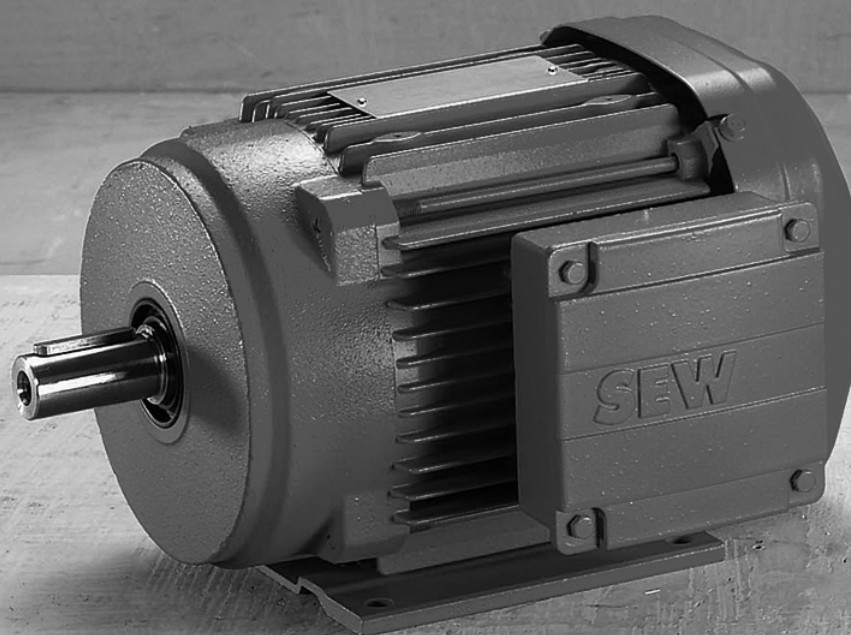




**SEW**  
**EURODRIVE**

# Operating Instructions



**EDR.71 – 225 AC Motors**  
**According to Class Definition System (HazLoc-NA<sup>®</sup>)**





## Contents

<b>1</b>	<b>General Information .....</b>	<b>5</b>
1.1	How to use this documentation .....	5
1.2	Structure of the safety notes .....	5
1.3	Rights to claim under warranty .....	6
1.4	Exclusion of liability .....	6
1.5	Copyright.....	6
1.6	Product names and trademarks .....	6
<b>2</b>	<b>Safety Notes .....</b>	<b>7</b>
2.1	Preliminary information .....	7
2.2	General information .....	7
2.3	Target group .....	8
2.4	Designated use .....	8
2.5	Other applicable documentation .....	9
2.6	Safety notes on the motor .....	9
2.7	Transport/storage .....	10
2.8	Installation .....	10
2.9	Electrical connection .....	11
2.10	Startup/operation .....	11
<b>3</b>	<b>Motor Structure .....</b>	<b>12</b>
3.1	General structure EDR.71 – EDR.132 .....	12
3.2	General structure EDR.160 – EDR.180 .....	13
3.3	General structure EDR.200 – EDR.225 .....	14
3.4	Nameplate, type designation .....	15
3.5	Additional features .....	17
3.6	Designation of motors for hazardous locations .....	20
<b>4</b>	<b>Mechanical Installation.....</b>	<b>22</b>
4.1	Before you start.....	22
4.2	Long-term storage of motors.....	23
4.3	Motor installation notes .....	25
4.4	Installation tolerances .....	27
4.5	Assembling the input elements .....	27
4.6	Non-SEW encoder mounting .....	27
4.7	Connecting XV.A encoder mounting adapter to EDR.71 – 225 motors ....	28
4.8	Tightening torques .....	29
4.9	Additional features .....	30
<b>5</b>	<b>Electrical Installation .....</b>	<b>32</b>
5.1	Additional regulations.....	32
5.2	Wiring diagrams and terminal assignment diagrams .....	32
5.3	Cable entries.....	32
5.4	Equipotential bonding .....	32
5.5	Wiring notes .....	33
5.6	Special aspects in switching operation .....	33
5.7	Improving the grounding (EMC).....	34



5.8	Ambient conditions during operation.....	38
5.9	Motors for hazardous locations.....	39
5.10	Notes regarding motor connection.....	41
5.11	Connection variants via terminal board.....	42
5.12	Connecting the brake.....	47
5.13	Accessory equipment.....	48
<b>6</b>	<b>Operating Modes and Limit Values .....</b>	<b>51</b>
6.1	Permitted duty types .....	51
<b>7</b>	<b>Startup.....</b>	<b>52</b>
7.1	Before startup .....	53
7.2	During startup .....	53
7.3	Changing the blocking direction of motors with backstop .....	54
<b>8</b>	<b>Inspection/Maintenance .....</b>	<b>57</b>
8.1	Inspection and maintenance intervals.....	59
8.2	Bearing lubrication .....	59
8.3	Corrosion protection.....	59
8.4	Motor and brake maintenance – preliminary work .....	60
8.5	Inspection/maintenance for EDR.71 – EDR.225 motors.....	61
8.6	Inspection/maintenance for EDR.71 – EDR.225 brakemotors.....	66
<b>9</b>	<b>Technical Data .....</b>	<b>86</b>
9.1	Overhung loads.....	86
9.2	Important notes on the brake .....	94
9.3	Braking torque assignment .....	95
9.4	Working air gap, braking torques .....	96
9.5	Operating currents .....	98
9.6	Resistances .....	100
9.7	Brake control system .....	102
9.8	Permitted work done by the BE brake in case of emergency off .....	104
9.9	Permitted rolling bearing types .....	105
9.10	Lubricant tables.....	106
9.11	Order information for lubricants and anti-corrosion agents.....	106
9.12	Mounting device.....	107
9.13	Mark on the nameplate .....	107
<b>10</b>	<b>Malfunctions .....</b>	<b>108</b>
10.1	Motor malfunctions.....	109
10.2	Brake malfunctions .....	111
10.3	Disposal .....	112
10.4	Customer service .....	112
<b>11</b>	<b>Appendix.....</b>	<b>113</b>
11.1	Wiring diagrams .....	113
<b>12</b>	<b>Address List .....</b>	<b>119</b>
	<b>Index.....</b>	<b>131</b>





# 1 General Information

## 1.1 How to use this documentation

The documentation is an integral part of the product and contains important information on operation and service. The documentation is written for all employees who assemble, install, start up, and service this product.

The documentation must be accessible and legible. Make sure that persons responsible for the system and its operation, as well as persons who work independently on the unit, have read through the documentation carefully and understood it. If you are unclear about any of the information in this documentation, or if you require further information, contact SEW-EURODRIVE.

## 1.2 Structure of the safety notes

### 1.2.1 Meaning of signal words

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

Signal word	Meaning	Consequences if disregarded
<b>▲ DANGER</b>	Imminent danger	Severe or fatal injuries
<b>▲ WARNING</b>	Possible dangerous situation	Severe or fatal injuries
<b>▲ CAUTION</b>	Possible dangerous situation	Minor injuries
<b>NOTICE</b>	Possible damage to property	Damage to the drive system or its environment
<b>NOTE ON EXPLOSION PROTECTION</b>	Important note on explosion protection	Suspension of explosion protection and resulting hazards
<b>INFORMATION</b>	Useful information or tip: Simplifies the handling of the drive system.	

### 1.2.2 Structure of the section safety notes

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

This is the formal structure of a section safety note:



#### **▲ SIGNAL WORD**

Type and source of danger.

Possible consequence(s) if disregarded.

- Measure(s) to prevent the danger.

### 1.2.3 Structure of the embedded safety notes

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

This is the formal structure of an embedded safety note:

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

Possible consequence(s) if disregarded.

- Measure(s) to avoid the danger.



#### **1.3 Rights to claim under warranty**

A requirement of fault-free operation and fulfillment of any rights to claim under limited warranty is that you adhere to the information in the documentation. Read the documentation before you start working with the unit!

#### **1.4 Exclusion of liability**

You must comply with the information contained in this documentation to ensure safe operation of the EDR.. explosion-proof AC motors units and to achieve the specified product characteristics and performance requirements. SEW-EURODRIVE assumes no liability for injury to persons or damage to equipment or property resulting from non-observance of the documentation. In such cases, any liability for defects is excluded.

#### **1.5 Copyright**

© 2012 - SEW-EURODRIVE. All rights reserved.

Copyright law prohibits the unauthorized duplication, modification, distribution, and use of this document, in whole or in part.

#### **1.6 Product names and trademarks**

All product names in this documentation are trademarks or registered trademarks of their respective titleholders.



## 2 Safety Notes

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

### 2.1 Preliminary information

The following safety notes are primarily concerned with the use of the following components: EDR.. explosion-proof AC motors. If using gearmotors, also refer to the safety notes in the corresponding operating instructions for:

- Gear unit

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

### 2.2 General information



#### **⚠ WARNING**

Danger of fatal injury or risk of injury during the operation of motors or gearmotors caused by live, bare (in the event of open connectors/terminal boxes) and movable or rotating parts.

Risk of burns caused by hot surfaces

Severe or fatal injuries

- All work related to transport, storage, installation, assembly, connection, startup, maintenance and repair may only be carried out by qualified personnel.
- For transport, storage, installation, assembly, connection, startup, maintenance and repair it is important that you adhere to the information in the following documents:
  - Warning and safety signs on the motor/gearmotor
  - All the project planning documents, startup instructions and wiring diagrams related to the drive
  - System-specific regulations and requirements
  - National/regional regulations governing the safety and prevention of accidents
- Never install damaged products.
- Never operate or energize the unit without the necessary protection covers or housing.
- Use the unit only for its intended purpose.
- Make sure the unit is installed and operated properly.



#### **INFORMATION**

In the event of damage caused by transport, submit a complaint to the shipping company immediately.

This documentation provides additional information.



### 2.3 Target group

Any mechanical work may only be performed by adequately qualified personnel. Qualified staff in the context of this documentation are persons familiar with the design, mechanical installation, troubleshooting and servicing of the product who possess the following qualifications:

- They have completed an apprenticeship in the field of mechanical engineering (e.g. mechanic or mechatronic technician).
- They are authorized under applicable law to carry out the necessary mechanical work.
- They are familiar with these operating instructions.

Any electrical work may only be performed by adequately qualified electricians. Qualified electricians in the context of this documentation are persons familiar with electrical installation, startup, troubleshooting and servicing of the product who possess the following qualifications:

- They have completed an apprenticeship in the field of electrical engineering (e.g. electrician or mechatronic technician).
- They are authorized under applicable law to carry out the necessary electrical work.
- They are familiar with these operating instructions.

Any work in further areas of transportation, storage, operation and waste disposal may only be carried out by persons who are trained appropriately.

All qualified personnel must wear appropriate protective clothing.

### 2.4 Designated use

The electric motors for hazardous locations are intended for industrial systems.

In case of installation in machines, startup of the motors, (i.e. start of designated operation) is prohibited until it is determined that the machine complies with the Canadian Electrical Code C22.1 (latest edition) in Canada or the National Electrical Code NFPA 70 (latest edition) in the USA as well as all applicable regional standards and regulations.



#### NOTES ON EXPLOSION PROTECTION

- The motor may only be operated under the conditions described in the "Startup" chapter.
- A motor may only be operated on a frequency inverter if the requirements of the CSA certification and/or this documentation and the information on the nameplate of the motor, if available, are fulfilled.
- Make sure that there are no aggressive substances in the vicinity that could damage the paint and seals.

Air-cooled types are dimensioned for ambient temperatures from -20 °C to +40 °C and installation altitudes ≤ 1000 m above sea level. Any differing specifications on the nameplate must be observed. The ambient conditions must comply with all the specifications on the nameplate.



## INFORMATION

The installed brake may only be used as a holding brake.

## 2.5 Other applicable documentation

The following publications and documents have to be observed as well:

- Wiring diagrams provided with the motor
- "Gear Unit Series R..7, F..7, K..7, S..7, SPIROPLAN® W" operating instructions for gearmotors
- Operating instructions of any mounted frequency inverter for motors powered by inverters.
- Operating instructions of installed options, if applicable
- "Gear Units" catalog
- "AC Motors" catalog and/or "DR Gearmotors" catalog
- "Explosion-Proof AC Motors" catalog
- "AC Motors EDR.71 – 225" catalog according to Class Definition System (in preparation)

## 2.6 Safety notes on the motor



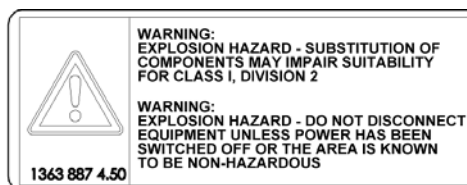
### ⚠ CAUTION

Safety notes and signs can get dirty over time.

Risk of injury due to illegible symbols.

- Always make sure that safety, warning, and operating notes are legible.
- Replace damaged safety notes and signs.

The safety notes attached to the motor, usually to the terminal box cover, must be observed.





## **2.7 Transport/storage**

Inspect the shipment for any damage that may have occurred in transit as soon as you receive the delivery. Inform the shipping company immediately in the event of damage. It may be necessary to preclude startup.

Tighten the eyebolts securely. They are designed to carry only the weight of the motor/gearmotor; do not attach any additional loads.

The built-in lifting eyebolts comply with DIN 580. Always observe the loads and regulations listed in this standard. If the gearmotor is equipped with two eyebolts, then both should be used for transportation. In this case, the tension force vector of the slings must not exceed a 45° angle according to DIN 580.

Use suitable, sufficiently rated handling equipment if required. Reattach these in the case of further transportation.

Store the motor/gearmotor in a dry, dust-free environment if it is not to be installed straight away. You must not store the motor/gearmotor outdoors or on the fan guard. The motor/gearmotor can be stored for up to 9 months without requiring any special measures before startup.

## **2.8 Installation**

Make sure that the supports are even, the foot and flange mounting is correct and if there is direct coupling, align with precision. Resonances between the rotational frequency and the double network frequency caused by the structure are to be avoided. Release the brake (if installed), turn rotor manually, check for unusual grinding noise. Check the direction of rotation in decoupled state.

Install or remove belt pulleys and couplings using only suitable devices (heat up) and cover with a touch guard. Avoid improper belt tension.

Make the pipe connections that may eventually be required. Mounting positions with shaft ends pointing upwards should be equipped with a cover to prevent foreign objects from falling into the fan. Ensure that ventilation openings are not obstructed and that waste air, or air from adjacent units, cannot be drawn in again straight away.

Observe the notes in the "Mechanical Installation" section.



## **2.9 Electrical connection**

All work may only be carried out by qualified personnel. During work, the low-voltage machine must be at standstill, de-energized, and safeguarded against accidental re-start. This also applies to auxiliary circuits.

Check whether the motor is de-energized!

Exceeding the tolerances stipulated in IEC 60034-1 (voltage +5 %, frequency +2 %, curve shape, symmetry) increases heating and influences electromagnetic compatibility. Observe IEC 60364 (and any national regulations, if applicable).

In addition to the generally applicable installation regulations for low-voltage electrical equipment, you must observe the special regulations for the installation of electrical systems in hazardous locations. NFPA 70 (for USA) and C22.1 (for Canada) and plant-specific conditions.

Observe the wiring information and differing data on the nameplate as well as the wiring diagram in the terminal box.

The connection must be a permanently secure electrical connection (no protruding wire ends); use the cable end equipment intended for this purpose. Establish a secure protective earth connection. When the motor is connected, the distances between live parts and between live and conductive parts must not be shorter than the minimum values according to CSA-C 22.2 No.100 and national regulations.

The terminal box must be free from foreign objects, dirt and humidity. Unused cable entry openings and the box itself must be closed so that they are dust- and water-proof. Secure the key for test mode without output elements. Make sure that the low-voltage machine is functioning properly before you start it up.

Observe the notes in the "Electrical Installation" chapter.

## **2.10 Startup/operation**

Whenever changes to normal operation occur, such as increased temperatures, noise, vibrations, etc., try to determine the cause. Consult the manufacturer if required. Never deactivate protection devices, even in test mode. Switch off the motor in case of doubt.

Regularly clean air ducts in dusty or dirty environments.



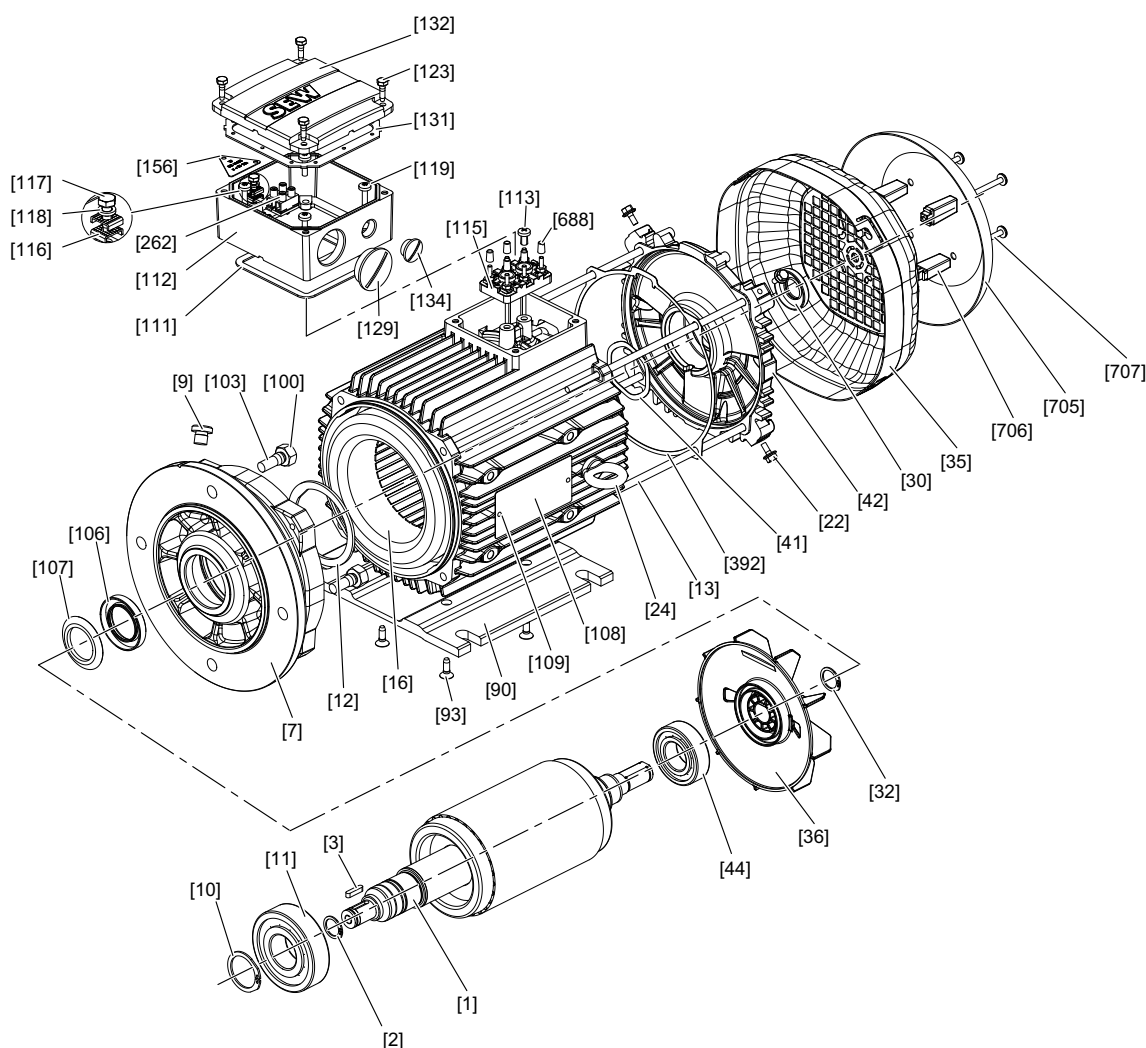
### 3 Motor Structure

#### INFORMATION



The following illustration is intended to explain the general structure. It helps you to assign components to the spare parts list. Deviations are possible depending on the motor size and version.

#### 3.1 General structure EDR.71 – EDR.132



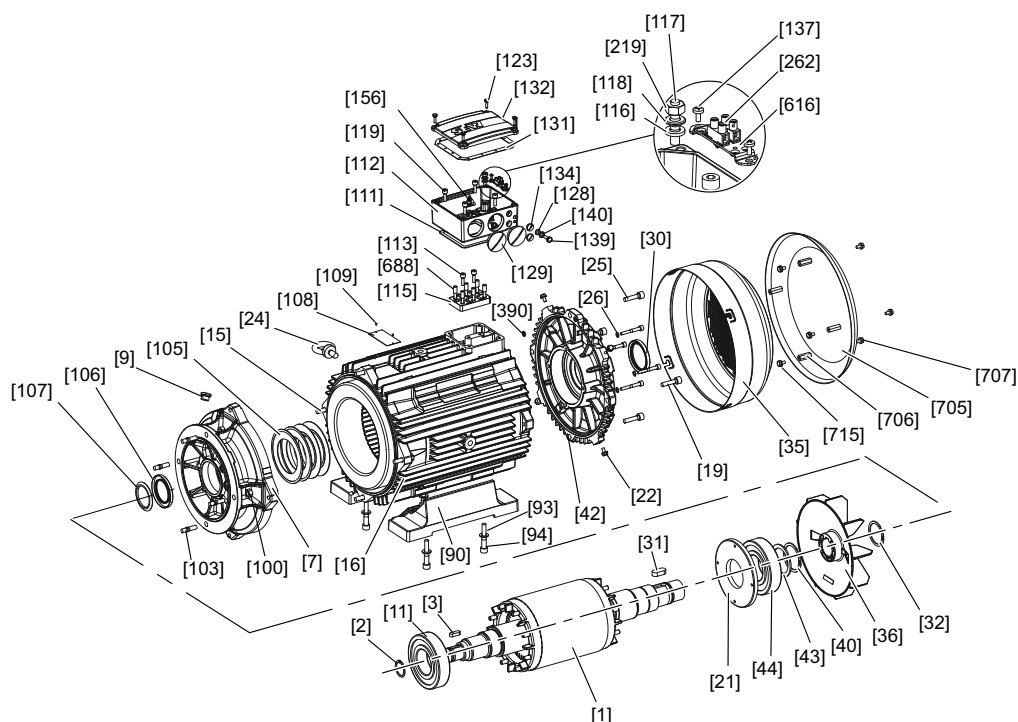
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[1] Rotor	[30] Oil seal	[107] Oil flinger	[129] Screw plug with O-ring
[2] Retaining ring	[32] Retaining ring	[108] Nameplate	[131] Gasket for cover
[3] Key	[35] Fan guard	[109] Grooved pin	[132] Terminal box cover
[7] Flanged endshield	[36] Fan	[111] Gasket for lower part	[134] Screw plug with O-ring
[9] Screw plug	[41] Shim	[112] Terminal box lower part	[156] Information label
[10] Retaining ring	[42] B-side endshield	[113] Pan head screw	[262] Terminal clip, complete
[11] Grooved ball bearing	[44] Grooved ball bearing	[115] Terminal board	[392] Seal
[12] Retaining ring	[90] Base plate	[116] Terminal clip	[688] Protection caps
[13] Cap screw	[93] Pan head screws	[117] Hexagon screw	[705] Canopy
[16] Stator	[100] Hex nut	[118] Lock washer	[706] Spacers
[22] Hexagon screw	[103] Stud	[119] Pan head screw	[707] Pan head screw
[24] Eyebolt	[106] Oil seal	[123] Hexagon screw	





### 3.2 General structure EDR.160 – EDR.180



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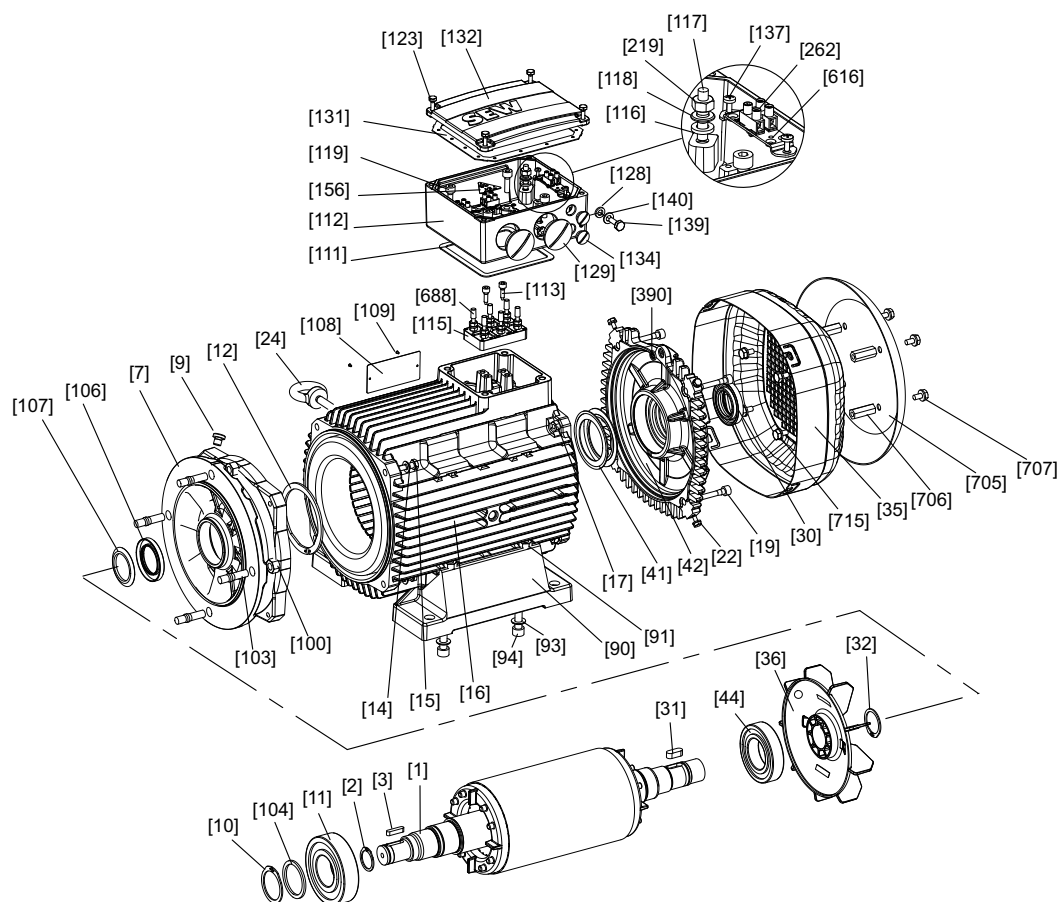
[1] Rotor	[31] Key	[108] Nameplate	[132] Terminal box cover
[2] Retaining ring	[32] Retaining ring	[109] Grooved pin	[134] Screw plug with O-ring
[3] Key	[35] Fan guard	[111] Gasket for lower part	[137] Screw
[7] Flange	[36] Fan	[112] Terminal box lower part	[139] Hexagon screw
[9] Screw plug	[41] Spring washer	[113] Screw	[140] Washer
[10] Retaining ring	[42] B-side endshield	[115] Terminal board	[153] Terminal strip, complete
[11] Grooved ball bearing	[44] Grooved ball bearing	[116] Serrated lock washer	[156] Information label
[12] Retaining ring	[90] Foot	[117] Stud	[219] Hex nut
[14] Washer	[91] Hex nut	[118] Washer	[262] Terminal clip
[15] Hexagon screw	[93] Washer	[119] Cap screw	[390] O-ring
[16] Stator	[94] Cap screw	[121] Grooved pin	[616] Retaining plate
[17] Hex nut	[100] Hex nut	[123] Hexagon screw	[688] Protection caps
[19] Cap screw	[103] Stud	[128] Serrated lock washer	[705] Canopy
[22] Hexagon screw	[104] Supporting ring	[129] Screw plug with O-ring	[706] Spacers
[24] Eyebolt	[106] Oil seal	[131] Gasket for cover	[707] Hexagon screw
[30] Sealing ring	[107] Oil flinger		[715] Hexagon screw



## Motor Structure

General structure EDR.200 – EDR.225

### 3.3 General structure EDR.200 – EDR.225



4285535115



[1] Rotor	[31] Key	[107] Oil flinger	[132] Terminal box cover
[2] Retaining ring	[32] Retaining ring	[108] Nameplate	[134] Screw plug
[3] Key	[35] Fan guard	[109] Grooved pin	[137] Screw
[7] Flange	[36] Fan	[111] Gasket for lower part	[139] Hexagon screw
[9] Screw plug	[40] Retaining ring	[112] Terminal box lower part	[140] Washer
[11] Grooved ball bearing	[42] B-side endshield	[113] Cap screw	[156] Information label
[15] Hexagon screw	[43] Supporting ring	[115] Terminal board	[219] Hex nut
[16] Stator	[44] Grooved ball bearing	[116] Serrated lock washer	[262] Terminal clip
[19] Cap screw	[90] Foot	[117] Stud	[390] O-ring
[21] Oil seal flange	[93] Washer	[118] Washer	[616] Retaining plate
[22] Hexagon screw	[94] Cap screw	[119] Cap screw	[688] Protection caps
[24] Eyebolt	[100] Hex nut	[123] Hexagon screw	[705] Canopy
[25] Cap screw	[103] Stud	[128] Serrated lock washer	[706] Spacer bolt
[26] Sealing washer	[105] Spring washer	[129] Screw plug	[707] Hexagon screw
[30] Oil seal	[106] Oil seal	[131] Gasket for cover	[715] Hexagon screw



### 3.4 Nameplate, type designation

#### 3.4.1 Nameplates of EDR. motors

EDR motor The following figure shows a nameplate:

<b>SEW-EURODRIVE</b>					
76646 Bruchsal / Germany		CC056A		MC170602	
EDRE90M4BE2/CICIID2					
01.1151928301.0001.12					
Hz	60	rpm	1740	V	230YY/460Y
kW	1.1/hp1.5	P.F.	0.73	K.V.A Code	
				3ph. IEC60034	A 4.50/2.25
				eff%	84.0 IE2
Th.Cl.	155(F)	Design	B starting torque	S.F.	1.0
CL I, DIV2 GP A, B, C & D T30		CL II, DIV2 GP F & G T4A		M.L. 03	
customerfield 1		customerfield 2			
Cmax		10/h	Ib in	176	external rectifier
IM		M5-M2A/ABY80°	Wmax	12000J	IHAC 0.5A Vbr 460
kg	19.5	AMB °C	-20...40	1886118 DE Made in Germany	

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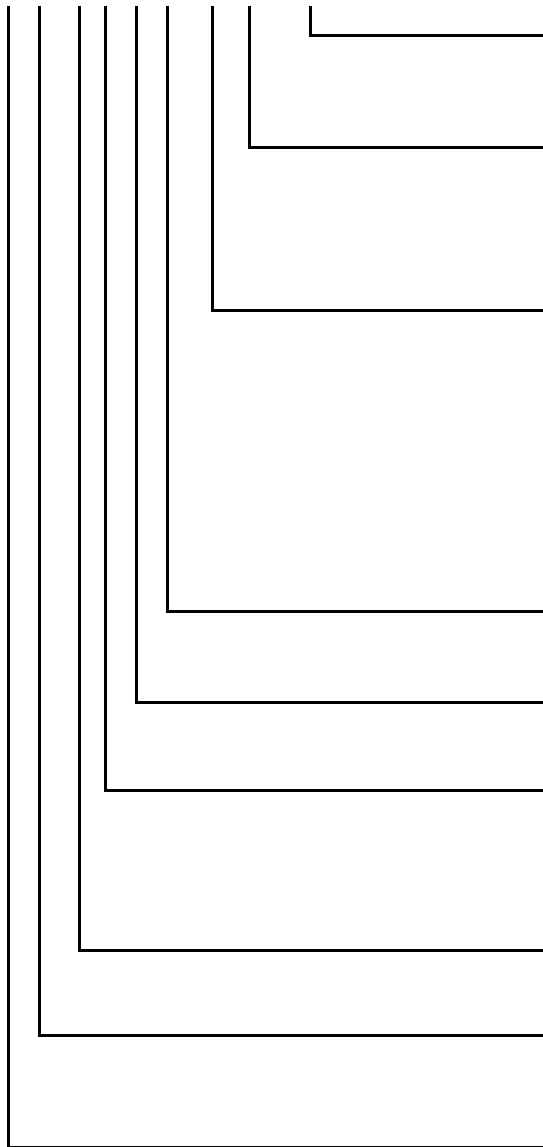
The marks on the upper edge of the nameplate are only present when the motor has been certified accordingly or when it includes the relevant components.



#### 3.4.2 Type designations of EDR. motors

EDR.. series AC motor The following diagram shows a type designation:

E DRE 90 M 4 /BE2 /FI /CI D2 /TF



##### Motor protection option (in preparation):

- TF temperature sensor
- PT or KY temperature detection

##### Designation of motors for hazardous locations:

- CID2: Class I, division 2, groups A, B, C and D
- CIID2: Class II, division 2, groups F and G
- CICIID2: Class I, division 2, groups A, B, C and D, and class II, division 2, groups F and G

##### Mounting variant:

- /FF: IEC flange-mounted motor with bore holes
- /FG: 7 series integral motor, as stand-alone motor
- /FM: 7 series integral motor with IEC feet
- /FI: IEC foot-mounted motor
- /FT: IEC flange-mounted motor with threads
- /FE: IEC flange-mounted motor with bore and IEC feet
- /FY: IEC flange-mounted motor with threads and IEC feet
- /FL: general flange-mounted motor (deviating from IEC)
- /FK: general flange-mounted motor (deviating from IEC) with feet

##### Brake:

- BE.. spring-loaded brakes with size specification

##### Number of poles:

- 4

##### Motor frame length:

- S: short
- M: medium
- L: long
- MC: medium, rotors with copper cage
- LC: long, rotors with copper cage

##### Motor size:

- 71 – 225

##### DR motor series with code letter:

- S: "Standard" efficiency class
- E: "Energy-Efficient" efficiency class

##### Code letter for motors for hazardous locations



### 3.5 Additional features

#### 3.5.1 AC motor series

The following table shows the types of AC motors:

Designation	Available class and division	
EDRS..	/CID2, /CIID2, /CICIID2	Motor for hazardous locations, 60 Hz
EDRE..		Motor for hazardous locations, energy-efficient, 60 Hz
71 – 225		Sizes: 71 / 80 / 90 / 100 / 112 / 132 / 160 / 180 / 200 / 225
S – L		Lengths: S = short / M = medium / L = long MC = medium, rotor with copper cage / LC = long, rotor with copper cage
4		Number of poles

#### 3.5.2 Mounting variants

The following table shows possible output variants:

Designation	Available class and division	Option
/FI	/CID2, /CIID2, /CICIID2	IEC foot-mounted motor with specification of shaft height
/FG		7 series integral motor, as stand-alone motor
/FF		IEC flange-mounted motor with bore holes
/FT		IEC flange-mounted motor with threads
/FL		General flange-mounted motor (other than IEC)
/FM		7-series integral gearmotor with IEC feet, with specification of shaft height if required
/FE		IEC flange-mounted motor with bore holes and IEC feet, with specification of shaft height
/FY		IEC flange-mounted motor with thread and IEC feet, with specification of shaft height if required
/FK		General flange-mounted motor (other than IEC) with feet, with specification of shaft height if required



#### 3.5.3 Mechanical attachments

The following table shows possible mechanical additions:

Designation	Available class and division	Option
BE	/CID2, /CIID2, /CICIID2	Spring-loaded brake with specification of size
HF		Manual brake release, lockable
HR		Manual brake release of the brake, automatic disengaging function
/RS		Backstop

#### 3.5.4 Encoder

The following table shows possible encoder variants:

Designation	Available class and division	Option
/XV.A	/CID2, /CIID2, /CICIID2	Mounting adapter for non-SEW encoders

#### 3.5.5 Temperature sensor / temperature detection (in preparation)

The following table shows the thermal protection options:

Designation	Available class and division	Option
/TF	/CID2, /CIID2, /CICIID2	Temperature sensor (PTC resistor)
/KY		One KTY84 – 130 sensor
/PT		One/three PT100 sensor(s)

#### 3.5.6 Ventilation

The following table shows possible ventilation variants:

Designation	Available class and division	Option
/AL	/CID2, /CIID2, /CICIID2	Metal fan
/C		Protection canopy for the fan guard
/LN		Low-noise fan guard (for EDR.71 – 132)



### 3.5.7 Motors for hazardous locations

The following table shows the option variants for hazardous locations:

Available class and division	Option
/CID2	Motors suitable for use in class I, division 2 Gas atmosphere
/CIID2	Motors suitable for use in class II, division 2 Dust atmosphere
/CICIID2	Motors suitable for use in class I or II, division 2 Gas or dust atmospheres

### 3.5.8 Other additional features

The following table shows an additional feature:

Designation	Available class and division	Option
/2W	/CID2,	Second shaft end on the motor/brakemotor
/RI	/CIID2,	Reinforced winding insulation
/RI2	/CICIID2	Reinforced winding insulation with increased resistance against partial discharge



### 3.6 Designation of motors for hazardous locations

The following table shows the areas of application according to the nameplate designation.

Identifier for hazardous locations	Range	Motor for hazardous locations
<b>CID2</b>	With potentially explosive gas-air / vapor-air mixtures	<ul style="list-style-type: none"> <li>Class I, division 2, groups A, B, C and D</li> </ul>
<b>CIID2</b>	With potentially explosive dust-air mixtures	<ul style="list-style-type: none"> <li>Class II, division 2, groups F and G</li> </ul>
<b>CICIID2</b>	With potentially explosive gas-air / vapor-air mixtures and with potentially explosive dust-air mixtures	<ul style="list-style-type: none"> <li>Class I, division 2, groups A, B, C and D</li> <li>Class II, division 2, groups F and G</li> </ul>

The class defines a general limit of the physical properties of the hazardous substances.

#### Class I:

Gases, vapors, and liquids that can be present in sufficient quantities to be explosive or ignitable.

#### Class II:

Dust or combustible dust that can be present in sufficient quantities to create potentially explosive mixtures or electrically conductive dust.

In addition, hazardous substances are assigned to different groups according to the nature of the hazardous substance.

The following table shows the assignment of the existing classes and groups:

Assignment of groups A – D in class I		Assignment of groups E – G in class II	
Gas and vapor		Dust	
<b>Group A</b>	Acetylene	<b>Group E<sup>1)</sup></b>	Flammable metal dust, including aluminum, magnesia, or similar substances
<b>Group B</b>	Flammable gas, flammable vapor, or flammable vapor-air mixtures, including hydrogen, butadiene, ethylene oxide, propylene oxide	<b>Group F</b>	Flammable dust containing carbon, e.g. black coal, carbon dust, charcoal, and coke dust
<b>Group C</b>	Flammable gas, flammable vapor, or flammable vapor-air mixtures, including ethylene, acetaldehyde, cyclopropane, ether, hydrogen sulfide	<b>Group G</b>	Flammable dust not covered by group E or F, including flour, grain, wood, plastic, and chemicals
<b>Group D</b>	Flammable gas, flammable vapor, or flammable vapor-air mixtures, including propane, acetone, alcohol, ammonia, gasoline, solvents, natural gas, propylene		

1) Group E is not available for EDR. motors.

Note that the table is not exhaustive. For a full description of the groups, refer to the standards CSA C22.1 and NFPA 70.





### Temperature class:

EDR. motors in class I for hazardous locations are additionally labeled with the respective temperature class. It is listed on the nameplate and specifies the maximum surface temperature.

The following table shows all possible temperature classes:

Temperature class	Maximum surface temperature
T1	450 °C
T2	300 °C
T2A	280 °C
T2B	260 °C
T2C	230 °C
T2D	215 °C
<b>T3</b> <sup>1)</sup>	<b>200 °C</b>
T3A	180 °C
T3B	165 °C
<b>T3C</b> <sup>1)</sup>	<b>160 °C</b>
T4	135 °C
T4A	120 °C
T5	100 °C
T6	85 °C

1) These two temperature classes are available from SEW-EURO-DRIVE.

EDR. motors for hazardous locations from SEW-EURODRIVE are labeled with one of the following temperature classes depending on the operating mode.

Operating mode	Temperature class
Line operation	T3C
Inverter operation	T3 (optional)

Before startup, make sure that the temperature class specified on the motor is lower than the ignition temperature of the hazardous substances (dust, fiber, or vapor), even if the ambient conditions correspond with the class and group listed on the nameplate.



### INFORMATION

EDR. motors of temperature class T3 ( $\leq 200$  °C) and T3C ( $\leq 160$  °C) can be safely used with gases that have a higher ignition temperature.



## 4 Mechanical Installation



### INFORMATION

Observe the safety notes in section 2 of these operating instructions for the mechanical installation.

### 4.1 Before you start



### NOTICE

The mounting position for installation must correspond to the specifications on the nameplate.

Only install the drive if the following conditions are met:

- The specifications on the nameplate of the drive correspond to the supply system or the output voltage of the frequency inverter
- The drive is undamaged (no damage caused by transportation or storage)
- All transport locks have been removed.
- You are certain that the following requirements have been met:

- Ambient temperature between -20 °C and +40 °C.

Note that the temperature range of the gear unit may also be restricted (see gear unit operating instructions)

Note that information on the nameplate may differ. The ambient conditions must comply with all the specifications on the nameplate.

- No oil, acid, gas, vapors, radiation, etc.
- Installation altitude max. 1000 m above sea level

Observe chapter "Electrical Installation" > "Ambient conditions during operation" > "Installation altitude".

- Note the restrictions for encoders
- Special design: Drive configured in accordance with the ambient conditions

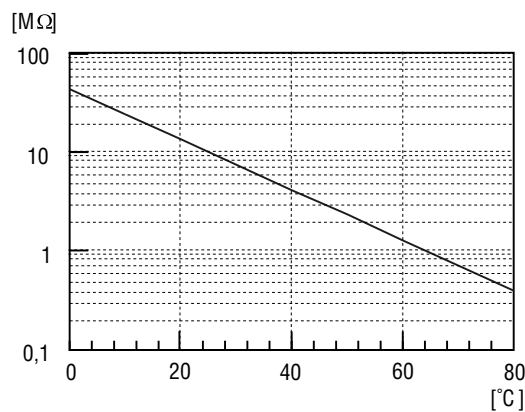
The above mentioned information refers to standard orders. The conditions might be different when you order drives other than the standard. Observe any differing conditions in the order confirmation.



## 4.2 Long-term storage of motors

- Note that the service life of the lubricant in the ball bearings is reduced by 10% per year after the first year of storage.
- Before startup, you should re-lubricate the lubrication devices on motors that have been in storage for longer than 5 years. Observe the information on the motor lubricant plate.
- Check whether the motor has absorbed moisture as a result of being stored for a long time. Measure the insulation resistance for this purpose (measuring voltage 500 V).

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



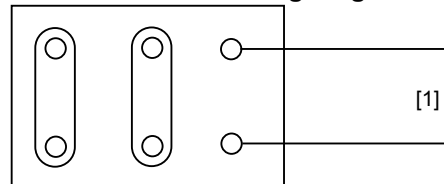
173323019

### 4.2.1 Drying the motor

Heating the motor either with warm air or via isolation transformer:

- With warm air
- Using isolation transformer
  - Connect the windings in series (see following figures)
  - Auxiliary AC voltage supply max. 10 % of the rated voltage with max. 20 % of the rated current

**Connection with wiring diagram R13:**



2336250251

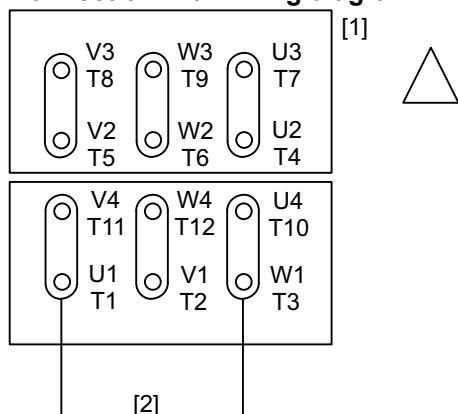
[1] Transformer



## Mechanical Installation

### Long-term storage of motors

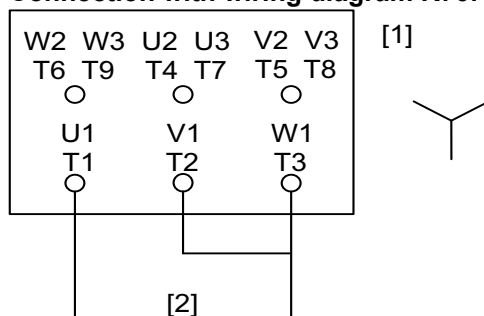
#### Connection with wiring diagram R72:



2343045259

- [1] Motor terminal boards  
[2] Transformer

#### Connection with wiring diagram R76:



2343047179

- [1] Motor terminal board  
[2] Transformer

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

In the terminal box, make sure that:

- The inside is clean and dry
- The connections and fixing parts are free from corrosion
- The seal and sealing surfaces are in good condition
- The cable glands are tight, otherwise clean or replace them



### 4.3 Motor installation notes



#### ⚠ CAUTION

Sharp edges due to open keyway.

Minor injuries.

- Insert key in keyway.
- Pull protective sleeve over shaft.



#### ⚠ CAUTION

Improper mounting may result in damages to the motor.

Possible damage to property

- Note the following:



#### NOTICE

The mounting position for installation must correspond with the specifications on the nameplate.

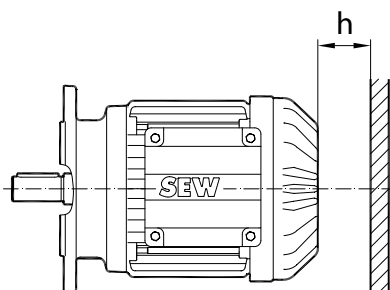
- Motor shaft ends must be thoroughly cleaned of anti-corrosion agents, contamination or similar (use a commercially available solvent). Do not allow the solvent to penetrate the bearings or shaft seals – this could damage the material.
- Mount the gearmotor only on a level, vibration-free and torsionally rigid support structure.
- Make sure the customer's counter-bearing is unobstructed and can move freely.
- Align the motor and the driven machine carefully in order to prevent the output shaft from being exposed to unacceptable strain. Observe the permitted overhung and axial forces.
- Do not jolt or hammer the shaft end.



## Mechanical Installation

### Motor installation notes

- Make sure that there is sufficient clearance around the motor to provide for adequate cooling, and that the motor does not suck in warm air from other units. Observe the following minimum clearance:



Motor type	h in mm for motors	
	Without brake	With brake
EDR.71, EDR.80	15	140
EDR.90, EDR.100	20	200
EDR.112, EDR.132	25	220
EDR.160	30	270
EDR.180	35	320
EDR.200, EDR.225	45	395

- Balance components for subsequent mounting on the shaft with a half key (motor shafts are balanced with a half key).
- For brakemotors with manual brake release, screw in the manual lever (for HR self-reengaging manual brake release).



### INFORMATION

- If using belt pulleys:
  - Only use belts that do not build up an electrostatic charge.
  - Do not exceed the maximum permitted overhung load; for motors without gear units, see chapter "Overhung loads (page 86)".
- Motors in vertical mounting position (e.g. M4/V1) are equipped with a canopy /C as standard.  
On request, the motor can be delivered without canopy. In this case, you have to install a cover when you install the drive in the plant/machine in order to prevent objects from falling into the ventilation openings. This cover must not obstruct the cooling air supply.
- In mounting positions with the motor output shaft pointing upwards (e.g. M2 / V3), a suitable cover must prevent small objects from falling through the fan guard. This cover must not obstruct the cooling air supply.

#### 4.3.1 Installation in damp locations or in the open

- Use suitable cable glands for the incoming cable (use reducing adapters if necessary) according to the installation instructions.
- If possible, arrange the terminal box so that the cable entries are pointing downwards.
- Seal the cable entry properly.
- Clean the sealing surfaces of the terminal box and the terminal box cover carefully before re-assembly; replace embrittled seals.
- If required, touch up the corrosion protection (especially at the eyebolts).
- Check the degree of protection.
- Protect the shaft against corrosion with a suitable anti-corrosion agent.



#### **4.4 Installation tolerances**

Shaft end	Flanges
Diameter tolerance according to ISO EN 50347 <ul style="list-style-type: none"> <li>• ISO j6 with <math>\varnothing \leq 28</math> mm</li> <li>• ISO k6 with <math>\varnothing \geq 38</math> mm up to <math>\leq 48</math> mm</li> <li>• ISO m6 at <math>\varnothing \geq 55</math> mm</li> <li>• Center bore in accordance with DIN 332, shape DR..</li> </ul>	Centering shoulder tolerance according to ISO EN 50347 <ul style="list-style-type: none"> <li>• ISO j6 with <math>\varnothing \leq 250</math> mm</li> <li>• ISO h6 with <math>\varnothing \geq 300</math> mm</li> </ul>

#### **4.5 Assembling the input elements**

Input elements that are mounted on the motor shaft end, e.g. pinions, must be warmed up prior to assembly in order to prevent damages to the encoder of stand-alone motors.

#### **4.6 Non-SEW encoder mounting**

If a drive was ordered with non-SEW encoder, SEW-EURODRIVE will deliver the drive with enclosed coupling. You must not connect the coupling for operation without non-SEW encoder.



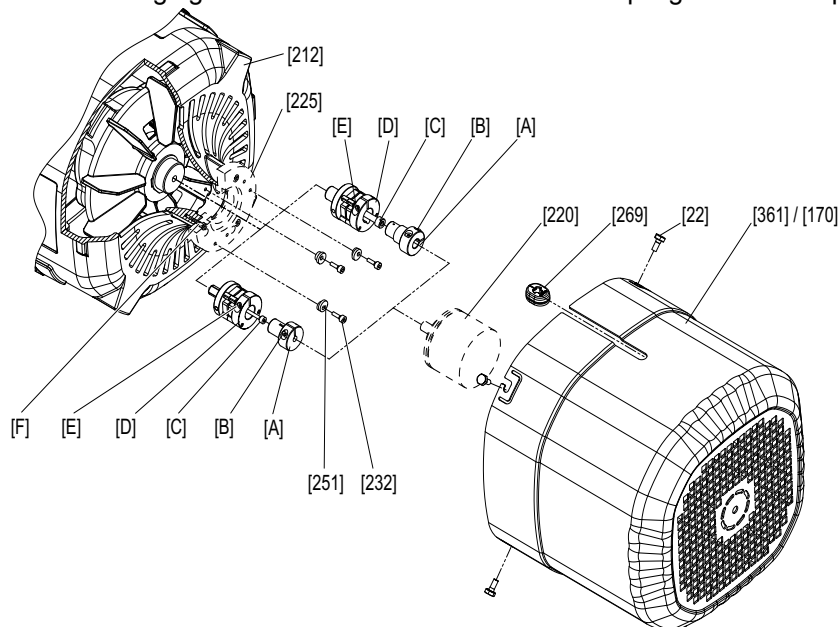
## Mechanical Installation

### Connecting XV.A encoder mounting adapter to EDR.71 – 225 motors

#### 4.7 Connecting XV.A encoder mounting adapter to EDR.71 – 225 motors

If you have ordered the XV.A encoder mounting adapter, the adapter and the coupling are enclosed with the motor and are to be assembled by the customer.

The following figure shows how to assemble the coupling and the adapter:



3633163787

[22] Screw	[361] Extended fan guard
[170] forced cooling fan guard	[269] Grommet
[212] Fan guard with encoder mount	[A] Adapter
[220] Encoder	[B] Retaining screw
[225] Intermediate flange (not with XV1A)	[C] Central retaining screw
[232] Screws (only with XV1A and XV2A)	[D] Coupling (spread- or solid shaft coupling)
[251] Conical spring washers (only with XV1A and XV2A)	[E] Retaining screw
	[F] Screw

1. If available, remove cover [361] or forced cooling fan guard [170].
2. **For XV2A and XV4A:** Remove intermediate flange [225].
3. Screw in the coupling [D] into the encoder bore of the motor shaft with the screw [C].  
**EDR.71 – 132:** Tighten the screw [C] with a tightening torque of 3 Nm [26.6 lb-in].  
**EDR.160 – 225:** Tighten the screw [C] with a tightening torque of 8 Nm [70.8 lb-in].
4. Push the adapter [A] on the encoder [220] and tighten it with the retaining screw [B] with a tightening torque of 3 Nm [26.6 lb-in].





5. **For XV2A and XV4A:** Mount the intermediate flange [225] with the screw [F] with a tightening torque of 3 Nm [26.6 lb-in].
6. Push the encoder and the adapter on the coupling [D] and tighten the retaining screw [E] with a tightening torque of 3 Nm [26.6 lb-in].
7. **With XV1A and XV2A:** Arrange conical spring washers [251] with retaining screws [232] and place in annular groove of the encoder [220] and tighten with a tightening torque of 3 Nm (26.6 lb-in).
8. **For XV3A and XV4A:** Installation by the customer via the bores in the encoder plate.

## 4.8 Tightening torques

The following table shows the necessary tightening torques:

Screw	Applies to	Tightening torque	
		in Nm	in lb-in
Terminal stud nut	M4 stud	1.2	10.6
	M6 stud	3	26.6
	M8 stud	6	53.1
	M10 stud	10	88.5
	M12 stud	15.5	137.2
Pan head screw	EDR.71 – 132	5	44.3
Hexagon screw grounding inside	EDR.71 – 132	4	35.4
	EDR.160	25.5	225.7
	EDR.180 – 225 (aluminum design)	25.5	225.7
	EDR.180 – 225 (gray-cast iron design)	50	442.5
Pan head screw of terminal box	EDR.71 – 132	5	44.3
	EDR.160 – 225	25.5	225.7
Hexagon screw terminal box cover	EDR.71 – 132	4	35.4
	EDR.160	10.3	91.2
	EDR.180 – 225 (aluminum design)	10.3	91.2
	EDR.180 – 225 (gray-cast iron design)	25.5	225.7
Screw option terminal	EDR.71 – 225	1.8	16.0
Hexagon screw grounding outside	EDR.71 – 225	4	35.4
Flat head screw option terminal	EDR.71 – 225	1	8.9
Pan head screw option terminal	EDR.71 – 225	1.8	16.0



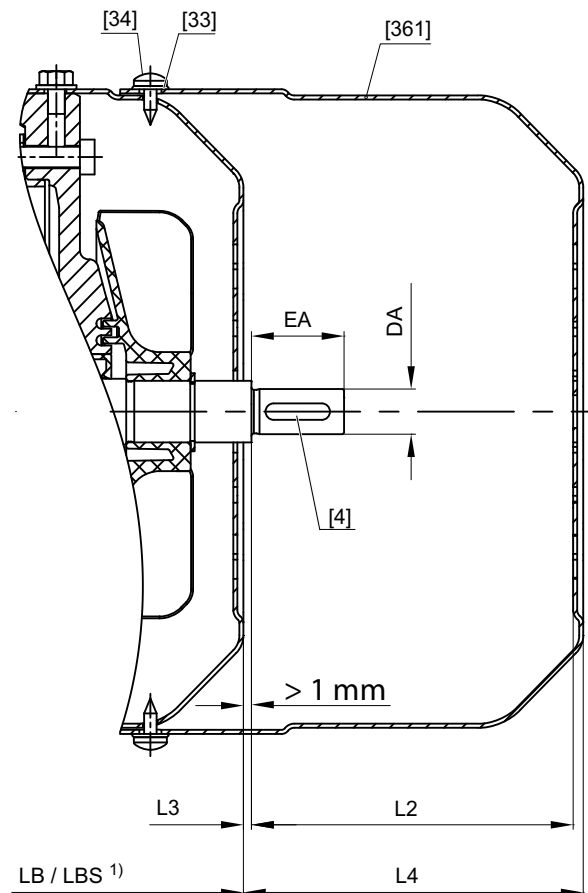
#### 4.9 Additional features

##### 4.9.1 2nd shaft end

As standard, SEW-EURODRIVE supplies the accessory equipment "second shaft end" with inserted key, additionally secured with a tape. No cover is supplied as standard. The cover can be ordered separately.

*With optional cover* Sizes EDR.71 – EDR.225 come equipped with an extended fan guard.

The following figure shows a schematic representation of the extended fan guard with dimensions for all frame sizes:



[2634738827]

- [4] Keyway
- [33] Washer
- [34] Tapping screw

- LB/LBS Length of the motor/brakemotor
- 1) Refer to the catalog for dimensions
- [361] Extended fan guard



Motor size	DA	EA	L2	L3	L4
EDR.71	11	23	87	2	91.5
EDR.71BE			83.5		88
EDR.80	14	30	91	2	95.5
EDR.80BE			90		94.5
EDR.90	14	30	84	2	88.5
EDR.90BE			76.5		81
EDR.100	14	30	83	2	87.5
EDR.100BE			76.5		81
EDR.112/132	19	40	120	3.5	125
EDR.112/132BE			115.5		120.5
EDR.160	28	60	187	4	193
EDR.160BE			180		187
EDR.180	38	80	226	4	233
EDR.180BE			229		236
EDR.200+225	48	110	221.5	5	230
EDR.200+225BE			237.5		246

Observe the distances between the shaft shoulder and the fan housing as well as the overhung loads when you connect accessories.

Without optional  
cover

Variants without cover must be provided with a cover by the customer.



#### ⚠ CAUTION

protective cover missing or incorrect.

Severe or fatal injuries.

- Only qualified personnel may mount the protective cover.
- Only start up the motor with the correct protective cover.



## 5 Electrical Installation



### **⚠ WARNING**

Danger of electric shock.

Severe or fatal injuries!

- Note the following:

- It is essential to comply with the safety notes in chapter 2 during installation!
- Switch contacts in utilization category AC-3 to IEC 60947-4-1 must be used for switching the motor and the brake.
- When motors are powered by inverters, you must adhere to the wiring instructions issued by the inverter manufacturer.
- Observe the operating instructions of the inverter.

### 5.1 *Additional regulations*

The generally applicable installation regulations CSA C22.0 and NFPA 70 for electrical low-voltage equipment must be observed when installing electrical systems.

### 5.2 *Wiring diagrams and terminal assignment diagrams*

Connect the motor only as shown in the wiring diagram(s) included with the motor. Do not connect or start up the motor if the wiring diagram is missing. You can obtain the valid wiring diagrams free of charge from SEW-EURODRIVE.

### 5.3 *Cable entries*

The terminal boxes have NPT tapped holes according to ANSI B1.20.1-1983. All bores are equipped with explosion-proof closing plugs upon delivery.

For a correct cable entry, replace the closing plugs with cable glands with strain relief that are certified for use in the respective hazardous location. Select the cable screw fitting according to the outer diameter of the cable used. For the tightening torque of the cable entry, refer to the operating/installation instructions. The IP degree of protection of the cable entry must be at least as high as the IP degree of protection of the motor.

Only use connection glands with screw heads that fit into the existing counterbore.

To meet the IP requirements, all unused cable entries must be sealed with a closing plug after the installation has been completed. A closing plug may only be replaced with another explosion-proof closing plug.

### 5.4 *Equipotential bonding*

IEC 60364-5 might require a connection to an equipotential bonding system. Observe the chapter "Electrical Installation" / "Improving the grounding (EMC)".



## 5.5 *Wiring notes*

Observe the accompanying wiring diagram during installation.

### 5.5.1 **Protecting the brake control system against interference**

Unless they are shielded, brake cables must always be routed separately from other power cables with phased currents to protect brake controls against interference. Power cables with phased currents are in particular

- Output cables from frequency inverters and servo controllers, soft start units and brake units
- Supply cables for braking resistors and similar options

### 5.5.2 **Protecting the motor protection devices against interference**

Adhere to the following points to protect SEW motor protection devices (TF temperature sensors) against interference:

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

## 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 IEC 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 Improving the grounding (EMC)

For improved, low-impedance grounding at high frequencies, we recommend using the following connections: SEW-EURODRIVE recommends to use corrosion-resistant connection elements.

If you require an NF equipotential bonding in addition to the HF equipotential bonding, you can apply the conductor at the same point.

The "Improved grounding" option can be ordered as follows:

- completely premounted or as
- "Connecting element" kit for customer installation; part numbers listed in the following table.

Motor size	Part number of "connecting element" kit
EDR.71S / M EDRE.80S / M	1363 3953
EDR.90M / L	
EDR.100M	
EDR.100 L – EDR.132	1363 3945
EDR.160 – EDR.225	
EDR.160 – EDR.225 with aluminum terminal box	



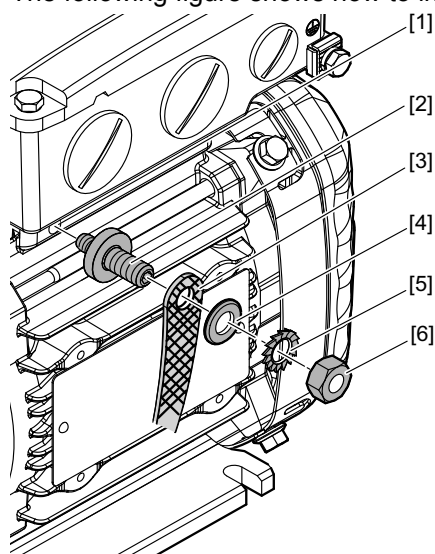
#### INFORMATION

For further information regarding the grounding, refer to the SEW publication "Drive Engineering – Practical Implementation, EMC in Drive Engineering".



### 5.7.1 Size EDR.71S / M and EDR.80S / M

The following figure shows how to install the grounding:

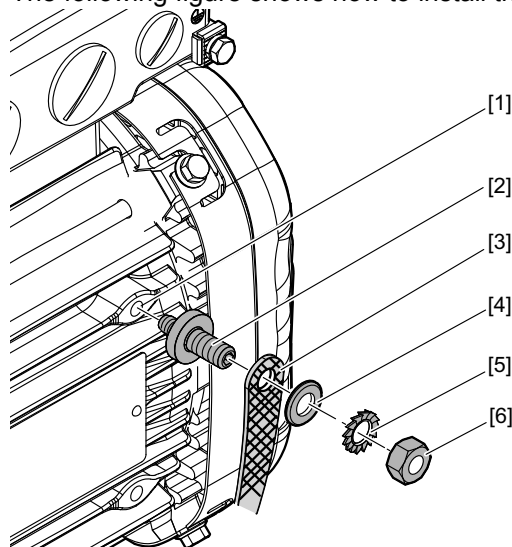


- |   |                          |
|---|--------------------------|
| [1] Use of the pre-cast bore at the terminal-box recess/foot  | [4] Disk ISO 7090        |
| [2] Grounding element with self-tapping screw ISO 7500 M6 x 10, customer M8 x 16, tightening torque 6 Nm (53.1 lb-in) | [5] Serrated lock washer |
| [3] Ground strap  | [6] M8 nut               |

You can order the complete connection element from SEW-EURODRIVE with part number 13633953.

### 5.7.2 Size EDR.90M / L

The following figure shows how to install the grounding:



- |   |                          |
|---|--------------------------|
| [1] Use of the pre-cast bore  | [4] Disk ISO 7090        |
| [2] Grounding element with self-tapping screw ISO 7500 M6 x 10, customer M8 x 16, tightening torque 6 Nm (53.1 lb-in) | [5] Serrated lock washer |
| [3] Ground strap  | [6] M8 nut               |

You can order the complete connection element from SEW-EURODRIVE with part number 13633953.

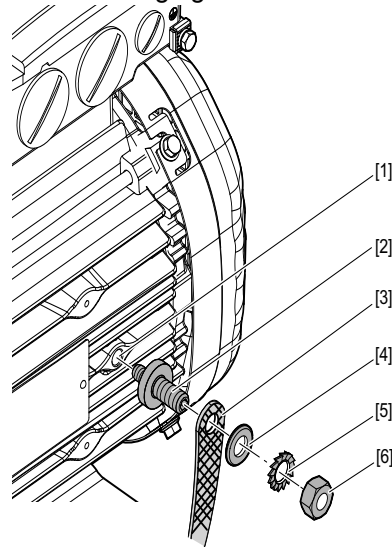


## Electrical Installation

### Improving the grounding (EMC)

#### 5.7.3 Size EDR.100M

The following figure shows how to install the grounding:

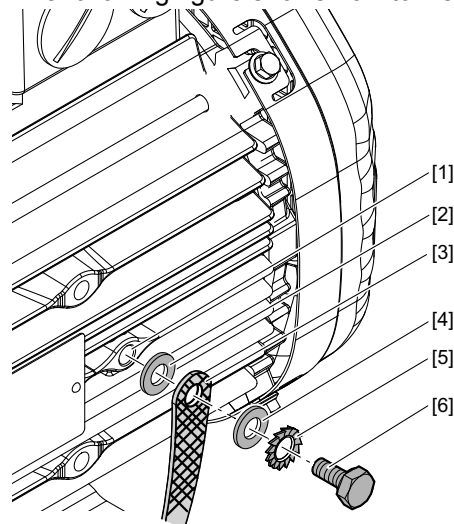


- |     |  |     |                      |
|-----|--|-----|----------------------|
| [1] | Use of the pre-cast bore   | [4] | Disk ISO 7090        |
| [2] | Self-tapping screw ISO 7500 M6 x 10, customer M8 x 16, tightening torque 6 Nm (53.1 lb-in) | [5] | Serrated lock washer |
| [3] | Ground strap   | [6] | M8 nut               |

You can order the complete connection element from SEW-EURODRIVE with part number 13633953.

#### 5.7.4 Size EDR.100L – EDR.132

The following figure shows how to install the grounding:



- |     |                                     |     |   |
|-----|-------------------------------------|-----|---|
| [1] | Use of tapped hole for lifting eyes | [5] | Serrated lock washer  |
| [2] | Disk ISO 7090                       | [6] | Hexagon screw ISO 4017 M8 x 16, tightening torque 6 Nm (53.1 lb-in) |
| [3] | Ground strap                        |     |   |
| [4] | Disk ISO 7090                       |     |   |

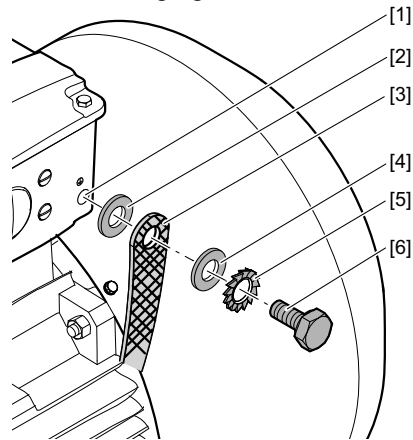
You can order the complete connection element from SEW-EURODRIVE with part number 13633945.





### 5.7.5 Sizes EDR.160 – EDR.225

The following figure shows how to install the grounding:



- [1] Use of the tapped holes at the terminal box
- [2] Disk ISO 7090
- [3] Ground strap
- [4] Disk ISO 7090
- [5] Serrated lock washer
- [6]
  - Hex head screw ISO 4017 M8 x 16 (with aluminum terminal boxes size EDR.160 – 225), tightening torque 6 Nm (53.1 lb-in)
  - Hex head screw ISO 4017 M10 x 25 (with gray cast iron terminal boxes size EDR.160 – 225), tightening torque 10 Nm (88.5 lb-in)

You can order the complete connection element from SEW-EURODRIVE with part number 13633945.

For sizes EDR.160 – 225 with gray cast iron terminal boxes, the grounding is always pre-installed upon delivery.

For aluminum terminal boxes size EDR.160 – 225, you can order the "connection element" kit with part number 13633945.

**5.8 Ambient conditions during operation****5.8.1 Ambient temperature**

The temperature range of -20 °C to +40 °C must be ensured unless specified otherwise on the nameplate.

**5.8.2 Installation altitude**

The maximum installation altitude of 1000 m above sea level must not be exceeded.

**5.8.3 Hazardous radiation**

Motors must not be subjected to hazardous radiation (such as ionizing radiation). Contact SEW-EURODRIVE if necessary.

**5.8.4 Harmful gas, vapor and dust**

If used according to their designated use, explosion-proof motors are incapable of igniting explosive gases, vapors or dusts. However, explosion-proof motors may not be subjected to gases, vapors or dusts that endanger operational safety, for example through

- Corrosion
- Damage to the protective coating
- Damage to the sealing material, etc.

**Seal selection**

If the motor is operated in environments with high environmental impact, such as increased ozone values, EDR motors can be equipped with high-quality seals. If you have doubts regarding the stability of the seals in connection with the respective environmental impacts, consult SEW-EURODRIVE.



## **5.9 Motors for hazardous locations**

### **5.9.1 General information**

The SEW-EURODRIVE motors for hazardous locations of the EDR.. series are designed for the following areas of application:

Identifier for hazardous locations	Operating range
CID2	Motor for hazardous locations according to CSA C22.1 or NFPA 70 <ul style="list-style-type: none"> <li>Class I, division 2, groups A, B, C and D</li> </ul>
CIID2	Motor for hazardous locations according to CSA C22.1 or NFPA 70 <ul style="list-style-type: none"> <li>Class II, division 2, groups F and G</li> </ul>
CICIID2	Motor for hazardous locations according to CSA C22.1 or NFPA 70 <ul style="list-style-type: none"> <li>Class I, division 2, groups A, B, C and D</li> <li>Class II, division 2, groups F and G</li> </ul>

### **5.9.2 Temperature classes**

The motors are authorized for temperature classes T3 and T3C. The temperature class of the motor can be found on the nameplate or on the order confirmation.

### **5.9.3 Surface temperature**

The surface temperature of the motor can be found on the nameplate or on the order confirmation.

### **5.9.4 Protection against impermissibly high surface temperatures**

Motors for hazardous locations ensure safe operation under normal operating conditions. The motor must be switched off securely in the case of overload to avoid the risk of impermissibly high surface temperatures.

### **5.9.5 Protection exclusively with motor protection switch**

Note the following when installing the motor protection switch according to IEC 60947:

- The motor protection switch must disconnect all poles in the event of a phase failure.
- The motor protection switch must be set to the rated motor current indicated on the nameplate.



#### 5.9.6 Protection exclusively with PTC thermistor (TF) (in preparation)

The positive coefficient thermistor must be evaluated using a suitable device. Observe the applicable installation regulations.



#### ⚠ CAUTION

Damage to the temperature sensor due to excessive voltage.

Possible destruction of the temperature sensor.

- Do not apply any voltages > 30 V.

The 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  $\Omega$ , thermal resistance > 4000  $\Omega$

The PTC thermistor (TF) is required in order to maintain a safe isolation and for thermal monitoring.

The evaluation function of the temperature monitoring must be activated in connection with the temperature sensor measuring circuit and must become effective in the event of an overtemperature.

#### 5.9.7 Protection with motor protection switch and additional PTC thermistor (in preparation)

The conditions stated for exclusive protection with motor protection switches also apply here. Protection with positive temperature coefficient thermistors (TF) only represents a supplementary protection measure which is irrelevant to certification for potentially explosive atmospheres.



#### INFORMATION

Proof of the efficacy of the installed protective equipment is required prior to startup.

---



### 5.10 Notes regarding motor connection



#### **INFORMATION**

It is essential to comply with the valid wiring diagram. Do not connect or start up the motor if this wiring diagram is missing. The applicable wiring diagrams are available from SEW-EURODRIVE free of charge.



#### **INFORMATION**

The terminal box must be free from foreign objects, dirt and humidity. Unused cable entry openings and the terminal box itself must be closed so they are dust and water-proof.



#### **INFORMATION**

The protection caps must be mounted properly on the terminal studs for startup; otherwise, the approval is void.

Observe the following points when connecting the motor:

- Check cable cross section
- Arrange terminal links correctly
- Screw on the connections and the PE conductor correctly
- Make sure that the connection cables are not cramped to avoid damage to the cable insulation.
- Observe clearances, see chapter "Electrical connection"
- In the terminal box: Check winding connections and tighten them if necessary
- Perform the connection in accordance with the enclosed wiring diagram
- Avoid protruding wire ends
- Observe the specified direction of rotation



### 5.11 Connection variants via terminal board

The motors are supplied and connected in different ways depending on the electrical design. Arrange the terminal links as shown in the wiring diagram and screw them on firmly. Observe the tightening torques specified in the following tables.

Motor size EDR.71-DR.100							
Terminal stud Ø	Tightening torque of hex nut	Connection Customer Cross sec.	Design	Connection type	Scope of delivery	PE Terminal stud Ø	PE design
M4	1.6 Nm (14.2 lb-in)	≤ 1.5 mm <sup>2</sup> (AWG 16)	1a	Solid wire Conductor end sleeve	Pre-assembled terminal links	M5	4
		≤ 6 mm <sup>2</sup> (AWG 10)	1b	Ring cable lug	Pre-assembled terminal links		
		≤ 6 mm <sup>2</sup> (AWG 10)	2	Ring cable lug	Small connection accessories enclosed in bag		
M5	2.0 Nm (17.7 lb-in)	≤ 2.5 mm <sup>2</sup> (AWG 14)	1a	Solid wire Conductor end sleeve	Pre-assembled terminal links		
		≤ 16 mm <sup>2</sup> (AWG 6)	1b	Ring cable lug	Pre-assembled terminal links		
		≤ 16 mm <sup>2</sup> (AWG 6)	2	Ring cable lug	Small connection accessories enclosed in bag		
M6	3.0 Nm (26.5 lb-in)	≤ 35 mm <sup>2</sup> (AWG 2)	3	Ring cable lug	Small connection accessories enclosed in bag		

Motor size EDR.112-DR.132							
Terminal stud Ø	Tightening torque of hex nut	Customer connection Cross sec.	Design	Connection type	Scope of delivery	PE Terminal stud Ø	PE design
M5	2.0 Nm (17.7 lb-in)	≤ 2.5 mm <sup>2</sup> (AWG 14)	1a	Solid wire Conductor end sleeve	Pre-assembled terminal links	M5	4
		≤ 16 mm <sup>2</sup> (AWG 6)	1b	Ring cable lug	Pre-assembled terminal links		
		≤ 16 mm <sup>2</sup> (AWG 6)	2	Ring cable lug	Small connection accessories enclosed in bag		
M6	3.0 Nm (26.5 lb-in)	≤ 35 mm <sup>2</sup> (AWG 2)	3	Ring cable lug	Small connection accessories enclosed in bag		

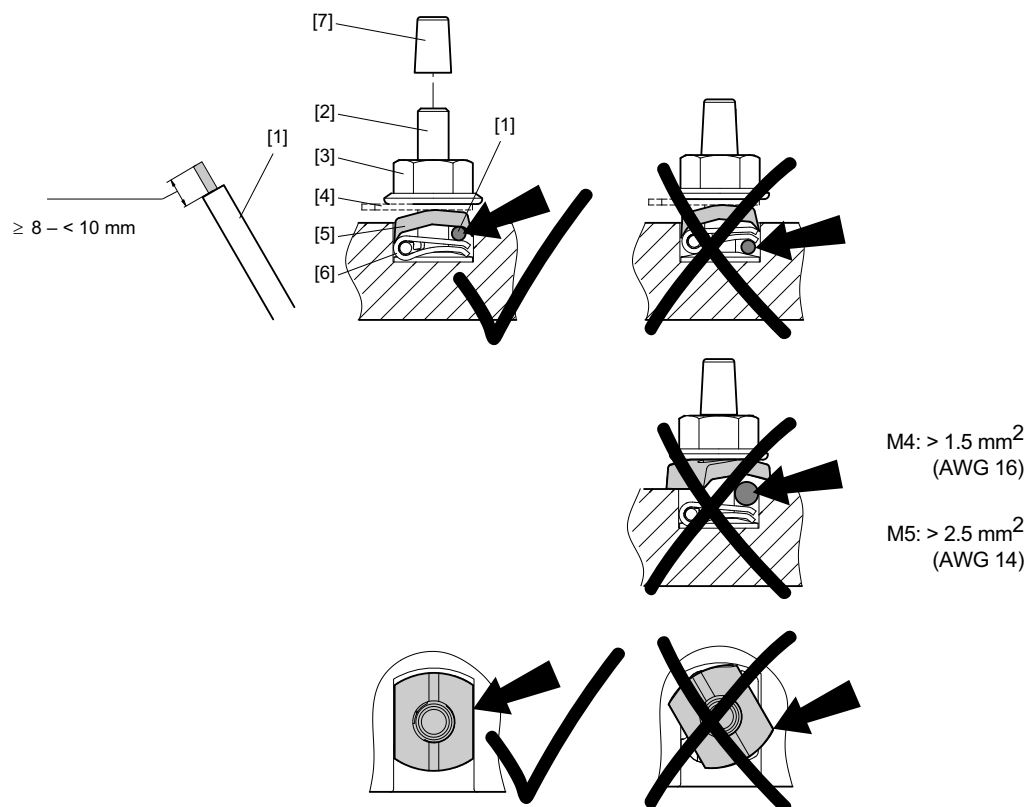
Motor size EDR.160							
Terminal stud Ø	Tightening torque of hex nut	Customer connection Cross sec.	Design	Connection type	Scope of delivery	PE Terminal stud Ø	PE design
M6	3.0 Nm (26.5 lb-in)	≤ 35 mm <sup>2</sup> (AWG 2)	3	Ring cable lug	Small connection accessories enclosed in bag	M8	5
M8	6.0 Nm (53.1 lb-in)	≤ 70 mm <sup>2</sup> (AWG 2/0)	3	Ring cable lug	Small connection accessories enclosed in bag	M10	5



Motor size EDR.180-DR.225							
Terminal stud  Ø	Tightening torque of hex nut	Customer connection  Cross sec.	Variant	Connection type	Scope of delivery	PE Terminal stud Ø	PE design
M8	6.0 Nm (53.1 lb-in)	≤ 70 mm <sup>2</sup> (AWG 2/0)	3	Ring cable lug	Small connection accessories enclosed in bag	M8	5
M10	10 Nm (88.5 lb-in)	≤ 95 mm <sup>2</sup> (AWG 3/0)	3	Ring cable lug	Small connection accessories enclosed in bag	M10	5
M12	15.5 Nm (137.2 lb-in)	≤ 95 mm <sup>2</sup> (AWG 3/0)	3	Ring cable lug	Small connection accessories enclosed in bag	M10	5

The designs in bold print apply to S1 operation for the standard voltages and standard frequencies according to the data in the catalog. Other variants may have different connections, for example, different terminal stud diameters and/or a different scope of delivery.

#### 5.11.1 Variant 1a:

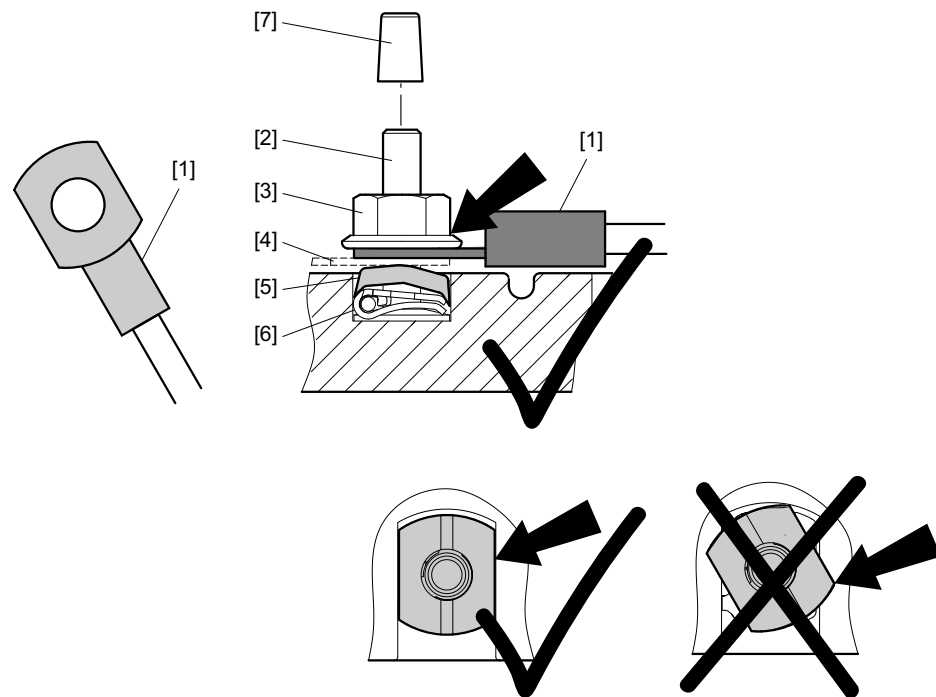


4343864843

- [1] External connection
- [2] Terminal stud
- [3] Flange nut
- [4] Terminal link
- [5] Terminal washer
- [6] Winding connection with Stocko connection terminal
- [7] Protection caps



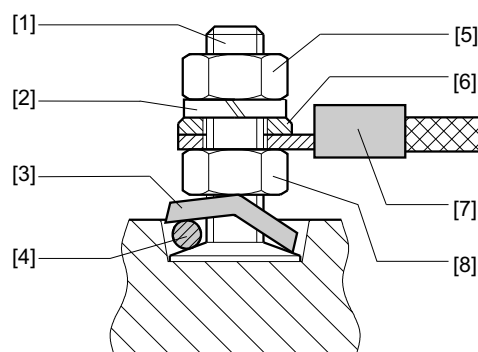
## 5.11.2 Variant 1b:



4343866763

- [1] External connection with ring cable lug, according to DIN 46237 or DIN 46234, for example.
- [2] Terminal stud
- [3] Flange nut
- [4] Terminal link
- [5] Terminal washer
- [6] Winding connection with Stocko connection terminal
- [7] Protection caps

## 5.11.3 Variant 2



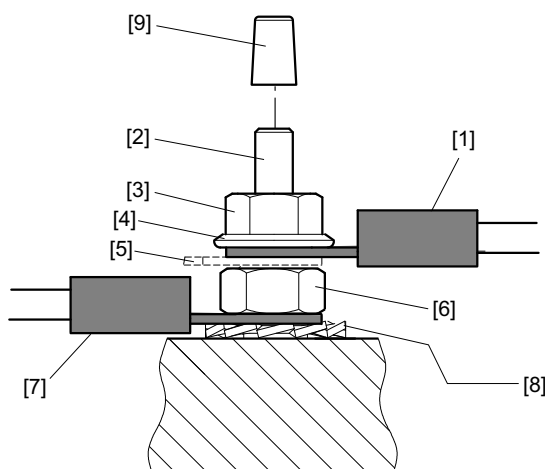
185439371

- [1] Terminal stud
- [2] Lock washer
- [3] Terminal washer
- [4] Winding connection
- [5] Upper nut
- [6] Washer
- [7] External connection with ring cable lug, according to DIN 46237 or DIN 46234, for example.
- [8] Lower nut





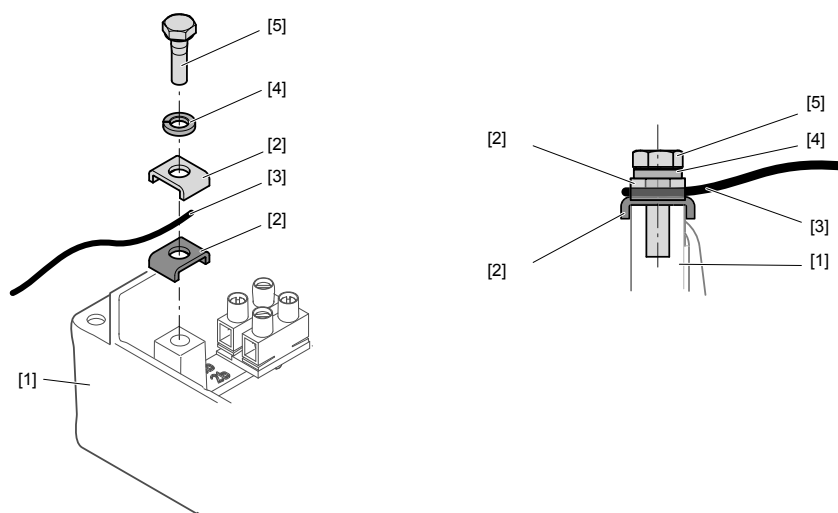
#### 5.11.4 Variant 3



4343868683

- [1] External connection with ring cable lug, according to DIN 4637 or DIN 46234, for example.
- [2] Terminal stud
- [3] Upper nut
- [4] Washer
- [5] Terminal link
- [6] Lower nut
- [7] Winding connection with ring cable lug
- [8] Serrated lock washer
- [9] Protection caps

#### 5.11.5 Variant 4

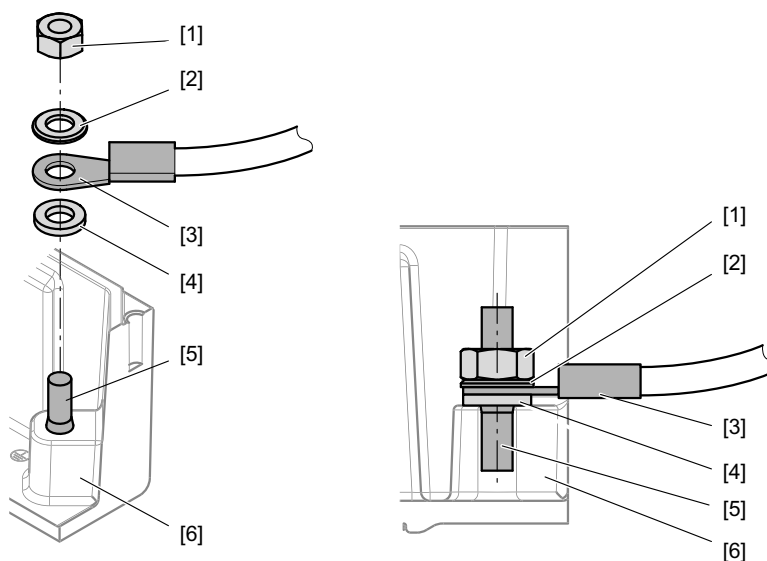


1139606667

- [1] Terminal box
- [2] Terminal clip
- [3] PE conductor
- [4] Lock washer
- [5] Hex head screw



### 5.11.6 Variant 5



- [1] Hex nut
- [2] Washer
- [3] PE conductor with cable lug
- [4] Serrated lock washer
- [5] Stud
- [6] Terminal box

1139608587



## 5.12 Connecting the brake

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



### ⚠ WARNING

Risk of crushing if the hoist falls.

Severe or fatal injuries.

- Comply with the applicable national or plant-specific regulations regarding phase failure protection and the associated circuit/circuit modification.
- Connect the brake according to the provided wiring diagram.
- 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 according to EN 60947-4-1.

### 5.12.1 Connecting the brake controller

The DC disk brake is powered by a brake control system with protection circuit. It is located in the terminal box or must be installed in the control cabinet.

- **Check the cable cross sections – brake currents (see chapter "Technical Data")**
- Connect the brake controller according to the provided wiring diagram
- Brakes must not be released electrically all the time while the motor is at standstill.



### 5.13 Accessory equipment

Connect accessory equipment as shown in the wiring diagram(s) provided with the motor. **Do not connect or startup any accessory equipment if the wiring diagram is missing.** You can obtain the relevant wiring diagrams from SEW-EURODRIVE free of charge.

#### 5.13.1 Temperature sensor / TF (in preparation)



#### NOTICE

Damage of the temperature sensor due to excessive heat.

The drive system might be damaged.

- Do not apply voltages > 30 V to the TF temperature sensor.

The 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  $\Omega$ , 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, a thermal protection function must be triggered immediately.

If there is a second terminal box for the TF temperature sensor, you must connect the temperature sensor in that terminal box.

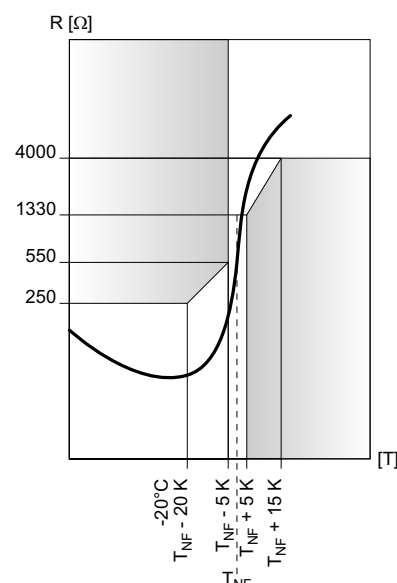
Observe the provided wiring diagram for the connection of the TF temperature sensor. If the wiring diagram is missing, you can obtain it from SEW-EURODRIVE free of charge.



#### INFORMATION

The temperature sensor TF may not be subjected to voltages > 30 V.

Below figure shows the characteristic curve of the TF with reference to the rated response temperature (referred to as  $T_{NF}$ ).



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### 5.13.2 Temperature sensor /KY (KTY84-130)



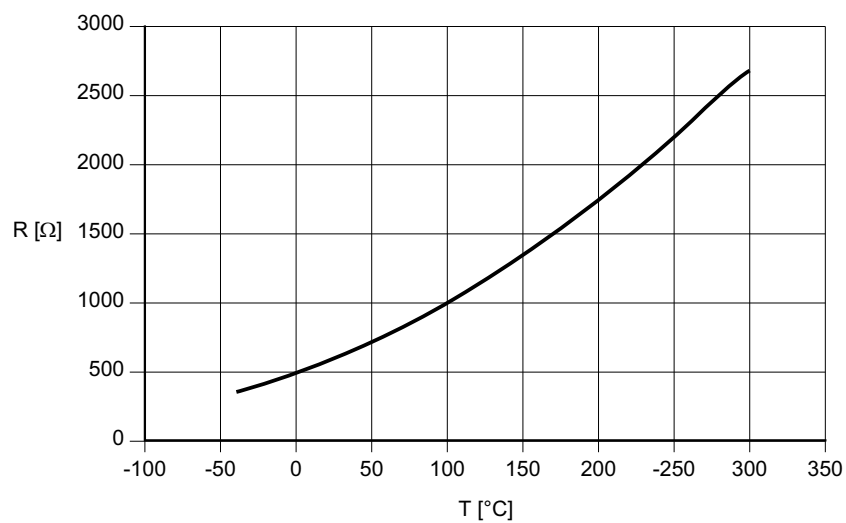
#### NOTICE

Excessive self-heating of the temperature sensor can damage the insulation of the temperature sensor.

The drive system might be damaged.

- Avoid currents > 4 mA in the circuit of the KTY.
- Observe the correct connection of KTY to ensure correct evaluation of the temperature sensor. Ensure correct polarity.

The characteristic curve in the following figure shows the resistance curve subject to the motor temperature with a measuring current of 2 mA and correct pole connection.



Technical data	KTY84 - 130
Connection	Red (+) Blue (-)
Total resistance at 20 - 25 °C	540 Ω < R < 640 Ω
Test current	< 3 mA



#### 5.13.3 Temperature sensor /PT (PT100)



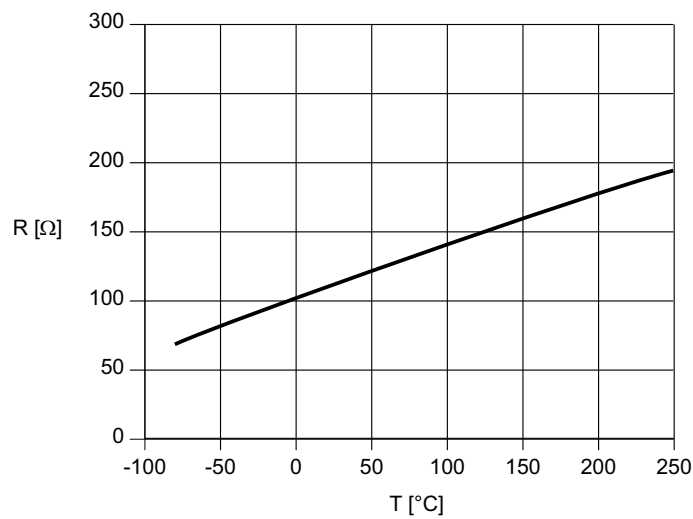
#### NOTICE

Excessive self-heating of the temperature sensor can damage the insulation of the temperature sensor.

The drive system might be damaged.

- Avoid currents > 4 mA in the circuit of the PT100.
- Observe the correct connection of PT100 to ensure correct evaluation of the temperature sensor. Ensure correct polarity.

The characteristic curve in the following figure shows the resistance curve subject to the motor temperature.



Technical data	PT100
Connection	Red/white
Resistance at 20 - 25 °C per PT100	107 Ω < R < 110 Ω
Test current	< 3 mA

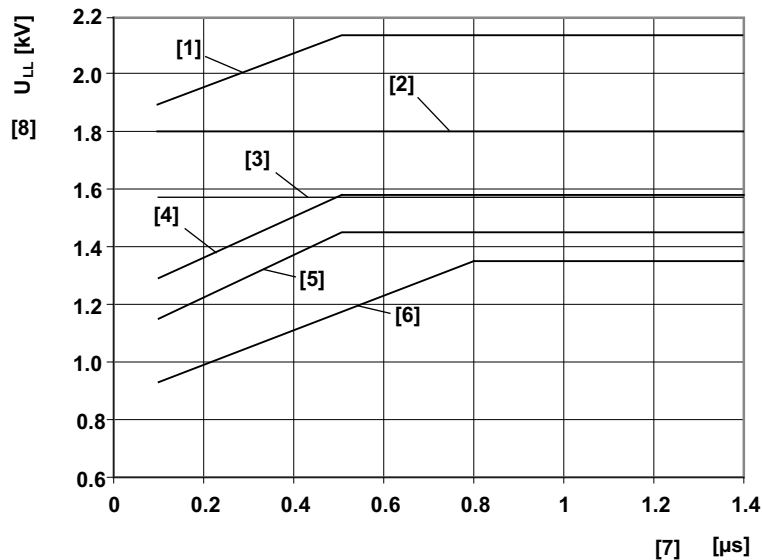


## 6 Operating Modes and Limit Values

### 6.1 Permitted duty types

The permitted duty type is "continuous duty".

#### 6.1.1 Permitted voltage load



3980591243

- [1] Permitted pulse voltage for EDR motors with reinforced insulation and increased resistance against partial discharge (/RI2)
- [2] Permitted pulse voltage for DR motors with reinforced insulation (/RI)
- [3] Permitted pulse voltage according to NEMA MG1 part 31,  $V_N \leq 500$  V
- [4] Permitted pulse voltage according IEC 60034-25, limit value curve A for nominal voltage  $V_N \leq 500$  V, star connection
- [5] Permitted pulse voltage according IEC 60034-25, limit value curve A for nominal voltage  $V_N \leq 500$  V, delta connection
- [6] Permitted pulse voltage according to IEC 60034-17
- [7] Voltage rise time
- [8] Permitted pulse voltage

### INFORMATION



EDR motors for line operation follow characteristic curve [5].



## 7 Startup



### INFORMATION

- Observe the safety notes in chapter 2 during installation.
- In case of problems, refer to the section "Malfunctions".



#### ⚠ WARNING

Risk of explosion due to the use of components that are not protected against explosions.

Severe or fatal injuries.

- Only use components that are designed for the relevant hazardous location class.



#### ⚠ WARNING

Risk of explosion due to sparks.

Severe or fatal injuries.

- Do not open the wiring space of the motor in hazardous locations.



#### ⚠ WARNING

Danger of electric shock.

Severe or fatal injuries.

Observe the following notes.

- Use switch contacts in utilization category AC-3 according to IEC 60947-4-1 for switching the motor.



#### ⚠ CAUTION

The surface temperatures on the drive can be very high during operation.

Danger of burns.

- Let the motor cool down before you start your work.





## 7.1 Before startup

Before startup, make sure that:

- The drive is undamaged and not blocked
- Any transport locks have been removed
- The measures stipulated in chapter "Extended storage of motors" (page 23) are performed after extended storage periods
- All connections have been made properly
- The direction of rotation of the motor/gearmotor is correct
  - Motor rotating clockwise: U, V, W (T1, T2, T3) to L1, L2, L3
- All protective covers have been properly installed
- All motor protection equipment is active and set for the rated motor current
- There are no other sources of danger
- The lockable manual brake release is permitted

## 7.2 During startup

During startup, make sure that:

- The motor is running properly, which means
  - No overload,
  - No speed fluctuation,
  - No loud noises,
  - No unusual vibrations, etc.
- The braking torque corresponds to the respective application. Observe the "Technical Data" (page 86) chapter and the nameplate.



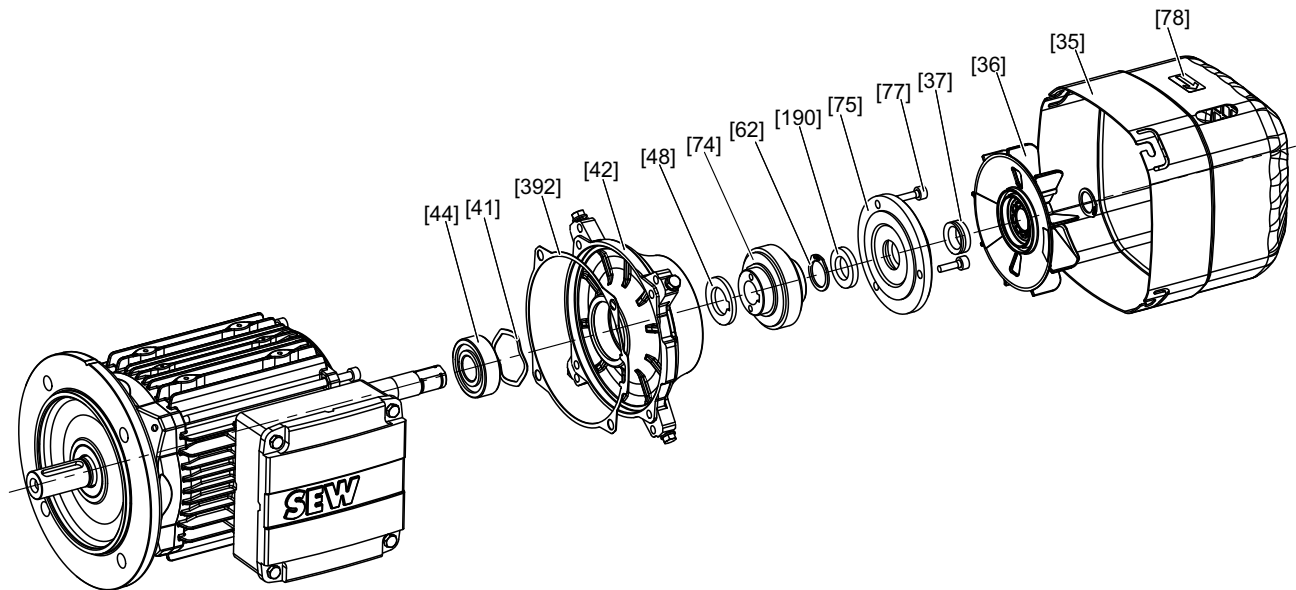
### INFORMATION

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



### 7.3 Changing the blocking direction of motors with backstop

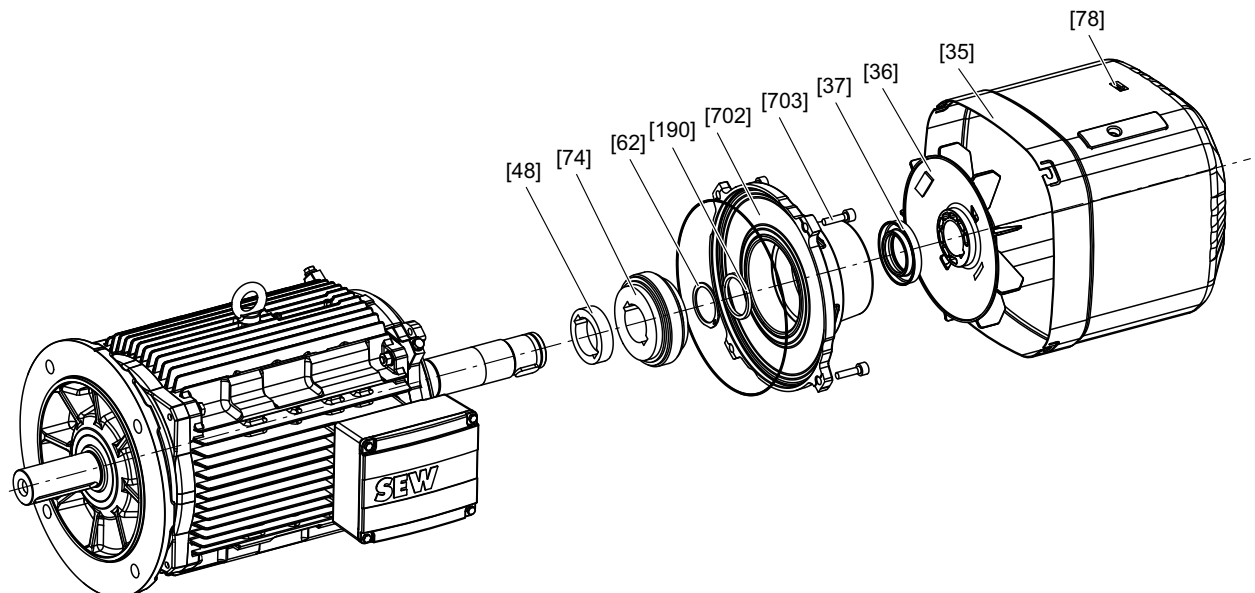
#### 7.3.1 Structure of an EDR.71 – EDR.80 with backstop



1142858251

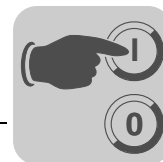
[35] Fan guard	[44] Grooved ball bearing	[77] Screw
[36] Fans	[48] Spacing ring	[78] Direction of rotation information tag
[37] Sealing ring	[62] Retaining ring	[190] Felt ring
[41] Shim	[74] Complete sprag ring	[392] Sealing
[42] Backstop endshield	[75] Sealing flange	

#### 7.3.2 Structure of EDR.90 – EDR.225 with backstop (example)



1142856331

[35] Fan guard	[62] Retaining ring	[190] Felt ring
[36] Fan	[74] Complete sprag ring	[702] Backstop housing, complete
[37] Sealing ring	[78] Direction of rotation information tag	[703] Machine screw
[48] Spacing ring		



### 7.3.3 Changing the blocking direction

A backstop is used to block/preclude a direction of rotation of the motor. The direction of rotation is indicated by an arrow on the fan guard of the motor or on the gearmotor housing.

Observe the direction of rotation of the end shaft and the number of stages when you mount the motor to the gear unit. **Do not start up the motor in blocking direction (ensure correct connection of power supply with motor).** For inspection purposes, you can operate the backstop once with half the motor voltage in the blocking direction.



#### INFORMATION

The blocking direction may only be changed for drives that are operated on the supply system.



#### ⚠ WARNING

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- De-energize the motor before you start working.
- Safeguard against accidental startup.
- Carefully observe the steps described below.

Proceed as follows to change the blocking direction:

1. Remove forced cooling fan and incremental encoder (if installed).  
See chapter "Inspection/Maintenance" > "Motor and brake maintenance – preliminary work".
2. Remove flange cover or fan guard [35]
3. EDR.71 – 80: Remove the sealing flange [75].  
EDR.90 – 225: Completely remove the backstop housing [702]
4. Loosen the circlip [62]
5. Remove the wedge element ring [74] via screws in the forcing threads or using a puller
6. Spacing ring [48], if provided, remains installed
7. Turn around wedge element ring [74], check the old grease and replace according to the specifications below and reinstall the wedge element ring.
8. Install circlip [62]  
**▲ NOTICE** Damage due to incorrect assembly  
Material damage
  - Do not exert pressure on or hit the wedge element train
9. EDR.71 – 80: Apply SEW L Spezial to the sealing flange [75] and install it. Replace felt ring [190] and sealing ring [37], if required.  
EDR.90 – 225: Replace seal [901], felt ring [190] and sealing ring [37], if required, and install the backstop housing [702].
10. Reinstall the removed parts.
11. Replace the label [78] indicating the direction of rotation



## Startup

### Changing the blocking direction of motors with backstop

#### *Lubricating the backstop*

The backstop is supplied with the corrosion protection low-viscosity grease Mobil LBZ. If you want to use a different grease, make sure it complies with NLGI class 00/000, with a base oil viscosity of 42 mm<sup>2</sup>/s at 40 °C on a lithium saponified and mineral oil base. The application temperature range is from -50 °C to +90 °C. See the following table for the amount of grease required.

Motor type	71	80	90/100	112/132	160	180	200/225
Grease quantity [g]	9	11	15	20	30	45	80

The tolerance regarding the grease level is ± 30%.



## 8 Inspection/Maintenance



### **⚠ WARNING**

Risk of crushing if the hoist falls or in the event of uncontrolled unit behavior.

Severe or fatal injuries.

- Secure or lower hoist drives (danger of falling)
- Safeguard and/or protect the driven machine against touching
- Isolate the motor, brake, and forced cooling fan, if installed, from the power supply before starting work, safeguarding them against unintentional re-start.
- Only use genuine spare parts in accordance with the valid spare parts list.
- Always install a new brake control system at the same time as replacing the brake coil.



### **⚠ CAUTION**

The surface temperatures on the drive can be very high during operation.

Danger of burns.

- Let the motor cool down before you start your work.



### **CAUTION**

For assembly, the ambient temperature and the oil seals themselves may not be colder than 0 °C, otherwise the oil seals might be damaged.

Only SEW service staff, repair workshops or plants that have the necessary expertise may repair or modify the motor.

Before re-startup of the motor, make sure that all regulations are complied with and document this with a label on the motor or a written test report.

Always perform safety and functional tests following all maintenance and repair work (thermal protection).



### **INFORMATION**

Apply a grease reservoir around the lip of the oil seals before assembly, see chapter "Order information for lubricants and anti-corrosion agents" (page 106).

**NOTES ON EXPLOSION PROTECTION**

- Use only original spare parts from the relevant and valid spare parts lists; otherwise, the approval for hazardous locations of the motor will become void.
  - The routine test must be repeated whenever motor parts relating to explosion protection are replaced.
  - Make sure that the motor is assembled correctly and all openings have been plugged after service and maintenance work.
  - Clean motors for hazardous locations regularly.
  - Explosion protection is largely dependent on the IP enclosure. Therefore, always check that the seals are fitted correctly and in perfect condition when performing any work on the machine.
  - Explosion protection can only be ensured if motors are serviced and maintained correctly.
-



## 8.1 Inspection and maintenance intervals

The following table lists the inspection and maintenance intervals:

Unit / unit part	Time interval	What to do?
<b>BE brake</b>	<ul style="list-style-type: none"> <li><b>If used as a holding brake:</b> Depending on the load conditions: 0.5 to 2 years <sup>1)</sup></li> </ul>	Brake inspection <ul style="list-style-type: none"> <li>Measuring the brake disk thickness</li> <li>Brake disk, lining</li> <li>Measuring and adjusting working air gap</li> <li>Pressure plate</li> <li>Carrier/gearing</li> <li>Pressure rings</li> <li>Sucking off any abrasion</li> <li>Inspect the switch contacts and replace them, if necessary (e.g. in case of burn-out)</li> </ul>
<b>Motor</b>	<ul style="list-style-type: none"> <li><b>Every 10,000 operating hours</b> <sup>2)</sup></li> </ul>	Motor inspection <ul style="list-style-type: none"> <li>Check rolling bearing and change if necessary</li> <li>Replace the oil seal</li> <li>Clean the cooling air passages</li> </ul>
<b>Drive</b>	<ul style="list-style-type: none"> <li>Varies <sup>2)</sup></li> </ul>	<ul style="list-style-type: none"> <li>Touch up or renew the surface/anticorrosion coating</li> <li>if applicable, clean condensation drain hole at the bottom of the fan guard</li> <li>Clean clogged bores</li> </ul>

1) Wear times are subject to many factors and can be quite short. The machine designer must calculate the required inspection/maintenance intervals individually in accordance with the project planning documents (e.g. "Project Planning for Drives").

2) The interval depends on outer influences and can be very short, e.g. in the event of high dust concentration in the environment.

If you open the motor compartment during inspection/maintenance, you have to clean it before you close it.

### 8.1.1 Connection cables

Check the connection cable for damage at regular intervals and replace if necessary.

## 8.2 Bearing lubrication

### 8.2.1 Bearing lubrication EDR.71- EDR.225

The motor bearings generally come with lubrication for life.

## 8.3 Corrosion protection

In all brakemotors for hazardous locations and in motors with the /KS corrosion protection option in IP56 or IP66, you have to replace the old sealing compound at the studs with new sealing compound, e.g. "SEW L Spezial", during maintenance.



#### 8.4 Motor and brake maintenance – preliminary work



#### ⚠ WARNING

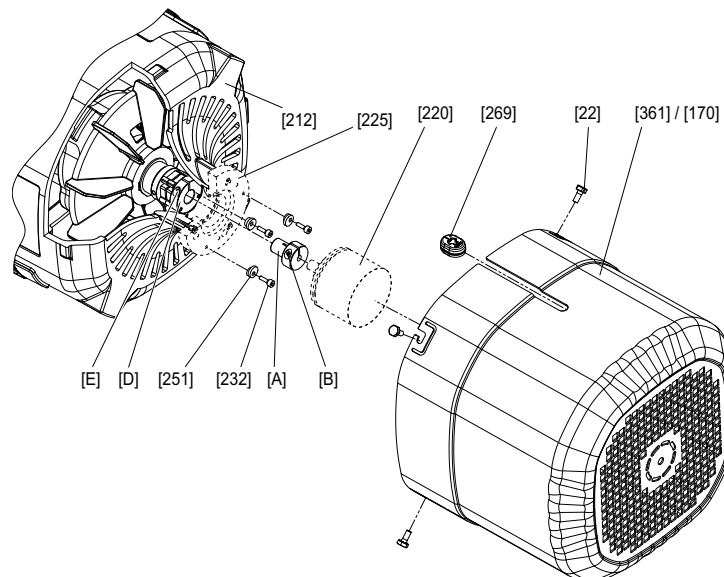
Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- Before starting work, isolate the motor, brake, and if installed, the forced cooling fan from the power supply.
- Safeguard against accidental startup.

##### 8.4.1 Removing/installing incremental encoders, absolute encoders and special encoders with XV.A mounting adapter from/on DR.71 – 225

The following figure illustrates the disassembly procedure using a non-SEW encoder as an example:



9007202887906699

[22]	Screw	[361]	Cover (normal/long)
[170]	forced cooling fan guard	[269]	Grommet
[212]	Fan guard with encoder mount	[A]	Adapter
[220]	Encoder	[B]	Clamping screw
[225]	Intermediate flange (not with XV1A)	[D]	Coupling (spread- or solid shaft coupling)
[232]	Screws (enclosed with XV1A and XV2A)	[E]	Clamping screw
[251]	Conical spring washers (enclosed with XV1A and XV2A)		

##### Removing the XV.. encoder

1. Remove the extended fan guard [361] by loosening the screws [22] or remove forced-cooling fan guard [170].
2. Loosen the retaining screws [232] and turn the conical spring washers [251] outwards.
3. Loosen the clamping screw [E] of the coupling.
4. Remove the adapter [A] and the encoder [220].

##### Re-assembly

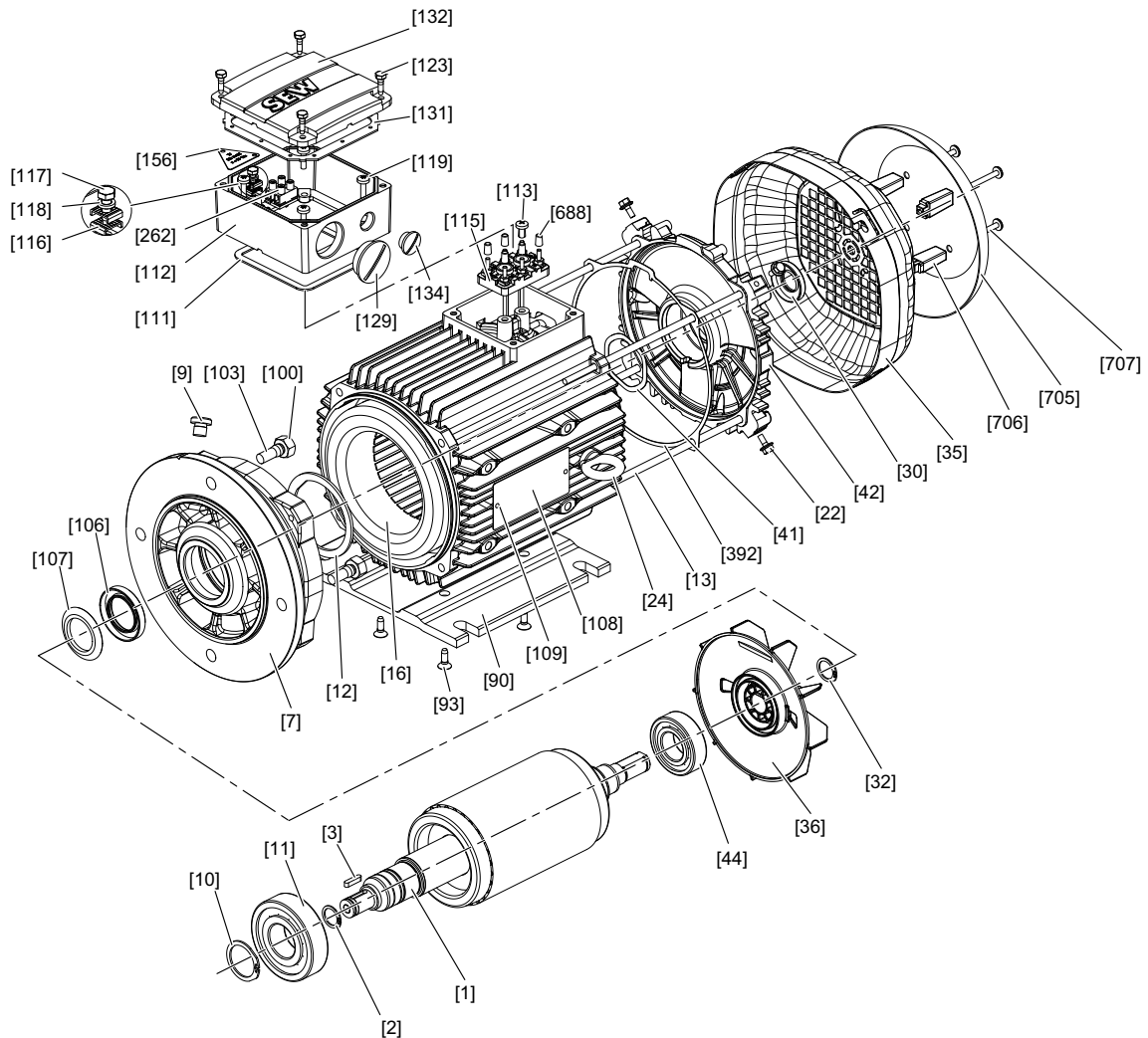
1. Proceed according to chapter "Installing XV.A encoder mounting adapter on EDR.71 – 225 motors (page 28)" to mount the encoder.





## 8.5 Inspection/maintenance for EDR.71 – EDR.225 motors

### 8.5.1 Basic structure of EDR.71 – EDR.132

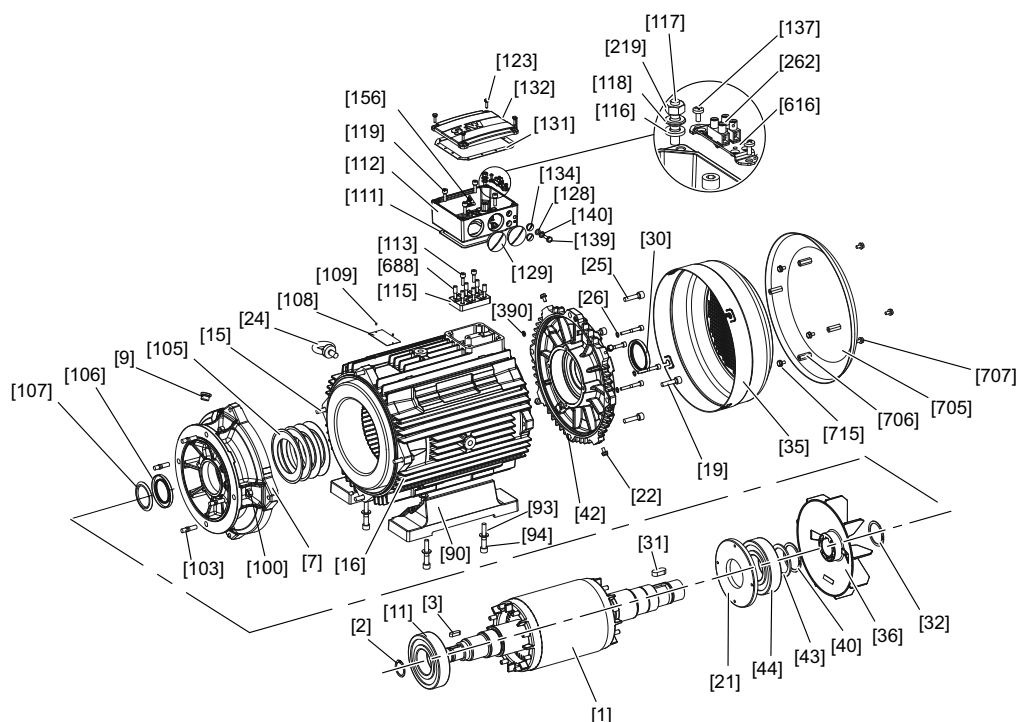


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[1] Rotor	[30] Oil seal	[107] Oil flinger	[129] Screw plug with O-ring
[2] Retaining ring	[32] Retaining ring	[108] Nameplate	[131] Gasket for cover
[3] Key	[35] Fan guard	[109] Grooved pin	[132] Terminal box cover
[7] Flanged endshield	[36] Fan	[111] Gasket for lower part	[134] Screw plug with O-ring
[9] Screw plug	[41] Shim	[112] Terminal box lower part	[156] Information label
[10] Retaining ring	[42] B-side endshield	[113] Pan head screw	[262] Terminal clip, complete
[11] Grooved ball bearing	[44] Grooved ball bearing	[115] Terminal board	[392] Seal
[12] Retaining ring	[90] Base plate	[116] Terminal clip	[688] Protection caps
[13] Cap screw	[93] Pan head screws	[117] Hexagon screw	[705] Canopy
[16] Stator	[100] Hex nut	[118] Lock washer	[706] Spacers
[22] Hexagon screw	[103] Stud	[119] Pan head screw	[707] Pan head screw
[24] Eyebolt	[106] Oil seal	[123] Hexagon screw	



### 8.5.2 Basic structure of EDR.160 – EDR.180

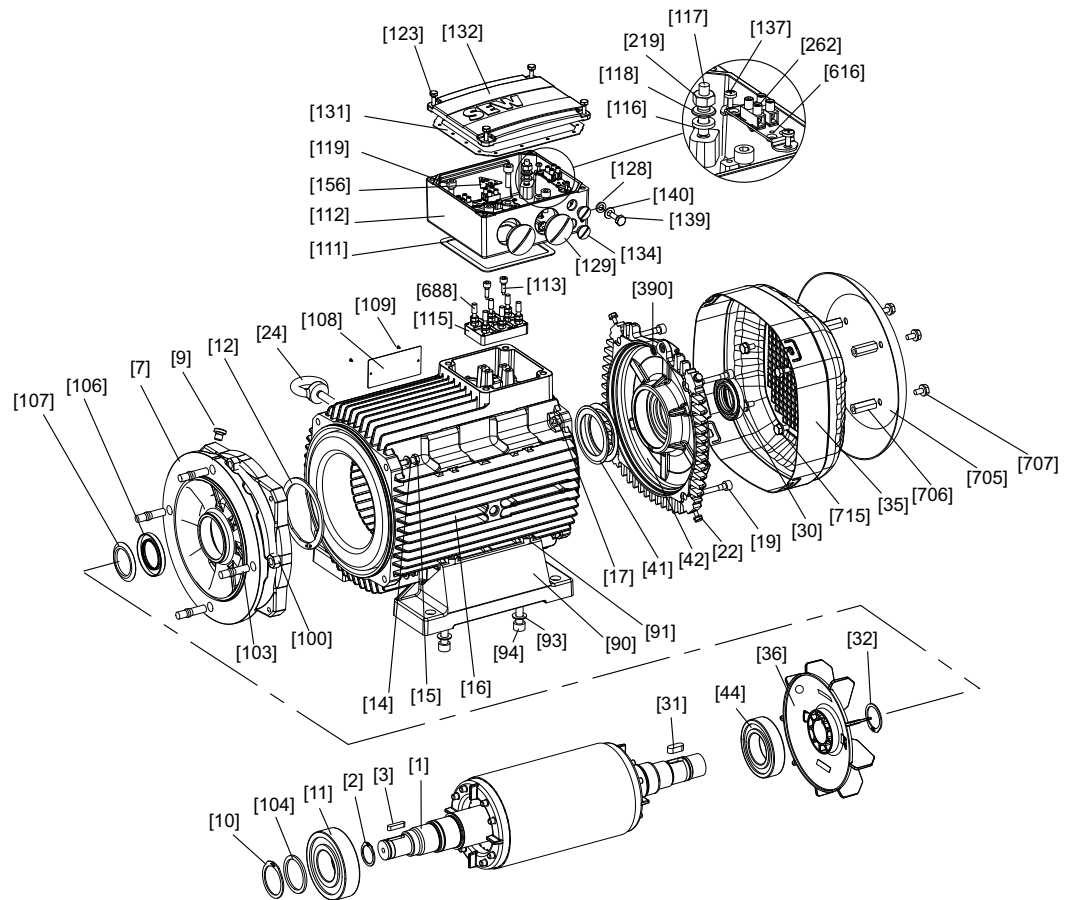


4285469195

[1] Rotor	[31] Key	[108] Nameplate	[132] Terminal box cover
[2] Retaining ring	[32] Retaining ring	[109] Grooved pin	[134] Screw plug with O-ring
[3] Key	[35] Fan guard	[111] Gasket for lower part	[137] Screw
[7] Flange	[36] Fan	[112] Terminal box lower part	[139] Hexagon screw
[9] Screw plug	[41] Spring washer	[113] Screw	[140] Washer
[10] Retaining ring	[42] B-side endshield	[115] Terminal board	[153] Terminal strip, complete
[11] Grooved ball bearing	[44] Grooved ball bearing	[116] Serrated lock washer	[156] Information label
[12] Retaining ring	[90] Foot	[117] Stud	[219] Hex nut
[14] Washer	[91] Hex nut	[118] Washer	[262] Terminal clip
[15] Hexagon screw	[93] Washer	[119] Cap screw	[390] O-ring
[16] Stator	[94] Cap screw	[121] Grooved pin	[616] Retaining plate
[17] Hex nut	[100] Hex nut	[123] Hexagon screw	[688] Protection caps
[19] Cap screw	[103] Stud	[128] Serrated lock washer	[705] Canopy
[22] Hexagon screw	[104] Supporting ring	[129] Screw plug with O-ring	[706] Spacers
[24] Eyebolt	[106] Oil seal	[131] Gasket for cover	[707] Hexagon screw
[30] Sealing ring	[107] Oil flinger		[715] Hexagon screw



### 8.5.3 Basic structure of EDR.200 – EDR.225



4285535115

[1] Rotor	[31] Key	[107] Oil flinger	[132] Terminal box cover
[2] Retaining ring	[32] Retaining ring	[108] Nameplate	[134] Screw plug
[3] Key	[35] Fan guard	[109] Grooved pin	[137] Screw
[7] Flange	[36] Fan	[111] Gasket for lower part	[139] Hexagon screw
[9] Screw plug	[40] Retaining ring	[112] Terminal box lower part	[140] Washer
[11] Grooved ball bearing	[42] B-side endshield	[113] Cap screw	[156] Information label
[15] Hexagon screw	[43] Supporting ring	[115] Terminal board	[219] Hex nut
[16] Stator	[44] Grooved ball bearing	[116] Serrated lock washer	[262] Terminal clip
[19] Cap screw	[90] Foot	[117] Stud	[390] O-ring
[21] Oil seal flange	[93] Washer	[118] Washer	[616] Retaining plate
[22] Hexagon screw	[94] Cap screw	[119] Cap screw	[688] Protection caps
[24] Eyebolt	[100] Hex nut	[123] Hexagon screw	[705] Canopy
[25] Cap screw	[103] Stud	[128] Serrated lock washer	[706] Spacer bolt
[26] Sealing washer	[105] Spring washer	[129] Screw plug	[707] Hexagon screw
[30] Oil seal	[106] Oil seal	[131] Gasket for cover	[715] Hexagon screw



#### 8.5.4 Inspection procedure for EDR.71 – EDR.225 motors



#### **⚠ WARNING**

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- Isolate the motor and forced cooling fan, if installed, from the power supply before starting work, safeguarding them against unintentional re-start.
- Carefully observe the steps described below.

1. Remove forced cooling fan and incremental encoder (if installed).  
See chapter "Inspection/Maintenance" > "Motor maintenance – preliminary work".
2. Remove fan guard [35] and fan [36].
3. Remove stator:
  - **Sizes EDR.71 – EDR.132:** Remove cap screws [13] from flanged endshield [7] and B-side endshield [42]. Remove stator [16] from flanged endshield [7].
  - **Sizes EDR.160 – EDR.180:** Loosen cap screws [19] and remove B-side endshield [42]. Loosen hexagon screw [15] and remove stator from flanged endshield.
  - **Sizes EDR.200 – EDR.225:**
    - Loosen hexagon screw [15] and remove the flanged endshield [7] from the stator.
    - With gearmotors: Remove oil flinger [107]
    - Loosen cap screws [19] and remove the complete rotor [1] together with the B-side endshield [42].
    - Loosen cap screws [25] and remove the complete rotor [1] from the B-side endshield [42].
4. Visual inspection: Is there any moisture or gear unit oil inside the stator?
  - If not, proceed with step 7
  - If there is moisture, proceed with step 5
  - If there is gear oil, have the motor repaired by a specialist workshop
5. If there is moisture inside the stator:
  - With gearmotors: Remove the motor from the gear unit
  - With motors without a gear unit: Remove the A-flange
  - Remove the rotor [1]
6. Clean the winding, dry it and check it electrically, see chapter "Mechanical Installation" > "Long-term storage of motors" > "Drying the motor".

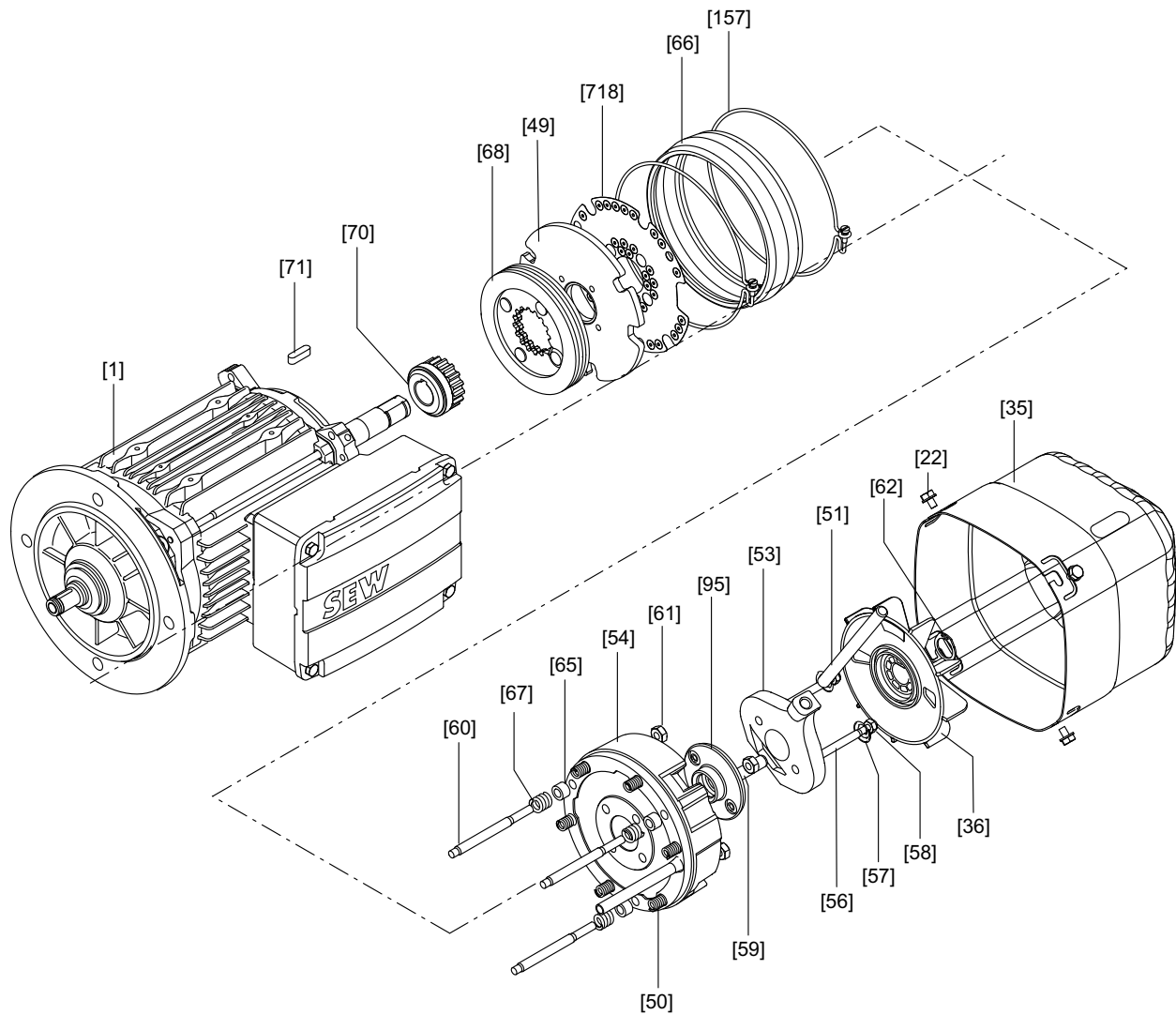


7. Replace the grooved ball bearings [11] [44] with permitted ball bearings.  
See chapter "Technical Data" > "Permitted rolling bearing types".
8. Reseal the shaft:
  - A-side: Replace the oil seal [106]
  - B-side: Replace the oil seal [95]  
Apply grease to the sealing lip (see chapter "Technical Data" > "Order information for lubricants and anti-corrosion agents").
9. Reseal the stator seat:
  - Seal the sealing surface with duroplastic sealing compound  
(operating temperature -40 °C to +180 °C) e.g. "SEW L Spezial".
  - Sizes EDR.71 – EDR.132: Replace sealing [392].
10. Install the motor and accessory equipment.



### 8.6 Inspection/maintenance for EDR.71 – EDR.225 brakemotors

#### 8.6.1 Basic structure of EDR.71 – EDR.80 brakemotors

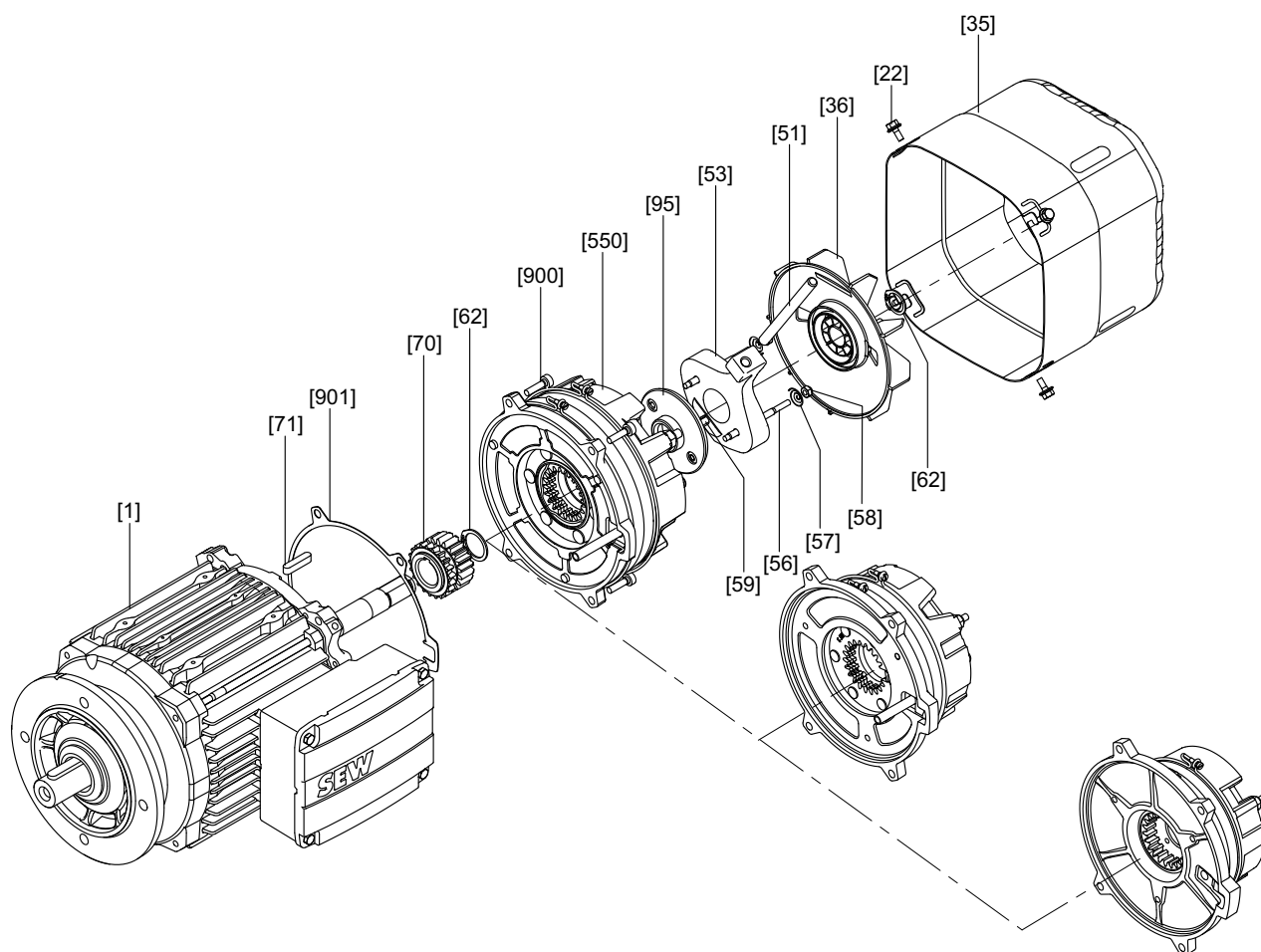


9007199428941963

- |                                |                     |                            |
|--------------------------------|---------------------|----------------------------|
| [1] Motor with brake endshield | [56] Stud           | [66] Rubber sealing collar |
| [22] Hex head screw            | [57] Conical spring | [67] Counter spring        |
| [35] Fan guard                 | [58] Setting nut    | [68] Brake disk            |
| [36] Fan                       | [59] Parallel pin   | [70] Driver                |
| [49] Pressure plate            | [60] Stud 3x        | [71] Key                   |
| [50] Brake spring              | [61] Hex nut        | [95] Sealing ring          |
| [51] Hand lever                | [62] Retaining ring | [157] Clamping straps 2x   |
| [53] Release lever             | [65] Pressure ring  | [718] Damping plate        |
| [54] Magnet, complete          |                     |                            |



## 8.6.2 Basic structure of EDR.90 – EDR.132 brakemotors



9007199434722955

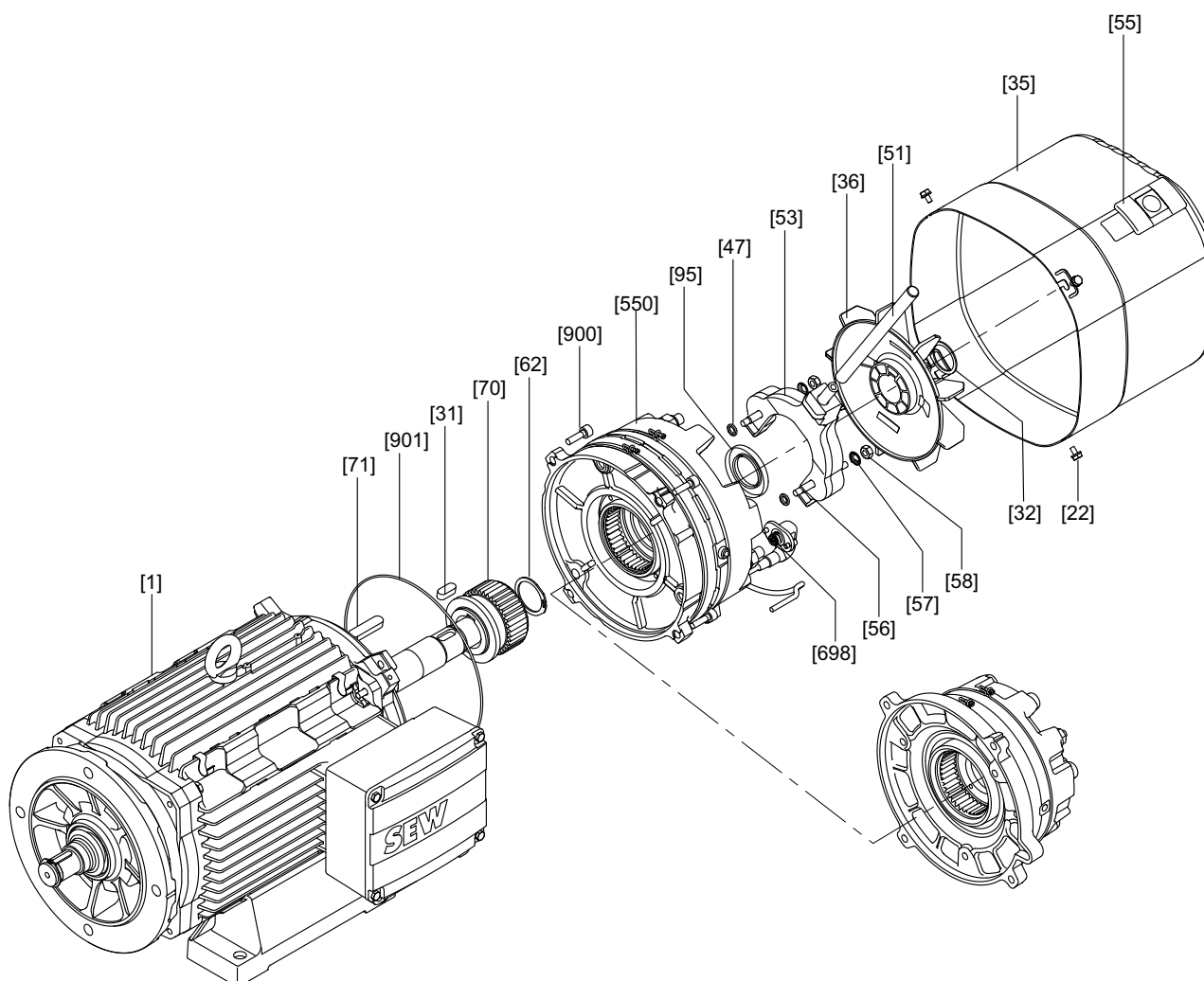
- [1] Motor with brake endshield
- [22] Hex head screw
- [32] Retaining ring
- [35] Fan guard
- [36] Fan
- [51] Hand lever

- [53] Release lever
- [56] Stud
- [57] Conical coil spring
- [58] Setting nut
- [59] Parallel pin
- [62] Retaining ring

- [70] Carrier
- [71] Key
- [95] Sealing ring
- [550] Pre-assembled brake
- [900] Screw
- [901] Sealing



### 8.6.3 Basic structure of EDR.160 – EDR.225 brakemotors



9007199781964683

[1] Motor with brake endshield  
[22] Hex head screw  
[31] Key  
[32] Retaining ring  
[35] Fan guard  
[36] Fan  
[47] O-ring  
[51] Hand lever

[53] Release lever  
[55] Closing piece  
[56] Stud  
[57] Conical coil spring  
[58] Setting nut  
[62] Retaining ring  
[70] Carrier  
[71] Key

[95] Sealing ring  
[550] Pre-assembled brake  
[698] Plug connector complete (only for BE20 – BE32)  
[900] Screw  
[901] O-ring





#### 8.6.4 Inspection procedure for EDR.71 – EDR.225 brakemotors



##### **⚠ WARNING**

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- Isolate the motor, brake, and forced cooling fan, if installed, from the power supply before starting work, safeguarding them against unintentional re-start.
- Carefully observe the steps described below.

1. Remove forced cooling fan and incremental encoder (if installed).  
See chapter "Motor and brake maintenance – preliminary work" (page 60).
2. Remove fan guard [35] and fan [36].
3. Remove stator:
  - **Sizes EDR.71 – EDR.132:** Remove cap screws [13] from flanged endshield [7] and brake endshield [42]. Remove stator [16] from flanged endshield [7].
  - **Sizes EDR.160 – EDR.180:** Loosen cap screws [19] and remove brake endshield [42]. Loosen hexagon screw [15] and remove stator from flanged endshield.
  - **Sizes EDR.200 – EDR.225:**
    - Loosen hexagon screw [15] and remove the flanged endshield [7] from the stator.
    - With gearmotors: Remove oil flinger [107]
    - Loosen cap screws [19] and remove the complete rotor [1] together with the brake endshield [42].
    - Loosen cap screws [25] and remove the complete rotor [1] from the brake endshield [42].
4. Remove the brake cable:
  - **BE05 – BE11:** Remove the terminal box cover and unfasten the brake cable from the rectifier.
  - **BE20 – BE32:** Loosen safety screws of the brake plug connector [698] and remove plug connector.
5. Push the brake off the stator and carefully lift it off.
6. Pull the stator back by about 3 to 4 cm.
7. Visual inspection: Is there any moisture or gear unit oil inside the stator?
  - If not, proceed with step 10
  - If there is moisture, proceed with step 8
  - If there is gear oil, have the motor repaired by a specialist workshop
8. If there is moisture inside the stator:
  - With gearmotors: Remove the motor from the gear unit
  - With motors without a gear unit: Remove the A-flange
  - Remove the rotor [1]
9. Clean the winding, dry it and check it electrically, see chapter "Mechanical Installation" > "Long-term storage of motors" > "Drying the motor".



## Inspection/Maintenance

### Inspection/maintenance for EDR.71 – EDR.225 brakemotors

---

10. Replace the grooved ball bearings [11] [44] with permitted ball bearings.

See section "Permitted rolling bearing types" (page 105).

11. Reseal the shaft:

- A-side: Replace the oil seal [106]

- B-side: Replace the oil seal [95]

Apply grease to the sealing lip (see chapter "Order information for lubricants and anti-corrosion agents" (page 106)).

12. Reseal the stator seat:

- Seal the sealing surface with duroplastic sealing compound

(operating temperature  $-40\text{ }^{\circ}\text{C}$  to  $+180\text{ }^{\circ}\text{C}$ ), e.g. "SEW L Spezial".

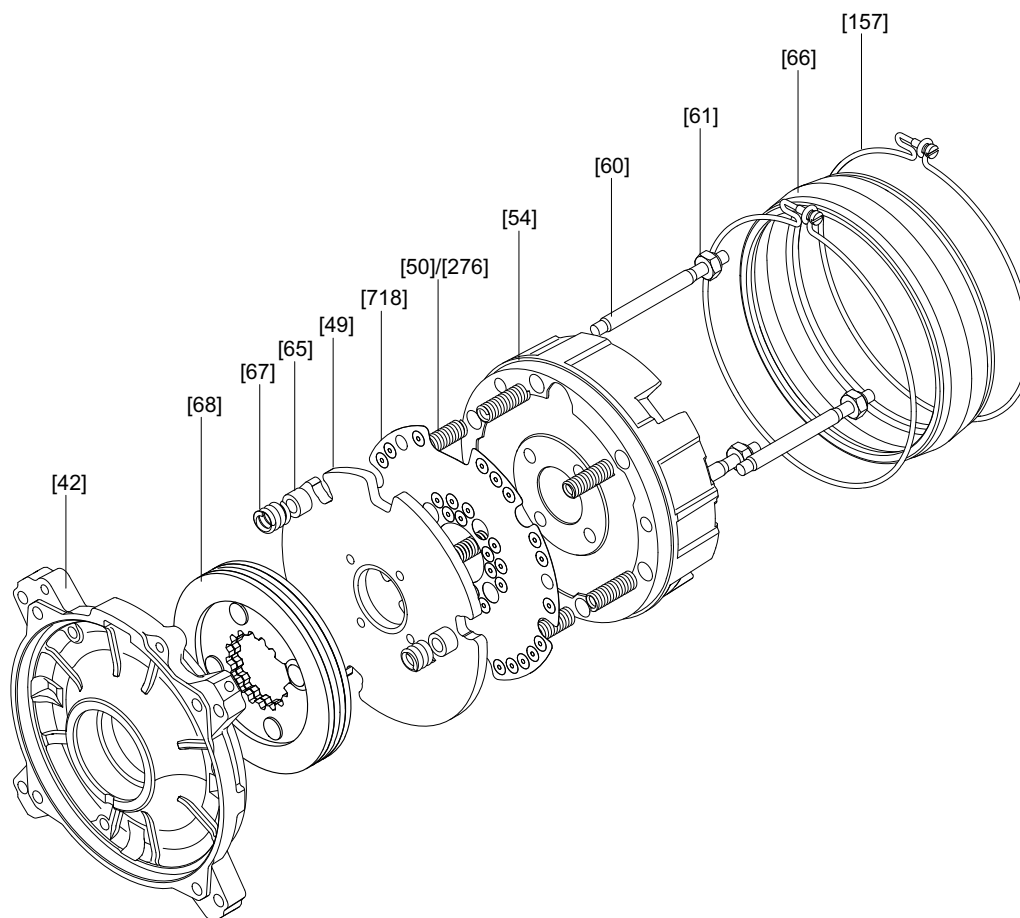
- Sizes EDR.71 – EDR.132: Replace sealing [392].

13. **Motor sizes EDR.160 – EDR.225:** Replace the O-ring [901] between the brake end-shield [42] and the pre-assembled brake [550]. Install the pre-assembled brake [550]

14. Install the motor, the brake and accessory equipment.

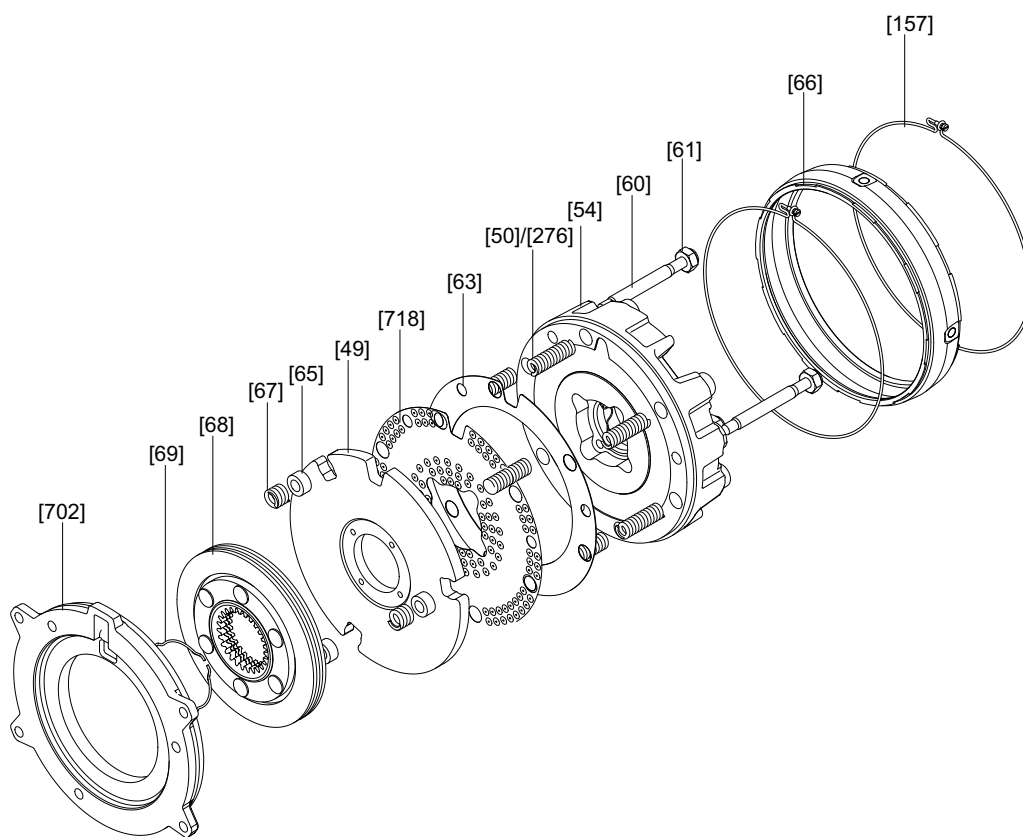


### 8.6.5 Basic structure of BE05 – BE2 brakes (EDR.71 – EDR.80)



3850425483

[42] Brake endshield	[61] Hex nut	[68] Brake disk
[49] Pressure plate	[65] Pressure ring	[157] Clamping straps 2x
[50] Brake spring (normal)	[66] Rubber sealing collar	[276] Brake spring (blue)
[54] Magnets, complete	[67] Counter spring	[718] Damping plate
[60] Stud 3x		

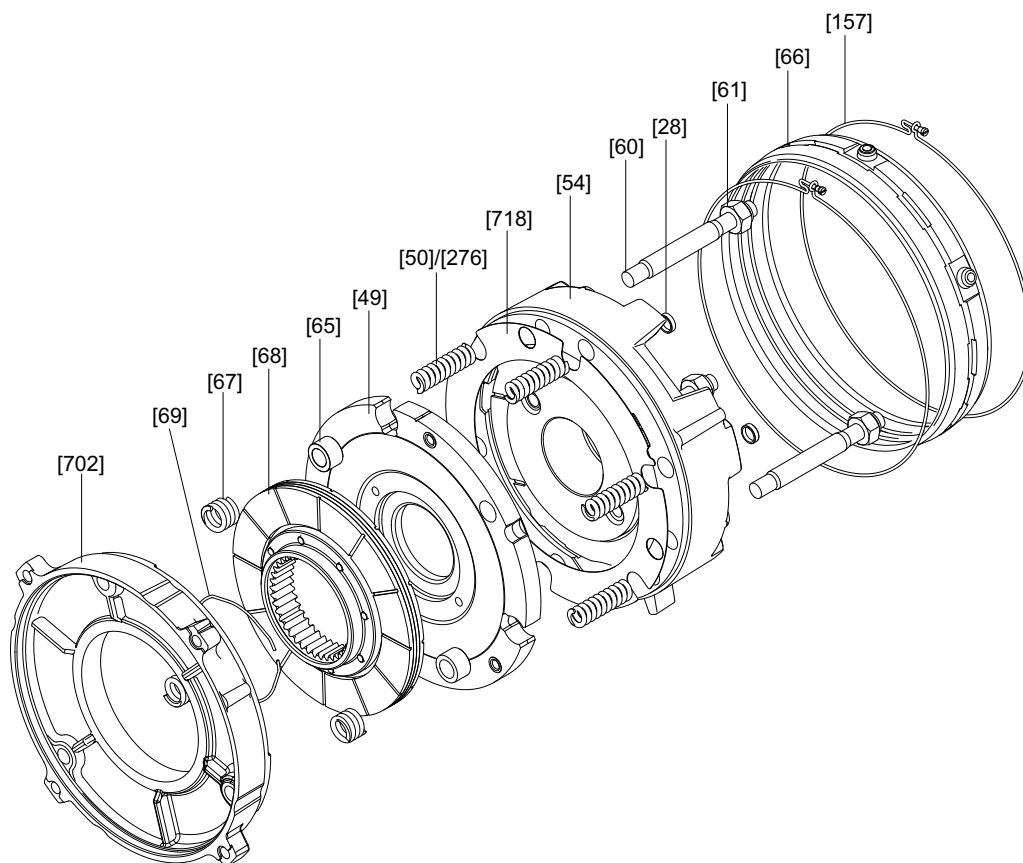

**8.6.6 Basic structure of BE1 – BE11 brakes (EDR.90 – EDR.160)**


3850423563

[49]	Pressure plate	[63]	Pole sheet	[69]	Circular spring
[50]	Brake spring (normal)	[65]	Pressure ring	[157]	Clamping straps 2x
[54]	Magnets, complete	[66]	Rubber sealing collar	[276]	Brake spring (blue)
[60]	Stud 3x	[67]	Counter spring	[702]	Friction disk
[61]	Hex nut	[68]	Brake disk	[718]	Damping plate



### 8.6.7 Basic structure of BE20 brakes (EDR.160 – EDR.180)

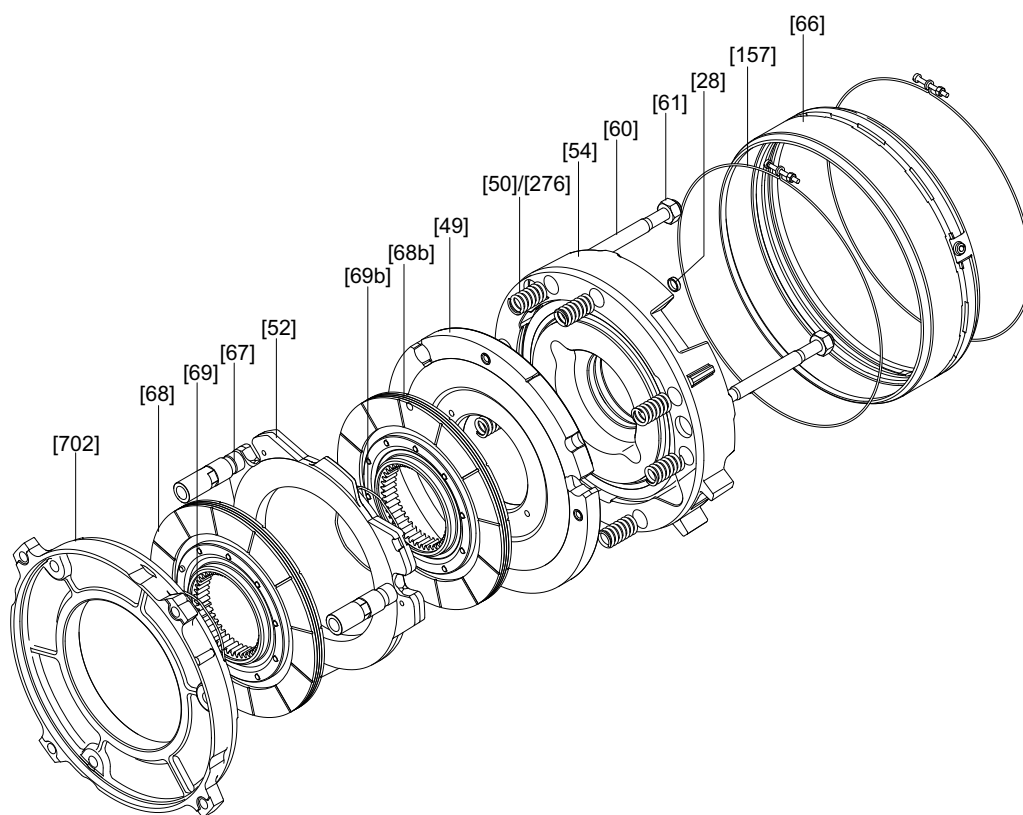


3850427403

[28]	Closing cap	[61]	Hex nut	[69]	Circular spring
[49]	Pressure plate, complete	[65]	Pressure ring	[157]	Clamping straps 2x
[50]	Brake spring (normal)	[66]	Rubber sealing collar	[276]	Brake spring (blue)
[54]	Magnets, complete	[67]	Counter spring	[702]	Friction disk
[60]	Stud 3x	[68]	Brake disk	[718]	Damping plate



### 8.6.8 Basic structure of BE30 – BE32 brakes (EDR.180 – EDR.225)



3850429323

[28]	Closing cap	[60]	Stud 3x	[69]	Circular spring
[49]	Pressure plate, complete	[61]	Hex nut	[157]	Clamping straps 2x
[50]	Brake spring (normal)	[66]	Rubber sealing collar	[276]	Brake spring (blue)
[52]	Brake stationary disk	[67]	Adjusting sleeve	[702]	Friction disk
[54]	Magnets, complete	[68]	Brake disk		



### 8.6.9 Setting the working air gap of BE05 – BE32 brakes



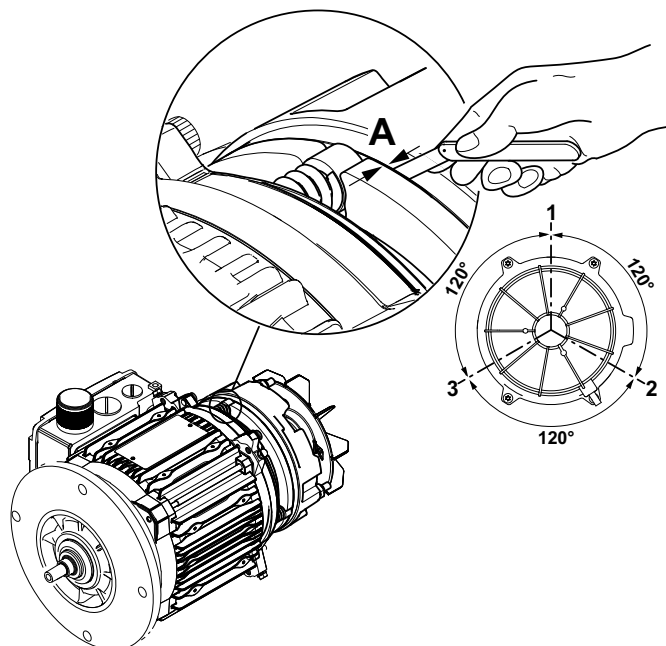
#### ⚠ WARNING

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- Isolate the motor, brake, and forced cooling fan, if installed, from the power supply before starting work, safeguarding them against unintentional re-start.
- Carefully observe the steps described below.

1. Remove the following:
  - Forced cooling fan and incremental encoder (if installed)  
See chapter "Motor and brake maintenance – preliminary work" (page 60).
  - Flange cover or fan guard [35]
2. Push the rubber sealing collar [66] aside,
  - Loosen the clamping straps [157]
  - Sucking off any abrasion
3. Measure the brake disk [68]:
  - Minimum brake disk thickness see chapter "Technical Data" (page 86).
  - Replace brake disk if necessary, see chapter "Replacing the brake disk of BE05 – BE32 brakes".
4. **BE30 – BE32:** Unfasten the setting sleeves [67] by turning them towards the brake endshield.
5. Measure the working air gap A (see the following figure)  
(use a feeler gauge and measure at three points offset by 120°):
  - **For BE05 – 11:** between pressure plate [49] and damping plate [718]
  - **For BE20 – 32:** between pressure plate [49] and coil body [54]



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## Inspection/Maintenance

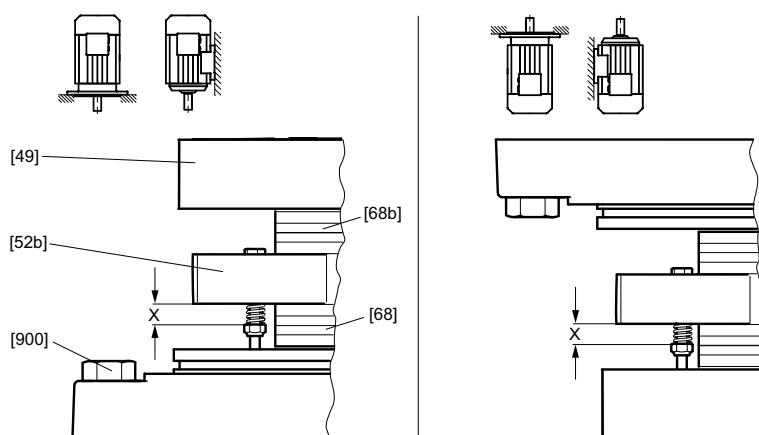
### Inspection/maintenance for EDR.71 – EDR.225 brakemotors

6. **BE05 – BE20:** Tighten the hex nuts [61] until the working air gap is set correctly, see chapter "Technical Data" (page 86).

**BE30 – BE32:** Tighten the hex nuts [61] until the working air gap is 0.25 mm.

7. If you are mounting the BE32 in a vertical position, set the 3 springs on the brake stationary disk to the following measurement:

Mounting position	X in [mm]
Brake at the top	7.3
Brake at the bottom	6.5



- [49] Pressure plate
- [52b] Brake lining (BE32 only)
- [68] Brake disk
- [68b] Brake disk (BE32 only)
- [900] Hex nut

8. **BE30 – BE32:** Tighten the setting sleeves [67]
- towards the magnet
  - until the working air gap is set correctly, see chapter "Technical Data" (page 86).
9. Seal hex nuts [61] with duroplastic sealing compound, e.g. "SEW L Spezial".
10. Mount sealing strip [66], clamping straps [157]. Re-install the removed parts.





### 8.6.10 Replacing the brake disk of BE05 – BE32 brakes

In addition to the brake elements listed in column "BE brake", see chapter "Inspection and maintenance intervals", check the hex nut nuts [61] for wear when you replace the brake disk. You must always replace the hex nuts [61] when you replace the brake disk.



#### **⚠ WARNING**

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- Isolate the motor, brake, and forced cooling fan, if installed, from the power supply before starting work, safeguarding them against unintentional re-start.
- Carefully observe the steps described below.



#### **INFORMATION**

- The brake of EDR.71 – EDR.80 motor sizes cannot be removed from the motor because the BE brake is directly installed on the brake endshield of the motor.
- The brake of EDR.90 – EDR.225 motor sizes can be removed from the motor for replacing the brake disk because the BE brake is pre-installed on the brake endshield of the motor via a friction disk .

1. Remove the following:
  - Forced cooling fan and incremental encoder (if installed)  
See chapter "Motor and brake maintenance – preliminary work" (page 60).
  - Flange cover or fan guard [35], circlip [32/62] and fan [36]
2. Remove the brake cable
  - **BE05 – BE11:** Remove the terminal box cover and unfasten the brake cable from the rectifier.
  - **BE11 – BE32:** Loosen safety screws of the brake plug connector [698] and remove plug connector.
3. Remove the sealing strip [66] and clamping strap [157]
4. Loosen hex nuts [61], carefully pull off the magnet [54] (brake cable!) and take out the brake springs [50].
5. **BE05 – BE11:** Remove the damping plate [718], pressure plate [49] and brake disk [68]  
**BE20 – BE30:** Remove pressure plate [49] and brake disk [68]  
**BE32:** Remove pressure plate [49], brake disks [68] and [68b]
6. Clean the brake parts, check for damage, and replace if necessary.
7. Install a new brake disk(s).
8. Re-install the brake components,
  - Leave out the fan and the fan guard, because the working air gap has to be set first, see chapter "Setting the working air gap of the BE05 – BE32 brakes".



## Inspection/Maintenance

### Inspection/maintenance for EDR.71 – EDR.225 brakemotors

#### 9. Reseal the shaft:

- Replace the sealing ring [95]

Apply grease to the sealing lip (see chapter "Order information for lubricants and anti-corrosion agents" (page 106)).

#### 10. In case of manual brake release: Use setting nuts to set the floating clearance "s" between the conical coil springs (pressed flat) and the setting nuts (see following figure).

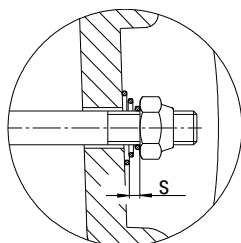


#### **⚠ WARNING**

No braking due to incorrectly set floating clearance "s".

Severe or fatal injuries.

- Set the floating clearance "s" correctly according to the following figure and table so that the pressure plate can move up as the brake lining wears.



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Brake	Floating clearance s [mm]
BE05; BE1; BE2	1.5
BE5; BE11, BE20; BE30; BE32	2

#### 11. Seal hex nuts [61] with duroplastic sealing compound, e.g. "SEW L Spezial".

#### 12. Mount sealing strip [66] and clamping straps [157]. Re-install the removed parts.



#### **INFORMATION**

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



#### **INFORMATION**

Important: After replacing the brake disk, the maximum braking torque is reached only after several cycles.



### 8.6.11 Changing the braking torque of brakes BE05 – BE62

The braking torque can be altered in stages.

- By changing the type and number of brake springs
- by changing the complete magnet (only possible for BE05 and BE1)
- by changing the brake (from motor size DR.90).
- by changing to a two-disk brake (BE30 only)

For the possible braking torque steps, please refer to chapter "Technical Data" (page 86).

### 8.6.12 Changing the brake spring of BE05 – BE32 brakes



#### **⚠ WARNING**

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- Isolate the motor, brake, and forced cooling fan, if installed, from the power supply before starting work, safeguarding them against unintentional re-start.
- Carefully observe the steps described below.

1. Remove the following:
  - Forced cooling fan and incremental encoder (if installed)  
See chapter "Motor and brake maintenance – preliminary work" (page 60).
  - Flange cover or fan guard [35], circlip [32/62] and fan [36]
2. Remove the brake cable
  - **BE05 – BE11:** Remove the terminal box cover and unfasten the brake cable from the rectifier.
  - **BE20 – BE32:** Loosen safety screws of the brake plug connector [698] and remove plug connector.
3. Remove the sealing strip [66] and clamping straps [157]; remove manual brake release if necessary:
  - setting nuts [58], conical coil springs [57], studs [56], releasing lever [53], spiral dowel pin [59]
4. Unfasten hex nuts [61] and pull off the magnet [54]
  - By approx. 50 mm (watch the brake cable)
5. Change or add brake springs [50/276]
  - Position the brake springs symmetrically, see chapter "Technical Data" > "Work done, working air gap, braking torques".
6. Re-install the brake components
  - Leave out the fan and the fan guard, because the working air gap has to be set first, see chapter "Setting the working air gap of the BE05 – BE32 brakes" (page 96).



## Inspection/Maintenance

### Inspection/maintenance for EDR.71 – EDR.225 brakemotors

7. In case of manual brake release: Use setting nuts to set the floating clearance "s" between the conical coil springs (pressed flat) and the setting nuts (see following figure).

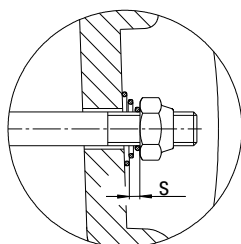


#### ⚠ WARNING

No braking due to incorrectly set floating clearance "s".

Severe or fatal injuries.

- Set the floating clearance "s" correctly according to the following figure and table so that the pressure plate can move up as the brake lining wears.



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Brake	Floating clearance s [mm]
BE05; BE1; BE2	1.5
BE5; BE11, BE20; BE30; BE32	2

8. Seal hex nuts [61] with duroplastic sealing compound, e.g. "SEW L Spezial".
9. Mount sealing strip [66] and clamping straps [157]. Re-install the removed parts.



#### INFORMATION

Replace setting nuts [58] and hex nuts [61] if the removal procedure is repeated.



### 8.6.13 Changing the magnet of BE05 – BE32 brakes



#### **⚠ WARNING**

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- Isolate the motor, brake, and forced cooling fan, if installed, from the power supply before starting work, safeguarding them against unintentional re-start.
- Carefully observe the steps described below.

1. Remove the following:
  - Forced cooling fan and incremental encoder (if installed)  
See chapter "Motor and brake maintenance – preliminary work" (page 60).
  - Flange cover or fan guard [35], circlip [32/62] and fan [36]
2. Remove the brake cable
  - **BE05 – BE11:** Remove the terminal box cover and unfasten the brake cable from the rectifier.
  - **BE20 – BE32:** Loosen safety screws of the brake plug connector [698] and remove plug connector.
3. Remove the sealing strip [66] and clamping straps [157]; remove manual brake release if necessary:
  - setting nuts [58], conical coil springs [57], studs [56], releasing lever [53], spiral dowel pin [59]
4. Unfasten hex nuts [61], remove complete magnet [54], remove brake springs [50/276].
5. Install new magnet with brake springs. For the possible braking torque steps, please refer to section "Technical Data" (page 86).
6. Clean the brake parts, check for damage, and replace if necessary.
7. Re-install the brake components
  - Leave out the fan and the fan guard, because the working air gap has to be set first, see chapter "Setting the working air gap of the BE05 – BE20 brakes".
8. Reseal the shaft:
  - Replace the sealing ring [95]  
Apply grease to the sealing lip (see chapter "Technical Data" > "Order information for lubricants and anti-corrosion agents").



## Inspection/Maintenance

Inspection/maintenance for EDR.71 – EDR.225 brakemotors

9. In case of manual brake release: Use setting nuts to set the floating clearance "s" between the conical coil springs (pressed flat) and the setting nuts (see following figure).

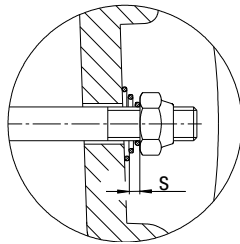


### ⚠ WARNING

No braking due to incorrectly set floating clearance "s".

Severe or fatal injuries.

- Set the floating clearance "s" correctly according to the following figure and table so that the pressure plate can move up as the brake lining wears.



177241867

Brake	Floating clearance s [mm]
BE05; BE1; BE2	1.5
BE5; BE11, BE20; BE30; BE32	2

10. Seal hex nuts [61] with duroplastic sealing compound, e.g. "SEW L Spezial".
11. Mount sealing strip [66] and clamping straps [157]. Re-install the removed parts.
12. Replace brake controller in the event of a brake failure due to an interturn short circuit or a short circuit to frame.



### INFORMATION

Replace setting nuts [58] and hex nuts [61] if the removal procedure is repeated.



#### 8.6.14 Replacing the brake of EDR.71 – EDR.80



##### **⚠ WARNING**

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- Isolate the motor, brake, and forced cooling fan, if installed, from the power supply before starting work, safeguarding them against unintentional re-start.
- Carefully observe the steps described below.

1. Remove the following:
  - Forced cooling fan and incremental encoder (if installed)  
See chapter "Motor and brake maintenance – preliminary work" (page 60).
  - Flange cover or fan guard [35], circlip [32/62] and fan [36]
2. Remove the terminal box cover and loosen the brake cable from the rectifier. If necessary, attach trailing wire to brake cables.
3. Loosen cap screws [13] and remove brake endshield with brake from stator.
4. Loosen the clamping straps [157] and store them.
5. Insert the brake cable of the new brake into the terminal box.
6. Install the new brake, observing the alignment of the cams of the brake endshield.
7. Mount the stored clamping straps [157] to the new brake.
8. Reseal the shaft:
  - Replace the sealing ring [95]  
Apply grease to the sealing lip (see chapter "Technical Data" > "Order information for lubricants and anti-corrosion agents").
9. In case of manual brake release: Use setting nuts to set the floating clearance "s" between the conical coil springs (pressed flat) and the setting nuts (see following figure).

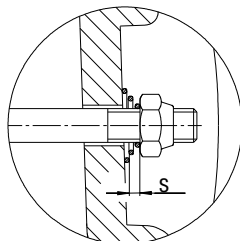


##### **⚠ WARNING**

No braking due to incorrectly set floating clearance "s".

Severe or fatal injuries.

- Set the floating clearance "s" correctly according to the following figure and table so that the pressure plate can move up as the brake lining wears.



177241867

Brake	Floating clearance s [mm]
BE05; BE1; BE2	1.5

10. Seal hex nuts [61] with duroplastic sealing compound, e.g. "SEW L Spezial".



#### 8.6.15 Replacing the brake of EDR.90 – EDR.225



#### ⚠ WARNING

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- Isolate the motor, brake, and forced cooling fan, if installed, from the power supply before starting work, safeguarding them against unintentional re-start.
- Carefully observe the steps described below.

##### 1. Remove the following:

- Forced cooling fan and incremental encoder (if installed)  
See chapter "Motor and brake maintenance – preliminary work" (page 60).
- Flange cover or fan guard [35], circlip [32/62] and fan [36]

##### 2. Remove the brake cable

- **BE05 – BE11:** Remove the terminal box cover and unfasten the brake cable from the rectifier.
- **BE20 – BE32:** Loosen safety screws of the brake plug connector [698] and remove plug connector.

##### 3. Unfasten screws [900] and remove brake from brake endshield.

##### 4. Loosen the clamping straps [157] and store them.

##### 5. **EDR.90 – EDR.132:** Pay attention to the alignment of the seal [901].

##### 6. Connect the brake cables of the new brake.

##### 7. Install the new brake, observing the alignment of the cams of the friction disk.

##### 8. Mount the stored clamping straps [157] to the new brake.

##### 9. Reseal the shaft:

- Replace the sealing ring [95]

Apply grease to the sealing lip (see chapter "Technical Data" > "Order information for lubricants and anti-corrosion agents").

##### 10. In case of manual brake release: Use setting nuts to set the floating clearance "s" between the conical coil springs (pressed flat) and the setting nuts (see following figure).

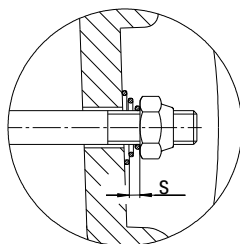


#### ⚠ WARNING

No braking due to incorrectly set floating clearance "s".

Severe or fatal injuries.

- Set the floating clearance "s" correctly according to the following figure and table so that the pressure plate can move up as the brake lining wears.



177241867





Brake	Floating clearance s [mm]
BE05; BE1; BE2	1.5
BE5; BE11, BE20, BE30, BE32	2

11. Seal hex nuts [61] with duroplastic sealing compound, e.g. "SEW L Spezial".



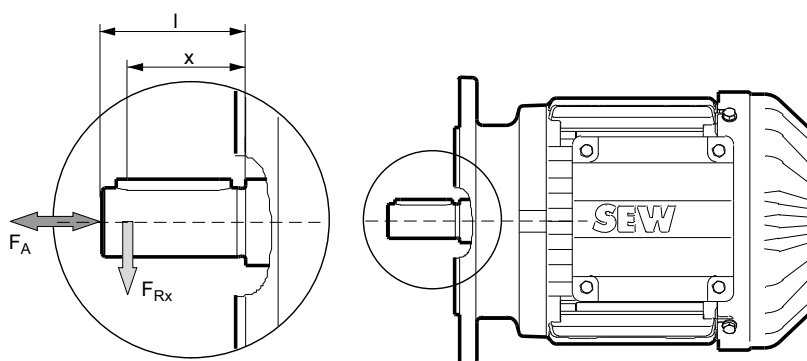
## 9 Technical Data

### 9.1 Overhung loads

#### 9.1.1 Permitted overhung load

Refer to the following diagrams for the permitted overhung load  $F_{Rx}$  for EDR AC brake-motors. In order to read the permitted overhung load from the diagram, you must know what the distance  $x$  is between the force application point of the overhung load  $F_R$  and the shaft shoulder.

The following figure shows the application point of the overhung load.



2636511499

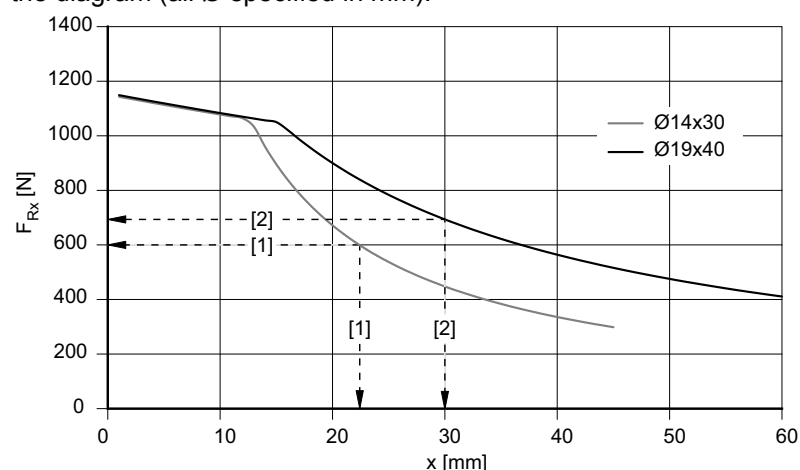
$l$  = Length of the shaft end

$F_{Rx}$  = Overhung load at force application point

$x$  = Distance between overhung load application point and shaft shoulder

$F_A$  = Axial force

The following diagram shows an example of how you can read the overhung load from the diagram (all  $\varnothing$  specified in mm):



2636513163

[1] Motor with shaft diameter 14 mm, force application  $x$  at 22 mm, permitted overhung load  $F_{Rx} = 600$  N

[2] Motor with shaft diameter 19 mm, force application  $x$  at 30 mm, permitted overhung load  $F_{Rx} = 700$  N

#### Permitted axial load for EDR motors

You can then determine the permitted axial load  $F_A$  by means of the previously determined overhung load  $F_{Rx}$ :

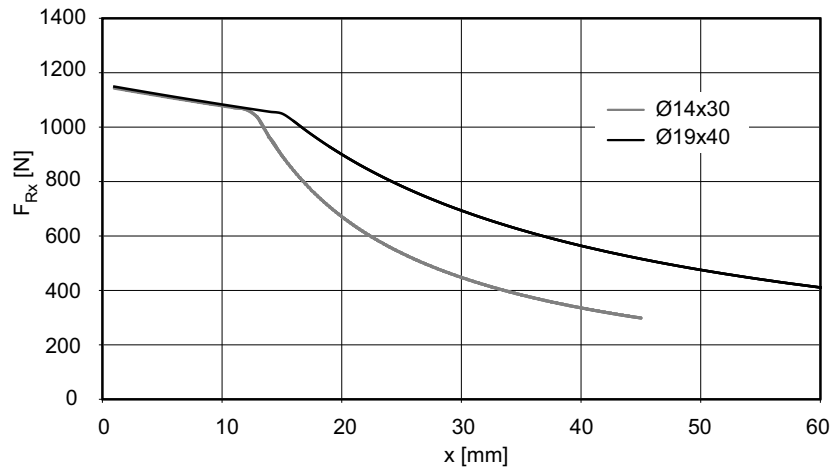
$$F_A = 0.2 \times F_{Rx}$$



### 9.1.2 Overhung load diagrams of the 4-pole EDR motors

Overhung load diagram EDR.71

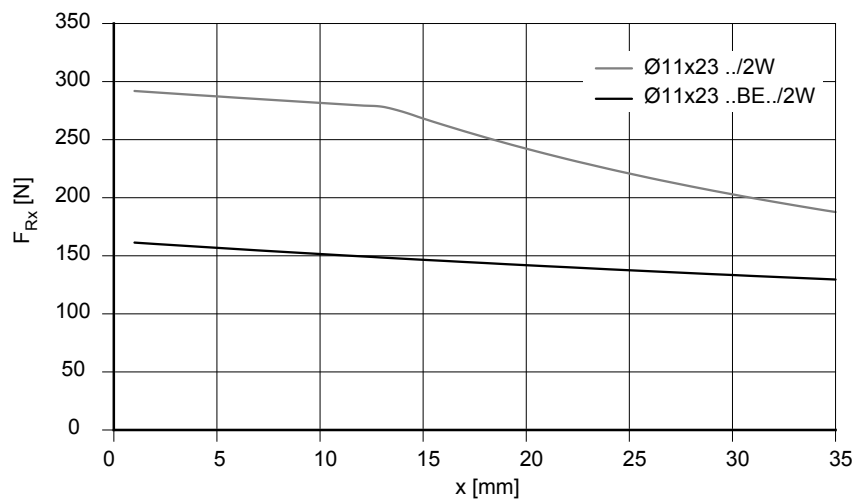
Overhung load diagram for 4-pole EDR.71 motors:  
EDR.71



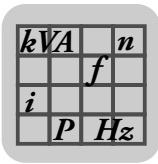
2637430411

Overhung load diagram EDR.71 on the 2. shaft end

Overhung load diagram for 4-pole EDR.71 motors at 2. shaft end:  
EDR.71/2W

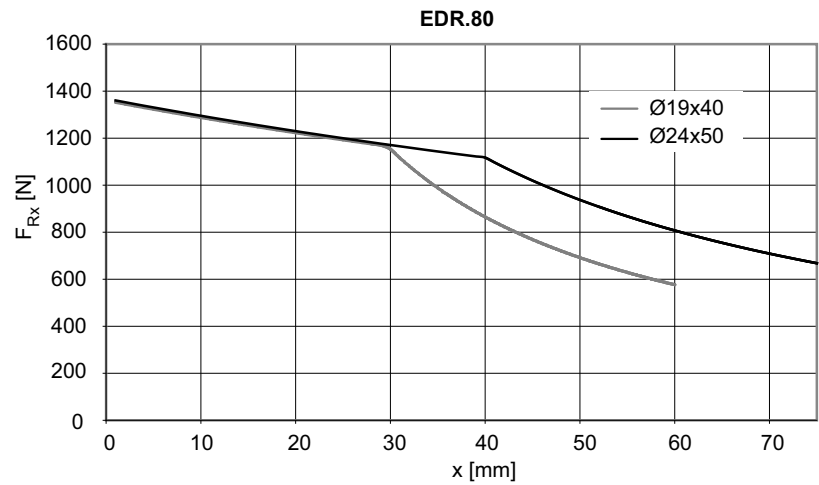


2636893835



Overhung load diagram EDR.80

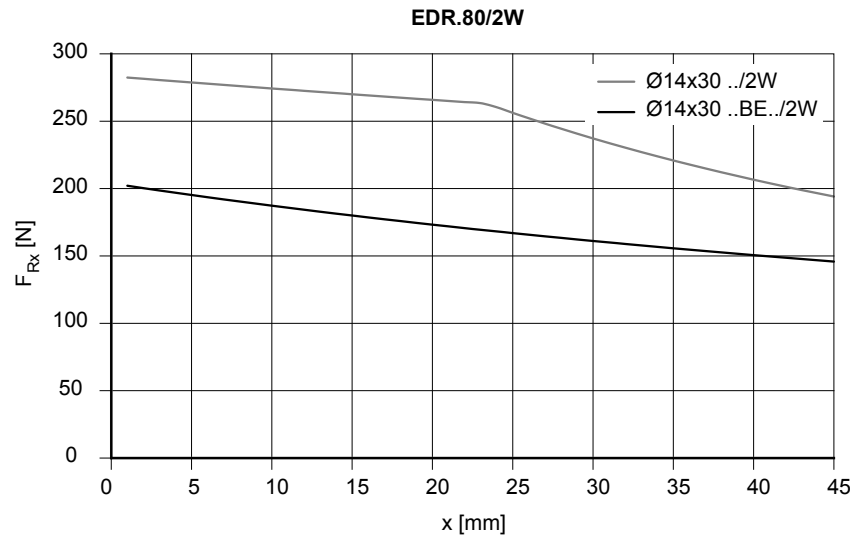
Overhung load diagram for 4-pole EDR.80 motors:



2636896523

Overhung load diagram EDR.80 on the 2. shaft end

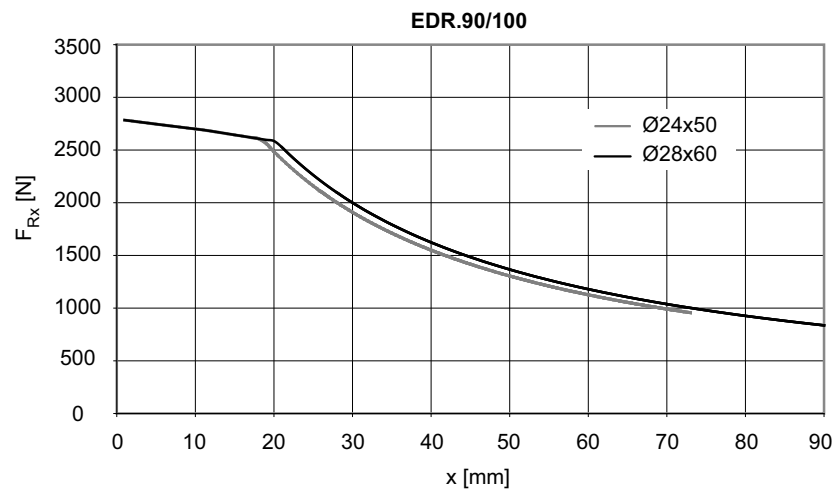
Overhung load diagram for 4-pole EDR.80 motors at 2. shaft end:



2636899211

Overhung load diagram EDR.90 and EDR.100

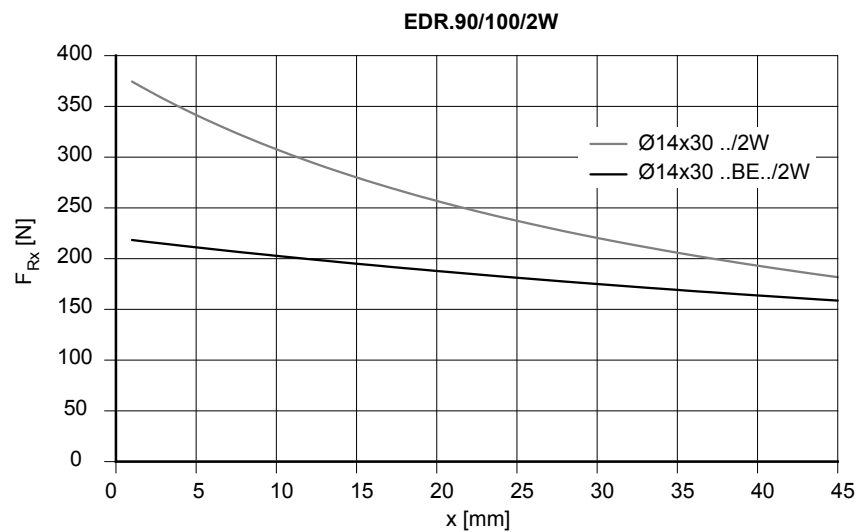
Overhung load diagram for 4-pole EDR.90 and EDR.100 motors:



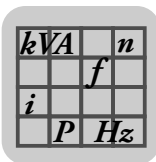
2636901899

Overhung load diagram EDR.90 and EDR.100 at 2. shaft end

Overhung load diagram for 4-pole EDR.90 and EDR.100 motors at 2. shaft end:

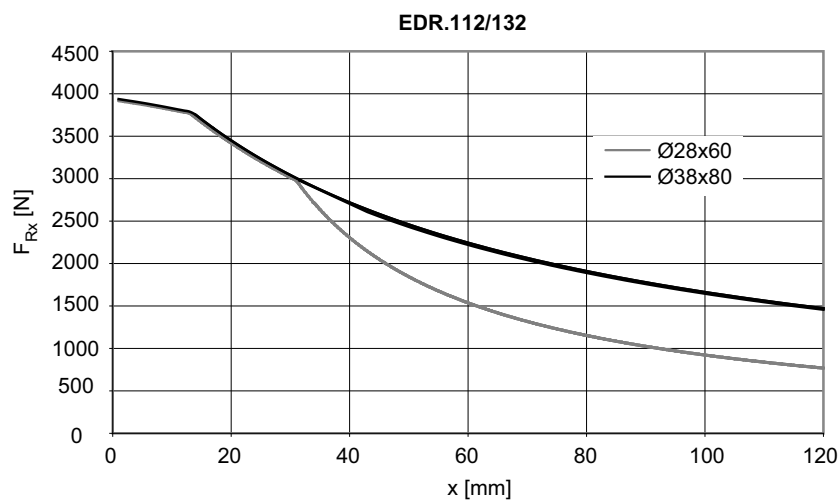


2636904587



Overhung load diagram EDR.112 and EDR.132

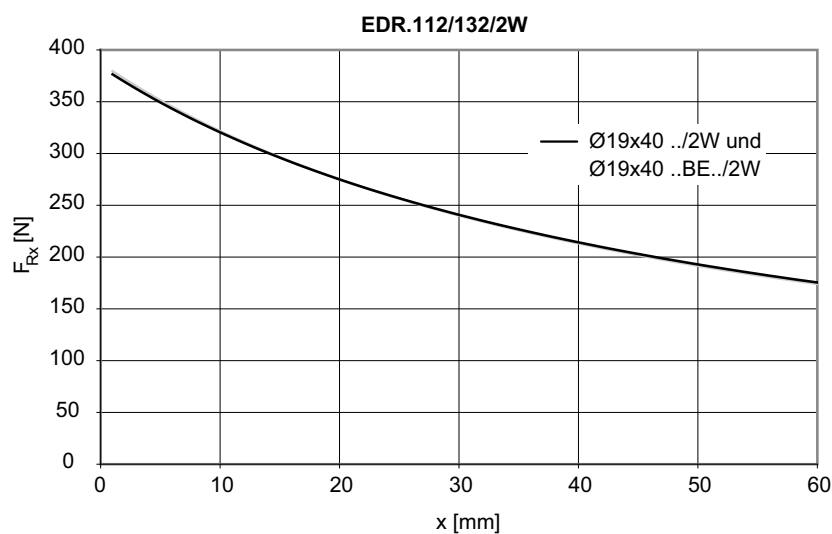
Overhung load diagram for 4-pole EDR.112 and EDR.132 motors:



2636907275

Overhung load diagram EDR.112 and EDR.132 at 2. shaft end

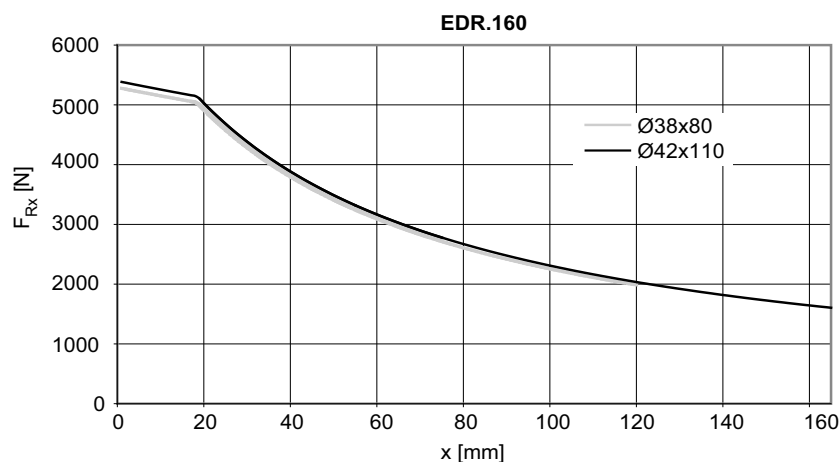
Overhung load diagram for 4-pole EDR.112 and EDR.132 motors at 2. shaft end:



2636909963

Overhung load diagram EDR.160

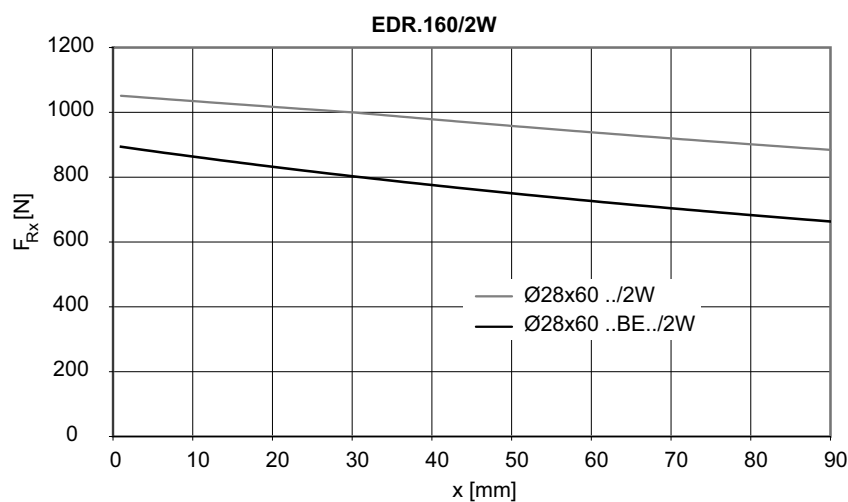
Overhung load diagram for 4-pole EDR.160 motors:



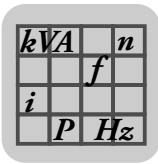
2636912651

Overhung load diagram EDR.160 on the 2. shaft end

Overhung load diagram for 4-pole EDR.160 motors at 2. shaft end:

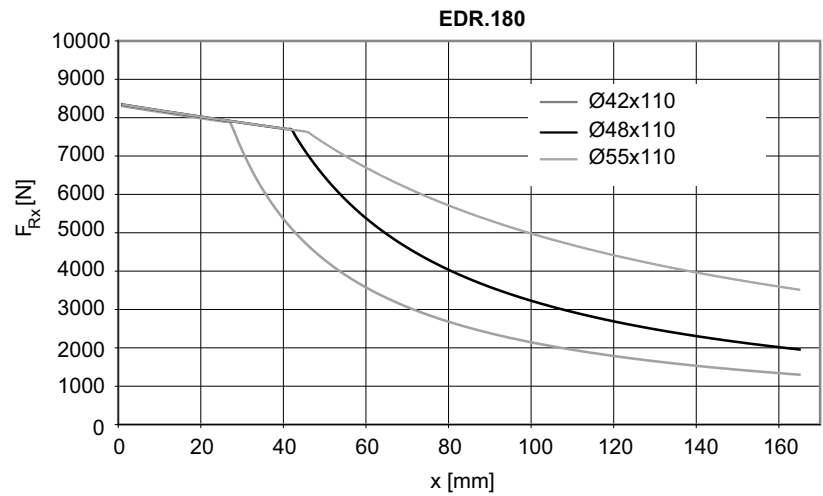


2636915339



Overhung load diagram EDR.180

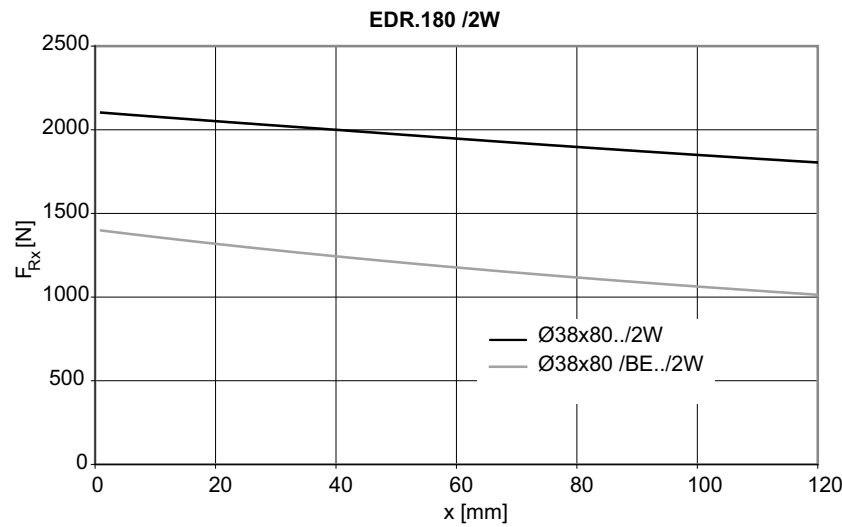
Overhung load diagram for 4-pole EDR.180 motors:



2636918027

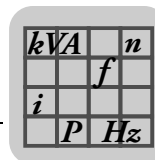
Overhung load diagram EDR.180 on the 2. shaft end

Overhung load diagram for 4-pole EDR.180 motors at 2. shaft end:



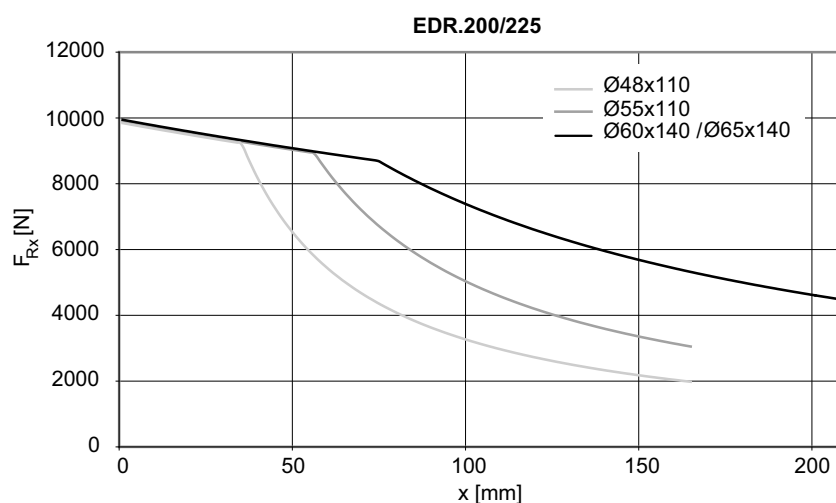
2636920715





Overhung load diagram EDR.200 and EDR.225

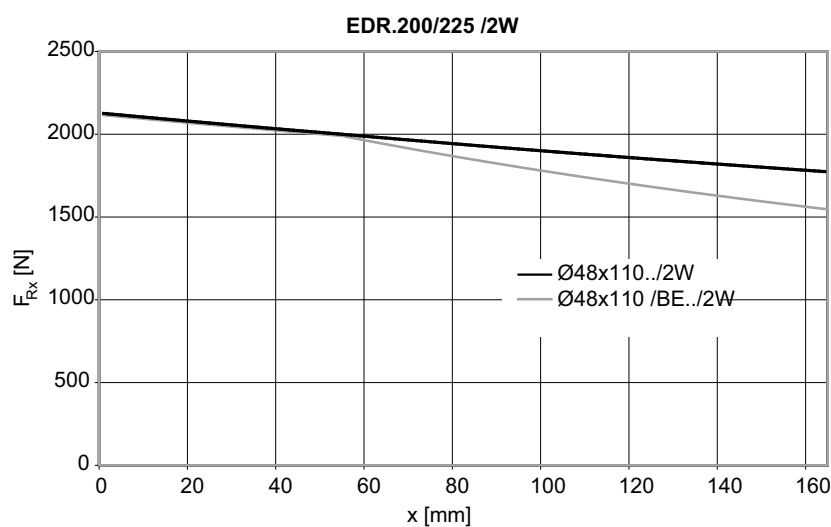
Overhung load diagram for 4-pole EDR.200 and EDR.225 motors:



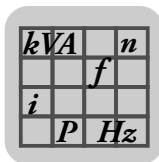
2636923403

Overhung load diagram EDR.200 and EDR.225 at 2. shaft end

Overhung load diagram for 4-pole EDR.200 and EDR.225 motors at 2. shaft end:



2636926091



## 9.2 Important notes on the brake

The type of application determines what the brake is used for. The decisive factor is the operating frequency of the brake.

In S1 continuous operation, the brake is only applied when the drive is switched off or in an emergency. The braking work may not exceed the specified maximum braking work per emergency braking operation. You can find this information on the nameplate and in the illustration "Permitted work of the BE.. brake in case of an emergency" (page 104).

A maximum of 10 emergency braking operations are permitted per hour. Between two braking operations, a waiting time of minimum 6 minutes must be adhered to.

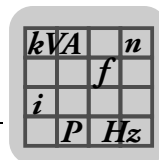
If the brakemotor is used in an application that required a high operating frequency, both the motor and the brake are dimensioned accordingly. In this case, the motor must be equipped with a TF temperature sensor. This option is currently in preparation.

The braking work in an emergency may not exceed the specified maximum braking work per emergency braking operation. It is listed on the nameplate.



### INFORMATION

Both the brake for high operating frequencies and the TF temperature sensor option are currently in preparation. They are not available yet.



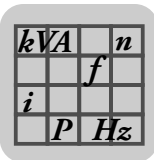
### 9.3 Braking torque assignment

#### 9.3.1 Motor sizes EDR.71 – EDR.100

Motor type	Brake type	Braking torque steps [Nm (lb-in)]										
EDR.71	BE05	1.8 (16)	2.5 (22)	3.5 (31)	5.0 (44)							
	BE1				5.0 (44)	7.0 (62)	10 (88)					
EDR.80	BE05	1.8 (16)	2.5 (22)	3.5 (31)	5.0 (44)							
	BE1				5.0 (44)	7.0 (62)	10 (88)					
	BE2				5.0 (44)	7.0 (62)	10 (88.5)	14 (124)	20 (177)			
EDR.90	BE1				5.0 (44)	7.0 (62)	10 (88)					
	BE2				5.0 (44)	7.0 (62)	10 (88)	14 (124)	20 (177)			
	BE5							14 (124)	20 (177)	28 (248)	40 (354)	55 (487)
EDR.100	BE2				5.0 (44)	7.0 (62)	10 (88)	14 (124)	20 (177)			
	BE5							14 (124)	20 (177)	28 (248)	40 (354)	55 (487)

#### 9.3.2 Motor sizes EDR.112 – EDR.225

Motor type	Brake type	Braking torque steps [Nm (lb-in)]												
EDR.112	BE5	14 (124)	20 (180)	28 (248)	40 (354)	55 (487)								
	BE11		20 (180)	28 (248)	40 (354)	55 (487)	80 (708)	110 (974)						
EDR.132	BE5	14 (124)	20 (180)	28 (248)	40 (354)	55 (487)								
	BE11		20 (180)	28 (248)	40 (354)	55 (487)	80 (708)	110 (974)						
EDR.160	BE11		20 (180)	28 (248)	40 (354)	55 (487)	80 (708)	110 (974)						
	BE20				40 (354)	55 (487)	80 (708)	110 (974)	150 (1328)	200 (1770)				
EDR.180	BE20				40 (354)	55 (487)	80 (708)	110 (974)	150 (1328)	200 (1770)				
	BE30						75 (667)	100 (885)	150 (1328)	200 (1770)	300 (2655)			
	BE32							100 (885)	150 (974)	200 (1770)	300 (2655)	400 (3540)		
EDR.200/ 225	BE30						75 (667)	100 (885)	150 (974)	200 (1770)	300 (2655)			
	BE32							100 (885)	150 (1328)	200 (1770)	300 (2655)	400 (3540)	500 (4425)	600 (5310)



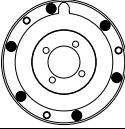
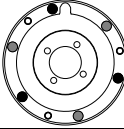
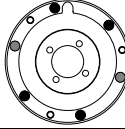
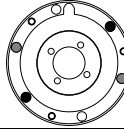
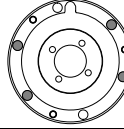
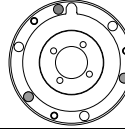


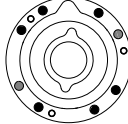

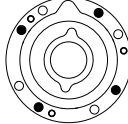
## 9.4 Working air gap, braking torques

Brake Type	Braking work until Maintenance [10 <sup>6</sup> J]	Working air gap [mm]		Brake disk [mm]	Part number damp- ing plate/pole sheet	Braking torque settings						
		min. 1)	max.			Braking torque [Nm (lb-in)]	Type and number of Brake springs			Order number of Brake springs		
							Normal	Blue	White	Normal	Blue	White
BE05	60	0.25	0.6	9.0	1374 056 3	5.0 (44) 3.5 (31) 2.5 (22) 1.8 (16)	3 – – –	– 6 4 3	– – – –	0135 017 X	1374 137 3	–
BE1	60	0.25	0.6	9.0	1374 056 3	10 (88.5) 7.0 (62) 5.0 (44)	6 4 3	– 2 –	– – –	0135 017 X	1374 137 3	–
BE2	90	0.25	0.6	9.0	1374 019 9	20 (177) 14 (124) 10 (88.5) 7.0 (62) 5.0 (44)	6 2 2 – –	– 4 2 4 3	– – – – –	1374 024 5	1374 052 0	–
BE5	190	0.25	0.6	9.0	1374 069 5	55 (487) 40 (354) 28 (248)	6 2 2	– 4 2	– – –	1374 070 9	1374 071 7	–
					1374 069 5	20 (177) 14 (124)	– –	– –	6 4			1374 773 8
BE11	320	0.3	0.9	10.0	1374 171 3	110 (974) 80 (708) 55 (487) 40 (354)	6 2 2 –	– 4 2 4	– – – –	1374 183 7	1374 184 5	–
					1374 171 3 + 1374 699 5	28 (248) 20 (177)	– –	3 –	– 4			1374 778 9
BE20	500	0.3	0.9	10.0	–	200 (1770) 150 (1328) 110 (974) 80 (708) 55 (487)	6 4 3 3 –	– 2 3 – 4	– – – – –	1374 322 8	1374 248 5	–
					1374 675 8	40 (354)	–	3	–			–
BE30	750	0.3	0.9	10.0	–	300 (2655) 200 (1770) 150 (1328) 100 (885) 75 (667)	8 4 4 – –	– 4 – 8 6	– – – – –	0187 455 1	1374 435 6	–
BE32	750	0.4	0.9	10.0	–	600 (5310) 500 (4425) 400 (3540) 300 (2655) 200 (1770) 150 (1328)	8 6 4 4 – –	– 2 4 – 8 6	– – – – – –	0187 455 1	1374 435 6	–
					1374 673 1	100 (885)	–	4	–			–

1) When checking the working air gap, note: Parallelism tolerances on the brake disk may cause deviations of  $\pm 0.15$  mm after a test run.

$kVA$	$n$
$i$	$f$
$P$	$H_z$

The following table shows the brake spring requirements:

<b>BE05 – BE20:</b>					
6 springs	3 + 3 springs	4 + 2 springs	2 + 2 springs	4 springs	3 springs
					
<b>BE30 – BE32:</b>					
8 springs	4 + 4 springs	6 + 2 springs	6 springs	4 springs	
					



### 9.5 Operating currents

#### 9.5.1 BE05, BE1, BE2 brake

The current values  $I_H$  (holding current) listed in the tables are r.m.s. values. Use only appropriate instruments for measuring r.m.s. values. The inrush current (accelerator current)  $I_B$  only flows for a short time (ca. 160 ms) when the brake is released. There is no increased inrush current if a BG or BMS brake rectifier is used or if there is a direct DC voltage supply (only possible with brakes up to size BE2).

	BE05, BE1	BE2
Max. braking torque [Nm (lb-in)]	5/10 (44/88)	20 (177)
Braking power [W (hp)]	32 (0.043)	43 (0.058)
Inrush current ratio $I_B/I_H$	4	4

Nominal voltage $V_N$		BE05, BE1		BE2	
AC V	DC V <sup>1)</sup>	$I_H$ [AC A]	$I_{DC}$ [DC A]	$I_H$ [AC A]	$I_{DC}$ [DC A]
24 (23-26)	10	2.25	2.90	2.95	3.80
60 (57-63)	24	0.90	1.17	1.18	1.53
120 (111-123)	48	0.45	0.59	0.59	0.77
147 (139-154)	60	0.36	0.47	0.48	0.61
184 (174-193)	80	0.29	0.37	0.38	0.49
208 (194-217)	90	0.26	0.33	0.34	0.43
230 (218-243)	96	0.23	0.30	0.30	0.39
254 (244-273)	110	0.20	0.27	0.27	0.35
290 (274-306)	125	0.18	0.24	0.24	0.31
330 (307-343)	140	0.16	0.21	0.21	0.28
360 (344-379)	160	0.14	0.19	0.19	0.25
400 (380-431)	180	0.13	0.17	0.17	0.22
460 (432-484)	200	0.11	0.15	0.15	0.19
500 (485-542)	220	0.10	0.13	0.14	0.18
575 (543-600)	250	0.09	0.12	0.12	0.16

1) In preparation

#### Key

$I_B$	Acceleration current – brief inrush current
$I_H$	Holding current r.m.s. value in the supply cable to the SEW brake rectifier
$I_{DC}$	Direct current with direct DC voltage supply
$V_N$	Nominal voltage (nominal voltage range)



### 9.5.2 Brakes BE5, BE11, BE20, BE30, BE32, BE60, BE62

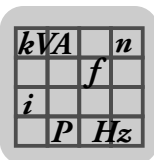
The current values  $I_H$  (holding current) listed in the tables are r.m.s. values. Use only appropriate instruments for measuring r.m.s. values. The inrush current (accelerator current)  $I_B$  only flows for a short time (ca. 160 ms) when the brake is released. A separate voltage supply is not possible.

	BE5	BE11	BE20	BE30, BE32	BE60, BE62
Max. braking torque [Nm (lb-in)]	55 (487)	110 (974)	200 (1770)	300/600 (2655/5310)	???
Braking power [W (hp)]	49 (0.066)	77 (0.10)	100 (0.13)	130 (0.17)	???
Inrush current ratio $I_B/I_H$	5.7	6.6	7	10	???

Nominal voltage $V_N$		BE5	BE11	BE20	BE30, BE32	BE60, BE62
AC V	DC V	$I_H$ [AC A]	$I_H$ [AC A]	$I_H$ [AC A]	$I_H$ [AC A]	$I_H$ [AC A]
60 (57-63)	24	1.28	2.05	2.55	-	???
120 (111-123)	48	0.64	1.04	1.28	1.66	???
147 (139-154)	60	0.51	0.83	1.02	1.33	???
184 (174-193)	80	0.41	0.66	0.81	1.05	???
208 (194-217)	90	0.37	0.59	0.72	0.94	???
230 (218-243)	96	0.33	0.52	0.65	0.84	???
254 (244-273)	110	0.29	0.47	0.58	0.75	???
290 (274-306)	125	0.26	0.42	0.51	0.67	???
330 (307-343)	140	0.23	0.37	0.46	0.59	???
360 (344-379)	160	0.21	0.33	0.41	0.53	???
400 (380-431)	180	0.18	0.30	0.37	0.47	???
460 (432-484)	200	0.16	0.27	0.33	0.42	???
500 (485-542)	220	0.15	0.24	0.29	0.38	???
575 (543-600)	250	0.13	0.22	0.26	0.34	???

#### Key

- $I_B$  Acceleration current – brief inrush current
- $I_H$  Holding current r.m.s. value in the supply cable to the SEW brake rectifier
- $I_{DC}$  Direct current with direct DC voltage supply
- $V_N$  Nominal voltage (nominal voltage range)



### 9.6 Resistances

#### 9.6.1 Brake BE05, BE1, BE2, BE5

	BE05, BE1	BE2	BE5
Max. braking torque [Nm (lb-in)]	5/10 (44/88)	20 (177)	55 (487)
Braking power [W (hp)]	3.2 (0.043)	43 (0.058)	49 (0.066)
Inrush current ratio $I_B/I_H$	4	4	5.7

Rated voltage $V_{Rated}$		BE05, BE1		BE2		BE5	
$V_{AC}$	$V_{DC}$	$R_B$	$R_T$	$R_B$	$R_T$	$R_B$	$R_T$
24 (23-26)	10	0.77	2.35	0.57	1.74	-	-
60 (57-63)	24	4.85	14.8	3.60	11.0	2.20	10.5
120 (111-123)	48	19.4	59.0	14.4	44.0	8.70	42.0
147 (139-159)	60	31.0	94.0	23.0	69.0	13.8	66
184 (174-193)	80	48.5	148	36.0	111	22.0	105
208 (194-217)	90	61.0	187	45.5	139	27.5	132
230 (218-243)	96	78.0	235	58.0	174	34.5	166
254 (244-273)	110	97.0	295	72.0	220	43.5	210
290 (274-306)	125	122	370	91	275	55.0	265
330 (307-343)	140	154	470	115	350	69.0	330
360 (344-379)	160	194	590	144	440	87.0	420
400 (380-431)	180	245	740	182	550	110	530
460 (432-484)	200	310	940	230	690	138	660
500 (485-542)	220	385	1180	290	870	174	830
575 (543-600)	250	490	1480	365	1100	220	1050

#### 9.6.2 Brakes BE11, BE20, BE30, BE32, BE60, BE62

	BE11	BE20	BE30, BE32	BE60, BE62
Max. braking torque [Nm (lb-in)]	110 (974)	200 (1770)	600 (5310)	???
Braking power [W (hp)]	77 (0.10)	100 (0.13)	130 (0.17)	???
Inrush current ratio $I_B/I_H$	6.6	7	10	???

Nominal voltage $V_N$		BE11		BE20		BE30, BE32		BE60, BE62	
$V_{AC}$	$V_{DC}$	$R_B$	$R_T$	$R_B$	$R_T$	$R_B$	$R_T$	$R_B$	$R_T$
60 (57-63)	24	1.20	7.6	1.1	7.1	-	-	???	???
120 (111-123)	48	4.75	30.5	3.3	28.6	2.1	15.8	???	???
147 (139-159)	60	7.7	43.5	5.4	36.0	3.7	27.5	???	???
184 (174-193)	80	12.0	76.0	8.4	57	5.3	39.8	???	???
208 (194-217)	90	15.1	96	10.6	71.7	6.7	50	???	???
230 (218-243)	96	19.0	121	13.3	90.3	8.4	63	???	???
254 (244-273)	110	24.0	152	16.7	134	10.6	79.3	???	???
290 (274-306)	125	30.0	191	21.1	143	13.3	100	???	???
330 (307-343)	140	38.0	240	26.5	180	16.8	126	???	???
360 (344-379)	160	47.5	305	33.4	227	21.1	158	???	???
400 (380-431)	180	60	380	42.1	286	26.6	199	???	???
460 (432-484)	200	76	480	52.9	360	33.4	251	???	???
500 (485-542)	220	95	600	66.7	453	42.1	316	???	???
575 (543-600)	250	120	760	83.9	570	53.0	398	???	???

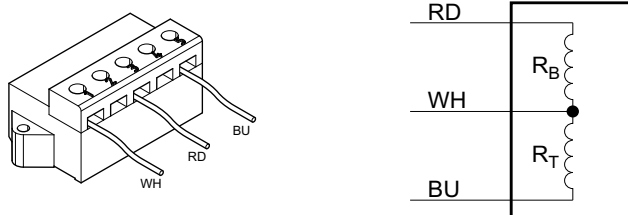


$kVA$	$n$
$f$	
$i$	$P$
$H_z$	

### 9.6.3 Resistance measurement BE05, BE1, BE2, BE5, BE30, BE32, BE60, BE62

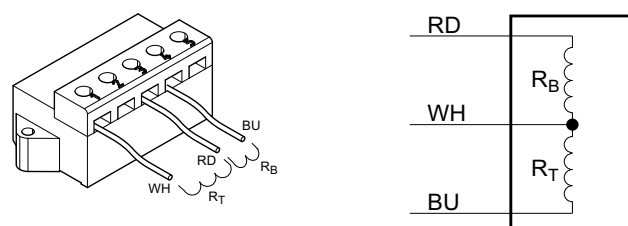
*Cut-off in the AC circuit*

The following illustration shows how to measure resistance with cutoff in the AC circuit.



*Cut-off in the DC and AC circuits*

The following illustration shows how to measure resistance with cut-off in the DC and AC circuits.



BS accelerator coil  
TS coil section  
 $R_B$  accelerator coil resistance at 20 °C [ $\Omega$ ]  
 $R_T$  coil section resistance at 20 °C [ $\Omega$ ]  
 $V_N$  nominal voltage (nominal voltage range)

RD red  
WH white  
BU blue



### INFORMATION

When measuring the resistance of the coil section ( $R_{Sec}$ ) or the acceleration coil ( $R_{Acc}$ ), remove the white conductor from the brake rectifier; if it remains connected, the internal resistance of the brake rectifier will cause erroneous results.



### 9.7 Brake control system

#### 9.7.1 Wiring space of the motor

The following tables list the technical data of brake control systems for installation in the motor wiring space and the assignments with regard to motor size and connection technology. The different housings have different colors (= color code) to make them easier to distinguish.

Motor sizes  
EDR.71 –  
EDR.225

The following table shows the technical data of the rectifiers:

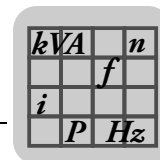
Type	Function	Voltage	Holding current $I_{Hmax}$ [A]	Type	Part number	Color code
<b>BGE</b>	One-way rectifier with electronic switching	AC 150 – 500 V	1.5	BGE 1.5	825 385 4	Red
		AC 42 – 150 V	3.0	BGE 3	825 387 0	Blue
BSR..E <sup>1)</sup>	One-way rectifier + current relay for cut-off in the DC circuit	AC 150 – 500 V	1.0	BGE 1.5 + SR 11 /II3D	825 385 4 826 761 8	Red –
			1.0	BGE 1.5 + SR 15 /II3D	825 385 4 826 762 6	Red –
			1.0	BGE 1.5 + SR 19 /II3D	825 385 4 826 246 2	Red –
		AC 42 – 150 V	1.0	BGE 3 + SR 11 /II3D	825 387 0 826 761 8	Blue –
			1.0	BGE 3 + SR 15 /II3D	825 387 0 826 762 6	Blue –
			1.0	BGE 3 + SR 19 /II3D	825 387 0 826 246 2	Blue –
<b>BUR..E<sup>1)</sup></b>	One-way rectifier + voltage relay for cut-off in the DC circuit	AC 150 – 500 V	1.0	BGE 1.5 + UR 15 /II3D	825 385 4 826 759 6	Red –
		AC 42 – 150 V	1.0	BGE 3 + UR 11 /II3D	825 387 0 826 758 8	Blue –

1) In preparation



### INFORMATION

If the voltage is higher than 500 V, the rectifiers may not be connected in the terminal box.



### 9.7.2 Control cabinet

The following tables list the technical data of brake control systems for installation in the control cabinet, and the assignment regarding the motor size and connection technology. The different housings have different colors (= color code) to make them easier to distinguish.

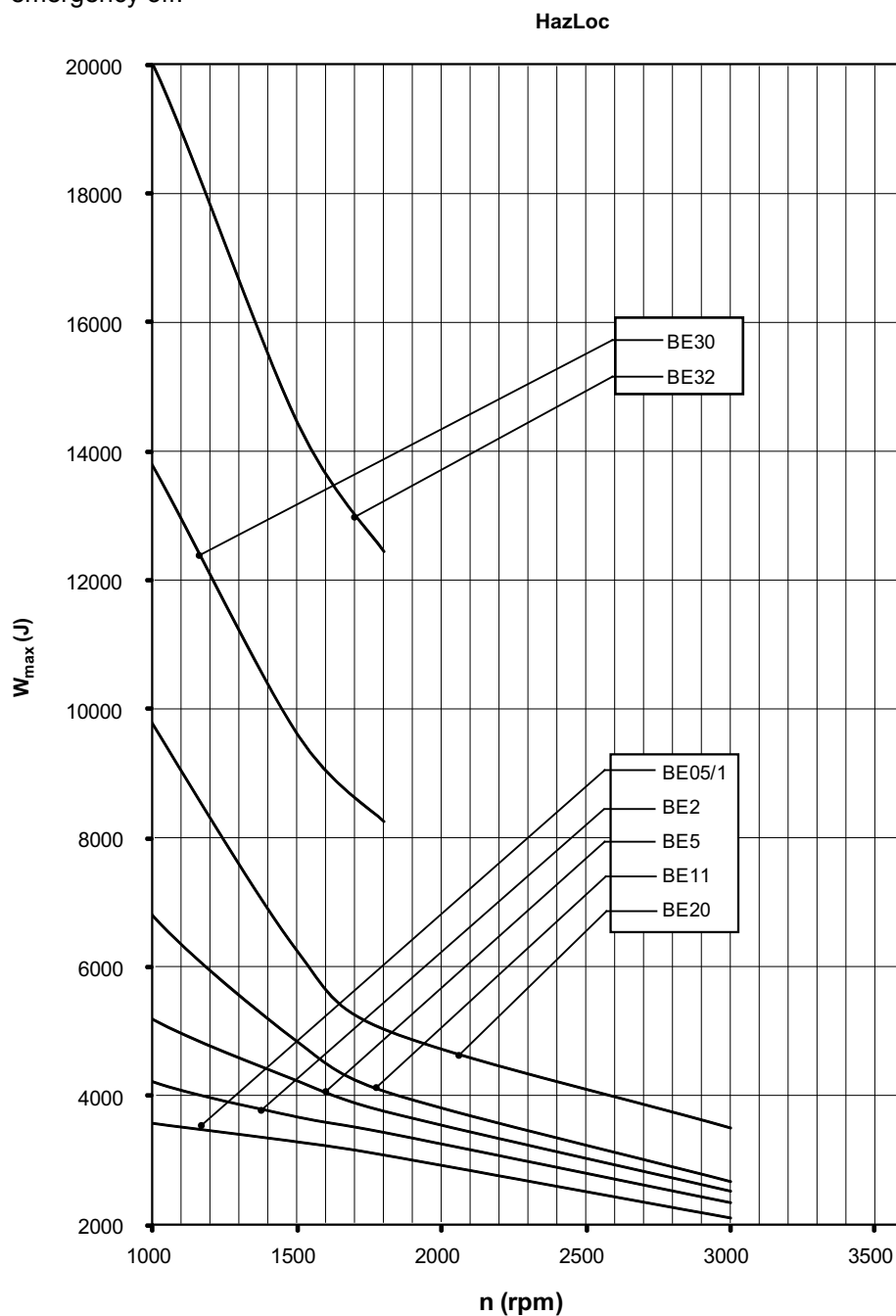
Motor size  
EDR.71-EDR.225

Type	Function	Voltage	Holding current $I_{Hmax}$ [A]	Type	Part number	Color code
BME	One-way rectifier with electronic switching as BGE	AC 230 – 575 V	1.4	BME 1.4	829 831 9	Red
		AC 150...500 V	1.5	BME 1.5	825 722 1	Red
		AC 42...150 V	3.0	BME 3	825 723 X	Blue
BMP	One-way rectifier with electronic switching, integrated voltage relay for cut-off in the DC circuit	AC 230 – 575 V	1.4	BMP 1.4	829 832 7	White
		AC 150...500 V	1.5	BMP 1.5	825 685 3	White
		AC 42...150 V	3.0	BMP 3	826 566 6	Light blue
BMK	One-way rectifier with electronic switch mode, DC 24 V control input and separation in the DC circuit	AC 230 – 575 V	1.4	BMK 1.4	829 833 5	Water blue
		AC 150...500 V	1.5	BMK 1.5	826 463 5	Water blue
		AC 42...150 V	3.0	BMK 3	826 567 4	Bright red
BMH	One-way rectifier with electronic switching and heating function	AC 230 – 575 V	1.4	BMH 1.4	829 834 3	Green
		AC 150...500 V	1.5	BMH 1.5	825 818 X	Green
		AC 42...150 V	3.0	BMH 3	825 819 8	Yellow



### 9.8 Permitted work done by the BE brake in case of emergency off

The following diagram shows the permitted braking work of the BE... brake in case of emergency off:



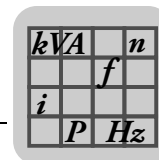
4919378571

- [1] Speed  $n$  in rpm  
 [2] Work done  $W_{\max}$  in J



#### INFORMATION

Max. 10 emergency off braking operations are permitted per hour, with at minimum of 6 minutes between two braking operations.



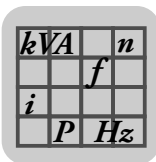
## 9.9 Permitted rolling bearing types

### 9.9.1 Rolling bearing types for EDR.71 – EDR.225 motors

Motor type	A-side bearing		B-side bearing	
	IEC motor	Gearmotor	AC motor	Brakemotor
EDR.71	6204-2Z-J-C3	6303-2Z-J-C3	6203-2Z-J-C3	6203-2RS-J-C3
EDR.80	6205-2Z-J-C3	6304-2Z-J-C3	6304-2Z-J-C3	6304-2RS-J-C3
EDR.90 – EDR.100	6306-2Z-J-C3		6205-2Z-J-C3	6205-2RS-J-C3
EDR.112 – EDR.132	6308-2Z-J-C3		6207-2Z-J-C3	6207-2RS-J-C3
EDR.160	6309-2Z-J-C3		6209-2Z-J-C3	6209-2RS-J-C3
EDR.180	6312-2Z-J-C3		6213-2Z-J-C3	6213-2RS-J-C3
EDR.200 – EDR.225	6314-2Z-J-C3		6314-2Z-J-C3	6314-2RS-J-C3

### 9.9.2 Current insulated rolling bearings for motor sizes EDR.200 – EDR.225

Motor type	AC motor	Brakemotor
EDR.200 – EDR.225	6314-C3-EI	6314-C3-EI



## 9.10 Lubricant tables

### 9.10.1 Lubricant table for rolling bearings



#### INFORMATION

Inadequate bearing greases may result in increased motor noise.

Motor sizes  
EDR.71 –  
EDR.225

The bearings are 2Z or 2RS closed bearings and cannot be re-lubricated.

	Ambient temperature	Manufacturer	Type	DIN designation
Motor rolling bearings	-20 °C to +40 °C	Esso	Polyrex EM <sup>1)</sup>	K2P-20
	-20 °C to +40 °C	Kyodo Yushi	Multemp SRL <sup>2)</sup>	K2N-40

1) mineral lubricant (= mineral-based rolling bearing grease)

## 9.11 Order information for lubricants and anti-corrosion agents

Lubricants and anti-corrosion agents may be obtained directly from SEW-EURODRIVE using the following order numbers.

Use	Manufacturer	Type	Packaging unit	Order number
Lubricant for rolling bearings	Esso	Polyrex EM	400 g	09101470
	SKF	GXN	400 g	09101276
Duroplastic sealing compound	Marston Domsel	SEW L Spezial	80 g	09112286
Lubricant for Sealing rings	Klüber	Petamo GHY 133 for [30], [37], [106], [95]	10 g	04963458
	Fuchs	Renolit CX-Tom 15 for [30], [37], [106], [95]	On request	On request
Anti-corrosion agent and lubricant	SEW-EURO-DRIVE	NOCO <sup>®</sup> FLUID	5.5 g	09107819








## 9.12 Mounting device

Mounting device	XV0A	XV1A	XV2A	XV3A	XV4A
For motors	EDR.71 – 225				
Mounting type of encoder	Flange centered with coupling				
Variant	Encoder shaft	Any	6 mm	10 mm	12 mm
	Centering	Any	50 mm	50 mm	80 mm
Suitable for encoder	Provided by the customer or by SEW-EURODRIVE on behalf of the customer.				

## 9.13 Mark on the nameplate

The following table lists all marks that can occur on a nameplate and an explanation of what they mean:

Mark	Meaning
	The CSA mark indicates that a product meets applicable Canadian standards.
	The CSA C/US mark indicates that the product meets applicable US and Canadian standards.
	The CSA combined Energy Verification mark indicates that the product meets applicable Canadian standards and complies with Canadian Federal and Provincial Energy Efficiency Regulations.
	The CSA C/US combined Energy Verification mark indicates that the product meets applicable US and Canadian standards and complies with Canadian Federal and Provincial Energy Efficiency Regulations along with US Federal Energy Efficiency Regulations.
	DoE mark to confirm compliance with US efficiency limit values for AC motors.



## 10 Malfunctions



### **⚠ WARNING**

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- De-energize the motor before you start working on the unit.
- Secure the motor against unintended power-up.



### **⚠ CAUTION**

The surface temperatures on the drive can be very high during operation.

Danger of burns.

- Let the motor cool down before you start your work.



### **NOTICE**

Improper troubleshooting measures may damage the drive.

Possible damage to property.

- Note the following information.
- Use only genuine spare parts in accordance with the valid parts list.
- Strictly observe the safety notes in the individual chapters.





## 10.1 Motor malfunctions

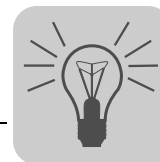
Malfunction	Possible cause	Remedy
Motor does not start up	Supply cable interrupted	Check the connections and (intermediate) terminal points, correct if necessary )
	Brake does not release	See chapter "Brake malfunctions"
	Supply cable fuse has blown	Replace fuse
	Motor protection (switch) has triggered	Check that the motor protection (switch) is set correctly; current specification is on the nameplate
	Motor protection does not trip	Check motor protection control
	Malfunction in control or in the control process	Observe the switching sequence; correct if necessary
Motor only starts with difficulty or does not start at all	Motor power designed for delta connection but connected in star	Correct the connection from star to delta; follow the wiring diagram
	Motor power designed for star-star connection but only connected in star	Correct the connection from star to star-star; follow the wiring diagram
	Voltage or frequency deviate considerably from setpoint, at least while being switched on	Provide better power supply system; reduce the power supply load; Check cross section of supply cable, replace with cable of larger cross section if need be
Motor does not start in star connection, only in delta connection	Star connection does not provide sufficient torque	If the delta inrush current is not too high (observe the regulations of the power supplier), start up directly in delta; Check the project planning and use a larger motor or special version if necessary (consult SEW-EURODRIVE)
	Contact fault on star/delta switch	Check the switch, replace if necessary; Check the connections
Incorrect direction of rotation	Motor connected incorrectly	Swap two phases of the motor supply cable
Motor hums and has high current consumption	Brake does not release	See chapter "Brake malfunctions"
	Winding defective	Send motor to specialist workshop for repair
	Rotor rubbing	
Fuses blow or motor protection trips immediately	Short circuit in the motor supply cable	Repair short circuit
	Supply cables connected incorrectly	Correct the wiring, observe the wiring diagram
	Short circuit in motor	Send motor to specialist workshop for repair
	Ground fault on motor	
Severe speed loss under load	Motor overload	Measure power, check project planning and use larger motor or reduce load if necessary
	Voltage drops	Check cross section of supply cable, replace with cable of larger cross section if need be
Motor heats up excessively (measure temperature)	Overload	Measure power, check project planning and use larger motor or reduce load if necessary
	Insufficient cooling	Provide for cooling air supply or clear cooling air passages, retrofit forced cooling fan if necessary. Check the air filter, clean or replace if necessary
	Ambient temperature too high	Observe the permitted temperature range, reduce the load if necessary
	Motor in delta connection instead of star connection as provided for	Correct the wiring, observe the wiring diagram
	Loose contact in supply cable (one phase missing)	Tighten loose contact, check connections, observe wiring diagram
	Fuse has blown	Look for and rectify cause (see above); replace fuse
	Line voltage deviates from the rated motor voltage by more than 5% (range A)/ 10% (range B).	Adjust motor to line voltage.
	Rated operation type (S1 to S10, DIN 57530) exceeded, e.g. through excessive starting frequency	Adjust the rated operating mode of the motor to the required operating conditions; consult a professional to determine the correct drive if necessary



## Malfunctions

### Motor malfunctions

Malfunction	Possible cause	Remedy
Excessively loud	Ball bearing compressed, dirty or damaged	Re-align motor and the driven machine, inspect rolling bearing and replace if necessary. See section "Permitted rolling bearing types" (page 105).
	Vibration of rotating parts	Look for the cause, possibly an imbalance; correct the cause, observe method for balancing
	Foreign bodies in cooling air passages	Clean the cooling air passages



## 10.2 Brake malfunctions

Malfunction	Possible cause	Remedy
Brake does not release	Incorrect voltage on brake control unit	Apply the correct voltage; brake voltage specified on the nameplate
	Brake control unit failed	Install a new brake control, check resistors and insulation of the brake coils (see "Resistors" section for resistance values). Check switchgear, replace if necessary
	Max. permitted working air gap exceeded because brake lining worn down.	Measure and set working air gap. See the following sections: <ul style="list-style-type: none"> <li>"Setting the working air gap of brakes BE05-BE32"</li> </ul> If the brake disk is too thin, replace the brake disk. See the following sections: <ul style="list-style-type: none"> <li>"Replacing the brake disk of BE05-BE32 brakes"</li> </ul>
	Voltage drop on supply cable > 10%	Provide correct connection voltage: brake voltage specifications on the nameplate. Check the cross section of the brake supply cable; increase cross section if necessary.
	Inadequate cooling, brake overheats	Provide for cooling air supply or clear cooling air passages, check air filter, clean or replace if necessary. Replace type BG brake rectifier with type BGE.
	Brake coil has interturn short circuit or a short circuit to frame	Check resistors and insulation of the brake coils (see "Resistors" section for resistance values). Replace complete brake and brake control (specialist workshop), Check switchgear, replace if necessary
	Rectifier defective	Replace rectifier and brake coil; it may be more economical to replace the complete brake.
Brake does not brake	Working air gap not correct	Measure and set working air gap. See the following sections: <ul style="list-style-type: none"> <li>"Setting the working air gap of brakes BE05-BE32"</li> </ul> If the brake disk is too thin, replace the brake disk. See the following sections: <ul style="list-style-type: none"> <li>"Replacing the brake disk of BE05-BE32 brakes"</li> </ul>
	Brake lining worn	Replace entire brake disk. See the following sections: <ul style="list-style-type: none"> <li>"Replacing the brake disk of BE05-BE32 brakes"</li> </ul>
	Incorrect braking torque.	Check the project planning and change the braking torque if needed; see chapter "Technical Data" > "Work done, working air gap, braking torques" <ul style="list-style-type: none"> <li>by changing the type and number of brake springs. See the following sections:  <ul style="list-style-type: none"> <li>"Changing the braking torque of brakes BE05-BE32" (page 79)</li> </ul> </li> <li>by selecting a different brake See section "Braking torque assignment"</li> </ul>
Brake does not brake	Working air gap so large that setting nuts for the manual release come into contact.	Set the working air gap. See the following sections: <ul style="list-style-type: none"> <li>"Setting the working air gap of brakes BE05-BE32"</li> </ul>
	Manual brake release device not set correctly	Set the setting nuts for the manual release correctly See the following sections: <ul style="list-style-type: none"> <li>"Changing the braking torque of brakes BE05-BE32" (page 79)</li> </ul>
	Brake locked by manual brake release HF	Loosen the setscrew, remove if necessary
Brake is applied with time lag	Brake is switched only on AC voltage side	Switch both the DC and AC circuits (e.g. by retrofitting the SR current relay to BSR); observe wiring diagram



Malfunction	Possible cause	Remedy
Noises in vicinity of brake	Gearing wear on the brake disk or the carrier caused by jolting startup	Check the project planning, replace the brake disk if necessary See the following sections: <ul style="list-style-type: none"> <li>"Replacing the brake disk of BE05-BE32 brakes"</li> </ul> Have a specialist workshop replace the carrier
	Alternating torques due to incorrectly set frequency inverter	Check correct setting of frequency inverter according to its operating instructions, correct if necessary.

### 10.3 Disposal

Dispose of the motors in accordance with the material structure and the regulations in force:

- Iron
- Aluminum
- Copper
- Plastic
- Electronic components
- Oil and grease (not mixed with solvents)

### 10.4 Customer service

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

- Nameplate data (complete)
- Type and extent of the problem
- Time the problem occurred and any accompanying circumstances
- Assumed cause
- Environmental conditions e.g.:
  - Ambient temperature
  - Humidity
  - Installation altitude
  - Dirt
  - etc.



## 11 Appendix

### 11.1 Wiring diagrams

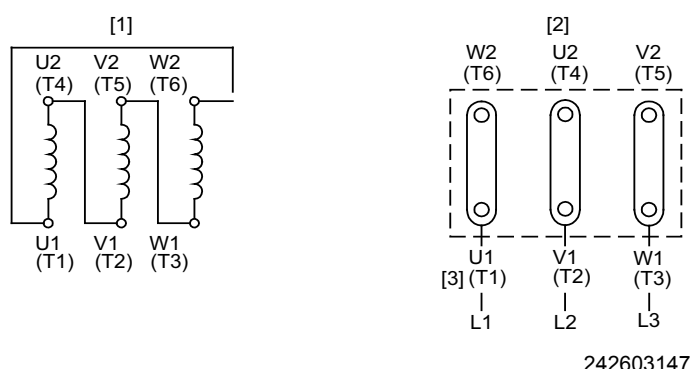


#### INFORMATION

The motor should be connected as shown in the connection wiring diagram or the assignment diagram, which are supplied with the motor. The following chapter only shows a selection of the common types of connections. You can obtain the relevant wiring diagrams free of charge from SEW-EURODRIVE.

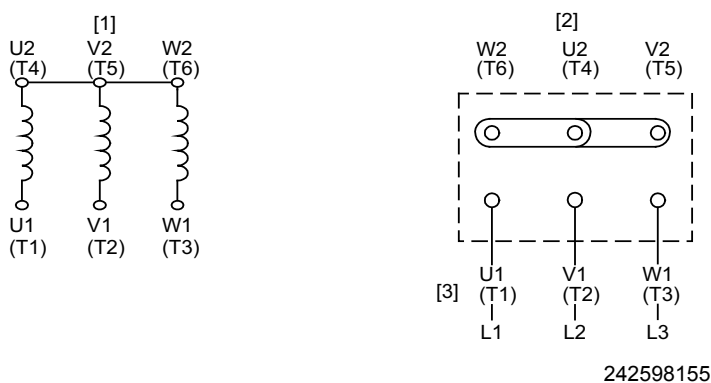
#### 11.1.1 Wiring diagram R13 (68001 xx 06)

△ connection The following figure shows △ connection for low voltage.



- [1] Motor winding
- [2] Motor terminal board
- [3] Supply cables

⋈ connection The following figure shows ⋈ connection for high voltage.



- [1] Motor winding
- [2] Motor terminal board
- [3] Supply cables

Change in direction of rotation: Swap connection of 2 supply cables, L1 - L2



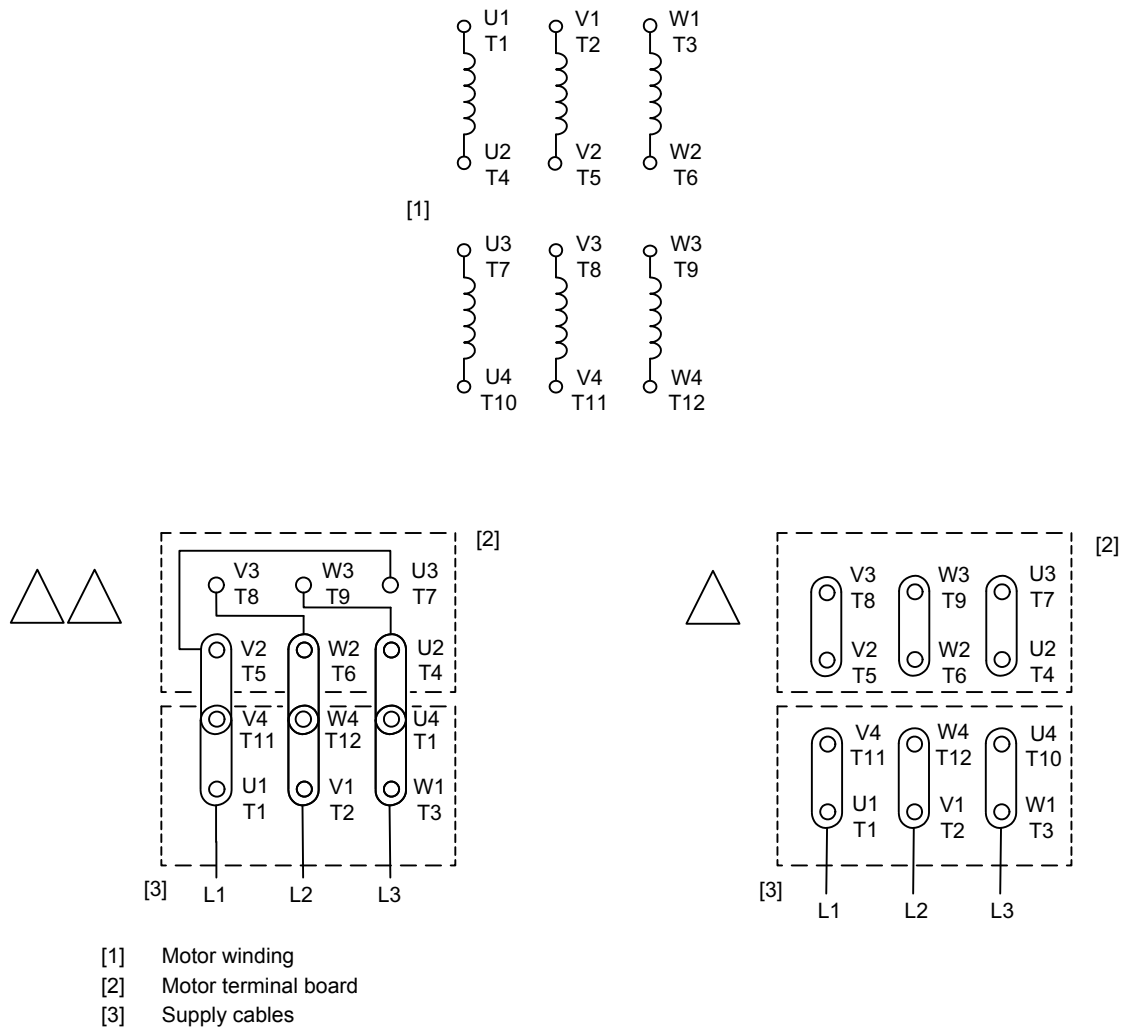
### 11.1.2 Delta connection with wiring diagram R72 (68192 xx 09)

AC motor

For all motors with one speed and direct power-on.

△ connection,  
△△ connection

The following figure shows △ connection for high voltages and △△ connection for low voltages.



Change in direction of rotation: Swap connection of 2 supply cables, L1 - L2

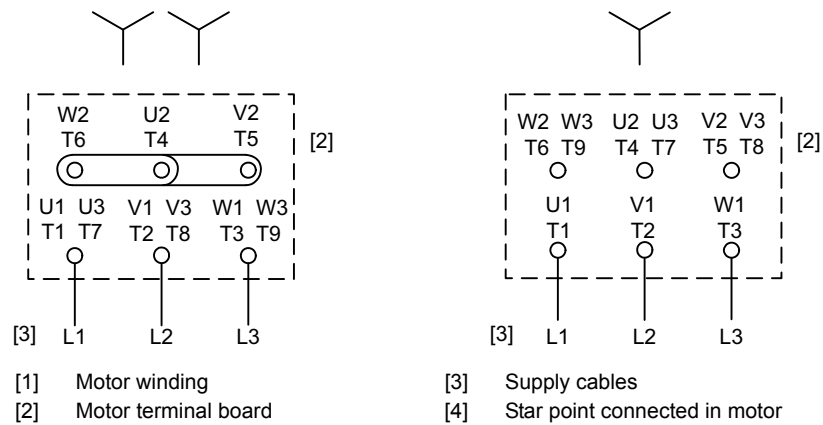
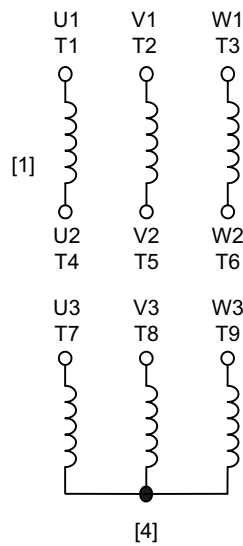
### 11.1.3 Star connection with wiring diagram R76 (68043 xx 06)

AC motor

For all motors with one speed and direct power-on.

⋈ connection,  
⋈⋈ connection

The following figure shows ⋈ connection for high voltages and ⋈⋈ connection for low voltages.



Change in direction of rotation: Swap connection of 2 supply cables, L1 - L2



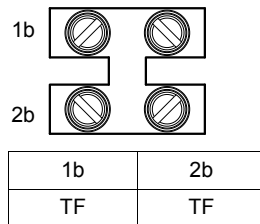
### 11.1.4 Motor protection with TF for EDR.71 – EDR.225

*TF (in preparation)*

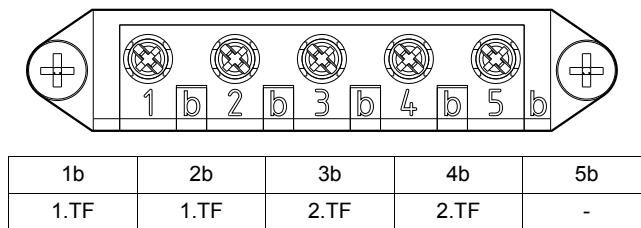
The following figures show the connection of motor protection with TF PTC thermistor sensor.

Either a two-pole terminal clip or a five-pole terminal strip is available for connecting to the trip switch.

#### Example: TF to 2-pole terminal strip

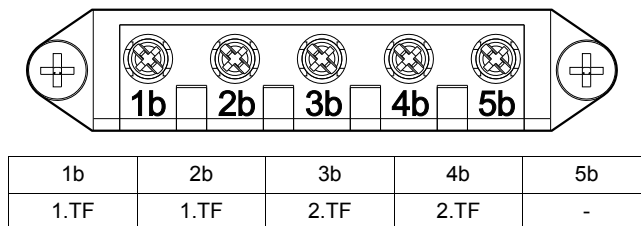


#### Example: 2 × TF to 5-pole terminal strip



*2 x TF (in preparation)*

The following figure shows the installation of motor protection with 2 PTC thermistors (TF):





### 11.1.5 BGE; BG; BSG brake control

BE brake

BGE; BG; BSG brake control

Apply voltage to release the brake (see nameplate).

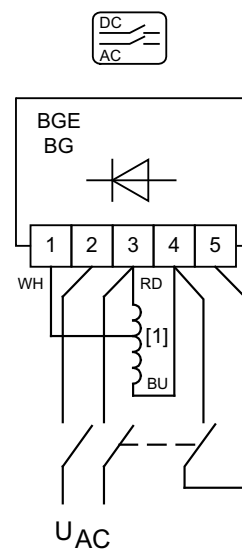
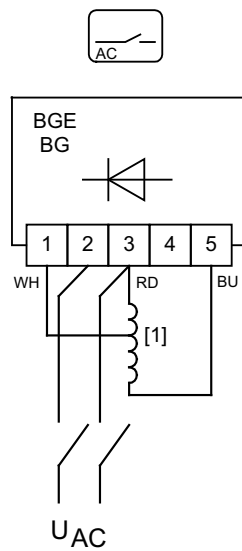
Contact rating of the brake control: AC3 in accordance with EN 60947-4-1.

The voltage can be supplied via a separate supply cable.

**This does not apply to frequency-controlled motors.**

*BG / BGE*

The following illustration shows the wiring for BG and BGE brake rectifiers for the AC-side shut-off as well as the DC and AC-side shutoff.



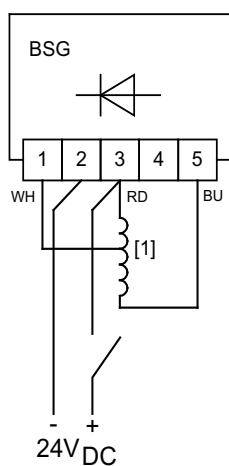
242604811

[1] Brake coil



BSG

The following illustration shows the DC 24 V connection of the BSG control unit



242606475

[1] Brake coil



## 12 Address List

Germany			
<b>Headquarters Production Sales</b>	<b>Bruchsal</b>	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 D-76646 Bruchsal P.O. Box Postfach 3023 • D-76642 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-1970 <a href="http://www.sew-eurodrive.de">http://www.sew-eurodrive.de</a> <a href="mailto:sew@sew-eurodrive.de">sew@sew-eurodrive.de</a>
<b>Production / Industrial Gears</b>	<b>Bruchsal</b>	SEW-EURODRIVE GmbH & Co KG Christian-Pähr-Str.10 D-76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-2970
<b>Service Competence Center</b>	<b>Central</b>	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 D-76676 Graben-Neudorf	Tel. +49 7251 75-1710 Fax +49 7251 75-1711 <a href="mailto:sc-mitte@sew-eurodrive.de">sc-mitte@sew-eurodrive.de</a>
	<b>North</b>	SEW-EURODRIVE GmbH & Co KG Alte Ricklinger Straße 40-42 D-30823 Garbsen (near Hannover)	Tel. +49 5137 8798-30 Fax +49 5137 8798-55 <a href="mailto:sc-nord@sew-eurodrive.de">sc-nord@sew-eurodrive.de</a>
	<b>East</b>	SEW-EURODRIVE GmbH & Co KG Dänkritzer Weg 1 D-08393 Meerane (near Zwickau)	Tel. +49 3764 7606-0 Fax +49 3764 7606-30 <a href="mailto:sc-ost@sew-eurodrive.de">sc-ost@sew-eurodrive.de</a>
	<b>South</b>	SEW-EURODRIVE GmbH & Co KG Domagkstraße 5 D-85551 Kirchheim (near München)	Tel. +49 89 909552-10 Fax +49 89 909552-50 <a href="mailto:sc-sued@sew-eurodrive.de">sc-sued@sew-eurodrive.de</a>
	<b>West</b>	SEW-EURODRIVE GmbH & Co KG Siemensstraße 1 D-40764 Langenfeld (near Düsseldorf)	Tel. +49 2173 8507-30 Fax +49 2173 8507-55 <a href="mailto:sc-west@sew-eurodrive.de">sc-west@sew-eurodrive.de</a>
	<b>Electronics</b>	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 D-76646 Bruchsal	Tel. +49 7251 75-1780 Fax +49 7251 75-1769 <a href="mailto:sc-elektronik@sew-eurodrive.de">sc-elektronik@sew-eurodrive.de</a>
	<b>Drive Service Hotline / 24 Hour Service</b>		+49 180 5 SEWHELP +49 180 5 7394357 14 euro cents/min on the German land-line network. Max 42 euro cents/min from a German mobile network. Prices for mobile and international calls may differ.
	Additional addresses for service in Germany provided on request!		

France			
<b>Production Sales Service</b>	<b>Haguenau</b>	SEW-USOCOME 48-54 route de Soufflenheim B. P. 20185 F-67506 Haguenau Cedex	Tel. +33 3 88 73 67 00 Fax +33 3 88 73 66 00 <a href="http://www.usocome.com">http://www.usocome.com</a> <a href="mailto:sew@usocome.com">sew@usocome.com</a>
<b>Production</b>	<b>Forbach</b>	SEW-USOCOME Zone industrielle Technopôle Forbach Sud B. P. 30269 F-57604 Forbach Cedex	Tel. +33 3 87 29 38 00
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	<b>Lyon</b>	SEW-USOCOME Parc d'affaires Roosevelt Rue Jacques Tati F-69120 Vaulx en Velin	Tel. +33 4 72 15 37 00 Fax +33 4 72 15 37 15



France			
	<b>Nantes</b>	SEW-USOCOME Parc d'activités de la forêt 4 rue des Fontenelles F-44140 Le Bignon	Tel. +33 2 40 78 42 00 Fax +33 2 40 78 42 20
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<b>Sales</b>	<b>Algiers</b>	REDUCOM Sarl 16, rue des Frères Zaghounne Bellevue 16200 El Harrach Alger	Tel. +213 21 8214-91 Fax +213 21 8222-84 info@reducom-dz.com http://www.reducom-dz.com
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Australia			
<b>Assembly Sales Service</b>	<b>Melbourne</b>	SEW-EURODRIVE PTY. LTD. 27 Beverage Drive Tullamarine, Victoria 3043	Tel. +61 3 9933-1000 Fax +61 3 9933-1003 http://www.sew-eurodrive.com.au enquires@sew-eurodrive.com.au
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<b>Assembly Sales Service</b>	<b>Wien</b>	SEW-EURODRIVE Ges.m.b.H. Richard-Strauss-Strasse 24 A-1230 Wien	Tel. +43 1 617 55 00-0 Fax +43 1 617 55 00-30 http://www.sew-eurodrive.at sew@sew-eurodrive.at
Belarus			
<b>Sales</b>	<b>Minsk</b>	SEW-EURODRIVE BY RybalkoStr. 26 BY-220033 Minsk	Tel. +375 17 298 47 56 / 298 47 58 Fax +375 17 298 47 54 http://www.sew.by sales@sew.by
Belgium			
<b>Assembly Sales Service</b>	<b>Brussels</b>	<b>SEW-EURODRIVE n.v./s.a.</b> Researchpark Haasrode 1060 Evenementenlaan 7 BE-3001 Leuven	Tel. +32 16 386-311 Fax +32 16 386-336 http://www.sew-eurodrive.be info@sew-eurodrive.be
<b>Service Competence Center</b>	<b>Industrial Gears</b>	<b>SEW-EURODRIVE n.v./s.a.</b> Rue de Parc Industriel, 31 BE-6900 Marche-en-Famenne	Tel. +32 84 219-878 Fax +32 84 219-879 http://www.sew-eurodrive.be service-wallonie@sew-eurodrive.be
Brazil			
<b>Production Sales Service</b>	<b>São Paulo</b>	SEW-EURODRIVE Brasil Ltda. Avenida Amâncio Gaiolli, 152 - Rodovia Presidente Dutra Km 208 Guarulhos - 07251-250 - SP SAT - SEW ATENDE - 0800 7700496	Tel. +55 11 2489-9133 Fax +55 11 2480-3328 http://www.sew-eurodrive.com.br sew@sew.com.br



Brazil			
Assembly Sales Service	Rio Claro	SEW-EURODRIVE Brasil Ltda. Rodovia Washington Luiz, Km 172 Condomínio Industrial Conpark Caixa Postal: 327 13501-600 – Rio Claro / SP	Tel. +55 19 3522-3100 Fax +55 19 3524-6653 montadora.rc@sew.com.br
	Joinville	SEW-EURODRIVE Brasil Ltda. Rua Dona Francisca, 12.346 – Pirabeiraba 89239-270 – Joinville / SC	Tel. +55 47 3027-6886 Fax +55 47 3027-6888 filial.sc@sew.com.br
	Indaiatuba	SEW-EURODRIVE Brasil Ltda. Estrada Municipal Jose Rubim, 205 Rodovia Santos Dumont Km 49 13347-510 - Indaiatuba / SP	Tel. +55 19 3835-8000 sew@sew.com.br
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Canada			
Assembly Sales Service	Toronto	SEW-EURODRIVE CO. OF CANADA LTD. 210 Walker Drive Bramalea, ON L6T 3W1	Tel. +1 905 791-1553 Fax +1 905 791-2999 <a href="http://www.sew-eurodrive.ca">http://www.sew-eurodrive.ca</a> l.watson@sew-eurodrive.ca
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China			
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	<b>Xi'An</b>	SEW-EURODRIVE (Xi'An) Co., Ltd. No. 12 Jinye 2nd Road Xi'An High-Technology Industrial Development Zone Xi'An 710065	Tel. +86 29 68686262 Fax +86 29 68686311 xian@sew-eurodrive.cn
Additional addresses for service in China provided on request!			
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		SEW-EURODRIVE CZ s.r.o. Lužná 591 16000 Praha 6 - Vokovice	
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Assembly Sales Service	Lahti	SEW-EURODRIVE OY Vesimäentie 4 FIN-15860 Hollola 2	Tel. +358 201 589-300 Fax +358 3 780-6211 http://www.sew-eurodrive.fi sew@sew.fi
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Gabon			
Sales	Libreville	ESG Electro Services Gabun Feu Rouge Lalala 1889 Libreville Gabun	Tel. +241 741059 Fax +241 741059 esg_services@yahoo.fr
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Assembly Sales Service	Normanton	SEW-EURODRIVE Ltd. Beckbridge Industrial Estate Normanton West Yorkshire WF6 1QR	Tel. +44 1924 893-855 Fax +44 1924 893-702 http://www.sew-eurodrive.co.uk info@sew-eurodrive.co.uk
	Drive Service Hotline / 24 Hour Service		Tel. 01924 896911
Greece			
Sales	Athens	Christ. Boznos & Son S.A. 12, K. Mavromichali Street P.O. Box 80136 GR-18545 Piraeus	Tel. +30 2 1042 251-34 Fax +30 2 1042 251-59 http://www.boznos.gr info@boznos.gr
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Assembly Sales Service	Hong Kong	SEW-EURODRIVE LTD. Unit No. 801-806, 8th Floor Hong Leong Industrial Complex No. 4, Wang Kwong Road Kowloon, Hong Kong	Tel. +852 36902200 Fax +852 36902211 contact@sew-eurodrive.hk
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India			
<b>Assembly Sales Service</b>	<b>Chennai</b>	SEW-EURODRIVE India Private Limited Plot No. K3/1, Sipcot Industrial Park Phase II Mambakkam Village Sriperumbudur - 602105 Kancheepuram Dist, Tamil Nadu	Tel. +91 44 37188888 Fax +91 44 37188811 saleschennai@seweurodriveindia.com
Ireland			
<b>Sales Service</b>	<b>Dublin</b>	Alpert Engineering Ltd. 48 Moyle Road Dublin Industrial Estate Glasnevin, Dublin 11	Tel. +353 1 830-6277 Fax +353 1 830-6458 info@alperton.ie http://www.alperton.ie
Israel			
<b>Sales</b>	<b>Tel-Aviv</b>	Liraz Handasa Ltd. Ahofer Str 34B / 228 58858 Holon	Tel. +972 3 5599511 Fax +972 3 5599512 http://www.liraz-handasa.co.il office@liraz-handasa.co.il
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Japan			
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Kazakhstan			
<b>Sales</b>	<b>Almaty</b>	ТОО "СЕВ-ЕВРОДРАЙВ" пр.Райымбека, 348 050061 г. Алматы Республика Казахстан	Тел. +7 (727) 334 1880 Факс +7 (727) 334 1881 http://www.sew-eurodrive.kz sew@sew-eurodrive.kz
Kenya			
<b>Sales</b>	<b>Nairobi</b>	Barico Maintenances Ltd Kamutaga Place Commercial Street Industrial Area P.O.BOX 52217 - 00200 Nairobi	Tel. +254 20 6537094/5 Fax +254 20 6537096 info@barico.co.ke
Latvia			
<b>Sales</b>	<b>Riga</b>	SIA Alas-Kuul Katlakalna 11C LV-1073 Riga	Tel. +371 6 7139253 Fax +371 6 7139386 http://www.alas-kuul.com info@alas-kuul.com





Lebanon			
Sales Lebanon	Beirut	Gabriel Acar & Fils sarl B. P. 80484 Bourj Hammoud, Beirut	Tel. +961 1 510 532 Fax +961 1 494 971 ssacar@inco.com.lb
		After Sales Service	service@medrives.com
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Sales	Swakopmund	DB Mining & Industrial Services Einstein Street Strauss Industrial Park Unit1 Swakopmund	Tel. +264 64 462 738 Fax +264 64 462 734 sales@dbmining.in.na



Netherlands			
<b>Assembly</b> <b>Sales</b> <b>Service</b>	<b>Rotterdam</b>	SEW-EURODRIVE B.V. Industrieweg 175 NL-3044 AS Rotterdam Postbus 10085 NL-3004 AB Rotterdam	Tel. +31 10 4463-700 Fax +31 10 4155-552 Service: 0800-SEWHELP <a href="http://www.sew-eurodrive.nl">http://www.sew-eurodrive.nl</a> <a href="mailto:info@sew-eurodrive.nl">info@sew-eurodrive.nl</a>
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<b>Assembly</b> <b>Sales</b> <b>Service</b>	<b>Auckland</b>	SEW-EURODRIVE NEW ZEALAND LTD. P.O. Box 58-428 82 Greenmount drive East Tamaki Auckland	Tel. +64 9 2745627 Fax +64 9 2740165 <a href="http://www.sew-eurodrive.co.nz">http://www.sew-eurodrive.co.nz</a> <a href="mailto:sales@sew-eurodrive.co.nz">sales@sew-eurodrive.co.nz</a>
	<b>Christchurch</b>	SEW-EURODRIVE NEW ZEALAND LTD. 10 Settlers Crescent, Ferryroad Christchurch	Tel. +64 3 384-6251 Fax +64 3 384-6455 <a href="mailto:sales@sew-eurodrive.co.nz">sales@sew-eurodrive.co.nz</a>
Norway			
<b>Assembly</b> <b>Sales</b> <b>Service</b>	<b>Moss</b>	SEW-EURODRIVE A/S Solgaard skog 71 N-1599 Moss	Tel. +47 69 24 10 20 Fax +47 69 24 10 40 <a href="http://www.sew-eurodrive.no">http://www.sew-eurodrive.no</a> <a href="mailto:sew@sew-eurodrive.no">sew@sew-eurodrive.no</a>
Pakistan			
<b>Sales</b>	<b>Karachi</b>	Industrial Power Drives Al-Fatah Chamber A/3, 1st Floor Central Commercial Area, Sultan Ahmed Shah Road, Block 7/8, Karachi	Tel. +92 21 452 9369 Fax +92-21-454 7365 <a href="mailto:seweurodrive@cyber.net.pk">seweurodrive@cyber.net.pk</a>
Peru			
<b>Assembly</b> <b>Sales</b> <b>Service</b>	<b>Lima</b>	SEW DEL PERU MOTORES REDUCTORES S.A.C. Los Calderos, 120-124 Urbanizacion Industrial Vulcano, ATE, Lima	Tel. +51 1 3495280 Fax +51 1 3493002 <a href="http://www.sew-eurodrive.com.pe">http://www.sew-eurodrive.com.pe</a> <a href="mailto:sewperu@sew-eurodrive.com.pe">sewperu@sew-eurodrive.com.pe</a>
Poland			
<b>Assembly</b> <b>Sales</b> <b>Service</b>	<b>Lodz</b>	SEW-EURODRIVE Polska Sp.z.o.o. ul. Techniczna 5 PL-92-518 Łódź	Tel. +48 42 676 53 00 Fax +48 42 676 53 49 <a href="http://www.sew-eurodrive.pl">http://www.sew-eurodrive.pl</a> <a href="mailto:sew@sew-eurodrive.pl">sew@sew-eurodrive.pl</a>
	<b>Service</b>	Tel. +48 42 6765332 / 42 6765343 Fax +48 42 6765346	Linia serwisowa Hotline 24H Tel. +48 602 739 739 (+48 602 SEW SEW) <a href="mailto:serwis@sew-eurodrive.pl">serwis@sew-eurodrive.pl</a>
Portugal			
<b>Assembly</b> <b>Sales</b> <b>Service</b>	<b>Coimbra</b>	SEW-EURODRIVE, LDA. Apartado 15 P-3050-901 Mealhada	Tel. +351 231 20 9670 Fax +351 231 20 3685 <a href="http://www.sew-eurodrive.pt">http://www.sew-eurodrive.pt</a> <a href="mailto:infosew@sew-eurodrive.pt">infosew@sew-eurodrive.pt</a>
Romania			
<b>Sales</b> <b>Service</b>	<b>Bucharest</b>	Sialco Trading SRL str. Madrid nr.4 011785 Bucuresti	Tel. +40 21 230-1328 Fax +40 21 230-7170 <a href="mailto:sialco@sialco.ro">sialco@sialco.ro</a>



<b>Russia</b>			
<b>Assembly</b> <b>Sales</b> <b>Service</b>	<b>St. Petersburg</b>	ZAO SEW-EURODRIVE P.O. Box 36 RUS-195220 St. Petersburg	Tel. +7 812 3332522 +7 812 5357142 Fax +7 812 3332523 <a href="http://www.sew-eurodrive.ru">http://www.sew-eurodrive.ru</a> <a href="mailto:sew@sew-eurodrive.ru">sew@sew-eurodrive.ru</a>
<b>Senegal</b>			
<b>Sales</b>	<b>Dakar</b>	SENEMECA Mécanique Générale Km 8, Route de Rufisque B.P. 3251, Dakar	Tel. +221 338 494 770 Fax +221 338 494 771 <a href="mailto:senemeca@sentoo.sn">senemeca@sentoo.sn</a> <a href="http://www.senemeca.com">http://www.senemeca.com</a>
<b>Serbia</b>			
<b>Sales</b>	<b>Beograd</b>	DIPAR d.o.o. Ustanicka 128a PC Košum, IV sprat SRB-11000 Beograd	Tel. +381 11 347 3244 / +381 11 288 0393 Fax +381 11 347 1337 <a href="mailto:office@dipar.rs">office@dipar.rs</a>
<b>Singapore</b>			
<b>Assembly</b> <b>Sales</b> <b>Service</b>	<b>Singapore</b>	SEW-EURODRIVE PTE. LTD. No 9, Tuas Drive 2 Jurong Industrial Estate Singapore 638644	Tel. +65 68621701 Fax +65 68612827 <a href="http://www.sew-eurodrive.com.sg">http://www.sew-eurodrive.com.sg</a> <a href="mailto:sewsingapore@sew-eurodrive.com">sewsingapore@sew-eurodrive.com</a>
<b>Slovakia</b>			
<b>Sales</b>	<b>Bratislava</b>	SEW-Eurodrive SK s.r.o. Rybničná 40 SK-831 06 Bratislava	Tel. +421 2 33595 202 Fax +421 2 33595 200 <a href="mailto:sew@sew-eurodrive.sk">sew@sew-eurodrive.sk</a> <a href="http://www.sew-eurodrive.sk">http://www.sew-eurodrive.sk</a>
	<b>Žilina</b>	SEW-Eurodrive SK s.r.o. Industry Park - PChZ ulica M.R.Štefánika 71 SK-010 01 Žilina	Tel. +421 41 700 2513 Fax +421 41 700 2514 <a href="mailto:sew@sew-eurodrive.sk">sew@sew-eurodrive.sk</a>
	<b>Banská Bystrica</b>	SEW-Eurodrive SK s.r.o. Rudlovská cesta 85 SK-974 11 Banská Bystrica	Tel. +421 48 414 6564 Fax +421 48 414 6566 <a href="mailto:sew@sew-eurodrive.sk">sew@sew-eurodrive.sk</a>
	<b>Košice</b>	SEW-Eurodrive SK s.r.o. Slovenská ulica 26 SK-040 01 Košice	Tel. +421 55 671 2245 Fax +421 55 671 2254 <a href="mailto:sew@sew-eurodrive.sk">sew@sew-eurodrive.sk</a>
<b>Slovenia</b>			
<b>Sales</b> <b>Service</b>	<b>Celje</b>	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 <a href="mailto:pakman@siol.net">pakman@siol.net</a>
<b>South Africa</b>			
<b>Assembly</b> <b>Sales</b> <b>Service</b>	<b>Johannesburg</b>	SEW-EURODRIVE (PROPRIETARY) LIMITED Eurodrive House Cnr. Adcock Ingram and Aerodrome Roads Aeroton Ext. 2 Johannesburg 2013 P.O.Box 90004 Bertsham 2013	Tel. +27 11 248-7000 Fax +27 11 494-3104 <a href="http://www.sew.co.za">http://www.sew.co.za</a> <a href="mailto:info@sew.co.za">info@sew.co.za</a>



South Africa			
	<b>Cape Town</b>	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 cfooster@sew.co.za
	<b>Durban</b>	SEW-EURODRIVE (PROPRIETARY) LIMITED 2 Monaco Place Pinetown Durban P.O. Box 10433, Ashwood 3605	Tel. +27 31 700-3451 Fax +27 31 700-3847 cdejager@sew.co.za
	<b>Nelspruit</b>	SEW-EURODRIVE (PTY) LTD. 7 Christie Crescent Vintonia P.O.Box 1942 Nelspruit 1200	Tel. +27 13 752-8007 Fax +27 13 752-8008 robermeyer@sew.co.za
South Korea			
<b>Assembly Sales Service</b>	<b>Ansan</b>	SEW-EURODRIVE KOREA CO., LTD. B 601-4, Banweol Industrial Estate #1048-4, Shingil-Dong, Danwon-Gu, Ansan-City, Kyunggi-Do Zip 425-839	Tel. +82 31 492-8051 Fax +82 31 492-8056 <a href="http://www.sew-korea.co.kr">http://www.sew-korea.co.kr</a> master.korea@sew-eurodrive.com
	<b>Busan</b>	SEW-EURODRIVE KOREA Co., Ltd. No. 1720 - 11, Songjeong - dong Gangseo-ku Busan 618-270	Tel. +82 51 832-0204 Fax +82 51 832-0230 master@sew-korea.co.kr
Spain			
<b>Assembly Sales Service</b>	<b>Bilbao</b>	SEW-EURODRIVE ESPAÑA, S.L. Parque Tecnológico, Edificio, 302 E-48170 Zamudio (Vizcaya)	Tel. +34 94 43184-70 Fax +34 94 43184-71 <a href="http://www.sew-eurodrive.es">http://www.sew-eurodrive.es</a> sew.spain@sew-eurodrive.es
Swaziland			
<b>Sales</b>	<b>Manzini</b>	C G Trading Co. (Pty) Ltd PO Box 2960 Manzini M200	Tel. +268 2 518 6343 Fax +268 2 518 5033 engineering@cgtrading.co.sz
Sweden			
<b>Assembly Sales Service</b>	<b>Jönköping</b>	SEW-EURODRIVE AB Gnejsvägen 6-8 S-55303 Jönköping Box 3100 S-55003 Jönköping	Tel. +46 36 3442 00 Fax +46 36 3442 80 <a href="http://www.sew-eurodrive.se">http://www.sew-eurodrive.se</a> jonkoping@sew.se
Switzerland			
<b>Assembly Sales Service</b>	<b>Basel</b>	Alfred Imhof A.G. Jurastrasse 10 CH-4142 Münchenstein bei Basel	Tel. +41 61 417 1717 Fax +41 61 417 1700 <a href="http://www.imhof-sew.ch">http://www.imhof-sew.ch</a> info@imhof-sew.ch
Thailand			
<b>Assembly Sales Service</b>	<b>Chonburi</b>	SEW-EURODRIVE (Thailand) Ltd. 700/456, Moo.7, Donhuaroh Muang Chonburi 20000	Tel. +66 38 454281 Fax +66 38 454288 sewthailand@sew-eurodrive.com



<b>Tunisia</b>			
<b>Sales</b>	<b>Tunis</b>	T. M.S. Technic Marketing Service Zone Industrielle Mghira 2 Lot No. 39 2082 Fouchana	Tel. +216 79 40 88 77 Fax +216 79 40 88 66 <a href="http://www.tms.com.tn">http://www.tms.com.tn</a> <a href="mailto:tms@tms.com.tn">tms@tms.com.tn</a>
<b>Turkey</b>			
<b>Assembly Sales Service</b>	<b>Istanbul</b>	SEW-EURODRIVE Hareket Sistemleri Sanayi Ticaret Limited Şirketi Gebze Organize Sanayi Bölgesi 400.Sokak No:401 TR-41480 Gebze KOCAELİ	Tel. +90-262-9991000-04 Fax +90-262-9991009 <a href="http://www.sew-eurodrive.com.tr">http://www.sew-eurodrive.com.tr</a> <a href="mailto:sew@sew-eurodrive.com.tr">sew@sew-eurodrive.com.tr</a>
<b>Ukraine</b>			
<b>Assembly Sales Service</b>	<b>Dnipropetrovsk</b>	ООО «СЕВ-Евродрайв» ул.Рабочая, 23-В, офис 409 49008 Днепропетровск	Тел. +380 56 370 3211 Факс. +380 56 372 2078 <a href="http://www.sew-eurodrive.ua">http://www.sew-eurodrive.ua</a> <a href="mailto:sew@sew-eurodrive.ua">sew@sew-eurodrive.ua</a>
<b>United Arab Emirates</b>			
<b>Sales Service</b>	<b>Sharjah</b>	Copam Middle East (FZC) Sharjah Airport International Free Zone P.O. Box 120709 Sharjah	Tel. +971 6 5578-488 Fax +971 6 5578-499 <a href="mailto:copam_me@eim.ae">copam_me@eim.ae</a>
<b>USA</b>			
<b>Production Assembly Sales Service</b>	<b>Southeast Region</b>	SEW-EURODRIVE INC. 1295 Old Spartanburg Highway P.O. Box 518 Lyman, S.C. 29365	Tel. +1 864 439-7537 Fax Sales +1 864 439-7830 Fax Manufacturing +1 864 439-9948 Fax Assembly +1 864 439-0566 Fax Confidential/HR +1 864 949-5557 <a href="http://www.seweurodrive.com">http://www.seweurodrive.com</a> <a href="mailto:cslyman@seweurodrive.com">cslyman@seweurodrive.com</a>
<b>Assembly Sales Service</b>	<b>Northeast Region</b>	SEW-EURODRIVE INC. Pureland Ind. Complex 2107 High Hill Road, P.O. Box 481 Bridgeport, New Jersey 08014	Tel. +1 856 467-2277 Fax +1 856 845-3179 <a href="mailto:csbridgeport@seweurodrive.com">csbridgeport@seweurodrive.com</a>
	<b>Midwest Region</b>	SEW-EURODRIVE INC. 2001 West Main Street Troy, Ohio 45373	Tel. +1 937 335-0036 Fax +1 937 332-0038 <a href="mailto:cstroy@seweurodrive.com">cstroy@seweurodrive.com</a>
	<b>Southwest Region</b>	SEW-EURODRIVE INC. 3950 Platinum Way Dallas, Texas 75237	Tel. +1 214 330-4824 Fax +1 214 330-4724 <a href="mailto:csdallas@seweurodrive.com">csdallas@seweurodrive.com</a>
	<b>Western Region</b>	SEW-EURODRIVE INC. 30599 San Antonio St. Hayward, CA 94544	Tel. +1 510 487-3560 Fax +1 510 487-6433 <a href="mailto:cshayward@seweurodrive.com">cshayward@seweurodrive.com</a>
Additional addresses for service in the USA provided on request!			
<b>Venezuela</b>			
<b>Assembly Sales Service</b>	<b>Valencia</b>	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 <a href="http://www.sew-eurodrive.com.ve">http://www.sew-eurodrive.com.ve</a> <a href="mailto:ventas@sew-eurodrive.com.ve">ventas@sew-eurodrive.com.ve</a> <a href="mailto:sewfinanzas@cantv.net">sewfinanzas@cantv.net</a>



Vietnam			
Sales	Ho Chi Minh City	<b>All sectors except harbor, steel, coal power and offshore:</b> Nam Trung Co., Ltd 250 Binh Duong Avenue, Thu Dau Mot Town, Binh Duong Province HCM office: 91 Tran Minh Quyen Street District 10, Ho Chi Minh City	Tel. +84 8 8301026 Fax +84 8 8392223 namtrungco@hcm.vnn.vn truongtantam@namtrung.com.vn khanh-nguyen@namtrung.com.vn
		<b>Harbor and offshore:</b> DUC VIET INT LTD Industrial Trading and Engineering Services A75/6B/12 Bach Dang Street, Ward 02, Tan Binh District, 70000 Ho Chi Minh City	Tel. +84 8 62969 609 Fax +84 8 62938 842 totien@ducvietint.com
		<b>Coal power and steel:</b> Thanh Phat Co Ltd DMC Building, L11-L12, Ward3, Binh Thanh Dist, Ho Chi Minh City	Tel. +84 835170381 Fax +84 835170382 sales@thanh-phat.com
	Hanoi	Nam Trung Co., Ltd R.205B Tung Duc Building 22 Lang ha Street Dong Da District, Hanoi City	Tel. +84 4 37730342 Fax +84 4 37762445 namtrunghn@hn.vnn.vn
Zambia			
Sales	Kitwe	EC Mining Limited Plots No. 5293 & 5294, Tangaanyika Road, Off Mutentemuko Road, Heavy Industrial Park, P.O.BOX 2337 Kitwe	Tel. +260 212 210 642 Fax +260 212 210 645 sales@ecmining.com http://www.ecmining.com



## Index

### A

Absolute encoder removal .....	60
Accessory equipment.....	48
Additional features .....	19
Mechanics.....	30
Overview .....	17
Altitude, installation .....	38
Ambient conditions.....	38
Ambient temperature .....	38
Hazardous radiation.....	38
Assembly	
Encoder mounting adapter XV.A .....	28
Assembly, conditions .....	22
Axial load, permitted .....	86

### B

Backstop RS .....	54
Lubrication .....	56
Bearing lubrication .....	59
Belt pulleys.....	26
BE05 – BE2 .....	71
BE1 – BE11 .....	72
BE20 .....	73
BE30 – BE32 .....	74
Blocking direction change .....	54
Brake	
BE05 – BE2 .....	71
BE1 – BE11 .....	72
BE20 .....	73
BE30 – BE32 .....	74
BE.. .....	104
Braking torques.....	96
Braking work .....	96
Working air gap.....	96
Brake connection .....	47
Brake control.....	33, 47
BG .....	117
BGE .....	117
BSG .....	117
Control cabinet.....	103
Motor wiring space.....	102
Brake control system.....	102
Brake malfunctions .....	111
Brakemotor inspection	
EDR.71 – EDR.225.....	69

### Brakemotor structure

EDR.160 – EDR.225.....	68
EDR.71 – EDR.80.....	66
EDR.90 – EDR.132.....	67
Braking torques.....	95, 96
Braking work .....	96

### C

Cable entries.....	32
Canopy .....	26
Changing the brake spring	
BE05 – BE32 .....	79
Changing the braking torque	
BE05-BE32 .....	79
Changing the magnet	
BE05 – BE32 .....	81
Class.....	20
Cleaning.....	58
Connect the motor .....	41
Connection	
Cable .....	59
Copyright .....	6
Counterbores .....	32
Customer service.....	112

### D

Degree of protection .....	58
Delta connection	
R13 .....	113
R72 .....	114
Designated use.....	8
Direction of rotation of the motor .....	55
Disposal .....	112
Drying the motor .....	23
Dust .....	38
Duty types.....	51

### E

Electrical connection.....	11
Electrical installation .....	32
Embedded safety notes .....	5
EMC.....	34
Encoder	
Non-SEW encoder mounting .....	27
Encoder mounting adapter .....	28



## Index

Encoder removal .....	60	Lubricant table .....	106
EV., AV.. and XV.....	60	Lubrication	
EV., AV.. and XV.....	60	Bearing .....	59
Environmental impact.....	38	<b>M</b>	
Equipment, accessory.....	48	Maintenance .....	57
Equipotential bonding .....	32	Maintenance intervals.....	59
Extended fan guard.....	30, 31	Malfunctions.....	108
Extended storage .....	23	Mark, nameplate .....	107
<b>F</b>		Mechanical attachments .....	18
Features, additional .....	17	Mechanical installation.....	22
<b>G</b>		Monitoring .....	40
Gas .....	38	Motor	
Gaskets .....	38	Connection.....	41
General safety notes.....	7	Drying .....	23
Grounding .....	34	For hazardous locations .....	39
<b>H</b>		Installation.....	25
Hazardous locations .....	20	Long-term storage .....	23
Hazardous locations, designation .....	20	Motor and brake maintenance – preliminary work.....	60
<b>I</b>		Motor bearing.....	59
Improving the grounding .....	34	Motor inspection	
Incremental encoder removal.....	60	EDR.71 – EDR.225.....	64
EV., AV.. and XV.....	60	Motor malfunctions .....	109
Input elements, assembly .....	27	Motor protection.....	39, 116
Inspection.....	57	Motor protection switch.....	39
Inspection intervals .....	59	TF .....	116
Installation.....	10, 25	TH.....	116
Electrical .....	32	Motor protection device .....	33
In damp locations or in the open.....	26	Motor protection switch.....	39, 40
Mechanical.....	22	Motor structure.....	12
Tolerances .....	27	DR.160-DR.180 .....	13, 62
Installation altitude .....	38	EDR.200 – EDR.225.....	14, 63
Installation regulations .....	32	EDR.71 – EDR.132.....	12, 61
Installation tolerances .....	27	Motors for hazardous locations.....	19
Insulation resistance .....	23	Mounting adapter.....	28
Intervals for inspection and maintenance.....	59	XV.A.....	60
Isolation transformer .....	23	<b>N</b>	
<b>K</b>		Nameplate .....	15
KS corrosion protection.....	59	Mark.....	107
KTY84-130 .....	49	Non-SEW encoder mounting .....	27
<b>L</b>		Notes	
Low-voltage equipment.....	32	Designation in the documentation .....	5
		<b>O</b>	
		Oil seals .....	57
		Operating currents .....	98
		Options .....	17





Other applicable documentation .....	9	Spare parts .....	58
Output variants .....	17	Special aspects in switching operation .....	33
Overhung load, permitted .....	86	Special design .....	22
		Special encoder removal .....	60
<b>P</b>		Star connection	
Pictograms on the motor .....	9	R13 .....	113
Positive temperature coefficient thermistor .....	40	R76 .....	115
Product names .....	6	Startup .....	52
Project planning information		Stickers on the motor .....	9
Overhung load .....	86	Storage, long-term .....	23
Project planning notes		Structure	
Axial load .....	86	Brakemotor .....	66, 67, 68
Protection device .....	40	EDR.160 – EDR.180 .....	13, 62
Protection type .....	20	EDR.160 – EDR.225 with BE .....	68
Protective cover .....	31	EDR.200 – EDR.225 .....	14, 63
PT100 .....	50	EDR.71 – EDR.132 .....	12, 61
		EDR.71 – EDR.80 with BE .....	66
<b>R</b>		EDR.90 – EDR.132 with BE .....	67
Repairs .....	57	Motor .....	12, 13, 14, 61, 62, 63
Replacing the brake		Supply of cooling air .....	26
EDR.71 – EDR.80 .....	83	Surface temperature .....	39
EDR.90 – EDR.225 .....	84	Switching contacts .....	52
Replacing the brake disk		Switching operation .....	33
BE05 – BE32 .....	77	Symbols on the motor .....	9
Resistance measurement of the brake .....	101		
Resistances .....	100	<b>T</b>	
Restart .....	57	Tapped holes .....	32
Rolling bearing types .....	105	Technical data .....	86
RS .....	54	Mounting device .....	107
		Temperature .....	38
<b>S</b>		Temperature class .....	21
Safety Notes		Temperature classes .....	39
Structure of the embedded .....	5	Temperature sensor KTY84-130 .....	49
Safety notes .....	7	Temperature sensor PT100 .....	50
Designated use .....	8	Temperature sensor / temperature detection .....	18
Designation in the documentation .....	5	Terminal box	
Electrical connection .....	11	Tightening torques .....	29
General information .....	7	Test report .....	57
Installation .....	10	TF .....	48, 116
Operation .....	11	TF temperature sensor .....	40, 48
Structure of the section safety notes .....	5	TH .....	116
Transport .....	10	Tightening torques of the terminal box .....	29
Section safety notes .....	5	Trademarks .....	6
Shaft end, second .....	30, 31	Transport .....	10
Signal words in safety notes .....	5	Type designation .....	16
		Temperature detection .....	18



Type designation EDR	Wiring diagrams .....	113
Mechanical additions .....	BG .....	117
Motor series .....	BGE .....	117
Motors for hazardous locations .....	BSG .....	118
Other additional features .....	Delta connection R13 .....	113, 114
Output variants .....	Star connection	
Temperature sensor and temperature detection .....	R13113	
Ventilation .....	Star connection R76 .....	115
	Wiring diagrams TF .....	116
<b>V</b>	Wiring diagrams TH .....	116
Vapor .....	Work done, BE brake .....	104
Ventilation .....	Working air gap .....	96
	Setting BE05 – BE32 .....	75
<b>W</b>		
Warning notes on the motor .....	<b>X</b>	
Wear .....	XV.A .....	28





**SEW-EURODRIVE**  
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**EURODRIVE**

SEW-EURODRIVE GmbH & Co KG  
P.O. Box 3023  
D-76642 Bruchsal/Germany  
Phone +49 7251 75-0  
Fax +49 7251 75-1970  
sew@sew-eurodrive.com

→ [www.sew-eurodrive.com](http://www.sew-eurodrive.com)