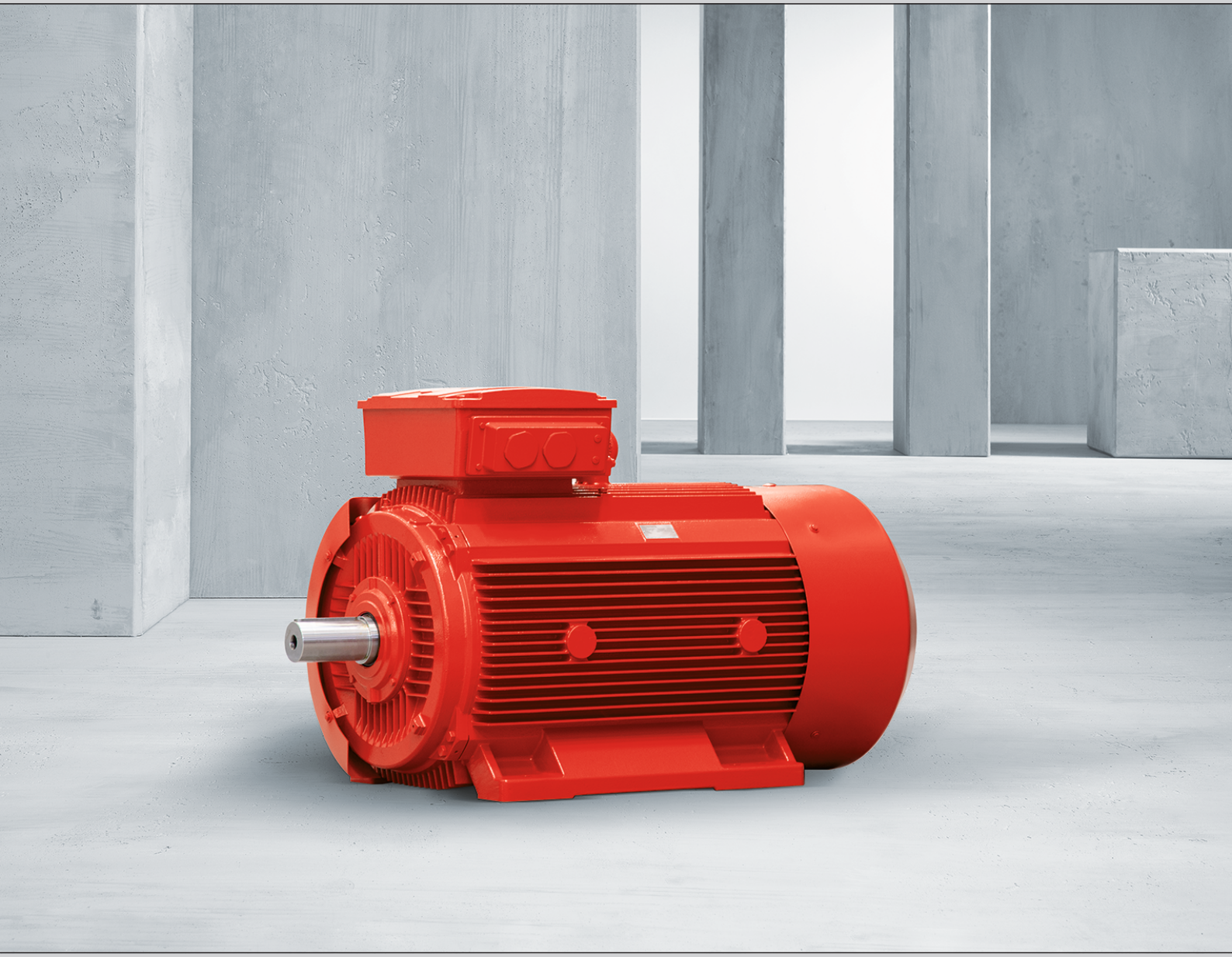
SEW EURODRIVE

Operating Instructions



AC Motors

DRN355 / DRU355

Edition 10/2022

27799263/EN

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1 General information

1.1 About this documentation

The documentation at hand is the original.

This documentation is an integral part of the product. The documentation is intended for all employees who perform work on the product.

Make sure this documentation is accessible and legible. Ensure that persons responsible for the systems and their operation as well as persons who work on the product independently 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:

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

1.2.2 Structure of section-related safety notes

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

This is the formal structure of a safety note for a specific section:

SIGNAL WORD

Type and source of hazard.

Possible consequence(s) if disregarded.

- Measure(s) to prevent the hazard.

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Meaning of the hazard symbols

The hazard symbols in the safety notes have the following meaning:

Hazard symbol	Meaning
	General hazard
	Warning of dangerous electrical voltage
	Warning of hot surfaces
	Warning of automatic restart

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1.3 Rights to claim under limited warranty

Read the information in this documentation. This is essential for fault-free operation and fulfillment of any rights to claim under limited warranty. Read the documentation before you start working with the product.

1.4 Product names and trademarks

The brands and product names in this documentation are trademarks or registered trademarks of their respective titleholders.

1.5 Copyright notice

1.6 Other applicable documentation

Observe the corresponding documentation for all additional components.

1.6.1 DRN355 / DRU355 AC motors

Also observe the following publications and documents:

- Wiring diagrams provided with the motor
- AC motors catalogs

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2 Safety notes

2.1 Preliminary information

The following general safety notes serve the purpose of preventing injury to persons and damage to property. They primarily apply to the use of products described in this documentation. If you use additional components, also observe the relevant warning and safety notes.

2.2 Duties of the user

As the user, you must ensure that the basic safety notes are observed and complied with. Make sure that persons responsible for the machinery and its operation as well as persons who work on the device independently have read through the documentation carefully and understood it.

As the user, you must ensure that all of the work listed in the following is carried out only by qualified specialists:

- Setup and installation
- Installation and connection
- Startup
- Maintenance and repairs
- Shutdown
- Disassembly

Ensure that the persons who work on the product pay attention to the following regulations, conditions, documentation, and information:

- National and regional safety and accident prevention regulations
- Warning and safety signs on the product
- All other relevant project planning documents, installation and startup instructions, and wiring diagrams
- Do not assemble, install or operate damaged products
- All system-specific specifications and conditions

Ensure that systems in which the product is installed are equipped with additional monitoring and protection devices. Observe the applicable safety regulations and legislation governing technical work equipment and accident prevention regulations.

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2.3 Target group

Specialist for mechanical work

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

- Qualifications in the field of mechanics in accordance with the national regulations
- Familiarity with this documentation

Specialist for electrotechnical work

Any electrotechnical work may be performed only by electrically skilled persons with a suitable education. Electrically skilled persons in the context of this documentation are persons who are familiar with electrical installation, startup, troubleshooting, and maintenance of the product, and who possess the following qualifications:

- Qualifications in the field of electrical engineering in accordance with the national regulations
- Familiarity with this documentation

Additional qualifications

In addition to that, these persons must be familiar with the valid safety regulations and laws, as well as with the requirements of the standards, directives, and laws specified in this documentation.

The persons must have the express authorization of the company to operate, program, parameterize, label, and ground devices, systems, and circuits in accordance with the standards of safety technology.

Instructed persons

All work in the areas of transportation, storage, operation and waste disposal must be carried out by persons who are trained appropriately. The purpose of the training is to give persons the ability to perform the required tasks and work steps in a safe and correct manner.

2.4 Designated use

The product is intended for use in industrial and commercial systems.

In the case of installation in electrical systems or machines, it is prohibited to start the proper operation of the product until it is determined that the machine meets the requirements stipulated in the local laws and directives.

The standards given in the declaration of conformity apply to the product.

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2.5 Transportation/storage

Inspect the shipment for damage as soon as you receive the delivery. Inform the shipping company immediately about any damage. If the product is damaged, it must not be assembled, installed or started up.

The lifting eyebolts are designed to carry only the weight of the motor without gear unit. Tighten installed lifting eyebolts. Mounted gear units have separate suspension attachments, which must be used according to the gear unit operating instructions when lifting the gearmotor. Do not mount any additional loads.

The installed lifting eyebolts are in accordance with DIN 580. Observe the loads and regulations specified there. The tension force vector of the slings must not exceed a 45° angle in accordance with DIN 580.

If necessary, use suitable, sufficiently dimensioned handling equipment.

Observe the following notes when transporting the device:

- Always use all attachment points if available. The attachment points are designed to carry only the mass of the product. Severe or fatal injuries. Do not apply any additional loads.
- Ensure that the product is not subject to mechanical impact.

If the product is not immediately installed, it must be stored in a dry and dust-free location. The product can be stored for up to 9 months without requiring any special measures before startup. Do not store the product outdoors.

Do not transport or store the product on the fan guard.

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2.6 Installation/assembly

Note the following points during installation:

- Make sure that the supports are even, the foot and flange mounting is correct and if there is direct coupling, align with precision.
- Avoid resonance between the rotational frequency and the double supply system frequency.
- Release the brake (for motors with mounted brake).
- Turn the rotor by hand and listen for unusual grinding noise.
- Check the direction of rotation in decoupled state.
- Only install or remove belt pulleys and couplings using suitable devices (heat up). Cover the belt pulleys and couplings with a touch guard. Avoid unacceptable belt tension.
- Establish any necessary pipe connections.
- Mounting positions with the shaft end pointing upward must be equipped with a cover to prevent foreign objects from falling into the fan. Ensure that ventilation openings are not obstructed and that used air cannot be drawn in again straight away. The same applies to air from adjacent units.

See also the information in chapter "Mechanical installation" (→ 🗎 22).

2.6.1 Restrictions of use

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

- Use in potentially explosive atmospheres
- Use in areas exposed to harmful oils, acids, gases, vapors, dust, and radiation

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2.7 Electrical work

2.7.1 Carrying out electrical work safely

Observe the following information to carry out electrical work safely during installation and maintenance:

- Electrical work may only be carried out by electrically skilled persons.
- Always adhere to the 5 safety rules for working on electrical components:
  - Disconnect
  - Secure the drive against restart
  - Check that no voltage is applied
  - Ground and short-circuit it
  - Cover or safeguard neighboring live parts
- When the device is switched on, dangerous voltages are present at all power connections as well as at any connected cables and terminals. This also applies even when the product is inhibited and the motor is at standstill.

2.7.2 Electrical connection

Exceeding the stated tolerances in EN 60034-1 (VDE 0530, Part 1) – voltage ± 5%, frequency ± 2%, curve shape, symmetry – increases the heating and influences electromagnetic compatibility. Adhere to the standard EN 50110. Observe other applicable national regulations, such as DIN VDE 0105 for Germany.

Observe the wiring information and differing data on the nameplate as well as the provided wiring diagram.

The connection must be a permanently secure electrical connection (no protruding wire ends). Use the corresponding cable end equipment. Establish a safe PE connection. When the motor is connected, the distances to non-insulated and live parts must not be shorter than the minimum values according to IEC 60664 and national regulations. With low voltage, the distances should be no shorter than the following values, in compliance with IEC 60664:

Nominal voltage V_N	Distance
≤ 500 V	3 mm
≤ 690 V	5.5 mm

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

Secure the key(s) for the test run without output elements.

When operating low-voltage machines with brakes, check that the brake is functioning properly before startup.

Observe the notes in chapter "Electrical installation".

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2.8 Startup/operation

Risk of burns: The surface temperature of the product can exceed 60 °C during operation. Do not touch the product during operation. Let the product cool down before touching it.

Do not deactivate monitoring and protection devices of the machine or system, even for a test run.

Depending on the degree of protection, products may have live, uninsulated, and sometimes moving or rotating parts as well as hot surfaces during operation.

Make sure that any existing transport protection is removed.

In the event of deviations from normal operation, switch the product off. Possible deviations are increased temperatures, noise, or vibration, for example. Determine the cause. Contact SEW-EURODRIVE if necessary.

Ensure that the terminal box is closed and screwed down before applying the supply voltage.

Additional preventive measures may be required for applications with increased hazard potential. Be sure to check the effectiveness of the protection devices after every modification.

Mechanical blocking or internal protective functions of the product can cause a motor standstill. Removing the cause of this problem can result in the drive re-starting. Disconnect the product from the power supply before you start with troubleshooting.

Overheating of motors with backstop /RS

With low motor speeds, the centrifugal forces are so low that the backstop sprags brush against the inner and outer ring. This causes overheating of the friction surfaces.

- Do not permanently operate motors with backstop /RS below lift-off speed.

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3 Motor structure

3.1 Basic structure

The following figures are schematic representations. Motor size and design may cause deviations.

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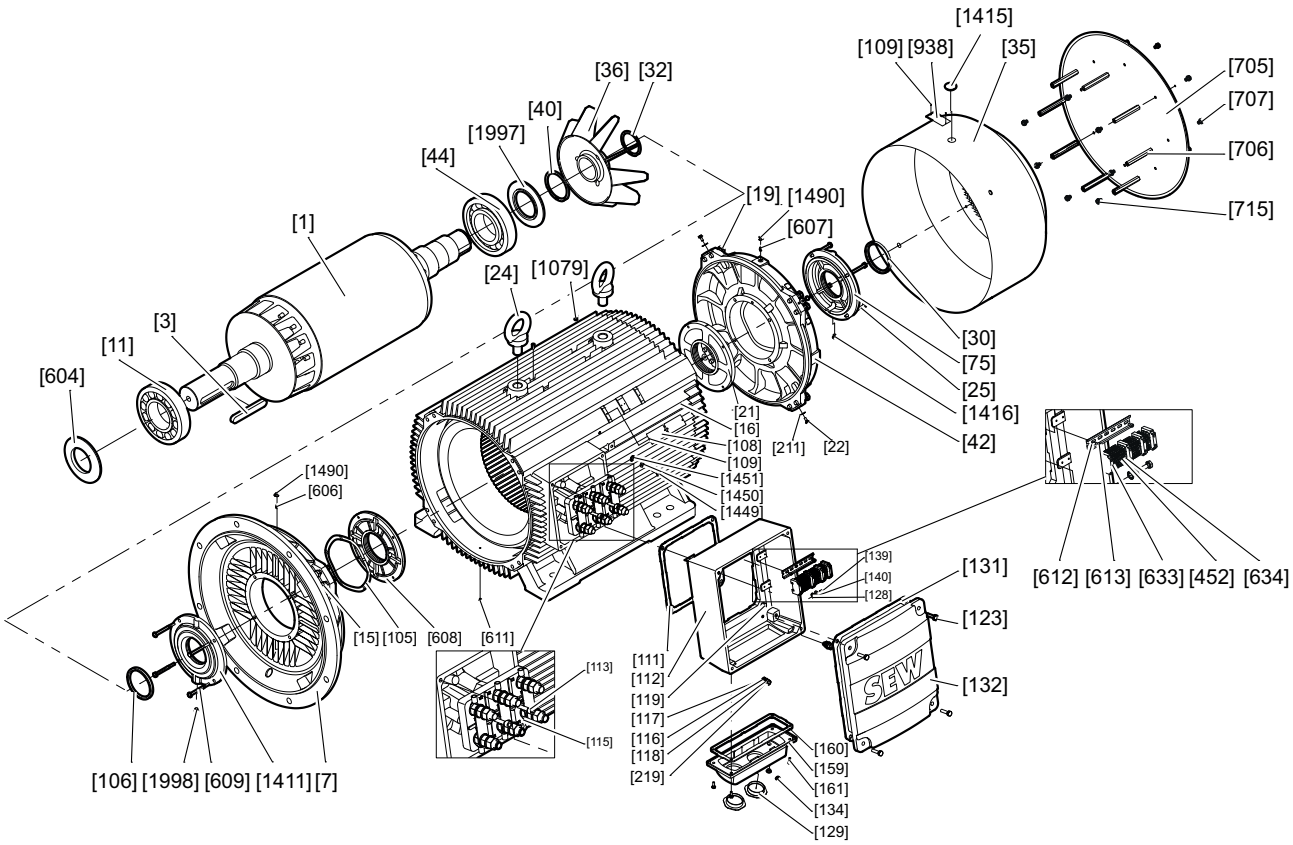
3.2 Basic structure of DRN355 / DRU355 motors



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[1]	Rotor	[75]	Bearing cover	[134]	Screw plug	[634]	End plate
[3]	Key	[105]	Equalizing ring	[139]	Hex head screw	[705]	Canopy
[7]	Flange	[106]	Oil seal	[140]	Washer	[706]	Spacer bolt
[11]	Deep groove ball bearing	[108]	Nameplate	[159]	Connection piece	[707]	Hex head screw
[15]	Cap screw	[109]	Grooved pin	[160]	Seal for connection piece	[715]	Hex head screw
[16]	Stator	[111]	Gasket for lower part	[161]	Hex head screw	[938]	Adhesive label
[19]	Hex head screw	[112]	Terminal box lower part	[211]	Washer	[1079]	Dowel pin
[21]	Oil seal flange	[113]	Pan head screw	[219]	Hex nut	[1411]	Bearing cover
[22]	Hex head screw	[115]	Terminal board	[452]	Terminal strip	[1415]	Closing plug
[24]	Lifting eyebolt	[116]	Serrated lock washer	[604]	Lubrication ring	[1416]	Screw plug
[25]	Hex head screw	[117]	Stud	[606]	Grease nipple	[1449]	Hex head screw
[30]	Oil seal	[118]	Washer	[607]	Grease nipple	[1450]	Washer
[32]	Retaining ring	[119]	Hex head screw	[608]	Oil seal flange	[1451]	Serrated lock washer
[35]	Fan guard	[123]	Hex head screw	[609]	Hex head screw	[1490]	Protection cap
[36]	Fan	[128]	Serrated lock washer	[611]	Condensation plug	[1997]	Lubrication ring
[40]	Retaining ring	[129]	Screw plug	[612]	Mounting rail	[1998]	Screw plug
[42]	Rear endshield	[131]	Gasket for cover	[613]	Cap screw		
[44]	Deep groove ball bearing	[131]	Terminal box cover	[633]	End bracket		

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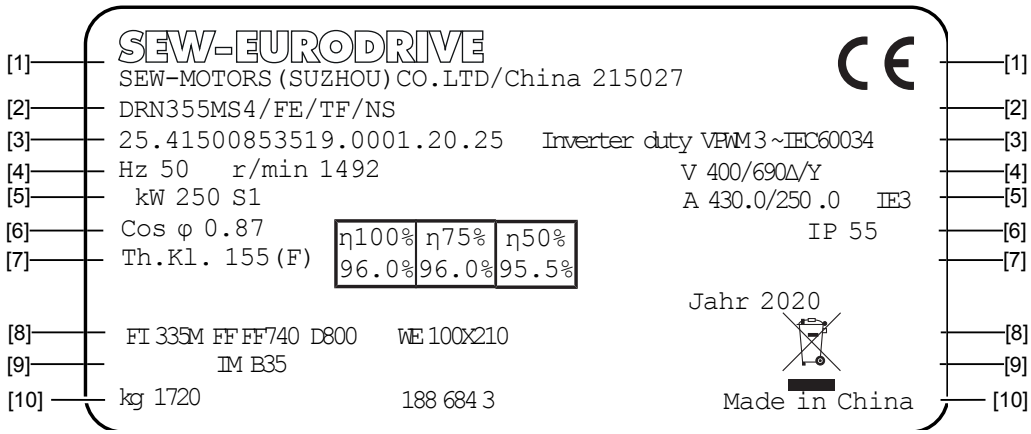
3.3 Nameplate

3.3.1 Nameplate for DRN355 / DRU355 motors

The following figure shows an example of a nameplate:



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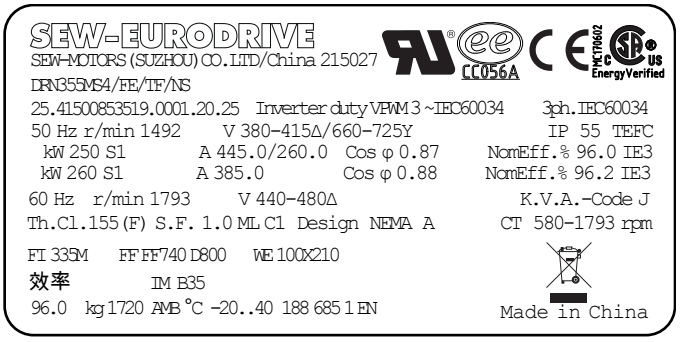
Line	Information
[1]	• Manufacturer, address • CE label
[2]	• Type designation
[3]	• Serial number • Suitability for inverter operation • Number of phases and underlying rating and performance standards (EN/IEC 60034-X and/or equivalent national standard)
[4]	• Rated frequency • Rated speed • Nominal voltage
[5]	• Rated power and operating mode • Rated current • IE class
[6]	• Power factor • Degree of protection according to IEC 60034-5
[7]	• Thermal class • Rated efficiency for motors included in the validity of the IEC 60034-30-1 standard
[8]	• Flange • Shaft end
[9]	• Mounting position
[10]	• Weight • Part number nameplate • Country of manufacture

3.3.2 DRN.. global motor nameplate



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3.3.3 Markings

The following table lists all the markings that can be provided on a nameplate, and an explanation of what they mean:

CE	CE mark to state compliance with European Directives (see EC declaration of conformity).
UR	UR logo to confirm that UL (Underwriters Laboratory) is informed about the registered components; register number by UL: E189357
CC056A	DoE mark to confirm compliance with US-American efficiency limit values for AC motors.
MC170602 C SA® US Energy Verified	CSAe mark to confirm compliance with the Canadian efficiency limit values for AC motors.
EAC	EAC mark (EurAsian Conformity) Confirms compliance with the technical regulations of the economic and customs union of Russia, Belarus, Kazakhstan, Armenia.
UK CA	The UKCA mark states the compliance with British guidelines.
	CMIM logo to confirm compliance with technical regulations of the country Morocco.
NOM	Confirms compliance with the official Mexican standard NOM-016-ENER-2016, energy efficiency of AC induction motors.
中国能效标识 CHINA ENERGY LABEL DRN90L4 1.5 kW	CEL mark to represent the energy efficiency in the Chinese grade classification.

RENDIMENTO E FATOR DE POTÊNCIA APROVADOS PELO INMETRO PROCEL NBR - 17094-1 INMETRO Registro INMETRO no: 005431/2015	ENCE mark (Brazil) Confirmation of compliance with the Brazilian efficiency limit values for AC motors.

3.3.4 Serial number

The following table shows the structure of a serial number:

Example: 01. 12212343 01. 0001. 21	
01.	Sales organization
12212343	Order number (8 digits)
01.	Order item (2 digits)
0001	Running unit no./copy number (4 digits)
21	End digits of the year of manufacture (2 digits)

3.4 Type designation

The following table shows the structure of a motor type designation:

DRN355M4/FI/TF/NS	
DR	Product family
N	Code for product line identification
355M	Size
4	Number of poles
/FI	Output option
/TF	Thermal motor protection
/NS	Relubrication device

3.4.1 Designation of the motors

Designation	
DRN..	Energy-efficient motor, Premium Efficiency IE3
DRU..	Energy-efficient motor, Super Premium Efficiency IE4
355	Nominal sizes: 355
MS, M, ML	Lengths
Q, R	Power designation (identification of motors with the same size but with different power)
4	Number of poles

3.5 Designs and options

3.5.1 Output variants

Designation	Description
/FI	IEC foot-mounted motor
/FF	IEC flange-mounted motor with bore
/FE	IEC flange-mounted motor with bore and IEC feet

3.5.2 Temperature sensor / temperature detection

Designation	Description
/TF	Temperature sensor (PTC thermistor or PTC resistor)
/TH	Thermostat (bimetallic switch)
/PT	1 or 3 PT100 sensor(s)
/PK	PT1000 temperature sensor

3.5.3 Encoder

Designation	Description
/EK8S, /EK8R, /EK8C	Incremental encoder
/AK8Y, /AK8W, /AK8H	Multi-turn absolute encoder

3.5.4 Ventilation

Designation	Description
/V	Forced cooling fan
/AL	Aluminum fan
/C	Canopy for fan guard

3.5.5 Bearings

Designation	Description
/NS	Relubrication device
/ERF	Reinforced bearings at A-side with cylindrical roller bearing
/NIB	Current-insulated rolling bearings at B-side

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3.5.6 Other additional features

Designation	Description
/DH	Condensation drain hole
/RI	Reinforced winding insulation
/RI2	Reinforced winding insulation with increased resistance against partial discharge
/2W	2nd shaft end on the motor/brakemotor

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4 Mechanical installation

4.1 Before you start

INFORMATION

Observe the safety notes in chapter 2 of this documentation for the mechanical installation.

INFORMATION

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

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

- The specifications on the nameplate of the drive correspond to the supply system or the output voltage of the inverter.
- The drive is undamaged (no damage caused by transportation or storage).
- All transport protection has been removed.
- The following provisions are met:
  - Ambient temperature as specified on the nameplate.

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

    Also observe the deviating information on the nameplate.
  - The drive must not be exposed to oils, acids, gases, vapors, radiation, etc. Otherwise, the drive needs to be explicitly designed for these ambient conditions.
  - The installation altitude is max. 1000 m above sea level.

    Observe the section "Designated use" in chapter 2.
  - Make sure all mounted options (such as encoders or brakes) are suitable for the ambient conditions.

The aforementioned information refers to standard orders. The conditions might be different when you order drives other than the standard. Refer to the order confirmation for deviating conditions.

Functional safety

If the drive has the FS logo on the nameplate, observe the information on mechanical installation in the corresponding addendum to the operating instructions.

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4.2 Preliminary work after longer periods of storage

Depending on the duration and ambient conditions during storage, corrosion, aging of lubricants, embrittlement of sealing elements, and moisture absorption in the insulation can occur.

Perform the measures described below on any drives that have been stored for longer than 9 months.

Corrosion

1. Check for damage to the motor and/or components (coating, shafts, connection and fastening parts).
2. Correct the corrosion damage.

Embrittlement of seals

3. Visually inspect seals and look for fissures, hardening, and embrittlement.
4. Replace any damaged seals.

Reduced grease service life

If the drives are stored for longer than a year, the service life of the bearing grease is reduced due to aging and de-oiling of the lubricant.

5. Check the condition and usability of the rolling bearings.
6. Replace any damaged rolling bearings.

Reduced grease quantity

7. If motors with relubrication devices are stored for longer than 5 years, relubricate the motor as specified on the lubrication plate.

Moisture absorption

8. Check to see that the wiring space of the motor is dry and clean.
9. Remove moisture and dirt.
10. If the motor has absorbed moisture, measure the insulation resistance (see chapter "Measuring the insulation resistance" (→ 🗎 24)) and dry the motor (see chapter "Drying the motor" (→ 🗎 25)).

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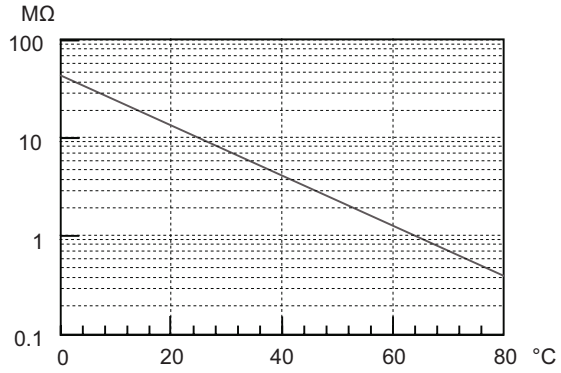
4.2.1 Measuring the insulation resistance

The insulation resistance (see following figure) varies greatly depending on the temperature.

If the measured resistance is within the range of the limit characteristic curve (depending on the ambient temperature), the insulation resistance is sufficient. If the value is below the limit characteristic curve, dry the motor.



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4.2.2 Drying the motor

Use either warm air or an isolation transformer to dry the motor.

INFORMATION

The motors of size 56 and DR..J motors must be dried only by warm air.

⚠ WARNING

Risk of crushing due to torque at the motor shaft.

Severe or fatal injuries.

- Only use warm air for drying DR..J motors.

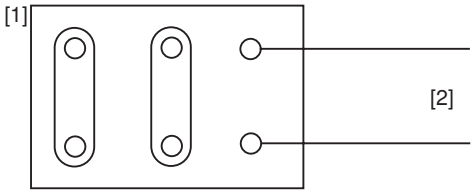
Drying the motor with warm air

1. Dry the motor with warm air.
2. End the drying process when the minimum insulation resistance is exceeded.

Drying the motor with an isolation transformer

1. Connect the windings in series.
2. Auxiliary AC voltage supply max. 10% of the nominal voltage with max. 20% of the rated current.

Connect the windings in series: Wiring diagram R13



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[1] Motor terminal board [2] Transformer

4.3 Motor installation notes

⚠ CAUTION

Sharp edges due to open keyway.

Risk of cutting injuries.

- Insert the key into the keyway.
- Pull a protective tubing over the shaft.

NOTICE

Improper assembly may damage the drive and corresponding components.

The drive system might be damaged.

- Observe the following information.

- Remove any anti-corrosion agent and dirt from motor shaft ends and flange surfaces. Use a commercially available solvent. Do not allow the solvent to come in contact with the bearings or sealing rings.
- Only install the stand-alone motor/gearmotor in the specified mounting position on a level, vibration-free and torsionally rigid support structure.
- The mounting position for installation must correspond with the specifications on the nameplate.
- Make sure that there is sufficient clearance around the motor to provide an adequate cooling air supply, and that the motor does not draw in warm exhaust air from other units.
- 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.
- Use an appropriate cover, e.g. option /C "Canopy", to prevent objects or fluids entering motors in vertical mounting positions (M4/V1).
- Balance components for subsequent mounting on the shaft with a half key (motor shafts are balanced with a half key).
- Existing condensation drain holes are sealed with closing plugs. If contaminated, the condensation drain holes must be checked for proper functionality on a regular basis and cleaned if required.

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4.3.1 Installation in damp locations or outdoors

- Use suitable cable glands for the incoming cable (use reducing adapters if necessary) according to the installation instructions.
- If possible, arrange the terminal box in such a way 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 gaskets.
- If required, touch up the corrosion protection (especially at the eyebolts).
- Check the degree of protection.
- Protect the shaft against corrosion using a suitable anti-corrosion agent.

4.4 Installation tolerances

Shaft end	Flanges
Diameter tolerance according to EN 50347 • ISO j6 with Ø ≤ 28 mm • ISO k6 with Ø ≥ 38 mm up to ≤ 48 mm • ISO m6 with Ø ≥ 55 mm • Centering bore according to DIN 332, shape DR	Centering shoulder tolerance according to EN 50347 • ISO j6 with Ø ≤ 250 mm • ISO h6 with Ø ≥ 300 mm

4.5 Assembling the input elements

Drive components that are installed on the motor shaft end, e.g. pinions, must be warmed up prior to assembly in order to prevent damage, e.g. to the encoder of standalone motors.

⚠ WARNING

Unsecured key flung out of the keyway.

Severe or fatal injuries.

- Only operate the motor with attached customer output element (e.g. gear unit), or with a suitably secured key.

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4.6 Encoder mounting adapter

If a drive was ordered with encoder mounting adapter, SEW-EURODRIVE will deliver the drive with enclosed coupling. Do not connect the coupling for operation without the encoder.

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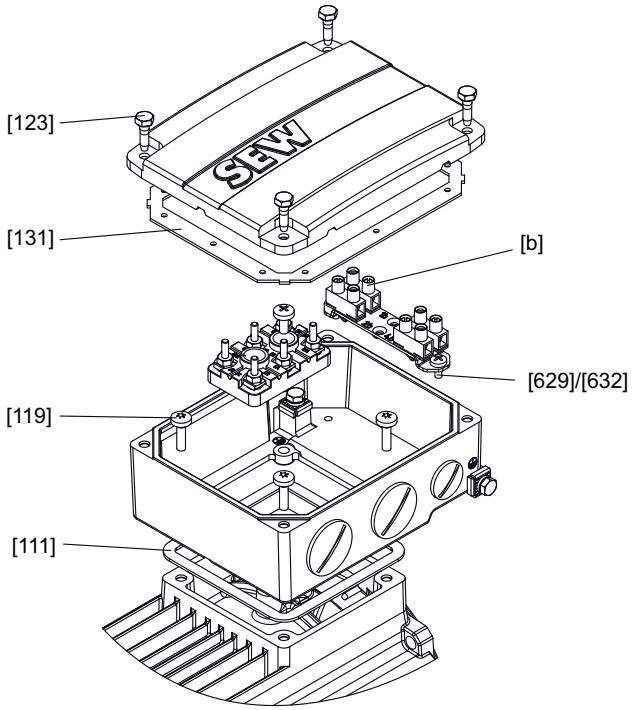
4.7 Terminal box

4.7.1 Turning the terminal box

The following figure shows the structure of the terminal box variant with terminal board:



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[111] Gasket
[119] Terminal box lower part
hex head screws (4 ×)
[123] Terminal box cover
hex head screws (4 ×)
[131] Gasket
[b] Terminal
[629]/ [632] Screws

Proceed as follows to turn the terminal box:

1. Loosen the screws [123] of the terminal box cover. Remove the terminal box cover.
2. Remove the retaining screws [119] of the terminal box.
3. Clean the sealing surfaces at the stator shoulder, terminal box lower part and terminal box cover.
4. Check the gaskets [111] and [131] for damage.
5. Replace any damaged gaskets.
6. ⚠ **DANGER!** Electric shock due to damaged cables. Severe or fatal injuries. When installing the terminal box lower part or the terminal board, make sure the cables are not crushed or twisted. Do not use sharp or pointed objects to align the cables.
   Turn the terminal box to the required position.
7. Make sure that the gasket [111] is positioned correctly.
8. Attach the terminal box lower part.
9. Apply the corresponding tightening torque to tighten the screws [119] of the terminal box lower part.

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10. Make sure that the gasket [131] is positioned correctly.
11. Attach the terminal box cover to the terminal box lower part.
12. Apply the corresponding tightening torque to tighten the screw [123] of the terminal box cover.
13. To make sure that the cables have not been damaged, perform an insulation test after reassembly, see chapter "Preliminary work after longer periods of storage" (→ 🗎 23).

Tightening torques of the terminal box lower part

- Tightening torque [119] M12 → Standard 96 Nm
- Tightening torque [123] M12 → Standard 96 Nm

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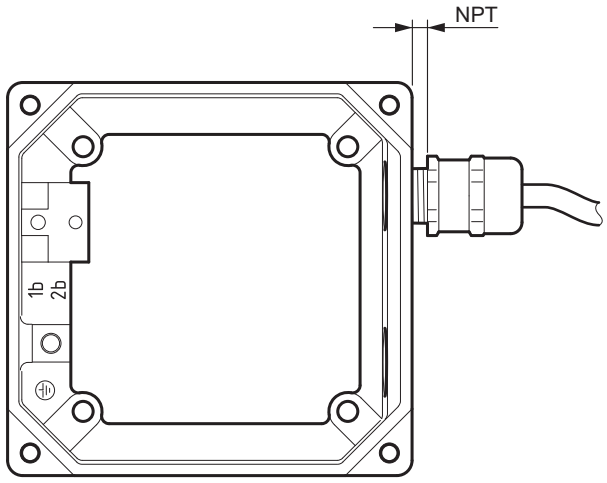
4.7.2 Terminal box with NPT thread

In terminal boxes with NPT thread, cable glands cannot always be screwed in all the way (up to the O-ring).



14949925387

For applications in wet areas, SEW-EURODRIVE recommends using metric screw fittings.

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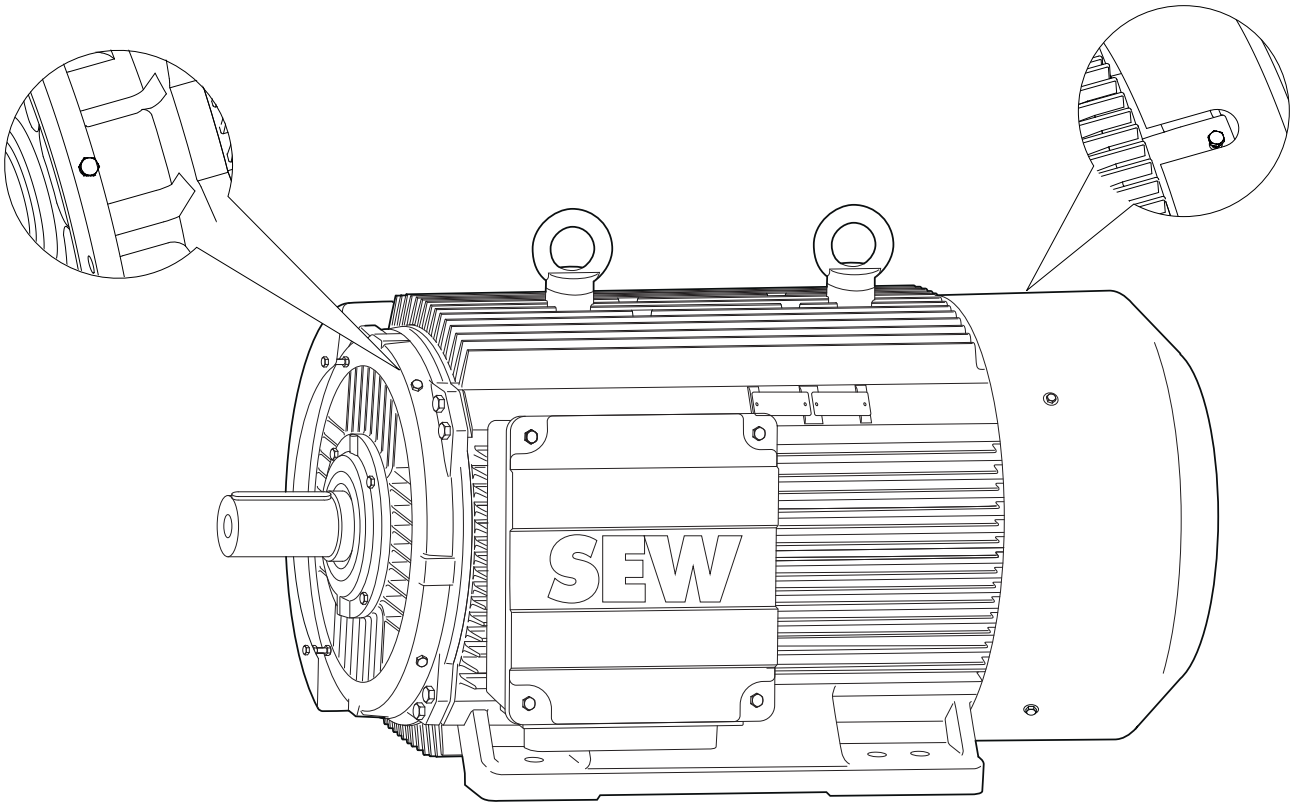
4.8 Options

4.8.1 Mounting adapter for measuring nipple

SEW-EURODRIVE delivers the drives as follows, depending on the order specifications:

- With tapped hole
- With tapped hole and included measuring nipples for vibration measurement

The following figure shows an example of a motor with tapped holes and mounted measuring nipples [445] and [446]:



33352027403

Proceed as follows to connect the customer's measuring device:

1. Remove the closing plugs [1199] (A-side) and [1200] (B-side) from the tapped holes.
   ⇨ If necessary, remove the closing plug [1415]/[1799] from the fan guard.
2. Screw the measuring nipples [445] and [446] into the tapped holes on the motor.
   ⇨ Tightening torque 15 Nm
3. Plug the mounting adapter of the measuring device onto the measuring nipples.

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4.8.2 Second shaft end with optional cover

SEW-EURODRIVE delivers motors with the 2nd shaft end option /2W with the key inserted and secured by transport protection.

⚠ WARNING

Unsecured key flung out of the keyway.

Severe or fatal injuries due to flying parts.

- Only operate the motor with a suitably secured key.

⚠ WARNING

Rotating shaft end or attachments.

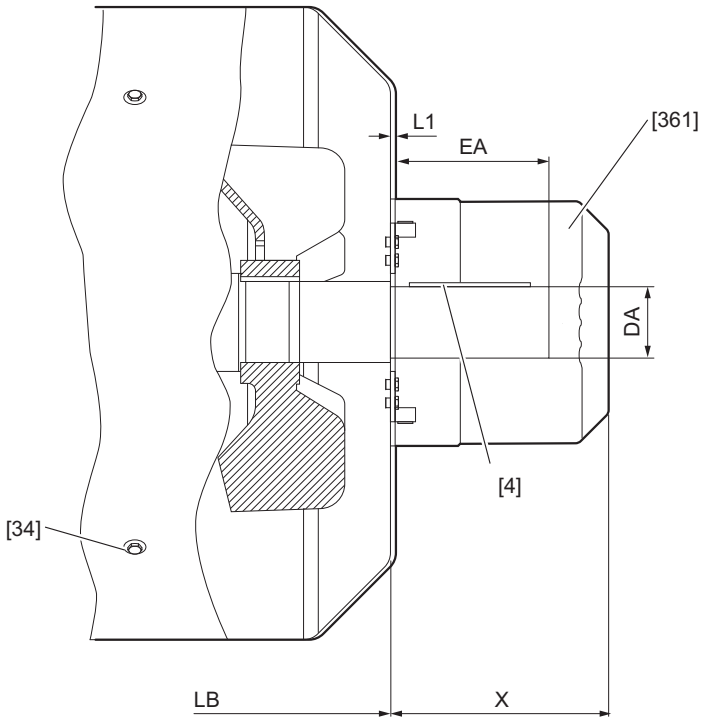
Severe or fatal injuries.

- Only start the motor with installed protective cover at the second shaft end.

The protection cover must meet the impact resistance requirements of EN 60079-0 (VDE 0170-1):2014-06, chapter 26.4.2.

As an option, SEW-EURODRIVE can also provide the safety cover [361] for the 2nd motor shaft end already installed at the DRN355 motor. This is not included in the delivery as standard.

The following figure shows the dimensions of the optional cover.



33352033547

[4]	Keyway	[361]	Safety cover
[34]	Tapping screw	LB	Length of motor

1) Refer to the "DRN355 AC motors" catalog

Dimensions

Motors	DA	EA	L1	X
	mm	mm	mm	mm
DRN355 DRU355	80	170	4	239

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5 Electrical installation

5.1 General information

⚠ WARNING

Electric shock due to incorrect installation.

Severe or fatal injuries.

- Use switch contacts in utilization category AC-3 according to EN 60947-4-1 for switching the motor.
- Use switch contacts to switch the brake. Depending on brake type and type design, the switch contacts meet the specifications in the following utilization categories:
  - Switch contacts for the supply voltage for operation with AC voltage: AC-3 according to EN 60947-4-1, or AC-15 according to EN 60947-5-1.
  - Switch contact for the supply voltage for operation with DC voltage: Preferably AC-3 or DC-3 according to EN 60947-4-1. As an alternative, contacts in utilization category DC-13 according to EN 60947-5-1 are also permitted.
  - Switch contacts for optional cut-off in the DC circuit: AC-3 according to EN 60947-4-1.
- When motors are powered by inverters, you must adhere to the wiring instructions in the frequency inverter operating instructions.

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5.2 Wiring diagrams and terminal assignment diagrams

Connect the motor as shown in the wiring connection diagrams provided with the motor. You can obtain the valid wiring diagrams free of charge from SEW-EURODRIVE.

INFORMATION

Do not connect or start up the motor if the wiring diagram is missing.

5.3 Wiring notes

During installation observe the safety notes in chapter 2 and 5.

5.3.1 Protecting the motor protection devices against interference

Adhere to the following points to protect motor protection devices by SEW-EURODRIVE against interference:

- You may route separately shielded supply cables together with power cables in one cable.
- Do not route unshielded supply cables together with power lines in one cable.

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5.4 Special aspects for operation with a frequency inverter

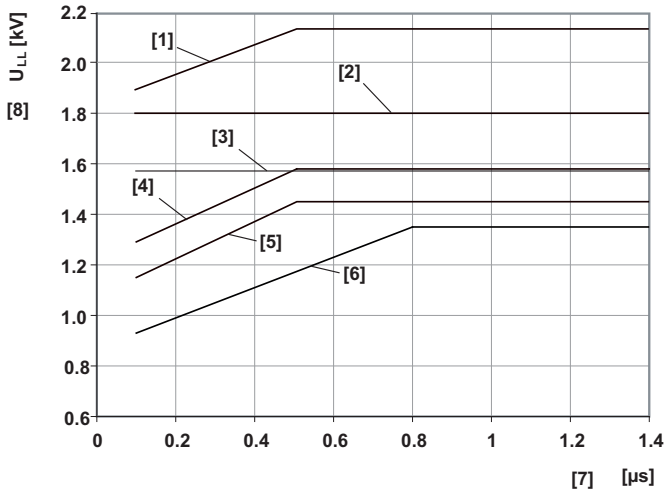
When motors are powered from inverters, you must observe the wiring instructions issued by the inverter manufacturer. You must also observe the operating instructions for the frequency inverter.

5.4.1 Motors with SEW-EURODRIVE frequency inverter

Operation of the motor on SEW-EURODRIVE frequency inverters has been tested. The required dielectric strength values of the motors were confirmed and the startup routines adjusted to the motor data. You can operate the motor with any frequency inverter from SEW-EURODRIVE. To do this, start up the motor as described in the operating instructions for the frequency inverter.

5.4.2 Motor with non-SEW inverter

Operating SEW-EURODRIVE motors on third-party frequency inverters is permitted if the pulse voltages at the motor terminals indicated in the following figure are not exceeded.



9007203235332235

[1] Permitted pulse voltage for DR.., DRN.. motors with reinforced insulation and increased resistance against partial discharge (/RI2)
[2] Permitted pulse voltage for DR.., DRN.. 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

The insulation class depends on the voltage.

- ≤ 500 V = standard insulation
- ≤ 600 V = /RI
- > 600 V – 690 V = /RI2

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INFORMATION

Compliance with the following limit values must be checked and considered:

- The supply voltage level at the third-party inverter
- The threshold of the brake chopper voltage
- The operating mode of the motor (motor mode/generator mode)

→ If the permitted pulse voltage is exceeded, you must install limiting measures, such as filters, chokes or special motor cables. Consult the manufacturer of the frequency inverter.

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5.5 External grounding HF (+LF)

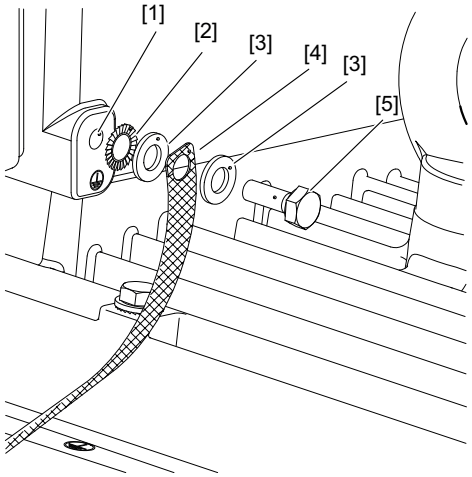
In addition to the interior PE connection, an HF grounding cable is attached to the outside of the terminal box. It is installed as standard.

The HF grounding is completely pre-installed at the factory.

INFORMATION

If 2 or more ground straps are used, you must attach them with a longer screw. The specified tightening torques refer to a strap thickness of t ≤ 3 mm.

5.5.1 DRN355 / DRU355 motors with HF (+LF) grounding on the terminal box



33370453771

[1]	Use of the pre-cast bore at the stator housing	[4]	Ground strap (not included in scope of delivery)
[2]	Serrated lock washer	[5]	Hex head screw ISO 4017 M12 × 30, tightening torque 15.5 Nm
[3]	Washer ISO 7093		

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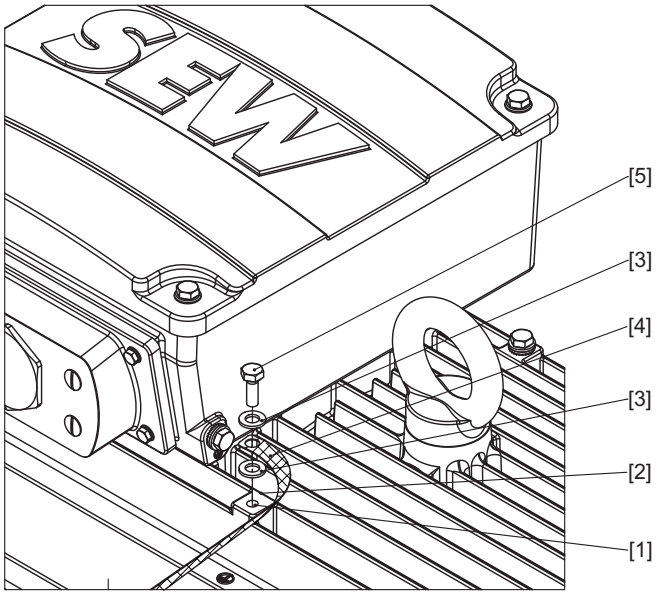
5.5.2 DRN355 / DRU355 motors with HF (+LF) grounding on the stator

In addition to the HF (+LF) grounding on the terminal box, there are 2 other HF (+LF) grounding points on the stator housing. The grounding points are installed as standard.



35682251915

[1] Use of the pre-cast bore at the stator housing
[2] Serrated lock washer DIN 6798
[3] Washer ISO 7089
[4] Ground strap (not included in scope of delivery)
[5] Hex head screw ISO 4017 M12 × 30, tightening torque 15.5 Nm

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5.6 Special aspects in switching operation

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

If the drive has been delivered with a suppressor circuitry in the motor, you must observe the provided wiring diagram.

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5.7 Notes regarding the connection of the motor

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. You can obtain the valid wiring diagrams free of charge from SEW-EURODRIVE.

⚠ WARNING

Danger due to contaminated terminal box.

Severe or fatal injuries.

- Seal the terminal box and unused cable entries against dust and humidity.
- Remove present foreign objects, dirt and humidity from the terminal box.

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 air gaps, see chapter "Electrical connection" (→ 🗎 13)
- 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
- Connect the motor according to the prescribed direction of rotation

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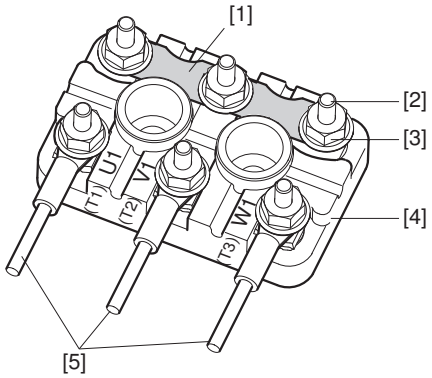
5.8 Connecting the motor via terminal block

5.8.1 According to wiring diagram R13

Arrangement of terminal links with ⅄ connection



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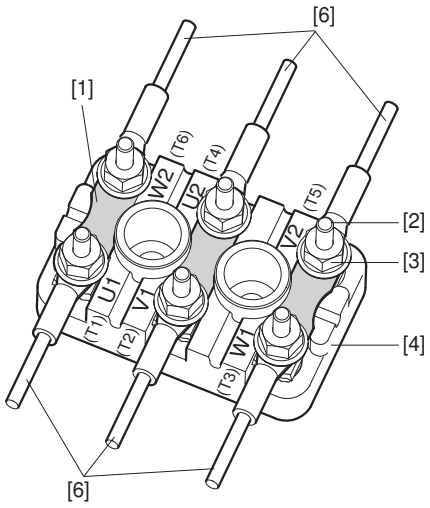
Arrangement of terminal links with △ connection (double-sided supply)



9007199734852747

[1] Terminal link
[2] Terminal stud
[3] Flange nut
[4] Terminal board
[5] Customer connection
[6] Customer connection with divided connection cable

INFORMATION

For DRN355 / DRU355 motors, SEW-EURODRIVE recommends a double-sided supply for load currents higher than

- M20: 400 A

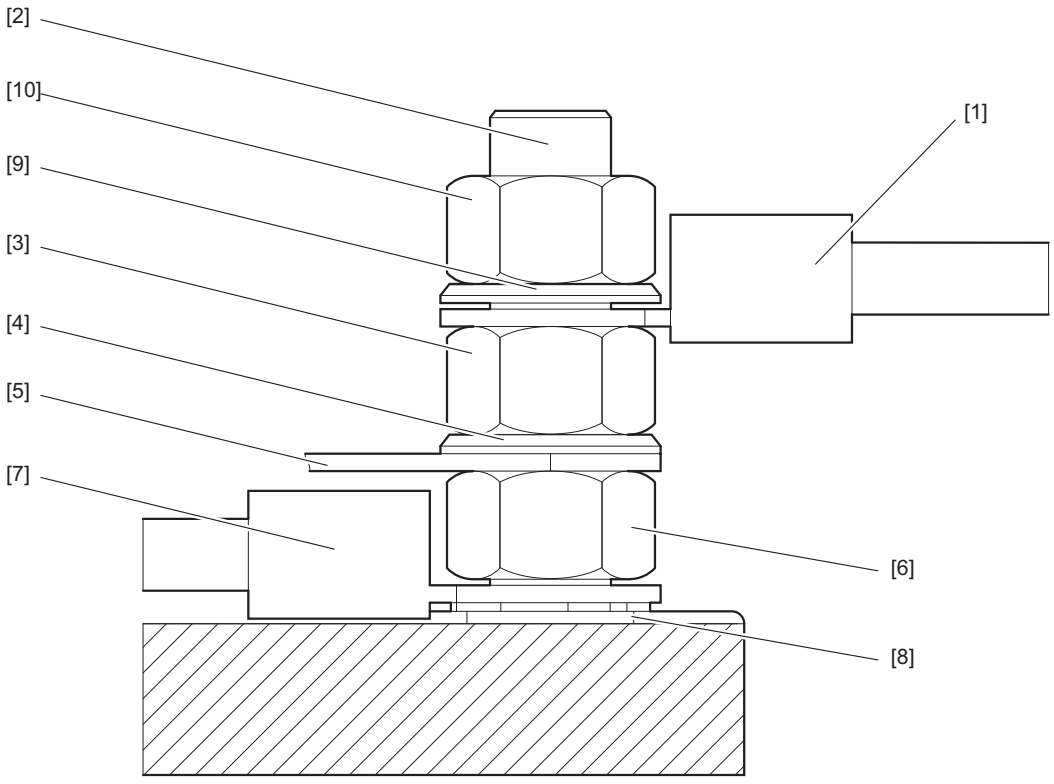
5.8.2 Connection variants via terminal block

The motors are supplied and connected differently 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:

DRN355 / DRU355 motors							
Terminal stud	**Tightening torque hex nut**	**Connection**	**Design**	**Connection type**	**Scope of delivery**	**PE terminal stud**	**PE design**
Ø		**Cross section**				**Ø**	
M20	**30 Nm**	**≤ 240 mm²**	**3b**	**Ring cable lug**	**Pre-mounted connection pieces**	M12	5

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

Design 3b



33201568139

[1] External connection with ring cable lug, according to DIN 46237 or DIN 46234, for example
[2] Terminal stud
[3] Middle nut
[4] Washer
[5] Terminal link
[6] Bottom nut
[7] Winding connection with ring cable lug
[8] Serrated lock washer
[9] Washer
[10] Top nut

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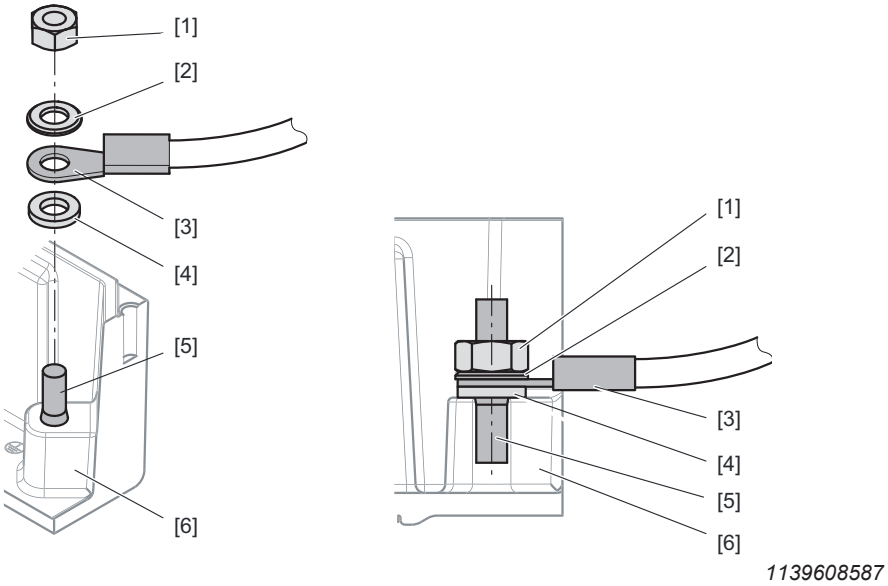
Variant 5



1139608587

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

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5.9 Options

Connect the options as shown in the wiring connection diagrams provided with the motor. You can obtain the valid wiring diagrams free of charge from SEW-EURODRIVE.

INFORMATION

Do not connect any options if the wiring diagram is missing.

5.9.1 Temperature sensor /TF

NOTICE

Impermissible heating of the motor due to defective temperature sensor /TF.

Damage to property.

- Do not connect any voltages > 30 V to the temperature sensor /TF.
- Observe the provided wiring diagram for the connection of the temperature sensor /TF.

The PTC thermistors comply with DIN 44082.

Resistance measurement check (measuring instrument with V ≤ 2.5 V or I < 1 mA):

- Standard measured values: 20 – 500 Ω, hot resistance > 4000 Ω

When using the temperature sensor for thermal monitoring, the evaluation function must be activated to maintain reliable isolation of the temperature sensor circuit. The thermal protection function must become active in case of overtemperature.

If there is a 2nd terminal box for the temperature sensor /TF, this is where you must connect the temperature sensor.

Observe the provided wiring diagram for connecting the temperature sensor /TF. If the wiring diagram is not enclosed, you can obtain it from SEW-EURODRIVE free of charge.

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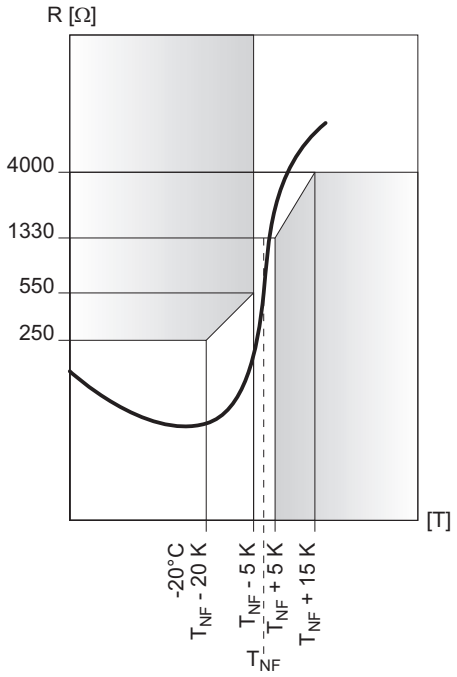
The figure below shows the characteristic curve of /TF with reference to the nominal response temperature (referred to as T_{NF}).



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5.9.2 Winding thermostats /TH

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

	AC V	DC V	
Voltage U in V	250	60	24
Current (cos ϕ = 1.0) in A	2.5	1.0	1.6
Current (cos ϕ = 0.6) in A	1.6		
Contact resistance max. 1 Ω at DC 5 V/1 mA			

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5.9.3 Temperature detection /PT (PT100)

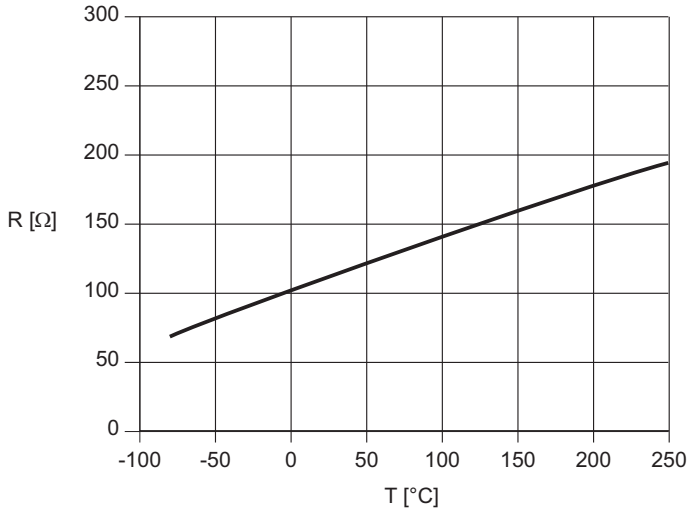
NOTICE

Excessive self-heating of the temperature detection can damage the insulation of the temperature detection as well as the motor winding.

The drive system might be damaged.

- The current in the circuit must not exceed 3 mA.
- Make sure that the PT100 is properly connected to ensure correct evaluation of the temperature detection.

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



1145838347

Technical data	PT100
Connection	Red/white
Resistance at 20 – 25 °C per PT100	107.8 Ω < R < 109.7 Ω
Test current	< 3 mA

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5.9.4 Temperature detection /PK (PT1000)

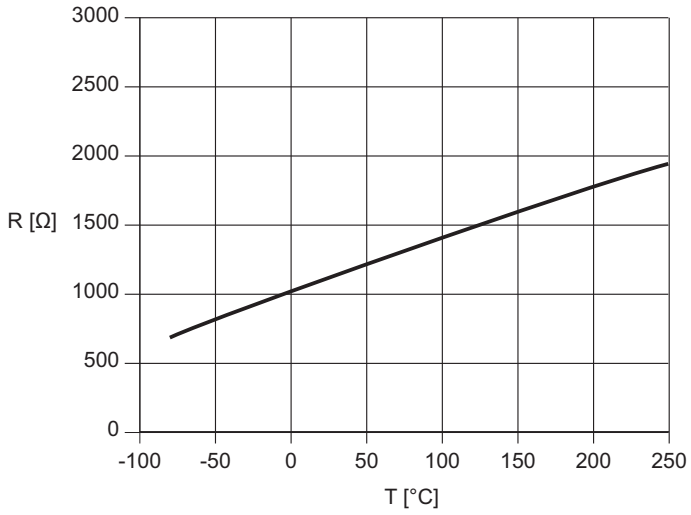
NOTICE

Excessive self-heating of the temperature sensor can damage the insulation of the temperature detection as well as the motor winding.

The drive system might be damaged.

- The current in the circuit must not exceed 3 mA.
- Make sure that the PT1000 is properly connected to ensure correct evaluation of the temperature detection.

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



17535480203

Technical data	PT1000
Connection	Black/red
Resistance at 20 – 25 °C per PT1000	1077 Ω < R < 1098 Ω
Test current	< 3 mA

5.9.5 Forced cooling fan /V

- Connection in separate terminal box
- Max. connection cross section 3 × 1.5 mm² (3 × AWG 15)
- Cable gland M16 × 1.5

Motors	Operating mode/connection	Frequency Hz	Voltage V
DRN355 DRU355	3 ~ AC ⅄	50	346 – 525
DRN355 DRU355	3 ~ AC △	50	200 – 400

Motors	Operating mode/connection	Frequency Hz	Voltage V
DRN355 DRU355	3 ~ AC ⅄	60	380 – 575
DRN355 DRU355	3 ~ AC △	60	220 – 400

INFORMATION

For information on how to connect the /V forced cooling fan, refer to chapter "Forced cooling fan /V" (→ 🗎 86).

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5.9.6 Overview of add-on encoders

Refer to the wiring diagrams for information on how to connect add-on encoders:

Encoder	Encoder type	Mounting type	Supply DC V	Signal	Wiring diagram
EK8S	Incremental	Shaft-centered	7 – 30	1 V_{PP} sin/cos	68180xx08
EK8C	Incremental	Shaft-centered	4.5 – 30	HTL/TTL (RS422)	68179xx08
EK8R	Incremental	Shaft-centered	7 – 30	TTL (RS422)	68179xx08
AK8W	Absolute value	Shaft-centered	7 – 30	1 V_{SS} sin/cos+ RS485	68181xx08
AK8Y	Absolute value	Shaft-centered	7 – 30	1 V_{PP} sin/cos + SSI	68182xx08

INFORMATION

- Maximum oscillation load for encoders ≤ 10 g ≈ 100 m/s^2 (10 Hz to 2 kHz)
- Shock resistance = 200 g ≈ 2000 m/s^2 for DRN355 / DRU355 motors

5.9.7 Installation notes for encoders

When connecting the encoder to the inverter, observe the provided wiring diagrams and the information in these operating instructions as well as the operating instructions/wiring diagrams of the inverter and the operating instructions/wiring diagrams provided with the third-party encoder.

Proceed as described in chapter "Motor and brake maintenance – preliminary work" to mount the encoders. Observe the following information:

- Maximum line length (inverter to encoder):
  - 100 m with a capacitance per unit length core – shield ≤ 110 nF/km
  - 100 m with a capacitance per unit length core – core ≤ 85 nF/km
- Core cross-section: 0.20 – 0.5 mm^2; recommendation ≥ 0.25 mm^2
- Use shielded cable with twisted pair cores and apply the shield over a large area at both ends:
  - In the cable gland of the encoder connection cover or in the encoder connector
  - To the inverter on the electronics shield clamp and to the housing of the D-sub connector
- Install the encoder cables separately from the power cables, maintaining a distance of at least 200 mm.
- Compare the operating voltage with the permitted operating voltage range on the encoder nameplate. Deviations in the operating voltage may overheat and damage the encoder.
- SEW-EURODRIVE recommends the use of stabilized voltage sources and separate supply systems for encoder or other sensor components and active components such as switches and light barriers.
- Supplies with voltage transients and interferences higher than the supply voltage U_B are not permitted.
- Observe the clamping area of 5 to 10 mm of the cable gland of the connection cover. If you use cables with a different cross section, you must replace the provided cable gland with another suitable EMC-compliant cable gland.
- The cable glands for the cable entry must meet the following conditions:
  - Clamping area is suitable for the used cable(s)
  - The IP degree of protection of the encoder connection is at least as high as the IP degree of protection of the actual encoder
  - The operating temperature range matches the designated ambient temperature range.
- Check the flawless state and the proper seat of the connection cover gasket.
- Tighten the screws of the connection cover with a tightening torque of 2.25 Nm.

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Minimum requirements for encoder cables

Make sure that self-assembled cables fulfill the following requirements:

- Cross section of voltage supply cable:
  - At least 0.25 mm^2 for cable lengths up to 50 m.
  - At least 0.5 mm^2 for cable lengths up to 100 m.
- Cross section of the signal wire:
  - At least 0.25 mm^2.
- Capacitance per unit length:
  - Maximum 70 pF/m – core/core.
  - Maximum 120 pF/m – core/shield.
- The cable must be shielded.
- Differential signals must be routed via twisted wires e.g. Data+ and Data-.

5.9.8 Anti-condensation heating /Hx

To protect a shutdown motor from freezing up (rotor blockage) or condensation inside the motor, it can be equipped with an optional anti-condensation heating. The anti-condensation heating consists of strip heaters that are integrated in the winding overhang and supplied with voltage when the motor is switched off. The motor is heated by the current flowing through the strip heaters.

The strip heaters are controlled according to the following principle:

- Motor switched off → anti-condensation heating activated
- Motor switched on → anti-condensation heating deactivated

Observe the permitted voltage according to the nameplate and the enclosed terminal assignment diagram.

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6 Startup

6.1 General information

NOTICE

The maximum limit torque (M_{pk}) and the maximum current (I_{max}) must not be exceeded, not even for acceleration.

The drive system might be damaged.

- Limit the maximum current at the inverter.

INFORMATION

Limit the maximum speed at the inverter. For information on the procedure, refer to the documentation of the inverter.

6.2 Before startup

Prior to startup make sure that:

- The drive is undamaged and not blocked.
- Any transport locks have been removed.
- The measures stipulated in chapter "Preliminary work after longer periods of storage" (→ 🗎 23) are performed after storage periods longer than 9 months.
- All connections have been made correctly.
- The direction of rotation of the motor/gearmotor is correct.
  - Motor rotating clockwise: U, V, W (T1, T2, T3) to L1, L2, L3
- All protection covers are installed correctly.
- All motor protection equipment is active and set for the rated motor current.
- There are no other sources of danger.
- Loose elements such as keys are appropriately secured.

6.3 Motors with reinforced bearing

NOTICE

Damage to bearings due to impermissible heating of bearing and motor.

Bearing damage.

- Do not operate cylindrical roller bearings without overhung load.

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7 Inspection/maintenance

⚠ WARNING

Risk of injury if the drive starts up unintentionally.

Severe or fatal injuries.

- Before you start working on the unit, disconnect the motor and all connected options from the power supply.
- Secure the motor against unintended power-up.

⚠ CAUTION

Inhalation and swallowing brake abrasion when releasing the brake.

Irritation of the respiratory tract and respiratory organs.

✓ Wear a respirator of class FFP2 during the maintenance of brakemotors.

- Avoid swirling of the brake abrasion.
- Remove the brake abrasion with suitable extraction systems or damp cloths that bind dust.
- Make sure that there is adequate ventilation in the work environment.

⚠ CAUTION

The surfaces on the drive can be very hot during operation.

Risk of burns.

- Let the motor cool down sufficiently before you start working on it.

NOTICE

Damage to the oil seals if the temperature is too low during installation.

Possible damage to the oil seals.

- Before assembly, make sure that the ambient temperature and the temperature of the oil seal are not below 0 °C.

INFORMATION

Apply grease with a grease depot to the lip of the oil seal before assembly. For further information on lubricants, refer to chapter "Order information for lubricants, anti-corrosion agents and sealants" (→ 🗎 72).

INFORMATION

Friction disks at brakemotors may only be replaced by SEW-EURODRIVE service.

Repairs

Only SEW-EURODRIVE repair workshops or plants that provide the necessary expertise may repair or modify the motor/brakemotor.

Before you take the motor back into operation, check to see if the regulations have been adhered to. Confirm the compliance with a corresponding identification on the motor or by issuing a test report.

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

7.1 Inspection and maintenance intervals

The following table lists the inspection and maintenance intervals:

Unit / part of unit	Time interval	What to do?
Motor	• Every 10000 operating hours[1)2)]	Motor inspection: • Check rolling bearing and change if necessary • Replace oil seals • Clean cooling air ducts
Drive	• Varying[3)]	• Touch up or renew the surface/anti-corrosion coating. • Check and clean the air filter. • If applicable, clean condensation drain hole at the bottom of the fan guard. • Clean clogged bores.
Connection cable	• as for the motor	Inspect cable • Check for damage. If necessary, replace connection cable. • Check all cable glands and retighten them, if necessary.

1) Wear times are subject to many factors and can be quite short. The system manufacturer must calculate the required inspection/maintenance intervals individually in accordance with the project planning documents.

2) For DRN355 motors with re-lubrication device, note the shortened re-lubrication periods in chapter "Bearing lubrication".

3) 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 during inspection/maintenance, you must clean it before you close it.

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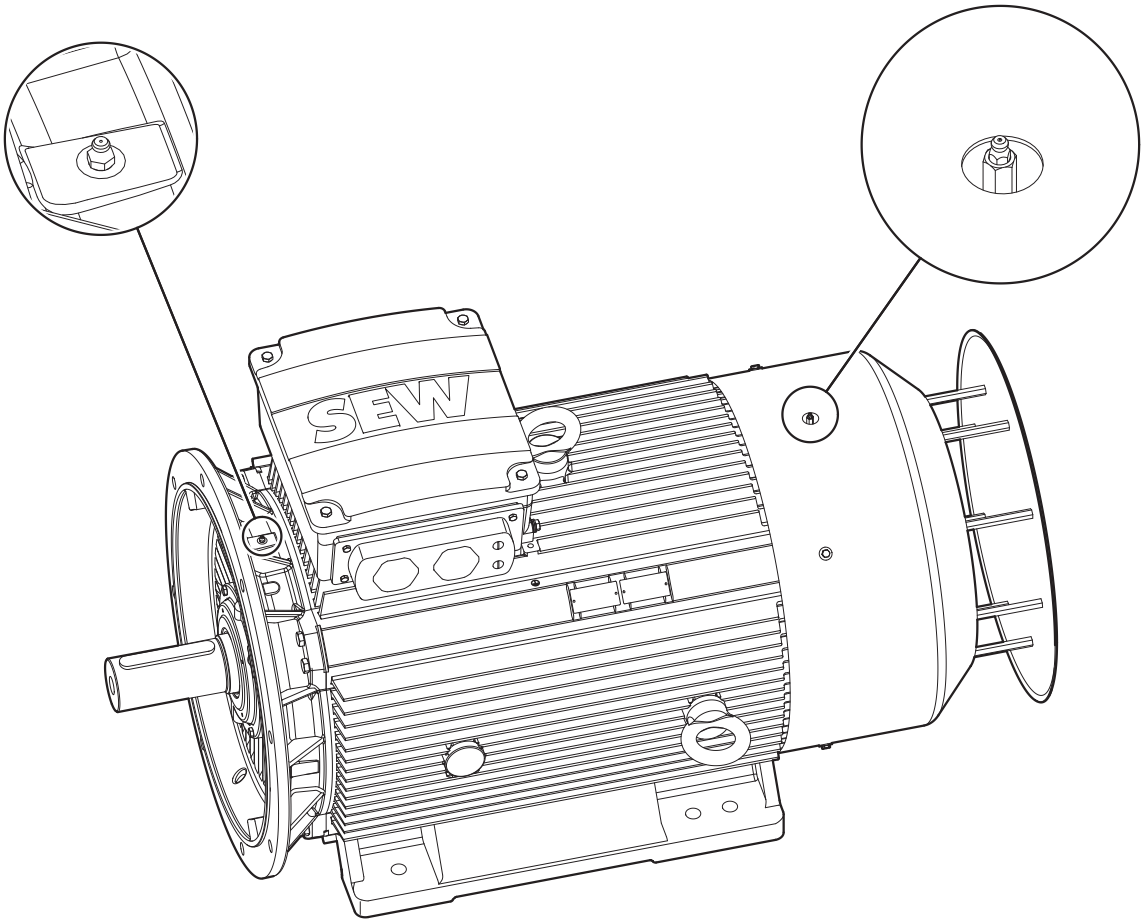
7.2 Bearing lubrication

7.2.1 Bearing lubrication for DRN355 / DRU355 motors with relubrication device /NS

The following figure shows the positions of the lubrication devices.



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Under normal operating conditions and at an ambient temperature between -20 °C to +40 °C, SEW-EURODRIVE uses Mobil Polyrex EM (K2P-20 DIN 51825), a polyurea-based mineral high-performance, high-temperature grease for initial lubrication.

For motors in the low temperature range up to -40 °C, SEW-EURODRIVE uses SKF GXN or LGHP2, which are also polyurea-based mineral greases.

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Relubrication

The grease can be purchased from SEW-EURODRIVE in 400 g cartridges. For the relevant order information, refer to chapter "Order information for lubricants, anti-corrosion agents and sealants" (→ 🗎 72).

INFORMATION

Only mix lubricants of the same thickness type, the same base oil and the same consistency (NLGI class).

Grease the motor bearings in accordance with the information on the lubricant plate. The used grease collects inside the motor and should be removed every 6 to 8 relubrication cycles during an inspection. Each time you relubricate the bearings, ensure that the bearing is two-thirds full.

Start up the motors slowly after lubrication so that the grease is distributed evenly.

The relubrication channels leading the grease from the grease nipples to the bearings must always be filled with grease. This is usually ensured by adhering to the relubrication intervals. During maintenance work, the grease may remain in the channels and does not need to be removed.

Re-lubrication period

For the relubrication intervals of the bearings, adhere to the requirements stated in the table:

- Ambient temperature: -20 °C to +40 °C
- Rated speed that corresponds to that of a 4-pole AC motor
- Normal load

In case of higher ambient temperatures, higher speeds, or larger loads, the relubrication intervals are shorter. Use 1.5 times of the stated quantity for the initial filling.

The relubrication channels leading the grease from the grease nipples to the bearings must always be filled with grease. This is usually ensured by adhering to the relubrication intervals. During maintenance work, the grease may remain in the channels and does not need to be removed.

Motors with option		Horizontal mounting position		Vertical mounting position	
		Duration	Quantity	Duration	Quantity
DRN355 /NS	Drive end	5000 h	60 g	2500 h	60 g
DRU355 /NS	Non-drive end				
DRN355 /ERF /NS	Drive end	3200 h	60 g	1600 h	60 g
DRU355 /ERF /NS	Non-drive end	5000 h	60 g	2500 h	60 g

7.3 Reinforced bearings

NOTICE

Damage to bearings due to impermissible heating of bearing and motor.

Bearing damage.

- Do not operate cylindrical roller bearings without overhung load.

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In the /ERF (reinforced bearing) option, cylindrical rolling bearings are installed on the A-side. The reinforced bearings must have overhung load applied to them and must never be operated without overhung load.

The reinforced bearings are only offered with the /NS (relubrication) option so as to facilitate optimal lubrication of the bearing.

For lubricating the bearings, observe the notes in chapter "Bearing lubrication for DRN355 / DRU355 motors with relubrication device /NS" (→ 🗎 57).

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7.4 Motor maintenance – preliminary work

⚠ WARNING

Risk of injury if the drive starts up unintentionally.

Severe or fatal injuries.

- Before you start working on the unit, disconnect the motor and all connected options from the power supply.
- Secure the motor against unintended power-up.

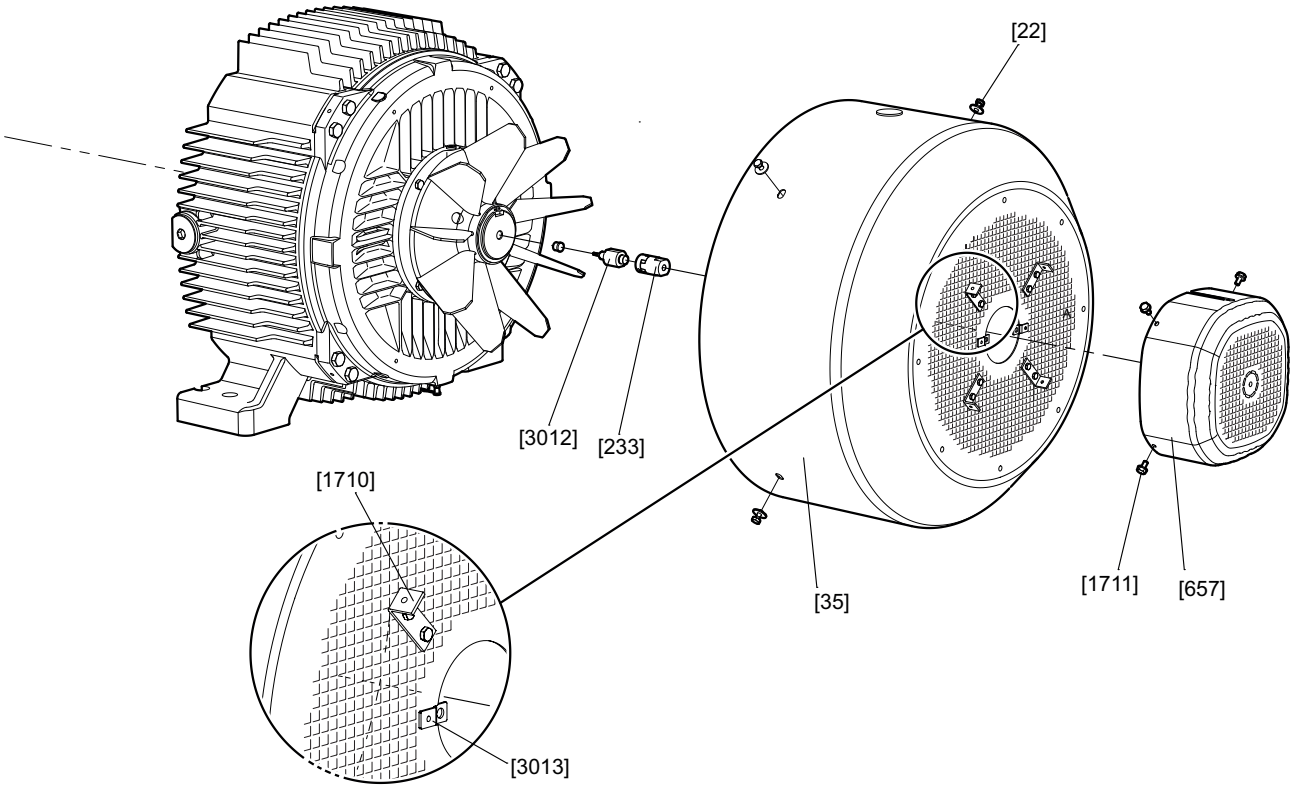
7.4.1 Encoder mounting adapter EK8A

Content of the accessory bag [1634]

The encoder mounting adapter EK8A...

- 21018642 (2 × M5×8)
- Screws [232] for fastening the torque arm of the encoder [220]
- Claw coupling [233]

Mounting the encoder mounting adapter EK8A



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[22]	Screw
[35]	Fan guard
[233]	Coupling
[657]	Safety cover
[1710]	Mounting bracket
[1711]	Screw (hexagonal)
[3012]	Bolt
[3013]	Retaining plate

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1. Unscrew the screws [1711].
2. Remove the safety cover [657] from the metal brackets [1710] that are installed at the fan guard [35].
3. Unscrew the screws [22].
4. Remove the fan guard [35] from the motor.
5. Push the coupling [233] onto the bolt [3012] of the rotor [1] up to the stop.
6. Fasten the coupling [233] using the retaining screw of the clamping hub.
   ⇨ Tightening torque 3 Nm

Then, proceed with the installation process as described in chapters "EK8./AK8./RK8M conical encoders (DRN355 / DRU355 motors)" (→ 🗎 62) and "EK8./AK8./RK8M conical encoders (DRN355 / DRU355 motors) – with forced cooling fan" (→ 🗎 65).

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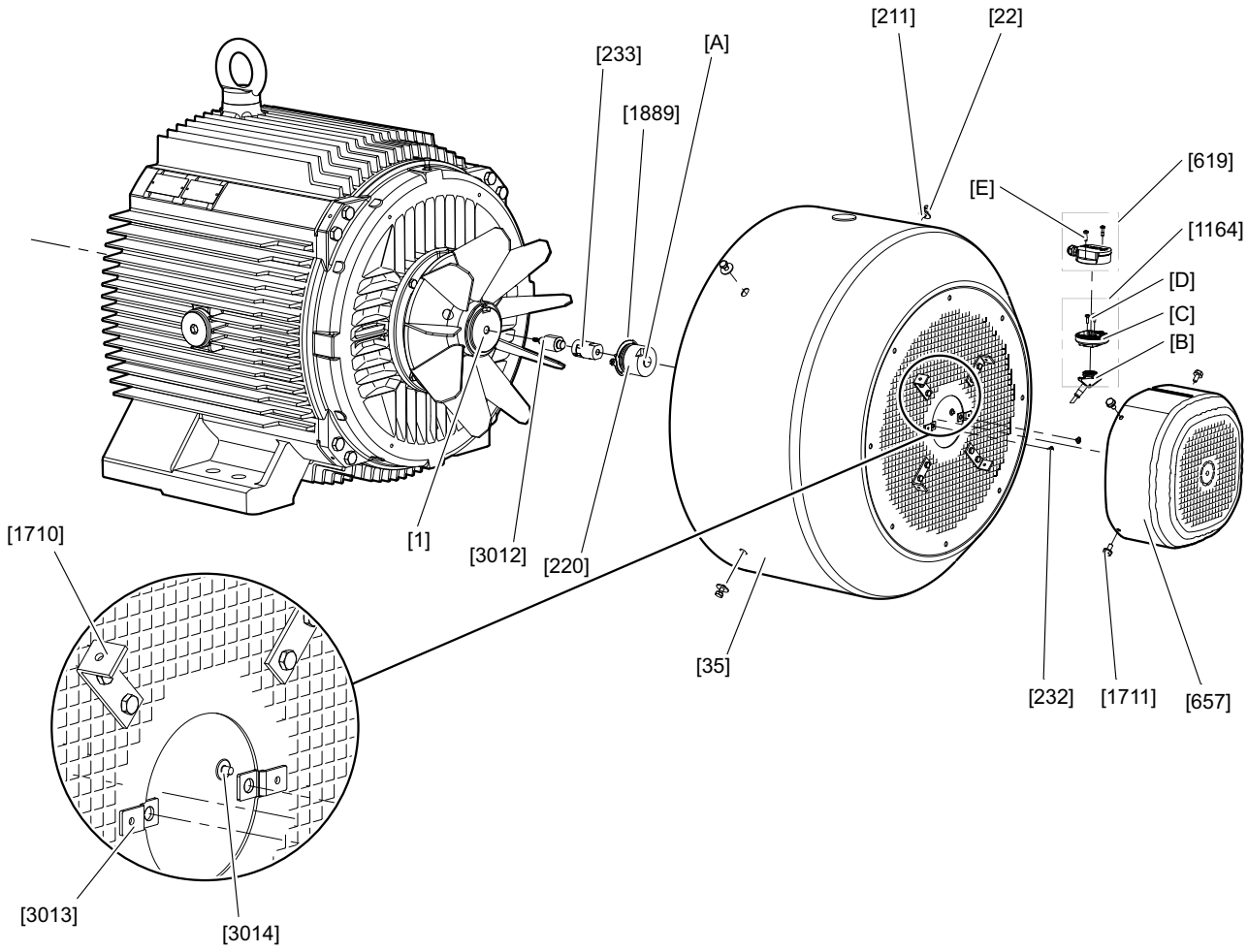
7.4.2 EK8./AK8./RK8M conical encoders (DRN355 / DRU355 motors)

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



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[1]	Rotor	[1889]	Torque arm
[22]	Screw (hexagonal)	[1902]	Threaded sleeve
[35]	Fan guard	[1927]	Set screw
[211]	Washer	[3012]	Bolt
[220]	Encoder	[3013]	Retaining plate
[232]	Screw (hexalobular)	[3014]	Round-head screw
[233]	Coupling		
[619]	Connection cover	[A]	Screw plug
[657]	Safety cover	[B]	T-slot nut
[1164]	Connection adapter	[C]	Lower part
[1710]	Angle bracket	[D]	Screw
[1711]	Screw (hexagonal)	[E]	Screw

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Removing EK8./AK8.

1. Unscrew the screws [E].
2. Remove the connection cover [619] from the connection adapter [1164].
3. Loosen the screws [D] in the lower part [C].
   ⇨ Only unscrew the screws [D] to such an extent that the connection adapter [1164] can be moved in the recess of the safety cover [657].
4. Unscrew the screws [1711].
5. Remove the safety cover [657] from the motor. When doing this, slide the connection adapter [1164] out of the recess.
6. Unscrew the screws [232].
7. Unscrew the screws [22].
8. Remove the fan guard [35] over the encoder [220]. Guide the connection adapter [1164] with the signal cable through the cutout of the fan guard [35].
9. Separate the coupling halves from each other. One half of the coupling [233] remains at the bolt [3012] of the rotor [1], the other half remains at the encoder [220].

If you want to loosen the coupling [233] from the encoder [220]:

10. Unscrew the central screw plug [A] of the encoder [220].
11. Loosen the central retaining screw of the encoder [220]. Use a tool that is at least 45 mm long for this.
    ⇨ If the central retaining screw of the encoder [220] cannot be loosened, counter-tighten the spanner flat SW10 of the encoder shaft.
12. Loosen the cone connection.
    ⇨ Encoder EK8., AK8W, AK8Y: To loosen the cone connection, continue turning the central retaining screw of the encoder [220] counterclockwise.
    ⇨ Encoder AK8H: Continue turning the central retaining screw of the encoder [220] counterclockwise. To loosen the conical connection, screw an M6 screw (≥ 70 mm long) into the bore.
13. Remove the encoder [220] from the coupling [233].

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Installing EK8./AK8.

1. Connect the two halves of the coupling [233] by plugging them together using the coupling star. The coupling [233] must be plugged in properly. Make sure that the encoder is centered [220].

When you have removed the coupling [233] from the encoder [220] (otherwise, proceed with point 8):

2. Clean the cone of the encoder [220] and the coupling [233].
3. Remove the central screw plug [A].
4. Place the coupling [233] onto the bolt [3012]. Tighten the retaining screw at the clamping hub on the motor side to fasten the coupling.
   ⇨ Tightening torque 3.3 Nm
5. Insert the encoder [220] into the coupling half with conical bore [233].
6. To secure the encoder [220] in place, tighten the central retaining screw. Use a tool that is at least 45 mm long for this.
   ⇨ Counter-tighten the spanner flat SW27 of the coupling.
   ⇨ Tightening torque 3.3 Nm
7. To seal the encoder [220], screw in the central screw plug [A].
   ⇨ Tightening torque 1.8 Nm
8. Mount the fan guard [35] over the encoder [220]. When doing this, guide the connection adapter [1164] with the signal cable through the central grille cutout of the fan guard [35].
9. Use the screws [22] to secure the fan guard [35] to the rear endshield or brake endshield [42] of the motor.
   ⇨ Tightening torque 28 Nm.
10. Screw the screws [232] through the retaining plates [3013] of the fan guard [35] and into the nuts of the torque arm [1889].
    ⇨ If you need to turn the encoder [220] in order for the screws to reach the nuts of the torque arm, turn the encoder [220] clockwise.
    ⇨ Make sure the signal cable is of a sufficient length so that the connection adapter [1164] can be inserted into the recess of the safety cover [657].
    ⇨ Tightening torque 3.3 Nm
11. Insert the connection adapter [1164] into the recess of the safety cover [657].
    ⇨ The arrow that is cast in the lower part [C] of the connection adapter [1164] indicates the direction of the subsequent cable outlet for the connection cover [619].
    ⇨ If you wish to change the direction of the cable outlet: Unscrew the screws [D]. Twist the lower part [C] against the T-slot nut [B]. Screw in the screws [D]. When doing so, only tighten the screws [D] lightly.
12. Place the safety cover [657] onto the metal brackets [1710].
13. Secure the safety cover [657] in place by using the screws [1711].
    ⇨ Tightening torque 12 Nm
14. Push the connection adapter [1164] up to the end of the recess of the safety cover [657] facing away from the motor. Turn the connection adapter [1164] clockwise up to the stop.

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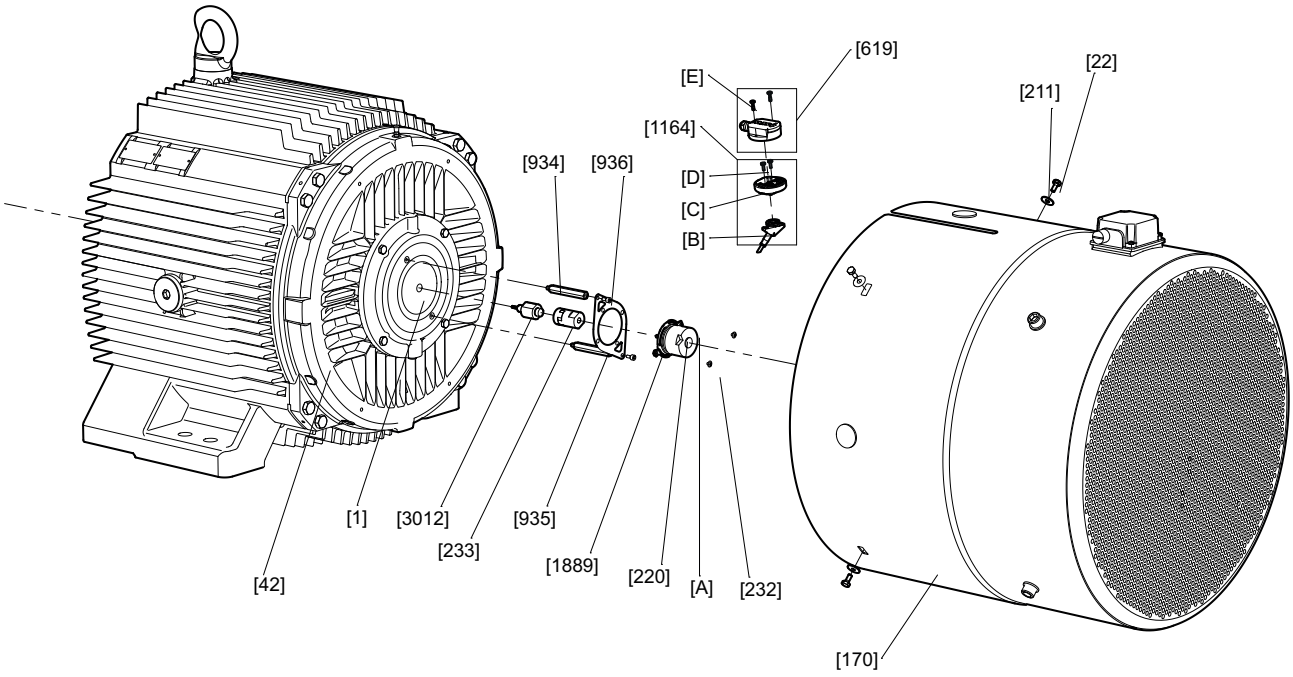
15. Secure the connection adapter [1164] in place by tightening the screws [D].
    ⇨ Tightening torque 2 Nm
16. Place the connection cover [619] onto the connection adapter [1164].
17. Screw the screws [E] through the bores on the connection cover [619] into the bores on the connection adapter [1164].
    ⇨ Tightening torque 2.25 Nm

7.4.3 EK8./AK8./RK8M conical encoders (DRN355 / DRU355 motors) – with forced cooling fan



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[1]	Rotor
[22]	Screw (hexagonal)
[42]	Rear endshield
[170]	Forced cooling fan
[211]	Washer
[220]	Encoder
[232]	Screw (hexalobular)
[233]	Coupling
[619]	Connection cover
[934]	Spacer bolt
[935]	Torque arm
[936]	Cap screw
[1164]	Connection adapter
[1889]	Torque arm
[1901]	Accessory bag
[1902]	Threaded sleeve
[1927]	Set screw
[3012]	Bolt
[A]	Screw plug
[B]	T-slot nut
[C]	Lower part
[D]	Screw
[E]	Screw

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Removing EK8./AK8. – with forced cooling fan

1. Unscrew the screws [E].
2. Remove the connection cover [619] from the connection adapter [1164].
3. Loosen the screws [D] in the lower part [C].
   ⇨ Only unscrew the screws [D] to such an extent that the connection adapter [1164] can be moved in the recess of the forced cooling fan [170].
4. Loosen the screws [22].
5. Remove the forced cooling fan [170] from the motor. When doing this, slide the connection adapter [1164] out of the recess.
6. Loosen the screws [232] from the torque arm [935].
7. Loosen the screws [936]. Remove the torque arm [935] and the spacer bolts [934].
8. Separate the coupling halves from each other. One half of the coupling [233] remains at the bolt [3012] of the rotor [1], the other half remains at the encoder [220].

If you want to remove the coupling [233] from the encoder [220]:

9. Unscrew the central screw plug [A] of the encoder [220].
10. Loosen the central retaining screw of the encoder [220]. Use a tool that is at least 45 mm long for this.
    ⇨ If the central retaining screw of the encoder [220] cannot be loosened, counter-tighten the spanner flat SW10 of the encoder shaft.
11. Loosen the cone connection.
    ⇨ Encoder EK8., AK8W, AK8Y: To loosen the cone connection, continue turning the central retaining screw of the encoder [220] counterclockwise.
    ⇨ Encoder AK8H: Continue turning the central retaining screw of the encoder [220] counterclockwise. To loosen the conical connection, screw an M6 screw (≥ 70 mm long) into the bore.
12. Remove the encoder [220] from the coupling [233].

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Installing EK8./AK8. – with forced cooling fan

1. Connect the two halves of the coupling [233] by plugging them together using the coupling star. The coupling [233] must be plugged in properly. Make sure that the encoder is centered [220].

When you have removed the coupling [233] from the encoder [220] (otherwise, proceed with point 8):

2. Clean the cone of the encoder [220] and the coupling [233].
3. Remove the central screw plug [A].
4. Place the coupling [233] onto the bolt [3012]. Tighten the retaining screw at the clamping hub on the motor side to fasten the coupling.
   ⇨ Tightening torque 3.3 Nm
5. Insert the encoder [220] into the conical bore of the coupling [233].
6. To secure the encoder [220] in place, tighten the central retaining screw. Use a tool that is at least 45 mm long for this.
   ⇨ Counter-tighten the spanner flat SW10 of the encoder shaft.
   ⇨ Tightening torque 3.3 Nm
7. To seal the encoder [220], screw in the central screw plug [A].
   ⇨ Tightening torque 1.8 Nm
8. Mount the spacer bolts [934].
   ⇨ Tightening torque 12 Nm
9. Guide the torque arm [935] over the connection adapter [1164] and the encoder [220].
10. Mount the torque arm [935] to the spacer bolt [934] using the screws [936].
11. When mounting the torque arm [935], make sure it is aligned centrally to the encoder [220]. Screw in the screw [936] with the spacer bushings [934].
    ⇨ Tightening torque 12 Nm
12. Screw the torque arm of the encoder [1889] with the screws [232] through the bores of the torque arm [935].
    ⇨ Make sure the signal cable is of a sufficient length so that the connection adapter [1164] can be inserted into the recess of the forced cooling fan [170].
    ⇨ Tightening torque 3.3 Nm
13. Insert the connection adapter [1164] into the recess of the forced cooling fan [170]. The standard alignment of the recess points towards the terminal box.
    ⇨ The arrow that is cast in the lower part [C] of the connection adapter [1164] indicates the direction of the subsequent cable outlet for the connection cover [619].
    ⇨ If you wish to change the direction of the cable outlet: Unscrew the screws [D]. Twist the lower part [C] against the T-slot nut [B]. Screw in the screws [D]. When doing so, only tighten the screws [D] lightly.
14. Place the forced cooling fan [170] onto the rear endshield or brake endshield [42].
15. Fasten the forced cooling fan [170] with the screws [22] on the rear or brake endshield [42] of the motor.
    ⇨ Tightening torque 28 Nm.

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16. Push the connection adapter [1164] up to the end of the recess facing away from the motor.
17. Secure the connection adapter [1164] in place by tightening the screws [D].
    ⇨ Tightening torque 2 Nm
18. Place the connection cover [619] onto the connection adapter [1164].
19. Screw the screws [E] through the bores on the connection cover [619] into the bores on the connection adapter [1164].
    ⇨ Tightening torque 2.25 Nm

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7.5 Inspection/maintenance for DRN355 / DRU355 motors

For the position numbers used in the following descriptions, refer to chapter "Motor structure" (→ 🗎 15).

7.5.1 Inspection steps for DRN355 / DRU355 motors

1. Before starting to perform any work on the motor, disconnect the motor and all mounted options from the power supply before and secure the motor against unintentional power-up.
2. Remove forced cooling fan and rotary encoder, if installed, see chapter "Motor maintenance – preliminary work" (→ 🗎 60).
3. Remove fan guard [35] and fan [36].
4. Remove stator:
   - Motor is in horizontal position.
   - Loosen hex head screw [25] and remove bearing cover [75].
   - Loosen hex head screw [609] and remove bearing cover [1411].
   - Loosen hex head screw [19] and remove rear endshield [42].
   - Loosen hex head screw [15] and remove flanged or drive-end endshield [7].
   - If necessary, use an M20×40 screw to push off at two opposite M20 tapped holes.
   - Before disassembly, preferably protect the oil seal seat from damage using adhesive tape or a protective sleeve.
   - Remove the rotor [1] from the stator [16] using an L-shaped lifting tool.
5. Visual inspection: Is there any moisture or gear unit oil inside the stator?
   - If not, proceed with step 9.
   - If there is moisture, proceed with step 6.
   - If there is gear oil, have the motor repaired by a specialist workshop.
6. If there is moisture inside the stator:
   - Remove the drive-end endshield or flange [7].
   - Remove the rotor [1].
7. Clean the winding, dry it and check it electrically, see chapter "Drying the motor" (→ 🗎 25).
8. Replace the rolling bearing [11], [44] with permitted rolling bearing types, see chapter "Permitted rolling bearings" (→ 🗎 71).

   Apply tension or pressure to the inner ring of the bearings. Warm up the DRN355 inner ring of the bearings and attach it to the rotor [1].
9. Motors with option /ERF or /NS
   - Fill the rolling bearing with grease until it is two-thirds full, see chapter "Bearing lubrication" (→ 🗎 57).
   - Notice: Before installing the bearings, place the oil seal flange [608] and [21] onto the rotor shaft.
   - After the bearings have been mounted, warm up the lubrication rings [604]/ [1997] to attach them to the rotor [1].
   - Hang the rotor [1] horizontally in the stator using an L-shaped lifting tool.

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- Place the cup spring [105] into the bearing bore of the flange [7].
- Attach the bearing cover [75] to the oil seal flange [21] using the hex head screws [25].
- Attach the bearing cover [1411] to the oil seal flange [608] using the hex head screws [609].

10. Reseal the shaft:
    - A-side: Replace the oil seal [106].
    - B-side: Replace the oil seal [30].

      Coat the sealing lip with grease (Klüber Petamo GHY 133).
11. Reseal the stator seat:
    - Seal the sealing surface with duroplastic sealing compound (operating temperature -40 °C to +180 °C), such as "SEW L Spezial".
12. Install the motor and options.

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8 Technical data

8.1 Permitted rolling bearings

8.1.1 Rolling bearing for DRN355 / DRU355 motors

Motors	A-side bearing	B-side bearing
DRN355 **DRU355**	6322-C3	6322-C3

8.1.2 Rolling bearing for DRN355 / DRU355 motors with reinforced bearings /ERF

Motors	A-side bearing	B-side bearing
DRN355 **DRU355**	NU322E	6322-C3

8.1.3 Rolling bearing for DRN355 / DRU355 motors with current-insulated rolling bearings /NIB

Motors	A-side bearing	B-side bearing
DRN355 **DRU355**	6322-C3	6322-C3-EI

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8.2 Lubricant tables

8.2.1 Lubricant table for rolling bearings

INFORMATION

Use of wrong bearing grease can damage the bearings.

Motors with open bearings

Motors in size DRN355 / DRU355 always have open bearings. If the DRN355 / DRU355 motors have the relubrication option /NS, they also have open bearings.

	Ambient temperature	Manufacturer	Type	DIN designation
Rolling bearings	-20 °C to +80 °C	Mobile	Polyrex EM[1)]	K2P-20
	-40 °C to +60 °C	SKF	LGHP 2[1)]	K2N-40

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

8.2.2 Order information for lubricants, anti-corrosion agents and sealants

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

Usage	Manufacturer	Type	Quantity	Purchase order number
Lubricant for rolling bearings	Mobil	Polyrex EM	400 g	09101470
	SKF	LGHP2	400 g	09101276
Lubricant for sealing rings				
Material: NBR/FKM	Klüber	Petamo GHY 133N	10 g	04963458
	FUCHS LUBRITECH	Gleitmo 100 S	1 kg	03258092
Material: EPDM/EPP	Klüber	Klübersynth BLR 46-122	10 g	03252663
Corrosion protection and lubricant	SEW-EURODRIVE	NOCO® fluid	5.5 g	09107819
Sealant	Marston Domsel	SEW-L-Spezial	80 g	09112286
Backstop lubricant	Mobil	Grease LBZ 1	400 g	03287211

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8.3 Encoders

8.3.1 Incremental encoder E.8.

Encoder		EK8S EV8S 1)	EK8R EV8R 2)	EK8C EV8C
Supply voltage	U_B	DC 7 V – 30 V		DC 4.75 V – 30 V
Supply voltage for functional safety applications	U_{B_FS}	DC 7 V – 30 V	–	
Maximum current consumption, free of load	I_{in}	100 mA (at U_B = 7 V)		
Max. pulse frequency	f_{pulse_max}	150 kHz	120 kHz	
Direction of rotation		A (cos) before B (sin) when looking at the motor output shaft in clockwise rotation B (sin) before A (cos) when looking at the fan guard and clockwise direction of rotation.		
Incremental tracks, periods per revolution	A, B	1024 (10 bits)		
	C	1		
Position resolution, increments per revolution	A, B	4096 (12 bits)		
Voltage output signal differential (peak-to-peak) (A' = A - $\overline{A}$; B' = B - $\overline{B}$)	U_{t_diff}	1 V ± 10%	–	
Voltage output signal non-differential (peak-to-peak)	U_t	0.5 V ± 10%	U_{Low} ≤ 0.5 V U_{High} ≥ 2.5 V	U_B ≤ 6 V: U_{Low} ≤ 0.5 V U_{High} ≥ 2.5 V U_B > 6 V: U_{Low} ≤ 3 V U_{High} ≥ U_B - 2.5 V
Signal level output, offset nominal against 0 V (A, B, C, $\overline{A}$, $\overline{B}$, $\overline{C}$) V	U_{t_o}	2.5 V ± 0.3 V	–	
Signal output		sin/cos	TTL (RS422)	HTL
Total harmonic distortion (THD)		40 dB (1%), 60 dB (0.1%) from 7th harmonic		–
Load resistance/load current differential	R_L/I_L	120 Ω ± 10%		U_B 6 V: 120 Ω ± 10% UB > 6 V: 1 – 3 kΩ
Resistance between tracks and reference ground	R_{gnd}	≥ 1 kΩ	–	
Load capacitance, output	C_o	≤ 20 nF	–	–
Voltage output signal, differential (C' = C - $\overline{C}$) (peak-to-peak)	U_{t_diff} e	0.3 – 1.4 V	–	–
C track offset	g	192 mV ± 5 mV	–	–
Voltage output signal, non-differential (C,$\overline{C}$) (peak-to-peak)	U_{t_C}	–	U_{Low} ≤ 0.5 V U_{High} ≥ 2.5 V	U_B ≤ 6 V: U_{Low} ≤ 0.5 V U_{High} ≥ 2.5 V U_B > 6 V: U_{Low} ≤ 3 V U_{High} ≥ U_B - 2.5 V
Phase angle track C', n = constant	k, l	k = 180° ± 90° l = 180° ± 90°	–	–
Signal width track C	W_C	see figure	90° electrical	
Signal logic track C		see figure	C = log 1, when A = B = log 1	
Pulse duty factor according to IEC 60469-1, n = constant		–	50% ± 10%	
Phase offset A: B; $\overline{A}$: $\overline{B}$ n = constant	d	90° ± 2°	90° ± 20°	
Accuracy of the incremental section[3)]		0.0194° (70 ")	0.033° (120 ")	

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Encoder		EK8S EV8S 1)	EK8R EV8R 2)	EK8C EV8C
Vibration resistance according to EN 60068-2-6		≤ 10 g (f > 18.5 Hz)		
Shock resistance according to EN 60068-2-27		≤ 100 g (t = 6 ms, 18 pulses)		
Maximum speed	n_{max}	6000 min^{-1}		
Maximum line length		100 m	300 m	100 m
Duration until fault message (disabled outputs)[4]		≤ 25 ms	–	
Activation time of rotary encoder internal diagnostics after switching on		≤ 200 ms	–	
Degree of protection in accordance with EN 60529		IP66		
Installation altitude	h	≤ 4000 m above sea level		
		In explosion-protected areas: Permitted external pressure 0.8 – 1.1 bar (at typical height ≤ 1800 m above sea level)		
Explosion protection mark ATEX/IECEx		ATEX equipment category 3 (3G, 3D, 3GD) IECEx EPL .c (3G-c, 3D-c, 3GD-c)		
IECEx certificate of conformity		IECEx IBE 18.0032X		
Corrosion protection, surface protection		KS, OS1 – OS4, OSG		
Connection		Integrated encoder plug connector on the fan guard (can be pre-assembled and plugged in the field)		
Ambient temperature of motor	T_{amb}	-30 to +60 °C		
Electronic nameplate		RS485 (serial, asynchronous); 1920 bytes	–	–
Maximum degree of pollution during installation work		Degree of pollution 1 (IEC 61010-1, EN 60664-1, VDE 0110-1)		

1) See figure "Sin/cos signals and phase relationship".
2) See figure "HTL/TTL signals and phase relationship".
3) Due to the stiffness of the torque arm, you must take into account an automatically resetting ±0.6° twist (depending of the direction of rotation) of the encoder housing compared to the encoder shaft.
4) Sin/cos encoders have a self-diagnostics function. If an error is detected, the sensor reports it by deactivating the output signals to the encoder evaluation unit.

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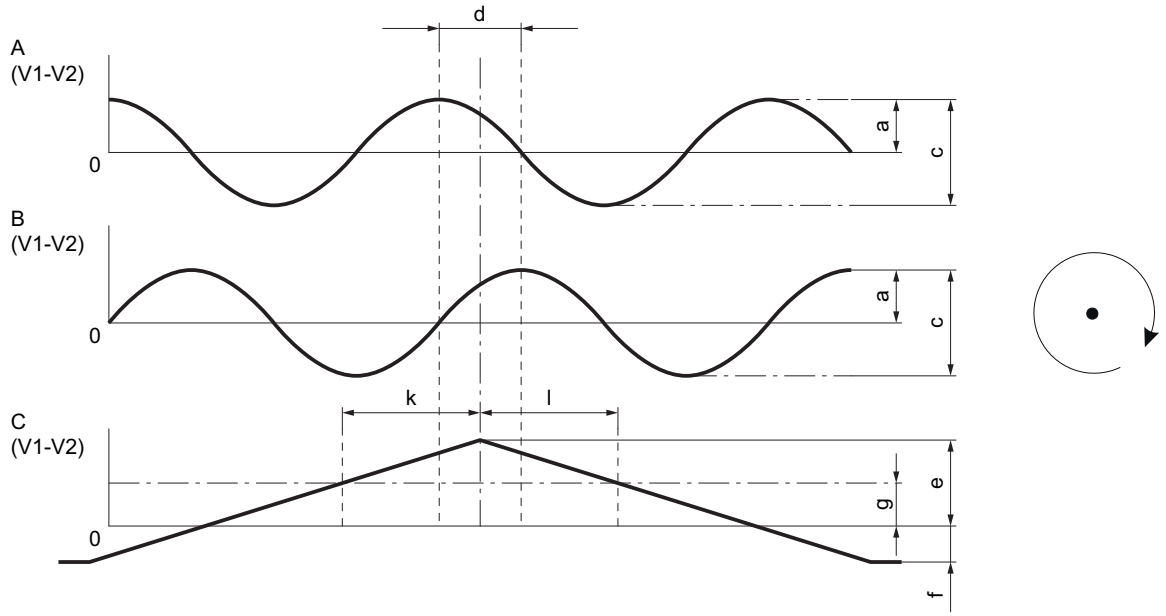
Sin/cos signals and phase relationship



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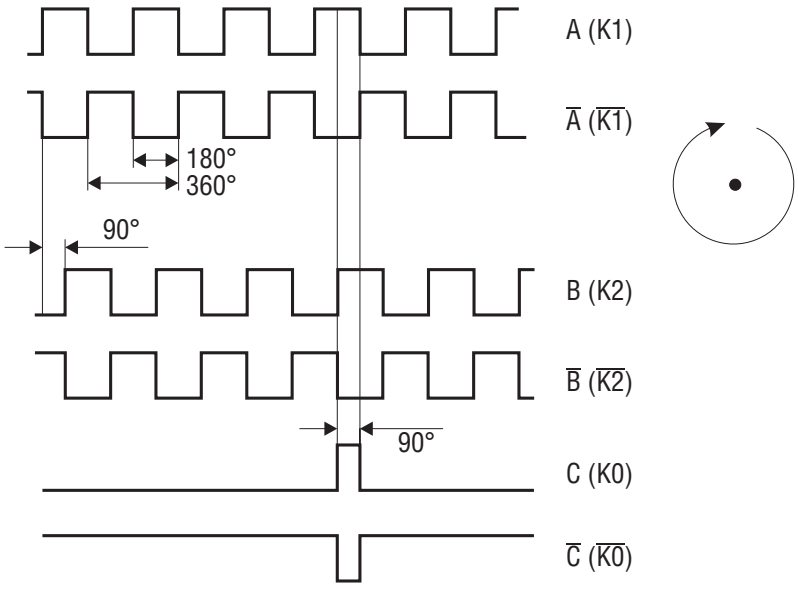
HTL/TTL signals and phase relationship



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8.3.2 Multi-turn absolute encoder A.8.

Encoder		AK8Y AV8Y 1)	AK8W AV8W 1)	AK8H AV8H 1)2)
Supply voltage	U_B	DC 7 V – 30 V		DC 7 V – 12 V
Supply voltage for FS applications	U_{B_FS}	DC 7 V – 30 V		–
Max. current consumption, free of load	I_{in}	100 mA (at U_B = 7 V)		80 mA
Max. pulse frequency	f_{pulse_max}	200 kHz		
Direction of rotation		A (cos) before B (sin) when looking at the motor output shaft in clockwise rotation B (sin) before A (cos) when looking at the fan guard and clockwise direction of rotation.		
Incremental tracks, periods per revolution	A, B	2048 (11 bits)		1024 (10 bits)
	C	–		
Position resolution, increments per revolution	A, B	4096 (12 bits) (SSI, RS422)	65536 (16 bits) (RS485)	32768 (15 bits) HIPERFACE®
Voltage output signal differential (peak-to-peak) (A' = A - $\overline{A}$; B' = B - $\overline{B}$	U_{t_diff}	1 V ± 10%		HIPERFACE®
Voltage output signal non-differential (peak-to-peak)	U_t	0.5 V ± 10%		
Signal level output, offset nominal against 0 V (A, B, C, $\overline{A}$, $\overline{B}$, $\overline{C}$) V	U_{t_o}	2.5 V ± 0.3 V		
Signal output		sin/cos + SSI, RS422	sin/cos + RS485	
Total harmonic distortion (THD)		40 dB (1%), 60 dB (0.1%) from 7th harmonic		
Load resistance/load current differential	R_L/I_L	120 Ω ± 10%		
Resistance between track and reference ground	R_{gnd}	≥ 1 kΩ		
Load capacitance, output		≤ 20 nF		
Voltage output signal, differential (C' = C - $\overline{C}$) (peak-to-peak)	U_{t_diff} e	–	–	
C track offset	g	–	–	
Voltage output signal, non-differential (C,$\overline{C}$) (peak-to-peak)	U_{t_C}	–	–	
Phase angle track C', n = constant	k, l	–	–	
Signal width track C	W_C	–	–	–
Signal logic track C		–	–	–
Pulse duty factor according to IEC 60469-1, n = constant		–		–
Phase offset A: B; $\overline{A}$: $\overline{B}$ n = constant		90° ± 2°		HIPERFACE®
Accuracy of the incremental section[3)]		0.0194° (70 ")		± 0.0144° (± 52 ")
Accuracy of the absolute section		±1 LSB (Least Significant Bit)		
Scanning code/counting direction		Gray code, ascending with the direction of rotation specified above	Binary code, ascending with the direction of rotation specified above	–
Multi-turn resolution		4096 revolutions (12 bits)	65536 revolutions (16 bits)	4096 revolutions (12 bits)
Communication, interface		SSI (synchronous, serial)	RS485 (asynchronous, serial)	HIPERFACE®
Communication, modules		Driver to EIA RS422	Driver to EIA RS485	
Clock frequency/bandwidth		100 – 800 kHz (100 m cable length with maximum 300 kHz)	9600 baud	HIPERFACE®

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Encoder		AK8Y AV8Y 1)	AK8W AV8W 1)	AK8H AV8H 1)2)
Clock-pulse space period		12 – 30 µs	–	
Vibration resistance according to EN 60068-2-6		≤ 10 g (f > 18.5 Hz)		
Shock resistance according to EN 60068-2-27		≤ 100 g (t = 6 ms, 18 pulses)		
Maximum speed	n_{max}	6000 min^{-1}		
Maximum line length		100 m		
Duration until fault message (disabled outputs)[4]		≤ 25 ms + 3/4 revolution		HIPERFACE®
Activation time of rotary encoder internal diagnostics after switching on		200 ms		HIPERFACE®
Degree of protection in accordance with EN 60529		IP66		
Installation altitude	h	≤ 4000 m above sea level		≤ 2000 m above sea level
		In explosion-protected areas: Permitted external pressure 0.8 – 1.1 bar (at typical height ≤ 1800 m above sea level)		
Explosion protection mark ATEX/IECEx		ATEX equipment category 3 (3G, 3D, 3GD) IECEx EPL .c (3G-c, 3D-c, 3GD-c)		–
IECEx certificate of conformity		IECEx IBE 18.0032X		–
Corrosion protection, surface protection		KS, OS1 – OS4, OSG		
Connection		Integrated encoder plug connector on the fan guard (can be pre-assembled and plugged in the field)		
Ambient temperature of motor	T_{amb}	-30 to +60 °C		
Electronic nameplate		–	RS485 (serial, asynchronous); 1920 bytes	HIPERFACE®; 1792 bytes
Maximum degree of pollution during installation work		Degree of pollution 1 (IEC 61010-1, EN 60664-1, VDE 0110-1)		
Other technical data		On request		

1) See figure "Sin/cos signals and phase relationship".
2) Observe the specification for the HIPERFACE® interface, Sick AG.
3) Due to the stiffness of the torque arm, you must take into account an automatically resetting ±0.6° twist (depending of the direction of rotation) of the encoder housing compared to the encoder shaft.
4) Absolute encoders A.8. and AG7Y have a self-diagnostics function. If an error is detected, the sensor reports it by deactivating the output signals to the encoder evaluation unit.

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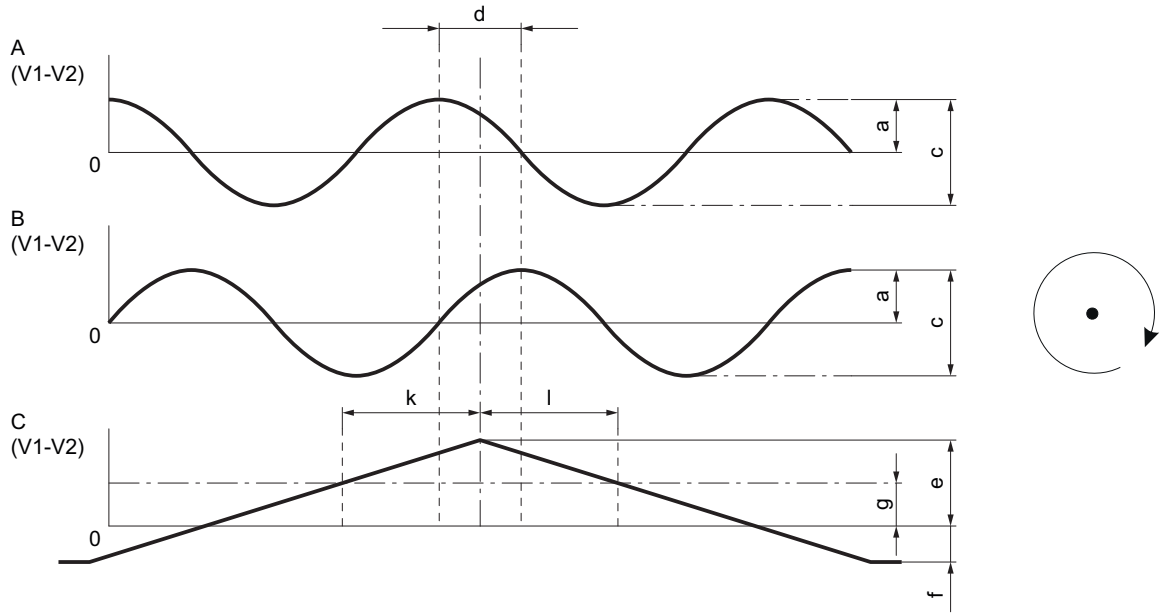
Sin/cos signals and phase relationship



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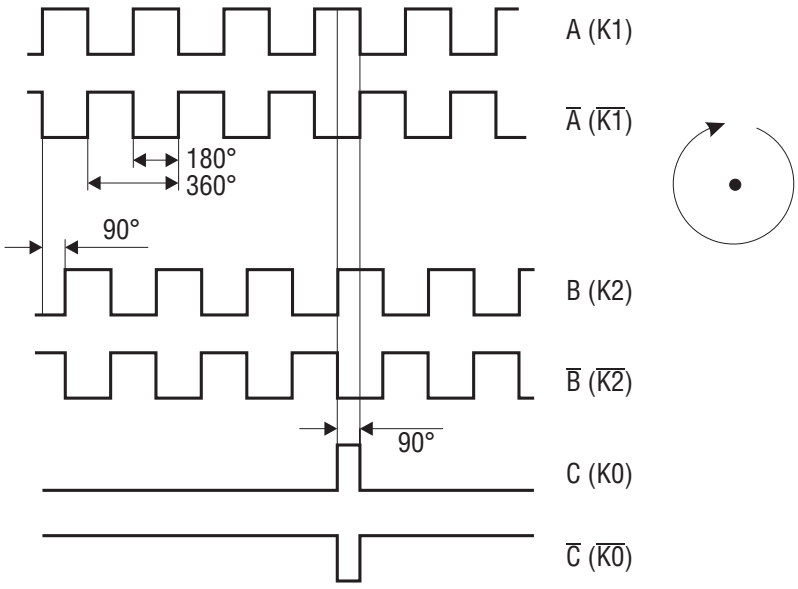
HTL/TTL signals and phase relationship



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9 Malfunctions

9.1 General information

⚠ WARNING

Risk of injury if the drive starts up unintentionally.

Severe or fatal injuries.

- Before you start working on the unit, disconnect the motor and all connected options from the power supply.
- Secure the motor against unintended power-up.

⚠ CAUTION

The surfaces on the drive can be very hot during operation.

Risk of burns.

- Let the motor cool down sufficiently before you start working on it.

NOTICE

Improper troubleshooting measures may damage the drive.

The drive system might be damaged.

- Use only genuine spare parts in accordance with the valid parts list.

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9.2 Motor malfunctions

Fault	Possible cause	Measure
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
	Error 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; Observe wiring diagram
	Motor power designed for star-star connection but only connected in star	Correct the connection from star to star-star; Observe wiring diagram
	Voltage or frequency differs considerably from the setpoint, at least when switching on the motor	Provide better power supply system; reduce the power supply load; Check cross section of supply cable, replace with cable of larger cross section if necessary
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 design if necessary. Contact 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 2 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	Send motor to specialist workshop for repair
Fuses blow or motor protection trips immediately	Short circuit in the motor supply cable	Eliminate short circuit
	Supply cables connected incorrectly	Correct the connection; Observe wiring diagram
	Short circuit in the motor	Send motor to specialist workshop for repair
	Ground fault on motor	Send motor to specialist workshop for repair

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Fault	Possible cause	Measure
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 necessary
Motor heats up excessively (measure temperature)	Overload	Measure power, check project planning and use larger motor or reduce load if necessary
	Insufficient cooling	Provide a 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 intended	Correct the wiring, observe the wiring diagram
	Loose contact in supply cable (one phase missing)	Tighten loose contact, check connections, observe wiring diagram
	Fuse defective	Look for and rectify cause; replace fuse
	Line voltage deviates from the rated motor voltage by more than 5% (range A) / 10% (range B)	Adjust motor to line voltage
	Operating mode (S1 to S10, DIN 57530) exceeded, e.g. caused by excessive switching frequency	Adjust the operating mode of the motor to the required operating conditions; consult a professional to determine the proper drive, if necessary
Loud noises	Ball bearing compressed, dirty or damaged	Realign motor and the driven machine, inspect rolling bearing and replace if necessary.
	Vibration of rotating parts	Look for the cause, possibly an imbalance; correct the cause, observe method for balancing
	Foreign bodies in cooling air ducts	Clean cooling air ducts
	For DR.. motors with rotor designation "J": Load too high	Reduce the load

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9.3 Malfunctions when operated with a frequency inverter

The symptoms described in chapter "Motor malfunctions" (→ 🗎 80) can also occur when the motor is operated with a frequency inverter. Refer to the frequency inverter operating instructions for the meaning of the problems that occur and to find information about rectifying the problems.

9.4 Waste disposal

Dispose of the product and all parts separately in accordance with their material structure and the national regulations. Put the product through a recycling process or contact a specialist waste disposal company. If possible, divide the product into the following categories:

- Iron, steel or cast iron
- Stainless steel
- Magnets
- Aluminum
- Copper
- Electronic parts
- Plastics

The following materials are hazardous to health and the environment. These materials must be collected and disposed of separately.

- Oil and grease

  Collect used oil and grease separately according to type. Ensure that the used oil is not mixed with solvent. Dispose of used oil and grease correctly.
- Screens
- Capacitors

Waste disposal according to WEEE Directive 2012/19/EU

This product and its accessories may fall within the scope of the country-specific application of the WEEE Directive. Dispose of the product and its accessories according to the national regulations of your country.

For further information, contact the responsible SEW-EURODRIVE branch or an authorized partner of SEW-EURODRIVE.

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9.5 Customer service

Have the following information available if you require customer service assistance:

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

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10 Appendix

10.1 Wiring diagrams

INFORMATION

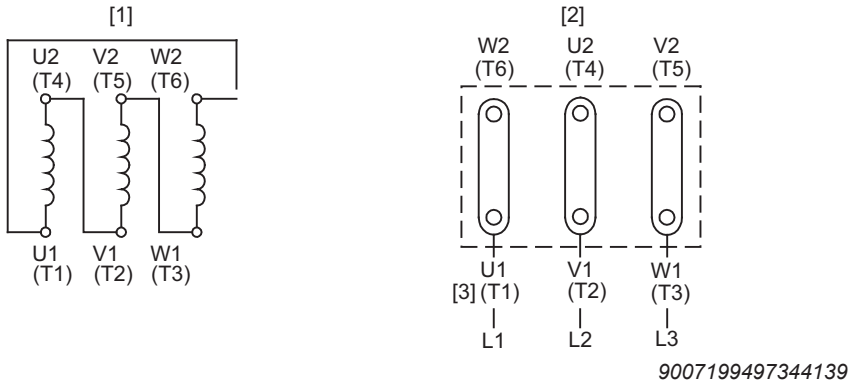
The motor should be connected as shown in the connection wiring diagram or the terminal assignment diagram, which are supplied with the motor. The following section only shows a selection of the common types of connections. You can obtain the relevant wiring diagrams free of charge from SEW-EURODRIVE.

10.1.1 Delta and star connection in wiring diagram R13 (68001 xx 06)

For all motors with one speed, direct on-line, or ⅄/△ start-up.

Delta connection

The following illustration shows the △ connection for lower voltage.



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

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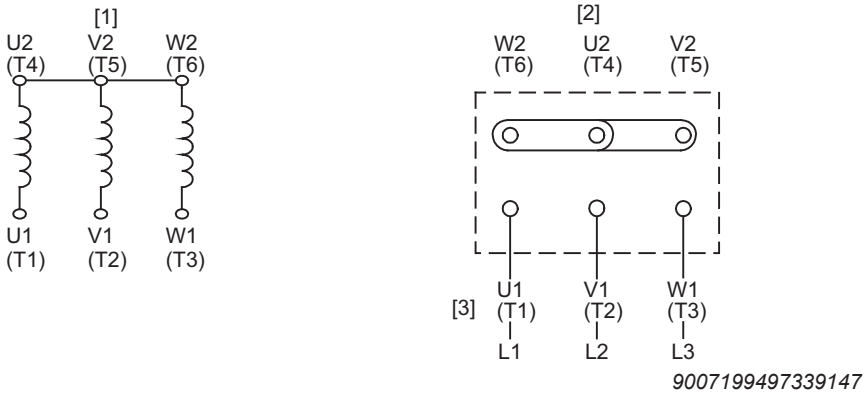
Star connection

The following illustration shows the ⅄ connection for high voltage.



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

Proceed as follows to reverse the direction of rotation:

1. Swap the supply cables L1 – L2.

10.1.2 Motor protection with /TF or /TH for DRN355 / DRU355 motors

INFORMATION

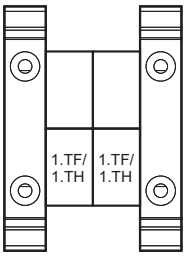
The following shows an example terminal assignment. The actual terminal assignment is included in the motor delivery as a wiring diagram.

/TF, /TH

The following figures show examples for connection of motor protection with /TF PTC thermistor sensors or /TH bimetallic thermostats.

Depending on the version, an "x-pole" terminal strip is available for connection to the trip switch.

Example: /TF, /TH to terminal strip



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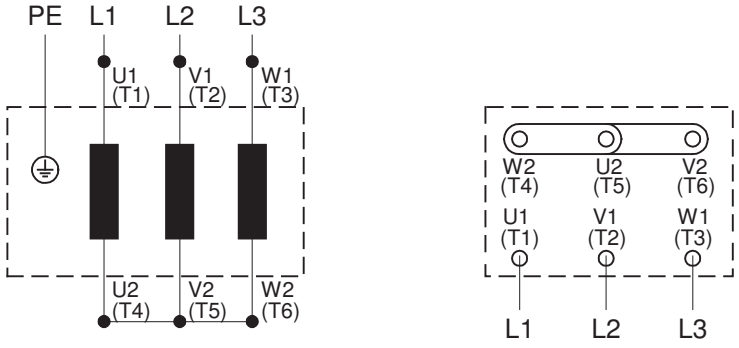
10.1.3 Forced cooling fan /V

Star connection

The following figure shows the wiring of the /V forced cooling fan for star connection.



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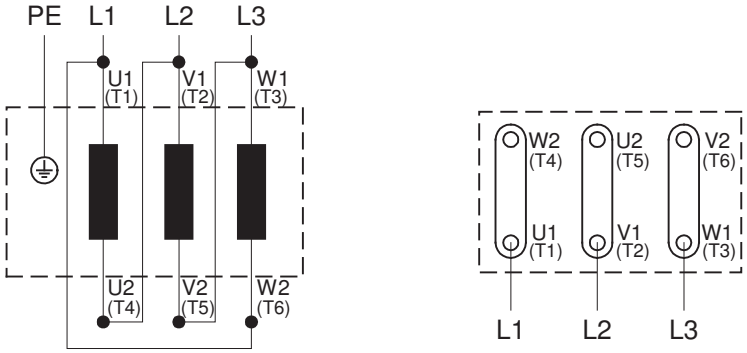
Delta connection

The following figure shows the wiring of the /V forced cooling fan for delta connection.



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	Lyon	SEW USOCOME 75 rue Antoine Condorcet 38090 Vaulx-Milieu	Tel. +33 4 74 99 60 00 dtclyon@usocome.com
	Nantes	SEW USOCOME Parc d'activités de la forêt 4 rue des Fontenelles 44140 Le Bignon	Tel. +33 2 40 78 42 00 dtcnantes@usocome.com
	Paris	SEW USOCOME Zone industrielle 2 rue Denis Papin 77390 Verneuil l'Étang	Tel. +33 1 64 42 40 80 dtcparis@usocome.com
Gabon			
Representation: Cameroon			
Germany			
Headquarters Production Sales	Bruchsal	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-1970 http://www.sew-eurodrive.de sew@sew-eurodrive.de
Production / Industrial Gears	Bruchsal	SEW-EURODRIVE GmbH & Co KG Christian-Pähr-Str. 10 76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-2970
Production / Precision Gear Units	Bruchsal	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-1970 sew@sew-eurodrive.de
Production	Graben	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 76676 Graben-Neudorf	Tel. +49 7251 75-0 Fax +49 7251-2970
Service Competence Center	Mechanics / Mechatronics	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 76676 Graben-Neudorf	Tel. +49 7251 75-1710 Fax +49 7251 75-1711 scc-mechanik@sew-eurodrive.de
	Electronics	SEW-EURODRIVE GmbH & Co KG Christian-Pähr-Straße 12 76646 Bruchsal	Tel. +49 7251 75-1780 Fax +49 7251 75-1769 scc-elektronik@sew-eurodrive.de
	MAXOLUTION® Factory Automation	SEW-EURODRIVE GmbH & Co KG Eisenbahnstraße 11 76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-1970 sew@sew-eurodrive.de
Drive Technology Center	North	SEW-EURODRIVE GmbH & Co KG Alte Ricklinger Straße 43 30823 Garbsen (Hannover)	Tel. +49 5137 8798-30 Fax +49 5137 8798-55 dtc-nord@sew-eurodrive.de
	East	SEW-EURODRIVE GmbH & Co KG Dänkritzer Weg 1 08393 Meerane (Zwickau)	Tel. +49 3764 7606-0 Fax +49 3764 7606-20 dtc-ost@sew-eurodrive.de
	South	SEW-EURODRIVE GmbH & Co KG Domagkstraße 5 85551 Kirchheim (München)	Tel. +49 89 909551-21 Fax +49 89 909551-50 dtc-sued@sew-eurodrive.de
	West	SEW-EURODRIVE GmbH & Co KG Siemensstraße 1 40764 Langenfeld (Düsseldorf)	Tel. +49 2173 8507-10 Fax +49 2173 8507-50 dtc-west@sew-eurodrive.de
Drive Center	Berlin	SEW-EURODRIVE GmbH & Co KG Melitta-Schiller-Straße 8 12526 Berlin	Tel. +49 306331131-30 Fax +49 306331131-36 dc-berlin@sew-eurodrive.de
	Bremen	SEW-EURODRIVE GmbH & Co KG Allerkai 4 28309 Bremen	Tel. +49 421 33918-10 Fax +49 421 33918-22 tb-bremen@sew-eurodrive.de

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Germany			
	Hamburg	SEW-EURODRIVE GmbH & Co KG Hasselbinnen 11 22869 Schenefeld	Tel. +49 40298109-60 Fax +49 40298109-70 dc-hamburg@sew-eurodrive.de
	Saarland	SEW-EURODRIVE GmbH & Co KG Gottlieb-Daimler-Straße 4 66773 Schwalbach Saar – Hülzweiler	Tel. +49 6831 48946 10 Fax +49 6831 48946 13 dc-saarland@sew-eurodrive.de
	Ulm	SEW-EURODRIVE GmbH & Co KG Dieselstraße 18 89160 Dornstadt	Tel. +49 7348 9885-0 Fax +49 7348 9885-90 dc-ulm@sew-eurodrive.de
	Würzburg	SEW-EURODRIVE GmbH & Co KG Nürnbergerstraße 118 97076 Würzburg-Lengfeld	Tel. +49 931 27886-60 Fax +49 931 27886-66 dc-wuerzburg@sew-eurodrive.de
Drive Service Hotline / 24 Hour Service			0 800 SEWHELP 0 800 7394357
Great Britain			
Assembly Sales Service	Normanton	SEW-EURODRIVE Ltd. DeVilliers Way Trident Park Normanton West Yorkshire WF6 1GX	Tel. +44 1924 893-855 Fax +44 1924 893-702 http://www.sew-eurodrive.co.uk info@sew-eurodrive.co.uk
Greece			
Sales	Athens	Christ. Boznos & Son S.A. 12, K. Mavromichali Street P.O. Box 80136 18545 Piraeus	Tel. +30 2 1042 251-34 Fax +30 2 1042 251-59 http://www.boznos.gr info@boznos.gr
Hungary			
Sales Service	Budapest	SEW-EURODRIVE Kft. Csillaghegyí út 13. 1037 Budapest	Tel. +36 1 437 06-58 Fax +36 1 437 06-50 http://www.sew-eurodrive.hu office@sew-eurodrive.hu
Iceland			
Sales	Reykjavik	Varma & Vélaverk ehf. Knarrarvogi 4 104 Reykjavík	Tel. +354 585 1070 Fax +354 585)1071 https://vov.is/ vov@vov.is
India			
Registered Office Assembly Sales Service	Vadodara	SEW-EURODRIVE India Private Limited 302, NOTUS IT PARK, Sarabhai Campus, Beside Notus Pride, Genda Circle, Vadodara 390023 Gujarat	Tel. +91 265 3045200 Fax +91 265 3045300 https://www.seweurodriveindia.com salesvadodara@seweurodriveindia.com
Assembly Sales Service	Chennai	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
	Pune	SEW-EURODRIVE India Private Limited Plant: Plot No. D236/1, Chakan Industrial Area Phase- II, Warale, Tal- Khed, Pune-410501, Maharashtra	Tel. +91 21 35 628700 Fax +91 21 35 628715 salespune@seweurodriveindia.com
	Tapukara	SEW-EURODRIVE India Private Limited Plot No SP-6-46, Tapukara, Karoli Industrial Area, No. 1, district : Alwar , Rajasthan - 301707	Tel. +91 265 3045200 Fax +91 265 3045300 tapukara.plant@seweurodriveindia.com
Sales	Gurgaon	SEW-EURODRIVE India Private Limited Global Business Park, M.G. Road Unit No. 205, 2nd Floor, Tower – D Gurugram 122001, Haryana	Tel. +91 99588 78855 salesgurgaon@seweurodriveindia.com

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Indonesia			
Registered Office Sales Service	Jakarta	PT SEW EURODRIVE INDONESIA Palma Tower, 16th Floor, Unit H & I, Jl R.A. Kartini II-S Kav 06 Pondok Pinang, Kebayoran Lama Jakarta Selatan 12310	Tel. +62 21 7593 0272 Fax +62 21 7593 0273 sales.indonesia@sew-eurodrive.com https://www.sew-eurodrive.com.sg
Sales	Medan	PT. Serumpun Indah Lestari Jl.Pulau Solor no. 8, Kawasan Industri Medan II Medan 20252	Tel. +62 61 687 1221 Fax +62 61 6871429 / +62 61 6871458 / +62 61 30008041 sil@serumpunindah.com serumpunindah@yahoo.com http://www.serumpunindah.com
	Jakarta	PT. Cahaya Sukses Abadi Komplek Rukan Puri Mutiara Blok A no 99, Sunter Jakarta 14350	Tel. +62 21 65310599 Fax +62 21 65310600 csajkt@cbn.net.id
	Jakarta	PT. Agrindo Putra Lestari JL.Pantai Indah Selatan, Komplek Sentra Industri Terpadu, Pantai indah Kapuk Tahap III, Blok E No. 27 Jakarta 14470	Tel. +62 21 2921-8899 Fax +62 21 2921-8988 aplindo@indosat.net.id http://www.aplindo.com
	Surabaya	PT. TRIAGRI JAYA ABADI Jl. Sukosemolo No. 63, Galaxi Bumi Permai G6 No. 11 Surabaya 60111	Tel. +62 31 5990128 Fax +62 31 5962666 sales@triagri.co.id http://www.triagri.co.id
	Surabaya	CV. Multi Mas Jl. Raden Saleh 43A Kav. 18 Surabaya 60174	Tel. +62 31 5458589 Fax +62 31 5317220 sianhwa@sby.centrin.net.id http://www.cvmultimas.com
Ireland			
Sales Service	Dublin	Alperton Engineering Ltd. 48 Moyle Road Dublin Industrial Estate Glasnevin, Dublin 11	Tel. +353 1 830-6277 Fax +353 1 830-6458 http://www.alperton.ie info@alperton.ie
Israel			
Sales	Tel Aviv	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
Italy			
Assembly Sales Service	Milan	SEW-EURODRIVE S.a.s. di SEW S.r.l. & Co. Via Bernini,12 20033 Solaro (Milano)	Tel. +39 02 96 980229 Fax +39 02 96 980 999 http://www.sew-eurodrive.it milano@sew-eurodrive.it
Ivory Coast			
Sales	Abidjan	SEW-EURODRIVE SARL Ivory Coast Rue des Pêcheurs, Zone 3 26 BP 916 Abidjan 26	Tel. +225 27 21 21 81 05 Fax +225 27 21 25 30 47 info@sew-eurodrive.ci http://www.sew-eurodrive.ci
Japan			
Assembly Sales Service	Iwata	SEW-EURODRIVE JAPAN CO., LTD 250-1, Shimoman-no, Iwata Shizuoka 438-0818	Tel. +81 538 373811 Fax +81 538 373814 http://www.sew-eurodrive.co.jp sewjapan@sew-eurodrive.co.jp
Kazakhstan			
Sales Service	Almaty	SEW-EURODRIVE LLP 291-291A, Tole bi street 050031, Almaty	Tel. +7 (727) 350 5156 Fax +7 (727) 350 5156 http://www.sew-eurodrive.com kazakhstan@sew-eurodrive.com
	Tashkent	Representative Office SEW-EURODRIVE Representative office in Uzbekistan 95A Amir Temur ave, office 401/3 100084 Tashkent	Tel. +998 97 134 01 99 http://www.sew-eurodrive.uz sew@sew-eurodrive.uz

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	Ulaanbaatar	IM Trading LLC Olympic street 28B/3 Sukhbaatar district, Ulaanbaatar 14230, MN	Tel. +976-77109997 Fax +976-77109997 imt@imt.mn
Latvia			
Sales	Riga	SIA Alas-Kuul Katlakalna 11C 1073 Riga	Tel. +371 6 7139253 Fax +371 6 7139386 http://www.alas-kuul.lv 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
Sales (Jordan, Kuwait , Saudi Arabia, Syria)	Beirut	Middle East Drives S.A.L. (offshore) Sin El Fil. B. P. 55-378 Beirut	Tel. +961 1 494 786 Fax +961 1 494 971 http://www.medrives.com info@medrives.com
Lithuania			
Sales	Alytus	UAB Irseva Statybininku 106C 63431 Alytus	Tel. +370 315 79204 Fax +370 315 56175 http://www.irseva.lt irmantas@irseva.lt
Luxembourg			
Representation: Belgium			
Macedonia			
Sales	Skopje	Boznos DOOEL Dime Anicin 2A/7A 1000 Skopje	Tel. +389 23256553 Fax +389 23256554 http://www.boznos.mk
Malaysia			
Assembly Sales Service	Johor	SEW-EURODRIVE SDN BHD No. 95, Jalan Seroja 39, Taman Johor Jaya 81000 Johor Bahru, Johor West Malaysia	Tel. +60 7 3549409 Fax +60 7 3541404 sales@sew-eurodrive.com.my
Mexico			
Assembly Sales Service	Quéretaro	SEW-EURODRIVE MEXICO S.A. de C.V. SEM-981118-M93 Tequisquiapan No. 102 Parque Industrial Quéretaro C.P. 76220 Querétaro, México	Tel. +52 442 1030-300 Fax +52 442 1030-301 http://www.sew-eurodrive.com.mx scmexico@seweurodrive.com.mx
Sales Service	Puebla	SEW-EURODRIVE MEXICO S.A. de C.V. Calzada Zavaleta No. 3922 Piso 2 Local 6 Col. Santa Cruz Buenavista C.P. 72154 Puebla, México	Tel. +52 (222) 221 248 http://www.sew-eurodrive.com.mx scmexico@seweurodrive.com.mx
Mongolia			
Technical Office	Ulaanbaatar	IM Trading LLC Olympic street 28B/3 Sukhbaatar district, Ulaanbaatar 14230, MN	Tel. +976-77109997 Tel. +976-99070395 Fax +976-77109997 http://imt.mn/ imt@imt.mn
Morocco			
Sales Service Assembly	Bouskoura	SEW-EURODRIVE Morocco SARL Parc Industriel CFCIM, Lot. 55/59 27182 Bouskoura Grand Casablanca	Tel. +212 522 88 85 00 Fax +212 522 88 84 50 http://www.sew-eurodrive.ma sew@sew-eurodrive.ma

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Namibia			
Sales	Swakopmund	DB MINING & INDUSTRIAL SUPPLIES CC Einstein Street Strauss Industrial Park Unit1 Swakopmund	Tel. +264 64 462 738 Fax +264 64 462 734 anton@dbminingnam.com
Netherlands			
Assembly Sales Service	Rotterdam	SEW-EURODRIVE B.V. Industrieweg 175 3044 AS Rotterdam Postbus 10085 3004 AB Rotterdam	Tel. +31 10 4463-700 Fax +31 10 4155-552 Service: 0800-SEWHELP http://www.sew-eurodrive.nl info@sew-eurodrive.nl
New Zealand			
Assembly Sales Service	Auckland	SEW-EURODRIVE NEW ZEALAND LTD. P.O. Box 58-428 82 Greenmount drive East Tamaki Auckland	Tel. +64 9 2745627 Fax +64 9 2740165 http://www.sew-eurodrive.co.nz sales@sew-eurodrive.co.nz
	Christchurch	SEW-EURODRIVE NEW ZEALAND LTD. 30 Lodestar Avenue, Wigram Christchurch	Tel. +64 3 384-6251 Fax +64 3 384-6455 sales@sew-eurodrive.co.nz
Nigeria			
Sales	Lagos	Greenpeg Nig. Ltd 64C Toyin Street Opebi-Allen Ikeja Lagos-Nigeria	Tel. +234-701-821-9200-1 http://www.greenpegltd.com sales@greenpegltd.com
Norway			
Assembly Sales Service	Moss	SEW-EURODRIVE A/S Solgaard skog 71 1599 Moss	Tel. +47 69 24 10 20 Fax +47 69 24 10 40 http://www.sew-eurodrive.no sew@sew-eurodrive.no
Pakistan			
Sales	Karachi	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 seweurodrive@cyber.net.pk
Paraguay			
Sales	Fernando de la Mora	SEW-EURODRIVE PARAGUAY S.R.L Nu Guazu No. 642 casi Campo Esperanza Santisima Trinidad Asuncion	Tel. +595 991 519695 Fax +595 21 3285539 sewpy@sew-eurodrive.com.py
Peru			
Assembly Sales Service	Lima	SEW EURODRIVE DEL PERU S.A.C. Los Calderos, 120-124 Urbanizacion Industrial Vulcano, ATE, Lima	Tel. +51 1 3495280 Fax +51 1 3493002 http://www.sew-eurodrive.com.pe sewperu@sew-eurodrive.com.pe
Philippines			
Sales	Makati	P.T. Cerna Corporation 4137 Ponte St., Brgy. Sta. Cruz Makati City 1205	Tel. +63 2 519 6214 Fax +63 2 890 2802 mech_drive_sys@ptcerna.com http://www.ptcerna.com
Poland			
Assembly Sales Service	Łódź	SEW-EURODRIVE Polska Sp.z.o.o. ul. Techniczna 5 92-518 Łódź	Tel. +48 42 293 00 00 Fax +48 42 293 00 49 http://www.sew-eurodrive.pl sew@sew-eurodrive.pl
	Service	Tel. +48 42 293 0030 Fax +48 42 293 0043	24 Hour Service Tel. +48 602 739 739 (+48 602 SEW SEW) serwis@sew-eurodrive.pl

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Portugal			
Assembly Sales Service	Coimbra	SEW-EURODRIVE, LDA. Av. da Fonte Nova, n.º 86 3050-379 Mealhada	Tel. +351 231 20 9670 Fax +351 231 20 3685 http://www.sew-eurodrive.pt infosew@sew-eurodrive.pt
Romania			
Sales Service	Bucharest	Sialco Trading SRL str. Brazilia nr. 36 011783 Bucuresti	Tel. +40 21 230-1328 Fax +40 21 230-7170 http://www.sialco.ro sialco@sialco.ro
Russia			
Assembly Sales Service	St. Petersburg	ЗАО «СЕВ-ЕВРОДРАЙФ» 188660, Russia, Leningrad Region, Vsevolozhsky District, Korabselki, Aleksandra Nevskogo str. building 4, block 1 P.O. Box 36 195220 St. Petersburg	Tel. +7 812 3332522 / +7 812 5357142 Fax +7 812 3332523 http://www.sew-eurodrive.ru sew@sew-eurodrive.ru
Senegal			
Sales	Dakar	SENEMECA Mécanique Générale Km 8, Route de Rufisque B.P. 3251, Dakar	Tel. +221 338 494 770 Fax +221 338 494 771 http://www.senemeca.com senemeca@senemeca.sn
Serbia			
Sales	Belgrade	DIPAR d.o.o. Ustanicka 128a PC Košum, IV floor 11000 Beograd	Tel. +381 11 347 3244 / +381 11 288 0393 Fax +381 11 347 1337 office@dipar.rs
Singapore			
Assembly Sales Service	Singapore	SEW-EURODRIVE PTE. LTD. 9, Tuas Drive 2 Singapore 638644	Tel. +65 68621701 Fax +65 68612827 http://www.sew-eurodrive.com.sg sewsingapore@sew-eurodrive.com
Slovakia			
Sales	Bernolákovo	SEW-Eurodrive SK s.r.o. Priemyselná ulica 6267/7 900 27 Bernolákovo	Tel.+421 2 48 212 800 http://www.sew-eurodrive.sk sew@sew-eurodrive.sk
Slovenia			
Sales Service	Celje	Pakman - Pogonska Tehnika d.o.o. UI. XIV. divizije 14 3000 Celje	Tel. +386 3 490 83-20 Fax +386 3 490 83-21 pakman@siol.net
South Africa			
Assembly Sales Service	Johannesburg	SEW-EURODRIVE (PROPRIETARY) LIMITED 32 O'Connor Place Eurodrive House Aeroton Johannesburg 2190 P.O.Box 90004 Bertsham 2013	Tel. +27 11 248-7000 Fax +27 11 248-7289 http://www.sew.co.za info@sew.co.za
	Cape Town	SEW-EURODRIVE (PROPRIETARY) LIMITED Rainbow Park Cnr. Racecourse & Omuramba Road Montague Gardens Cape Town P.O.Box 36556 Chempet 7442	Tel. +27 21 552-9820 Fax +27 21 552-9830 Telex 576 062 bgriffiths@sew.co.za
	Durban	SEW-EURODRIVE (PROPRIETARY) LIMITED 48 Prospecton Road Isipingo Durban P.O. Box 10433, Ashwood 3605	Tel. +27 31 902 3815 Fax +27 31 902 3826 cdejager@sew.co.za

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South Africa			
	Nelspruit	SEW-EURODRIVE (PROPRIETARY) LIMITED 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			
Assembly Sales Service	Ansan	SEW-EURODRIVE Korea Co., Ltd. 7, Dangjaengi-ro, Danwon-gu, Ansan-si, Gyeonggi-do, Zip 425-839	Tel. +82 31 492-8051 Fax +82 31 492-8056 http://www.sew-eurodrive.kr master.korea@sew-eurodrive.com
	Busan	SEW-EURODRIVE Korea Co., Ltd. 28, Noksansandan 262-ro 50beon-gil, Gangseo-gu, Busan, Zip 618-820	Tel. +82 51 832-0204 Fax +82 51 832-0230
Assembly Service	Siheung	SEW-EURODRIVE Korea Co., Ltd. 35, Emtibeui 26-ro 58beon-gil, Siheung-si, Gyeonggi-do	http://www.sew-eurodrive.kr
Spain			
Assembly Sales Service	Bilbao	SEW-EURODRIVE ESPAÑA, S.L. Parque Tecnológico, Edificio, 302 48170 Zamudio (Vizcaya)	Tel. +34 94 43184-70 http://www.sew-eurodrive.es sew.spain@sew-eurodrive.es
Sri Lanka			
Sales	Colombo	SM International (Pte) Ltd 254, Galle Raod Colombo 4, Sri Lanka	Tel. +94 1 2584887 Fax +94 1 2582981
Swaziland			
Sales	Manzini	C G Trading Co. (Pty) Ltd Simunye street Matsapha, Manzini	Tel. +268 7602 0790 Fax +268 2 518 5033 charles@cgtrading.co.sz www.cgtradingswaziland.com
Sweden			
Assembly Sales Service	Jönköping	SEW-EURODRIVE AB Gnejsvägen 6-8 553 03 Jönköping Box 3100 S-550 03 Jönköping	Tel. +46 36 34 42 00 Fax +46 36 34 42 80 http://www.sew-eurodrive.se jonkoping@sew.se
Switzerland			
Assembly Sales Service	Basel	Alfred Imhof A.G. Jurastrasse 10 4142 Münchenstein bei Basel	Tel. +41 61 417 1717 Fax +41 61 417 1700 http://www.imhof-sew.ch info@imhof-sew.ch
Taiwan			
Sales	Taipei	Ting Shou Trading Co., Ltd. 6F-3, No. 267, Sec. 2 Tung Huw S. Road Taipei	Tel. +886 2 27383535 Fax +886 2 27368268 Telex 27 245 sewtwn@ms63.hinet.net http://www.tingshou.com.tw
	Nan Tou	Ting Shou Trading Co., Ltd. No. 55 Kung Yeh N. Road Industrial District Nan Tou 540	Tel. +886 49 255353 Fax +886 49 257878 sewtwn@ms63.hinet.net http://www.tingshou.com.tw
Tanzania			
Sales	Daressalam	SEW-EURODRIVE PTY LIMITED TANZANIA Plot 52, Regent Estate PO Box 106274 Dar Es Salaam	Tel. +255 0 22 277 5780 Fax +255 0 22 277 5788 http://www.sew-eurodrive.co.tz info@sew.co.tz
Thailand			
Assembly Sales Service	Chonburi	SEW-EURODRIVE (Thailand) Ltd. 700/456, Moo.7, Donhuaroh Muang Chonburi 20000	Tel. +66 38 454281 Fax +66 38 454288 sewthailand@sew-eurodrive.com

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Tunisia			
Sales	Tunis	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 http://www.tms.com.tn tms@tms.com.tn
Turkey			
Assembly Sales Service	Kocaeli-Gebze	SEW-EURODRIVE Ana Merkez Gebze Organize Sanayi Böl. 400 Sok No. 401 41480 Gebze Kocaeli	Tel. +90 262 9991000 04 Fax +90 262 9991009 http://www.sew-eurodrive.com.tr sew@sew-eurodrive.com.tr
Ukraine			
Assembly Sales Service	Dnipropetrovsk	SEW-EURODRIVE, LLC Robochya str., bld. 23-B, office 409 49008 Dnipro	Tel. +380 56 370 3211 Fax +380 56 372 2078 http://www.sew-eurodrive.ua sew@sew-eurodrive.ua
United Arab Emirates			
Drive Technology Center	Dubai	SEW-EURODRIVE FZE PO Box 263835 Jebel Ali Free Zone – South, P.O. Box Dubai, United Arab Emirates	Tel. +971 (0)4 8806461 Fax +971 (0)4 8806464 info@sew-eurodrive.ae
Uruguay			
Assembly Sales	Montevideo	SEW-EURODRIVE Uruguay, S. A. Jose Serrato 3569 Esqina Corumbe CP 12000 Montevideo	Tel. +598 2 21181-89 Fax +598 2 21181-90 sewuy@sew-eurodrive.com.uy
USA			
Production Sales Service	Southeast Region	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 Production +1 864 439-9948 Fax Assembly +1 864 439-0566 Fax Confidential/HR +1 864 949-5557 http://www.seweurodrive.com cslyman@seweurodrive.com
Assembly Sales Service	Northeast Region	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 csbridgeport@seweurodrive.com
	Midwest Region	SEW-EURODRIVE INC. 2001 West Main Street Troy, Ohio 45373	Tel. +1 937 335-0036 Fax +1 937 332-0038 cstroy@seweurodrive.com
	Southwest Region	SEW-EURODRIVE INC. 202 W. Danieldale Rd. DeSoto, TX 75115	Tel. +1 214 330-4824 Fax +1 214 330-4724 csdallas@seweurodrive.com
	Western Region	SEW-EURODRIVE INC. 30599 San Antonio St. Hayward, CA 94544	Tel. +1 510 487-3560 Fax +1 510 487-6433 cshayward@seweurodrive.com
	Wellford	SEW-EURODRIVE INC. 148/150 Finch Rd. Wellford, S.C. 29385	Tel. +1 864 439-7537 Fax +1 864 661 1167 IGOrders@seweurodrive.com
		SEW-EURODRIVE INC. 220 Finch Rd. Wellford, S.C. 29385-9630	
	Additional addresses for service provided on request!		
Vietnam			
Sales	Ho Chi Minh City	SEW-EURODRIVE PTE. LTD. RO at Hochiminh City Floor 8, KV I, Loyal building, 151-151 Bis Vo Thi Sau street, ward 6, District 3, Ho Chi Minh City, Vietnam	Tel. +84 937 299 700 huytam.phan@sew-eurodrive.com

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Zambia
Representation: South Africa

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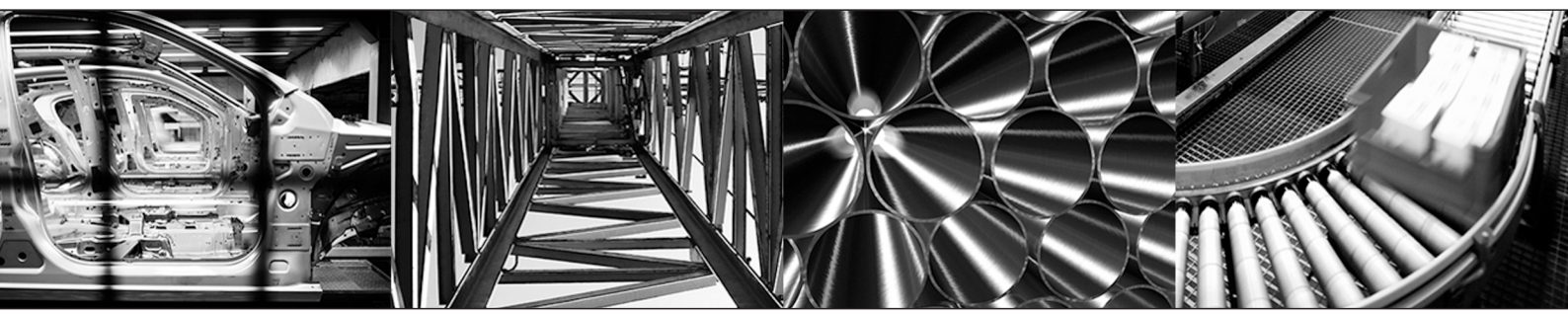

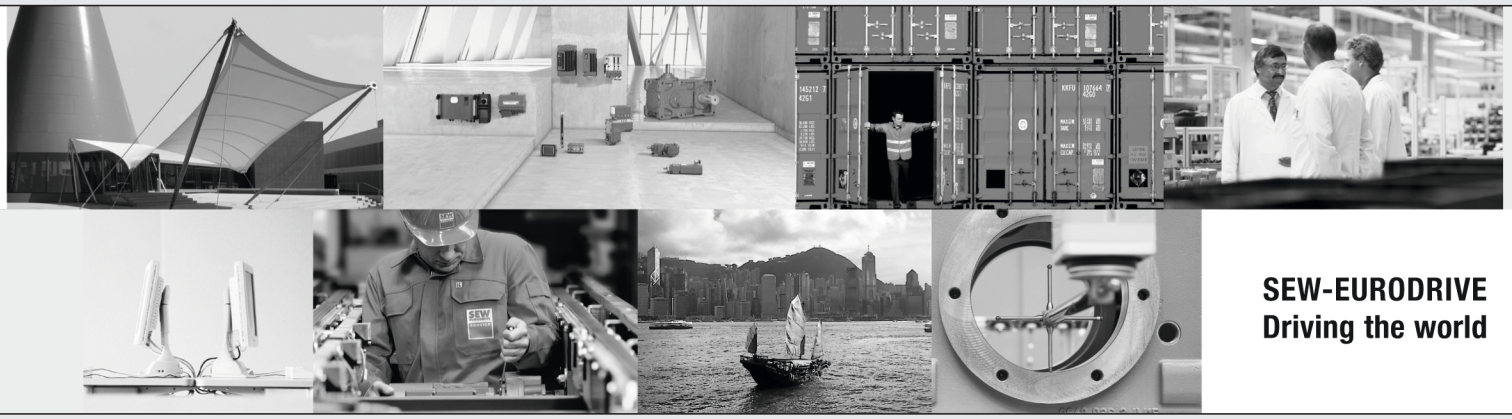

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