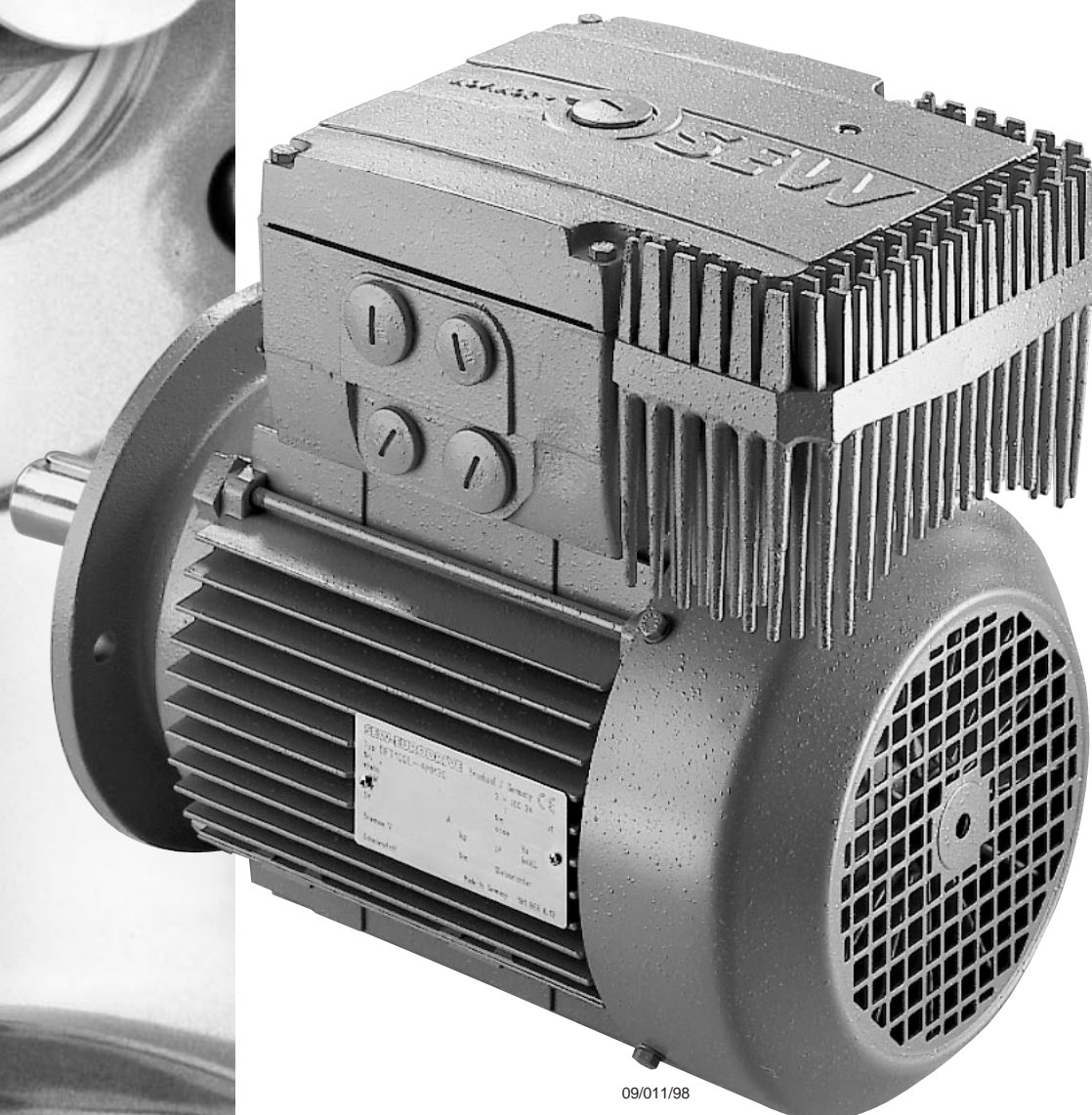


MOVIMOT®

**Operating Instructions
MM03B - MM30B**

Edition 08/99



09/01/98

0918 1415 / 0899



**SEW
EURODRIVE**



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Important Notes

Safety and warning instructions , disposal

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



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

A requirement for fault-free operation and fulfillment of any rights to claim under guarantee is that you observe the information in the operating instructions.

The operating instructions contain important information about servicing and should therefore be kept in the vicinity of the unit.

Waste Disposal



This product consists of

- iron
- aluminum
- copper
- plastic
- electronic components

Please dispose of these components according to the valid guidelines.



2 Safety Notes



- **Never install damaged products nor 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 in compliance 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).
Necessary protective measures: Grounding of unit.
- **Disconnect the unit from the supply system** prior to **removing the protective cover**. Dangerous voltages **may still be present for up to 1 minute after mains disconnection**.
- The terminal box cover is to remain closed during operation.
- The fact that the **Status LED** and other display elements are no longer illuminated does **not indicate** that the unit has been disconnected from the power supply and **does not carry any voltage**.
- **Mechanical blocking** or unit-internal **safety functions** in MOVIMOT® can cause a **motor standstill**. Removal of the cause of this problem or a reset of MOVIMOT® can result in the motor **re-starting on its own**. If, for safety reasons, this is not permissible, the unit must be disconnected from the supply system before correcting the fault.
- **Important:** MOVIMOT® is not suitable for hoist applications!
- **Caution! Danger of burns!** The MOVIMOT® surface temperature (especially of the heat sink) can exceed 60°C (140°F) during operation!



Mechanical Installation

Before you begin, set tolerances for installation of MOVIMOT®

3 Mechanical Installation

Before you begin



Install MOVIMOT® only if

- the entries on the name plate of the drive match the mains power supply,
- the drive is undamaged (no damage caused by transport or storage) and
- it is certain that the following requirements have been met:
 - Ambient temperatures between -15°C and +40°C (5°F and 104°F) (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 (3,000 ft.) above sea level.

Installation tolerances

Shaft end	Flanges
Diametric tolerance in accordance with DIN 748 <ul style="list-style-type: none"> • ISO k6 with $\varnothing \leq 50\text{mm}$ • ISO m6 with $\varnothing > 50\text{mm}$ (Center hole according to DIN 332, shape DR)	Centering shoulder tolerance acc. to DIN42948 <ul style="list-style-type: none"> • ISO j6 with $\varnothing \leq 230\text{mm}$ • ISO h6 with $\varnothing > 230\text{mm}$

→ Catalog "MOVIMOT® Geared Motors", "Section Notes on Dimension Sheets".

Mounting of MOVIMOT®

Mounting/installation of MOVIMOT® in given mounting position only on level, vibration-free and torsionally rigid subconstruction.

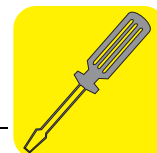


- Thoroughly remove anti-corrosion agents from the shaft ends (use a commercially available solvent). Do not allow the solvent to penetrate the bearings and shaft seals – this could cause material damage!
- Carefully align MOVIMOT® and the driven machine to avoid placing any unacceptable strain on the motor shafts (observe permissible overhung load and axial thrust data!).
- Do not butt or hammer the shaft end.
- **Protect motors in vertical mounting positions from objects or fluids entering with an appropriate cover!**
- Ensure an unobstructed cooling air supply and that air heated by other aggregates cannot be drawn in or reused.
- Align any parts to be mounted on shaft afterwards with half a key (output shafts are aligned with half a key)
- **Any condensation drain holes are sealed with plastic plugs and should only be opened when necessary.**
- **Open condensation drain holes are not permissible, since this will cancel higher-rated enclosures.**



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 screwed cable glands and sealing plugs with sealant and tighten them well – then coat them again.
- Seal the cable inlets well.
- Clean the sealing faces of connection box covers well before re-assembly.
- Restore the anticorrosive coating if necessary.
- Check the type of enclosure is authorized (refer to the nameplate).



4 Electrical Installation



It is imperative to observe all safety notes (see page 5) during installation!

4.1 Type Designation, Nameplates

Sample unit designation

MOVIMOT® MM 30 B - 503 - 00

- └─ Type series MOVIMOT®
- └─ Motor power (30 = 3.0 kW)
- └─ **Version B**
- └─ Rated supply voltage (50 = 380...500 V_{AC})
- └─ Type of supply (3 = three-phase)
- └─ Version (00 = Standard)

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MOVIMOT® nameplate

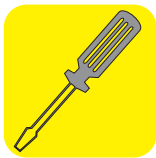
SEW-EURODRIVE		Bruchsal / Germany		CE
Typ	KA67DT100L4BMGMM30	3~	IEC 34	
Nr.	010012345.6.00.00	IM	B3	
KW	3,0 / 50 HZ	cosφ	0,99	
50Hz	V 380-500	A	6,70	○
60Hz	V 380-500	A	6,70	
r/min	92/1400	IP	54 KI	F
Bremse	V 110	Nm 40	Gleichrichter	
kg 54	Ma 310	Nm	i 15,19 :1	
Schmierstoff		Made in Germany 184103 3.14		

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Electronics nameplate

59 51 B 50 50 -- A A 54			
SEW EURODRIVE		Typ MM30B-503-00	
Sach. Nr. 8229546		P _N =3,0kW	
Eingang / Input		Ausgang / Output	
U=3*380...500V		U=3*0V...U _{NETZ}	
f=50...60Hz		f=2...100Hz	
I=6,7A AC		I=7,3A AC	
T=-25...40 C		Motor: 3,0kW	
Made in Germany		Lastart M	
		△/2,2kW	
		CE	

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4.2 Inverter Unit Structure

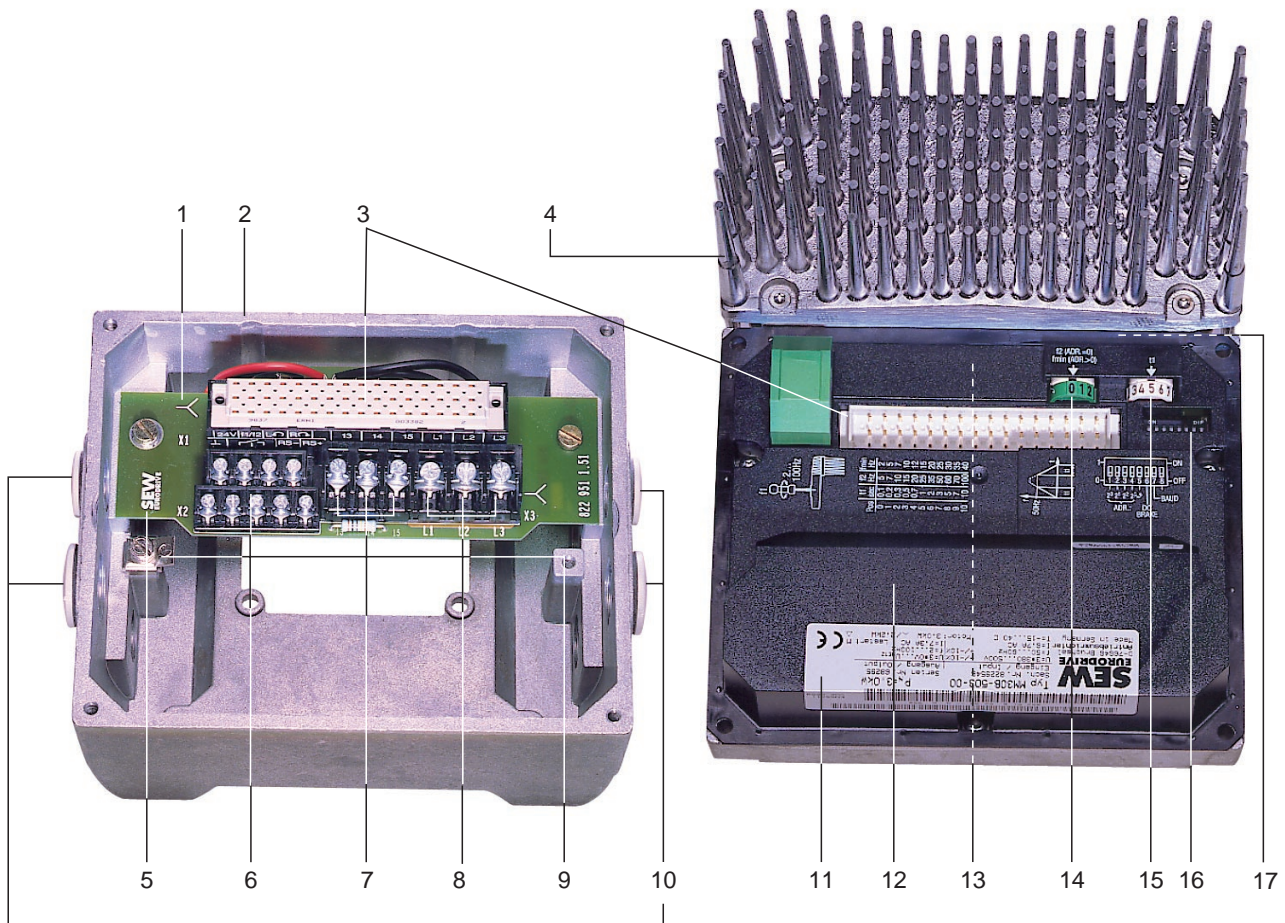
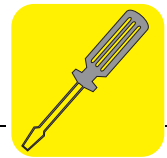


Fig. 1: Structure of the unit

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- 1 Identification of motor wiring connection type
- 2 Terminal box
- 3 Plug connector for connection unit with inverter
- 4 Terminal box cover with inverter and heat sink
- 5 Connection unit with terminals
- 6 Electronics terminal strip X2
- 7 Connection of brake coil (X3)
For motors without brake: Connection of internal braking resistor BW1/BW2 (standard)
- 8 Mains connection L1, L2, L3 (X3) (suitable for 2 x 4mm²)
- 9 Screws for PE connection ⊕
- 10 PG fittings
MM03B-MM15B: (2 x PG11 and 2 x PG16)
MM22B-MM30B: (4 x PG11 and 4 x PG16, not all visible in illustration)
- 11 Electronics nameplate
- 12 Shroud cover for inverter electronics
- 13 Setpoint potentiometer f1 (not visible),
accessible from top of terminal box cover via hole plug
- 14 Setpoint switch f2 (green)
- 15 Switch t1 for ramp generator (white)
- 16 DIP switch S1 for setting of bus address, motor protection, DC braking, PWM frequency
- 17 Status LED (visible from top of terminal box cover, see also "Status LED" on page 24)



4.3 Description of Control Elements

DIP SWITCH S1

S1	1	2	3	4	5	6	7	8
ON	2 ⁰	2 ¹	2 ²	2 ³	Motor protection deactivated	DC braking	PWM frequency 16kHz ¹⁾ variable	No function
OFF	RS-485 address				Motor protection active *	4Q operation	PWM frequency 4kHz fixed *	

1) 16 kHz PWM frequency (low operation noise)

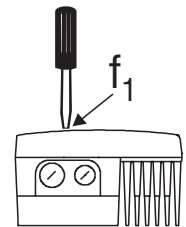
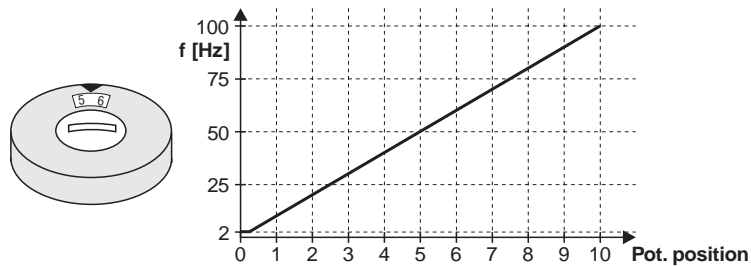
With setting DIP-SWITCH S1/7 = ON, the units operate with only 16 kHz-PWM frequency (low operation noise) and gradually switch back to smaller switching frequencies as a function of the heat sink temperature.

* Factory setting

Setpoint potentiometer f1

The potentiometer has a different meaning, depending on the unit operating mode

- **Control via terminals:** Setpoint f1 (selected via terminal f1/f2 = "0")
- **Control via RS-485:** Maximum frequency f_{\max}



02704AEN

Setpoint switch f2



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

- **Control via terminals:** Setpoint f1 (selected via terminal f1/f2 = "0")
- **Control via RS-485:** Minimum frequency f_{\min}

Setpoint switch f2											
Lock-in 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 f_{\min} [Hz]	2 *	5	7	10	12	15	20	25	30	35	40

* Factory setting

Switch t1



For ramp generator

Switch t1											
Lock-in 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

* Factory setting



4.4 Installation Notes

Connect power supply lines (3x 380...500 V_{AC} + PE)

Nominal voltage
and
frequency

- The nominal voltage and frequency of MOVIMOT[®] must correspond to the data for the mains supply.

Line cross section:

- Line cross section:
according to input current $I_{\text{supply system}}$ for rated power
see "Technical Data (based on 4kHz-PWM frequency)" on page 36).

Permissible
line cross section
of terminals

Power terminals	Control terminals
1.0 mm ² - 4.0 mm ² (2 x 4.0 mm ²)	0.25 mm ² - 1.0 mm ² (2 x 0.75 mm ²)
AWG17 - AWG10 (2 x AWG10)	AWG22 - AWG17 (2 x AWG18)

Conductor end
sleeves

- Use conductor end sleeves without insulation collar (DIN 46228 Part 1, material E-CU).



Line safety

- Install line safety at the beginning of supply system cable behind supply bus junction (see "Possible Connections" on page 12: F11/F12/F13). Use D, DO, NH or circuit breakers. The fusible rating should be selected in accordance with the cross-section of the cable.

Earth leakage
circuit breaker

- It is not permissible to use a conventional residual-current-operated circuit breaker (r.c.c.b.) as a protective device. Universal current-sensitive residual-current-operated circuit breakers (tripping current 300 mA) are permissible as a protective device. Earth-leakage current > of 3.5 mA can occur during normal operation of MOVIMOT[®].

Contactor
switch contacts

- Use contactor switch contacts to switch MOVIMOT[®] from utilization category AC-3 according to IEC 158.

IT networks

- SEW recommends using earth-leakage monitors with pulse-code measurement for power supply systems with non-grounded star point (IT systems). This step will prevent accidental triggering of the earth-leakage monitor by means of the grounding capacities of the inverter.

24 V_{DC}
Supply

- Supply MOVIMOT[®] either via the external 24 V_{DC} voltage supply or via the MLU11A or MLG11A options .

Conventional
control
(via binary control)

- Connect the required electronic control leads (e.g. CW/Stop, CCW/Stop, setpoint change f1/f2).
- Use cables shielded as control cables and run separate from power cables.

Control via RS-
485 interface

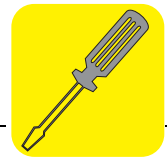
(with bus master PLC, option MLG11A, MBG11A, MWA21A or fieldbus interface MF...)



- Important: Connect only one bus master!**
- Use twisted pair shielded cables as control leads and route them separately from power current cables.

Protection
elements

MOVIMOT[®] drives have integrated protection elements against overloads, external elements will not be necessary.



4.5 Operating Modes

4Q operation with external braking resistor (standard)
in motors **without** mechanical brake

- This is recommended for applications in which the level of regenerative energy is low.
- BW1/BW2 is integrated into the terminal box of the MOVIMOT®.
- The resistor is self-protecting (reversible) against regenerative overload. This is achieved by it abruptly going to high resistance and no longer accepting any more energy.
The inverter then switches off and signals an overvoltage fault (fault code 07).
- Regenerative load of BW1/BW2 (see page 38).

4Q operation with external braking resistor (optional)
in motors **without** mechanical brake

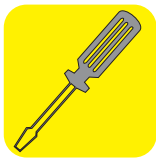


Important: Internal braking resistor must be removed!

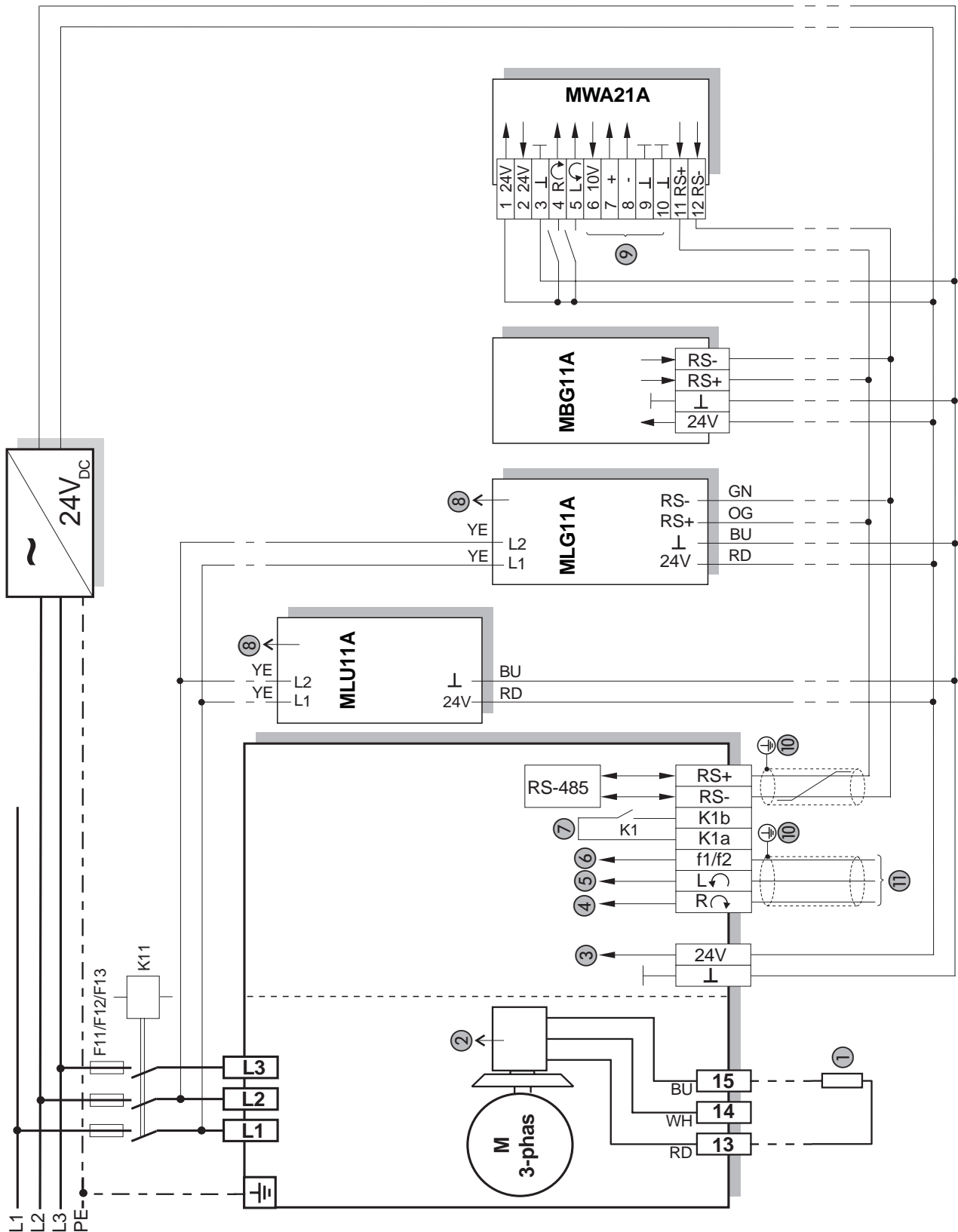
- Covers applications with regenerative short-term performance up to rated input performance. This requires an external resistor (MM03-MM015: 200 Ω, e.g. BW 200-xxx / MM22 - MM30: 100 Ω e.g. BW 100-005).
- Cross section of leads according to rated current of MOVIMOT® (see "Technical Data (based on 4kHz-PWM frequency)" on page 36).
- **The braking resistor connection leads carry a high DC voltage (approx. 900 V) during rated operation.**
- If necessary, fit flat-type braking resistors together with appropriate touch guard.
- Regenerative load of external braking resistors (see page 39).

4Q operation
in motors **with** mechanical brake

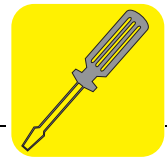
- The brake coil is used as a braking resistor in 4Q operation.
- No external braking resistor is allowed to be connected.
- Regenerative load of brake coil (see page 39).



4.6 Possible Connections



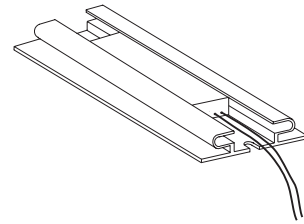
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4.7 Legend "Possible Connections"

- ① Internal braking resistor BW1/BW2 (only in motors without brake)
- ② BMG brake

Color coding		
red (RD)	white (WH)	blue (BU)
Terminal 13	Terminal 14	Terminal 15



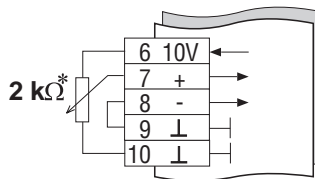
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- ③ Feeding of electronics supply voltage
- ④ Terminal CW/Stop
- ⑤ Terminal CCW/Stop
- ⑥ Terminal setpoint changeover f1/f2
("0" = Setpoint potentiometer f1 active / "1" = Setpoint switch f2 active)
- ⑦ Terminal ready signal
(Contact closed = Ready for operation)
- ⑧ Color coding MLU 11A / MLG 11A

	yellow (YE)	red (RD)	blue (BU)	orange (OG)	green (GN)
MLU11A	L1, L2	24 V	⊥	-	-
MLG11A	L1, L2	24 V	⊥	RS+	RS-

⑨

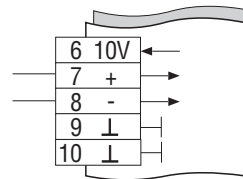
Potentiometer with integration of 10V reference voltage



* optional 5 kΩ

MWA21A

Potential-free analog signal

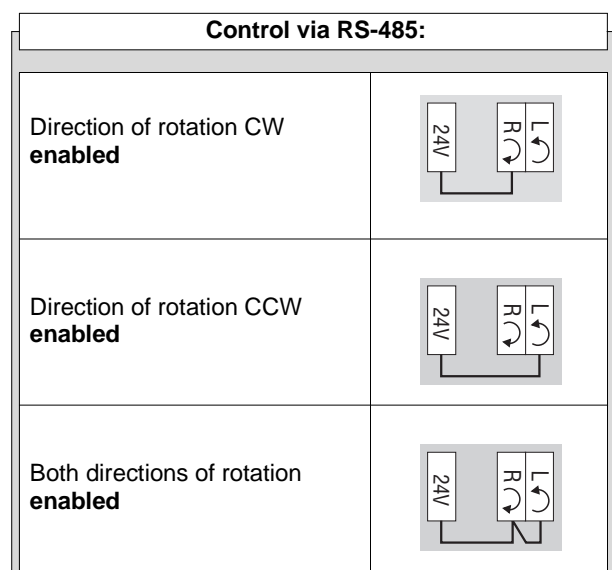
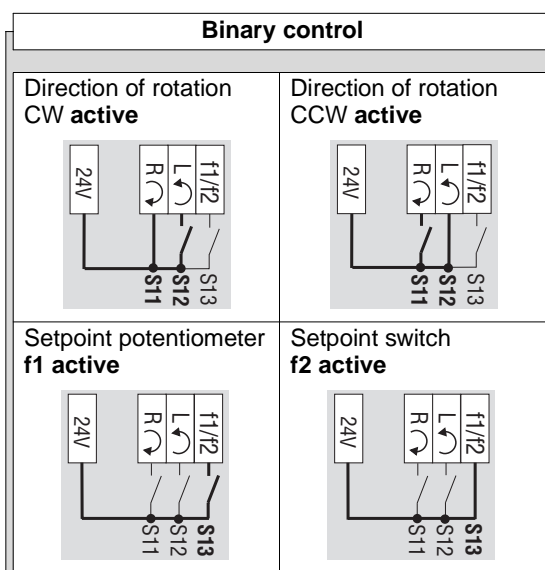


MWA21A

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- ⑩ Place cable shielding over an EMC metal gland on the MOVIMOT®

⑪





Options

MLU11A, MLG11A, MBG11A, MWA21A, MLK11A, MF..

4.8 Options

Option MLU11A

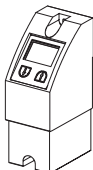


24 V supply

MLU11A offers the possibility of operating a MOVIMOT® without external 24 V_{DC} power supply.

Installation: In an available PG fitting on the MOVIMOT® (see addendum to operating instructions "Installation MLU11A / MLG11A").

Option MLG11A

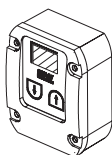


Speed control module with 24 V power supply

In addition to the functions of the MLU11A, the MLG11A also offers the function of local speed adjustment.

Installation: In an available PG fitting on the MOVIMOT® (see addendum to operating instructions "Installation MLU11A / MLG11A").

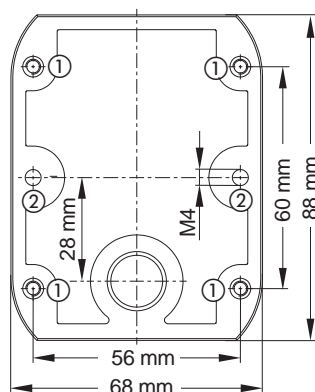
Option MBG11A



Speed control module

MBG11A offers the possibility of controlling up to 31 MOVIMOT® units at the same time

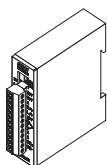
Installation: As required, e.g. on a switch panel or similar.



- ① drilled holes on the rear
- ② retaining openings for M4 screws

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Option MWA21A

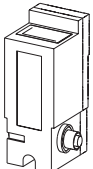


Analog/RS-485 setpoint converter

Up to 31 MOVIMOT® units can be controlled at the same time with the MWA21A option.

Installation: In the switch cabinet on the DIN rail.

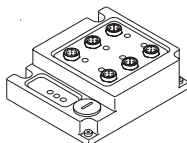
Option MLK11A



AS-i binary slave

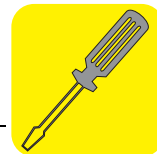
Information regarding assembly, installation and startup are contained in the addendum to the operating instructions: "MLK11A option (AS-i binary slave)".

Option MF...



Fieldbus interfaces MFI.. (INTERBUS) and MFP.. (Profibus)

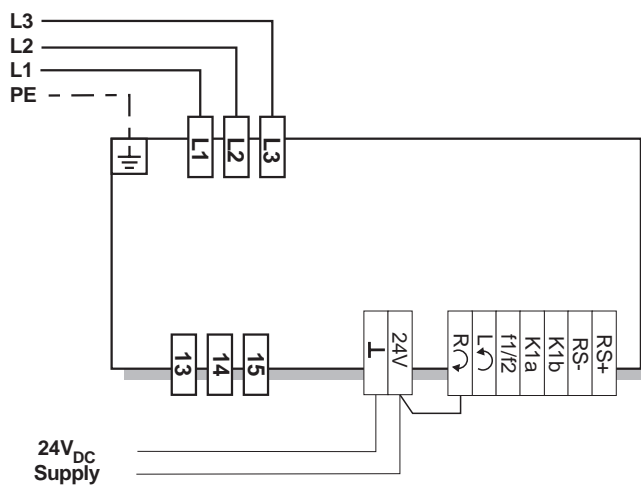
Detailed information in the manual "MOVILINK® Unit Profile, Communications and Fieldbus Interfaces".



4.9 Connection Examples

Example 1:

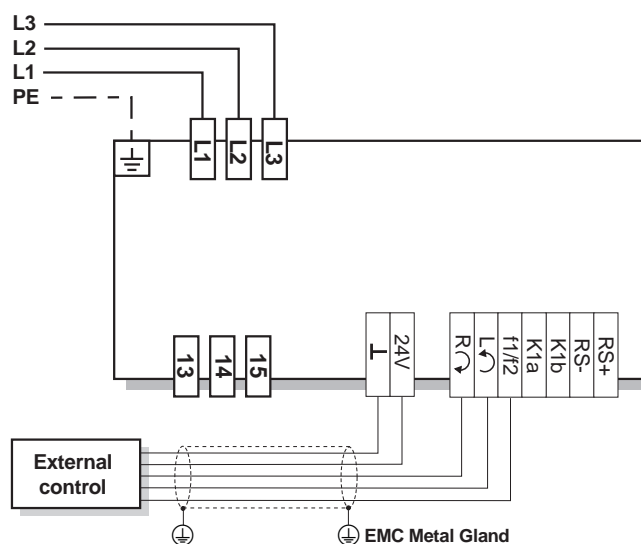
with binary control
and one fixed
direction of rotation
(Example: Clock-
wise rotation)



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Example 2:

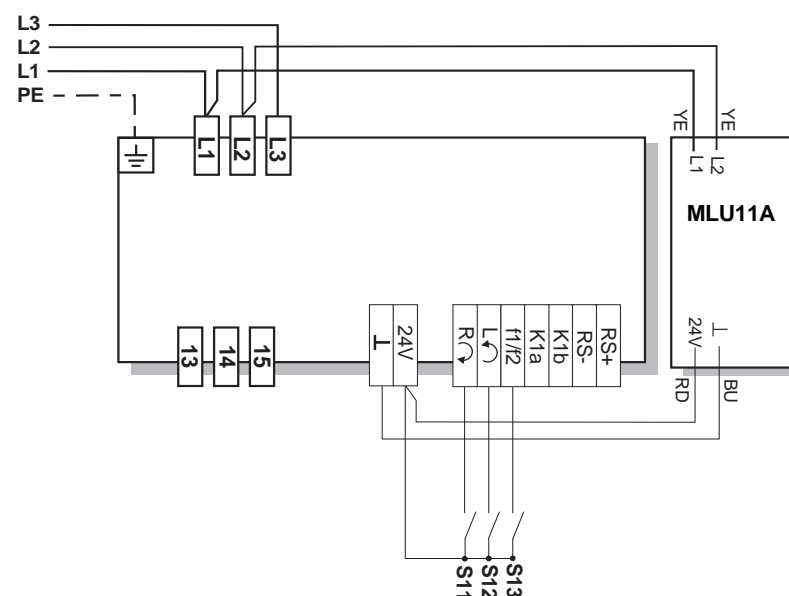
with binary control
and external
control



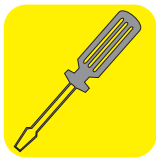
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Example 3:

with binary control and option
MLU11A



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Connection Examples

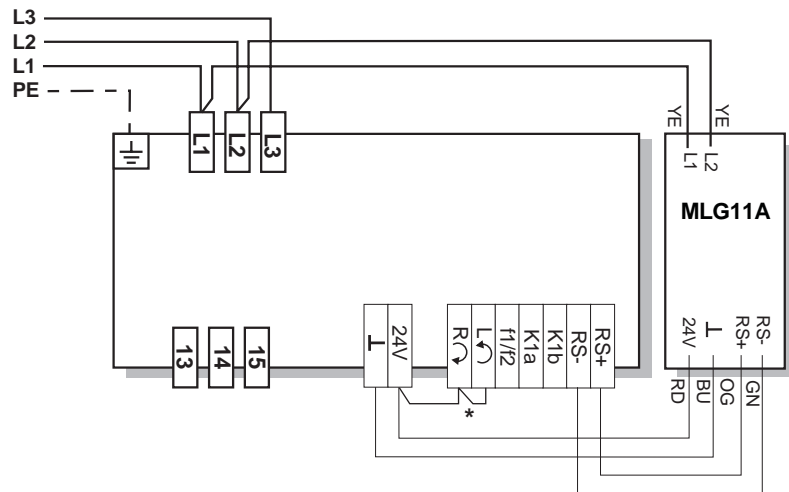
with MLG11A, with MBG11A, with MWA21A

Example 4:

with option
MLG11A

Control via RS-485
interface:

* both directions of
rotation are
enabled in the
example



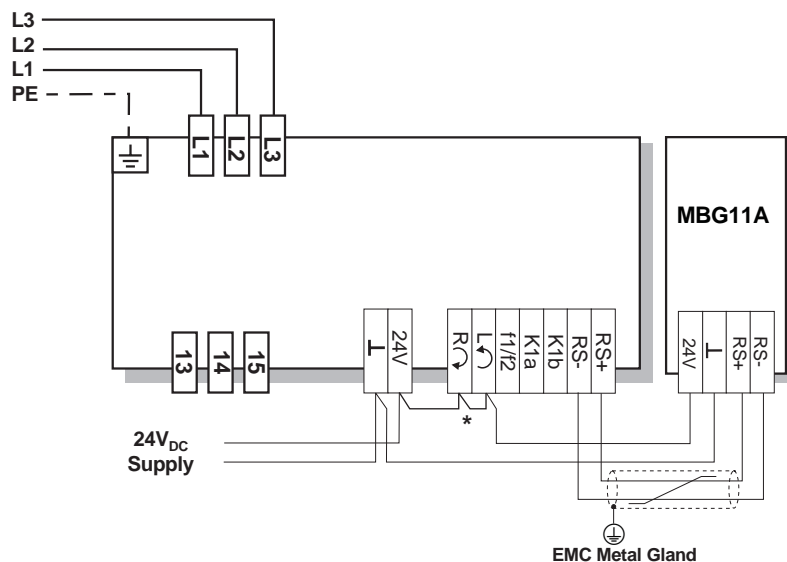
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Example 5:

with option
MBG11A

Control via RS-485
interface:

* both directions of
rotation are
enabled in the
example



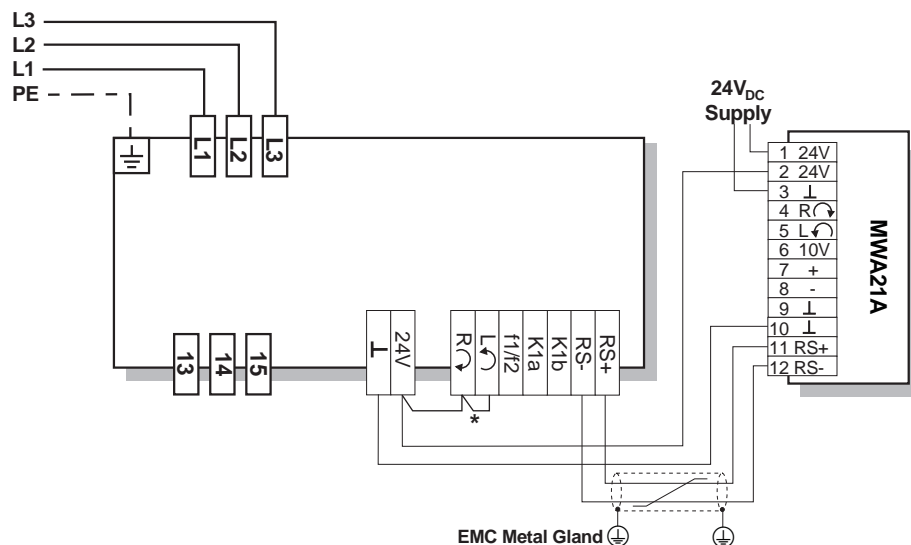
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Example 6:

with option
MWA21A

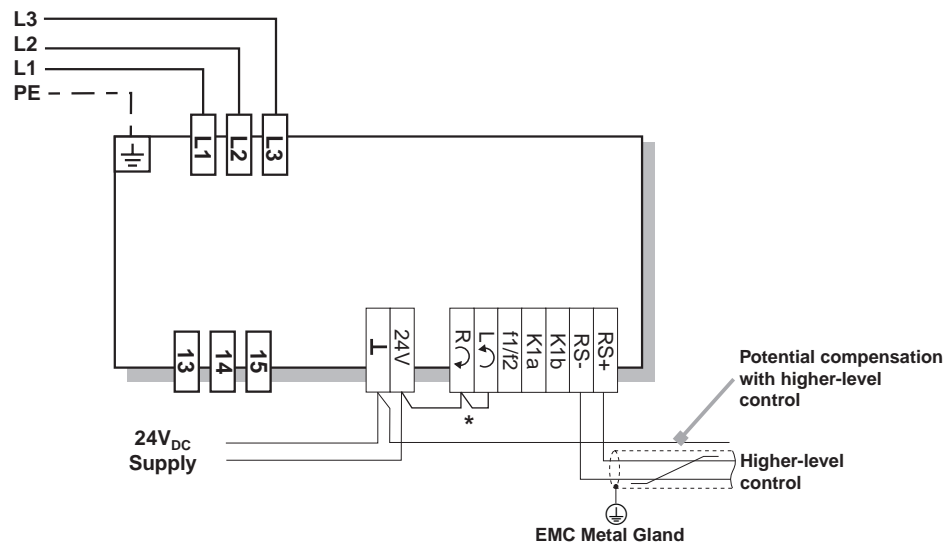
Control via RS-485
interface:

* both directions of
rotation are
enabled in the
example



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** both directions
of rotation are
enabled in the
example*



02732AEN

4.10 UL-compliant Installation

Connection cable

- Only use copper cables with the following temperature ranges as connection leads:
Temperature range: 60 / 75°C (140 / 167°F)

Tightening torques

- The permissible tightening torques of the MOVIMOT® power terminals are:
1.5 Nm (13.3 lb.-in.)

Suitable voltage supply systems

- MOVIMOT® are suited for operation on voltage supply systems with grounded star point (TN and TT nets) supplying a **max. supply current of 5000 A_{AC}** and have a **maximum voltage of 500 V_{AC}** . The rating for the fuses is not to exceed the following values:

MM03B to MM07B: 25A/600V

MM11B to MM30B: 35A/600V

External voltage
source 24 V_{DC}

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





Important Notes on Startup

Startup with binary control

5 Startup

5.1 Important Notes on Startup



- During startup strictly observe safety notes (see page 5)!
- Switch off power supply to the MOVIMOT® prior to removing/installing terminal box cover.
- Ensure prior to startup that
 - the drive has not been damaged.
 - all protective covers have been fitted correctly.
- MOVIMOT® has been adapted to the motor by internally saved parameters. Therefore, the parameters have been set permanently.
- Set to CW/Stop or CCW/Stop for jog mode.
- Keep a minimum switch-off time of **2 seconds** for the supply system contactor K11.

5.2 Startup with Binary Control

Inspect connection

1. Review correct connection of MOVIMOT® (see "Possible Connections" on page 12 and "Connection Examples" on page 15).
2. Ensure that DIP switches S1/1 - S1/4 are set to OFF (= Address 0).

Inspect DIP switch

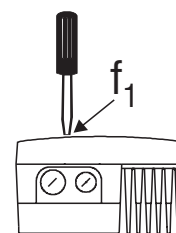
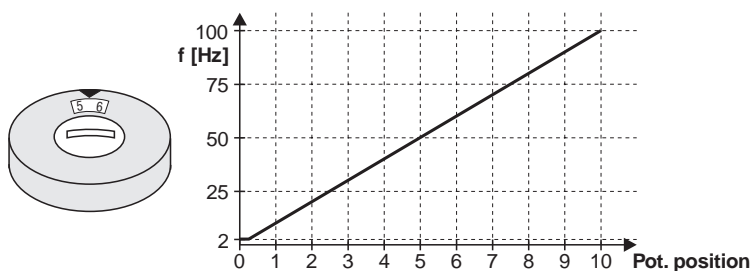
3. Inspect setting for 4Q operation (DIP switch S1/6 = Off).



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Set first speed

4. Set first speed with setpoint potentiometer f1 (activated, if terminal f1/f2 = "0") (Factory setting: approximately 50 Hz).



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Fig. 2: Frequency of setpoint potentiometer f1

The first speed can be controlled in an infinitely variable manner during operation with the externally accessible setpoint potentiometer f1.

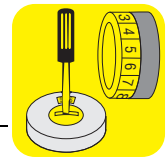
Set second speed



5. Set second speed with switch potentiometer f1 (activated, if terminal f1/f2 = "0").

Switch f2											
Lock-in 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

* Factory setting



Set ramp time



- Set ramp time with switch t1.

Switch t1											
Lock-in 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

* Factory setting

- Place and fasten terminal box cover.
- Replace hole plug of cover with installed gasket.
- Connect control voltage 24 V_{DC} and power supply.

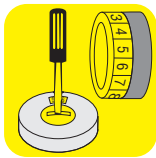
Inverter behavior in relation to terminal level

Mains	24 V	f1/f2	CW/Stop	CCW/Stop	Status LED	Inverter behavior
0	0	X	X	X	Off	Inverter off
1	0	X	X	X	Off	Inverter off
1	1	X	0	0	Yellow	Stop
1	1	0	1	0	Green	Clockwise rotation with f1
1	1	0	0	1	Green	Counterclockwise rotation with f1
1	1	1	1	0	Green	Clockwise rotation with f2
1	1	1	0	1	Green	Counterclockwise rotation with f2
1	1	X	1	1	Yellow	Stop

0 = no voltage

1 = voltage

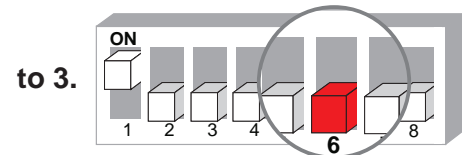
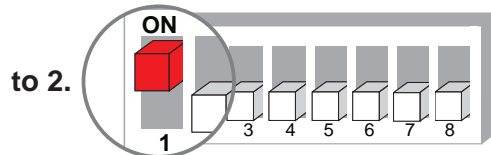
X = random



5.3 Startup with Options MBG11A or MLG11A

Inspect connection 1. Check connection of MOVIMOT® (see "Possible Connections" on page 12 and "Connection Examples" on page 15).

Inspect DIP switch 2. Set DIP switch S1/1 (on MOVIMOT®) to ON (= Address 1).
3. Inspect setting for 4Q operation (DIP switch S1/6 = Off).



Set minimum frequency



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

02765AEN

Switch f2											
Lock-in 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

* Factory setting

Set ramp time



5. Set ramp time with switch t1.

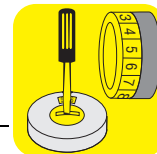
Switch t1											
Lock-in position	0	1	2	3	4	5 *	6	7	8	9	10
Ramp time t1 [s]	0.1	0.2	0.3	0.5	0.7	1 *	2	3	5	7	10

* Factory setting

Enable direction of rotation

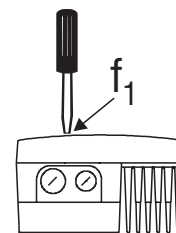
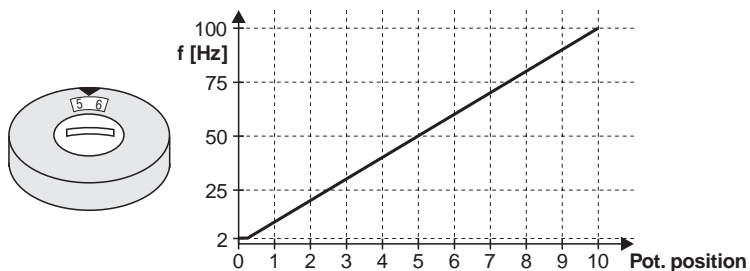
6. Ensure that desired direction of rotation has been enabled.

Terminal R ↻	Terminal L ↻	Message
activated	activated	<p>a)</p> <ul style="list-style-type: none"> both directions of rotation are enabled
activated	Not activated	<p>b)</p> <ul style="list-style-type: none"> only clockwise direction of rotation is enabled preselected setpoints for counterclockwise rotation result in standstill of drive
Not activated	activated	<p>c)</p> <ul style="list-style-type: none"> only counterclockwise direction of rotation is enabled preselected setpoints for clockwise rotation result in a standstill of drive
Not activated	Not activated	<p>d)</p> <ul style="list-style-type: none"> unit is blocked or the drive is stopped



Set maximum speed

7. Place and fasten terminal box cover.
8. Set the maximum speed using setpoint potentiometer f1.

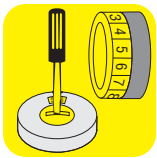


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9. Replace hole plug of cover with installed gasket.
10. Activate voltage supply.

Operation

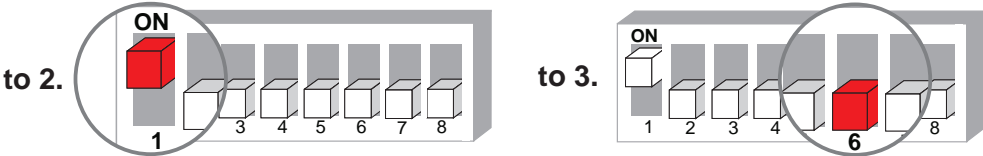
See "Operating Options MBG11A and MLG11A" on page 27.



Startup with MWA21A Option (setpoint converter)

5.4 Startup with MWA21A Option (setpoint converter)

- Inspect connection* 1. Check connection of MOVIMOT® (see "Possible Connections" on page 12 and "Connection Examples" on page 15).
- Inspect DIP switch* 2. Set DIP switch S1/1 (on MOVIMOT®) to ON (= Address 1).
3. Inspect setting for 4Q operation (DIP switch S1/6 = Off).



Set minimum frequency



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

02765AEN

Switch f2											
Lock-in 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

* Factory setting

Set ramp time



5. Set ramp time with switch t1.

Switch t1											
Lock-in 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

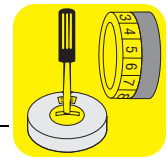
* Factory setting

Enable direction of rotation

6. Ensure that desired direction of rotation has been enabled.

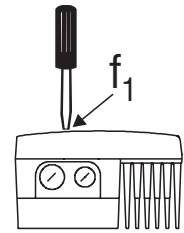
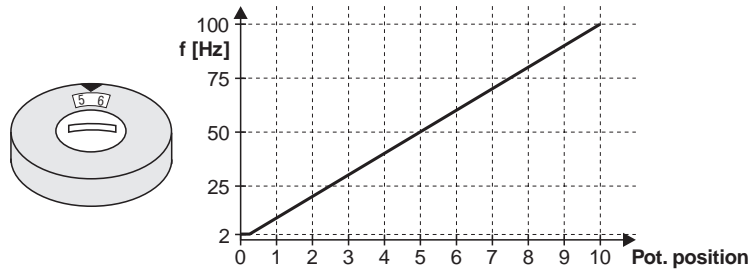
Terminal R	Terminal L	Message
activated	activated	<p>a)</p> <ul style="list-style-type: none"> both directions of rotation are enabled
activated	Not activated	<p>b)</p> <ul style="list-style-type: none"> only clockwise direction of rotation is enabled preselected setpoints for counterclockwise rotation result in standstill of drive
Not activated	activated	<p>c)</p> <ul style="list-style-type: none"> only counterclockwise direction of rotation is enabled preselected setpoints for clockwise rotation result in a standstill of drive
Not activated	Not activated	<p>d)</p> <ul style="list-style-type: none"> unit is blocked or the drive is stopped

7. Place and fasten terminal box cover.



Set maximum speed

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



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9. Replace hole plug of cover with installed gasket.

Select signal type

10. Select the signal type for the analog input (terminals 7 and 8) of the MWA21A option using switches S1 and S2.

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

11. Activate voltage supply.

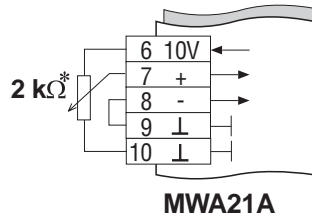
Enable MOVIMOT®

12. Enable MOVIMOT® by applying +24 V on terminal 4 (clockwise rotation) or terminal 5 (counterclockwise rotation) of MWA21A.

Control

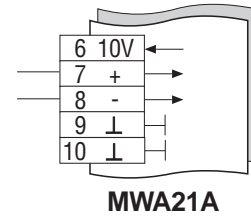
MOVIMOT® will be controlled with analog signal on terminals 7 and 8 f_{\min} to f_{\max} .

Potentiometer with integration of 10V reference voltage



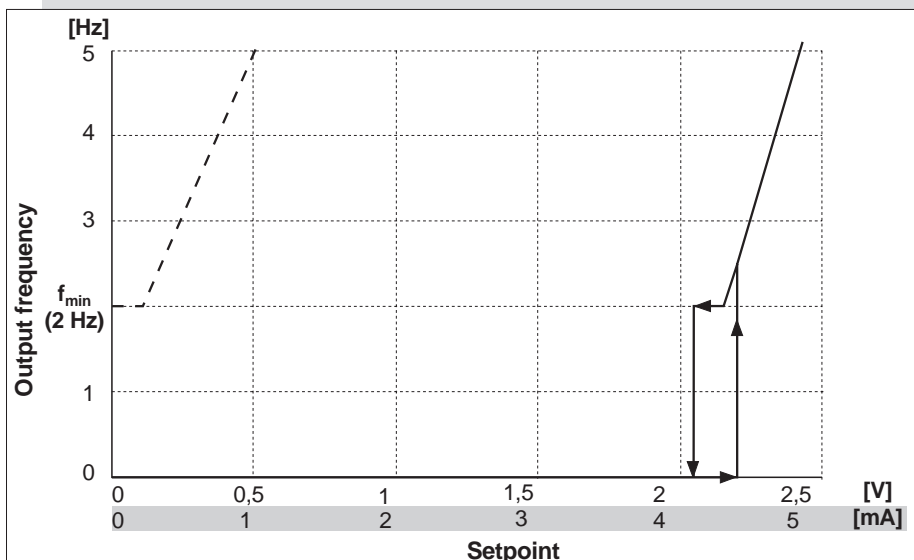
* optional 5 kΩ

Potential-free analog signal



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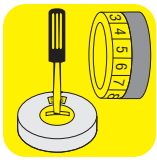
Setpoint-stop function



Setting

--- 0...10 V / 0...20 mA
— 2...10 V / 4...20 mA

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5.5 Startup with RS-485 Bus Operation

Inspect connection

1. Check connection of MOVIMOT® (see "Possible Connections" on page 12 and "Connection Examples" on page 15).

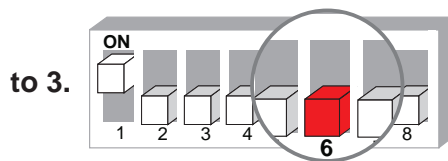
Set DIP switch

2. Set correct RS-485 address at DIP switches S1/1...S1/4.

Address	- *	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
S1/1	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON
S1/2	OFF	OFF	ON	ON	OFF	OFF	ON	ON	OFF	OFF	ON	ON	OFF	OFF	ON	ON
S1/3	OFF	OFF	OFF	OFF	ON	ON	ON	ON	OFF	OFF	OFF	OFF	ON	ON	ON	ON
S1/4	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON	ON	ON

* Factory setting

3. Inspect setting for 4Q operation (DIP switch S1/6 = Off).



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Set minimum frequency



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

Switch f2											
Lock-in 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

* Factory setting

Set ramp time



5. If not set via RS-485, set ramp time with switch t1.

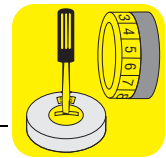
Switch t1											
Lock-in position	0	1	2	3	4	5 *	6	7	8	9	10
Ramp time t1 [s]	0.1	0.2	0.3	0.5	0.7	1 *	2	3	5	7	10

* Factory setting

Enable direction of rotation

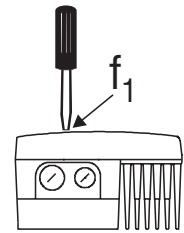
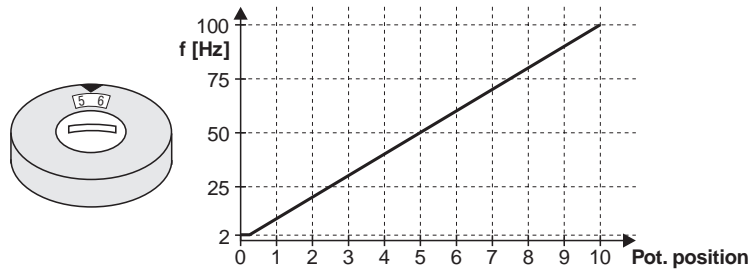
6. Ensure that desired direction of rotation has been enabled.

Terminal R	Terminal L	Message
a) activated	activated	<ul style="list-style-type: none"> both directions of rotation are enabled
b) activated	not activated	<ul style="list-style-type: none"> only clockwise rotation is enabled preselected setpoints for counterclockwise rotation result in standstill of drive
c) not activated	activated	<ul style="list-style-type: none"> only counterclockwise direction of rotation is enabled preselected setpoints for clockwise rotation result in a standstill of drive
d) not activated	not activated	<ul style="list-style-type: none"> unit is blocked or the drive is stopped



Set maximum speed

7. Place and fasten terminal box cover.
8. Set the required maximum speed using setpoint potentiometer f1.



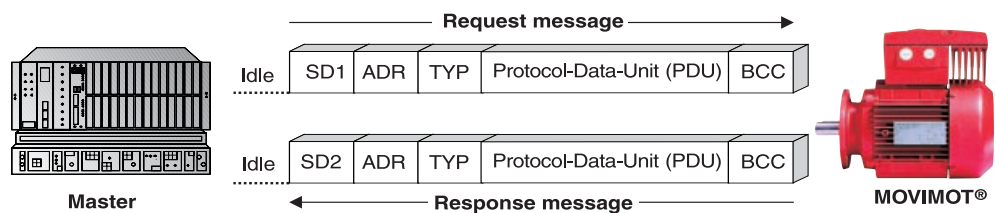
02704AEN

9. Replace hole plug of cover with installed gasket.
10. Activate voltage supply.

5.6 Serial Communication

- The controller (e.g. PLC) is the master, MOVIMOT® is the slave.
- 1 start bit, 1 stop bit and 1 parity bit (even parity) are used.
- Transmission conforms to the SEW-MOVILINK® protocol with a fixed transmission rate of 9600 Baud.

Message structure



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Legend

- Idle** = Start break min. 3.44ms
- SD1** = Start delimiter 1: Master → MOVIMOT®: 02_{hex}
- SD2** = Start delimiter 2: MOVIMOT® → Master: 1D_{hex}
- ADR** = Address 1 - 15
Group address 101 - 115
254 = Point to point
255 = Broadcast
- TYP** = User data

TYP	Transmission variable	Process data length	User data
03 _{hex}	cyclic	2 words	control word / speed [%]
83 _{hex}	acyclic	2 words	status word 1 / output current
05 _{hex}	cyclic	3 words	control word / speed [%] / ramp
85 _{hex}	acyclic	3 words	status word 1 / output current / status word 2

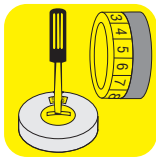
PDU = User data

BCC = Block Check Character: XOR of all bytes

Note:

If the type "cyclic" is selected, MOVIMOT® expects the next bus activity after a maximum of one second (Master Protocol). If this activity is not detected, MOVIMOT® rests automatically (time-out monitoring).

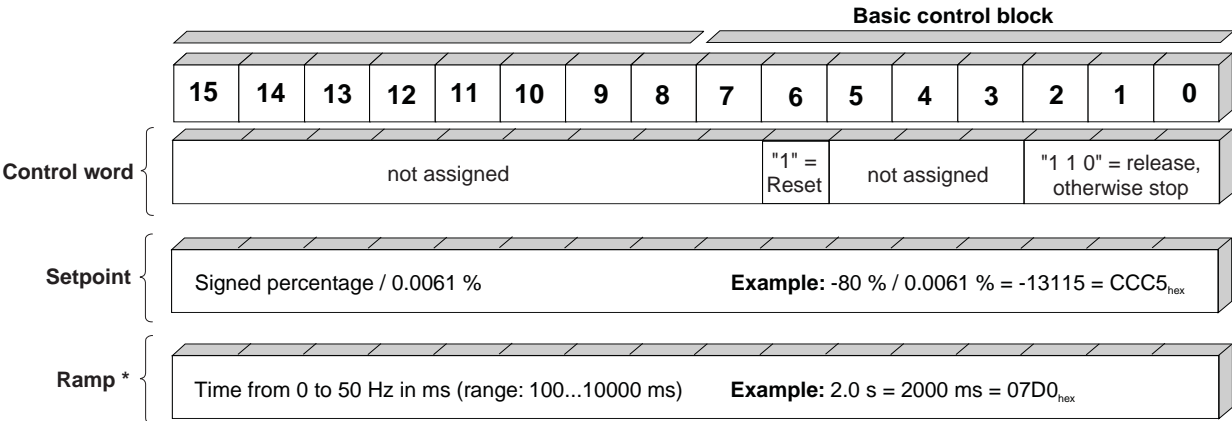
There is no time-out monitoring when the type "acyclic" is selected.



Serial Communication

User data master → slave, user data slave → master

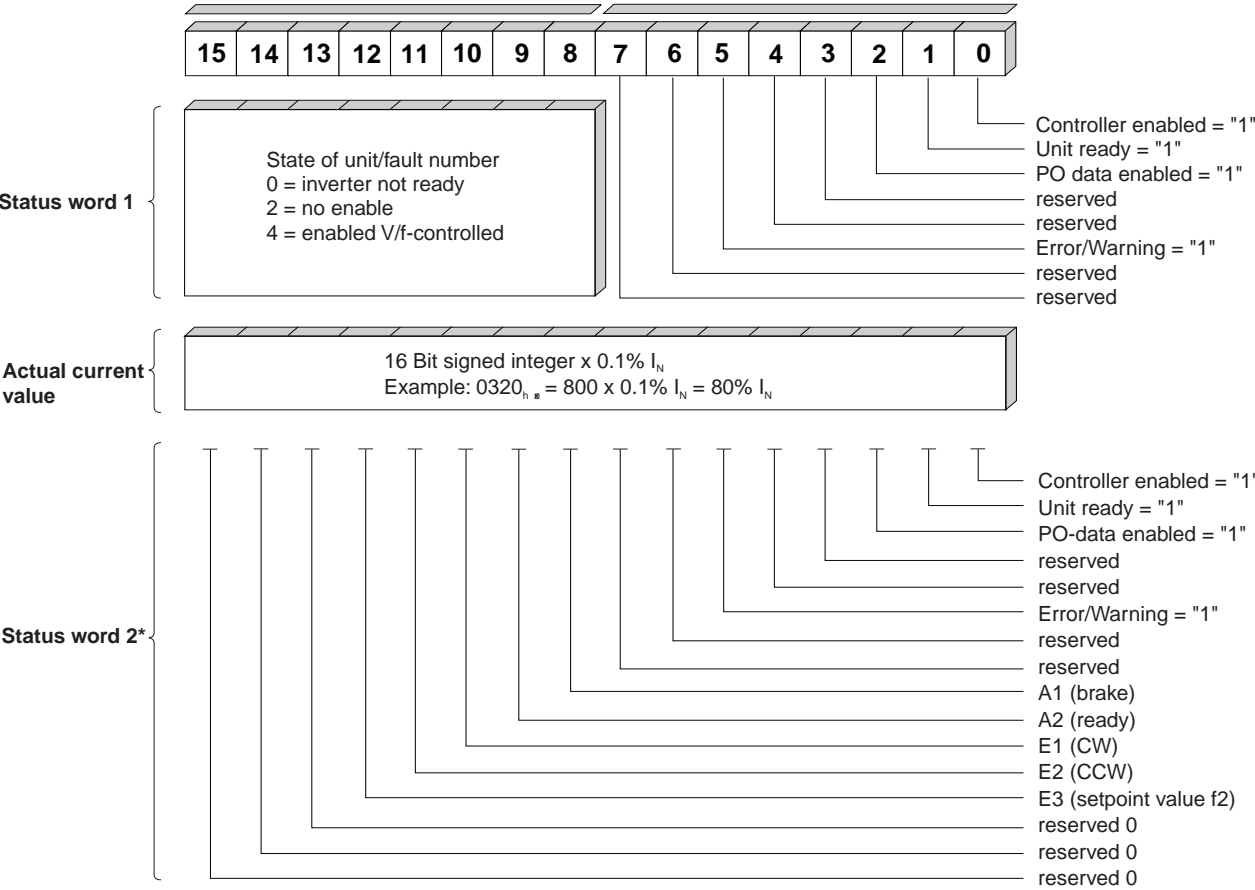
User data master → slave



* only with 3 word protocol

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User data slave → master



* (only with 3 word protocol)



















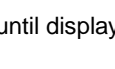








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For more detailed information about startup with RS-485 bus operation as well as the MOVILINK[®] unit profile, please consult the publications MOVIMOT[®] System Manual and the manual MOVILINK[®] Unit Profile, Communication and Field-bus Interfaces!



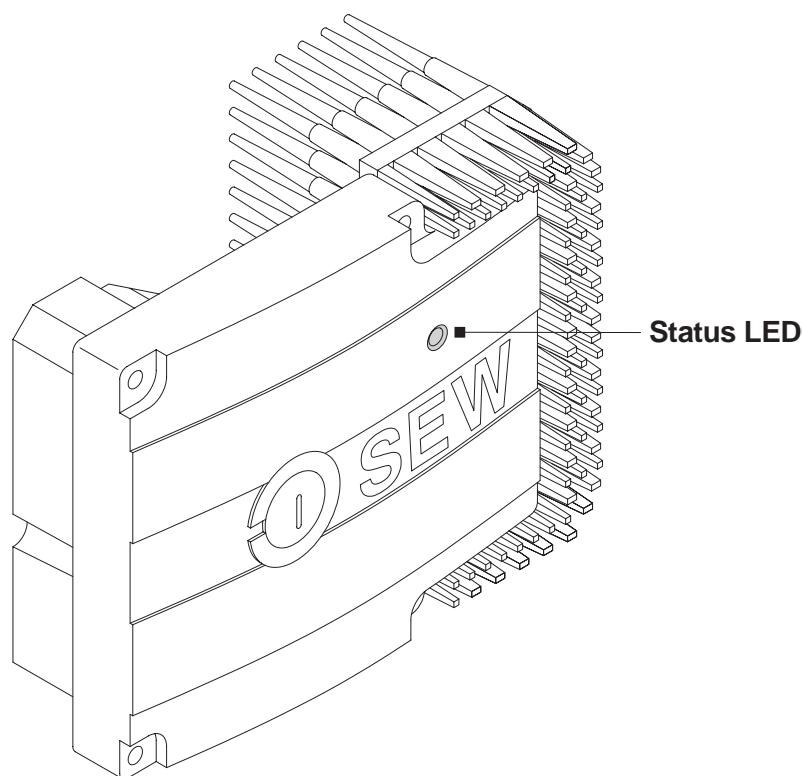
6 Operation and Servicing

6.1 Operating Options MBG11A and MLG11A

Operating MBG11A and MLG11A	
Display	<p>Negative display value e.g.  = counterclockwise rotation</p> <p>Positive display value e.g.  = clockwise rotation</p> <p>The displayed value refers to the speed entered with setpoint value f1. For example: Display "50" = 50 % of the speed set with setpoint potentiometer. Important: With display "0" drive rotates with f_{min}.</p>
Increase speed	<p>With CW rotation:   With CCW rotation:  </p>
Reduce speed	<p>With CW rotation:   With CCW rotation:  </p>
Blocking MOVIMOT®	<p>Press the following buttons simultaneously:  +  Display = </p>
Releasing MOVIMOT®	<p>  or   Important: After release, MOVIMOT® accelerates to the value saved last.</p>
Changing direction of rotation: from right to left	<p>1.   until display reads = </p> <p>2. Pressing it again   will change direction of rotation</p>
Changing direction of rotation: from left to right	<p>1.   until display reads = </p> <p>2. Pressing it again   will change direction of rotation</p>
Memory function:	<p>The value last saved will be retained after power supply has been turned off and on if the 24V supply was active for at least 4 seconds after the setpoint was last changed.</p>



6.2 Status LED



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6.3 Messages of Status LED Display:

The operating and error messages are signaled by the three-color LED display.

Color		Operational status	Description
-	off	not ready for operation	24 V power supply not connected
Yellow	flashing at regular intervals	not ready for operation	self-testing phase or 24 V power supply present, but supply voltage not o.k.
Yellow	steady light	ready to operate, but unit is blocked	24 V power supply and supply voltage o.k., but no enable signal
Green / Yellow	flashing with changing color	ready to operate, but in timeout mode	communication via RS-485 faulty
Green	steady light	unit enabled	motor in operation
Green	rapid flashing at regular intervals	current limit active	drive has reached the current limit value
Red	2 x flash, pause	Fault 7	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
Red	5 x flash, pause	Fault 89	excessive temperature in brake
Red	6 x flash, pause	Fault 06	mains - phase fault



6.4 List of Faults

Fault codes can be evaluated in case of communication with external control via the MOVILINK[®] profile¹⁾ or via the status LED (see page 28) .

Fault	Cause / Remedy
Timeout of communication¹⁾ (Motor comes to a stop without fault code)	a) Missing connection \perp, RS+, RS- between MOVIMOT[®] and RS-485 master. Check and establish connection, especially grounding. b) EMC influence Check shielding of data lines and improve, if necessary. c) Wrong type (cyclical) with acyclical protocol Time period between individual messages >1s with protocol type "cyclical." Shorten message cycle or select "acyclical."
DC link voltage too small, net off was recognized (Motor comes to a stop without fault code)	Check net supply lines and net supply voltage for interruptions. Motor starts operating again as soon as the net supply voltage reaches standard values.
Fault code 06 Phase fault	Check power supply lines for phase fault. Reset faults by switching off 24 V_{DC} supply voltage or reset via MOVILINK^{®1)}
Fault code 7 DC link voltage too large	a) Ramp time too short → Extend ramp time b) Faulty connection brake coil / braking resistor → Check braking resistor/brake coil and rectify, if necessary c) Faulty internal resistance brake coil / brake resistor → Check internal resistance brake coil / braking resistor (see page 39) d) Thermal overload of brake resistor → Wrong size brake resistor Reset fault by switching off 24 V_{DC} supply voltage or reset via MOVILINK^{®1)}
Fault code 11 Thermal overload of output stage or internal unit defect	<ul style="list-style-type: none"> • Clean heat sink • Lower ambient temperature • Prevent heat build-up • Reduce drive load Reset fault by switching off 24 V_{DC} supply voltage or reset via MOVILINK^{®1)}
Fault code 84 Thermal overload of motor	<ul style="list-style-type: none"> • Lower ambient temperature • Prevent heat build-up • Reduce motor load • Increase speed Reset fault by switching off 24 V_{DC} supply voltage or reset via MOVILINK^{®1)}
Fault code 89 Thermal overload of brake coil or brake coil defect	<ul style="list-style-type: none"> • Extend set ramp time • Brake inspection (see "Inspection/Service Brake" on page 22) • Contact SEW service department Reset fault by switching off 24 V_{DC} supply voltage or reset via MOVILINK^{®1)}

1) For detailed information on communications see manual "MOVILINK[®] Unit Profile, Communications and Fieldbus Interfaces"

If you need the assistance of our service department:

- List the nameplate data.
- Indicate when and under which operating conditions the problem occurred.
- Type and extent of the fault.
- List the probable cause.



7 Inspection and Maintenance

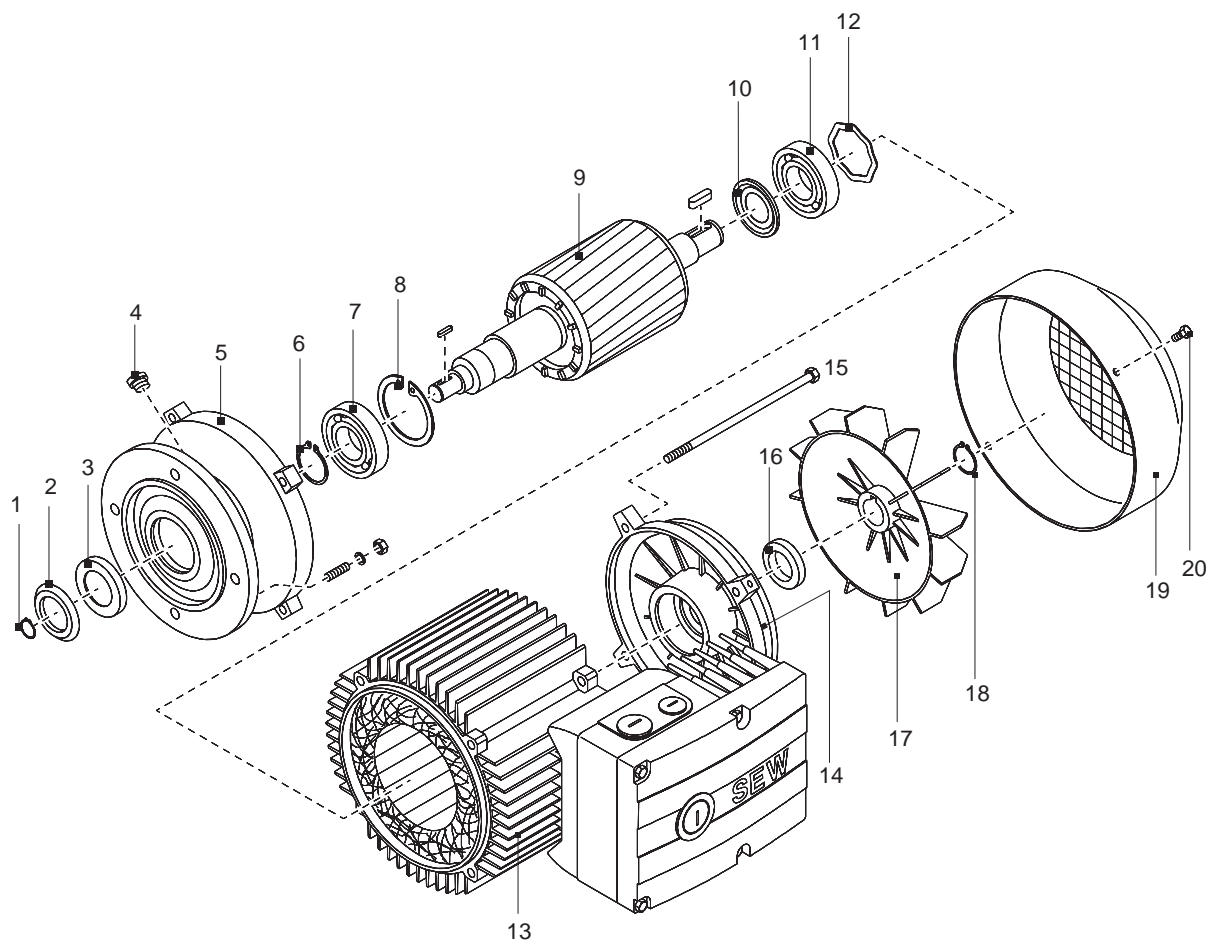


- Use only genuine spare parts in accordance with the valid parts list!
- Caution! Danger of burns: Motors can get very hot during operation!

Inspection/Service intervals:

Frequency	Unit/Unit part	What to do
Depending on loading conditions: every 2 to 4 years (The periods of wear are affected by many factors and may be short. Calculate the required inspection/service intervals in accordance with the project planning documents)	Brake	<ul style="list-style-type: none"> • Inspect brake (working air gap, brake disc, pressure plate, carrier / gearing, pressure rings) • Extract abraded matter
Every 10,000 operating hours	Motor	<ul style="list-style-type: none"> • Inspect motor (replace ball bearing/oil seal) • Clean cooling air passages
Varying intervals (depending on external factors)		<ul style="list-style-type: none"> • Touch up or renew the anticorrosion coating

7.1 Inspection/Maintenance of Motor



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Fig. 3: Example Motor DFT MM

- | | | | |
|----------------------------|----------------|---------------------|-----------------|
| 1 Circlip | 6 Circlip | 11 Ball bearing | 16 V-ring |
| 2 Oil splasher | 7 Ball bearing | 12 Equalizing ring | 17 Fan |
| 3 Oil seal | 8 Circlip | 13 Stator | 18 Circlip |
| 4 Screw plug | 9 Rotor | 14 B bearing shield | 19 Fan guard |
| 5 A-(flange)bearing shield | 10 Nilos ring | 15 Stator rod | 20 Housing bolt |



**Inspect
motor
(Fig. 3)**



1. **Important: Switch off MOVIMOT® and prevent from unintentional restart.**
2. Remove proximity sensor NV16 / NV26, if present.
3. Remove the flange cover or fan guard (19).
4. Remove the stator rod (15) from the drive-end bearing shield (5) and the non drive-end bearing shield (14), release the stator (13) from the drive-end bearing shield.
5. a) Motors with brake:
 - Open terminal box cover, remove brake cable from terminals.
 - Push the non drive-end bearing shield and brake off the stator and carefully remove them (drag brake cable by means of trailing wire, if necessary).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?
 - No, continue with 9.
 - In case of humidity continue with 7.
 - If you detect gear oil, have the motor repaired by a specialist workshop.
7. a) With geared motors: remove the motor from the gear unit.
b) Motors without gear unit: remove drive end flange.
c) Remove the rotor (9).
8. Clean the winding, dry it and check it electrically.
9. Replace ball bearings (7, 11) (use only approved ball bearings, see page 36).
10. Fit a new oil seal (3) in the drive-end bearing shield.
11. Reseal the stator seat, reassemble the motor, brake, etc., check the gear unit, if applicable (see Gear Unit - Operating Instructions).



7.2 Inspection/Maintenance of Brake

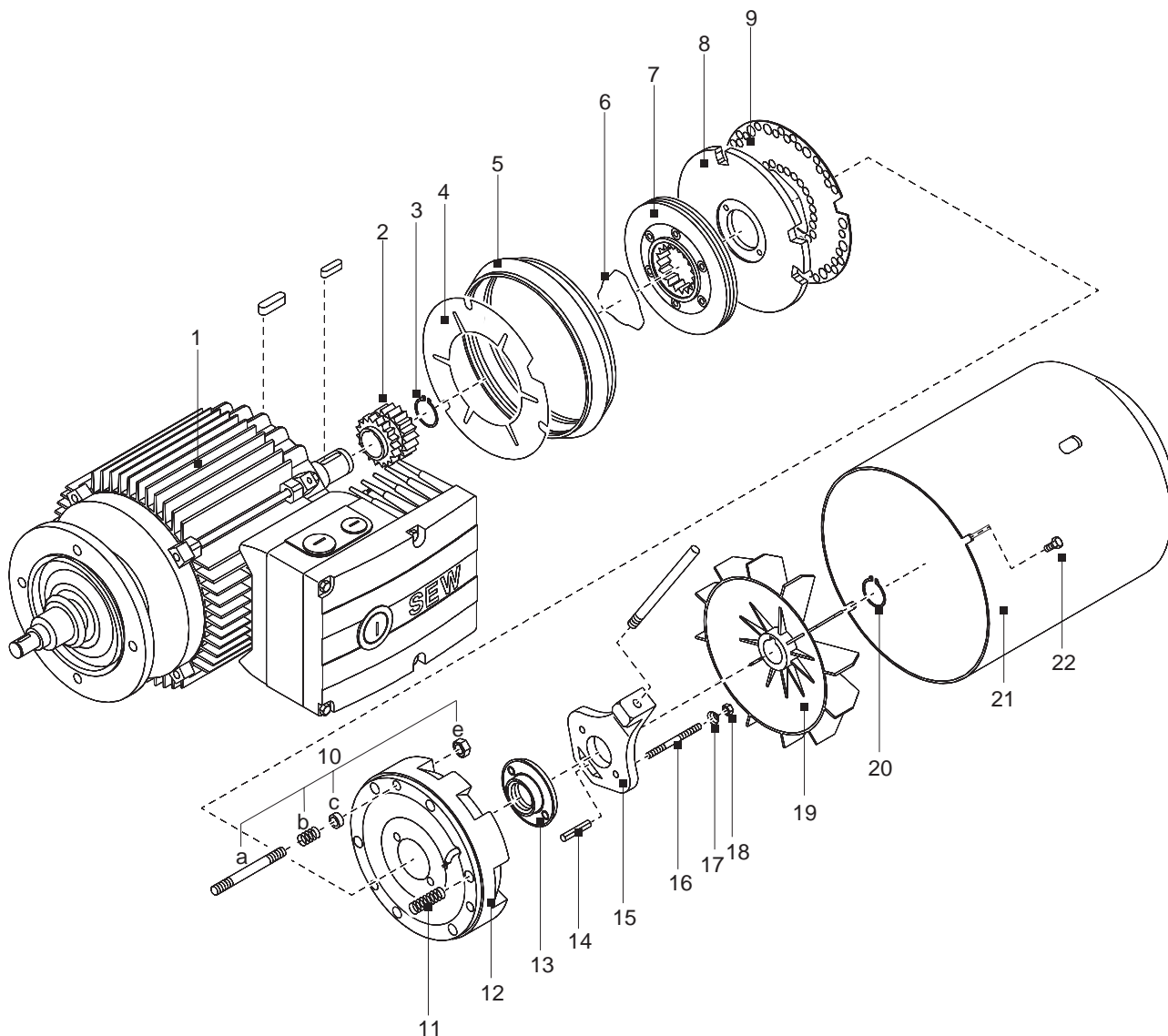


Fig. 4: Type BMG 05 - BMG 4

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



Brake inspection

(Fig.4 + Fig. 5)



Check brake disc

Set working air gap

1. **Switch off MOVIMOT® and prevent unintentional restart.**
2. Remove the following:
 - Proximity sensor NV16 / NV26, if installed.
 - Flange cover or fan guard (21).
3. Move rubber sealing collar (5) (loosen clamp, if necessary).
Extract abraded matter.
4. Measure the brake disk (7, 7b).
If brake disc ≤ 9 mm.
Replace brake disc (see page 34).
5. Measure working air gap A (see Fig. 5)
 - with feeler gauge in three places, 120 degrees apart, between pressure plate and damping plate (9).
6. Tighten the hexagon nuts (10e) until working air gap is set correctly (see page 39).
7. Fit the rubber sealing collar back in place and re-install the dismantled parts.

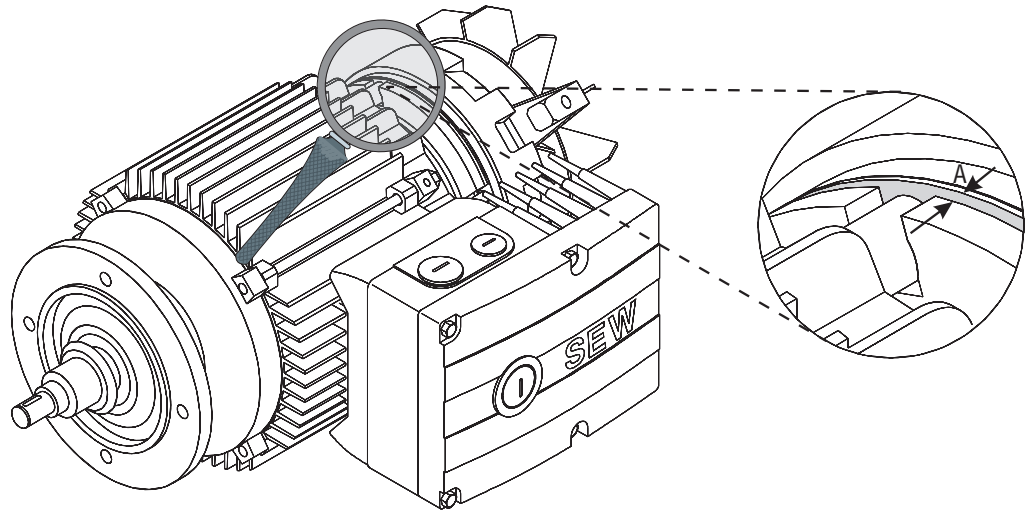


Fig. 5: Measuring the working air gap

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Inspection/Maintenance of Brake

Replacing brake disc

Replace brake disc

(Fig. 4 + Fig. 5)



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

1. **Switch off MOVIMOT® and prevent unintentional restart.**
2. Remove the following:
 - Proximity sensor NV16 / NV26, if installed.
 - Flange cover or fan guard (21), circlip (20) and fan (19).
3. Remove rubber sealing collar (5).
Removal manual brake release: setting nuts (18), conical coil springs (17), studs (16), releasing lever (15), scroll dowel pin (14).
4. Loosen hexagon nuts (10e), carefully pull off the coil body (12) (brake cable!) and take out the brake springs (11).
5. Remove the damping plate (9), pressure plate (8) and brake disc (7, 7b) and clean the brake components.
6. Install a new brake disk.
7. Re-install brake components (except rubber sealing collar, fan and fan guard), set working air gap
(see page 33 / items 5. to 7.).
8. With manual brake release (type HF or HR):
Set floating clearance between conical coil springs (flattened) and setting nuts with setting nuts (→ Fig. 6).

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 manual brake release 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

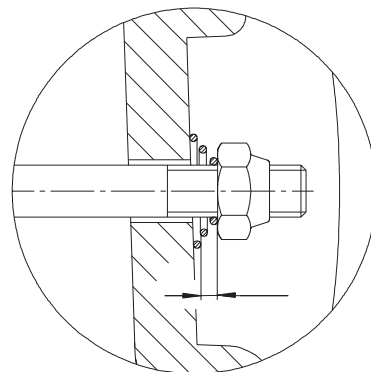


Fig. 6

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Adjust braking torque
(Fig. 4 + Fig. 5)



Braking torque can be adjusted in increments (*see page 39*)

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

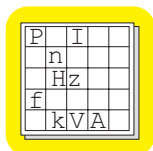
1. **Switch off MOVIMOT® and prevent unintentional restart.**
2. Remove the following:
 - Remove proximity sensor NV16 / NV26, if installed.
 - fFange cover or fan guard (21), circlip (20) and fan (19).
3. Remove rubber sealing collar (5).
Removal manual brake release:
setting nuts (18), conical coil springs (17), studs (16), releasing lever (15), scroll dowel pin (14).
4. Loosen hex nuts (10e), slide off brake coil body (12) by approximately 50 mm (Caution, brake cable!).
5. Change or add brake springs (11)
(position brake springs symmetrically).
6. Re-install brake components (except rubber sealing collar, fan and fan guard)
Set working air gap (*see page 33 / items 5. to 7.*).
7. With manual brake release:
Set floating clearance between conical coil springs (flattened) and setting nuts with setting nuts (→ Fig. 6).

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:

In case of repeated disassembly, replace setting nuts (18) and hex nuts (10e) (due to reduced self-locking of nuts!).



8 Technical Data (based on 4kHz-PWM frequency)

8.1 IEC Version

MOVIMOT® type		MM 03B-503-00	MM 05B-503-00	MM 07B-503-00	MM 11B-503-00	MM 15B-503-00	MM22B-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 with $V_{\text{mains}} = 380...500 \text{ V}_{\text{AC}}$	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_{mains}	$3 \times 380 \text{ V}_{\text{AC}} / \mathbf{400 \text{ V}_{\text{AC}}} / 415 \text{ V}_{\text{AC}} / 460 \text{ V}_{\text{AC}} / 500 \text{ V}_{\text{AC}}$ $V_{\text{mains}} = 380 \text{ V}_{\text{AC}} - 10 \% - 500 \text{ V}_{\text{AC}} + 10 \%$						
Mains frequency	f_{mains}	50 Hz – 60 Hz ± 10 %						
Mains rated current (with $V_{\text{mains}} = 400 \text{ V}_{\text{AC}}$)	I_{mains}	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_{A}	0... V_{mains}						
Output frequency	f_{A}	2...100 Hz						
Resolution		0.01Hz						
Operating point		400 V at 50 Hz / 100 Hz						
Output rated current	I_{N}	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 % at Υ , 150% at Δ regenerative: 160 % at Υ , 150% at Δ						
External braking resistor	R_{min}	200 Ω						100 Ω
Interference immunity		meets EN 50082 - parts 1+2						
Emitted interference		according to limit value class A according to EN 55011 and EN 55014 meets EN 50081 - part 2						
Ambient temperature	ϑ_{amb}	-25°C...40°C (-13°F...104°F) (P_{N} -reduction: 3.0% I_{N} per K to max. 60 °C)						
Enclosure (indicate when ordering)		IP54, IP55, IP65						
Operating mode		DB (EN 60149-1-1 and 1-3)						
Type of cooling (DIN 41 751)		Self-cooling						
Mounting height		$h \leq 1000 \text{ m}$ (P_{N} -reduction: 1% per 100 m up to max. 2,000 m)						
External power supply to control electronics	Tl. 24 V	$V = +24 \text{ V} \pm 25\%$ $I_{\text{E}} \leq 250 \text{ mA}$						
Binary inputs		Potential free via opto-coupler, PLC compatible (EN 61131-2) $R_{\text{i}} \approx 3,0 \text{ k}\Omega$, $I_{\text{E}} \approx 10 \text{ mA}$, sampling time ≤ 5 ms						
Signal level		13 V...+30 V \triangle "1" = contact closed -3 V...+5 V \triangle "0" = contact open						
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 according to IEC 337-1						
Message function		Contactor for ready signal						
Serial interface	Tl. RS + Tl. RS -	RS-485 (according to EIA standard) max. 32 participants (1 Busmaster ³⁾ + 31 MOVIMOT®) max. cable length: 200m (with transmission rate: 9600 Baud) 30m (with transmission rate: 31250 Baud ⁴⁾)						

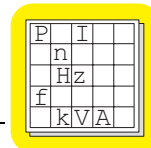
1) Factory setting

2) **16 kHz-PWM frequency (low operation noise)**

With setting **DIP-SWITCH S1/7 = ON**, the units operate with 16 kHz-PWM frequency (low operation noise) and gradually switch back to smaller switching frequencies depending on heat sink temperature.

3) Ext. control or option MBG11, MWA11A or MLG11A

4) Transmission rate of 31250 baud will be automatically recognized during operation with fieldbus interface MF...



8.2 UL US Version (in preparation)

MOVIMOT® type		MM 03B-503-00	MM 05B-503-00	MM 07B-503-00	MM 11B-503-00	MM 15B-503-00	MM22B-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 with V _{mains} = 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 _{mains}	3 x 380 V _{AC} / 400 V _{AC} /415 V _{AC} / 460 V_{AC} /500 V _{AC} V _{mains} = 380 V _{AC} - 10 % ... 500 V _{AC} +10 %						
Mains frequency	f _{mains}	50 Hz ... 60 Hz ± 10 %						
Mains rated current (with V _{mains} =400 V _{AC})	I _{mains}	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 _A	0...V _{mains}						
Output frequency	f _A	2...100 Hz						
Resolution		0.01 Hz						
Operating point		460 V at 60 Hz						
Output rated current	I _N	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 HP	1.1 kW 1.5 HP	1.5 kW 2 HP	2.2 kW 3 HP	3.7 kW 5 HP
PWM frequency		4 ¹⁾ / 8 / 12 / 16 ²⁾ kHz						
Current limitation	I _{max}	motor: 160 % at √ regenerative: 160 % at √						
External braking resistor	R _{min}	200 Ω					100 Ω	
Interference immunity		meets EN 50082 - parts 1+2						
Emitted interference		according to limit value class A according to EN 55011 and EN 55014 meets EN 50081 - part 2						
Ambient temperature	ϑ _{amb}	-25°C...40°C (-13°F...104°F) (P _N -reduction: 3.0% I _N per K to max. 60 °C						
Enclosure (indicate when ordering)		IP54, IP55, IP65						
Operating mode		DB (EN 60149-1-1 and 1-3)						
Type of cooling (DIN 41 751)		Self-cooling						
Mounting height		h ≤ 1000 m (P _N -reduction: 1% per 100 m up to max. 2,000 m)						
Ext. power supply to control electronics	TI. 24 V	V = +24 V ± 25% I _E ≤ 250 mA						
Binary inputs		Potential free via opto-coupler, PLC compatible (EN 61131-2) R _i ≈ 3,0 kΩ, I _E ≈10 mA, sampling time ≤ 5 ms						
Signal level		13 V...+30 V Δ "1" = contact closed -3 V...+5 V Δ "0" = contact open						
Control functions	TI. R ↻ TI L ↻ TI f1/f2	CW/Stop CCW/Stop "0" = Setpoint 1 / "1" = Setpoint 2						
Output relay	TI. K1a	Response time ≤ 10 ms						
Contact data	TI. K1b	24 V _{DC} /0.6 A _{DC} / DC11 according to IEC 337-1						
Message function		Contactor for ready signal						
Serial interface	TI. RS + TI. RS -	RS-485 (according to EIA standard) max. 32 participants (1 Busmaster ³⁾ + 31 MOVIMOT®) max. cable length: 200m (with transmission rate: 9600 Baud) 30m (with transmission rate: 31250 ⁴⁾ Baud)						

1) Factory setting

2) **16 kHz-PWM frequency (low operation noise)**

With setting **DIP-SWITCH S1/7 = ON**, the units operate with 16 kHz-PWM frequency (low operation noise) and gradually switch back to smaller switching frequencies depending on heat sink temperature.

3) External control or option MBG11, MWA21A or MLG11A


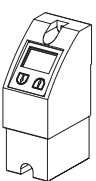

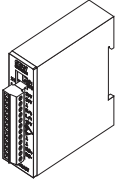
4) Transmission rate of 31250 baud will be automatically recognized during operation with fieldbus interface MF...



Technical Data Options

Regenerative Load Capacity Braking Resistors

8.3 Technical Data Options

Option	MLU11A	MLG11A	MBG11A	MWA21A
				
Part number	822 584 2	822 762 4	822 547 8	823 006 4
Input voltage	380... 500 V _{AC} +10 %		24 V _{DC} ± 25%	
Output voltage	24 V _{DC} ± 25%		-	
Output current	250 mA		-	
Current requirements	-		ca 70mA	
Setpoint resolution	-	1 %	1 %	8 bit
Serial interface	-	RS-485 for connection of max. 31 MOVIMOT® inverters (max. 200 m, 9600 Baud)		
Analog input	-			0...10 V / 2...10 V, R _i ≈ 12kΩ 0...20 mA / 4...20 mA, R _i ≈ 22Ω
Signal form	-			+13 V ...+30 V \triangle "1" - 3 V ...+5 V \triangle "0"
Enclosure	IP 65			IP 20
Dimensions HxWxD	107x40x60 mm		90x70x38 mm	75.1 x 22.7 x 73 mm

8.4 Regenerative Load Capacity Braking Resistors

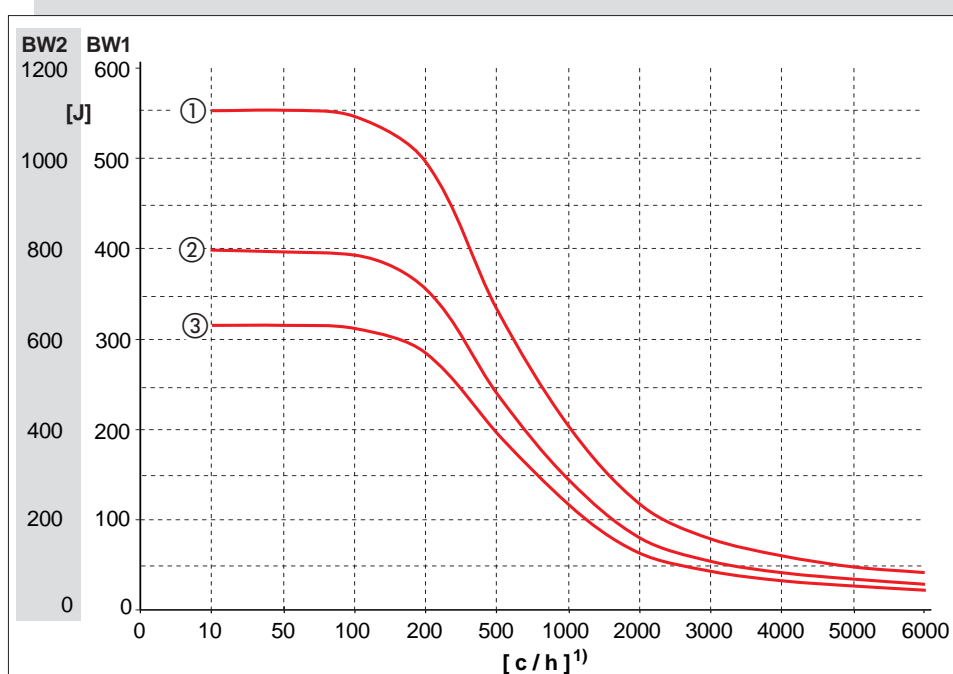
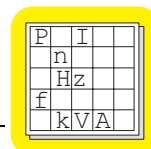


Fig. 7: Regenerative load capacity braking resistors

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¹) Cycle times per hour

① brake ramp 10 s ② brake ramp 4 s ③ brake ramp 0.2s



8.5 Regenerative Load Capacity External Braking Resistors

Load capacity with	BW200-003	BW200-005	BW100-005
100% cdf	0.23 kW	0.45 kW	0.45 kW
50% cdf	0.31 kW	0.60 kW	0.60 kW
25% cdf	0.43 kW	0.79 kW	0.83 kW
12% cdf	0.58 kW	1.06 kW	1.11 kW
6% cdf	1.02 kW	1.76 kW	2.0 kW

Load capacity applies to horizontal mounting position, values are reduced by 10% with vertical mounting position

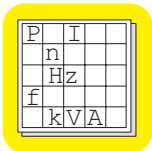
8.6 Regenerative Load of Brake Coil

Load capacity at	Brake coil BMG05/1 (DT71/DT80)	Brake coil BMG2 (DT90)	Brake coil BMG4 (DT 100)
100% cdf	30 W	57 W	70 W
50% cdf	39 W	88 W	105 W
25% cdf	56 W	150 W	175 W
12% cdf	90 W	270 W	330 W
6% cdf	150 W	480 W	620 W

8.7 Working air gap, braking torque, brake

Brake type	for motor size	Working air gap mm		Settings brake torques					Resistance of brake ¹⁾
		min. ²⁾	max.	brake torque (Nm)	type and number of springs		part number of springs		
					normal	red	normal	red	
BMG 05	DT 71	0.25	0,6	5.0	3	-	135 017 X	135 018 8	277Ω (230V)
				4.0	2	2			
				2.5	-	6			
				1.6	-	4			
				1.2	-	3			
BMG 1	DT 80			10	6	-	135 150 8	135 151 6	248Ω (230V)
				7.5	4	2			
				6.0	3	3			
BMG 2	DT 90			20	3	-	135 150 8	135 151 6	216Ω (230V)
				16	2	2			
				10	-	6			
				6.6	-	4			
				5.0	-	3			
BMG 4	DT 100			10	6	-	135 150 8	135 151 6	43.5Ω (110V)
				30	4	2			
				24	3	3			

- 1) Nominal value measured between red (terminal 13) and blue (terminal 15) connections at 20°C (68°F), temperature-dependent fluctuations in the range of -25% / +40 % are possible.
- 2) **Observe when checking working air gap:**
There can be deviations of ± 0.1 mm after a trial run due to the parallelism tolerances of the brake disc.



8.8 Approved Ball Bearing Types

Motor type	A bearing (AC motor, brake motor)			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

Germany	Headquarters Manufacture Sales, Service	Bruchsal	SEW-EURODRIVE GmbH & Co Ernst-Blickle-Straße 42 D-76646 Bruchsal Postfach 3023, D-76642 Bruchsal	Tel. (0 72 51) 75-0 Telefax (0 72 51) 75-19 70 Telex 7 822 391 http://www.SEW-EURODRIVE.com sew @ sew-eurodrive.com
	Manufacture	Graben	SEW-EURODRIVE GmbH & Co Ernst-Blickle-Straße 1 D-76676 Graben-Neudorf Postfach 1220, D-76671 Graben-Neudorf	Tel. (0 72 51) 75-0 Telefax (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 Postfach 110453, D-30804 Garbsen	Tel. (0 51 37) 87 98-30 Telefax (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 Telefax (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 Telefax (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 Telefax (0 37 64) 76 06-30
France	Headquarters Manufacture Service	Haguenau	SEW-USOCOME S.A. 48-54, route de Soufflenheim B. P.185 F-67506 Haguenau Cedex	Tel. 03 88 73 67 00 Telefax 03 88 73 66 00 Telex: 870 033 http://www.usocomme.com sew@usocomme.com
	Manufacture	Forbach	SEW-EUROCOME S.A. Zone industrielle Technopole Forbach Sud B. P. 30269, F-57604 Forbach Cedex	
	Assembly Service Technical Offices	Bordeaux	SEW-USOCOME Parc d 'activités de Magellan 62, avenue de Magellan - B. P.182 F-33607 Pessac Cedex	Tel. 05 57 26 39 00 Telefax 05 57 26 39 09
		Paris	SEW-USOCOME Zone industrielle, 2, rue Denis Papin F-77390 Vermeuil l' Etang	Tel. 01 64 42 40 80 Telefax 01 64 42 40 88
Australia	Assembly Sales, Service	Melbourne	SEW-EURODRIVE PTY. LTD. 27 Beverage Drive Tullamarine, Victoria 3043	Tel. (03) 93 38-79 11 Telefax (03) 93 30-32 31 + 93 35 35 41
		Sydney	SEW-EURODRIVE PTY. LTD. 9, Sleigh Place, Wetherill Park Sydney N. S. W. 2164	Tel. (02) 97 56 10 55 Telefax (02) 97 56 10 05
Austria	Assembly Sales, Service	Wien	SEW-EURODRIVE Ges.m.b. H. Industriestraße B4 A-2345 Brunn a. Geb. bei Wien	Tel. (0 22 36) 3 16 31 Telefax (0 22 36) 3 33 85
Belgium	Assembly Sales, Service	Bruxelles	CARON-VECTOR S.A. Avenue Eiffel 5 B-1300 Wavre	Tel. (010) 23 13 11 Telefax (010) 23 13 36 http://www.caron-vector.be info@caron-vector.be
Brazil	Manufacture Sales, Service	São Paulo	SEW DO BRASIL Motores-Redutores Ltda. Caixa Postal 201-0711-970 Rodovia Presidente Dutra km 213 CEP 07210-000 Guarulhos-SP	Tel. (011) 64 60-6433 Telefax (011) 64 80-43 43 E-Mail: sew.brasil@originet.com.br
Canada	Assembly Sales, Service	Toronto	SEW-EURODRIVE CO. OF CANADA LTD. 210 Walker Drive, Bramalea, Ontario L6T3W1	Tel. (905) 7 91-15 53 Telefax (905) 7 91-29 99
		Vancouver	SEW-EURODRIVE CO. OF CANADA LTD. 7188 Honeyman Street, Delta. B.C. V4G 1 E2	Tel. (604) 2 72 42 88 + 9 46 55 35 Telefax (604) 946-2513
		Montreal	SEW-EURODRIVE CO. OF CANADA LTD. 2555 Rue Leger Street LaSalle, Quebec H8N 2V9	Tel. (514) 3 67-11 24 Telefax (514) 3 67-36 77
Chile	Assembly Sales, Service	Santiago de Chile	SEW-EURODRIVE CHILE Motores-Redutores LTDA. Panamericana Norte N° 9261 Casilla 23-Correo Quilicura RCH-Santiago de Chile	Tel. (02) 6 23 82 03 + 6 23 81 63 Telefax (02) 6 23 81 79
China	Manufacture Assembly Sales, Service	Tianjin	SEW-EURODRIVE (Tianjin) Co., LTD No. 46, 7th Avenue, TEDA Tianjin 300457	Tel. (022) 25 32 26 12 Telefax (022) 25 32 26 11
Denmark	Assembly Sales, Service	Kopenhagen	SEW-EURODRIVE A/S Geminivej 28-30, P.O. BoX 100 DK-2670 Greve	Tel. 4395 8500 Telefax 4395 8509
Finland	Assembly Sales, Service	Lahti	SEW-EURODRIVE OY Vesimäentie 4, FIN-15860 Hollola2	Tel. (3) 58 93 00 Telefax (3) 7 80 62 11
Great Britain	Assembly Sales, Service	Normanton	SEW-EURODRIVE Ltd. Beckbridge Industrial Estate P.O. Box No.1 GB-Normanton, West-Yorkshire WF61 QR	Tel.1 /9 24 89 38 55 Telefax 1 /9 24 89 37 02
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 + 7 96 04 65 Telefax 2-795-91 29

Service and spare parts



Italy	Assembly Sales, Service	Milano	SEW-EURODRIVE di R. Blicke & Co. s.a.s. Via Bernini, 14, I-20020 Solaro (Milano)	Tel. (02) 96 79 97 71 Telefax (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. (053 83) 7 38 11-13 Telefax (053 83) 7 38 14
Korea	Assembly Sales, Service	Ansan	SEW-EURODRIVE CO., LTD. B 601-4, Banweol Industrial Estate 1048-4, Shingil-dong, Ansan 425-120	Tel. (03 45) 4 92-80 51 Telefax (03 45) 4 92-80 56
Malaysia	Assembly Sales, Service	Johore	SEW-EURODRIVE Sdn. Bhd. 95, Jalan Seroja 39 81100 Johore Bahru, Johore	Tel. (07) 3 54 57 07 + 3 54 94 09 Telefax (07) 3 5414 04
Netherlands	Assembly Sales, Service	Rotterdam	VECTOR Aandrijftechniek B.V. Industrieweg 175 NL-3044 AS Rotterdam Postbus 10085, N L-3004 AB Rotterdam	Tel. (010) 4 46 37 00 Telefax (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. (09) 2 74 56 27 2 74 00 77 Telefax (09) 2 74 01 65
Norway	Assembly Sales, Service	Moss	SEW-EURODRIVE A/S Solgaard skog 71, N-1539 Moss	Tel. (69) 24 10 20 Telefax (69) 24 10 40
Portugal	Assembly Sales, Service	Coimbra	SEW-EURODRIVE, LDA. Apartado 15, 3050 Mealhada	Tel. (031) 20 96 70 Telefax (031) 20 36 85
Singapore	Assembly Sales, Service	Singapore	SEW-EURODRIVE PTE. LTD. No 9, Tuas Drive 2, Jurong Industrial Estate Singapore 638644 Jurong Point Post Office, P.O. Box 813 Singapore 916428	Tel. 86 21 701-705 Telefax 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 27032, 2011 Benrose, Johannesburg	Tel. (2711) 4 94 43 80 Telefax (2711) 4 94 23 00
		Capetown	Gearedmotors of South Africa Pty. Ltd. 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 Telefax (021) 5 11 44 58 Telex: 576 062
		Durban	Gearedmotors of South Africa Pty. Ltd. 39 Circuit Road, Westmead, Pinetown P.O. Box 10433, Ashwood 3605	Tel. (031) 7 00 34 51 Telex: 622 407
Spain	Assembly Sales, Service	Bilbao	SEW-EURODRIVE ESPAÑA, S.L. Parque Tecnológico, Edificio, 302 E-48170 Zamudio (Vizcaya)	Tel. 9 44 31 84 70 Telefax 9 44 31 84 71
Sweden	Assembly Sales, Service	Jönköping	SEW-EURODRIVE AB Gnejsvägen 6-8 S-55303 Jönköping	Tel. (036) 16 50 70 Telefax (036) 16 44 69 Telex: 70162
Switzerland	Assembly Sales, Service	Basel	Alfred Imhof A.G. Jurastrasse 10 CH-4142 Münchenstein bei Basel	Tel. (061) 4 17 17 17 Telefax (061) 4 17 17 00
Thailand	Assembly	Chon Buri	SEW-EURODRIVE (Thailand) Ltd. Bangpakong Industrial Park 2 700/456, M007, Tambol Bonhwaroh Muang District, Chon Buri 20000	Tel. 0066-38 21 45 29/30 Telefax 0066-38 21 45 31
Turkey	Assembly Sales, Service	Istanbul	SEW-EURODRIVE Hareket Sistemleri Ticaret Ltd. Sirketi Bagdat Cad. Koruma Cikmazi No. 3 TR-81540 Maltepe ISTANBUL	Telefon (216) 4 41 91 63 + 4 41 91 64 + 3 83 80 14 + 3 83 80 15 Telefax (216) 3 05 58 67
USA	Manufacture Assembly Sales, Service	Greenville	SEW-EURODRIVE INC. 1275 Old Spartanburg Highway P.O. Box 518 Lyman, S.C. 29365	Tel. (864) 4 39-75 37 Telefax Sales (864)439-78 30 Telefax Man. (864) 4 39-99 48 Telefax Ass. (864) 4 39-05 66 Telex: 805 550
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		Philadelphia/PA	SEW-EURODRIVE INC. Pureland Ind. Complex 200 High Hill Road, P.O. Box 481 Bridgeport, New Jersey 08014	Tel. (609) 4 67-22 77 Telefax (609) 8 45-31 79
		Dayton	SEW-EURODRIVE INC. 2001 West Main Street Troy, Ohio 45373	Tel. (513) 3 35-00 36 Telefax (513) 2 22-41 04 Telex: 6 874 204
		Dallas	SEW-EURODRIVE INC. 3950 Platinum Way, Dallas, Texas 75237	Tel. (214) 3 30-48 24 Telefax (214) 3 30-47 24
Venezuela	Assembly Sales, Service	Caracas	Edif. Asea Brown Boveri Av. Diego Cisneros Los Ruices	Tel. (02) 2 39 64 33 + 2 38 24 22 + 2 38 24 11 Telefax (02) 2 39 63 83 + 2 39 58 34 Telex: 2 52 49 + 2 52 65

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