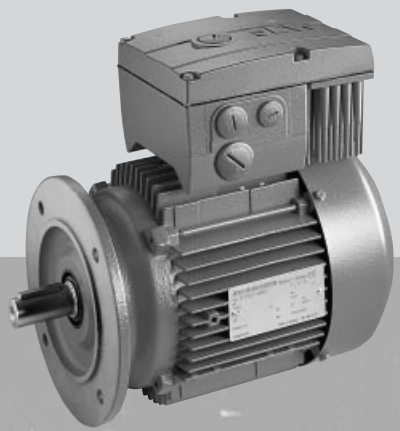
SEW EURODRIVE

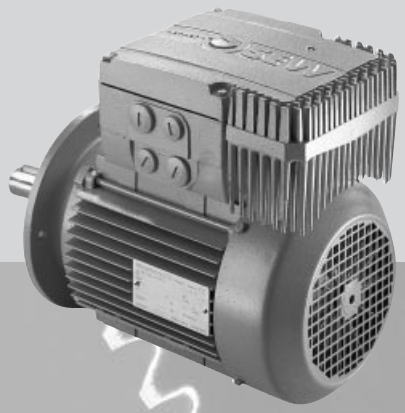
MOVIMOT®

MM03**B** to MM30**B**

Edition

10/2000





Operating Instructions

1050 5814 / EN

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Contents

1 Important Notes

Safety and warning instructions

Always follow the safety and warning instructions contained in this publication!

Electrical hazard
Possible consequences: Severe or fatal injuries.

Hazard
Possible consequences: Severe or fatal injuries.

Hazardous situation
Possible consequences: Slight or minor injuries.

Harmful situation
Possible consequences: Damage to the unit and the environment.

Tips and useful information.

A requirement for fault-free operation and fulfillment of any rights to claim under guarantee is that the information in the operating instructions is adhered to. Consequently, read the operating instructions before you start working with the motor/unit!

The operating instructions contain important information about servicing; as a result, they should be kept in the vicinity of the motor/unit.

Other applicable documents

- "Drive System for Decentralized Installation" system manual
- MOVIMOT® catalog

Waste disposal

This product consists of

- Iron
- Aluminum
- Copper
- Plastic
- Electronics components

Please dispose of the parts in accordance with the applicable regulations.

2 Safety Notes

- **Never install damaged products or take them into operation.** Please submit a complaint to the transport company immediately in the event of damage.

- Only **electrical specialists** with the relevant accident prevention training are allowed to perform **installation, startup and service work** on the unit. They must also comply with the regulations in force (e.g. EN 60204, VBG 4, DIN-VDE 0100/0113/0160).

- Make sure that **preventive measures** and **protection devices** correspond to the **applicable regulations** (e.g. EN 60204 or EN 50178).
  – **Required preventive measures:** Grounding the unit

- **Disconnect the unit from the supply system** prior to **removing the connection box cover** (MOVIMOT® inverter). **Dangerous voltages** may still be present for up to **1 minute after mains disconnection**.

- Keep the connection box cover closed during operation.

- When the **operation LED and other display elements** are not lit up, this **does not necessarily mean** that the unit has been disconnected from the supply system and is **de-energized**.

- **Mechanical blockage** or unit internal **safety functions** of MOVIMOT® can lead to a **motor standstill**. The removal of the source of the interruption or a reset of MOVIMOT® can result in an **automatic restart of the motor**. If, for safety reasons, this is not permissible for the driven machine, **MOVIMOT® must be disconnected from the mains before correcting the fault**.

- **Important: MOVIMOT® is not suitable for hoist applications!**

- **Important – Danger of burns:** The surface temperature of MOVIMOT® units (in particular that of the heat sink) may **exceed 60 °C** during operation!

Designated use

These electric motors are intended for industrial systems. They comply with the applicable standards and regulations and meet the requirements of the Low Voltage Directive 73/23/EEC.

Technical data and information about the permitted conditions where the unit is used can be found on the nameplate and in these operating instructions.

It is essential for this specified information to be observed!

3 Unit Structure

3.1 MOVIMOT ®(inverter)

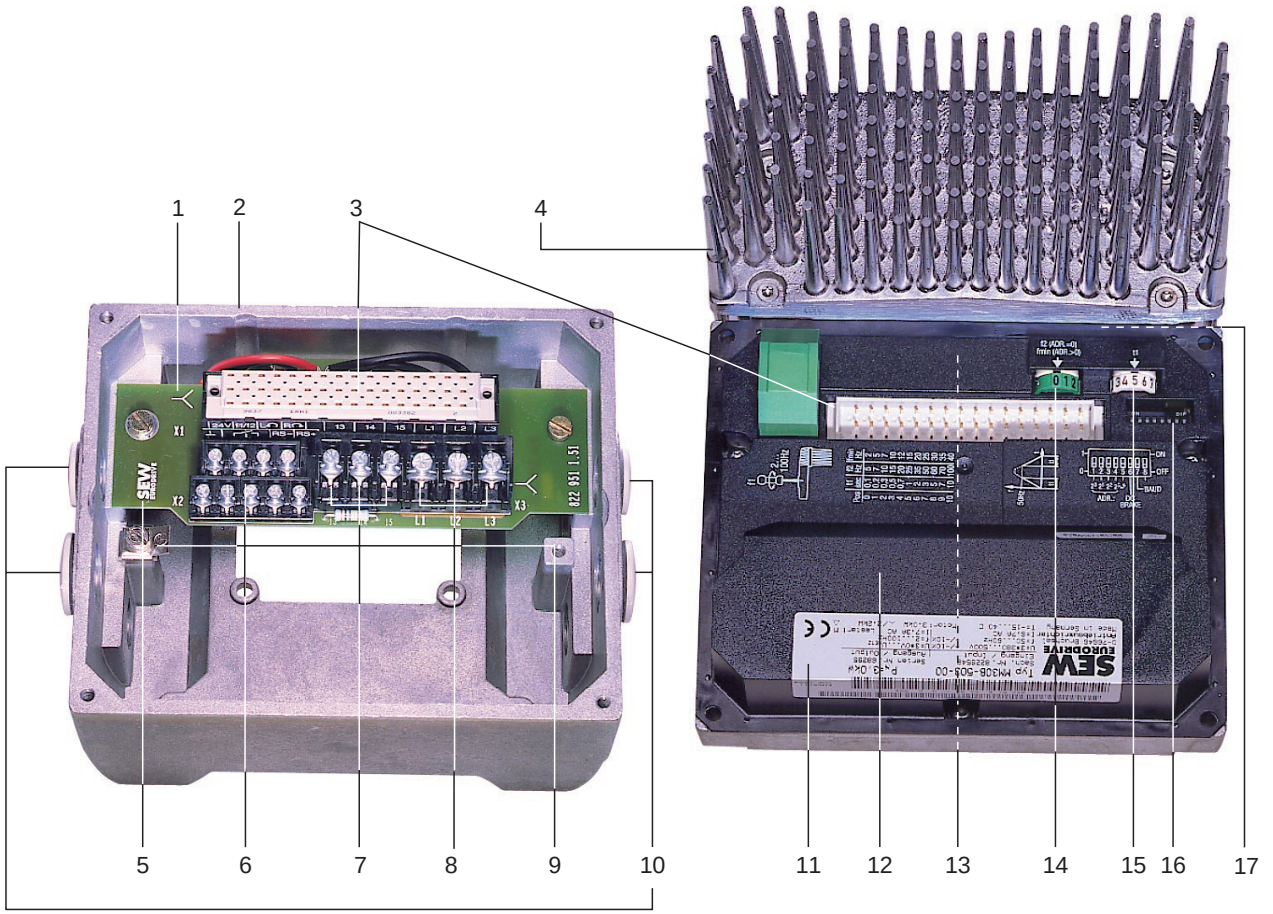

Fig. 1: MOVIMOT® (inverter) unit structure

1. Identification of the circuit type
2. Terminal box
3. Connection plug between connection unit and inverter
4. Connection box cover with inverter and heat sink
5. Connection unit with terminals
6. Electronics terminal strip X2
7. Connection of brake coil (X3); in motors without brake: Connection of internal braking resistor BW. (standard)
8. Mains connection L1, L2, L3 (X3) (suitable for 2 x 4 mm^2)
9. Screws for PE connection ⏚
10. Cable screw fittings
11. Electronics nameplate
12. Safety hood for inverter electronics
13. Setpoint potentiometer f1 (not visible), accessible through a screw fitting on the top of the connection box cover
14. Setpoint switch f2 (green)
15. Switch t1 for generator ramp (white)
16. DIP switch S1 for setting the bus address, motor protection, DC braking, PWM frequency
17. Status LED (visible from the top of the connection box cover, see section 7.1)

3.1.1 MOVIMOT® unit designations / nameplates (examples)

Sample unit designation

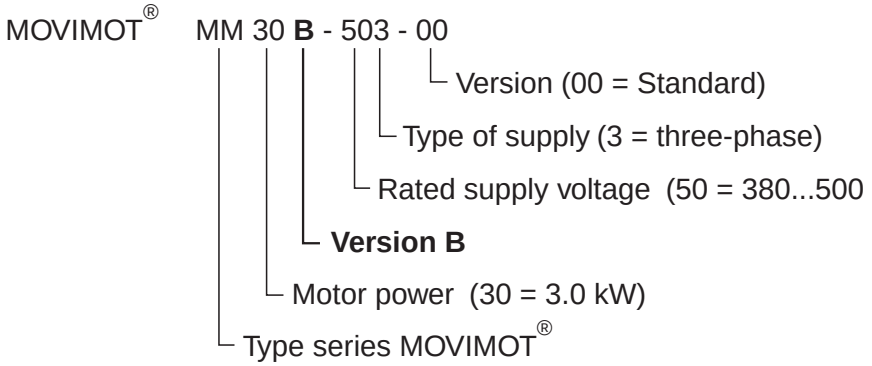

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Fig. 2:

Sample inverter nameplate

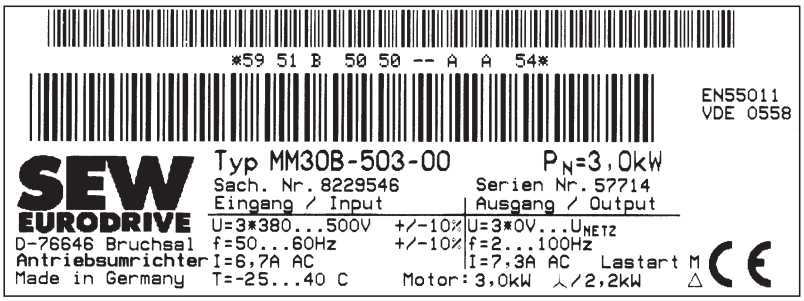

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Fig. 3

Sample motor nameplate

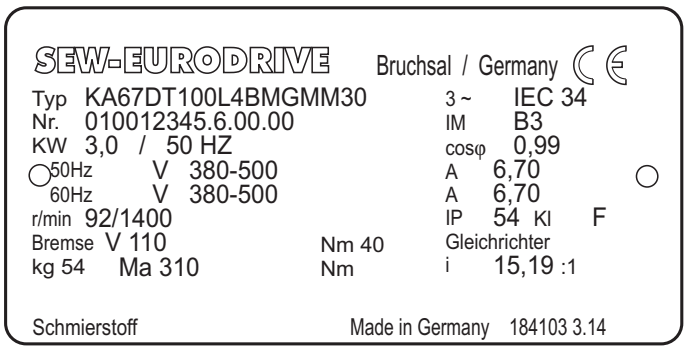

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Fig. 4

4 Mechanical Installation

Before you begin

MOVIMOT® may not be installed unless:

- the entries on the nameplate of the drive match the voltage supply system,
- the drive is undamaged (no damage caused by transport or storage) and
- it is certain that the following requirements have been fulfilled:
  - Ambient temperatures between -25 °C and +40 °C (remember that the temperature range of the gear unit may be restricted → operating instructions for the gear unit)
  - No oil, acid, gas, vapors, radiation, etc.
  - Installation altitude max. 1000 m above sea level

Installation tolerances

→ "MOVIMOT® Geared Motors" catalog, "Notes Appertaining to the Dimension Sheets" section.

Shaft end	Flanges
Diametric tolerance in accordance with DIN 748 ISO k6 at ∅ ≤ 50mm ISO m6 at ∅ > 50mm (Center bore in accordance with DIN 332, shape DR)	Centering shoulder tolerance in accordance with DIN 42948 ISO j6 at ∅ ≤ 230 mm ISO h6 at ∅ > 230 mm

Mounting MOVIMOT®

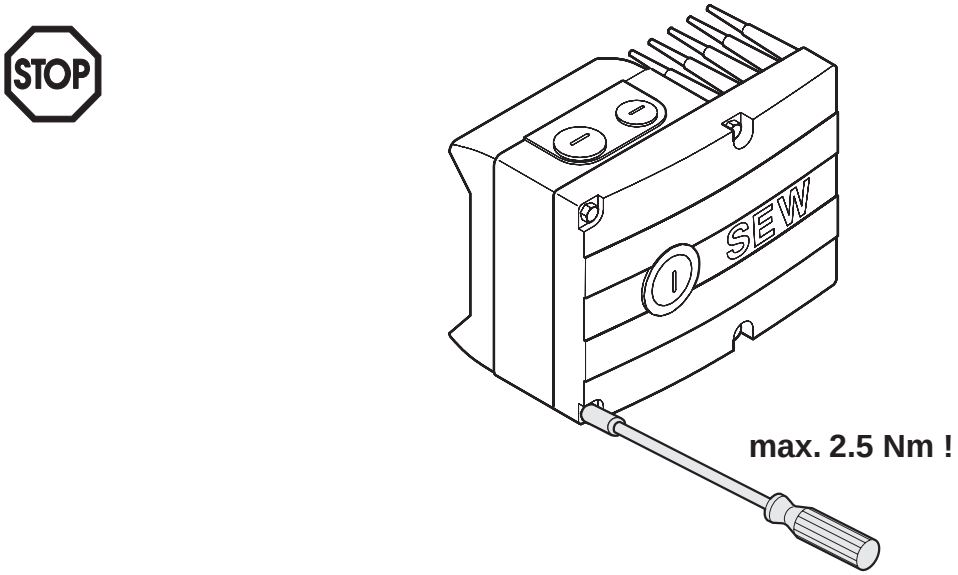
- The MOVIMOT® may only be mounted or installed in the specified mounting position on a level, vibration-proof and torsionally rigid support structure.
- Thoroughly remove anti-corrosion agents from the shaft extensions (use a commercially available solvent). Do not allow the solvent to penetrate the bearings and shaft seals – this could cause material damage!
- Carefully align MOVIMOT® and the driven machine to avoid placing any unacceptable strain on the motor shafts (observe permissible overhung load and axial thrust data!).
- Do not butt or hammer the shaft end.
- Use an appropriate cover to protect motors in vertical mounting positions from objects or fluids entering!
- Ensure an unobstructed cooling air supply and that air heated by other apparatus cannot be drawn in or reused.
- Balance components for subsequent mounting on the shaft with a half key (output shafts are balanced with a half key).
- Any condensation drain holes are closed with plastic plugs and must not be opened unless needed.
- Do not leave any condensation drain holes open, since this defeats higher enclosure ratings.

Installation in damp areas or in the open air

- Use suitable screwed cable glands for the supply leads (use reducing adapters if necessary).
- Coat the threads of cable screw fittings and pocket caps with sealant and tighten them well – then coat them again.
- Seal the cable entry well.
- Clean the sealing faces of the connection box cover well before re-assembly.
- Restore the anticorrosive coating if necessary.
- Check the type of enclosure is authorized (refer to the nameplate).

Screwing on the connection box cover

- Tighten the screws for the connection box cover to maximum **2.5 Nm**.
- The connection box cover may be deformed and damaged if it is tightened to a higher torque value.



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5 Electrical Installation

5.1 Installation regulations

Connecting supply system leads

- The rated voltage and frequency of MOVIMOT® must correspond to the data for the supply system.
- Line cross section:
  according to switch-on current I_{system} at rated power (see Technical Data).
- Permitted line cross section of the MOVIMOT® terminals

Power terminals	Control terminals
1.0 mm² – 4.0 mm² (2 x 4.0 mm²)	0.25 mm² – 1.0 mm² (2 x 0.75 mm²)
AWG17 – AWG10 (2 x AWG10)	AWG22 – AWG17 (2 x AWG18)

- Use conductor end sleeves without insulating shrouds (DIN 46228 part 1, material E-CU).

- Install the line protection at the start of the supply system lead behind the supply bus junction (see section 5.2, F11/F12/F13). Use D, DO, NH or circuit breakers. The fusible rating should be selected in accordance with the line cross section.
- It is not permissible to use a conventional earth leakage circuit-breaker as a protective device. Universal current-sensitive earth leakage circuit-breakers (tripping current 300 mA) are permissible as a protective device. Earth-leakage currents > 3.5 mA may occur during normal operation of the MOVIMOT®.
- Contactor switch contacts in utilization category AC-3 to IEC 158 must be used for switching MOVIMOT®.
- SEW recommends using earth-leakage monitors with a pulse code measuring process in voltage supply systems with a non-earthed star point (IT systems). This avoids mis-tripping of the earth-leakage monitor due to the earth capacitance of the inverter.

Connecting 24 V_{DC} supply

- Power MOVIMOT® either from an external 24 V_{DC} voltage or using the MLU..A or MLG..A options.

Conventional control *(using binary commands)*

- Connect the required electronic control leads
  (e.g. CW/STOP, CCW/STOP, setpoint changeover f1/f2).
- Use shielded cables as control leads and route them separately from power current cables.

Control via RS-485 interface

(With Busmaster PLC, MLG..A, MBG11A, MWA21A option or MF... fieldbus interfaces)

- **Important: Only ever connect <u>one</u> bus master.**
- Use twisted pair shielded cables as control leads and route them separately from power current cables.

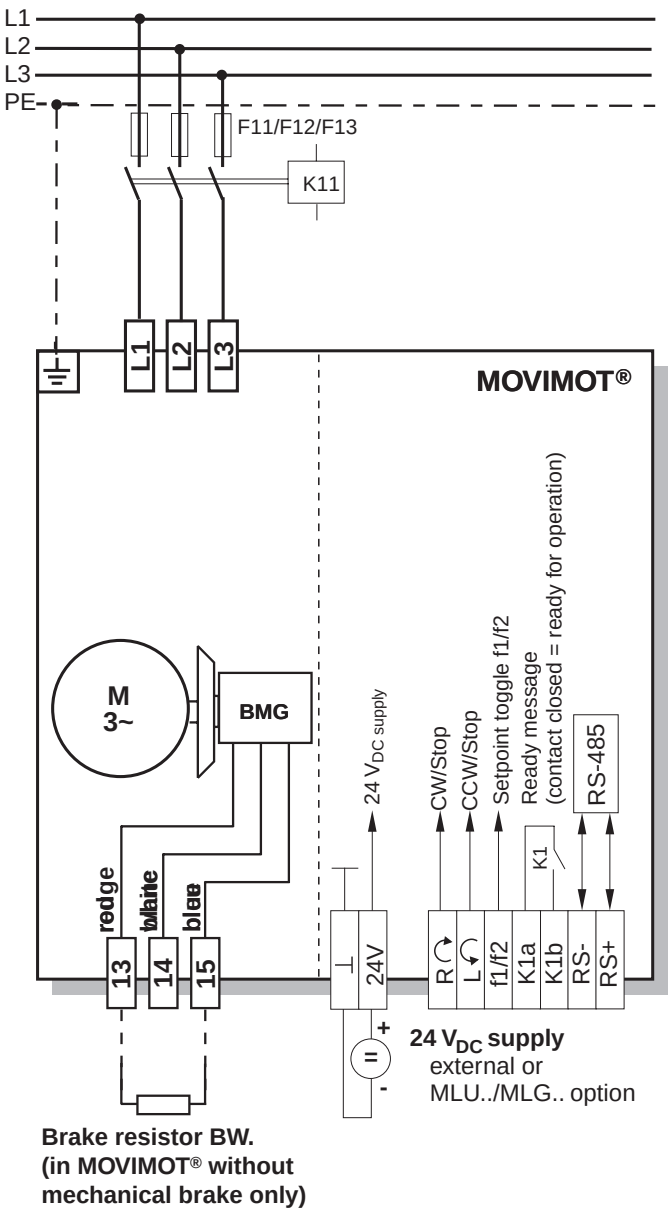
Protection devices

MOVIMOT® drives possess integrated overload protective devices, so external devices are not required.

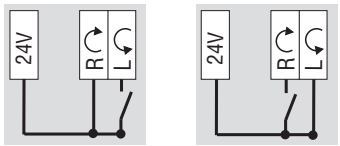
UL compliant installation

- Only use copper cables with the following temperature ranges as connection leads: Temperature range: 60/75 °C
- The permitted tightening torques for MOVIMOT® power terminals are:
  - 1.5 Nm (13.3 lb.in)
- MOVIMOT® is suitable for operation on voltage supply systems with an earthed star point (TN and TT systems), which can supply a max. supply current of 5000 A_{AC} and have a max. rated voltage of 240 V_{AC} (MM03B-233 to MM22B-233) or 500 V_{AC} (MM03B-503 to MM30B-503). The performance data of the fuses must not exceed the following values:
  - **MM03B-503** to **MM07B-503: 25A/600V**
  - **MM11B-503** to **MM30B-503: 35A/600V**
  - **MM03B-233** to **MM22B-233: 35A/250V**
- Only use tested units with a limited output voltage (V_{max} = 30 V_{DC}) and limited output current ($I \leq 8$ A) as an external 24 V_{DC} voltage source.
- UL certification does not apply to operation in voltage supply systems with a non-earthed star point (IT systems).

5.2 MOVIMOT® connection



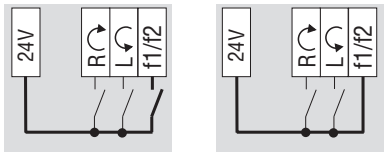
Functions of terminals R and L with binary control:



Rotation **CW** active

Rotation **CCW** active

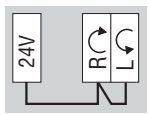
Functions of terminals f1/f2:



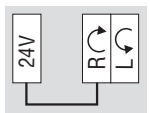
Setpoint **f1** active

Setpoint **f2** active

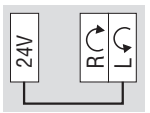
Functions of terminals R and L with control via RS-485 interface / fieldbus:



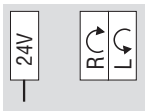
Both directions of rotation are enabled



Only **CW rotation** is enabled
Setpoint selections for CCW rotation result in standstill of drive



Only **CCW** rotation is enabled
Setpoint selections for CW rotation result in standstill of drive



Drive is blocked or brought to standstill

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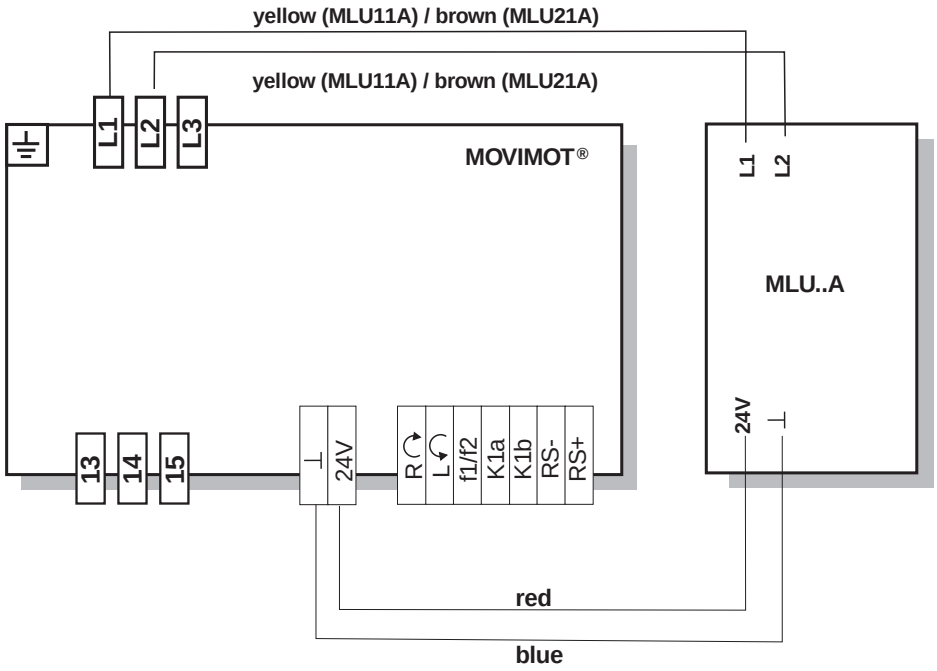
Fig. 5: MOVIMOT® connection

5.3 MLU11A / MLU21A option connection



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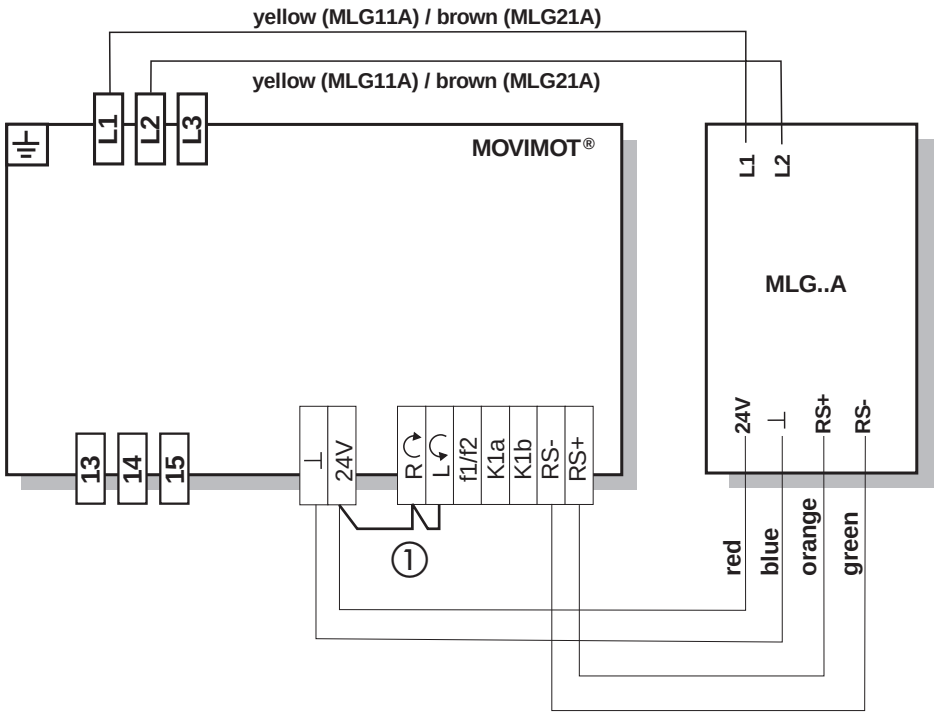
5.4 MLG11A / MLG21A option connection



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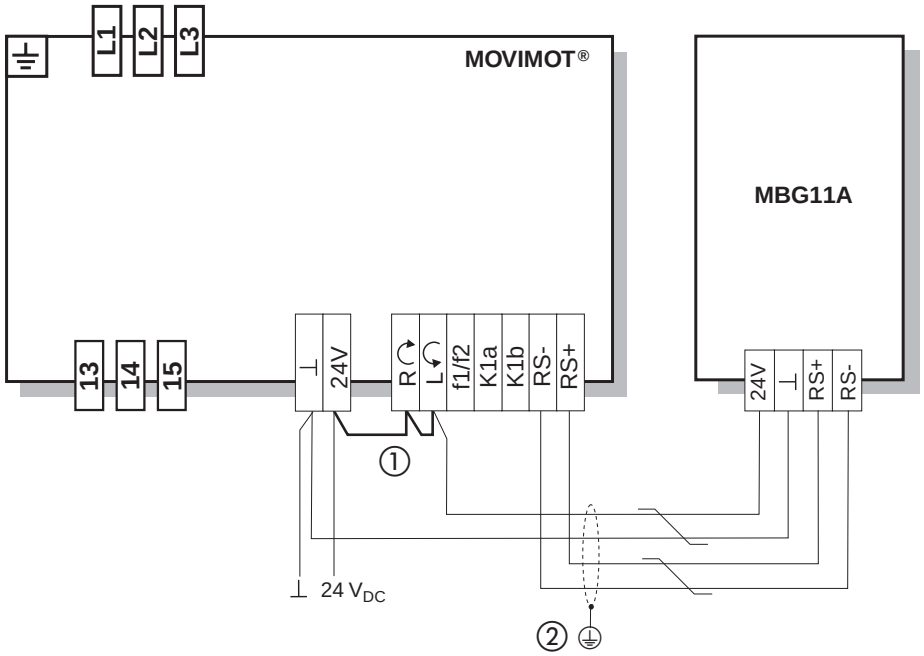
① **Note the direction of rotation release (see section 5.2 / Functions of the CW/ STOP, CCW/STOP terminals in control via RS-485 interface)**

5.5 MBG11A option connection



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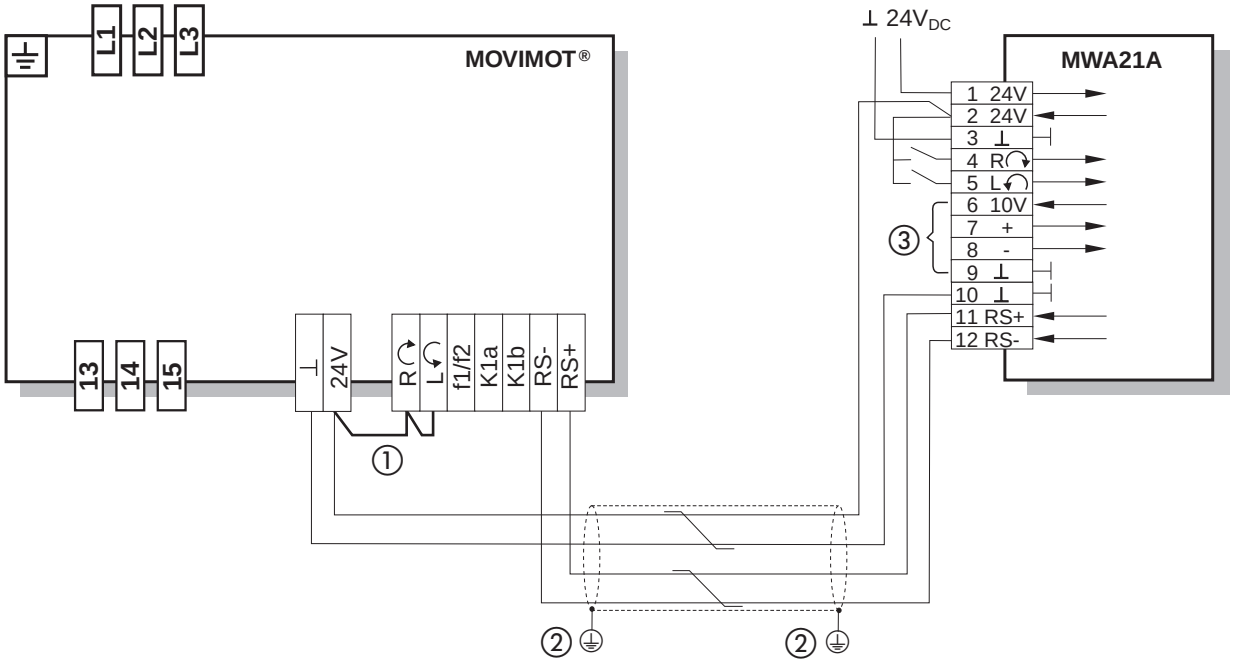
5.6 MWA21A option connection



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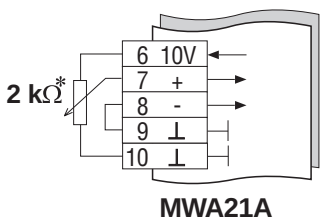
① **Note the direction of rotation release (see section 5.2 / Functions of the CW/STOP, CCW/STOP terminals in control via RS-485 interface)**

② **EMC metal cable screw fitting**

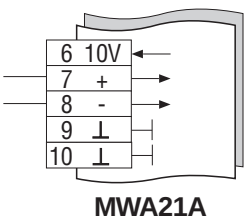
③

Potentiometer with integration of 10V reference voltage

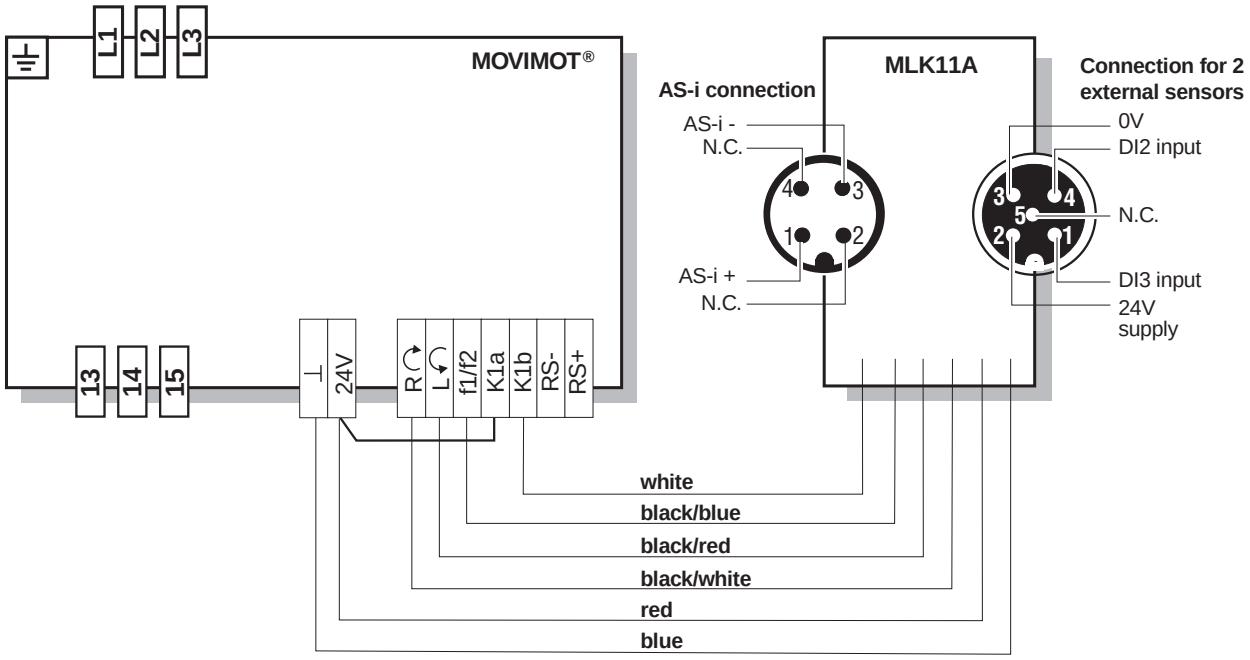


∗ optional 5 kΩ

Potential-free analog signal



5.7 AS-i binary slave MLK11A connection



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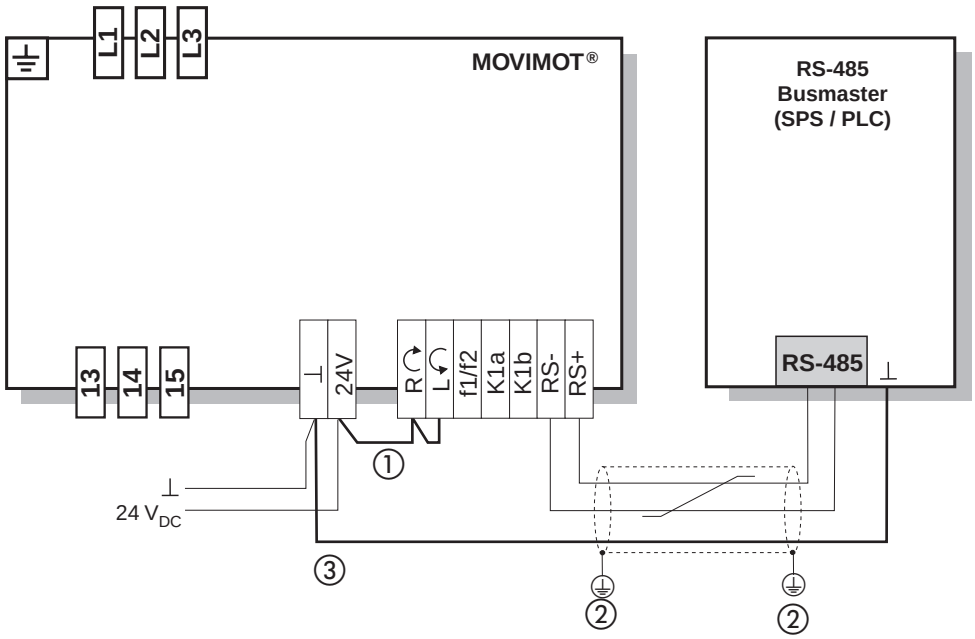
5.8 RS-485 Busmaster connection



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① **Note the direction of rotation release (see section 5.2 / Functions of the CW/ STOP, CCW/STOP terminals in control via RS-485 interface)**

② **EMC metal cable screw fitting**

③ **Equipotential bonding MOVIMOT® / RS-485 master**

6 Startup

6.1 *Important startup instructions*

- **It is essential to comply with the safety notes during startup!**
- Disconnect MOVIMOT® from the supply system before removing/replacing the connection box cover.
- Before startup, make sure the drive is undamaged.
- Check that all protective covers are installed correctly.
- MOVIMOT® is optimally adapted to the motor by means of parameters stored in the unit. As a result, the parameter settings are fixed.
- Use CW/STOP or CCW/STOP for jog mode.
- A minimum switch-off time of 2 seconds must be maintained for the supply system contactor K11.

6.2 Description of MOVIMOT® controls

DIP SWITCH S1

S1/..	1	2	3	4	5	6	7	8
ON	RS-485 address				Motor protection deactivated	DC braking	PWM frequency 16 kHz variable[1)]	No function
OFF					**Motor protection active**	**4Q operation**	**PWM frequency 4 kHz fix**	

1) When DIP SWITCH S1/7 = ON, the units operate with a 16 kHz PWM frequency (low noise) and switch back in steps to lower switching frequencies depending on the heat sink temperature.

Setpoint potentiometer f1

The function of the potentiometer changes depending on the unit's operating mode.

- Control via terminals: Setpoint f_1 (selected by tl. f1/f2 = "0")
- Control via RS-485: Maximum frequency f_{max}

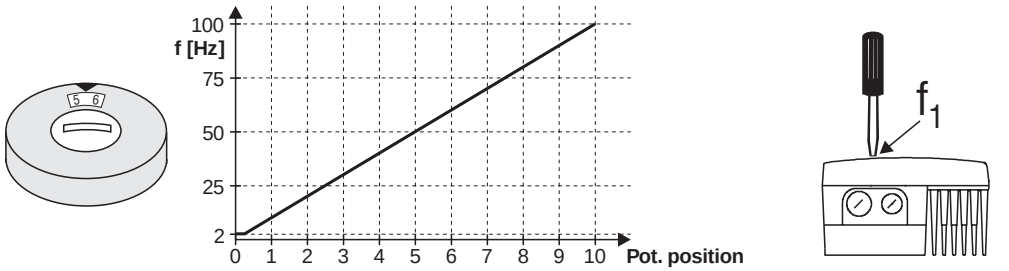

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Fig. 6

Setpoint switch f2

The function of the switch changes depending on the unit's operating mode.

- Control via terminals: Setpoint f_2 (selected by tl. f1/f2 = "1")
- Control via RS-485: Minimum frequency f_{min}

Switch f2	* = Factory setting										
Detent position	**0***	1	2	3	4	5	6	7	8	9	10
Setpoint f2 [Hz]	**5***	7	10	15	20	25	35	50	60	70	100
Minimum frequency [Hz]	**2***	5	7	10	12	15	20	25	30	35	40

Switch t1

For ramp generator ramp (ramp times in relation to a setpoint step change of 50 Hz)

Switch t1	* = Factory setting										
Detent position	0	1	2	3	4	**5***	6	7	8	9	10
Ramp time t1 [s]	0.1	0.2	0.3	0.5	0.7	**1***	2	3	5	7	10

6.3 Startup with binary control

1. **Check MOVIMOT® is connected correctly (see section 5).**
2. Make sure DIP switches S1/1 – S1/4 are set to OFF (= address 0).
3. Check the setting for 4Q operation (DIP switch S1/6 = OFF).

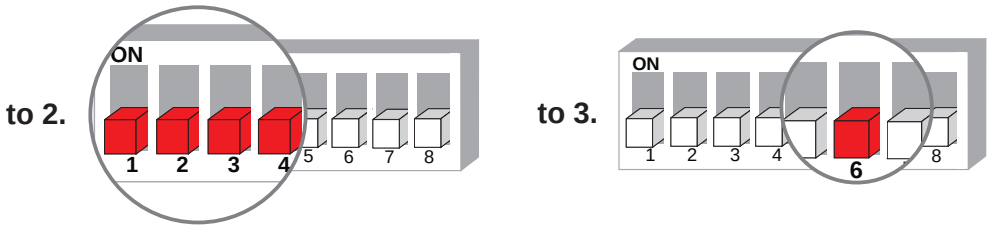

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Fig. 7: Setting DIP switches

4. Set the first speed with setpoint potentiometer f1 (active when tl. f1/f2 = "0", factory setting: approx. 50 Hz).

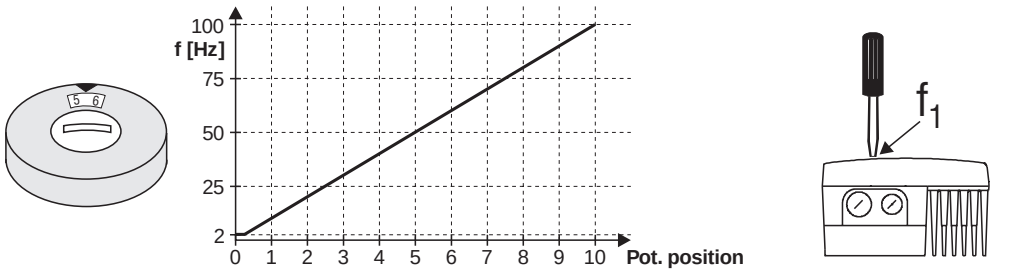

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Fig. 8: Frequency response of setpoint potentiometer f1

During operation, the first speed is infinitely variable using the setpoint potentiometer f1 which is accessible from outside.

5. Set the second speed with switch f2 (active when tl. f1/f2 = "1").

Switch f2											
Detent position	0	1	2	3	4	5	6	7	8	9	10
Setpoint f2 [Hz]	5	7	10	15	20	25	35	50	60	70	100

6. Set the ramp time with switch t1 (ramp times in relation to a setpoint step change of 50 Hz).

Switch t1											
Detent position	0	1	2	3	4	5	6	7	8	9	10
Ramp time t1 [s]	0.1	0.2	0.3	0.5	0.7	1	2	3	5	7	10

7. Put on the connection box cover and screw it into place (max. 2.5 Nm).
8. Make sure the retaining screw of the cover has a seal and fit it back in.
9. Switch on the control voltage 24 V_{DC} and supply system.

Inverter response according to the terminal level

System	24 V	f1/f2	CW/STOP	CCW/STOP	Status LED	Inverter response
0	0	x	x	x	Off	Inverter off
1	0	x	x	x	Off	Inverter off
0	1	x	x	x	Flashing yellow	Stop, no supply system
1	1	x	0	0	Yellow	Stop
1	1	0	1	0	Green	Clockwise with f1
1	1	0	0	1	Green	Counter-clockwise with f1
1	1	1	1	0	Green	Clockwise with f2
1	1	1	0	1	Green	Counter-clockwise with f2
1	1	x	1	1	Yellow	Stop

Key

0 = No voltage

1 = Voltage

X = Any

6.4 Startup with MBG11A or MLG11A options

1. **Check MOVIMOT® is connected correctly (see section 5).**
2. Set DIP switch S1/1 (on MOVIMOT®) to ON (= address 1).
3. Check the setting for 4Q operation (DIP switch S1/6 = OFF).

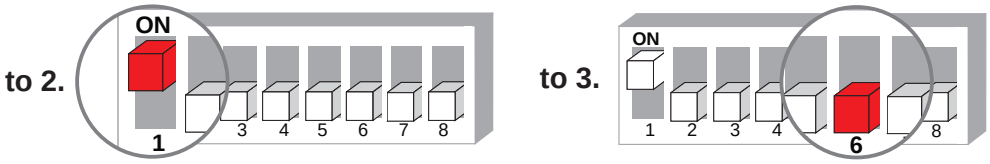

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Fig. 9: Setting DIP switches

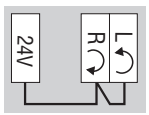
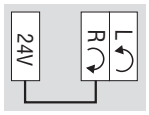
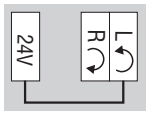
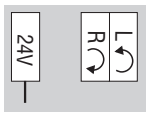
4. Set the minimum frequency f_{min} with switch f2.

Switch f2											
Detent position	0	1	2	3	4	5	6	7	8	9	10
Minimum frequency f_{min} [Hz]	2	5	7	10	12	15	20	25	30	35	40

5. Set the ramp time with switch t1 (ramp times in relation to a setpoint step change of 50 Hz).

Switch t1											
Detent position	0	1	2	3	4	5	6	7	8	9	10
Ramp time t1 [s]	0.1	0.2	0.3	0.5	0.7	1	2	3	5	7	10

6. Check whether the required direction of rotation is enabled.

Terminal R	Terminal L	Meaning
Activated	Activated	• Both directions of rotation are enabled
		
Activated	Not activated	• Only clockwise direction of rotation is enabled • Setpoint selections for counterclockwise lead to the drive being stopped
		
Not activated	Activated	• Only counterclockwise direction of rotation is enabled • Setpoint selections for clockwise lead to the drive being stopped
		
Not activated	Not activated	• Unit is blocked or the drive is stopped
		

7. Put on the connection box cover and screw it into place (max. 2.5 Nm).

8. Set the required maximum speed using setpoint potentiometer f1.

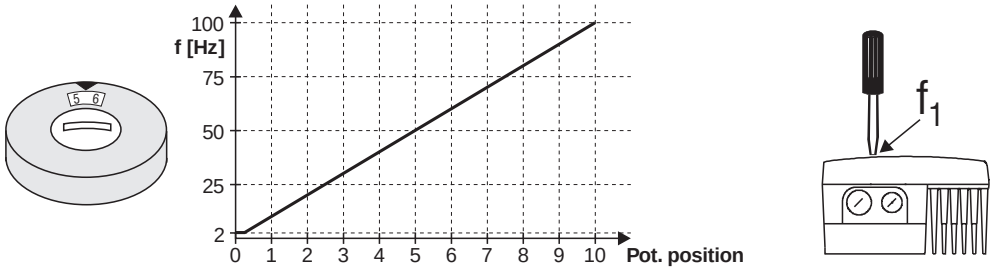
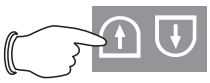
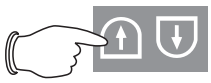
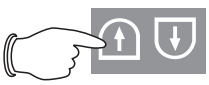
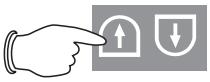


Fig. 10: Setting the second speed

9. Make sure the retaining screw of the cover has a seal and fit it back in.
10. Switch on the voltage.

6.5 Operating MBG11A and MLG..A options

Operating MBG11A and MLG..A options	
Display	**Negative** display value e.g.  = Counterclockwise **Positive** display value e.g.  = Clockwise The displayed value relates to the speed set using setpoint potentiometer f1. For example: Display "50" = 50 % of the speed set using the setpoint potentiometer. Important: If the display is "0", the drive is turning at f_{min}.
Increase the speed	If clockwise:  If counterclockwise: 
Reduce the speed	If clockwise:  If counterclockwise: 
Inhibit MOVIMOT®	Press the following keys simultaneously:  Display = 
Enable MOVIMOT®	 **or**  **Important:** MOVIMOT® accelerates to the previously stored value after enable
Change in direction of rotation from CW to CCW	**1.**  until display shows  **2.** Press  again to change the direction of rotation from CW to CCW
Change in direction of rotation from CCW to CW	**1.**  until display shows  **2.** Press  again to change the direction of rotation from CW to CCW
Memory function	After the supply system has been switched off and on again, the value last set is retained provided the 24 V supply was present for at least 4 seconds following the most recent setpoint change.

6.6 Commissioning with MWA21A option (speed control module)

1. **Check MOVIMOT® is connected correctly (see section 5).**
2. Set DIP switch S1/1 (on MOVIMOT®) to ON (= address 1).
3. Check the setting for 4Q operation (DIP switch S1/6 = OFF).

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Fig. 11: Setting DIP switches

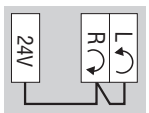
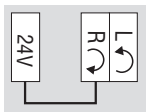
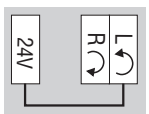
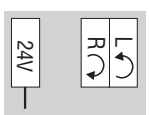
4. Set the minimum frequency f_{min} with switch f2.

Switch f2											
Detent position	0	1	2	3	4	5	6	7	8	9	10
Minimum frequency f_{min} [Hz]	2	5	7	10	12	15	20	25	30	35	40

5. Set the ramp time with switch t1 (ramp times in relation to a setpoint step change of 50 Hz).

Switch t1											
Detent position	0	1	2	3	4	5	6	7	8	9	10
Ramp time t1 [s]	0.1	0.2	0.3	0.5	0.7	1	2	3	5	7	10

6. Check whether the required direction of rotation is enabled.

Terminal R	Terminal L	Meaning
Activated	Activated	• Both directions of rotation are enabled
		
Activated	Not activated	• Only clockwise direction of rotation is enabled • Setpoint selections for counterclockwise lead to the drive being stopped
		
Not activated	Activated	• Only counterclockwise direction of rotation is enabled • Setpoint selections for clockwise lead to the drive being stopped
		
Not activated	Not activated	• Unit is blocked or the drive is stopped
		

7. Put on the connection box cover and screw it into place (max. 2.5 Nm).

8. Set the required maximum speed using setpoint potentiometer f1.

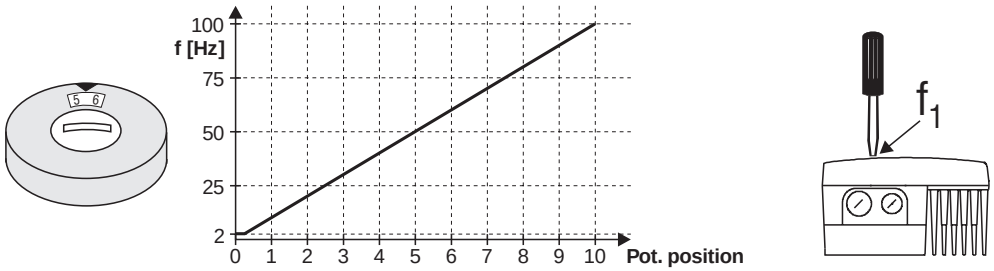


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Fig. 12: Setting the maximum speed

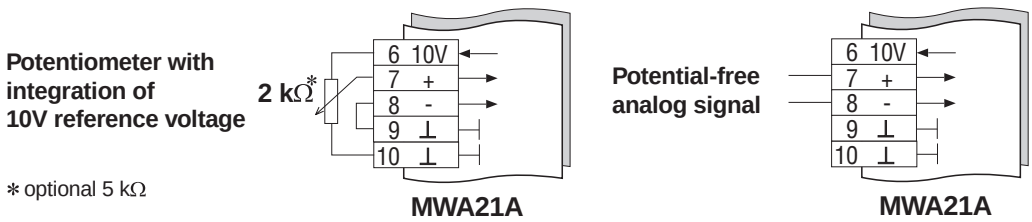
9. Make sure the retaining screw of the cover has a seal and fit it back in.
10. Select the signal type for the analog input (tl. 7 and tl. 8) of the MWA21A option using switches S1 and S2.

	S1	S2	Setpoint stop function
U signal 0 – 10 V	OFF	OFF	No
I signal 0 – 20 mA	ON	OFF	
I signal 4 – 20 mA	ON	ON	Yes
U signal 2 – 10 V	OFF	ON	

11. Switch on the voltage.
12. Release MOVIMOT® by applying +24 V to tl. 4 (CW rotation) or tl. 5 (CCW rotation) of the MWA21A.

Activation

MOVIMOT® is controlled from f_{min} to f_{max} using the analog signal at terminal 7 and terminal 8.

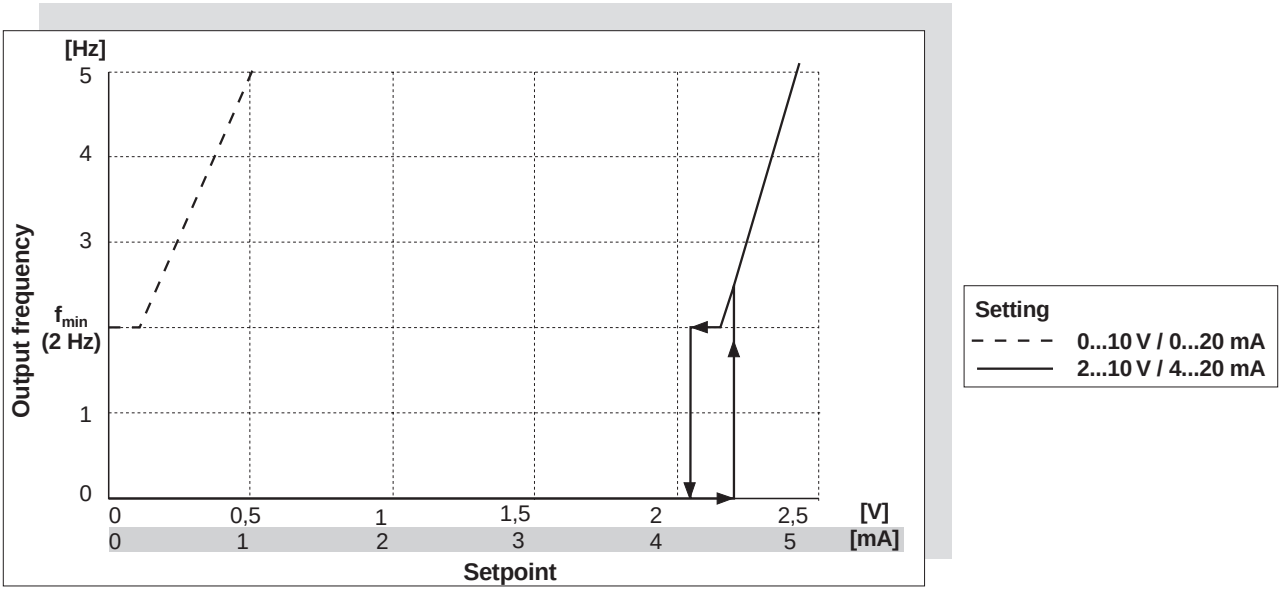


∗ optional 5 kΩ

02569AEN

Fig. 13

Setpoint stop function:

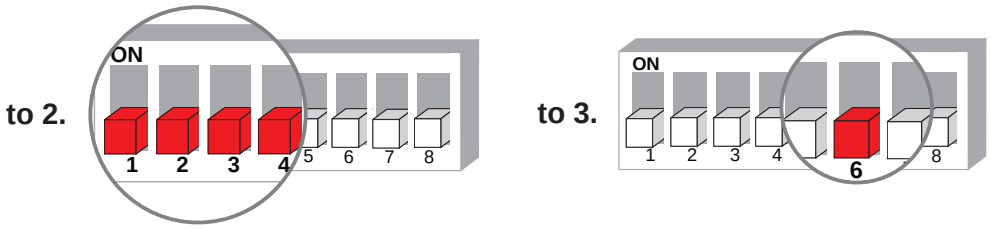


02588AEN

Fig. 14: Setpoint stop function

6.7 AS-i binary slave MLK11A startup

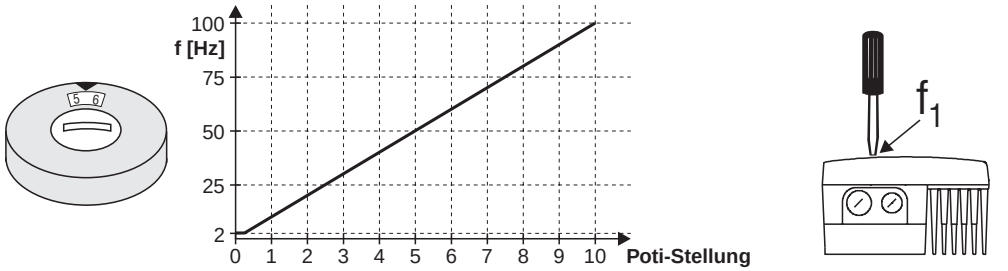
1. **Check MOVIMOT® is connected correctly (see section 5).**
2. Make sure DIP switches S1/1 – S1/4 are set to OFF (= address 0).
3. Check the setting for 4Q operation (DIP switch S1/6 = OFF).



02764AEN

Fig. 15: Setting DIP switches

4. Set the first speed with setpoint potentiometer f1 (active when tl. f1/f2 = "0", factory setting: approx. 50 Hz).



02704AEN

Fig. 16: Frequency response of setpoint potentiometer f1

During operation, the first speed is infinitely variable using the setpoint potentiometer f1 which is accessible from outside.

5. Set the second speed with switch f2 (active when tl. f1/f2 = "1").

Switch f2											
Detent position	0	1	2	3	4	5	6	7	8	9	10
Setpoint f2 [Hz]	5	7	10	15	20	25	35	50	60	70	100

6. Set the ramp time with switch t1 (ramp times in relation to a setpoint step change of 50 Hz).

Switch t1											
Detent position	0	1	2	3	4	5	6	7	8	9	10
Ramp time t1 [s]	0.1	0.2	0.3	0.5	0.7	1	2	3	5	7	10

7. Put on the connection box cover and screw it into place (max. 2.5 Nm).
8. Make sure the retaining screw of the cover has a seal and fit it back in.
9. Switch on the AS-i voltage supply and the supply system.

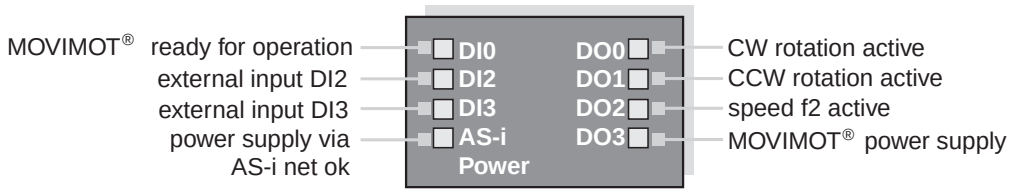
Outputs (function and designation)

Bit	Function	Display / LED color
D0	Clockwise (terminal R)	DO 0 / yellow
D1	Counterclockwise (terminal L)	DO 1 / yellow
D2	Speed f1 / speed f2 (terminal f1/ f2)	DO 2 / yellow
D3	Voltage supply / reset (terminal 24 V)	DO 3 / green

Inputs (function and designation)

Bit	Function	Display / LED color
D0	Ready signal (relay K1)	DI 0 / yellow
D1	-	-
D2	Sensor 1 (M12 socket, pin 4)	DI 2 / yellow
D3	Sensor 2 (M12 socket, pin 2)	DI 3 / yellow

LED display



02507BEN

Fig. 17

6.8 Startup with communications interface / Fieldbus

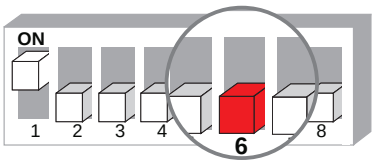
1. **Check MOVIMOT® is connected correctly (see section 5).**
2. Set the correct RS-485 address on DIP switches S1/1 – S1/4. **Always set address "1" in conjunction with SEW fieldbus interfaces (MF...).**

Address	–	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
S1/1	–	X	–	X	–	X	–	X	–	X	–	X	–	X	–	X
S1/2	–	–	X	X	–	–	X	X	–	–	X	X	–	–	X	X
S1/3	–	–	–	–	X	X	X	x	–	–	–	–	X	X	X	X
S1/4	–	–	–	–	–	–	–	–	X	X	X	X	X	X	X	X

X = Switch setting ON – = Switch setting OFF

3. Check the setting for 4Q operation (DIP switch S1/6 = OFF).

to 3.



02766AEN

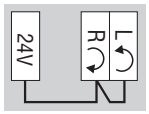
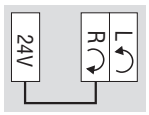
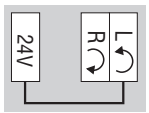
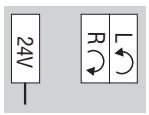
4. Set the minimum frequency f_{min} with switch f2.

Switch f2											
Detent position	0	1	2	3	4	5	6	7	8	9	10
Minimum frequency f_{min} [Hz]	2	5	7	10	12	15	20	25	30	35	40

5. Set the ramp time using switch t1 if the ramp is not specified via RS-485 (ram time in relation to a setpoint step change of 50 Hz).

Switch t1											
Detent position	0	1	2	3	4	5	6	7	8	9	10
Ramp time t1 [s]	0.1	0.2	0.3	0.5	0.7	1	2	3	5	7	10

6. Check whether the required direction of rotation is enabled.

Terminal R	Terminal L	Meaning
Activated	Activated	• Both directions of rotation are enabled
		
Activated	Not activated	• Only clockwise direction of rotation is enabled • Setpoint selections for counterclockwise lead to the drive being stopped
		
Not activated	Activated	• Only counterclockwise direction of rotation is enabled • Setpoint selections for clockwise lead to the drive being stopped
		
Not activated	Not activated	• Unit is blocked or the drive is stopped
		

7. Put on the connection box cover and screw it into place (max. 2.5 Nm).
8. Set the required maximum speed using setpoint potentiometer f1.

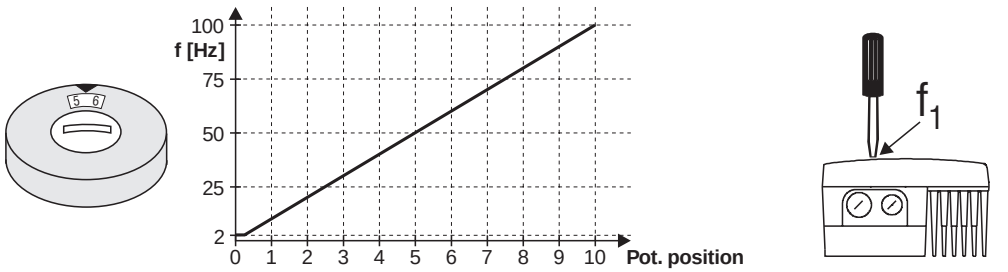


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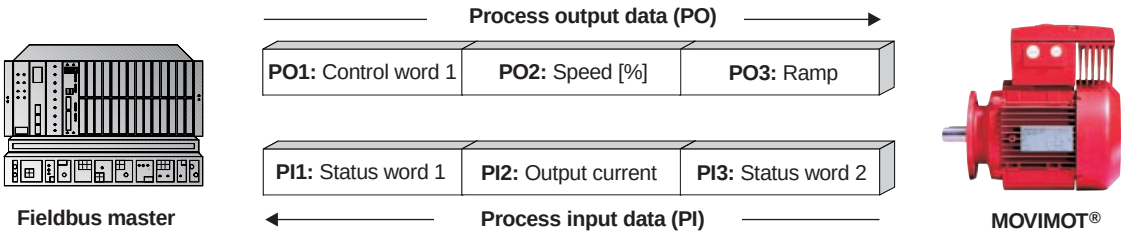
Fig. 18: Setting the maximum speed

9. Make sure the retaining screw of the cover has a seal and fit it back in.
10. Switch on the voltage.

6.9 MOVILINK® unit profile (coding of process data)

The same process data information is used for controlling and selecting setpoints for all fieldbus systems. The process data are coded using the uniform MOVILINK® profile for SEW drive inverters. In the case of MOVIMOT®, it is always possible to differentiate between the following variants:

- 2 process data words (2 PD)
- 3 process data words (3 PD)



02775AEN

Fig. 19: MOVIMOT® process data

2 PD

In order to control MOVIMOT® using 2 process data words, the master programmable controller sends the process output data Control word 1 and Speed [%] to MOVIMOT®; the process input data (PI) Status word 1 and Output current are sent from MOVIMOT® to the programmable controller.

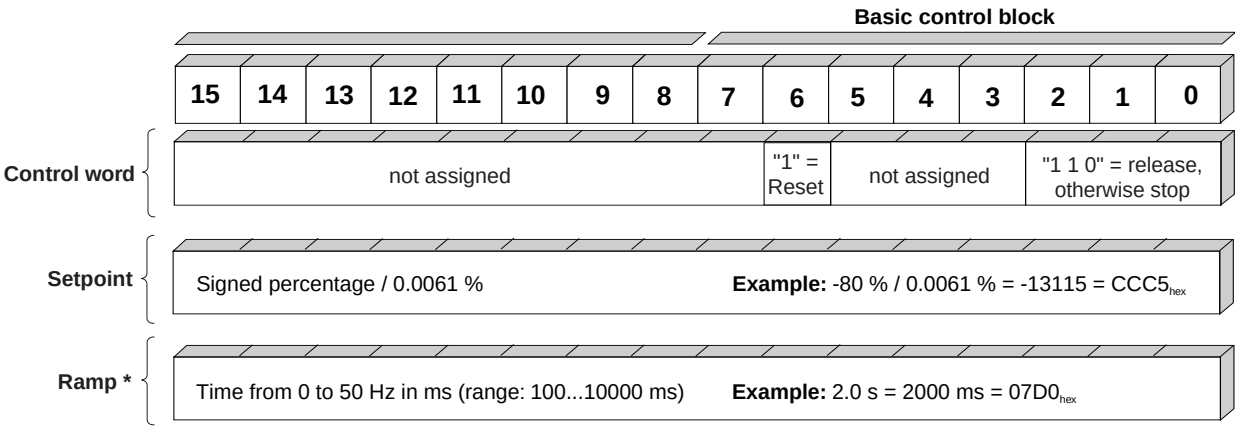
3 PD

When control is with 3 process data words, Ramp is sent as the additional process output data word; Status word 2 is sent as the third process input data word.

Process output data

Process output data are sent from the master programmable controller to MOVIMOT® (control information and setpoints). However, they only come into effect in MOVIMOT® if the RS-485 address in MOVIMOT® is set to a value other than 0 (DIP switches S1/1 to 4). MOVIMOT® can be controlled with the following process output data:

- PO1: Control word 1
- PO2: Speed [%] (setpoint)
- PO3: ramp



02758AEN

Fig. 20: Process output data

Control word, bits 0 – 2

The "Enable" control command is specified with bits 0 – 2 by entering the control word = 0006_{hex}. The CW and CCW input terminal must also be set to +24 V (jumpered) in order to enable the MOVIMOT®.

The "Stop" control command is issued by resetting bit 2 = "0". You should use the stop command 0002_{hex} in order to stay compatible with other SEW inverter ranges. However, MOVIMOT® always triggers a stop with the current ramp whenever bit 2 = "0", irrespective of the status of bit 0 and bit 1.

Control word bit 6 = Reset

In the event of a malfunction, the fault can be acknowledged with bit 6 = "1" (Reset). The value of unassigned control bits should be 0, in order to ensure compatibility.

Speed [%]

The speed setpoint is specified as a percentage, relative to the maximum speed set using the setpoint potentiometer f1.

Coding: $C000_{hex}$ = -100 % (counterclockwise)
4000_{hex} = +100 % (clockwise)
→ 1 digit = 0.0061 %

Example: 80 % f_{max}, CW direction of rotation:

Calculation: -80 % / 0.0061 = -13115_{dec} = $CCC5_{hex}$

Ramp

The current integrator in the process output data word PO3 is transferred if the process data exchange takes place using three process data words. The integrator set using switch t1 is used if MOVIMOT® is being controlled by 2 process data words.

Coding: 1 digit = 1 ms

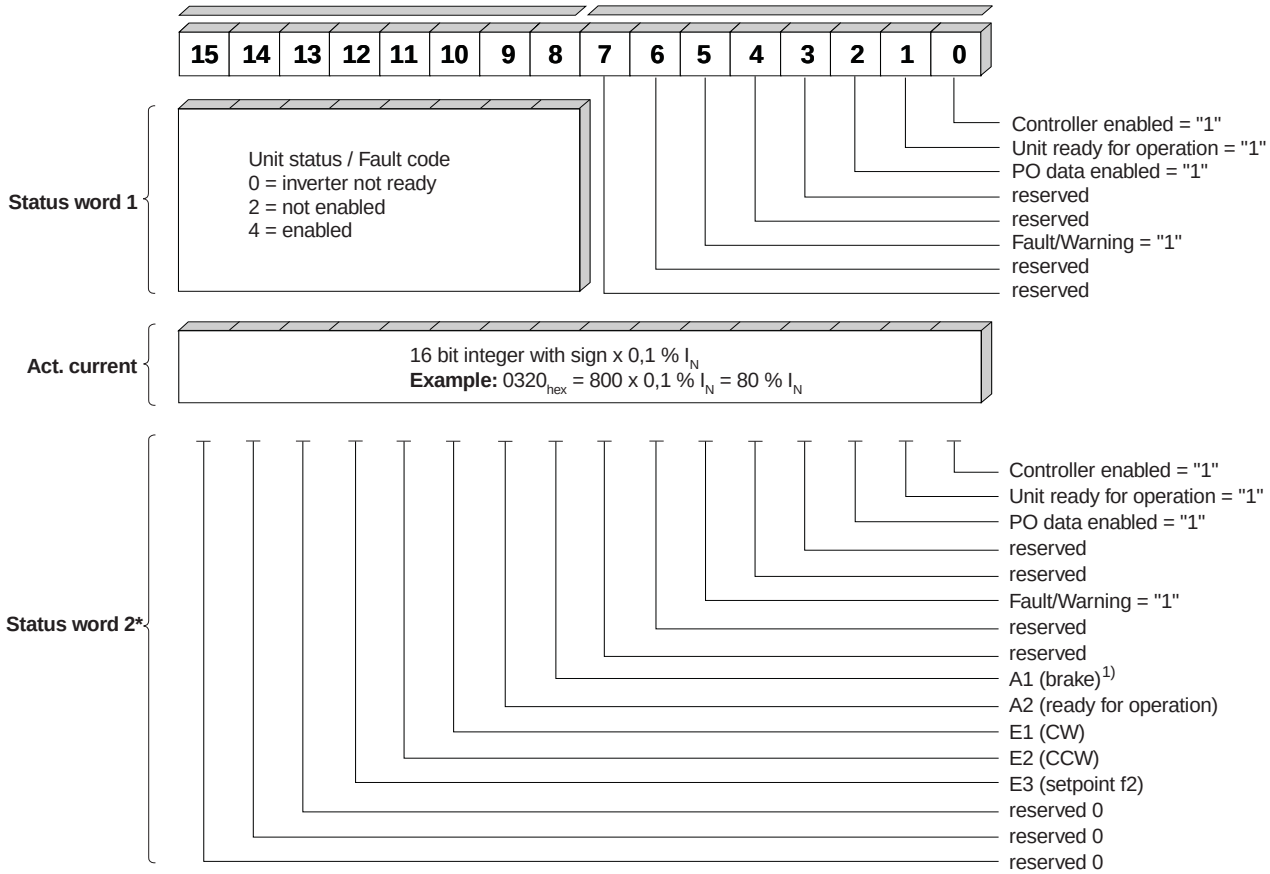
Range: 100 – 10000 ms

Example: 2.0 s = 2000 ms = 2000_{dec} = $07D0_{hex}$

Process input data (PI)

MOVIMOT® sends process input data back to the master programmable controller. The process input data consist of status and actual value information. The following process input data are supported by MOVIMOT®:

- PI1: Status word 1
- PI2: Output current
- PI3: Status word 2



* with 3 word protocol only

1) "1" = brake engaged, "0" brake released

03570AEN

Fig. 21: Process input data

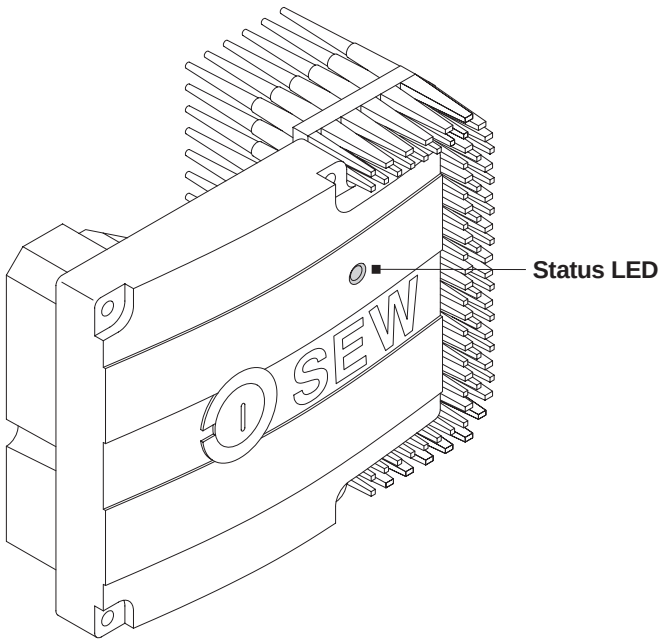
Status word 1, bit 0: Enable output stage

This bit signals whether the output stage of MOVIMOT® is enabled.

Refer to the "Drive System for Decentralized Installation" system manual for further information.

7 Operation and Servicing

7.1 MOVIMOT® status LED



02600AEN

Fig. 22

Meaning of the status LED states The 3-color LED signals the operating and fault states.

LED color	LED status	Operational status	Description
-	Off	Not ready	No 24 V power supply
Yellow	Steady flashing	Not ready	Self-test phase active or 24 V power supply present but supply voltage not OK
Yellow	Steady light	Ready but unit inhibited	24 V power supply and supply voltage OK, but no enable signal
Green/ yellow	Flashing with alternating colors	Ready, but timeout	Communication via RS-485 disrupted
Green	Steady light	Unit enabled	Motor operating
Green	Steady, fast flashing	Current limit active	Drive has reached the current limit
Red	Steady light	Not ready	Check the 24 V_{DC} supply Make sure that there is a smoothíng DC voltage with a low ripple (residual ripple max. 13 %) present
Red	2 x flash, pause	Fault 07	DC link voltage too high
Red	3 x flash, pause	Fault 11	Excessive temperature in output stage
Red	4 x flash, pause	Fault 84	Excessive temperature in motor Assignment of motor to frequency inverter incorrect
Red	5 x flash, pause	Fault 89	Excessive temperature in brake Assignment of motor to frequency inverter incorrect
Red	6 x flash, pause	Fault 06	Mains phase fault

7.2 MOVIMOT® fault table

Faults	Cause/solution
Communication timeout (motor stops, without fault code)	A No connection ⊥, RS+, RS- between MOVIMOT® and RS-485 master. Check the connection, in particular the ground, and repair. B EM interference. Check the shielding of the data cables and improve if necessary. C Incorrect type (cyclical) in acyclical protocol Time between the individual telegrams > 1 s for protocol type "cyclical". Shorten telegram cycle or select "acyclical".
DC link voltage too low, supply system off detected (motor stops, without fault code)	Check supply system leads and supply voltage for interruption. Motor restarts automatically as soon as the supply voltage reaches normal values.
Fault code 06 Phase fault	Check the supply system leads for phase fault. Reset the fault by switching off the 24 V_{DC} supply voltage or use MOVILINK®.
Fault code 07 DC link voltage too high	A Ramp time too short → Increase ramp time B Faulty connection between brake coil and braking resistor → Check the connection between the braking resistor and the brake coil. Correct if necessary. C Incorrect internal resistance brake coil / braking resistor → Check the internal resistance of the brake coil / braking resistor (see chapter 9.6) D Thermal overload in braking resistor → Wrong size of braking resistor selected Reset the fault by switching off the 24 V_{DC} supply voltage or use MOVILINK®.
Fault code 11 Thermal overload of the output stage or internal unit fault	• Clean the heat sink • Reduce the ambient temperature • Prevent heat accumulation • Reduce the load on the drive Reset the fault by switching off the 24 V_{DC} supply voltage or use MOVILINK®.
Fault code 84 Thermal overload of motor	• Reduce the ambient temperature • Prevent heat accumulation • Reduce the load on the motor • Increase the speed Check the combination of the drive and MOVIMOT® frequency inverter if the fault is signaled shortly after the first release. Reset the fault by switching off the 24 V_{DC} supply voltage or use MOVILINK®.
Fault code 89 Thermal overload of brake coil or brake coil defective	• Extend the set ramp time • Brake inspection (see chapter 8.3) • Contact SEW service Check the combination of the drive and MOVIMOT® frequency inverter if the fault is signaled shortly after the first release. Reset the fault by switching off the 24 V_{DC} supply voltage or use MOVILINK®.

Note: If you require assistance from our customer service staff, please state the following:
- Data on the nameplate
- Type and extent of the fault
- Time and peripheral circumstances of the fault
- Presumed cause

8 MOVIMOT® Inspection and Maintenance

- Only use genuine spare parts in accordance with the valid parts list!
- Important – Danger of burns: Motors can become very hot during operation!

8.1 Inspection and maintenance periods

Frequency	Equipment/ components	What to do
Depending on loading conditions: Every 2 to 4 years [1)]	Brake	• Inspect the brake (working air gap, brake disk, pressure plate, carrier / gearing, pressure rings) • Extract the abraded matter
Every 10,000 hours of operation	Motor	• Inspect the motor (change ball bearings / oil seal) • Clean the cooling air passages
Varies (depending on external factors)	Motor	• Touch up or renew the anticorrosion coating

1) The periods of wear are affected by many factors and may be short. Calculate the required inspection/maintenance intervals in accordance with the project planning documents.

8.2 Inspection and maintenance work, motor

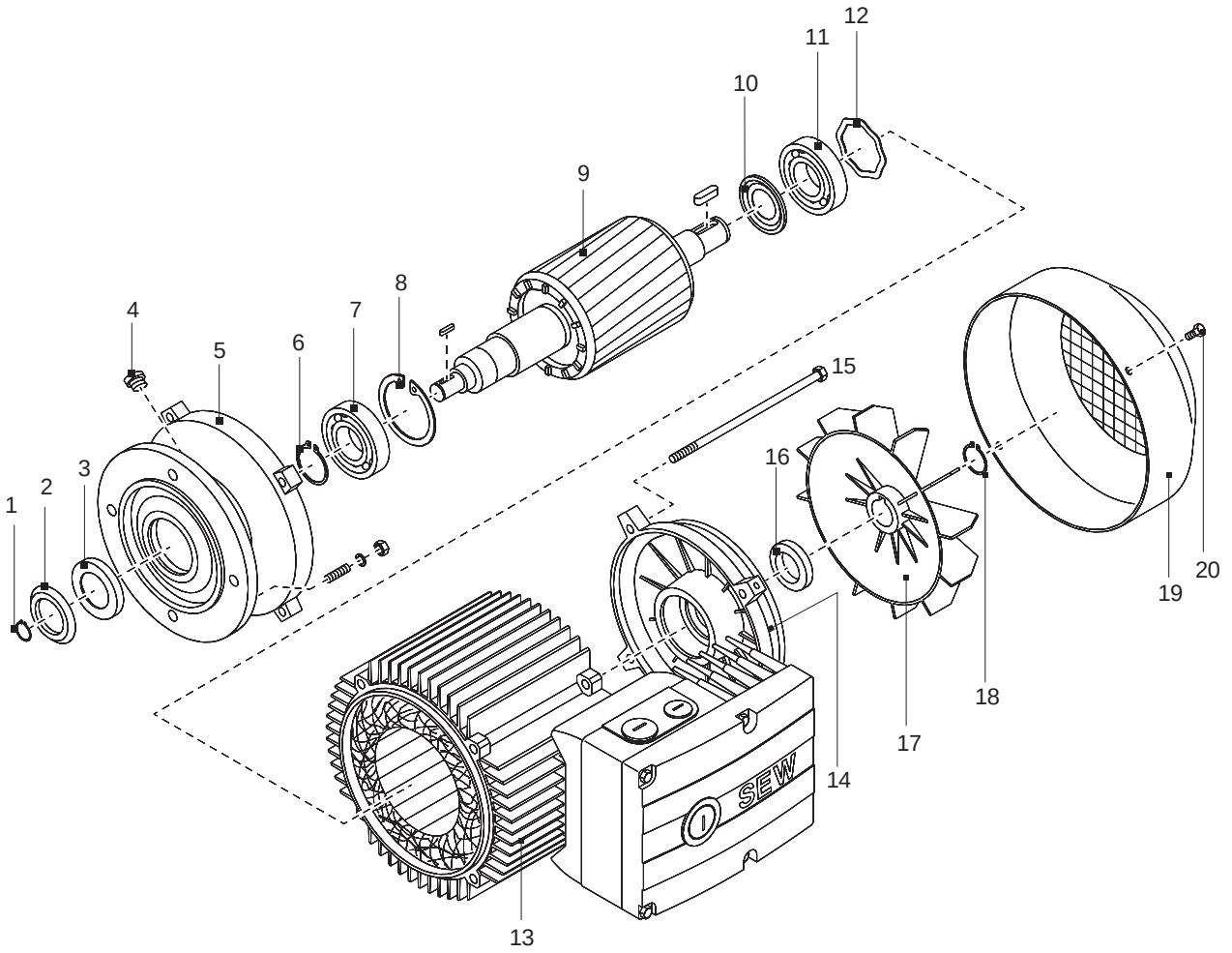


Fig. 23: Example of DFT...MM.. motor

1	Circlip	6	Circlip	11	Ball bearing	16	V-ring
2	Oil flinger	7	Ball bearing	12	Equalizing ring	17	Fan
3	Oil seal	8	Circlip	13	Stator	18	Circlip
4	Screw plug	9	Rotor	14	Non-drive end bearing end shield	19	Fan guard
5	Drive end bearing end shield	10	Nilos ring	15	Hex head screw	20	Housing screw

8.2.1 Inspecting the motor

1. **Important: Isolate MOVIMOT® from the supply, safeguarding it against unintentional power-up.**
2. Remove proximity sensor NV16 / NV26 if fitted.
3. Remove the flange cover or fan guard (19).
4. Remove the hexagon head cap screws (15) from the drive end bearing end shield (5) and the non-drive end bearing end shield (14), release the stator (13) from the drive end bearing end shield.
5. a) Motors with a brake:
   - Open the connection box cover, unfasten the brake cable from its terminals
   - Push the non-drive end bearing end shield and the brake off the stator and carefully lift them off (if necessary, run the brake cable along with trailing wire)

   b) Pull the stator back by approx. 3 to 4 cm
6. Visual check:
   Are there traces of gear oil or condensation inside the stator?
   – If not, continue with 9
   – If there is condensation, continue with 7
   – If there is gear oil, have the motor repaired by a specialist workshop
7. a) Geared motors: Remove the motor from the gear unit.
   b) Motors without a gear unit: Remove the drive end flange.
   c) Remove the rotor (9).
8. Clean the winding, dry it and check it electrically.
9. Fit new ball bearings (7, 11) (only use authorized ball bearings, see section 8.4).
10. Fit a new oil seal (3) in the drive end bearing end shield.
11. Reseal the stator seat, reassemble the motor, brake, etc.
12. Then check the gear unit if applicable (see the gear unit operating instructions).

8.3 Inspection and maintenance work, brake

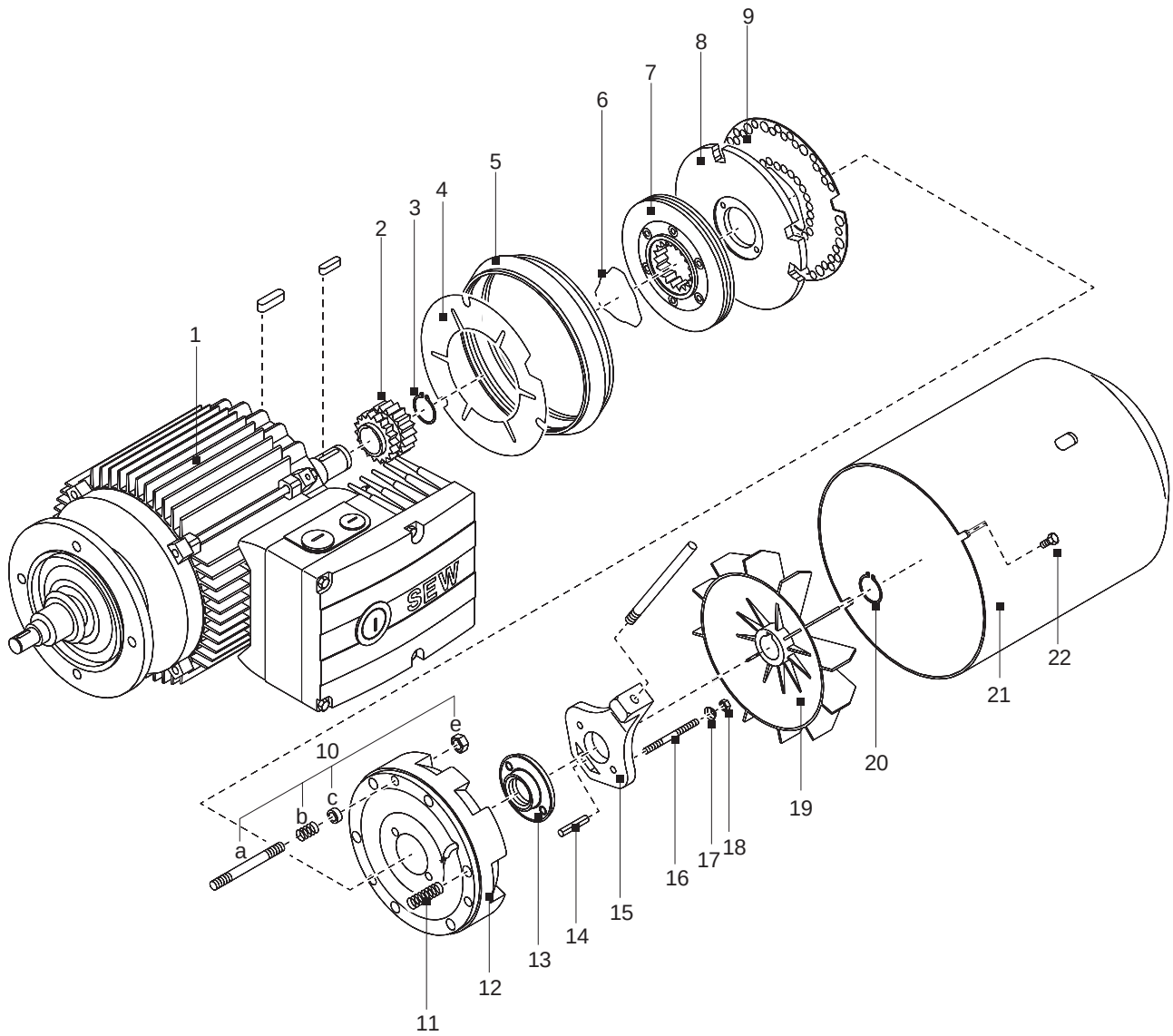


Fig. 24: Type BMG 05 - BMG4

1 Motor with brake bearing end shield
2 Carrier
3 Circlip
4 Niro disk
5 Rubber sealing collar
6 Annular spring
7 Brake disk
8 Pressure plate
9 Damping plate (BMG only)
10a Stud (3 pcs.)
10b Counter spring
10c Pressure ring
10e Hexagon nut
11 Brake spring
12 Brake coil body
13 Sealing washer
14 Dowel pin
15 Releasing lever with hand lever
16 Stud (2 pcs.)
17 Conical coil spring
18 Setting nut
19 Fan
20 Circlip
21 Fan guard
22 Housing screw

8.3.1 Inspecting the brake, setting the working air gap

1. **Isolate MOVIMOT® from the supply, safeguarding it against unintentional power-up.**
2. Remove the following:
   - Proximity sensor NV16 / NV26, if fitted
   - Flange cover or fan guard (21).
3. Push the rubber sealing collar (5) aside (loosen the clamp to do this if necessary). Vacuum up the abraded particles.
4. Measure the brake disk (7, 7b):
   - If the brake disk is ≤ 9 mm: Fit a new brake disk (see section 8.3.2)
5. Measure the working air gap A (see Fig. 25).
   - Using a feeler gauge at three points offset by approx. 120° between the pressure plate and the damping plate (9)
6. Tighten the hexagon nuts (10e) until the working air gap is set correctly (see section 8.5).
7. Fit the rubber sealing collar back in place and re-install the dismantled parts.

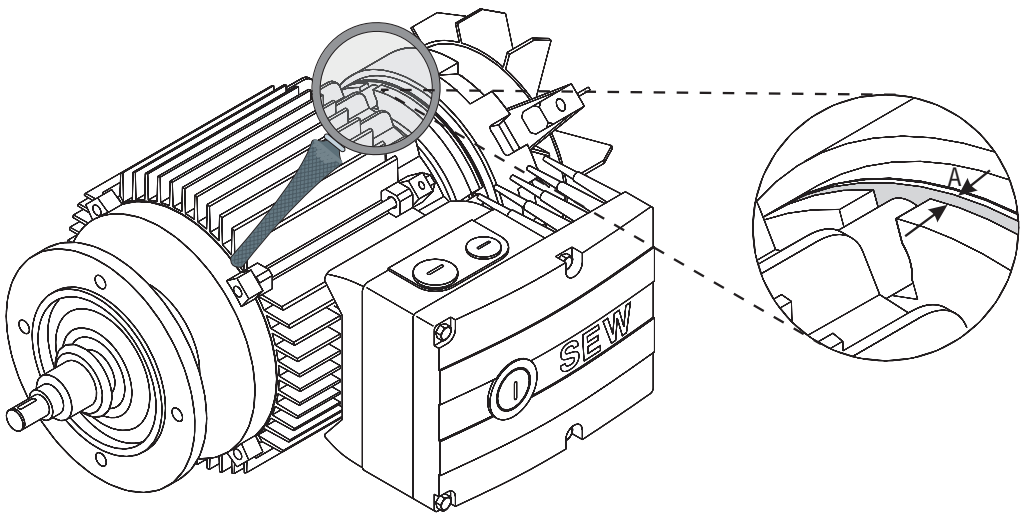


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Fig. 25: Setting the working air gap

8.3.2 Fitting a new brake disk

When fitting a new brake disk, inspect the other removed parts as well and fit new ones if necessary.

1. **Isolate MOVIMOT® from the supply, safeguarding it against unintentional power-up.**
2. Remove the following:
   - Proximity sensor NV16 / NV26, if fitted
   - Flange cover or fan guard (21), circlip (20) and fan (19)
3. Remove the rubber sealing collar (5).
   Remove the manual brake release: setting nuts (18), conical coil springs (17), studs (16), releasing lever (15).
4. Unscrew hex nuts (10e), carefully pull off the brake coil body (12) (brake cable!) and take out the brake springs (11).
5. Remove the damping plate (9), pressure plate (8) and brake disk (7, 7b) and clean the brake components.
6. Fit a new brake disk.
7. Reinstall the brake components (except for the rubber sealing collar, fan and fan guard). Set the working air gap (see section 8.3.1, points 5 to 7).
8. For manual brake release (type HF or HR):
   Use setting nuts to set the floating clearance between the conical coil springs (pressed flat) and the setting nuts (see Fig. 26).

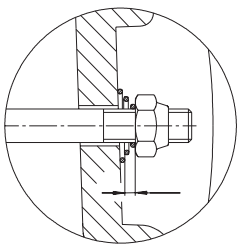
Important: This floating clearance is necessary so that the pressure plate can move up as the brake lining wears.

9. Fit the rubber sealing collar back in place and re-install the dismantled parts.

Note

- The lockable manual brake release (type HF) is already released if a resistance is encountered when operating the grub screw.
- The self-reengaging manual brake release (type HR) can be operated with normal hand pressure.

Important: In brake motors with self-reengaging manual brake release, the manual brake release lever must be removed after startup/maintenance. A bracket is provided for storing it on the outside of the motor.



Brake	Floating clearance [mm]
BMG 05 - 1	1.5
BMG 2 - BMG4	2

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Fig. 26: Floating clearance

8.3.3 Changing the braking torque

The braking torque can be changed in steps (see section 8.5).

- by installing different brake springs,
- by changing the number of brake springs.

1. **Isolate MOVIMOT® from the supply, safeguarding it against unintentional power-up.**
2. Remove the following:
   - Proximity sensor NV16 / NV26, if fitted
   - Flange cover or fan guard (21), circlip (20) and fan (19)
3. Remove the rubber sealing collar (5).
   Remove the manual brake release:
   setting nuts (18), conical coil springs (17), studs (16), releasing lever (15).
4. Unscrew the hexagon nuts (10e) and pull off the brake coil body (12) by about 50 mm (caution: brake cable!).
5. Change or add brake springs (11). (Position the brake springs symmetrically).
6. Reinstall the brake components (except for the rubber sealing collar, fan and fan guard). Set the working air gap (see section 8.3.1, points 5 to 7).
7. With manual brake release:
   Use setting nuts to set the floating clearance between the conical coil springs (pressed flat) and the releasing lever (see Fig. 26).

Important: This floating clearance is necessary so that the pressure plate can move up as the brake lining wears.

8. Fit the rubber sealing collar back in place and re-install the dismantled parts.

Note: Fit new setting nuts (18) and hexagon nuts (10e) if the removal procedure is repeated! (This is due to the reduction in the self-locking effect of the nuts!)

8.4 Permitted ball bearing types

Motor type	Driving end A-bearing (AC motor, brake motor)			Non-driving end B-bearing (foot-mounted, flange-mounted, geared motors)	
	Flange-mounted motor	Geared motor	Foot-mounted motor	AC motor	Brake motor
DT 71-80	6204-Z-J	6303-Z-J	6204-Z-J	6203-J	6203-RS-J-C3
DT 90-100	6306-Z-J-C3			6205-J	6205-RS-J-C3

8.5 Working air gap, braking torque of brake

Brake	Motor	Working air gap mm		Braking torque settings				
		min.[1]	max.	Braking torque [Nm]	Type and number of springs		Order numbers of springs	
					Normal	Red	Normal	Red
BMG 05	**DT 71**	0.25	0.6	5.0 4.0 2.5 1.6 1.2	3 2 - - -	- 2 6 4 3	135 017 X	135 018 8
BMG 1	**DT 80**			10 7.5 6.0	6 4 3	- 2 3		
BMG 2	**DT 90**			20 16 10 6.6 5.0	3 2 - - -	- 2 6 4 3	135 150 8	135 151 6
BMG 4	**DT 100**			40 30 24	6 4 3	- 2 3		

1) Please note when checking the working air gap:
Parallelism tolerances on the brake disk may give rise to deviations of ± 0.1 mm after a test run.

9 Technical Data

9.1 IEC design with connection voltages 380 ... 500 V_{AC}

MOVIMOT® type		MM 03B-503-00	MM 05B-503-00	MM 07B-503-00	MM 11B-503-00	MM 15B-503-00	MM 22B-503-00	MM 30B-503-00
Part number		**823 022 6**	**823 023 4**	**823 024 2**	**823 025 0**	**823 026 9**	**822 953 8**	**822 954 6**
Output power at V_{in} = 380 – 500 V_{AC}	P_{rated}	1.1 kVA	1.4 kVA	1.8 kVA	2.2 kVA	2.8 kVA	3.8 kVA	5.1 kVA
Connection voltages Permitted range	V_{in}	3 x 380 V_{AC} / **400 V_{AC}** /415 V_{AC} /460 V_{AC} /500 V_{AC} V_{in} = 380 V_{AC} -10 % ... 500 V_{AC} +10 %						
Supply frequency	f_{supply}	50 Hz – 60 Hz ± 10 %						
Rated system current (at V_{in} = 400 V_{AC})	I_{system}	1.3 A_{AC}	1.6 A_{AC}	1.9 A_{AC}	2.4 A_{AC}	3.5 A_{AC}	5.0 A_{AC}	6.7 A_{AC}
Output voltage	V_{out}	0 ... V_{in}						
Output frequency **Resolution** **Operating point**	f_{out}	2 ... 100 Hz 0.01 Hz 400 V at 50 Hz / 100 Hz						
Output rated current	I_{rated}	1.6 A_{AC}	2.0 A_{AC}	2.5 A_{AC}	3.2 A_{AC}	4.0 A_{AC}	5.5 A_{AC}	7.3 A_{AC}
Motor power	P_{mot}	**0.37 kW**	**0.55 kW**	**0.75 kW**	**1.1 kW**	**1.5 kW**	**2.2 kW**	**3.0 kW**
PWM frequency		**4**[1] / 8 / 12 / 16[2] kHz						
Current limitation	I_{max}	**motor:** 160 % with ⋎, 150 % with △ **regenerative:** 160 % with ⋎, 150 % with △						
External braking resistor	R_{min}	200 Ω					100 Ω	
Interference immunity		Complies with EN 50082 – Parts 1+2						
Interference emission		In accordance with limit value class A to EN 55011 and EN 55014, complies with EN 50081 – Part 2						
Ambient temperature	ϑ_{amb}	**-25 °C ... 40 °C** (P_{rated} reduction: 3 n % I_{rated} per K to max. 60 °C)						
Enclosure		IP54, IP55, IP65 (options, specify when ordering)						
Operating mode		DB (EN 60149-1-1 and 1-3)						
Type of cooling (DIN 41 751)		Self-cooling						
Altitude		h ≤ 1000 m (P_{rated} reduction: 1 % per 100 m up to max. 2000 m)						
Ext. power supply to electronics	Tl. 24 V	V = +24 V ± 25 % I_{in} ≤ 250 mA						
Binary inputs		Isolated by opto-coupler, PLC-compatible (EN 61131-2) R_i ≈ 3.0 kΩ, I_{in} ≈10 mA, sampling interval ≤ 5 ms						
Signal level		+13 V ... +30 V = "1" = Contact made -3 V ... +5 V = "0" = Contact not made						
Control functions	Tl. R ↻ Tl. L ↺ Tl. f1/f2	CW/STOP CCW/STOP "0" = Setpoint 1 / "1" = Setpoint 2						
Output relay **Contact data**	Tl. K1a Tl. K1b	Response time≤ 10 ms 24 V_{DC} / 0.6 A_{DC} / DC11 to IEC 337-1						
Signaling function		Normally open contact for ready signal						
Serial interface	Tl. RS+ Tl. RS-	RS-485 (to EIA standard) Max. 32 stations (1 bus master[3] + 31 MOVIMOT® units) Max. cable length: 200 m (for transmission rate: 9600 baud) 30 m (for transmission rate: 31250 baud [4])						

1) Factory setting
2) 16 kHz PWM frequency (low noise) When DIP SWITCH S1/7 = ON, the units operate with a 16 kHz PWM frequency (low noise) and switch back in steps to lower switching frequencies depending on the heat sink temperature.
3) Ext. control or MBG1A1, MWA21A or MLG..A option
4) Transmission rate 31250 baud is detected automatically when operating with fieldbus interface MF...

9.2 UL design with connection voltages 380 ... 500 V_{AC}

MOVIMOT® type		MM 03B-503-00	MM 05B-503-00	MM 07B-503-00	MM 11B-503-00	MM 15B-503-00	MM 22B-503-00	MM 30B-503-00
Part number		**823 022 6**	**823 023 4**	**823 024 2**	**823 025 0**	**823 026 9**	**822 953 8**	**822 954 6**
Output power at V_{in} = 380 – 500 V_{AC}	P_N	1.1 kVA	1.4 kVA	1.8 kVA	2.2 kVA	2.8 kVA	3.8 kVA	5.1 kVA
Connection voltages Permitted range	V_{in}	3 x 380 V_{AC} / 400 V_{AC} /415 V_{AC} /**460 V_{AC}** / 500 V_{AC} V_{in} = 380 V_{AC} -10 % ... 500 V_{AC} +10 %						
Supply frequency	f_{supply}	50 Hz ... 60 Hz ± 10 %						
Rated system current (at V_{in} = 460 V_{AC})	I_{system}	1.1 A_{AC}	1.4 A_{AC}	1.7 A_{AC}	2.1 A_{AC}	3.0 A_{AC}	4.3 A_{AC}	5.8 A_{AC}
Output voltage	V_{out}	0 ... V_{in}						
Output frequency Resolution Operating point	f_{out}	2 ... 100 Hz 0.01Hz 460 V at 60 Hz						
Output rated current	I_{rated}	1.6 A_{AC}	2.0 A_{AC}	2.5 A_{AC}	3.2 A_{AC}	4.0 A_{AC}	5.5 A_{AC}	7.3 A_{AC}
Motor power	P_{mot}	**0.37 kW 0.5 HP**	**0.55 kW 0.75 HP**	**0.75 kW 1.0 HP**	**1.1 kW 1.5 HP**	**1.5 kW 2 HP**	**2.2 kW 3.0 HP**	**3.7 kW 5 HP**
PWM frequency		**4**[1] / 8 / 12 / 16[2] kHz						
Current limitation	I_{max}	**motor:** 160 % with ⋎ **regenerative:** 160 % with ⋎						
External braking resistor	R_{min}	200 Ω					100 Ω	
Interference immunity		Complies with EN 50082 – Parts 1+2						
Interference emission		In accordance with limit value class A to EN 55011 and EN 55014, complies with EN 50081 – Part 2						
Ambient temperature	ϑ_{amb}	**-25 °C – 40 °C** (P_{rated} reduction: 3 % I_{rated} per K to max. 60 °C)						
Enclosure		IP54, IP55, IP65 (options, specify when ordering)						
Operating mode		DB (EN 60149-1-1 and 1-3)						
Type of cooling (DIN 41 751)		Self-cooling						
Altitude		h ≤ 1000 m (P_{rated} reduction: 1 % per 100 m up to max. 2000 m)						
Ext. power supply to electronics	Tl. 24 V	V = +24 V ± 25 % I_{in} ≤ 250 mA						
Binary inputs		Isolated by opto-coupler, PLC-compatible (EN 61131-2) R_i ≈ 3.0 kΩ, I_E ≈10 mA, sampling interval ≤ 5 ms						
Signal level		+13 V ... +30 V = "1" = Contact made –3 V ... +5 V = "0" = Contact not made						
Control functions	Tl. R ↻ Tl. L ↺ Tl. f1/f2	CW/STOP CCW/STOP "0" = Setpoint 1 / "1" = Setpoint 2						
Output relay Contact data	Tl. K1a Tl. K1b	Response time ≤ 10 ms 24 V_{DC} / 0.6 A_{DC} / DC11 to IEC 337-1						
Signaling function		Normally open contact for ready signal						
Serial interface	Tl. RS+ Tl. RS-	RS-485 (to EIA standard) Max. 32 stations (1 bus master[3] + 31 MOVIMOT® units) Max. cable length: 200 m (for transmission rate: 9600 baud) 30 m (for transmission rate: 31250 baud [4])						

1) Factory setting
2) 16 kHz PWM frequency (low noise) When DIP SWITCH S1/7 = ON, the units operate with a 16 kHz PWM frequency (low noise) and switch back in steps to lower switching frequencies depending on the heat sink temperature.
3) Ext. control or MBG11A, MWA21A or MLG..A option
4) Transmission rate 31250 baud is detected automatically when operating with fieldbus interface MF...

9.3 UL design with connection voltages 200 ... 240 V_{AC}

MOVIMOT® type		MM 03B-233-00	MM 05B-233-00	MM 07B-233-00	MM 11B-233-00	MM 15B-233-00	MM 22B-233-00
Part number		**823 259 8**	**823 260 1**	**823 261 X**	**823 262 8**	**823 263 6**	**823 264 4**
Output power at V_{in} = 200 – 240 V_{AC}	P_{rated}	1.0 kVA	1.3 kVA	1.7 kVA	2.0 kVA	2.9 kVA	3.4 kVA
Connection voltages Permitted range	V_{in}	3 x 200 V_{AC} / **230 V_{AC}** / 240 V_{AC} V_{in} = 200 V_{AC} -10 % ... 240 V_{AC} +10 %					
Supply frequency	f_{supply}	50 Hz ... 60 Hz ± 10 %					
Rated system current (at V_{in} = 230 V_{AC})	I_{system}	2.2 A_{AC}	2.9 A_{AC}	3.5 A_{AC}	4.7 A_{AC}	6.2 A_{AC}	8.2 A_{AC}
Output voltage	V_{out}	0 ... V_{in}					
Output frequency Resolution Operating point	f_{out}	2 ... 100 Hz 0.01Hz 230 V at 60 Hz					
Output rated current	I_{rated}	2.5 A_{AC}	3.3 A_{AC}	4.2 A_{AC}	5.7 A_{AC}	6.9 A_{AC}	9.0 A_{AC}
Motor power	P_{mot}	**0.37 kW 0.5 HP**	**0.55 kW 0.75 HP**	**0.75 kW 1.0 HP**	**1.1 kW 1.5 HP**	**1.5 kW 2 HP**	**2.2 kW 3.0 HP**
PWM frequency		**4**[1] / 8 / 12 / 16[2] kHz					
Current limitation	I_{max}	**motor:** 160 % with ⋎⋎ **regenerative:** 160 % with ⋎⋎					
External braking resistor	R_{min}	27 Ω					
Interference immunity		Complies with EN 50082 – Parts 1+2					
Interference emission		In accordance with limit value class A to EN 55011 and EN 55014, complies with EN 50081 – Part 2					
Ambient temperature	ϑ_{amb}	**-25 °C ... 40 °C** (P_{rated} reduction: 3 % I_{rated} per K to max. 60 °C)					
Enclosure		IP54, IP55, IP65 (options, specify when ordering)					
Operating mode		DB (EN 60149-1-1 and 1-3)					
Type of cooling (DIN 41 751)		Self-cooling					
Altitude		h ≤ 1000 m (P_{rated} reduction: 1 % per 100 m up to max. 2000 m)					
Ext. power supply to electronics	Tl. 24 V	V = +24 V ± 25 % I_{in} ≤ 250 mA					
Binary inputs		Isolated by opto-coupler, PLC-compatible (EN 61131-2) R_i ≈ 3.0 kW, I_{in}≈10 mA, sampling interval ≤ 5 ms					
Signal level		+13 V ... +30 V = "1" = Contact made -3 V ... +5 V = "0" = Contact not made					
Control functions	Tl. R ↻ Tl. L ↺ Tl. f1/f2	CW/STOP CCW/STOP "0" = Setpoint 1 / "1" = Setpoint 2					
Output relay Contact data	Tl. K1a Tl. K1b	Response time ≤ 10 ms 24 V_{DC} / 0.6 A_{DC} / DC11 to IEC 337-1					
Signaling function		Normally open contact for ready signal					
Serial interface	Tl. RS+ Tl. RS-	RS-485 (to EIA standard) Max. 32 stations (1 bus master[3] + 31 MOVIMOT® units) Max. cable length: 200 m (for transmission rate: 9600 baud) 30 m (for transmission rate: 31250 baud [4])					

1) Factory setting
2) 16 kHz PWM frequency (low noise) When DIP SWITCH S1/7 = ON, the units operate with a 16 kHz PWM frequency (low noise) and switch back in steps to lower switching frequencies depending on the heat sink temperature.
3) Ext. control or MBG11A, MWA21A or MLG..A option
4) Transmission rate 31250 baud is detected automatically when operating with fieldbus interface MF...

9.4 Integrated RS-485 interface

RS-485 interface	
Standard	RS-485 (with integrated dynamic terminating resistor)
Baud rate	9.6 kbaud 31.25 kbaud (in conjunction with fieldbus interfaces MF..)
Start bits	1 start bit
Stop bits	1 stop bit
Data bits	8 data bits
Parity	1 parity bit, supplementing to even parity
Data direction	Unidirectional
Operating mode	Asynchronous, half-duplex
Line length	max. 200 m in RS-485 operation at 9600 baud
Number of stations	1 master and max. 31 stations (MOVIMOT® with address 1 to 15)

9.5 Assignment of internal braking resistors

MOVIMOT	MOVIMOT® type	Braking resistor
with input voltage 380 – 500 V_{AC}	MM03..MM15	BW1
	MM22..MM30	BW2
with input voltage 200 – 240 V_{AC}	MM03..MM07	BW3
	MM11..MM22	BW4

9.6 Resistance of the brake coil

Motor	Brake	Resistance of the brake coil[1)]	
		MOVIMOT® with input voltage 380 – 500 V_{AC}	**MOVIMOT® with input voltage 200 – 240 V_{AC}**
DT71	**BMG05**	277 Ω (230 V)	69.6 Ω (110 V)
DT80	**BMG1**	248 Ω (230 V)	62.2 Ω (110 V)
DT90	**BMG2**	216 Ω (230 V) / 54.2 Ω (110 V)	54.2 Ω (110 V)
DT100	**BMG4**	43.5 Ω (110 V)	27.3 Ω (88 V)

1) Rated value measured between the red connection (terminal 13) and the blue connection (terminal 15) at 20 °C, temperature-dependent fluctuations in the range -25 % / +40 % are possible.

9.7 Technical data, options

MLU..A

3921AXX

	for MOVIMOT® with connection voltages 380 to 500 V_{AC}	for MOVIMOT® with connection voltages 200 to 240 V_{AC}
Option	**MLU11A**	**MLU21A**
Part number	823 383 7	823 387 X
Input voltage	380 ... 500 V_{AC} ± 10 %	200 ... 240 V_{AC} ± 10 %
Output voltage	24 V_{DC} ±25 %	24 V_{DC} ±25 %
Output current	250 mA	250 mA
Enclosure	IP 65	IP 65

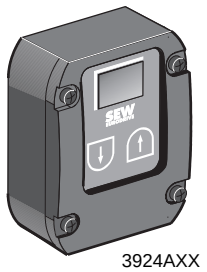
MLG..A


3922AXX

	for MOVIMOT® with connection voltages 380 to 500 V_{AC}	for MOVIMOT® with connection voltages 200 to 240 V_{AC}
Option	**MLG11A**	**MLG21A**
Part number	823 384 5	823 388 8
Input voltage	380 ... 500 V_{AC} ± 10 %	200 ... 240 V_{AC} ± 10 %
Output voltage	24 V_{DC} ±25 %	24 V_{DC} ±25 %
Output current	250 mA	250 mA
Setpoint resolution	1 %	1 %
Serial interface[1]	RS-485 for connecting a MOVIMOT® inverter	
Enclosure	IP 65	IP 65

1) with integrated dynamic terminating resistor

MBG11A

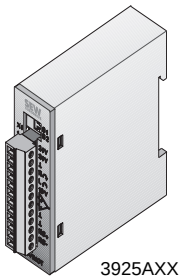


3924AXX

MBG11A option	
Part number	823 547 8
Input voltage	24 V_{DC} ±25 %
Current consumption	approx. 70 mA
Setpoint resolution	1 %
Serial interface[1]	RS-485 for connecting max. 31 MOVIMOT® inverters (max. 200 m, 9600 baud)
Enclosure	IP 65

1) with integrated dynamic terminating resistor

MWA21A

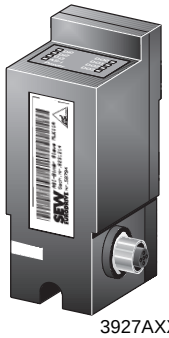


3925AXX

MWA21A option	
Part number	823 006 4
Input voltage	24 V_{DC} ±25 %
Current consumption	approx. 70 mA
Serial interface[1)]	RS-485 for connecting max. 31 MOVIMOT® inverters (max. 200 m, 9600 baud)
Analog input	0 ... 10 V / 2 ... 10 V, $R_i \approx 12k\Omega$ 0 ... 20 mA / 4 ... 20 mA, $R_i \approx 22\Omega$
Setpoint resolution of the analog input	8 bits
Output voltage **Output current**	+13 V ... +30 V = "1" - 3 V ... +5 V = "0"
Enclosure	IP 20

1) with integrated dynamic terminating resistor

MLK11A



3927AXX

MLK 11A option	
Part number	823 121 4
AS-i profile	7.F (free profile)
I/O configuration	7_{hex}
ID code	F_{hex}
Address	1 to 31 (factory setting: address 0) Address can be changed up to 10 times
Watchdog	≥ 40 ms (all outputs deenergized)
Ambient temperature	-25 °C to +60 °C
Enclosure	IP 65
Current consumption without external sensors	≤ 320 mA typically 250 mA including MLK11A (with MOVIMOT®) typically 150 mA including MLK11A (with MOVI-SWITCH®)
Total current consumption	≤ 420 mA (including sensor supply)
Sensor connection	
Voltage supply	18 V_{DC} to 30 V_{DC} from the AS-i network, short-circuit proof $I_{max} \leq$ 100 mA
Binary inputs DI2 / DI3	PNP switching
Signal level	"1" : U ≥ 10 V, I ≥ 6 mA (max. 10 mA) "0" : U ≤ 5 V, I ≤ 2 mA
Signal delay	< 5 ms

Address List

Germany			
Headquarters **Production** **Sales** **Service**	**Bruchsal**	SEW-EURODRIVE GmbH & Co Ernst-Blickle-Straße 42 D-76646 Bruchsal P.O. Box Postfach 3023 · D-76642 Bruchsal	Tel. (0 72 51) 75-0 Fax (0 72 51) 75-19 70 Telex 7 822 391 http://www.SEW-EURODRIVE.de sew@sew-eurodrive.de
Production	**Graben**	SEW-EURODRIVE GmbH & Co Ernst-Blickle-Straße 1 D-76676 Graben-Neudorf P.O. Box Postfach 1220 · D-76671 Graben-Neudorf	Tel. (0 72 51) 75-0 Fax (0 72 51) 75-29 70 Telex 7 822 276
Assembly **Service**	**Garbsen** (near Hannover)	SEW-EURODRIVE GmbH & Co Alte Ricklinger Straße 40-42 D-30823 Garbsen P.O. Box Postfach 110453 · D-30804 Garbsen	Tel. (0 51 37) 87 98-30 Fax (0 51 37) 87 98-55
	Kirchheim (near München)	SEW-EURODRIVE GmbH & Co Domagkstraße 5 D-85551 Kirchheim	Tel. (0 89) 90 95 52-10 Fax (0 89) 90 95 52-50
	Langenfeld (near Düsseldorf)	SEW-EURODRIVE GmbH & Co Siemensstraße 1 D-40764 Langenfeld	Tel. (0 21 73) 85 07-30 Fax (0 21 73) 85 07-55
	Meerane (near Zwickau)	SEW-EURODRIVE GmbH & Co Dänkritzer Weg 1 D-08393 Meerane	Tel. (0 37 64) 76 06-0 Fax (0 37 64) 76 06-30
	Additional addresses for service in Germany provided on request!		
France			
Production **Sales** **Service**	**Haguenau**	SEW-USOCOME SAS 48-54, route de Soufflenheim B. P. 185 F-67506 Haguenau Cedex	Tel. 03 88 73 67 00 Fax 03 88 73 66 00 http://www.usocome.com sew@usocome.com
Assembly **Service** **Technical Offices**	**Bordeaux**	SEW-USOCOME SAS Parc d'activités de Magellan 62, avenue de Magellan - B. P. 182 F-33607 Pessac Cedex	Tel. 05 57 26 39 00 Fax 05 57 26 39 09
	Lyon	SEW-USOCOME SAS Parc d'Affaires Roosevelt Rue Jacques Tati F-69120 Vaulx en Velin	Tel. 04 72 15 37 00 Fax 04 72 15 37 15
	Paris	SEW-USOCOME SAS Zone industrielle 2, rue Denis Papin F-77390 Verneuil l'Etang	Tel. 01 64 42 40 80 Fax 01 64 42 40 88
	Additional addresses for service in France provided on request!		
Argentina			
Assembly **Sales** **Service**	**Buenos Aires**	SEW EURODRIVE ARGENTINA S.A. Centro Industrial Garin, Lote 35 Ruta Panamericana Km 37,5 1619 Garin	Tel. (3327) 45 72 84 Fax (3327) 45 72 21 sewar@sew-eurodrive.com.ar
Australia			
Assembly **Sales** **Service**	**Melbourne**	SEW-EURODRIVE PTY. LTD. 27 Beverage Drive Tullamarine, Victoria 3043	Tel. (03) 99 33 10 00 Fax (03) 99 33 10 03
	Sydney	SEW-EURODRIVE PTY. LTD. 9, Sleigh Place, Wetherill Park New South Wales, 2164	Tel. (02) 97 25 99 00 Fax (02) 97 25 99 05
Austria			
Assembly **Sales** **Service**	**Wien**	SEW-EURODRIVE Ges.m.b.H. Richard-Strauss-Strasse 24 A-1230 Wien	Tel. (01) 6 17 55 00-0 Fax (01) 6 17 55 00-30 sew@sew-eurodrive.at

Belgium			
Assembly **Sales** **Service**	**Brüssel**	CARON-VECTOR S.A. Avenue Eiffel 5 B-1300 Wavre	Tel. (010) 23 13 11 Fax (010) 2313 36 http://www.caron-vector.be info@caron-vector.be
Brazil			
Production **Sales** **Service**	**Sao Paulo**	SEW DO BRASIL Motores-Redutores Ltda. Caixa Postal 201-0711-970 Rodovia Presidente Dutra km 208 CEP 07210-000 Guarulhos-SP	Tel. (011) 64 60-64 33 Fax (011) 64 80-46 12 sew.brasil@originet.com.br
Bulgaria			
Sales	**Sofia**	BEVER-DRIVE GMBH Bogdanovetz Str.1 BG-1606 Sofia	Tel. (92) 9 53 25 65 Fax (92) 9 54 93 45 bever@mbox.infotel.bg
Canada			
Assembly **Sales** **Service**	**Toronto**	SEW-EURODRIVE CO. OF CANADA LTD. 210 Walker Drive Bramalea, Ontario L6T3W1	Tel. (905) 7 91-15 53 Fax (905) 7 91-29 99
	Vancouver	SEW-EURODRIVE CO. OF CANADA LTD. 7188 Honeyman Street Delta. B.C. V4G 1 E2	Tel. (604) 9 46-55 35 Fax (604) 946-2513
	Montreal	SEW-EURODRIVE CO. OF CANADA LTD. 2555 Rue Leger Street LaSalle, Quebec H8N 2V9	Tel. (514) 3 67-11 24 Fax (514) 3 67-36 77
Chile			
Assembly **Sales** **Service**	**Santiago de Chile**	SEW-EURODRIVE CHILE Motores-Reductores LTDA. Panamericana Norte No 9261 Casilla 23 - Correo Quilicura RCH-Santiago de Chile	Tel. (02) 6 23 82 03+6 23 81 63 Fax (02) 6 23 81 79
China			
Production **Assembly** **Sales** **Service**	**Tianjin**	SEW-EURODRIVE (Tianjin) Co., Ltd. No. 46, 7th Avenue, TEDA Tianjin 300457	Tel. (022) 25 32 26 12 Fax (022) 25 32 26 11
Colombia			
Assembly **Sales** **Service**	**Bogotá**	SEW-EURODRIVE COLOMBIA LTDA. Calle 22 No. 132-60 Bodega 6, Manzana B Santafé de Bogotá	Tel. (0571) 5 47 50 50 Fax (0571) 5 47 50 44 sewcol@andinet.com
Croatia			
Sales **Service**	**Zagreb**	KOMPEKS d. o. o. PIT Erdödy 4 II HR 10 000 Zagreb	Tel. +385 14 61 31 58 Fax +385 14 61 31 58
Czech Republic			
Sales	**Praha**	SEW-EURODRIVE S.R.O. Business Centrum Praha Luná 591 16000 Praha 6	Tel. 02/20 12 12 34 + 20 12 12 36 Fax 02/20 12 12 37 sew@sew-eurodrive.cz
Denmark			
Assembly **Sales** **Service**	**Kopenhagen**	SEW-EURODRIVEA/S Geminivej 28-30, P.O. Box 100 DK-2670 Greve	Tel. 4395 8500 Fax 4395 8509
Estonia			
Sales	**Tallin**	ALAS-KUUL AS Paldiski mnt.125 EE 0006 Tallin	Tel. 6 59 32 30 Fax 6 59 32 31

Finland			
Assembly **Sales** **Service**	**Lahti**	SEW-EURODRIVE OY Vesimäentie 4 FIN-15860 Hollola 2	Tel. (3) 589 300 Fax (3) 780 6211
Great Britain			
Assembly **Sales** **Service**	**Normanton**	SEW-EURODRIVE Ltd. Beckbridge Industrial Estate P.O. Box No.1 GB-Normanton, West- Yorkshire WF6 1QR	Tel. 19 24 89 38 55 Fax 19 24 89 37 02
Greece			
Sales **Service**	**Athen**	Christ. Boznos & Son S.A. 12, Mavromichali Street P.O. Box 80136, GR-18545 Piraeus	Tel. 14 22 51 34-6 + 14 22 51 48-9 Fax 1-4 22 51 59 Boznos@otenet.gr
Hong Kong			
Assembly **Sales** **Service**	**Hong Kong**	SEW-EURODRIVE LTD. Unit No. 801-806, 8th Floor Hong Leong Industrial Complex No. 4, Wang Kwong Road Kowloon, Hong Kong	Tel. 2-7 96 04 77 + 79 60 46 54Fax 2-7 95-91 29sew@sewhk.com
Hungary			
Sales **Service**	**Budapest**	SEW-EURODRIVE Kft. H-1037 Budapest Kunigunda u. 18	Tel. +36 1 437 06 58 Fax +36 1 437 06 50
India			
Assembly **Sales** **Service**	**Baroda**	SEW-EURODRIVE India Private Limited Plot NO. 4, Gidc Por Ramangamdi · Baroda - 391 243 Gujarat	Tel. 0 265-83 10 86 Fax 0 265-83 10 87 sewindia@wilnetonline.net
Ireland			
Sales **Service**	**Dublin**	Alperton Engineering Ltd. 48 Moyle Road Dublin Industrial Estate Glasnevin, Dublin 11	Tel. (01) 8 30 62 77 Fax (01) 8 30 64 58
Italy			
Assembly **Sales** **Service**	**Milano**	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Via Bernini,14 I-20020 Solaro (Milano)	Tel. (02) 96 98 01 Fax (02) 96 79 97 81
Japan			
Assembly **Sales** **Service**	**Toyoda-cho**	SEW-EURODRIVE JAPAN CO., LTD 250-1, Shimoman-no, Toyoda-cho, Iwata gun Shizuoka prefecture, P.O. Box 438-0818	Tel. (0 53 83) 7 3811-13 Fax (0 53 83) 7 3814
Korea			
Assembly **Sales** **Service**	**Ansan-City**	SEW-EURODRIVE CO., LTD. R 601-4, Banweol Industrial Estate Unit 1048-4, Shingil-Dong Ansan 425-120	Tel. (031) 4 92-80 51 Fax (031) 4 92-80 56
Luxembourg			
Assembly **Sales** **Service**	**Brüssel**	CARON-VECTOR S.A. Avenue Eiffel 5 B-1300 Wavre	Tel. (010) 23 13 11 Fax (010) 2313 36 http://www.caron-vector.be info@caron-vector.be
Macedonia			
Sales	**Skopje**	SGS-Skopje / Macedonia "Teodosij Sinactaski" 6691000 Skopje / Macedonia	Tel. (0991) 38 43 90 Fax (0991) 38 43 90

Malaysia			
Assembly **Sales** **Service**	**Johore**	SEW-EURODRIVE SDN BHD No. 95, Jalan Seroja 39, Taman Johor Jaya 81000 Johor Bahru, Johor West Malaysia	Tel. (07) 3 54 57 07 + 3 54 94 09 Fax (07) 3 5414 04
Netherlands			
Assembly **Sales** **Service**	**Rotterdam**	VECTOR Aandrijftechniek B.V. Industrieweg 175 NL-3044 AS Rotterdam Postbus 10085 NL-3004AB Rotterdam	Tel. (010) 4 46 37 00 Fax (010) 4 15 55 52
New Zealand			
Assembly **Sales** **Service**	**Auckland**	SEW-EURODRIVE NEW ZEALAND LTD. P.O. Box 58-428 82 Greenmount drive East Tamaki Auckland	Tel. 0064-9-2 74 56 27 Fax 0064-9-2 74 01 65 sales@sew-eurodrive.co.nz
	Christchurch	SEW-EURODRIVE NEW ZEALAND LTD. 10 Settlers Crescent, Ferrymead Christchurch	Tel. (09) 3 84 62 51 Fax (09) 3 84 64 55 sales@sew-eurodrive.co.nz
Norway			
Assembly **Sales** **Service**	**Moss**	SEW-EURODRIVE A/S Solgaard skog 71 N-1539 Moss	Tel. (69) 2410 20 Fax (69) 2410 40
Peru			
Assembly **Sales** **Service**	**Lima**	SEW DEL PERU MOTORES REDUCTORES S.A.C. Los Calderos # 120-124 Urbanizacion Industrial Vulcano, ATE, Lima	Tel. (511) 349-52 80 Fax (511) 349-30 02
Poland			
Sales	**Lodz**	SEW-EURODRIVE Polska Sp.z.o.o. ul. Pojezierska 63 91-338 Lodz	Tel. (042) 6 16 22 00 Fax (042) 6 16 22 10 sew@sew-eurodrive.pl
Portugal			
Assembly **Sales** **Service**	**Coimbra**	SEW-EURODRIVE, LDA. Apartado 15 P-3050-901 Mealhada	Tel. (0231) 20 96 70 Fax (0231) 20 36 85 infosew@sew-eurodrive.pt
Romania			
Sales **Service**	**Bucuresti**	Sialco Trading SRL str. Madrid nr.4 71222 Bucuresti	Tel. (01) 2 30 13 28 Fax (01) 2 30 71 70 sialco@mediasat.ro
Russia			
Sales	**St. Petersburg**	ZAO SEW-EURODRIVE P.O. Box 193 193015 St. Petersburg	Tel. (812) 3 26 09 41 + 5 35 04 30 Fax (812) 5 35 22 87 sewrus@post.spbnit.ru
Singapore			
Assembly **Sales** **Service**		SEW-EURODRIVE PTE. LTD. No 9, Tuas Drive 2 Jurong Industrial Estate Singapore 638644	Tel. 8 62 17 01-705 Fax 8 61 28 27 Telex 38 659

South Africa			
Assembly **Sales** **Service**	**Johannesburg**	SEW-EURODRIVE (PROPRIETARY) LIMITED Eurodrive House Cnr. Adcock Ingram and Aerodrome Roads Aeroton Ext. 2 Johannesburg 2013 P.O.Box 90004 Bertsham 2013	Tel. 0027-11-248-70 00 Fax 0027-11-494-23 11
	Capetown	SEW-EURODRIVE (PROPRIETARY) LIMITED Rainbow Park Cnr. Racecourse & Omuramba Road Montague Gardens, 7441 Cape Town P.O.Box 53 573 Racecourse Park, 7441 Cape Town	Tel. (021) 5 11 09 87 Fax (021) 5 11 44 58 Telex 576 062
	Durban	SEW-EURODRIVE (PROPRIETARY) LIMITED 2 Monaceo Place Pinetown Durban P.O. Box 10433, Ashwood 3605	Tel. 0027-31-700-34 51 Fax 0027-31-700-38 47
Spain			
Assembly **Sales** **Service**	**Bilbao**	SEW-EURODRIVE ESPAÑA, S.L. Parque Tecnologico, Edificio, 302 E-48170 Zamudio (Vizcaya)	Tel. 9 44 31 84 70 Fax 9 44 31 84 71 sew.spain@sew-eurodrive.es
Sweden			
Assembly **Sales** **Service**	**Jönköping**	SEW-EURODRIVE AB Gnejsvägen 6-8 S-55303 Jönköping Box 3100 S-55003 Jönköping	Tel. (036) 34 42 00 Fax (036) 34 42 80 www.sew-eurodrive.se
Switzerland			
Assembly **Sales** **Service**	**Basel**	Alfred Imhof A.G. Jurastrasse 10 CH-4142 Münchenstein bei Basel	Tel. (061) 4 17 17 17 Fax (061) 4 17 17 00 http://www.imhof-sew.ch info@imhof-sew.ch
Thailand			
Assembly **Sales** **Service**	**Chon Buri**	SEW-EURODRIVE (Thailand) Ltd. Bangpakong Industrial Park 2 700/456, Moo.7, Tambol Donhuaroh Muang District Chon Buri 20000	Tel. 0066-38 21 40 22 Fax 0066-38 21 45 31
Turkey			
Assembly **Sales** **Service**	**Istanbul**	SEW-EURODRIVE Hareket Sistemleri San. ve Tic. Ltd. Sti Bagdat Cad. Koruma Cikmazi No. 3 TR-81540 Maltepe ISTANBUL	Tel. (0216) 4 41 91 63 + 4 41 91 64 + 3 83 80 14 + 3 83 80 15 Fax (0216) 3 05 58 67 seweurodrive@superonline.com.tr
USA			
Production **Assembly** **Sales** **Service**	**Greenville**	SEW-EURODRIVE INC. 1295 Old Spartanburg Highway P.O. Box 518 Lyman, S.C. 29365	Tel. (864) 4 39 75 37 Fax Sales (864) 439-78 30 Fax Manuf. (864) 4 39-99 48 Fax Ass. (864) 4 39-05 66 Telex 805 550

USA			
Assembly **Sales** **Service**	**San Francisco**	SEW-EURODRIVE INC. 30599 San Antonio St. Hayward, California 94544-7101	Tel. (510) 4 87-35 60 Fax (510) 4 87-63 81
	Philadelphia/PA	SEW-EURODRIVE INC. Pureland Ind. Complex 200 High Hill Road, P.O. Box 481 Bridgeport, New Jersey 08014	Tel. (856) 4 67-22 77 Fax (856) 8 45-31 79
	Dayton	SEW-EURODRIVE INC. 2001 West Main Street Troy, Ohio 45373	Tel. (9 37) 3 35-00 36 Fax (9 37) 4 40-37 99
	Dallas	SEW-EURODRIVE INC. 3950 Platinum Way Dallas, Texas 75237	Tel. (214) 3 30-48 24 Fax (214) 3 30-47 24
	Additional addresses for service in the USA provided on request!		
Venezuela			
Assembly **Sales** **Service**	**Valencia**	SEW-EURODRIVE Venezuela S.A. Av. Norte Sur No. 3, Galpon 84-319 Zona Industrial Municipal Norte Valencia	Tel. (041) 32 95 83 + 32 98 04 + 32 94 51 Fax (041) 38 62 75 sewventas@cantr.net sewfinanzas@cantr.net

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