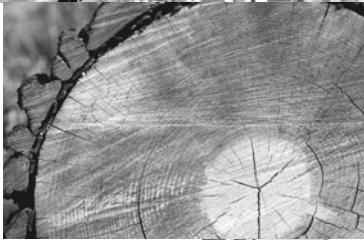


**AC Motors DR/DV/DT/DTE/DVE,
Asynchronous Servo Motors CT/CV**

Edition 11/2007

11291613 / US

Operating Instructions





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1 Important Notes

Safety and warning notes

Always follow the safety and warning instructions in these operating instructions!



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 drive and the environment.



Tips and useful information.



You must adhere to the operating instructions to ensure:

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

Consequently, read the operating instructions before you start operating the drive!

The operating instructions contain important information about servicing. Therefore, keep the operating instructions close to the drive.

Waste disposal



Dispose of the following materials in accordance with the regulations in force:

- Iron
- Aluminum
- Copper
- Plastic
- Electronic components



2 Safety Notes

- Preface** The following safety notes are concerned with the use of motors. If using **gearmotors**, also refer to the safety notes for gear units in the corresponding operating instructions.
- Please also consider the supplementary safety notes in the individual sections of these operating instructions.**
- General information** During and after operation, motors and gearmotors have live and moving parts and their surfaces may be hot.
- All work related to transport, putting into storage, setting up/mounting, connection, startup, maintenance and repair may only be performed by trained personnel observing**
- The corresponding detailed operating instructions and wiring diagrams
 - The warning and safety signs on the motor/gearmotor
 - The specific regulations and requirements for the system
 - The national / regional regulations governing safety and accident prevention
- Severe injuries and damage to property may result from**
- Improper use
 - Incorrect installation or operation
 - Unauthorized removal of necessary protection covers or the housing
- Designated use** These electric motors are intended for industrial systems. They fulfill the applicable standards and regulations:
- Low voltage directive 73/23/EEC
- Technical data and information about the permitted conditions can be found on the nameplate and in the documentation.
- It is essential to observe all the specified information!**
- Transportation** **Inspect the shipment for damage as soon as you receive the delivery. Inform the shipping company immediately. It may be necessary to preclude startup.**
- Tighten installed eyebolts. They are only designed for the weight of the motor/gearmotor; do not attach any additional loads.
- The installed lifting eyebolts comply with DIN 580. Observe the loads and regulations specified in this standard. If the gearmotor is equipped with two suspension eye lugs or lifting eyebolts, then both of the suspension eye lugs should be used for transportation. In this case, the tension force vector of the slings must not exceed a 45° angle in accordance with DIN 580.**
- Use suitable, sufficiently rated handling equipment if necessary. Remove any transportation fixtures prior to startup.
- Installation / assembly** Follow the instructions in the section "Mechanical Installation"!
- Inspection / maintenance** Follow the instructions in the section "Inspection and Maintenance"!

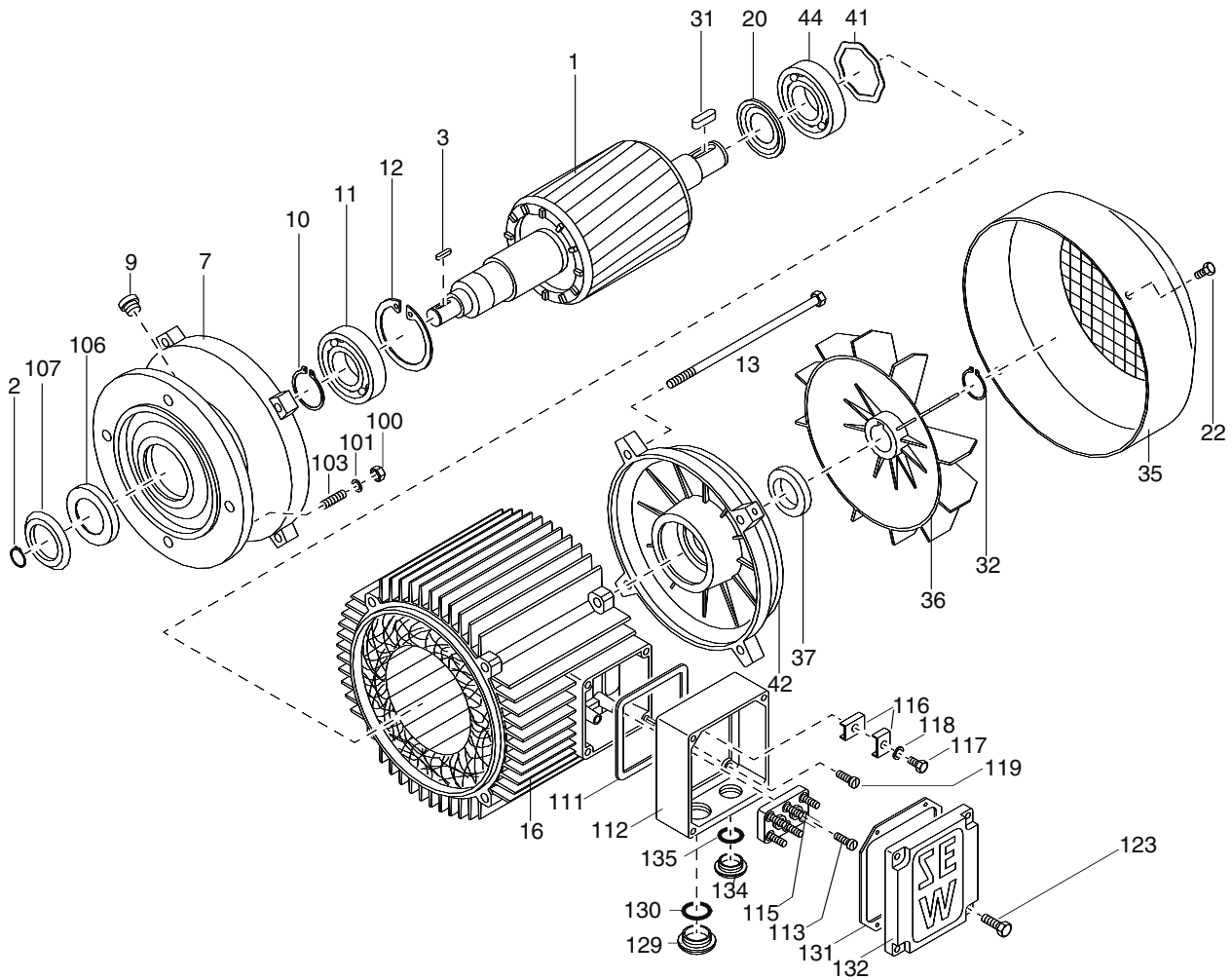


3 Motor Design



The following illustration is intended to explain the general structure. Its only purpose is to facilitate the assignment of components to the spare parts lists. Discrepancies are possible depending on the motor size and version!

3.1 Basic structure of AC motors



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[1] Rotor, cpl.	[31] Key	[107] Oil-flinger ring	[131] Sealing washer
[2] Circlip	[32] Circlip	[111] Gasket	[132] Terminal box cover
[3] Key	[35] Fan guard	[112] Terminal box lower part	[134] Screw plug
[7] Flanged end shield	[36] Fan	[113] Machine screw	[135] Sealing washer
[9] Screw plug	[37] V-ring	[115] Terminal board	
[10] Circlip	[41] Equalizing ring	[116] Terminal yoke	
[11] Grooved ball bearing	[42] Non drive-end bearing shield	[117] Hex head bolt	
[12] Circlip	[44] Grooved ball bearing	[118] Lock washer	
[13] Hex head screw (tie rod)	[100] Hex nut	[119] Machine screw	
[16] Stator, cpl.	[101] Lock washer	[123] Hex head bolt	
[20] Nilos ring	[103] Stud	[129] Screw plug	
[22] Hex head bolt	[106] Oil seal	[130] Sealing washer	



3.2 Nameplate, unit designation

Nameplate

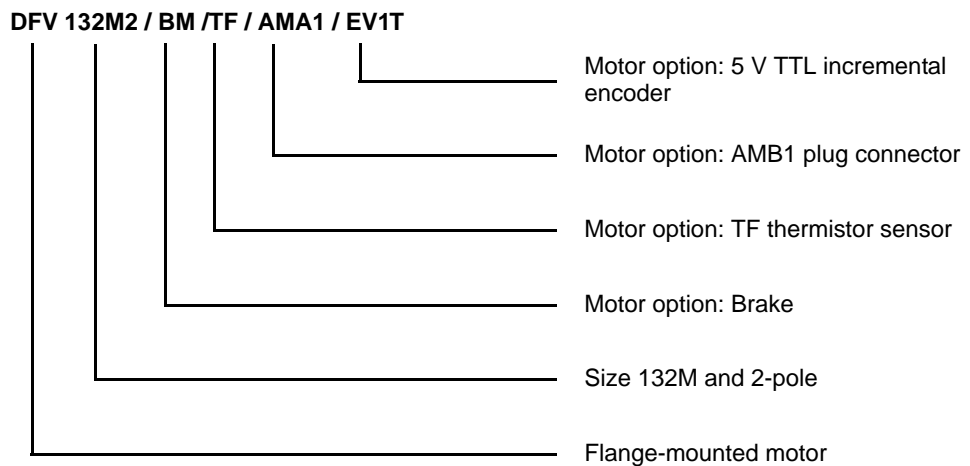
Example: DFV 160 M4 /BM brake motor

SEW-EURODRIVE, INC. USA						SE W
Type	DFV160M4BM15HR				TEFC 3PH	
S.O.	870012345.07.07.001					
V	230YY / 460Y				HZ	60
A	20 / 40		Code	J	NEMA Nom Eff %	Conn Dia
HP	15.0		S.F.	1.0		Duty
rpm	1720				Ins Class	B
Brake	V 460AC		Torque	53.8		lb-ft Control
						BGE1.5
						Design Letter
						B
						Maximum Ambient
						40 °C

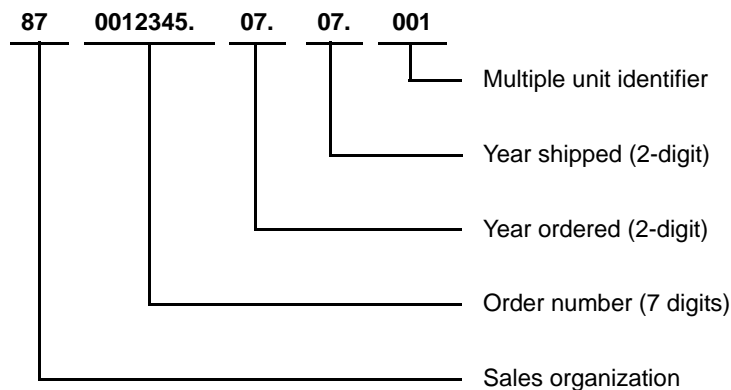
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Unit designation

Example: DR / DT / DV / DTE / DVE AC (brake) motors



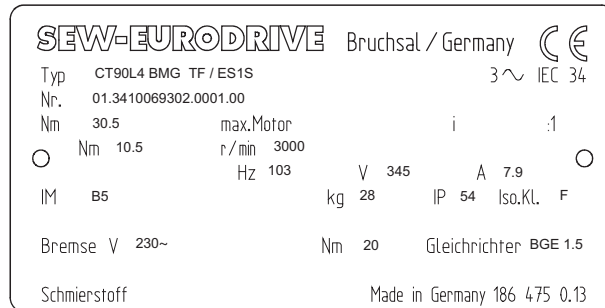
Example: Serial number





Nameplate

Example: CT90L4 / BMG / TF / ES1S servo brake motor

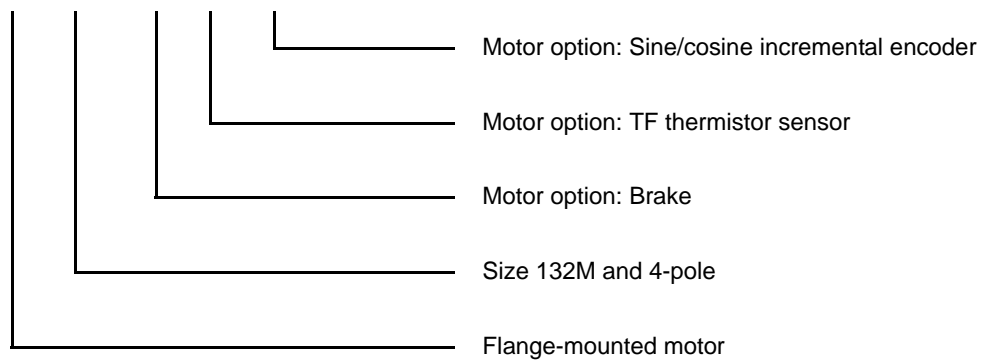


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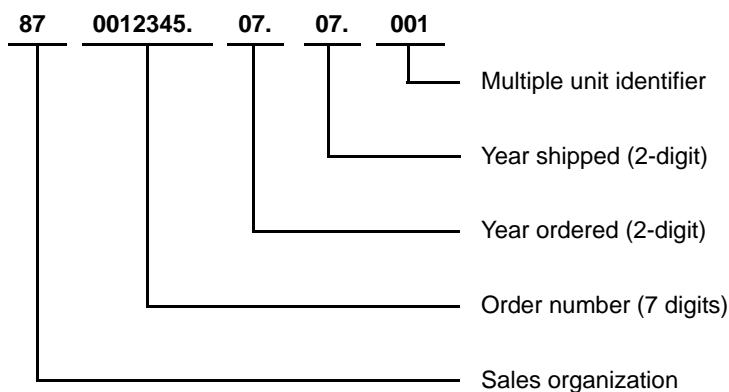
Unit designation

Examples: Servo (brake) motors CT / CV

CFV 132M4 / BM / TF / EV1S



Example: Serial number





4 Mechanical Installation



It is essential to comply with the safety notes in Section 2 during installation!

4.1 Before you begin

The drive may only be installed if

- The entries on the nameplate of the drive and/or the output voltage of the frequency inverter match the voltage supply system
- The drive is undamaged (no damage caused by transportation or storage)
- It is certain that the following requirements have been met:
 - Ambient temperature between -20 °C and $+40\text{ °C}^{1)}$
 - No oil, acid, gas, vapors, radiation, etc.
 - Installation altitude max. 1000 m above sea level
 - Note the restrictions for encoders
 - Special versions: Drive configured in accordance with the ambient conditions

4.2 Preliminary work

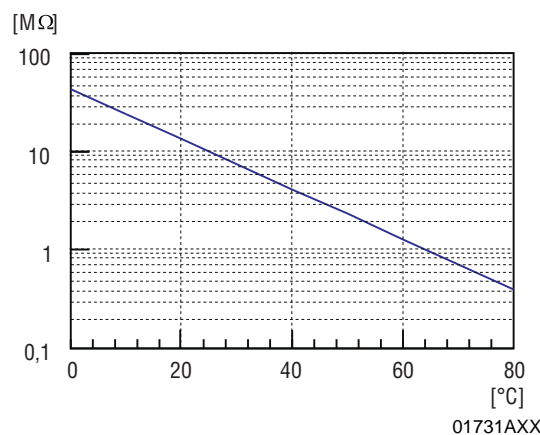
Motor shaft ends must be thoroughly cleaned of anti-corrosion agents, contamination or similar (use a commercially available solvent). Do not allow the solvent to penetrate the bearings or shaft seals – this could cause material damage!

Extended storage of motors

- Please note the reduced grease utilization period of the ball bearings after storage periods exceeding one year.
- Check whether the motor has absorbed moisture as a result of being stored for a long time. Measure the insulation resistance to do this (measuring voltage 500 V).



The insulation resistance (→ following figure) varies greatly depending on the temperature! The motor must be dried if the insulation resistance is not adequate.



1) Minimum temperature for motors with backstop: -15 °C . Note that the temperature range of the gear unit may also be restricted (→ gear unit operating instructions)



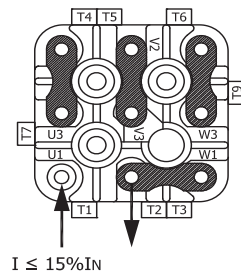
Mechanical Installation

Installing the motor

Drying the motor

Heat up the motor

- with hot air or
- using an isolation transformer
 - Connect the windings in series (→ following figure)
 - Auxiliary AC voltage supply max. 10 % of the rated voltage with max. 15% of the rated current



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The drying process is finished when the minimum insulation resistance has been attained.

Check the terminal box to see whether

- The inside is clean and dry
- The connections and fixing parts are free from corrosion
- The joint seals are OK
- The cable glands are sound, otherwise clean or replace them.

4.3 Installing the motor



The motor or gearmotor may only be mounted or installed in the specified mounting position on a level and torsionally rigid support structure which is not subjected to shocks.

Carefully align the motor and the driven machine to avoid placing any unacceptable strain on the output 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 (protection cowl C).

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 (motor shafts are balanced with a half key).

Any condensation drain holes sealed by plastic plugs should only be opened when necessary.

If using brake motors with manual brake release, screw in either the hand lever (with self-reengaging manual brake release) or the setscrew (with lockable manual brake release).

Note the following for encoder mounting:

Foot-mounted motors CT/DT71, CT/DT90, CV/DV132M, CV/DV160L must be mounted on supports because the radius of the cover is greater than the shaft height.



Installation in damp locations or in the open

For foot-mounted (brake) motors sizes DTE90L and DVE132M, the shaft height corresponds to the IEC standard motor of the next higher power level (100 mm or 160 mm). The foot dimensions of DTE90, DVE180, and DVE225 motors differ from the IEC dimensions; see Sec. "Dimension Sheet Notes" in the Gearmotors catalog.

If possible, arrange the terminal box so the cable entries are pointing downwards.

Coat the threads of cable glands and pocket caps with sealant and tighten them well – then coat them again.

Seal the cable entry well.

Thoroughly clean the sealing surfaces of terminal boxes and terminal box covers prior to reassembly; gaskets must be glued in on one side. Install new gaskets to replace embrittled ones!

Restore the anticorrosive coating if necessary.

Check the enclosure.

4.4 Installation tolerances

Shaft end	Flanges
Diameter tolerance in accordance with DIN 748 <ul style="list-style-type: none"> • ISO k6 at $\varnothing \leq 50$ mm • ISO m6 at $\varnothing > 50$ mm • Center bore in accordance with DIN 332, shape DR.. 	Centering shoulder tolerance in accordance with DIN 42948 <ul style="list-style-type: none"> • ISO j6 at $\varnothing \leq 230$ mm • ISO h6 at $\varnothing > 230$ mm



5 Electrical Installation



It is essential to comply with the safety notes in section 2 during installation!

Switch contacts in utilization category AC-3 to EN 60947-4-1 must be used for switching the motor and the brake.

Using the wiring diagrams

The motor must only ever be connected as shown in the wiring diagram included with the motor. **Do not connect or start up the motor if this wiring diagram is missing.** You can obtain the valid wiring diagram free of charge from SEW-EURODRIVE.

5.1 Wiring notes

Comply with the safety notes during installation.

Protecting brake control systems against interference

Do not route brake cables alongside switched-mode power cables, as otherwise there is a risk of disrupting brake control systems.

Switched-mode power cables include in particular:

- Output cables from frequency and servo controllers, converters, soft start units and brake units
- Feeder cables for brake resistors and similar options

Protecting motor protection devices against interference

To protect SEW motor protection devices (temperature sensors TF, winding thermostats TH) against interference:

- Route separately shielded feeder cables together with switched-mode power lines in one cable
- Do not route unshielded feeder cables together with switched-mode power lines in one cable

5.2 Special aspects for operation with a frequency inverter

When motors are powered from inverters, you must adhere to the wiring instructions issued by the inverter manufacturer. It is essential to observe the operating instructions for the frequency inverter.

5.3 Special aspects of single-phase motors

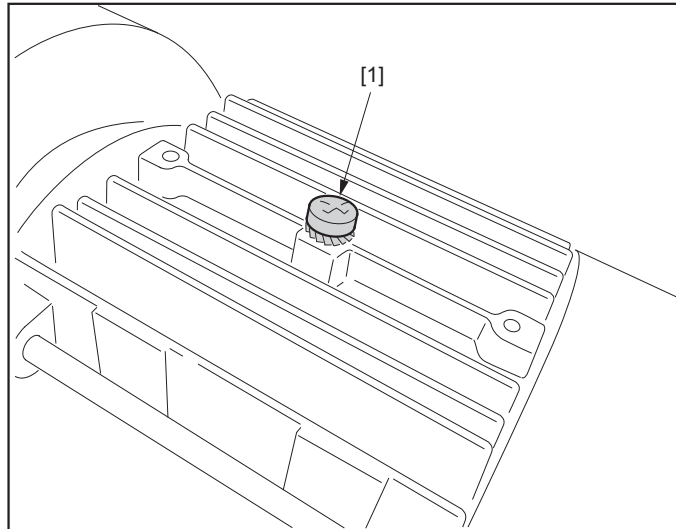
Bear in mind that SEW single-phase motors are supplied without accessory equipment such as capacitors, starting relays or centrifugal switches (exception: ET56L4 → Sec. "Single-phase version ET56"). Any parts you need must be obtained from your dealer and connected according to the corresponding instructions and wiring diagrams.



5.4 Improving the grounding (EMC)

For improved, low-impedance grounding at high frequencies, we recommend using the following connections with the DR/DV/DT AC motors:

- Sizes DT71 ... DV 132S: [1] M5x10 thread rolling screw and 2 serrated lock washers to DIN 6798 in the stator housing.



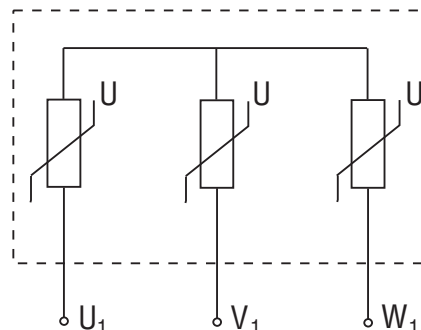
- Sizes DV112M ... DV280: Screw and 2 serrated lock washers in the bore of the eye bolt.

Thread size of the eye bolt:

- DV112 / 132S: M8
- DV132M ... 180L: M12
- DV200 ... 280: M16

5.5 Special aspects of torque motors and low-speed motors

Due to the design of torque motors and low-speed motors, very high induction voltages may be generated when they are switched off. Consequently, SEW-EURODRIVE recommends using the varistor circuit shown below for protection. The size of the varistors depends, amongst other factors, on the starting frequency – note for project planning!



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5.6 Special aspects in switching operation

When the motors are used in switching operation, possible interference of the switch-gear must be excluded by ensuring suitable wiring. According to EN 60204 (electrical equipment of machines), motor windings must have interference suppression to protect the numerical or programmable logic controllers. As it is primarily switching operations that cause interference, SEW-EURODRIVE recommends installing protective circuitry in the switching devices.

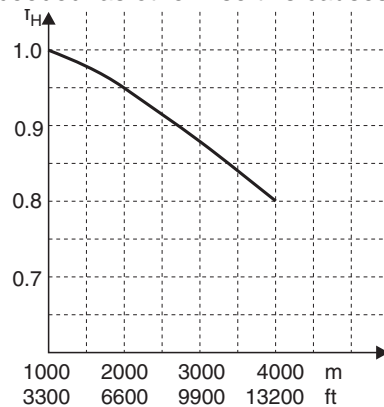
5.7 Environmental conditions during operation

Ambient temperature

The temperature range of -20 °C to +40 °C (-4 °F to +104 °F) must be ensured unless specified otherwise on the nameplate. Motors intended for use in higher or lower ambient temperatures have the appropriate designation on the nameplate.

Altitude

The maximum installation altitude of 1000 m (3300 ft) above sea level must not be exceeded as otherwise this causes a derating as specified in the following diagram.



Hazardous radiation

Motors must not be subjected to hazardous radiation. Contact SEW-EURODRIVE if necessary.



5.8 Connecting the motor



In case of operation with electronic control units, it is essential to adhere to the corresponding operating instructions / wiring diagrams!

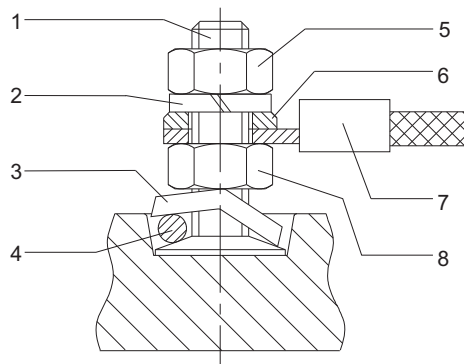
Connecting the motor via terminal boxes

- According to the circuit diagram provided
- Check the line cross section
- Arrange terminal links correctly
- Screw connections and protective earth conductors on firmly
- In terminal boxes: Check winding connections and tighten them if necessary

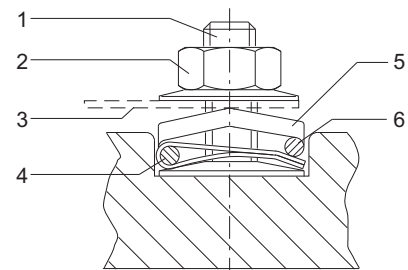
Small connection accessories

Note: In the case of motor sizes DR63 - DV132S, the small connection accessories (connection nuts for feeder cables, terminal links, lock washer and washers) are supplied in a bag. Depending on the type of terminal board, install the parts in accordance with the figure below. In the connection type shown on the right in the figure below, the second retaining nut, the lock washer and the washer are not used. The external connection [6] can be installed directly or as a lug [4] below the connection disk [5]. The tightening torque of the hex nut in the figure on the right is:

- 1.6 Nm (14 lb-in) \pm 20 % for M4
- 2 Nm (17.7 lb-in) \pm 20 % for M5



- 1 Terminal stud
- 2 Lock washer
- 3 Connection disk
- 4 Motor terminal lead
- 5 Top nut
- 6 Washer
- 7 External connection
- 8 Bottom nut



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- 1 Terminal stud
- 2 Hex nut with flange
- 3 Terminal link
- 4 Motor connection with Stocko connection terminal
- 5 terminal
- 6 Connection disk
External connection



The asynchronous servomotors of the CT/CV series are supplied with connected terminal links according to the nameplate.

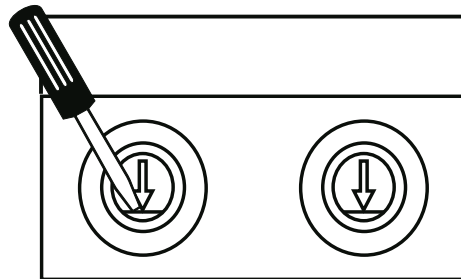


5.9 Preparing motor sizes 56 and 63 – knockout



Important: Wear safety glasses – danger of injury from fragments!

- Put on the terminal box cover and screw it into place
- Define which cable entries to open
- Open the cable entries
 - with a chisel or similar (hold at an angle)
 - by a light tap with a hammer



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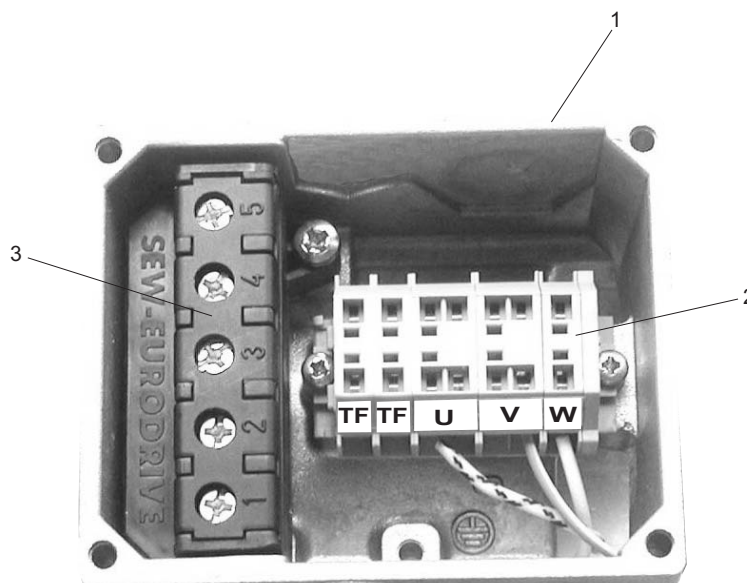


Caution – Do not knock through into the inside of the terminal box!

- Open the terminal box, remove the knockout cover if it has broken off
- Secure the cable screw fittings with the supplied lock nuts

5.10 Connecting DT56 motor...+/BMG

The motor has a star point with three fixed connection points in the winding overhang. The supply system leads (L1, L2, L3) are connected to a spring cage terminal block [2] in the terminal box [1]. The BMG02 brake is controlled using the BG1.2 brake rectifier [3]. As an alternative, the brake can be controlled from the switch cabinet using BM series rectifiers.



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5.11 Single-phase version ET56

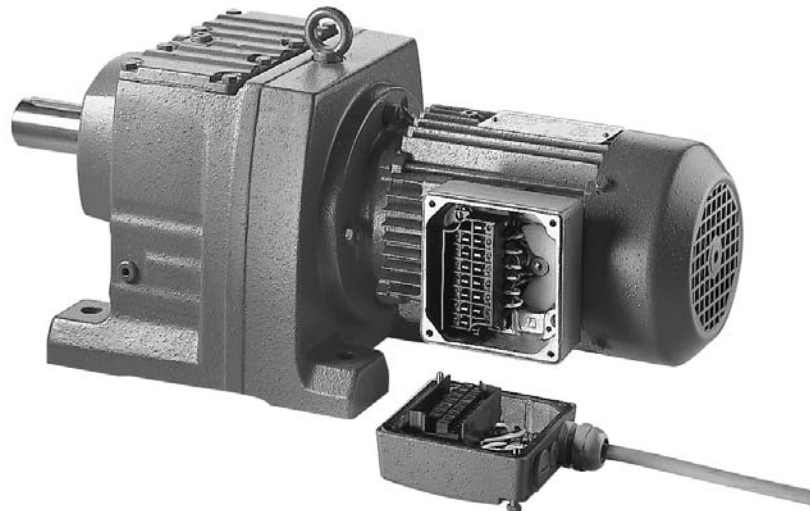
The ET56 single-phase motor is supplied with a running capacitor that is mounted and connected:

- 1~230 V, 50 Hz $C_B = 4 \mu\text{F}$
- 1~230 V, 60 Hz $C_B = 4 \mu\text{F}$
- 1~110 V, 60 Hz $C_B = 20 \mu\text{F}$



No full-load startup is possible with the running capacitor alone! The single-phase motor cannot be combined with a TF.

5.12 Connecting the motor using the IS plug connector



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The IS plug connector is supplied from the factory with its base fully wired-up, including additional features such as a brake rectifier. The upper section of the IS connector is included in the scope of delivery and must be connected as shown in the wiring diagram.

The IS plug connector has CSA approval up to 600 V. Note for application according to CSA regulations: Tighten the M3 terminal screws to a torque of 0.5 Nm (4.4 lb-in)! See the following table for American Wire Gauge (AWG) line cross sections!

Line cross section

Make sure the type of line corresponds to the applicable regulations. The rated currents are specified on the motor nameplate. The line cross sections that can be used are listed in the following table.

Without variable terminal link	With variable terminal link	Link cable	Double assignment (Motor and brake/SR)
0.25 - 4.0 mm ²	0.25 - 2.5 mm ²	max. 1.5 mm ²	max. 1 x 2.5 and 1 x 1.5 mm ²
23 - 12 # AWG	23 - 14 # AWG	max. 16 # AWG	max. 1 x 14 # and 1 x 16 # AWG



Electrical Installation

Connecting the motor using the IS plug connector

Wiring the upper section of the plug connection

- Loosen the housing cover screws
 - Remove the housing cover
- Remove the screws from the upper section of the plug connector
 - Remove the upper section of the plug connector from the cover
- Strip the insulation off the connection lead
 - Strip about 9 mm (0.3") insulation off the connecting leads
- Pass the cable through the cable gland

Wiring up as shown in circuit diagram DT82, DT83

- Connect the lines as shown in the circuit diagram
 - Tighten the clamping screws carefully!
- Install the plug connector (→ Sec. "Installing the plug connector")

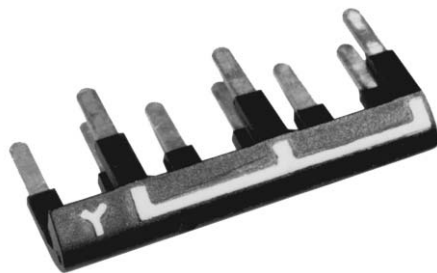
Wiring up as shown in wiring diagram DT81

For \wedge / Δ startup:

- Connect with 6 lines
 - Tighten the clamping screws carefully!
 - Motor contactors in the switch cabinet
- Install the plug connector (→ Sec. "Installing the plug connector")

For \wedge or Δ operation:

- Connect as shown in the wiring diagram
- Install the variable terminal link as shown in the following figures according to the required motor operation (Δ or \wedge)
- Install the plug connector (→ Sec. "Installing the plug connector")



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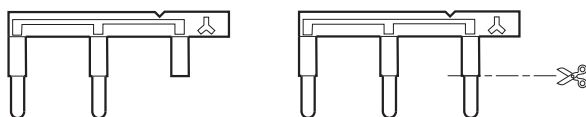
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Brake control system BSR – preparing the variable terminal link

For \curvearrowright operation:

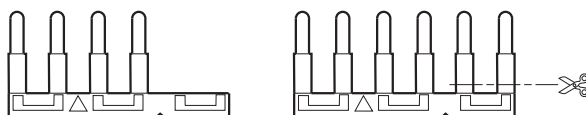
On the \curvearrowright side of the variable terminal link as shown in the following figure: Remove only the bare metal pin of the marked prong horizontally – touch guard!



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For \triangle operation:

On the \triangle side of the variable terminal link as shown in the following figure: Completely remove two prongs horizontally.



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Wiring according to the DT81 wiring diagram for \curvearrowright or \triangle operation with double terminal assignment

- At terminal point for double assignment:
 - Connect the link cable
- When operation is as required:
 - Insert the link cable in the variable terminal link
- Install the variable terminal link
- At terminal point for double assignment:
 - Connect the motor lead above the variable terminal link
- Connect the other lines as shown in the wiring diagram.
- Install the plug connector (→ Sec. "Installing the plug connector")



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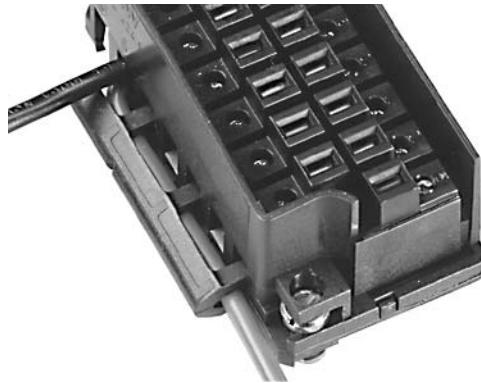
Electrical Installation

Connecting the motor using the IS plug connector

Installing the plug connector

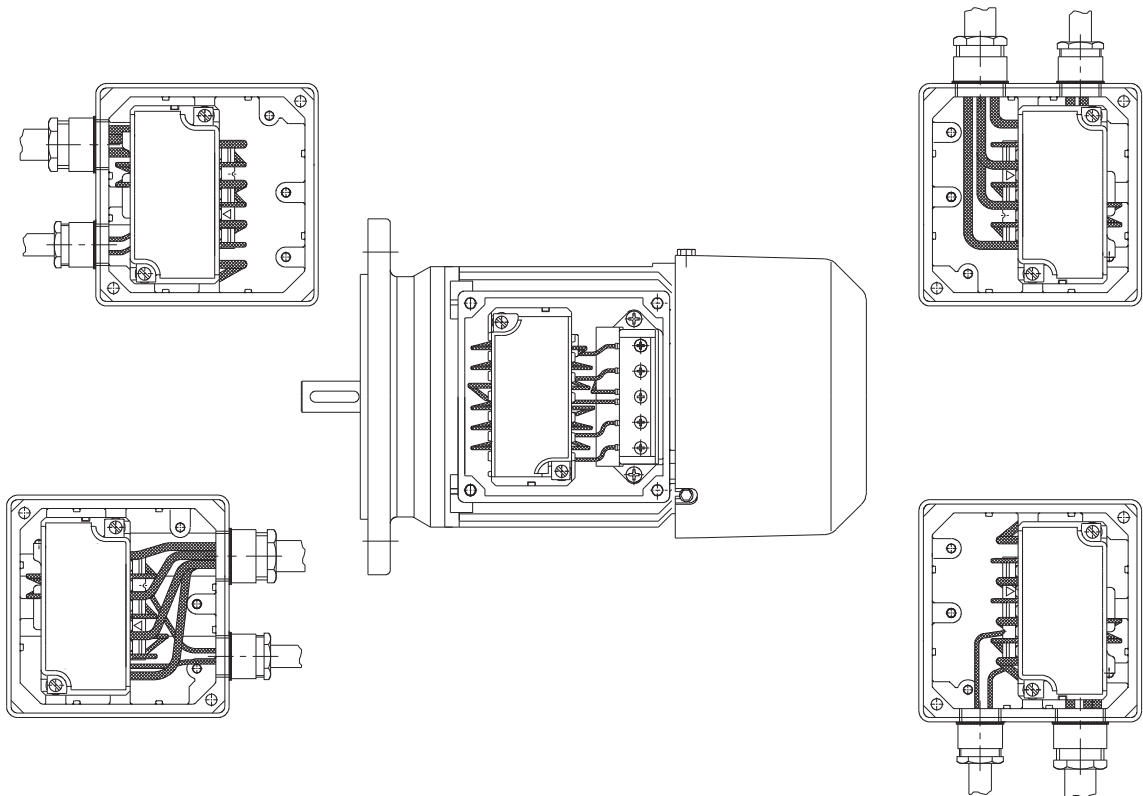
The housing cover of the IS plug connector can be screwed onto the lower section of the plug connector depending on the required position of the cable lead. The upper section of the plug connector shown in the following figure must first be installed in the housing cover so it will match the position of the lower section of the plug connector:

- Define the required mounting position
- Install the upper section of the plug connector into the housing cover in accordance with the mounting position
- Close the plug connector
- Tighten the cable gland



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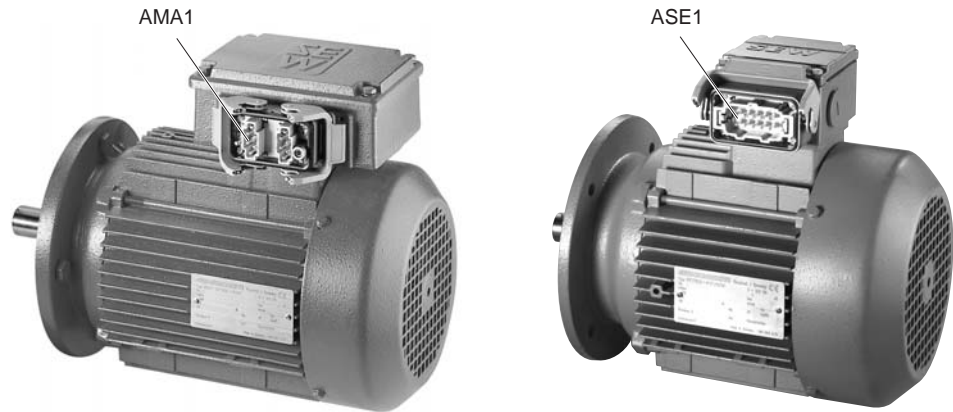
Mounting position of the upper section of the plug connection in the housing cover



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5.13 Connect the motor using plug connectors AB., AD., AM., AS



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The installed plug connector systems AB., AD., AM., AC.. and AS.. are based on the plug connector systems made by Harting.

- AB., AD., AM.. → Han Modular®
- AC., AS.. → Han 10E / 10ES

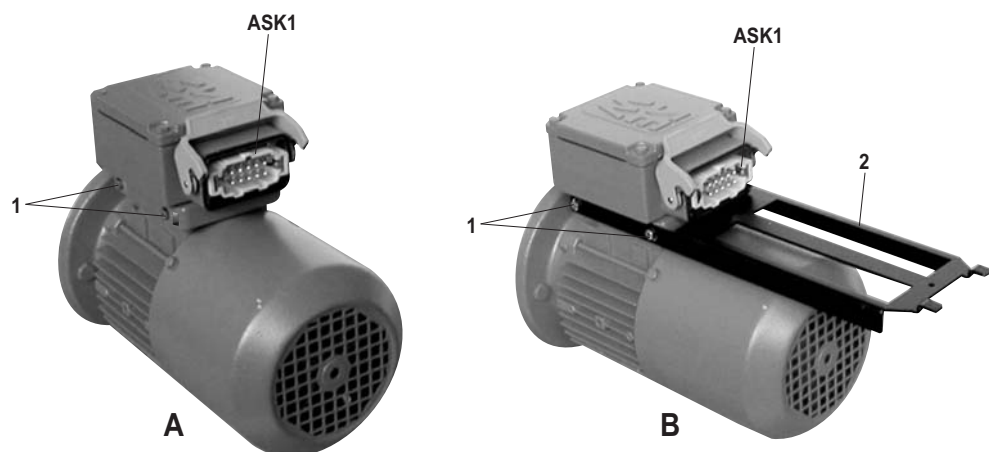
The plugs are mounted on the side of the terminal box. They are locked either using two clamps or one clamp on the terminal box.

UL approval has been granted for the plug connectors.

The mating connectors (sleeve housing) with contact tubes are not included in the scope of delivery.

The enclosure is only applied when the mating connector is mounted and locked.

5.14 Connecting the motor using ASK1 plug connector



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Drives with ASK1 plug connectors are certified according to the ECOFAST specification (version 1.1). Switchgear or control units which also have to be certified can be connected to SEW-EURODRIVE motors using a pre-fabricated system cable or a carrier plate (installation integrated in the motor → Fig. B). The ASK1 plug connector with single-clip locking is mounted on the side of the terminal box and is supplied from the



Electrical Installation

Connecting the motor using ASK1 plug connector

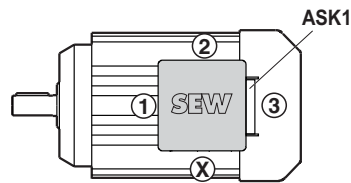
factory fully wired up, including additional features such as a brake rectifier.



- The customer must obtain the system cable pre-fabricated according to the ECOFAST specification from a specialist retailer.
- For installation integrated in the motor according to the ECOFAST specification, the customer must obtain the carrier plate from SEW-EURODRIVE by quoting part number 0187 390 3. Carrier plates from other manufacturers do not fit on SEW-EURODRIVE motors.

Position of the plug connector

Possible positions of the ASK1 plug connector are "X" (= normal position), "1", "2" or "3". Unless specified otherwise, the unit is supplied with the plug connector in position "3". For installation integrated in the motor (using the carrier plate), units are exclusively supplied with the plug connector in position "3".



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Installing the carrier plate

- Unscrew and remove four retaining screws [1] below the terminal box (→ Fig. A)
- Place the carrier plate [2] against the holes for the retaining screws and install it by screwing in the four retaining screws [1] (→ Fig. B).



5.15 Connecting the brake

The brake is released electrically. The brake is applied mechanically when the voltage is switched off.



Comply with the applicable regulations issued by the relevant employer's liability insurance association regarding phase failure protection and the associated circuit/circuit modification!

- Connect the brake according to the wiring diagram supplied with the brake.
- **Note:** In view of the DC voltage to be switched and the high level of current load, it is essential to use either special brake contactors or AC contactors with contacts in utilization category AC-3 to EN 60947-4-1.
- Attach one of the following options for the version with manual brake release
 - Hand lever (for self-reengaging manual brake release)
 - Setscrew (for locking manual brake release)
- After replacing the brake disc, the maximum braking torque is reached only after several cycles.

Connecting the brake control system

The DC disk brake is powered from a brake control system with a protection circuit. It is located in the terminal box / IS lower part or must be installed in the switch cabinet (→ Sec. "Wiring notes").



- **Check the line cross sections - braking currents (→ Sec. "Technical Data")**
- Connect the brake control system according to the wiring diagram supplied with the brake
- For motors in thermal class H, install the brake rectifier in the switch cabinet!



5.16 Accessory equipment



Connect supplied accessory equipment according to the wiring diagrams included.

TF temperature sensor



Do not apply voltage!

The positive temperature coefficient (PTC) thermistors comply with DIN 44082.

Resistance measurement (measuring instrument with $V \leq 2.5 \text{ V}$ or $I < 1 \text{ mA}$):

- Standard measured values: 20...500 Ω , thermal resistance $> 4000 \Omega$
- Measured values pole-changing with separate winding: 40...1000 Ω ,
Thermal resistance $> 4000 \Omega$



When using the temperature sensor for thermal monitoring, the evaluation function must be activated to maintain reliable isolation of the temperature sensor circuit. If the temperature reaches an excessive level, the thermal protection function must be effective immediately.

TH winding thermostats

The thermostats are connected in series as standard and open when the permitted winding temperature is exceeded. They can be connected in the drive monitoring loop.

	V_{AC}		V_{DC}	
Voltage U [V]	250	400	60	24
Current (cos $\varphi = 1.0$) [A]	2.5	0.75	1.0	1.6
Current (cos $\varphi = 0.6$) [A]	1.6	0.5		
Contact resistance max. 1 ohm at 5 V = / 1 mA				

Forced cooling fan

Motor sizes 71 - 132S

VS system

- 1 x 230 V_{AC} , 50/60 Hz
- Connection in separate terminal box
- Max. connection cross section 3 x 1.5 mm² (16 AWG)
- Cable screw fitting M16x1.5



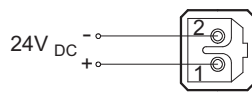
Refer to the VS wiring diagram for information about connecting the VS forced cooling fan (order number: 0975 8385).



VR system

- $24 V_{DC} \pm 20 \%$
- Plug connector
- Max. connection cross section $3 \times 1 \text{ mm}^2$ (18 AWG)
- Pg7 cable gland with 7 mm inside diameter

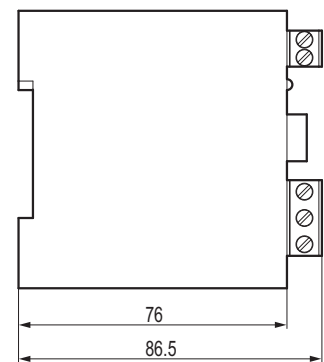
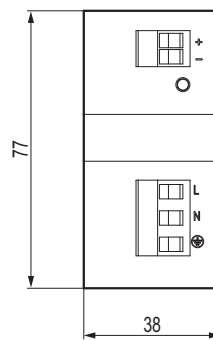
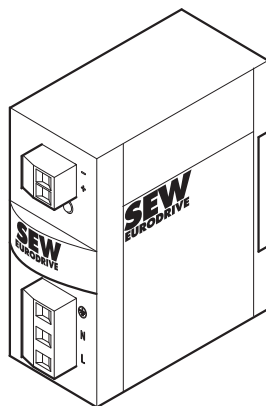
The **VR forced cooling fan** is available for 24 V DC voltage and for 100 ... 240 V AC voltage.



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The AC voltage type includes a VR forced cooling fan and the UWU51A switch-mode power supply (→ following figure).

- Input: $90 \dots 265 V_{AC} - 6 \% / + 10 \%$, 50/60 Hz
- Output: $24 V_{DC} - 1 \% / + 2 \%$, 1.3 A
- Connection: Terminal screws $0.2 \dots 2.5 \text{ mm}^2$ (24...14 AWG), separable
- Enclosure: IP20; mounted on mounting rail EN 60715TH35 in the switch cabinet



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Refer to the VR wiring diagram for information about connecting the VR forced cooling fan (order number: 0880 3198)



Motor size 132M - 280

V system

- 3 x 400 V_{AC}, 50/60 Hz
- Connection in separate terminal box
- Max. connection cross section 4 x 1.5 mm² (16 AWG)
- Cable gland M16x1.5



Refer to the V wiring diagram for information about connecting the V system (order number: 0975 8385).

A transformer may be present in the VS system to adapt to a voltage other than the standard.

Overview of encoders

Encoder	For SEW motor	Encoder type	Shaft	Specification	Supply	Signal	
EH1T ¹⁾	DR63...	Encoder	Hollow shaft	-	5 V _{DC} regulated	5 V _{DC} TTL/RS-422	
EH1S ²⁾					24 V _{DC}	1 V _{SS} sin/cos	
EH1R						5 V _{DC} TTL/RS-422	
EH1C						24 V _{DC} HTL	
ES1T ¹⁾	CT/DT/CV/DV71...100 DTE/DVE90...100	Encoder	Spreadshaft	-	5 V _{DC} regulated	5 V _{DC} TTL/RS-422	
ES1S ²⁾					24 V _{DC}	1 V _{SS} sin/cos	
ES1R						5 V _{DC} TTL/RS-422	
ES1C						24 V _{DC} HTL	
ES2T ¹⁾	CV/DV(E)112...132S	Encoder	Spreadshaft	-	5 V _{DC} regulated	5 V _{DC} TTL/RS-422	
ES2S ²⁾					24 V _{DC}	1 V _{SS} sin/cos	
ES2R						5 V _{DC} TTL/RS-422	
ES2C						24 V _{DC} HTL	
EV1T ¹⁾	CT/CV71...200 DT/DV71...280 DTE/DVE90...225	Encoder	Solid shaft	-	5 V _{DC} regulated	5 V _{DC} TTL/RS-422	
EV1S ²⁾					24 V _{DC}	1 V _{SS} sin/cos	
EV1R						5 V _{DC} TTL/RS-422	
EV1C						24 V _{DC} HTL	
NV11	DT/DV71...132 DTE/DVE90...132S	Proximity sensor	Solid shaft	-	24 V _{DC}	1 pulse/revolution, normally open contact	
NV21						A+B tracks	2 pulses/revolution, normally open contact
NV12						A track	
NV22						A+B tracks	6 pulses/revolution, normally open contact
NV16						A track	
NV26						A+B tracks	
AV1Y	CT/CV71...200 DT/DV71...280 DTE/DVE90...225	absolute encoder	Solid shaft	-	15/24 V _{DC}	MSSI interface and 1 V _{SS} sin/cos	
AV1H ³⁾		HIPERFACE [®] encoder			12 V _{DC}	RS485 interface and 1 V _{SS} sin/cos	

1) Recommended encoder for operation with MOVITRAC[®] 31C

2) Recommended encoder for operation with MOVIDRIVE[®]

3) recommended encoder for operation with MOVIDRIVE[®] compact



- Refer to the following wiring diagrams for information about connecting ES1./ES2./EV1./EH1. encoders and AV1Y and AV1H absolute encoders:
 - Wiring diagrams for ES1./ES2./EV1./EH1. encoders: Order number 0918 6832
 - Wiring diagram AV1Y absolute encoder: Order number 0918 6808
 - Wiring diagram AV1H absolute encoder: Order number 1052 9705



- Maximum oscillation load for encoder $\leq 10 \text{ g} \approx 100 \text{ m/s}^2$ (10 Hz ... 2 kHz)
- Shock resistance $\leq 100 \text{ g} \approx 1000 \text{ m/s}^2$

Encoder connection

When connecting the encoders to the inverters, always follow the operating instructions for the relevant inverter!

- Maximum line length (inverter - encoder):
 - 100 m (330 ft) with a capacitance per unit length $\leq 120 \text{ nF/km}$
- Core cross section: 0,20 ... 0.5 mm² (24...20 AWG)
- Use a shielded cable with twisted pairs of insulated conductors (exception: cable for HTL sensor) and connect the shield over a large surface area at both ends:
 - to the encoder in the cable gland or in the encoder plug
 - to the inverter on the electronics shield clamp or to the housing of the sub D plug
- Install the encoder cables separately from the power cables, maintaining a distance of at least 200 mm (7.9 in).



6 Startup

6.1 Prerequisites for startup



It is essential to comply with the safety notes in Sec. 2 during startup!

Before startup, make sure that

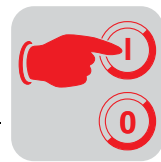
- The drive is undamaged and not blocked
- The measures stipulated in the "Preliminary work" section are performed after extended storage
- All connections have been made properly
- The direction of rotation of the motor/gearmotor is correct
 - (motor rotating clockwise: U, V, W to L1, L2, L3)
- All protective covers have been fitted correctly
- All motor protection equipment is active and set for the rated motor current
- The self-reengaging manual brake release is used in case of hoist drives
- There are no other sources of danger present

During startup, make sure that

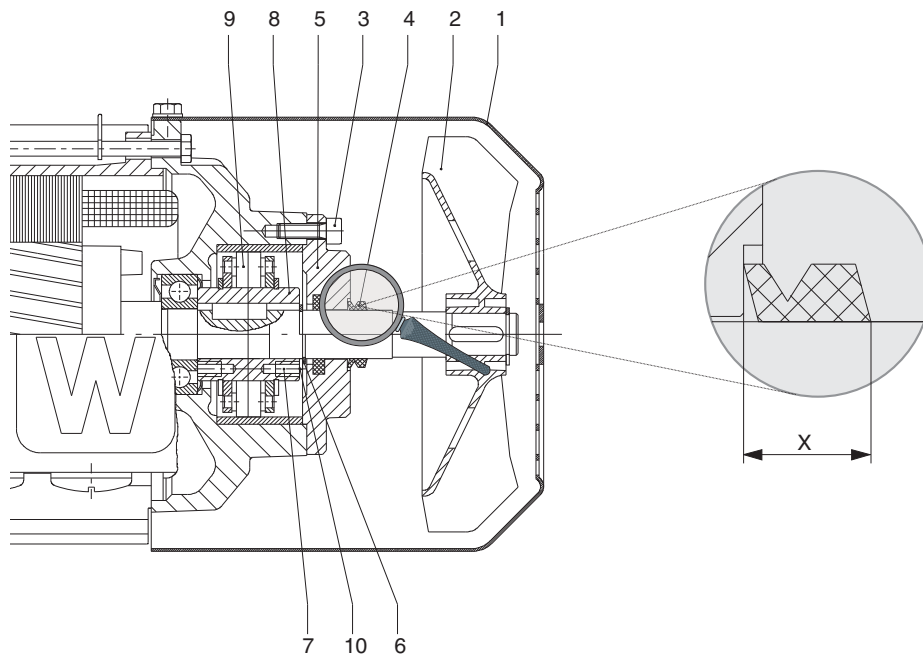
- The motor is running correctly (no overload, no speed fluctuation, no loud noises, etc.)
- The correct braking torque is set according to the specific application (→ Sec. "Technical Data")
- In case of problems (→ Sec. "Malfunctions")



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



6.2 Altering the blocking direction on motors with a backstop



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- | | | |
|-----------------------------------|-------------------|-------------------------|
| [1] Fan guard | [5] Felt ring | [9] Wedge element train |
| [2] Fan | [6] Circlip | [10] Equalizing ring |
| [3] Hexagon socket head cap screw | [7] Threaded hole | |
| [4] V-ring | [8] Carrier | |

Dimension "x" after installation

Motor	Dimension "x" after installation
DT71/80	6.7 mm (0.26 in)
DT90/DV100	9.0 mm (0.35 in)
DV112/132S	9.0 mm (0.35 in)
DV132M-160M	11.0 mm (0.43 in)
DV160L - 225	11.0 mm (0.43 in)
DV250-280	13.5 mm (0.53 in)



Startup

Altering the blocking direction on motors with a backstop



Do not start up the motor in the blocking direction (note the phase angle when connecting). Note the direction of rotation of the output shaft and the number of stages when mounting the motor on a gear unit. The backstop can be operated once in the blocking direction at half the motor voltage for checking purposes.

1. **Isolate the motor from the supply, safeguarding it against unintentional power-up.**
2. Remove fan guard [1] and fan [2], unscrew hexagon socket head cap screws [3]
3. Remove the V-ring [4] and sealing flange with felt ring [5]. (Collect the grease for subsequent use.)
4. Remove the circlip [6] (not for DT71/80); for DV132M-160M, also remove the equalizing rings [10].
5. Pull the carrier [8] and wedge element train [9] completely off the threaded holes [7], turn them by 180° and press them back on.
6. Refill the grease.
7. **Important: Do not exert pressure on or hit the wedge element train – danger of damaging the material!**
8. During the press-in operation – shortly before the wedge element penetrates the locking collar – slowly turn the rotor shaft by hand in the direction of rotation. This allows the wedge element to slide into the locking collar more easily.
9. Install the remaining parts of the backstop by following steps 4. to 2. in reverse order. Note the installation dimension "x" for the V-ring [4].



7 Malfunctions

7.1 Motor Malfunctions

Problem	Possible cause	Remedy
Motor does not start up	Interruption in connecting harness	Check connections, correct if necessary
	Brake does not release	→ Sec. "Brake Problems"
	Fuse blown	Replace fuse
	Motor protection has tripped	Check motor protection for correct setting, correct error if necessary.
	Motor protection does not switch, error in control	Check motor protection control, correct error if necessary.
Motor does not start or only with difficulty	Motor designed for delta connection but used in star connection	Correct circuit
	Voltage and frequency deviate markedly from setpoint, at least during switch-on	Provide better power supply system; check cross section of connecting harness
Motor does not start in star connection, only in delta connection	Torque not sufficient in star connection	Switch on directly if delta inrush current is not too great; otherwise use a larger motor or a special version (contact SEW)
	Contact fault on star delta switch	Rectify fault
Incorrect direction of rotation	Motor connected incorrectly	Swap over two phases
Motor hums and has high current consumption	Brake does not release	→ Sec. "Brake Problems"
	Winding defective	Send motor to specialist workshop for repair
	Rotor rubbing	
Fuses blow or motor protection trips immediately	Short circuit in line	Rectify short circuit
	Short circuit in motor	Send motor to specialist workshop for repair
	Lines connected incorrectly	Correct circuit
	Ground fault on motor	Send motor to specialist workshop for repair
Severe speed loss under load	Overload	Perform power measurement, use larger motor or reduce load if necessary
	Voltage drops	Increase cross section of connecting harness
Motor heats up excessively (measure temperature)	Overload	Perform power measurement, use larger motor or reduce load if necessary
	Inadequate cooling	Correct cooling air supply or clear cooling air passages, retrofit forced cooling fan if necessary
	Ambient temperature is too high	Adhere to permitted temperature range
	Use delta connection for motor rather than star connection as provided for	Correct circuit
	Loose contact in connecting harness (one phase missing)	Rectify loose contact
	Fuse blown	Look for and rectify cause (see above); replace fuse
	Supply voltage deviates from rated motor voltage by more than 5 %. A higher voltage has a particularly unfavorable effect in motors with a low-speed winding since in these, the no-load current is already close to the rated current even when the voltage is normal.	Adapt motor to supply voltage
Rated operation type (S1 to S10, DIN 57530) exceeded, e.g. through excessive starting frequency	Adjust rated operation type of motor to required operating conditions; if necessary call in a specialist to determine correct drive	
Excessively loud	Ball bearing compressed, contaminated or damaged	Re-align motor, inspect ball bearing (→ Sect. "Permitted ball bearing types"), grease if necessary (→ Sect. "Lubricant Table for Anti-Friction Bearings of SEW Motors"), replace
	Vibration of rotating parts	Rectify cause, possibly imbalance
	Foreign bodies in cooling air passages	Clean the cooling air passages



7.2 Brake problems

Problem	Possible cause	Remedy
Brake does not release	Incorrect voltage on brake control unit	Apply correct voltage
	Brake control unit failed	Install a new brake control system, check internal resistance and insulation of brake coil, check switchgear
	Max. permitted working air gap exceeded because brake lining worn down	Measure and set working air gap
	Voltage drop along connecting harness > 10 %	Provide for correct connection voltage; check cable cross section
	Inadequate cooling, brake overheats	Replace type BG brake rectifier with type BGE
	Brake coil has interturn fault or short circuit to exposed conductive part	Replace complete brake and brake control system (specialist workshop), check switchgear
	Rectifier defective	Replace the rectifier and brake coil
Motor does not brake	Working air gap not correct	Measure and set working air gap
	Brake lining worn down	Replace entire brake disk
	Incorrect braking torque	Change the braking torque (→ Sect. "Technical Data") <ul style="list-style-type: none"> • By the type and number of brake springs • BrakeBMG 05: By installing the same brake coil body design as in brakeBMG 1 • BrakeBMG 2: By installing the same brake coil body design as in brakeBMG 4
	BM(G) only: Working air gap so large that setting nuts come into contact	Set the working air gap
	Only BR03, BM(G): Manual brake release device not set correctly	Set the setting nuts correctly
Brake is applied with time lag	Brake is switched on AC voltage side	Switch on DC and AC voltage sides (e.g. BSR); please refer to wiring diagram
Noise in the brake area	Gearing wear caused by jolting startup	Check project planning
	Pulsating torques due to incorrectly set frequency inverter	Check/correct setting of frequency inverter according to operating instructions

7.3 Malfunctions during operation with a frequency inverter



The symptoms described in the "Motor Malfunctions" section may also occur when the motor is operated with a frequency inverter. Please refer to the frequency inverter operating instructions for the significance of the problems which occur and to find information about rectifying the problems.

Customer service

Please have the following information to hand if you require the assistance of our customer service:

- Data from the nameplate (complete)
- Nature and extent of the fault
- Time and peripheral circumstances of the fault
- Presumed cause



8 Inspection / Maintenance



- Use only genuine spare parts in accordance with the valid parts list!
- Always install a new brake control system at the same time as replacing the brake coil!
- Motors can become very hot during operation (danger of burns)!
- Secure hoist drives or lower them (danger of falling).
- Isolate the motor and brake from the supply before starting work, safeguarding them against unintentional power-up!

8.1 Inspection and maintenance intervals

Unit / unit part	Frequency	What to do?
Brake BMG02, BR03, BMG05-8, BM15-62	<ul style="list-style-type: none"> • If used as a working brake: At least every 3000 hours of operation¹⁾ • If used as a holding brake: Every 2 to 4 years, depending on operating conditions¹⁾ 	Inspect the brake <ul style="list-style-type: none"> • Measure the brake disk thickness • Brake disk, lining • Measure and set working air gap • Pressure plate • Carrier / gearing • Pressure rings <ul style="list-style-type: none"> • Extract the abraded matter. • Inspect the switch elements and change if necessary (e.g. in case of burn-out)
Motor	<ul style="list-style-type: none"> • Every 10,000 hours of operation 	Inspect the motor: <ul style="list-style-type: none"> • Check ball bearings and change if necessary • Change the oil seal • Clean the cooling air passages
Motor with backstop		<ul style="list-style-type: none"> • Change the low-viscosity grease in the backstop
Tacho-generator		<ul style="list-style-type: none"> • Inspection / maintenance as described in the enclosed operating instructions
Drive	<ul style="list-style-type: none"> • Varies (depending on external factors) 	<ul style="list-style-type: none"> • Touch up or renew the surface/anticorrosion coating.

1) The periods of wear are affected by many factors and may be short. The machine designer must calculate the required inspection/maintenance intervals individually in accordance with the project planning documents (e.g. "Drive Planning").

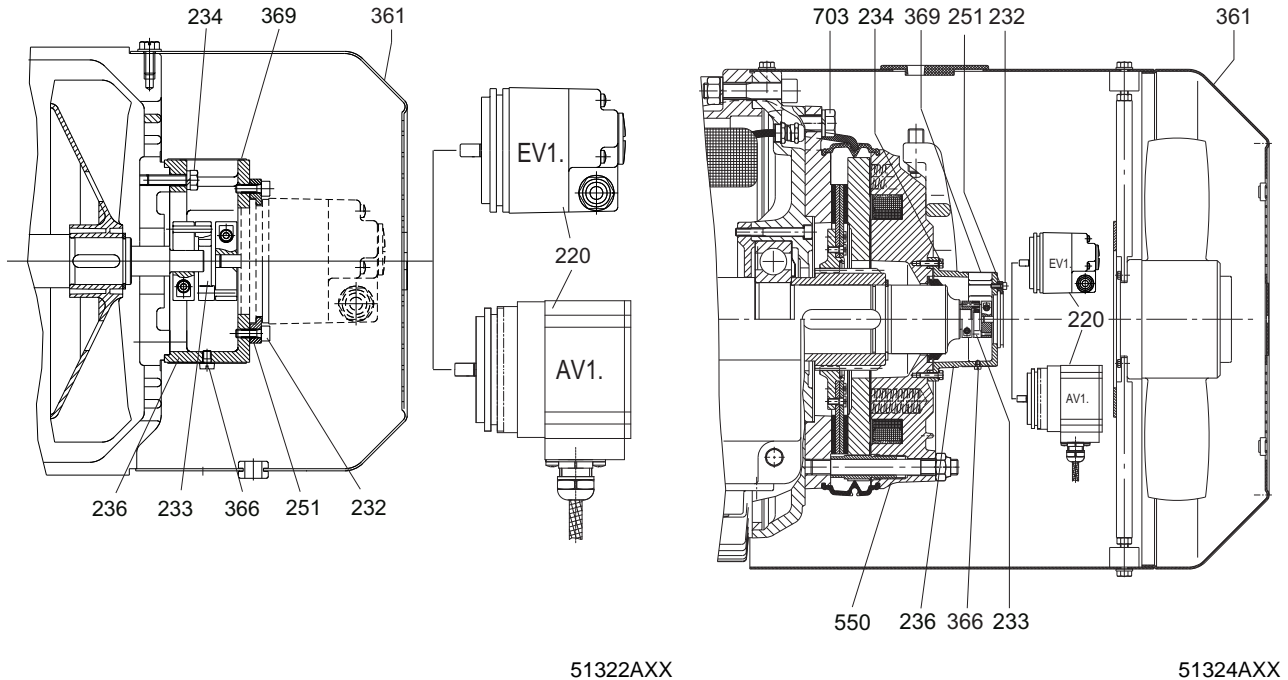


8.2 Preliminary work for motor and brake maintenance



Isolate the motor and brake from the power supply before starting work, safeguarding them against unintentional power-up!

Removing the EV1. incremental encoder / AV1H absolute encoder



Removing EV1. / AV1 encoders from motors up to size 225

Removing EV1. / AV1 encoders from motors from size 250 upwards

[220] Encoder
[232] Hexagon socket head cap screw
[233] Coupling
[234] Hex head screw

[236] Adapter flange
[251] Conical spring washer
[361] Protective canopy / fan guard
[366] Hexagon socket head cap screw

[369] Cover plate
[550] Brake
[703] Hex head screw

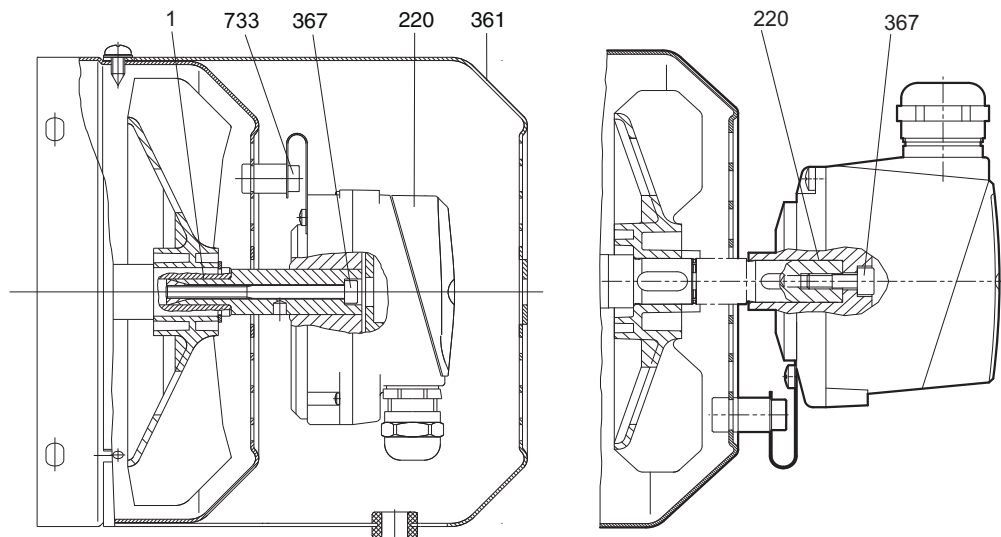
- Remove the protective canopy [361]. If a forced cooling fan is fitted, remove it first.
- Unscrew the screw [366] from the adapter flange and remove the cover plate [369].
- Unscrew the clamping hub connection of the coupling.
- Loosen the retaining screws [232] and turn the conical spring washers [251] outwards.
- Remove the encoder [220] together with the coupling [233].
- Lever off the intermediate flange [236] after removing the screws [234].

Note:

During re-assembly, make sure the runout of the shaft end is ≤ 0.05 mm (0.002 in).
Brakes for the encoder mounting must be completely replaced.



Incremental encoder ES1. Removing / ES2. / EH1.



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[220] Encoder
[367] Retaining screw

[361] Protective canopy
[733] Retaining screw for torque arm

- Remove the protective canopy [361].
- Unscrew the retaining screws [733] for the torque arm.
- Open the screw cover at the rear of the encoder [220].
- Unscrew the central retaining screw [367] by about 2-3 turns and loosen the cone by tapping lightly on the head of the screw. Then unscrew the retaining screw and pull off the encoder.



During re-assembly:

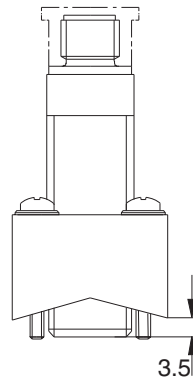
- Apply Noco[®] fluid to the encoder spigot
- Tighten the central retaining screw [367] to 2.9 Nm (25.6 lb-in).



Inspection / Maintenance

Preliminary work for motor and brake maintenance

Removing the proximity sensor NV1. / NV2.



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Caution! It is essential for the fan wheel to be stationary!

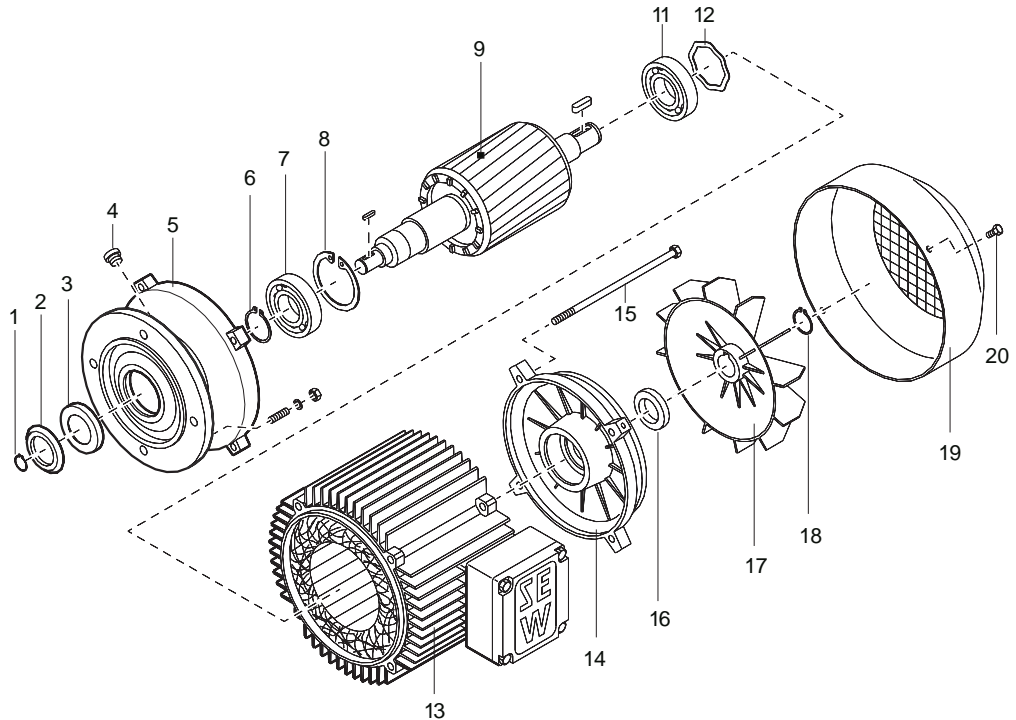
- Disconnect plug
- Pull off the fan guard including NV1. / NV2. Do not tilt it, in order to avoid damaging the proximity switch.
- If the mounting block has been removed from the fan guard or has come loose, it is essential to ensure the following during re-assembly:

The switching surface of the proximity switch must be calibrated to a distance of 3.5 mm (0.14 in) from the edge of the prismatic block (→ figure above).



8.3 Inspection / maintenance on the motor

Example: Motor DFT90



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Key

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



Sequence



Isolate the motor and brake from the supply, safeguarding them against unintentional power-up!

1. Remove the forced cooling fan and encoder, if installed (→ Sec. "Preliminary work for motor and brake maintenance")
2. Remove flange or fan guard [19], fan [17].
3. Remove the hex head bolt [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.
4. **Motors with BM/BMG brake:**
 - Open the terminal box cover, unfasten the brake cable from the rectifier
 - 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)
 - Pull the stator back by approx. 3 to 4 cm (1.2 to 1.5 in)
5. **Motors with BMG02, BR03 brake:**
 - Remove the complete brake with the releasing lever (on version with manual brake release)
6. Visual inspection: 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. If there is moisture inside the stator:
 - With gearmotors: Remove the motor from the gear unit
 - With motors without a gear unit: Remove the drive end flange
 - Remove the rotor [9]
8. Clean the winding, dry it and check it electrically (→ Sec. "Preliminary work")
9. Replace the ball bearings [7], [11] (only use authorized ball bearings → Sec. "Permitted ball bearing types")
10. Reseal the stator seat and grease the V-ring or labyrinth seal (DR63)
11. Install the motor, brake and accessories
12. Check the gear unit (→ gear unit operating instructions)

Lubrication of the backstop

The backstop is supplied with Mobil LBZ low-viscosity grease as a lubricant and anticorrosion protection. If you want to use a different grease, make sure it complies with NLGI class 00/000, with a base oil viscosity of 42 mm²/s at 40 °C on a lithium saponified and mineral oil base. The temperature range extends from –50 °C to +90 °C. See the following table for the amount of grease required.

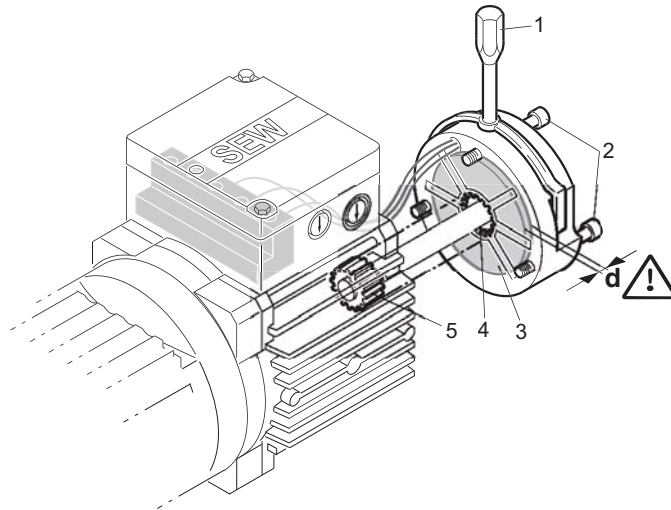
Motor type	71/80	90/100	112/132	132M/160M	160L/225	250/280
Grease [g]	9	15	15	20	45	80



8.4 Inspection / maintenance of the BMG02 brake

Measure the brake disk thickness, install a new brake BMG02

The status of the brake disk is ascertained by measuring the brake disk thickness. Install a new BMG02 brake once the brake disk thickness reaches the minimum value (→ figure below). It is not possible to adjust the working air gap.



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Important: Load held by brake may be released during brake maintenance and adjustment procedures. The load must be supported by alternate means while working on brake!



1. Isolate the motor and brake from the supply, safeguarding them against unintentional power-up.
2. Unscrew the hand lever [1] (on version with manual brake release), remove the fan guard and the fan.
3. Loosen the screws [2] and remove the complete brake with the releasing lever (on version with manual brake release).
4. Measure the thickness "d" of the brake disk [3]:

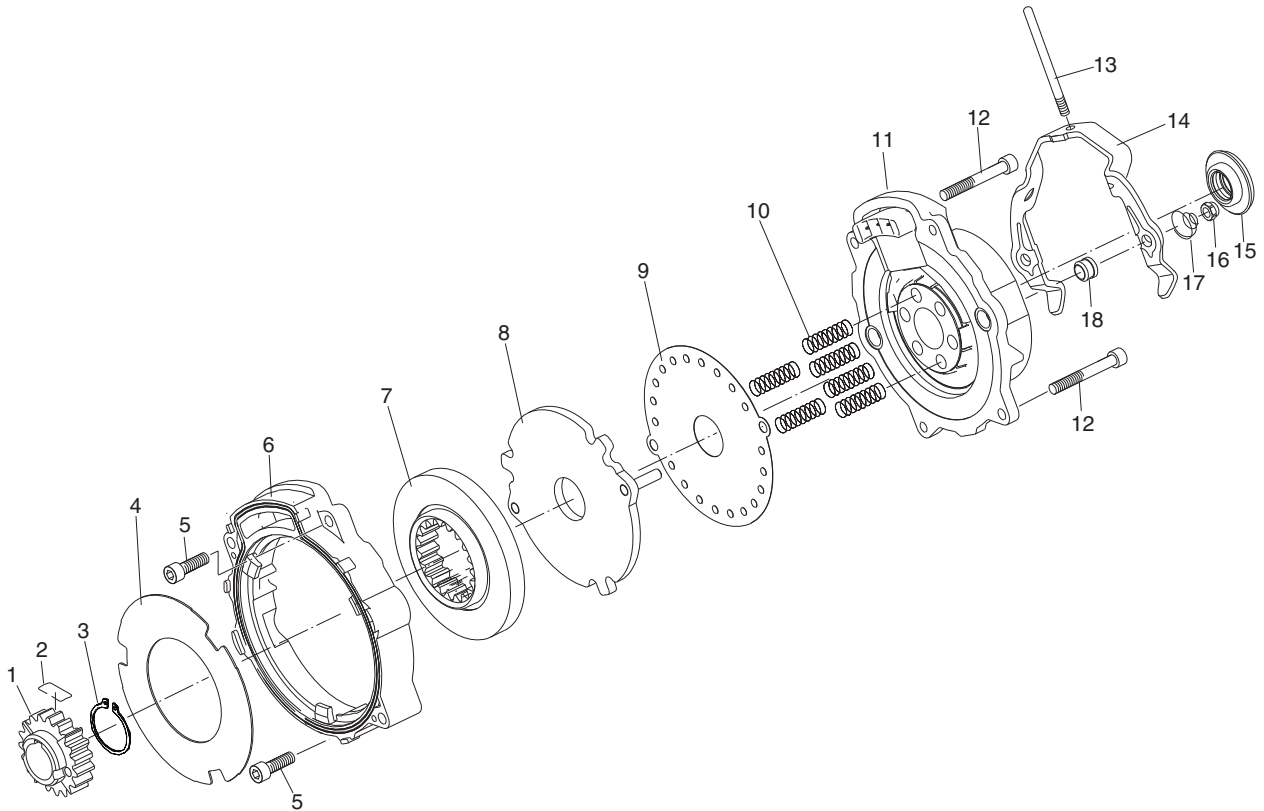
Brake Type	Thickness "d" of the brake disk [mm / inch]		Max. braking torque [Nm / lb-in]
	Maximum	Minimum	
BMG02	6 / .24	5.4 / .21 5.6 / .22	0.8 / 7.08 1.2 / 10.62



5. Replace the complete brake if the brake disk thickness has reached the minimum value.
6. Install the complete brake in the motor:
 - Make sure that the gearing of the brake disk [4] engages in the gearing of the carrier [5]
 - Route the electric connection leads through the non drive-end bearing shield and the inside of the motor into the terminal box
7. Use screws [2] to install the brake back onto the non drive-end bearing shield
8. Refit the fan and fan guard, screw the hand lever [1] (on version with manual brake release)



8.5 Inspection / maintenance of the brake BR03



50067AXX

Key

1 Carrier	7 Brake disk	13 Hand lever
2 Clip	8 Pressure plate with stud	14 Releasing lever
3 Circlip	9 Damping plate	15 Sealing washer
4 Friction plate	10 Brake springs	16 Self locking counter nut
5 Screw	11 Brake coil body	17 Conical coil spring
6 Guide ring	12 Screw	18 Sealing element



Inspect brake BR03, measure the working air gap

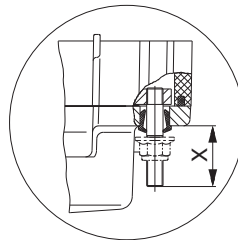
The working air gap cannot be adjusted and can only be measured by means of the stroke of the pressure plate when the brake is released.



Important: Load held by brake may be released during brake maintenance and adjustment procedures. The load must be supported by alternate means while working on brake!

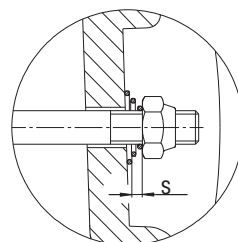


1. Isolate the motor and brake from the supply, safeguarding them against unintentional power-up.
2. Unscrew the hand lever [13] (on version with manual brake release), remove the fan guard and the fan.
3. Remove the self locking counter nuts [16] and, if manual brake release is fitted, remove the conical coil springs [17] and the releasing lever [14]
4. Measure clearance x (→ following figure) with the brake at rest:



50066AXX

- From the end of the stud on the pressure plate [8] to the brake coil body [11]
5. Release the brake electrically
 6. Measure clearance x with the brake released:
 - From the end of the stud on the pressure plate [8] to the brake coil body [11]
 7. The differential corresponds to the working air gap, i.e. the stroke of the pressure plate [18]:
 - If the working air gap ≤ 0.8 mm (.003 in), reinstall the conical coil springs [17], releasing lever [14] and self locking counter nuts [16]
 - If the working air gap ≥ 0.8 mm (.003 in), install a complete new brake
 - Use setting nuts to set the floating clearance "s" between the conical coil springs (pressed flat) and the setting nuts (→ following figure)



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Inspection / Maintenance

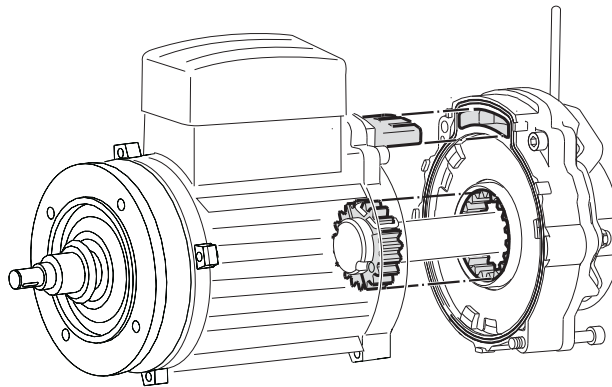
Inspection / maintenance of the brake BR03

Brake	Floating clearance s [mm / inch]
BR03	2 / .08



Important: The floating clearance "s" is necessary so that the pressure plate can move up as the brake lining wears. Otherwise, reliable braking is not guaranteed.

8. Reassemble the removed parts. Connect the complete new brake (replaced if the working air gap ≥ 0.8 mm (.003 inch)) to the motor (\rightarrow following figure)
 - Make sure the gearing of the brake disk engages in the gearing of the carrier and that the plug on the motor end fits into the socket on the brake end.



50175AXX

Changing the BR03 braking torque

The braking torque can be changed in steps (\rightarrow Sec. "Work done, working air gap, braking torques of brake BR03, BMG05-8")

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



Important: Load held by brake may be released during brake maintenance and adjustment procedures. The load must be supported by alternate means while working on brake!



1. Isolate the motor and brake from the supply, safeguarding them against unintentional power-up!
2. Unscrew the hand lever [13] (on version with manual brake release), remove the fan guard and the fan.
3. Loosen the screws [12] and remove the complete brake with the releasing lever (on version with manual brake release).
4. Loosen the screws [5] and remove the guide ring [6] with friction plate [4], brake disc [7], pressure plate [8] and damping plate [9]
5. Remove the brake springs [10] from the brake coil body [11] and replace them with new ones.
6. Position the new brake springs symmetrically
7. Slide the damping plate [9] over the two studs attached to the pressure plate [8] so the embossing pattern is located with the projecting side facing the pressure plate.
8. Pressure plate [8]:
 - Place on the brake springs [10] together with the damping plate [9]
 - Guide the studs attached to the pressure plate [8] through the holes in the brake



coil body [6] and make sure the pressure plate is in the correct position

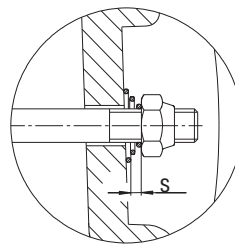
9. Place the flat side of the brake disk [7] on the pressure plate [8].

Note: Do not bring the disk into contact with grease or oil!

10. Place the guide ring [6] and friction disk [4] onto the brake disk [7], press down and install the screws [5].

11. **Design with manual brake release:**

- Put on the conical coil springs [17] and releasing lever [14], install the self locking counter nuts [16]
- With manual brake release: Use setting nuts to set the floating clearance "s" between the conical coil springs (pressed flat) and the setting nuts (→ following figure)



01111BXX

Brake	Floating clearance s [mm / inch]
BR03	2 / .08



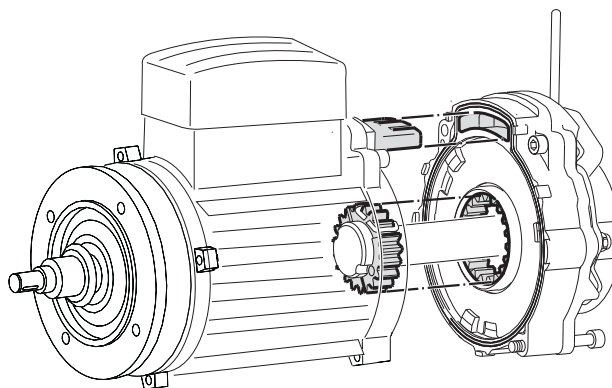
Important: Load held by brake may be released during brake maintenance and adjustment procedures. The load must be supported by alternate means while working on brake!



Important: The floating clearance "s" is necessary so that the pressure plate can move up as the brake lining wears. Otherwise, reliable braking is not guaranteed.

12. Connect the complete brake back onto the motor (→ following figure):

- Make sure the gearing of the brake disk engages in the gearing of the carrier and that the plug on the motor end fits into the socket on the brake end



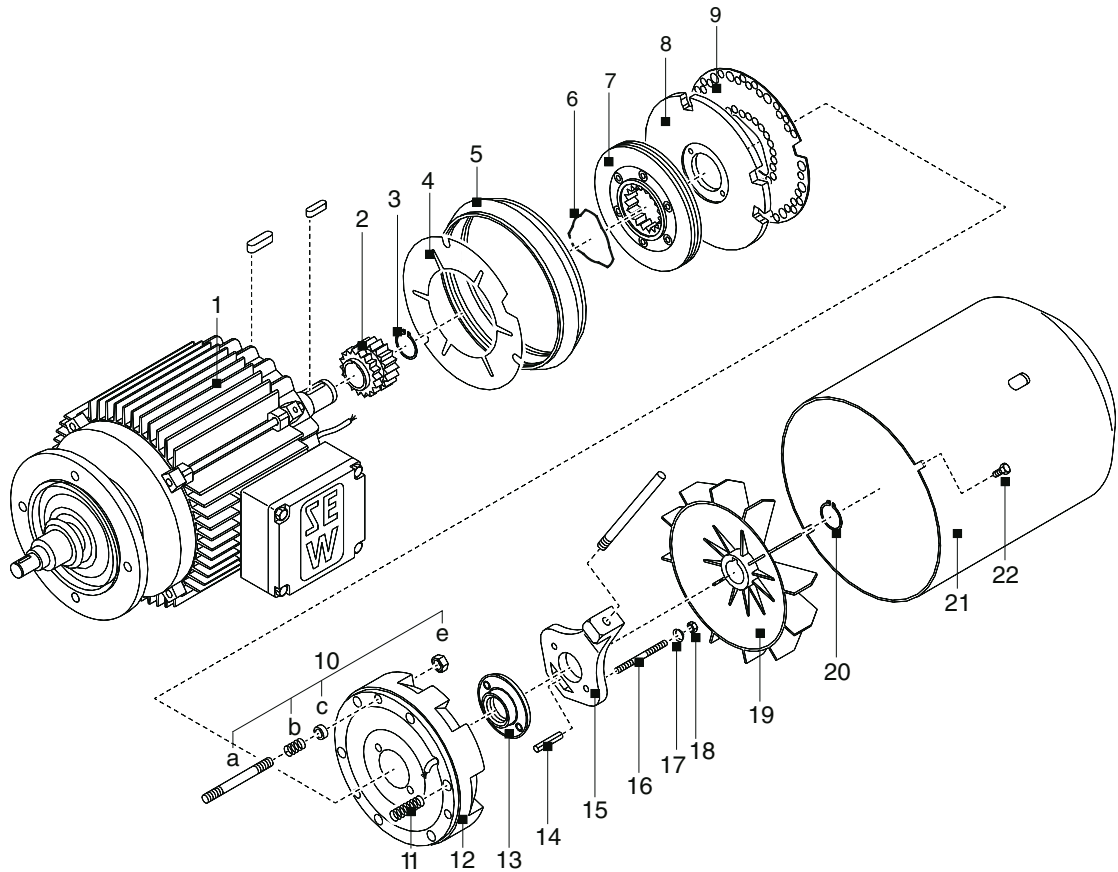
50175AXX

13. Refit the fan and fan guard, screw the hand lever [10] (on version with manual brake release)



8.6 Inspection / maintenance for BMG05-8, BM15-62 brakes

BM(G)05-08 brakes



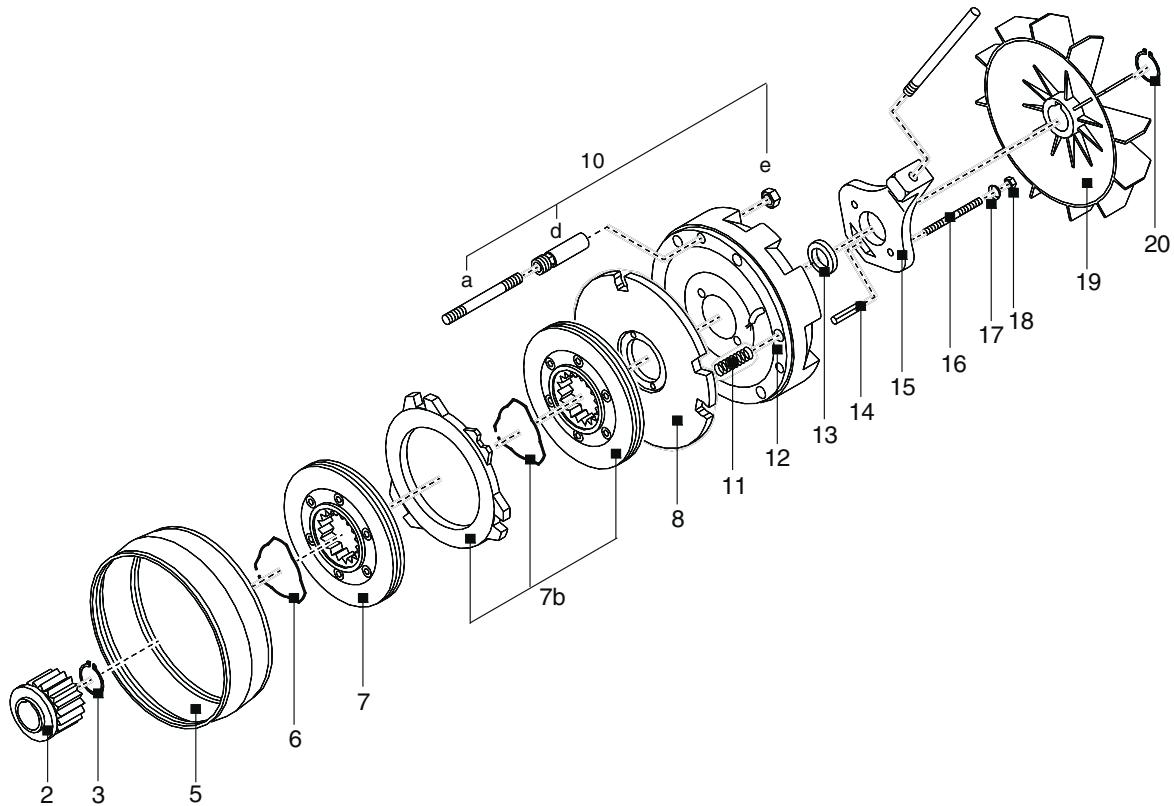
01955AXX

Key

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



BM15-62 brake



01956AXX

Key

- | | | |
|--|------------------------------------|----------------------------------|
| 1 Motor with brake bearing end shield | 8 Pressure plate | 14 Dowel pin |
| 2 Carrier | 9 Damping plate (BMG only) | 15 Release lever with hand lever |
| 3 Circlip | 10a Stud (3 pcs.) | 16 Stud (2 pcs.) |
| 4 Niro disk (BMG only) | 10b Counter spring | 17 Conical coil spring |
| 5 Rubber sealing collar | 10c Pressure ring | 18 Setting nut |
| 6 Annular spring | 10e Hex nut | 19 Fan |
| 7 Brake disk | 11 Brake spring | 20 Circlip |
| 7b Only BM 32, 62:
Brake stationary disk, annular spring,
Brake disk | 12 Brake coil body | 21 Fan guard |
| | 13 In BMG: Gasket
In BM: V-ring | 22 Housing screw |



BMG05-8, BM15-62 brakes, set the working air gap



Important: Load held by brake may be released during brake maintenance and adjustment procedures. The load must be supported by alternate means while working on brake!



1. Isolate the motor and brake from the supply, safeguarding them against unintentional power-up.

2. Remove the following:

- If installed, forced cooling fan, tacho/encoder (→ Sec. "Preliminary work for motor and brake maintenance")
- Flange cover or fan guard [21]

3. Push the rubber sealing collar aside [5]

- Release the clip to do this, if necessary
- Extract the abraded matter.

4. Measure the brake disc [7], [7b]:

If the brake disc is

- ≤ 9 mm (0.35 inch) on brake motors up to size 100
- ≤ 10 mm (0.39 inch) on brake motors up to size 112

Install a new brake disk (→ Sec. "Changing the brake disk BMG 05-8, BM 15-62"), otherwise

5. With BM30-62:

Loosen the setting sleeve [10d] by turning it towards the bearing end shield

6. Measure the working air gap A (→ following figure)

(use a feeler gauge and measure at three points offset by 120°)

- In BM, between the pressure plate [8] and the brake coil body [12]
- In BMG, between the pressure plate [8] and the damping plate [9]

7. Tighten the hexagon nuts [10e]

- Until the working air gap is set correctly (→ Sec. "Technical Data")
- In BM 30-62, until the working air gap is initially 0.25 mm (0.009 inch)

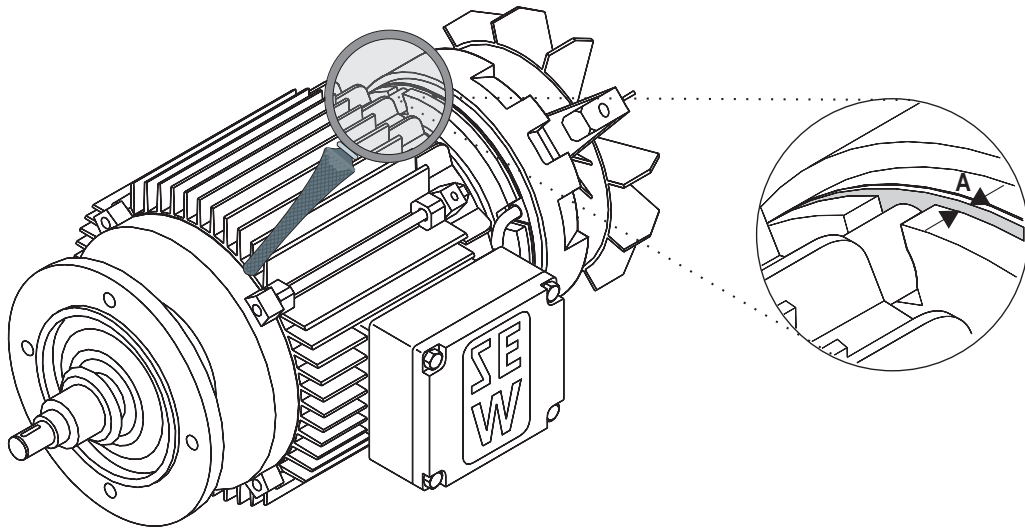
8. With BM30-62:

Tighten the setting sleeves

- Against the brake coil body
- Until the working air gap is set correctly (→ Sec. "Technical Data")



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



01957AXX

Changing the BMG05-8, BM15-62 brake discs

When fitting a new brake disk (thickness BMG05-4 \leq 9 mm [0.35 inch]; in BMG62 \leq 10 mm [0.39 inch]) inspect the other removed parts as well and install new ones if necessary.



Important: Load held by brake may be released during brake maintenance and adjustment procedures. The load must be supported by alternate means while working on brake!



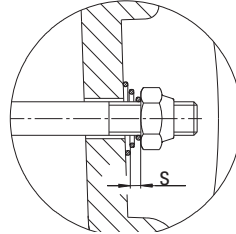
1. Isolate the motor and brake from the supply, safeguarding them against unintentional power-up!
2. Remove the following:
 - If installed, forced cooling fan, tacho/encoder (\rightarrow Sec. "Preliminary work for motor and brake maintenance")
 - Flange or fan guard [21], circlip [20] and fan [19].
3. Remove the rubber sealing collar [5] and the manual brake release:
 - Setting nuts [18], conical coil springs [17], studs [16], release lever [15], dowel pin [14]
4. Unscrew hexagon nuts [10e], carefully pull off the coil body [12] (brake cable!) and take out the brake springs [11].
5. Remove the damping cable [9], pressure plate [8] and brake disc [7], [7b], clean the brake components
6. Install a new brake disk
7. Re-install the brake components
 - Except for the rubber sealing collar, fan and fan guard, set the working air gap (\rightarrow Sec. "Inspecting brake BMG 05-8, BM 30-62, setting the working air gap", points 5 to 8)



Inspection / Maintenance

Inspection / maintenance for BMG05-8, BM15-62 brakes

8. With manual brake release: Use setting nuts to set the floating clearance "s" between the conical coil springs (pressed flat) and the setting nuts (→ following figure)



01111BXX

Brake	Floating clearance s [mm / inch]
BMG05-1	1.5 / 0.59
BMG2-8	2 / 0.79
BM15-62	2 / 0.79



Notes

Important: The floating clearance "s" is necessary so that the pressure plate can move up as the brake lining wears. Otherwise, reliable braking is not guaranteed.

9. Install the rubber sealing collar back in place and re-install the dismantled parts.
- The lockable manual brake release (type HF) is already released if resistance is encountered when operating the grub screw.
 - The self-reengaging manual brake release (type HR) can be operated with normal hand pressure.



Change braking torque of BMG05-8, BM15-62

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 the lever on the outside of the motor.

The braking torque can be changed in steps (→ Sec. "Technical Data")

- by installing different brake springs
- by changing the number of brake springs
- by changing the brake coil body:
 - **BMG05:** if the maximum braking torque is not sufficient for the specific application, install the brake coil body [12] of brake BMG1 of the same design to ensure safe braking
 - **BMG2:** if the maximum braking torque is not sufficient for the specific application, install the brake coil body [12] of brake BMG4 of the same design to ensure safe braking



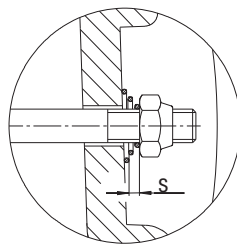
Important: Load held by brake may be released during brake maintenance and adjustment procedures. The load must be supported by alternate means while working on brake!



1. Isolate the motor and brake from the supply, safeguarding them against unintentional power-up



2. Remove the following:
 - If installed, forced cooling fan, tacho/encoder (→ Sec. "Preliminary work for motor and brake maintenance")
 - Flange or fan guard [21], circlip [20] and fan [19].
3. Remove the rubber sealing collar [5] and the manual brake release:
 - Setting nuts [18], conical coil springs [17], studs [16], release lever [15], dowel pin [14]
4. Unscrew hex nuts [10e], pull off the coil body [12].
 - by approx. 50 mm / 1.97 inch (watch the brake cable!)
5. Change or add brake springs [11]
 - Position the brake springs symmetrically
6. Re-install the brake components
 - Except for the rubber sealing collar, fan and fan guard, set the working air gap (→ Sec. "Inspecting brake BMG 05-8, BM 15-62", points 5 to 8)
7. With manual brake release: Use setting nuts to set the floating clearance "s" between the conical coil springs (pressed flat) and the setting nuts (→ following figure)



01111BXX

Brake	Floating clearance s [mm / inch]
BMG05-1	1.5 / 0.06
BMG2-8	2 / 0.08
BM15-62	2 / 0.08



Note

Important: The floating clearance "s" is necessary so that the pressure plate can move up as the brake lining wears. Otherwise, reliable braking is not guaranteed.

8. Install the rubber sealing collar back in place and re-install the dismantled parts.
 Install new setting nuts [18] and hexagon nuts [10e] if the removal procedure is repeated!

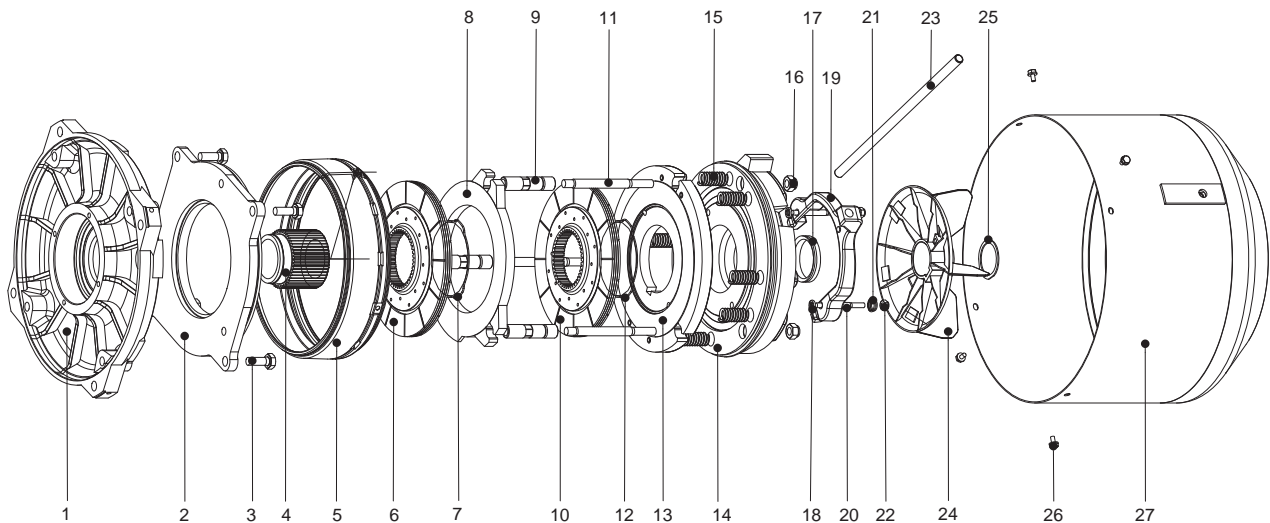


8.7 Inspection / maintenance of the BMG61/122 brake



BMG61/122 brakes with encoder mounting are only used as a holding brake. Maintenance work is only allowed to be performed by SEW-EURODRIVE.

BMG61/122 brakes



54318AXX

Key

1 Brake end shield	10 Brake disc, complete 2	19 Release lever
2 Intermediate flange	11 Stud	20 Stud
3 Hex head bolt	12 Annular spring 2	21 Conical coil spring
4 Carrier	13 Brake stationary disc	22 Hex nut
5 Rubber sealing collar	14 Magnet, complete	23 Hand lever
6 Brake disc, complete 1	15 Brake spring	24 Fan
7 Annular spring 1	16 Hex head bolt	25 Circlip
8 Brake stationary disc	17 V-ring	26 Hex head bolt
9 Setting sleeve	18 O-ring	27 Fan guard



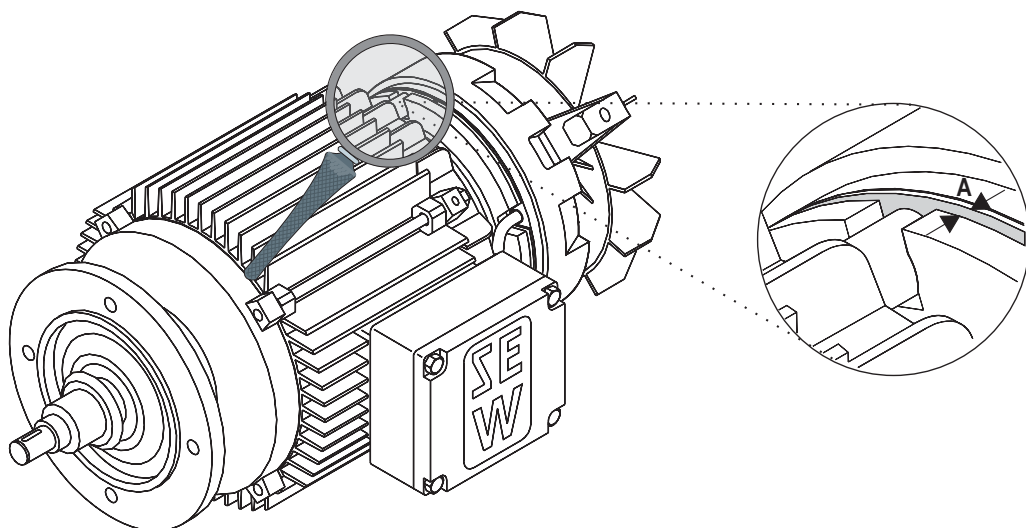
BMG61/122 brake without encoder mounting, set the working air gap



Important: Load held by brake may be released during brake maintenance and adjustment procedures. The load must be supported by alternate means while working on brake!



1. **Isolate the motor and brake from the supply, safeguarding them against unintentional power-up.**
2. Remove the following:
 - Remove the forced cooling fan, if installed (→ Sec. "Preliminary work for motor and brake maintenance")
 - Flange cover or fan guard [27]
3. Push the rubber sealing collar aside [5]
 - Release the clamping strap to do this, if necessary
 - Extract the abraded matter.
4. Measure the brake discs [6], [10]:
If the brake disc ≤ 12 mm / 0.47 inch, change it (→ Sec. "Changing the BMG 61/122 brake disc), otherwise
5. Loosen the setting sleeve [9] by turning it towards the bearing end shield
6. Measure the working air gap A (→ following figure)
(use a feeler gauge and measure at three points offset by 120° between the pressure plate [13] and the magnet [14])
 -
7. Tighten the hexagon nuts [16]
 - Until the working air gap is initially 0.25 mm / 0.009 inch
8. Tighten the setting sleeves [9]
 - Against the magnet [14]
 - Until the working air gap is set correctly (→ Sec. "Technical Data")
9. Refit the rubber sealing collar [5] and re-install the dismantled parts



01957AXX



BMG 61/122 brake without encoder mounting, change the brake disc

When fitting a new brake disk (≤ 12 mm / 0.47 inch), inspect the other removed parts as well and install new ones if necessary.



Important: Load held by brake may be released during brake maintenance and adjustment procedures. The load must be supported by alternate means while working on brake!



1. **Isolate the motor and brake from the supply, safeguarding them against unintentional power-up!**

2. Remove the following:

- Forced cooling fan, if installed (→ Sec. "Preliminary work for motor and brake maintenance")
- Flange or fan guard [27], circlip [25] and fan [24].

3. Remove the rubber sealing collar [5] and the manual brake release:

- Hex nuts [16], conical coil springs [21], studs [20], release level [17]

4. Loosen the hex nuts [16], remove the connection cable to the plug connector for the magnet [14], remove the magnet, and remove the brake springs [15].

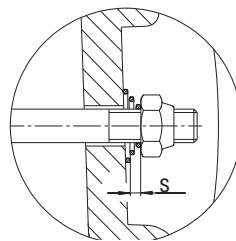
5. Remove the complete pressure plate [8], the complete brake disc [10] as well as the brake stationary disk and complete brake disc [6] for BMG122, clean the brake components.

6. Install a new brake disk

7. Re-install the brake components

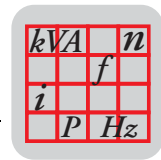
- Except for the rubber sealing collar, fan and fan guard, set the working air gap (→ Sec. "Inspecting brake BMG 61/122, setting the working air gap", points 5 to 8)

8. With manual brake release: Use setting nuts [22] to set the floating clearance "s" between the conical coil springs [21] (pressed flat) and the setting nuts (→ following figure)



01111BXX

s = 2 mm / 0.08 inch)



9 Technical Data

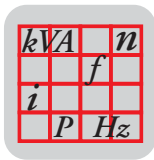
9.1 Work done, braking torque BMG02

Brake Type	For motor size	Work done until maintenance [10 ⁶ J]	Thickness of brake disk [mm / inch]		Braking torque [Nm / lb-in]
			max.	min	
BMG02	DT56 ET56	30	6 / 0.24	5.6 / 0.22 5.4 / 0.21	1.2 / 10.6 0.8 / 7.1

9.2 Information for ordering a replacement BMG02

Brake Type	Voltage [V _{DC}]	Braking torque [Nm / lb-in]		Brake part number
		0.8 / 7.1	1.2 / 10.6	
BMG02	24	0.8 / 7.1		0574 319 2
			1.2 / 10.6	0574 323 0
BMG02/HR	24	0.8 / 7.1		0574 327 3
			1.2 / 10.6	0574 331 1

Brake Type	Voltage [V _{AC}]	Braking torque [Nm / lb-in]		Brake part number
		0.8 / 7.1	1.2 / 10.6	
BMG02	230	0.8 / 7.1		0574 320 6
			1.2 / 10.6	0574 324 9
	400	0.8 / 7.1		0574 321 4
			1.2 / 10.6	0574 325 7
	460/500	0.8 / 7.1		0574 322 2
			1.2 / 10.6	0574 326 5
BMG02/HR	230	0.8 / 7.1		0574 328 1
			1.2 / 10.6	0574 332 X
	400	0.8 / 7.1		0574 329 X
			1.2 / 10.6	0574 333 8
	460/500	0.8 / 7.1		0574 330 3
			1.2 / 10.6	0574 334 6



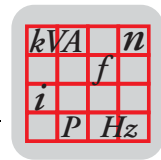
Technical Data

Work done, working air gap, braking torques of BMG05-8, BR03, BC, Bd

9.3 Work done, working air gap, braking torques of BMG05-8, BR03, BC, Bd

Brake type	For motor size	Work done until maintenance [10 ⁶ J]	Working air gap [mm / inch]		Braking torque [Nm / lb-in]	Braking torque settings			
			min. ¹⁾	max.		Type and no. of brake springs		Order number of brake springs	
						standard	red	standard	red
BR03	63	200	-	0.8 / 0.031	3.2 / 28.3 2.4 / 21.2 1.6 / 14.2 0.8 / 7.1	6 4 3 -	- 2 - 6	185 815 7	185 873 4
BMG05 ²⁾	71 80	60	0.25 / 0.010	0.6 / 0.024	5.0 / 44.3 4.0 / 35.4 2.5 / 22.1 1.6 / 14.2 1.2 / 10.6	3 2 - - -	- 2 6 4 3	135 017 X	135 018 8
BMG1	80	60	0.25 / 0.010	0.6 / 0.24	10 / 88.5 7.5 / 66.4 6.0 / 53.1	6 4 3	- 2 3	135 017 X	135 018 8
BMG2 ³⁾	90 100	130	0.25 / 0.010	0.6 / 0.24	20 / 177 16 / 141.6 10 / 88.5 6.6 / 58.4 5.0 / 44.3	3 2 - - -	- 2 6 4 3	135 150 8	135 151 6
BMG4	100	130	0.25 / 0.010	0.6 / 0.24	10 / 88.5 30 / 265.5 24 / 212.4	6 4 3	- 2 3	135 150 8	135 151 6
BMG8	112M 132S	300	0.3 / 0.012	0.9 / 0.035	75 / 663.8 55 / 486.8 45 / 398.3 37 / 327.5 30 / 265.5 19 / 168.2 12.6 / 111.5 9.5 / 84.1	6 4 3 3 2 - - -	- 2 3 - 2 6 4 3	184 845 3	135 570 8

- 1) Please note when checking the working air gap: Parallelism tolerances on the brake disk may give rise to deviations of ± 0.1 mm / .004 inch after a test run.
- 2) BMG05: If the maximum braking torque (5 Nm / 44.3 lb-in) is not sufficient, it is possible to install the brake coil body of the BMG1 brake.
- 3) BMG2: If the maximum braking torque (20 Nm / 177 lb-in) is not sufficient, it is possible to install the brake coil body of the BMG4 brake.

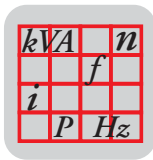


9.4 Work done, working air gap, braking torques of BM15 - 62

Brake type	For motor size	Work done until maintenance [10 ⁶ J]	Working air gap [mm / inch]		Braking torque [Nm / lb-in]	Braking torque settings			
			min. ¹⁾	max.		Type and no. of springs		Order number of springs	
						standard	red	standard	red
BM15	132M, ML 160M	1000			150 / 1328	6	-	184 486 5	184 487 3
					125 / 1106	4	2		
					100 / 885	3	3		
					75 / 663.8	3	-		
					50 / 442.5	-	6		
35 / 309.8	-	4							
25 / 221.3	-	3							
BM30	160L 180	1500	0.3 / 0.012	1.2 / 0.047	300 / 2655	8	-		
BM31	200 225	1500					250 / 2213		
			200 / 1770	4			4		
			150 / 1328	4			-		
			125 / 1106	2			4		
			100 / 885	-			8		
75 / 663.8	-	6							
50 / 442.5	-	4							
BM32 ²⁾	180	1500			300 / 2655	4	-		
					250 / 2213	2	4		
					200 / 1770	-	8		
					150 / 1328	-	6		
					100 / 885	-	4		
BM62 ²⁾	200 225	1500	0.4 / 0.016	1.2 / 0.047	600 / 5310	8	-	187 455 1	187 457 8
					500 / 4425	6	2		
					400 / 3540	4	4		
					300 / 2655	4	-		
					250 / 2213	2	4		
					200 / 1770	-	8		
					150 / 1328	-	6		
					100 / 885	-	4		
BMG61	250 280	2500	0.3 / 0.012	1.2 / 0.047	600 / 5310	8	-	186 838 1	186,839 X
					500 / 4425	6	2		
					400 / 3540	4	4		
					300 / 2655	4	-		
					200 / 1770	-	8		
BMG122 ²⁾			0.4 / 0.016		1200 / 10620	8	-		
					1000 / 8850	6	2		
					800 / 7080	4	4		
					600 / 5310	4	-		
					400 / 3540	-	8		

1) Please note when checking the working air gap: Parallelism tolerances on the brake disk may give rise to deviations of ± 0.15 mm / 0.006 inch after a test run.

2) Double disc brake



9.5 Operating currents

The current values I_H (holding current) specified in the tables are r.m.s. values. Use only units to measure the r.m.s. values. The inrush current (acceleration current) I_B only flows for a short time (max. 120 ms) when the brake is released or during voltage dips below 70 % of rated voltage. There is no increased inrush current if the BG brake rectifier is used or if there is a direct DC voltage supply – both are only possible with brakes up to motor size BMG4.

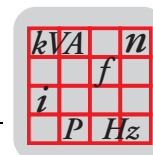
BMG02, BR03 brake

	BMG02	BR03
Motor size	56	63
Max. braking torque [Nm / lb-in]	1.2 / 10.6	3.2 / 28.3
Braking power [W]	25	25
Inrush current ratio I_B/I_H	-	4

Rated voltage V_N		BMG02		BR03	
V_{AC}	V_{DC}	I_H [A _{AC}]	I_G [A _{DC}]	I_H [A _{AC}]	I_G [A _{DC}]
	24	-	0.72	-	0.72
24 (23-26)	10	-	-	1.5	1.80
42 (40-45)	18	-	-	0.81	1.01
48 (46-50)	20	-	-	0.72	0.90
53 (51-56)	22	-	-	0.64	0.80
60 (57-63)	24	-	-	0.57	0.72
67 (64-70)	27	-	-	0.50	0.64
73 (71-78)	30	-	-	0.45	0.57
85 (79-87)	36	-	-	0.40	0.51
92 (88-98)	40	-	-	0.35	0.45
110 (99-110)	44	-	-	0.31	0.40
120 (111-123)	48	-	-	0.28	0.36
133 (124-138)	54	-	-	0.25	0.32
147 (139-154)	60	-	-	0.22	0.29
160 (155-173)	68	-	-	0.20	0.25
184 (174-193)	75	-	-	0.17	0.23
208 (194-217)	85	-	-	0.16	0.20
230 (218-243)	96	0.14	0.18	0.14	0.18
254 (244-273)	110	-	-	0.12	0.16
290 (274-306)	125	-	-	0.11	0.14
318 (307-343)	140	-	-	0.10	0.13
360 (344-379)	150	-	-	0.09	0.11
400 (380-431)	170	0.08	0.10	0.08	0.10
460 (432-500)	190	0.07	0.09	0.07	0.09

Key

- I_B Accelerator current – brief inrush current
- I_H Holding current r.m.s. value in the connecting harness to the SEW brake rectifier
- I_G Direct current with direct DC voltage supply with rated voltage V_N
- V_N Rated voltage (rated voltage range)



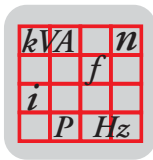
**BMG 05 - BMG 4
brake**

	BMG05	BMG1	BMG2	BMG4
Motor size	71/80	80	90/100	100
Max. braking torque [Nm / lb-in]	5 / 44.3	10 / 88.5	20 / 177	40 / 354
Braking power [W]	32	36	40	50
Inrush current ratio I_B/I_H	4	4	4	4

Rated voltage V_N		BMG05		BMG 1		BMG 2		BMG 4	
V_{AC}	V_{DC}	I_H [A _{AC}]	I_G [A _{DC}]	I_H [A _{AC}]	I_G [A _{DC}]	I_H [A _{AC}]	I_G [A _{DC}]	I_H [A _{AC}]	I_G [A _{DC}]
	24		1.38		1.54		1.77		2.20
24 (23-25)	10	2.0	3.3	2.4	3.7	-	-	-	-
42 (40-46)	18	1.14	1.74	1.37	1.94	1.46	2.25	1.80	2.80
48 (47-52)	20	1.02	1.55	1.22	1.73	1.30	2.00	1.60	2.50
56 (53-58)	24	0.90	1.38	1.09	1.54	1.16	1.77	1.43	2.20
60 (59-66)	27	0.81	1.23	0.97	1.37	1.03	1.58	1.27	2.00
73 (67-73)	30	0.72	1.10	0.86	1.23	0.92	1.41	1.14	1.76
77 (74-82)	33	0.64	0.98	0.77	1.09	0.82	1.25	1.00	1.57
88 (83-92)	36	0.57	0.87	0.69	0.97	0.73	1.12	0.90	1.40
97 (93-104)	40	0.51	0.78	0.61	0.87	0.65	1.00	0.80	1.25
110 (105-116)	48	0.45	0.69	0.54	0.77	0.58	0.90	0.72	1.11
125 (117-131)	52	0.40	0.62	0.48	0.69	0.52	0.80	0.64	1.00
139 (132-147)	60	0.36	0.55	0.43	0.61	0.46	0.70	0.57	0.88
153 (148-164)	66	0.32	0.49	0.39	0.55	0.41	0.63	0.51	0.79
175 (165-185)	72	0.29	0.44	0.34	0.49	0.37	0.56	0.45	0.70
200 (186-207)	80	0.26	0.39	0.31	0.43	0.33	0.50	0.40	0.62
230 (208-233)	96	0.23	0.35	0.27	0.39	0.29	0.44	0.36	0.56
240 (234-261)	110	0.20	0.31	0.24	0.35	0.26	0.40	0.32	0.50
290 (262-293)	117	0.18	0.28	0.22	0.31	0.23	0.35	0.29	0.44
318 (294-329)	125	0.16	0.25	0.19	0.27	0.21	0.31	0.25	0.39
346 (330-369)	147	0.14	0.22	0.17	0.24	0.18	0.28	0.23	0.35
400 (370-414)	167	0.13	0.20	0.15	0.22	0.16	0.25	0.20	0.31
440 (415-464)	185	0.11	0.17	0.14	0.19	0.15	0.22	0.18	0.28
500 (465-522)	208	0.10	0.15	0.12	0.17	0.13	0.20	0.16	0.25

Key

- I_B Accelerator current – brief inrush current
- I_H Holding current r.m.s. value in the connecting harness to the SEW brake rectifier
- I_G Direct current with direct DC voltage supply
- V_N Rated voltage (rated voltage range)



Technical Data

Operating currents

BMG 8 - BM 32/62 brake

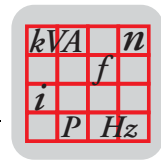
	BMG8	BM 15	BM30/31; BM32/62
Motor size	112/ 132S	132M-160M	160L-225
Max. braking torque [Nm / lb-in]	75 / 663.8	150 / 1328	600 / 5310
Braking power [W]	65	95	120
Inrush current ratio I_B/I_H	6.3	7.5	8.5

Rated voltage V_N		BMG8	BM 15	BM 30/31; BM 32/62
V_{AC}	V_{DC}	I_H [A _{AC}]	I_H [A _{AC}]	I_H [A _{AC}]
	24	2.77 ¹⁾	4.15 ¹⁾	4.00 ¹⁾
42 (40-46)	-	2.31	3.35	-
48 (47-52)	-	2.10	2.95	-
56 (53-58)	-	1.84	2.65	-
60 (59-66)	-	1.64	2.35	-
73 (67-73)	-	1.46	2.10	-
77 (74-82)	-	1.30	1.87	-
88 (83-92)	-	1.16	1.67	-
97 (93-104)	-	1.04	1.49	-
110 (105-116)	-	0.93	1.32	1.78
125 (117-131)	-	0.82	1.18	1.60
139 (132-147)	-	0.73	1.05	1.43
153 (148-164)	-	0.66	0.94	1.27
175 (165-185)	-	0.59	0.84	1.13
200 (186-207)	-	0.52	0.74	1.00
230 (208-233)	-	0.46	0.66	0.90
240 (234-261)	-	0.41	0.59	0.80
290 (262-293)	-	0.36	0.53	0.71
318 (294-329)	-	0.33	0.47	0.63
346 (330-369)	-	0.29	0.42	0.57
400 (370-414)	-	0.26	0.37	0.50
440 (415-464)	-	0.24	0.33	0.44
500 (465-522)	-	0.20	0.30	0.40

1) Direct current in BSG operation

Key

- I_H Holding current r.m.s. value in the connecting harness to the SEW brake rectifier
- I_B Accelerator current – brief inrush current
- I_G Direct current with direct DC voltage supply
- V_N Rated voltage (rated voltage range)



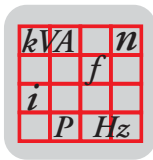
**BMG61, BMG122
brake**

	BMG61	BMG122
Motor size	250M...280S	
Max. braking torque [Nm / lb-in]	600 / 5310	1200 / 10620
Braking power [W]	200	
Inrush current ratio I_B/I_H	6	

Rated voltage V_N V_{AC}	BMG61/122 I_H [A _{AC}]
208 (194-217)	1.50
230 (218-243)	1.35
254 (244-273)	1.20
290 (274-306)	1.10
318 (307-343)	1.00
360 (344-379)	0.85
400 (380-431)	0.75
460 (432-484)	0.65
500 (485-500)	0.60

Key

- I_B Accelerator current – brief inrush current
- I_H Holding current r.m.s. value in the connecting harness to the SEW brake rectifier
- V_N Rated voltage (rated voltage range)



9.6 Permitted ball bearing types

Motor type	Drive-end bearing (AC motor, brakemotor)			Non drive-end bearing (foot-mounted, flange-mounted, gearmotors)	
	Flange-mounted motor	Gearmotor	Foot-mounted motor	AC motor	Brake motor
DT56	-	6302-2Z-J	-	6001-2RS-J	6001-2RS-J
DFR63	6203-2Z-J	6303-2Z-J	-	6202-2Z-J	6202-2RS-J-C3
DT71 - DT80	6204-2Z-J	6303-2Z-J	6204-2Z-J	6203-2Z-J	6203-2RS-J-C3
DT(E)90 - DV(E)100		6306-2Z-J		6205-2Z-J	6205-2RS-J-C3
DV(E)112 - 132S	6208-2Z-J	6307-2Z-J	6208-2Z-J	6207-2Z-J	6207-2RS-J-C3
DV(E)132M - 160M		6309-2Z-J-C3		6209-2Z-J-C3	
DV(E)160L - 180L		6312-2Z-J-C3		6213-2Z-J-C3	
DV(E)200 - 225		6314-2Z-J-C3		6314-2Z-J-C3	
DV250-280		6316-2Z-J-C3		6315-2Z-J-C3	

9.7 Lubricant table for anti-friction bearings of SEW motors

The bearings are 2Z or 2RS closed bearings and cannot be regreased.

	= Synthetic lubricant (= synthetic-based anti-friction bearing grease)
	= Mineral lubricant (= mineral-based anti-friction bearing grease)

	Ambient temperature	Manufacturer	Type
Anti-friction bearing in motor ¹⁾²⁾	-20 °C ... +80 °C	Esso	Polyrex EM
	+20 °C ... +100 °C	Klüber	Barrierta L55/2
	-40 °C ... +60 °C	Kyodo Yushi	Multemp SRL ³⁾

- 1) The motor anti-friction bearings are covered on both sides and cannot be regreased.
- 2) Greases providing equivalent performance are acceptable.
- 3) Recommended for continuous operation at ambient temperature below 0 °C, example in a cold storage.



10 Appendix

10.1 Index of changes

The following additions and changes have been made since the last edition of the "DR/DV/DT/DTE/DVE AC Motors, CT/CV Asynchronous Servomotors" operating instructions (publication number: 10567917, Edition 02/2003):

General updates and revisions.

Motor design

- Nameplate, unit designation: Example has been changed.

Mechanical installation

- Before you start: Ambient temperature.

Electrical installation

- Using wiring diagrams.
- Improving the grounding (EMC).
- Ambient conditions during operation.
- Connecting the motor: Tightening torques.
- Connecting the motor via the plug connectors AB., AD., AM., AS.
- Optional equipment: VR forced cooling fan.

Inspection / maintenance

- Inspection / maintenance of the BMG61/122 brake.



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		District Sales Representative L.H. Flaherty Company Larry Flaherty / Denny Duimstra 1577 Jefferson, S.E. Grand Rapids, MI 49507	Tel. 616 245-9266 / 800 878-0081 Fax 616 241-0954
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	Pennsylvania	Scott Bansky 1213 Milton Street Pittsburgh, PA 15218	Tel. 412 243-9040 Fax 412 243-9041 sbansky@seweurodrive.com
		Mark Betzer 17 West Main Street Canton, PA 17724	Tel. 570 673-3443 Fax 570 673-3552 mbetzer@seweurodrive.com
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	Wisconsin	Frank Carr 1171 W. Cecil Street Neenah, WI 54956	Tel. 920 751-3871 Fax 920 751-0107 fcarr@seweurodrive.com	
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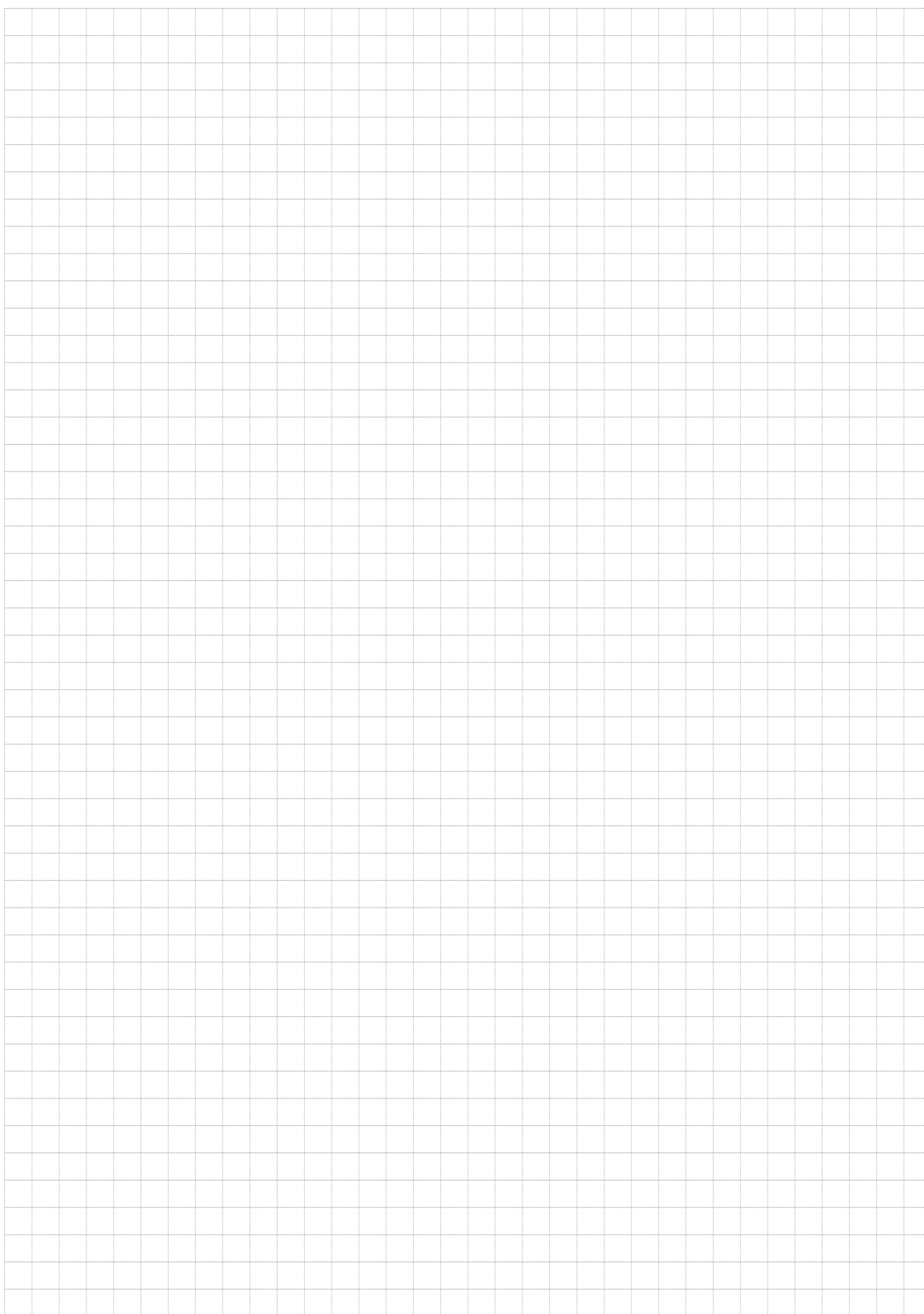


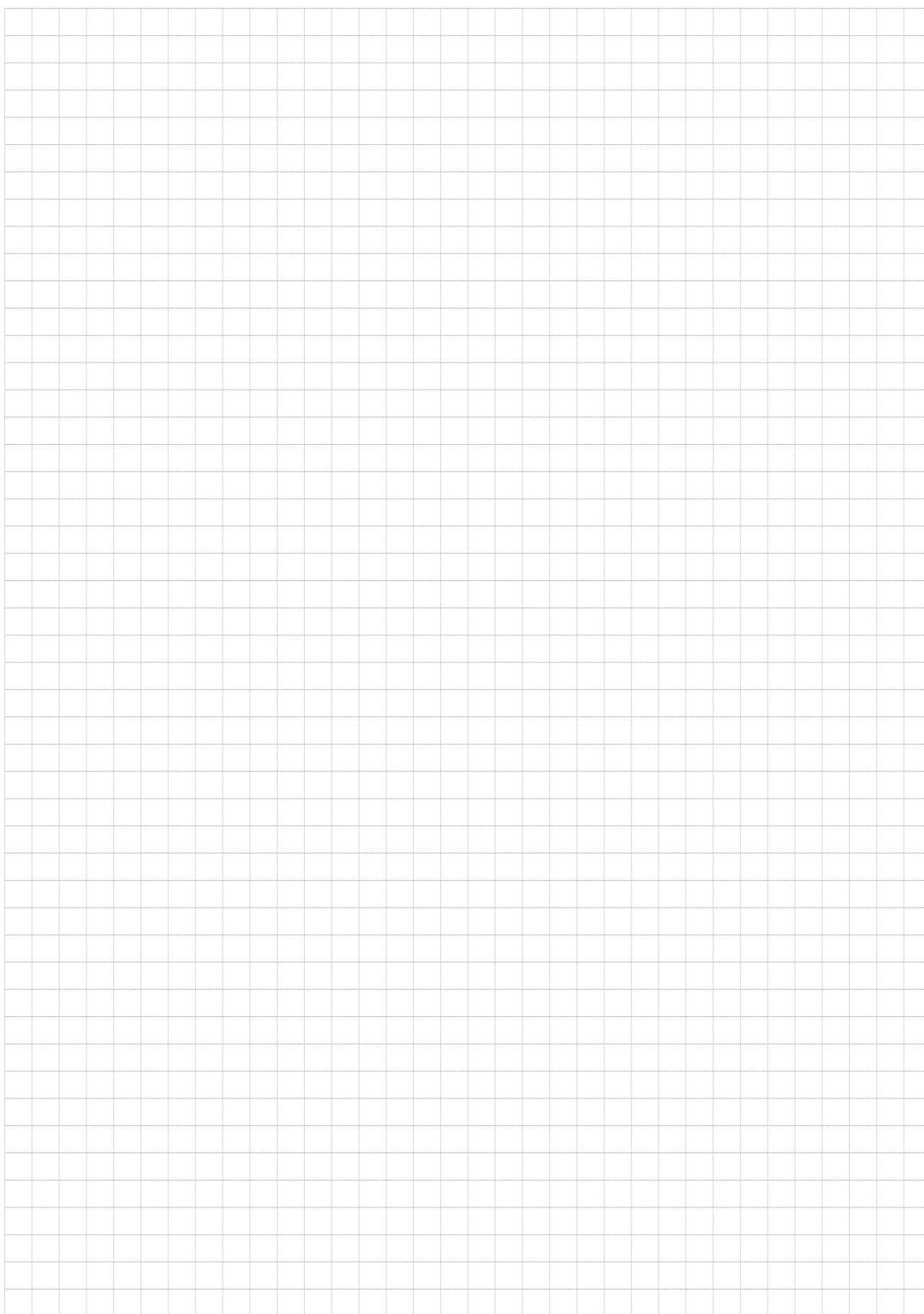
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Sales	St. Petersburg	ZAO SEW-EURODRIVE P.O. Box 263 RUS-195220 St. Petersburg	Tel. +7 812 5357142 +812 5350430 Fax +7 812 5352287 http://www.sew-eurodrive.ru sew@sew-eurodrive.ru
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Assembly Sales Service	Singapore	SEW-EURODRIVE PTE. LTD. No 9, Tuas Drive 2 Jurong Industrial Estate Singapore 638644	Tel. +65 68621701 ... 1705 Fax +65 68612827 sales@sew-eurodrive.com.sg
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Sales Service	Celje	Pakman - Pogonska Tehnika d.o.o. Ul. XIV. divizije 14 SLO – 3000 Celje	Tel. +386 3 490 83-20 Fax +386 3 490 83-21 pakman@siol.net
South Africa			
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	Capetown	SEW-EURODRIVE (PROPRIETARY) LIMITED Rainbow Park Cnr. Racecourse & Omuramba Road Montague Gardens Cape Town P.O.Box 36556 Chempet 7442 Cape Town	Tel. +27 21 552-9820 Fax +27 21 552-9830 Telex 576 062 dswanepoel@sew.co.za
	Durban	SEW-EURODRIVE (PROPRIETARY) LIMITED 2 Monaceo Place Pinetown Durban P.O. Box 10433, Ashwood 3605	Tel. +27 31 700-3451 Fax +27 31 700-3847 dtait@sew.co.za
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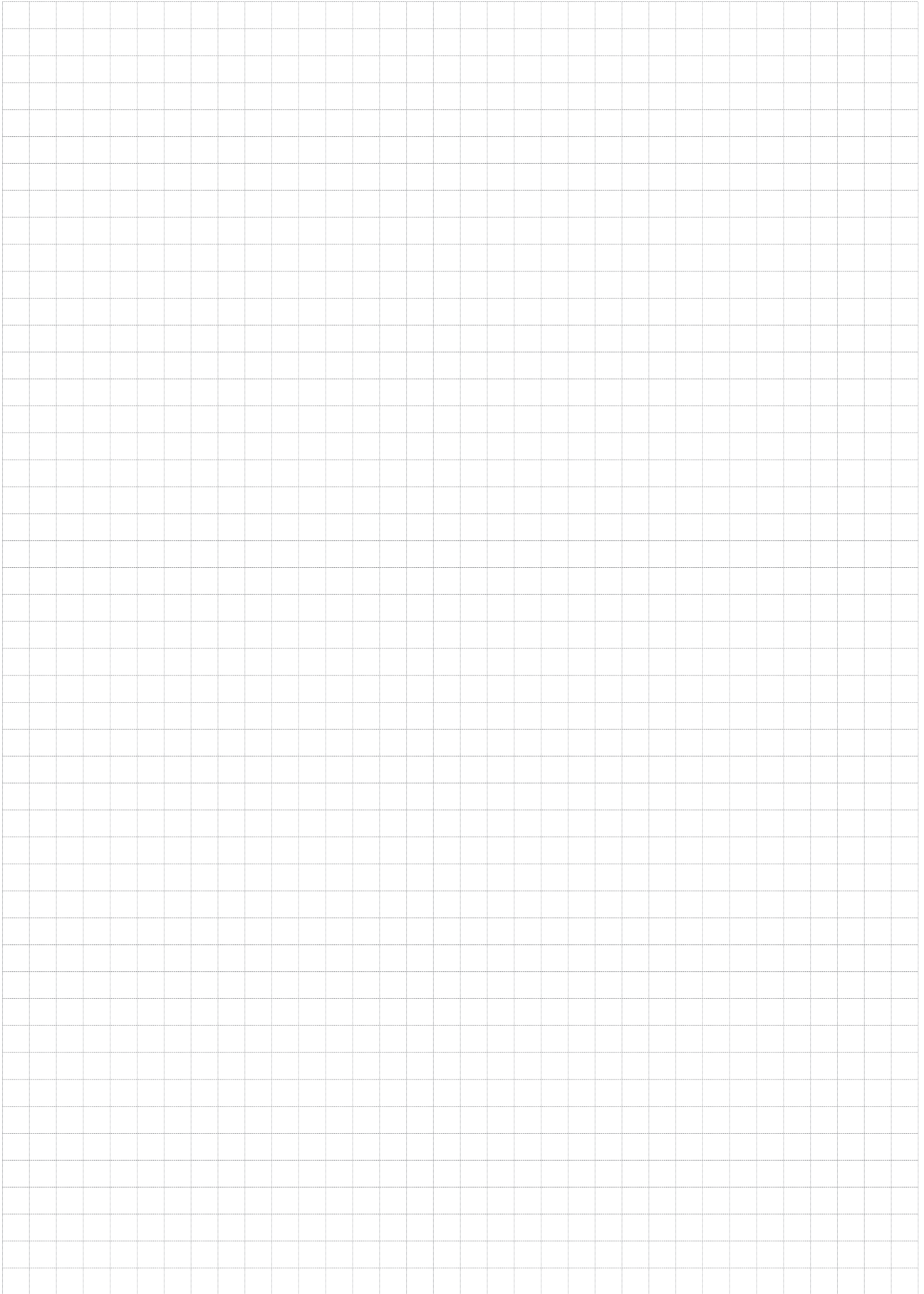


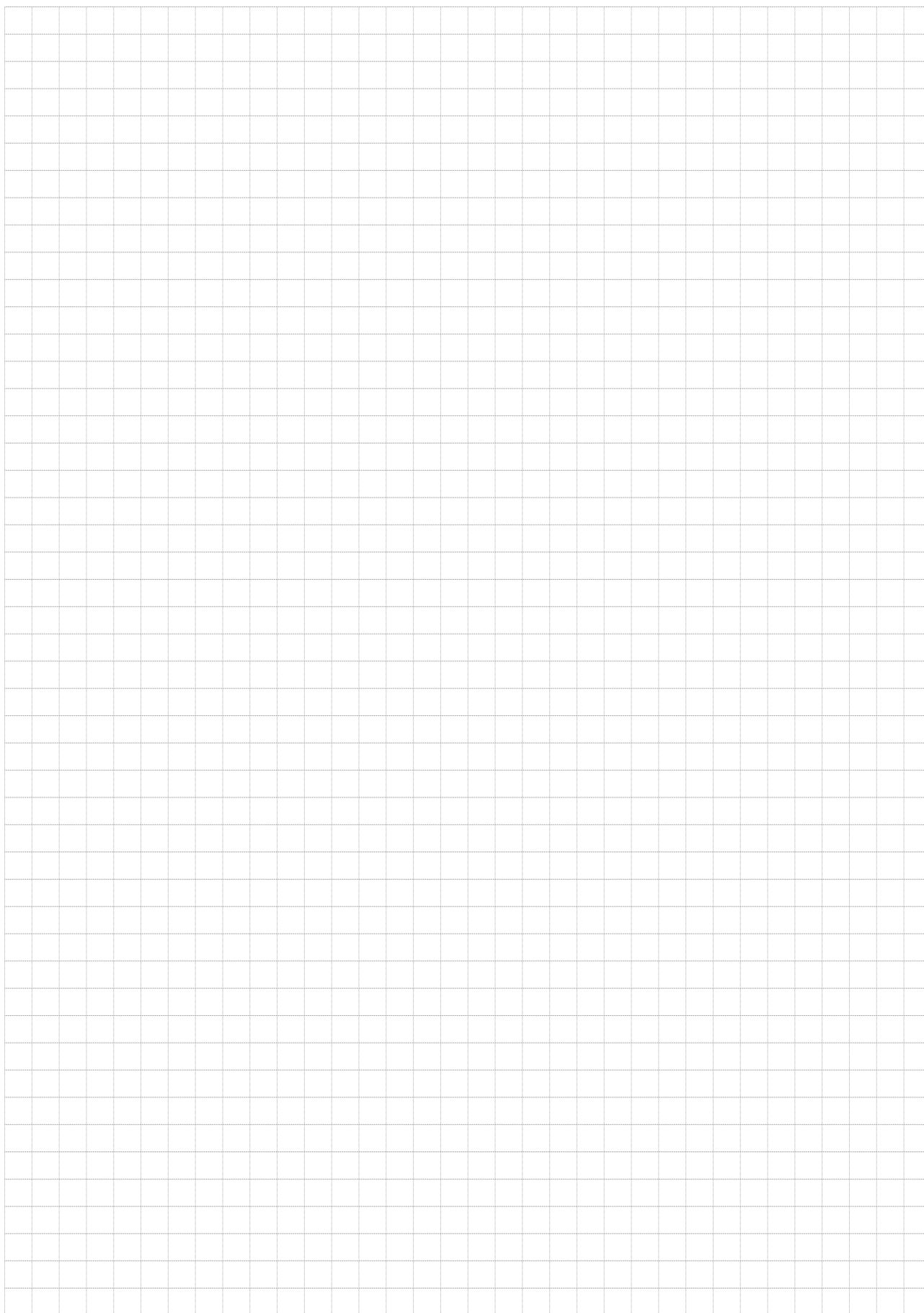
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Assembly Sales Service	Chon Buri	SEW-EURODRIVE (Thailand) Ltd. Bangpakong Industrial Park 2 700/456, Moo.7, Tambol Donhuaroh Muang District Chon Buri 20000	Tel. +66 38 454281 Fax +66 38 454288 sewthailand@sew-eurodrive.co.th
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Assembly Sales Service	Valencia	SEW-EURODRIVE Venezuela S.A. Av. Norte Sur No. 3, Galpon 84-319 Zona Industrial Municipal Norte Valencia, Estado Carabobo	Tel. +58 241 832-9804 Fax +58 241 838-6275 sewventas@cantv.net sewfinanzas@cantv.net









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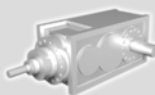
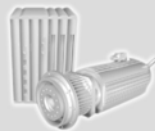


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