.

Damage to the MOVIFIT® basic unit

- Make sure the screw plug of the diagnostics interface has a seal and screw it in.

7. Switch off the line voltage.
8. Set the AS-Interface slave address of the MOVIFIT® basic unit (only for MOVIFIT® basic with AS-Interface).
9. Start up the higher-level controller.
10. Plug in the motor connector at the MOVIFIT® basic.
11. Switch on the line voltage.



6.3 MOVIFIT® basic motor starter – startup procedure



⚠ WARNING

Electric shock due to dangerous voltages in the ABOX.

Severe or fatal injuries.

- De-energize the MOVIFIT® basic unit using a suitable external cut-off device before removing the EBOX.
- Secure the MOVIFIT® basic unit against unintended re-connection to the voltage supply.

Proceed as follows to startup the MOVIFIT® basic motor starter:

1. Check the connection of the MOVIFIT® basic unit.

See chapter "Electrical Installation".

2. Set the I_{Mot} / I_N ratio at the I_{Motor} potentiometer (factory setting: about 100%).

I_{Mot} = nominal motor current as listed on the motor nameplate

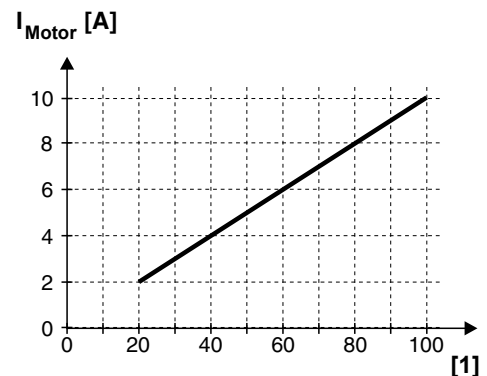
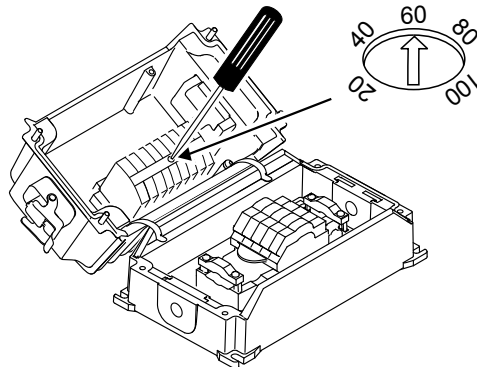
I_N = nominal output current as listed on the MOVIFIT® basic nameplate

NOTICE Damage due to incorrect setting of I_{Motor} potentiometer. The potentiometer setting protects the motor against overload.

Damage to the motor.

- When setting the potentiometer, observe the current rating on the nameplates of the motor and the MOVIFIT® basic unit.

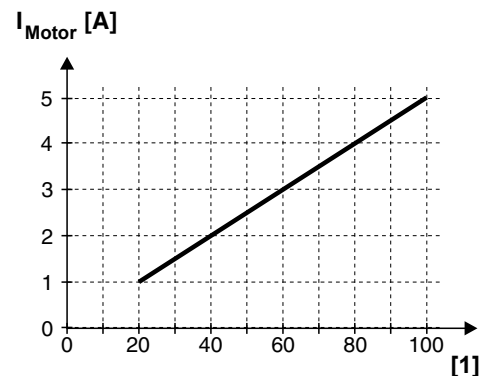
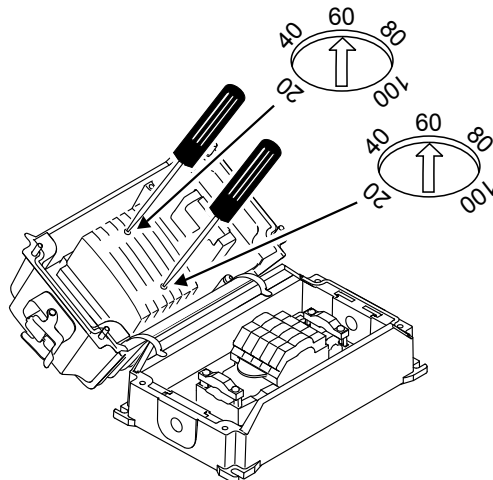
Reversing starter:



[1]

9007203014544907

Dual motor starter:



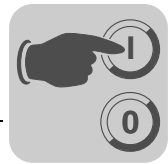
[1]

[1] Potentiometer setting I_{Mot} / I_N in %

7774056715

**Startup****MOVIFIT® basic motor starter – startup procedure**

3. Make sure that the motor cannot start
e.g. by unplugging the motor connector(s) from the MOVIFIT® basic unit.
4. Set the AS-Interface slave address of the MOVIFIT® basic unit (only for MOVIFIT® basic with AS-Interface).
5. Start up the higher-level controller.
6. Plug in the motor connector(s) at MOVIFIT® basic.
7. Switch on the line voltage.



6.4 Parameterization with LT-BG keypad

6.4.1 Description of LT-BG keypad

Function You can use the LT-BG keypad for startup, parameterization and manual operation of MOVIFIT® basic inverters. In addition to that, the keypad displays important information about the state of the drive.

Features

- Illuminated display
- Keypad with 5 keys
- Connection cable

Key assignment The following figure shows the key assignment of the LT-BG operator terminal:




2669822603



Key	Navigate	<ul style="list-style-type: none"> • Switch menu • Saving parameter values • Show real-time information
Key	Up	<ul style="list-style-type: none"> • Increase speed • Increase parameter values
Key	Down	<ul style="list-style-type: none"> • Decrease speed • Decrease parameter values
Key	Stop	<ul style="list-style-type: none"> • Stop the drive • Reset the drive
Key	Start	<ul style="list-style-type: none"> • Enabling the drive • Changing the direction of rotation






6.4.2 Parameterization



Proceed as follows to change the parameter values:


1. Check the connection of the MOVIFIT® basic unit.
See chapter "Electrical Installation".
2. Connect the LT-BG operator terminal to the MOVIFIT® basic unit.
See chapter "Connecting the operator terminals LT-BG and MB-LC" (page 28)
3. Make sure that the motor cannot start
e.g. by unplugging the motor connector(s) from the MOVIFIT® basic unit.
4. Switch on the line voltage.
After initialization, the operator terminal shows the rotational frequency "H", the output current "A", or the motor power "P".
To change the display, briefly press the  key.



H 50.0
5. Use the  key to activate the parameter mode.
(Press the  key for more than 1 s)

P 1 - 0 1
6. Use the  key and the  key to select the desired parameter.

P 1 - 0 3
7. Use the  key to activate the setting mode.

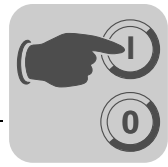
5.0
8. Use the  key and the  key to set the required parameter value.

2.0
9. Use the  key to quit the setting mode.

P 1 - 0 3
10. Use the  key to quit the parameter mode.
(Press the  key for more than 1 s)
The operator terminal shows "StoP", "H ", "A ", or "P ".





StoP
11. Switch off the line voltage.
12. Plug in the motor connector(s) at the MOVIFIT® basic unit.
13. **NOTICE** Damage due to missing or incorrectly mounted screw plug of the diagnostics interface X50. The degree of protection of MOVIFIT® basic specified in chapter "Technical data" only applies if the screw plug of the diagnostic interface is mounted correctly.
Damage to the MOVIFIT® basic unit.
 - Once you have finished working with the operator terminal, unplug the connector from the diagnostics interface.
 - Screw the screw plug of the diagnostics interface back in with the seal.

For a description of the parameters, refer to chapter "Parameter list – MOVIFIT® basic inverter"



6.4.3 Reset parameters to default settings

To reset the parameters to their default value, proceed as follows:

1. Check the connection of the MOVIFIT[®] basic unit.
See chapter "Electrical Installation".
2. Connect the LT-BG operator terminal to the MOVIFIT[®] basic unit.
See chapter "LT-BG operator terminal connection".
3. Press the 3 keys , , and  simultaneously for at least 2 s.
After 2 s, the display shows "**P-def**".
4. Press the  key to confirm the factory settings.



6.5 Functions of MOVIFIT® basic with AS-Interface

6.5.1 Data transfer AS-Interface master → MOVIFIT® basic

MOVIFIT® basic
inverter

The following table shows the 4 data bits that the AS-Interface master sends to the MOVIFIT® basic inverter and the functions of the drive:

AS-Interface bit				Function
DO3	DO2	DO1	DO0	MOVIFIT® basic inverter
X	X	0	0	Stop
X	X	0	1	Enable CW
X	X	1	0	Enable CCW
X	X	1	1	Stop/reset
0	0	X	X	Setpoint speed = n1
0	1	X	X	Setpoint speed = n2
1	0	X	X	Setpoint speed = n3
1	1	X	X	Setpoint speed = n4

MOVIFIT® basic
motor starter

The following table shows the 4 data bits that the AS-Interface master sends to the MOVIFIT® basic motor starter and the functions of the drive:

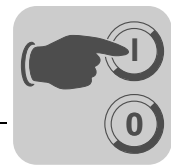
AS-Interface bit			Function	
DO2	DO1	DO0	MOVIFIT® basic Reversing starter	MOVIFIT® basic dual motor starter
0	0	0	Stop	Stop
0	0	1	Enable CW	Enable signal for motor at terminal X9
0	1	0	Enable CCW	Enable signal for motor at terminal X8
0	1	1	Stop	Enable signal for both motors at X9 + X8
1	X	X	Reset	Reset

6.5.2 Data transfer MOVIFIT® basic → AS-Interface master

The following table shows the 4 data bits that MOVIFIT® basic sends back to the AS-Interface master:

AS-Interface bit				Meaning
DI3	DI2	DI1	DI0	
X	X	X	1 / 0	Ready signal 0: The MOVIFIT® basic drive is <u>not</u> ready 1: The MOVIFIT® basic drive is ready for operation
X	X	1 / 0	X	Manual mode 0: MOVIFIT® basic control via AS-Interface 1: Manual control of MOVIFIT® basic
X	1 / 0	X	X	Sensor input 2 0: The signal of sensor 2 = "0" 1: The signal of sensor 2 = "1"
1 / 0	X	X	X	Sensor input 3 0: Signal of sensor 3 = "0" 1: Signal of sensor 3 = "1"

X = any status



6.6 Functions of MOVIFIT® basic with binary control

6.6.1 Data transfer PLC → MOVIFIT® basic

MOVIFIT® basic
inverter

The following table shows the control signal that the higher-level controller (e.g. PLC) sends to the MOVIFIT® basic inverter and the functions of the drive:

Control signals				Function
DI3	DI2	DI1	DI0	MOVIFIT® basic inverter
X	X	0	0	Stop
X	X	0	1	Enable CW
X	X	1	0	Enable CCW
X	X	1	1	Stop/reset
0	0	X	X	Setpoint speed = n1
0	1	X	X	Setpoint speed = n2
1	0	X	X	Setpoint speed = n3
1	1	X	X	Setpoint speed = n4

MOVIFIT® basic
motor starter

The following table shows the control signal that the higher-level controller (e.g. PLC) sends to the MOVIFIT® basic motor starter and the functions of the drive:

Control signals			Function	
DI2	DI1	DI0	MOVIFIT® basic Reversing starter	MOVIFIT® basic Dual motor starter
0	0	0	Stop	Stop
0	0	1	Enable CW	Enable signal for motor at terminal X9
0	1	0	Enable CCW	Enable signal for motor at terminal X8
0	1	1	Stop	Enable signal for both motors at X9 + X8
1	X	X	Reset	Reset

6.6.2 Data transfer MOVIFIT® basic → PLC

The following table shows the binary signals that MOVIFIT® basic sends back to the higher-level controller (e.g. PLC):

Binary signals		Meaning
DO1	DO0	
X	1 / 0	Ready signal 0: The MOVIFIT® basic drive is <u>not</u> ready 1: The MOVIFIT® basic drive is ready for operation
1 / 0	X	Manual mode 0: MOVIFIT® basic control via control signals 1: Manual control of MOVIFIT® basic

X = any status



Operation

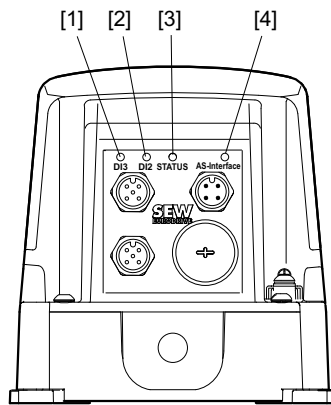
Operating displays of MOVIFIT® basic (LEDs)

7 Operation

7.1 Operating displays of MOVIFIT® basic (LEDs)

The following figure shows the LEDs of MOVIFIT® basic:

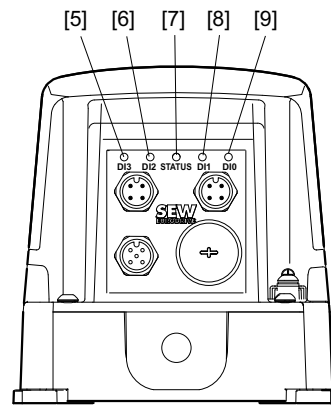
MOVIFIT® basic with AS-Interface



2816401035

- [1] LED "DI3"
- [2] LED "DI2"
- [3] LED "Status"
- [4] LED "AS-Interface"

MOVIFIT® basic with binary control



2816399115

- [5] LED "DI3"
- [6] LED "DI2"
- [7] LED "Status"
- [8] LED "DI1"
- [9] LED "DI0"

7.1.1 LEDs "DI0 – DI3"

LED color	LED status	Meaning
–	Off	Input signal at binary input DI. open or "0"
Yellow	Illuminated	Input signal present at binary input DI.

7.1.2 LED "Status"

LED color	LED status	Meaning
–	Off	No voltage supply
Green	On	MOVIFIT® basic drive is enabled
Yellow	On	MOVIFIT® basic drive is ready for operation
Red	On	An error has occurred
Red	Flashing	Internal unit error
Red/yellow		
Green/red		
Green/yel-low		



7.1.3 LED "AS-Interface"

LED color	LED status	Meaning
–	Off	No 24 V supply at AS-Interface connection
Green	On	Normal operation 24 V supply at AS-Interface connection OK Communication established
Red	On	Communication interrupted or slave address set to 0
Green/red	Flashing	Communication interrupted



Operation

Description of the MB-LC keypad

7.2 Description of the MB-LC keypad

7.2.1 Function






You can use the MB-LC keypad to operate MOVIFIT® basic units (inverter and motor starter) in manual mode. In addition to that, the keypad displays important information about the state of the drive.

7.2.2 Key assignment

The following figure shows the key assignment of the MB-LC keypad:



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- Key  Activation/deactivation of **manual mode** with the MB-LC keypad
- Key  Setting/resetting of **bit DO0** of the MOVIFIT® basic drive
- Key  Setting/resetting of **bit DO1** of the MOVIFIT® basic drive
- Key  Setting/resetting of **bit DO2** of the MOVIFIT® basic drive
- Key  Setting/resetting of **bit DO3** of the MOVIFIT® basic drive




INFORMATION

For a description of the functions the drive performs based on the control bit settings, refer to chapter "MOVIFIT® basic – manual mode (page 42).



7.3 Operating displays of MB-LC keypad

The MB-LC keypad has the following operating displays:

SCAN	The MB-LC performs an initialization.
StoP	<p>MOVIFIT® basic is ready for normal operation.</p> <p>The power section of MOVIFIT® basic is switched off.</p> <p>This message is displayed when the drive is at a standstill and no error is pending.</p>
run	The MOVIFIT® basic drive has been enabled by the higher-level controller (drive running)
Lt-C	<p>The MOVIFIT® basic drive is in LT control mode (parameter <i>P1-12</i> ≠ "0", only for MOVIFIT® basic inverters).</p> <p>Controlling the drive is only possible via the LT-BG keypad or the LT Shell.</p>
bUSY	<p>The MOVIFIT® basic drive is inhibited for control via the MB-LC keypad.</p> <p>Reasons:</p> <ul style="list-style-type: none">• The MOVIFIT® basic drive has been enabled by the higher-level controller (drive running)• Parameter <i>P1-12</i> ≠ "0".
L-0000	<p>Manual mode has been activated via the  key.</p> <p>The MB-LC keypad controls the MOVIFIT® basic drive via control bits DO3 – DO0.</p> <p>The digits show the status ("0" or "1") of the current control bits (DO3 CCW, DO0 CW)</p>
triP	An error has occurred.



Operation

Manual operation with MB-LC keypad

7.4 Manual operation with MB-LC keypad



7.4.1 Activating manual mode

The manual mode can only be activated if:

- the drive has not been enabled by the higher-level controller
- and parameter $P1-12 = "0"$.

To activate manual mode, press the  for at least 2.5 s. The display then shows "L-0000".

7.4.2 MOVIFIT® basic manual mode

In manual mode, you control the drive by setting/resetting control bits DO3 – DO0 via the  –  keys.

The display shows the current status of control bits DO3 – DO0.

MOVIFIT® basic inverter

The following table shows control bits and the functions of the drive.

Control bit				Function
DO3	DO2	DO1	DO0	MOVIFIT® basic inverter
X	X	0	0	Stop
X	X	0	1	Enable CW
X	X	1	0	Enable CCW
X	X	1	1	Stop/reset
0	0	X	X	Setpoint speed = n1
0	1	X	X	Setpoint speed = n2
1	0	X	X	Setpoint speed = n3
1	1	X	X	Setpoint speed = n4

MOVIFIT® basic motor starter

The following table shows control bits and the functions of the drive.

Control bit			Function	
DO2	DO1	DO0	MOVIFIT® basic Reversing starter	MOVIFIT® basic dual motor starter
0	0	0	Stop	Stop
0	0	1	Enable CW	Enable signal for motor at terminal X9
0	1	0	Enable CCW	Enable signal for motor at terminal X8
0	1	1	Stop	Enable signal for both motors at X9 + X8
1	X	X	Reset	Reset



7.4.3 Deactivating manual operation




⚠ WARNING

Risk of crushing due to unexpected start of the drive. The signals of the higher-level controller become effective immediately after deactivating manual operation. The drive runs with the speed (status) that is specified by the higher-level controller.

Severe or fatal injuries.

- During deactivation, observe a sufficient safety distance to all parts driven by the motor.
- or, before deactivating manual operation, make sure that the drive is not enabled by the higher-level controller.

Press the  key to deactivate manual mode.



8 Service

8.1 Diagnostics with LT-BG operator terminal

The following table helps you with troubleshooting:

Fault	Cause	Solution
Overload or overcurrent error of the unloaded motor during acceleration		<ul style="list-style-type: none"> Check the star/delta terminal connection in the motor. The nominal operating voltages of motor and MOVIFIT® basic must match. Delta connection always yields the lower voltage of a multi-voltage motor.
Overload or overcurrent	Motor axis is blocked	<ul style="list-style-type: none"> Check whether the rotor of the motor is blocked. Make sure that the mechanical brake is released (if installed).
Display remains on "StoP" Drive not enabled		<ul style="list-style-type: none"> Check whether the enable signal from the higher-level controller is present. Make sure the M12 connectors are plugged in correctly. Check the parameter <i>P1-12</i> for terminal control/manual operation. Press the <Start> key while in manual mode. The line voltage must correspond with the specified values.
The drive does not start in very cold environments	Ambient temperature below -10 °C	<ul style="list-style-type: none"> Provide for a heat source that keeps the ambient temperature of the drive above -10 °C.
Drive does not run properly in vector mode.		<ul style="list-style-type: none"> You must set the parameters <i>P1-07</i>, <i>P1-08</i>, and <i>P1-09</i> according to the data on the motor nameplate before starting the auto-tune process. Start auto-tune by setting <i>P4-02</i> = "1".



8.2 Status and error display

8.2.1 Meaning of the status LED

The following table shows the meaning of the status LED in case of a fault:

LED color	LED status	Meaning	Solution
Red	On	A fault has occurred	Read out fault code with LT-BG or LT Shell software. Remedy fault as described in chapter "Fault list for MOVIFIT® basic".
Red	Flashing	Internal unit error	Contact SEW Service.
Red/yellow			
Green/red			
Green/yellow			

8.2.2 Fault list for MOVIFIT® basic

The LT-BG operator terminal displays the faults that occurred at the MOVIFIT® basic drive. In addition, you can read out the 4 latest faults from parameter *P1-13 error log* on the PC.

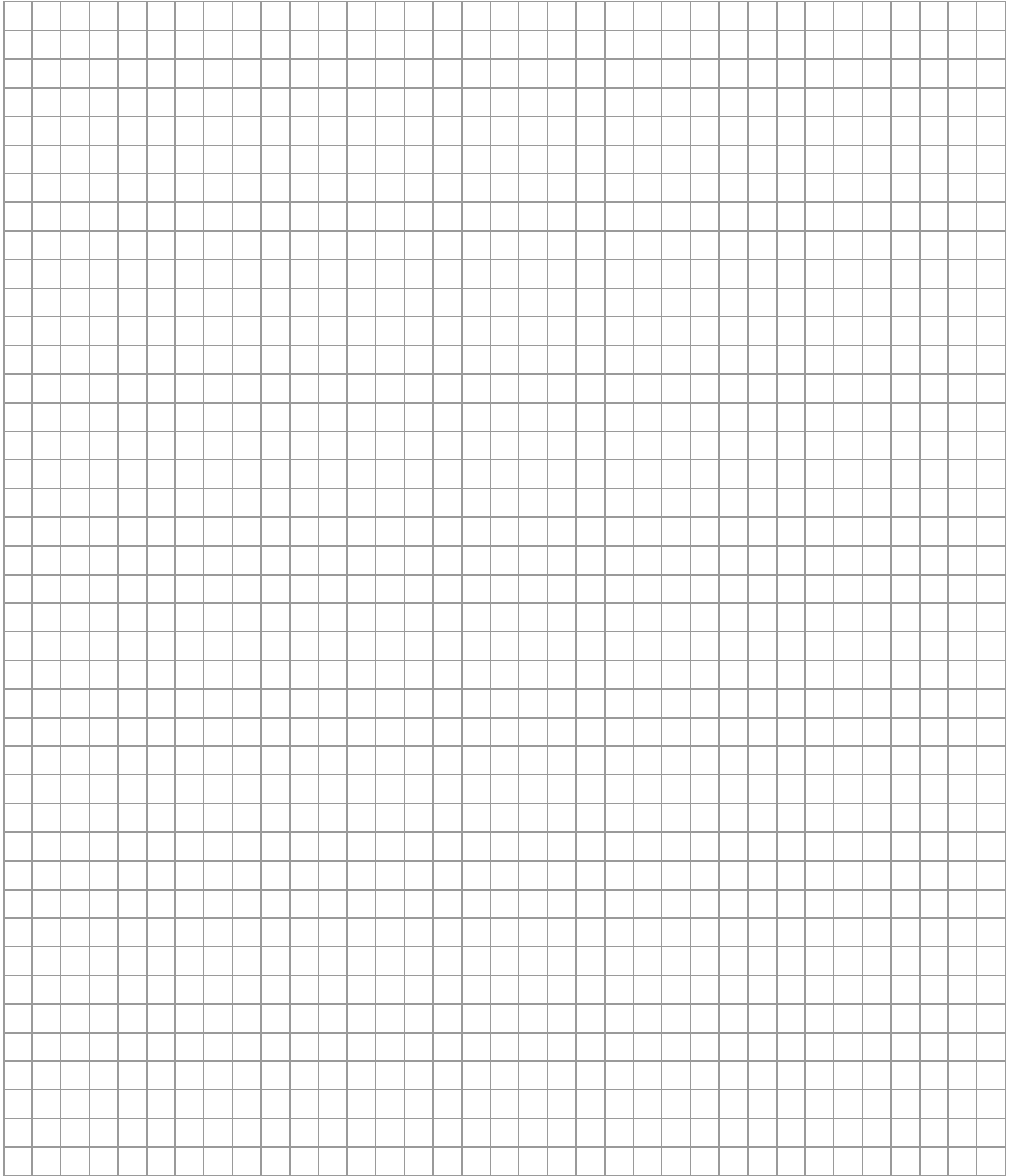
Error code	Fault	Solution
O-I	Overcurrent at inverter output to the motor. Motor overload.	<ul style="list-style-type: none"> Check motor and connection cables for phase short circuits or ground faults. Check load for blocking, stalling, or shock loads. Make sure that the parameters <i>P1-07</i>, <i>P1-08</i>, and <i>P1-09</i> are set correctly according to the motor nameplate. For vector control (<i>P4-01</i> = "0" or "1"): Check the motor power factor in <i>P4-05</i>. Make sure that the auto-tune process for the connected motor has been completed successfully. Increase the ramp time in <i>P1-03</i>.
hO-I	Overtemperature at the heat sink of the inverter.	
I_t-trP	An inverter overload error occurs when the inverter has delivered > 100% of the nominal current for a certain time (defined in <i>P1-08</i>). The display is flashing to indicate the overload.	<ul style="list-style-type: none"> Increase the acceleration ramp or reduce the motor load. Make sure that the cable length meets the requirements. Make sure that the parameters <i>P1-07</i>, <i>P1-08</i>, and <i>P1-09</i> are set correctly according to the motor nameplate. In vector control mode (<i>P4-01</i> = "0" or "1"), check the motor power factor in <i>P4-05</i>. Make sure that the auto-tune process for the connected motor has been completed successfully. Check the load mechanically. Make sure that the load can move freely and that there are no blockages or other mechanical faults.
PS-trP	Internal output stage error	<p>Error when enabling the drive:</p> <ul style="list-style-type: none"> Check for incorrect wiring or short circuit. Check for phase short circuits or ground faults. <p>Error during operation:</p> <ul style="list-style-type: none"> Check for sudden overload or overtemperature. Provide additional space or cooling, if necessary.
O_Uo It	DC link overvoltage	<ul style="list-style-type: none"> Check whether the supply voltage is too high. If the inverter switches off during deceleration, increase the deceleration ramp in <i>P1-04</i>.



Service

Status and error display

Error code	Fault	Solution
U_Uo It	DC link undervoltage	Occurs routinely when switching off the inverter. <ul style="list-style-type: none"> Check line voltage if this occurs while the drive is running.
O-t	Overtemperature at heat sink	<ul style="list-style-type: none"> Check inverter cooling. Provide additional space or cooling, if necessary.
U-t	Undertemperature	Occurs at an ambient temperature below -10°C . <ul style="list-style-type: none"> Increase the ambient temperature to above -10°C before switching on the inverter.
th-Flt	Faulty thermistor at heat sink.	<ul style="list-style-type: none"> Contact the SEW-EURODRIVE Service.
P-LOSS	Input phase failure error	One input phase failed in an inverter designed for operation on a three-phase system.
Ph-Ib	Phase asymmetry	Asymmetry of $> 3\%$ occurs for more than 30 s in the supply input voltage. <ul style="list-style-type: none"> Check input voltage and fuses.
dAtA-F	Internal memory error	<ul style="list-style-type: none"> Parameters not saved. Factory settings loaded. Try again. If this problem occurs repeatedly, contact the SEW-EURODRIVE service.
At-FO1	Auto-tune error	The measured stator resistance of the motor fluctuates between the phases. <ul style="list-style-type: none"> Make sure that the motor is connected correctly and without error. Check the winding for correct resistance and symmetry.
At-F02		The measured stator resistance of the motor is too high. <ul style="list-style-type: none"> Make sure that the motor is connected correctly. Check whether the power rating of the motor corresponds with the power rating of the connected inverter.
At-F03		The measured motor inductivity is too low. <ul style="list-style-type: none"> Make sure that the motor is connected correctly.
At-F04		The measured motor inductivity is too high. <ul style="list-style-type: none"> Make sure that the motor is connected correctly. Check whether the power rating of the motor corresponds with the power rating of the connected inverter.
At-F05		The measured motor parameters are contradictory. <ul style="list-style-type: none"> Make sure that the motor is connected correctly. Check whether the power rating of the motor corresponds with the power rating of the connected inverter.





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