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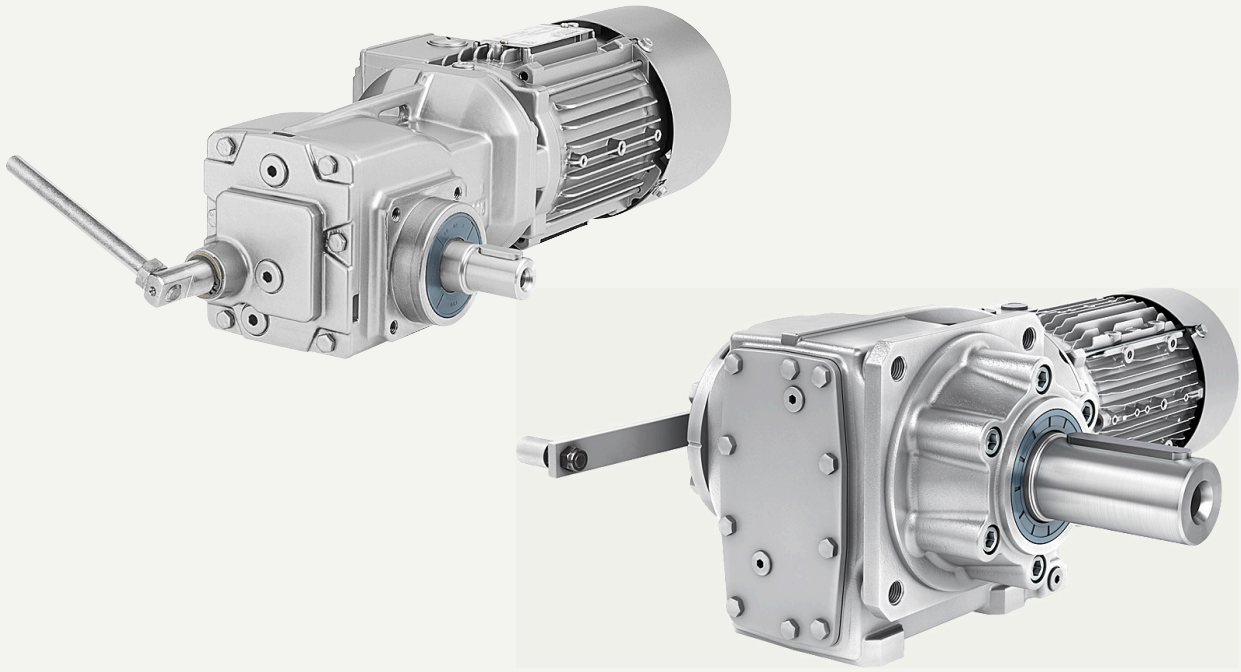

Edition 01/2024

ORIGINAL MOUNTING AND OPERATING INSTRUCTIONS

SIMOGEAR

Electric monorail gearboxes

BA 2535 - BH, KH

www.siemens.com/simogear

SIEMENS

Geared motors
SIMOGEAR electric monorail gearbox

Operating Instructions

Translation of the original instructions
01/2024
A5E53220855A/RS-AA

Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠ **DANGER**
indicates that death or severe personal injury **will** result if proper precautions are not taken.

⚠ **WARNING**
indicates that death or severe personal injury **may** result if proper precautions are not taken.

⚠ **CAUTION**
indicates that minor personal injury can result if proper precautions are not taken.

NOTICE
indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Innomotics products

Note the following:

⚠ **WARNING**
Innomotics products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Innomotics. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

All names identified by ® are registered trademarks of Innomotics GmbH. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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GERMANY

A5E53220855A/RS-AA
Ⓟ 11/2023 Subject to change

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Introduction 1

Note

The following pages contain the Siemens logo and the Siemens legal information.

Please note that since July 1st, 2023 the Siemens Businesses **Large Drives Applications** and **Low Voltage Motors** are part of **Innomotics GmbH**, Germany.

All rights to and product information on the following pages have been transferred from Siemens to Innomotics.

The re-branding of the document will take place in due course.

1.1 About SIMOGEAR

Description

SIMOGEAR is the Siemens product family of geared motors in Digital Industry.

1.2 Sales legislation

Typical use cases are listed in this product documentation and in the online help to illustrate possible application areas for our products. These are purely exemplary and do not constitute a statement relating to the suitability of the respective product for use in specific individual cases. Unless explicitly agreed as part of a contract, Siemens assumes no liability relating to such suitability. Suitability for a particular application in specific individual cases must be assessed by the user on a case-for-case basis, taking into account all technical, legal and other requirements. Always observe the descriptions of the technical features and the relevant constraints of the respective product provided in the product documentation.

1.3 About this manual

1.3.1 Content

Description

These operating instructions provide you with information about the geared motors and their associated components. You will learn about safely and professionally handling the geared motors – from the initial delivery up to final disposal:

- Transporting and storing
- Setup and mounting
- Connecting
- Commissioning
- Testing
- Operating
- Searching for and eliminating faults
- Disassembly
- Disposal

Keeping the documentation in a safe place

This documentation should be kept in a location where it can be accessed. Make the documentation available to the personnel that have been deployed.

Description

This documentation includes recommendations relating to third-party products. Siemens is aware of the fundamental suitability of these third-party products. You can use equivalent products from other manufacturers.

Siemens does not accept any warranty when using third-party products.

1.3.2 Target group

Description

These operating instructions address all personnel who work on a geared motor or use a geared motor.

1.3.3 Preventing hazards

The safety instructions provided in these operating instructions are intended to avoid personal injury and material damage. They also guarantee the function and a long service life of the geared motors.

- Read these operating instructions before handling the geared motors.
- Always follow the safety instructions and notices in these operating instructions.

The warning note concept is explained at the beginning of this documentation.

1.3.4 What's new in BA_2535_0619?

Main changes in this edition

Revisions

- Address changed from Siemens AG to Innomotics GmbH
- Front covers U1 and U4 adapted

1.3.5 Standard scope

Description

This documentation describes the functionality of the standard scope. This scope may differ from the scope of the functionality of the system that is actually supplied. The functions of the system delivered can only be found in the order documents.

Additional functions may be able to be executed in the system, which are not explained in this documentation. However, these functions cannot be claimed in the case of a new delivery or service.

This documentation does not contain all detailed information on all product types. Furthermore, this documentation cannot take into consideration every conceivable type of installation, operation and service/maintenance.

The machine manufacturer must document any additions or modifications made to the product.

1.3.6 Websites of third-party companies

Description

This document may contain hyperlinks to third-party websites. Siemens is not responsible for and shall not be liable for these websites and their content. Siemens does not check the information that appears on these websites and is not responsible for the content and information provided there. The user bears the full risk when visiting these websites.

1.4 SIMOGEAR documentation

Description

Comprehensive documentation on SIMOTICS, SIMOGEAR and on the SINAMICS converter family are provided in Internet (https://support.industry.siemens.com/cs/de/en/ps/13204/man).

You can display documents or download them in the PDF and HTML5 format.

The documentation is divided into the following categories:

Table 1-1 SIMOTICS / SIMOGEAR / SINAMICS documentation

Information	Documentation class[1)]	Content	Target group
General information	Configuration Manual	Rules, guidelines and tools for configuring products, systems, and plants. Further: Information about the operating and ambient conditions for hardware and software, the use of functions, as well as about circuit diagrams and terminal diagrams and the installation of software assuming that this is necessary for commissioning.	Planners, application engineers
Device information	Installation Instructions	All relevant information on setting up, installing and cabling as well as the required dimension drawings and circuit diagrams	Installation personnel, commissioning engineers, service and maintenance personnel

Information	Documentation class[1)]	Content	Target group
Basic information	Operating instructions	Comprehensive collection of all information necessary for the safe operation of products, plant/system parts and complete plants (IEC 82079)	Machine operators, plant operators
	Compact instructions	Essential contents of the operating instructions in abbreviated and compressed form	Machine operators, plant operators
	Product Information	Information that only becomes known shortly before or even after start of delivery and is therefore not included in the associated user documentation	Planners, configuration engineers, technologists, installation personnel, constructors; commissioning engineers, machine operators, programmers, service and maintenance personnel
	Online help	Instructions for configuring, programming and commissioning	Application engineers, programmers, commissioning engineers

[1)] Not all documentation classes are available for every SIMOTICS / SIMOGEAR / SINAMICS product.

1.5 Documentation on the Internet

The manuals for the motors, gearboxes and geared motors are available here: SIOS web site (https://support.industry.siemens.com/cs/ww/en/ps/13424/man)

1.6 Service and support

1.6.1 Siemens Industry Online Support on the Web

Description

The following is available via Siemens Industry Online Support (https://support.industry.siemens.com/cs/ww/en/), among others:

- Product support
- Global forum for information and best practice sharing between users and specialists
- Local contact persons via the contact person database (→ Contact)
- Information about field services, repairs, spare parts, and much more (→ Services)
- Search for product info

- Important topics at a glance
- FAQs (frequently asked questions)
- Application examples
- Manuals
- Downloads
- Compatibility tool
- Newsletters with information about your products
- Catalogs/brochures

1.6.2 Spare parts services

Description

The online spare part service "Spares on Web" offers certain spare parts for the product:

- Website: SOW address (https://www.sow.siemens.com/?lang=en).

1.7 Important product information

1.7.1 Use as prescribed

The SIMOGEAR gearboxes described in these Operating Instructions have been developed for use as travel drives in monorail conveyors.

Unless otherwise agreed, the gearboxes have been designed for use in plants and equipment in industrial environments.

They are used to transport goods in roofed over industrial applications. They can be used outdoors if the necessary contractual arrangements are made.

The gearboxes are shipped in an operationally safe condition. Changes made by users could affect this operational reliability and are forbidden.

Note

The data on the rating plate assumes an installation altitude of up to 1 000 m above sea level.

The permissible ambient temperature is stamped on the rating plate.

For different installation altitudes and ambient temperatures, contact Technical Support.

The gearboxes have been designed for only the applications described in the Technical data (Page 71). Do not operate the gearbox outside the specified power limit. Other operating conditions must be contractually agreed.

Do not climb on the gearbox. Do not place any objects on the gearbox.

1.7.2 Predictable incorrect use

⚠ WARNING

Injuries due to incorrect use

Death or severe injury can occur if you use the gearbox or the geared motor other than in the way intended by Siemens. You destroy or damage the gearbox or the geared motor.

Incorrect use includes, for example

- Not complying with the operating instructions
- Not observing the data on the rating plate
- Using the gearbox or geared motor in hazardous zones
- Using the gearbox or geared motor outside the permissible ambient conditions
- Using the gearbox or geared motor as generator
- Using the motor holding brake as an operating brake to reduce the motor speed
- Using the gearbox or geared motor as a result of its size, its weight, its shape or its material for applications other than those precisely described in this manual

Fundamental safety instructions

2

2.1 General safety instructions

⚠ WARNING

Electric shock and danger to life due to other energy sources

Touching live components can result in death or severe injury.

- Only work on electrical devices when you are qualified for this job.
- Always observe the country-specific safety rules.

Generally, the following steps apply when establishing safety:

1. Prepare for disconnection. Notify all those who will be affected by the procedure.
2. Isolate the drive system from the power supply and take measures to prevent it being switched back on again.
3. Wait until the discharge time specified on the warning labels has elapsed.
4. Check that there is no voltage between any of the power connections, and between any of the power connections and the protective conductor connection.
5. Check whether the existing auxiliary supply circuits are de-energized.
6. Ensure that the motors cannot move.
7. Identify all other dangerous energy sources, e.g. compressed air, hydraulic systems, or water. Switch the energy sources to a safe state.
8. Check that the correct drive system is completely locked.

After you have completed the work, restore the operational readiness in the inverse sequence.

⚠ WARNING

Electric shock due to connection to an unsuitable power supply

When equipment is connected to an unsuitable power supply, exposed components may carry a hazardous voltage. Contact with hazardous voltage can result in severe injury or death.

- Only use power supplies that provide SELV (Safety Extra Low Voltage) or PELV- (Protective Extra Low Voltage) output voltages for all connections and terminals of the electronics modules.

⚠ WARNING

Electric shock due to damaged motors or devices

Improper handling of motors or devices can damage them.

Hazardous voltages can be present at the enclosure or at exposed components on damaged motors or devices.

- Ensure compliance with the limit values specified in the technical data during transport, storage and operation.
- Do not use any damaged motors or devices.

⚠ WARNING

Electric shock due to unconnected cable shield

Hazardous touch voltages can occur through capacitive cross-coupling due to unconnected cable shields.

- As a minimum, connect cable shields and the conductors of power cables that are not used (e.g. brake cores) at one end at the grounded housing potential.

⚠ WARNING

Electric shock if there is no ground connection

For missing or incorrectly implemented protective conductor connection for devices with protection class I, high voltages can be present at open, exposed parts, which when touched, can result in death or severe injury.

- Ground the device in compliance with the applicable regulations.

⚠ WARNING

Arcing when a plug connection is opened during operation

Opening a plug connection when a system is in operation can result in arcing that may cause serious injury or death.

- Only open plug connections when the equipment is in a voltage-free state, unless it has been explicitly stated that they can be opened in operation.

NOTICE

Property damage due to loose power connections

Insufficient tightening torques or vibration can result in loose power connections. This can result in damage due to fire, device defects or malfunctions.

- Tighten all power connections to the prescribed torque.
- Check all power connections at regular intervals, particularly after equipment has been transported.

NOTICE

Damage to equipment due to unsuitable tightening tools.

Unsuitable tightening tools or fastening methods can damage the screws of the equipment.

- Only use screw inserts that exactly match the screw head.
- Tighten the screws with the torque specified in the technical documentation.
- Use a torque wrench or a mechanical precision nut runner with a dynamic torque sensor and speed limitation system.
- Adjust the tools used regularly.

⚠ WARNING

Unexpected machine movement caused by radio devices or mobile phones

Using radio devices, cellphones, or mobile WLAN devices in the immediate vicinity of the components can result in equipment malfunction. Malfunctions may impair the functional safety of machines and can therefore put people in danger or lead to property damage.

- Therefore, if you move closer than 20 cm to the components, be sure to switch off radio devices, cellphones or WLAN devices.
- Use the "SIEMENS Industry Online Support App" or a QR code scanner only on equipment that has already been switched off.

⚠ WARNING

Unrecognized dangers due to missing or illegible warning labels

Dangers might not be recognized if warning labels are missing or illegible. Unrecognized dangers may cause accidents resulting in serious injury or death.

- Check that the warning labels are complete based on the documentation.
- Attach any missing warning labels to the components, where necessary in the national language.
- Replace illegible warning labels.

⚠ WARNING

Unexpected movement of machines caused by inactive safety functions

Inactive or non-adapted safety functions can trigger unexpected machine movements that may result in serious injury or death.

- Observe the information in the appropriate product documentation before commissioning.
- Carry out a safety inspection for functions relevant to safety on the entire system, including all safety-related components.
- Ensure that the safety functions used in your drives and automation tasks are adjusted and activated through appropriate parameterizing.
- Perform a function test.
- Only put your plant into live operation once you have guaranteed that the functions relevant to safety are running correctly.

Note

Important Safety instructions for Safety Integrated

If you want to use Safety Integrated functions, you must observe the Safety instructions in the Safety Integrated documentation.

⚠ WARNING

Active implant malfunctions due to electromagnetic fields

Electromagnetic fields (EMF) are generated by the operation of electrical power equipment, such as transformers, converters, or motors. People with pacemakers or implants are at particular risk in the immediate vicinity of this equipment.

- If this affects you, maintain the minimum distance to such equipment that is specified in the "Important product information" chapter.

⚠ WARNING

Active implant malfunctions due to permanent-magnet fields

Even when switched off, electric motors with permanent magnets represent a potential risk for persons with heart pacemakers or implants if they are close to converters/motors.

- If this affects you, maintain the minimum distance to such equipment that is specified in the "Important product information" chapter.
- When transporting or storing permanent-magnet motors always use the original packing materials with the warning labels attached.
- Clearly mark the storage locations with the appropriate warning labels.
- IATA regulations must be observed when transported by air.

⚠ WARNING

Injury caused by moving or ejected parts

Contact with moving motor parts or drive output elements and the ejection of loose motor parts (e.g. feather keys) out of the motor enclosure can result in severe injury or death.

- Remove any loose parts or secure them so that they cannot be flung out.
- Do not touch any moving parts.
- Safeguard all moving parts using the appropriate safety guards.

⚠ WARNING

Fire due to incorrect operation of the motor

When incorrectly operated and in the case of a fault, the motor can overheat resulting in fire and smoke. This can result in severe injury or death. Further, excessively high temperatures destroy motor components and result in increased failures as well as shorter service lives of motors.

- Operate the motor according to the relevant specifications.
- Only operate the motors in conjunction with effective temperature monitoring.
- Immediately switch off the motor if excessively high temperatures occur.

⚠ CAUTION

Burns and thermal damage caused by hot surfaces

Temperatures above 100 °C may occur on the surfaces of motors, converters, and other drive components.

Touching hot surfaces may result in burns. Hot surfaces may damage or destroy temperature sensitive parts.

- Ensure that temperature-sensitive parts do not come into contact with hot surfaces.
- Mount drive components so that they are not accessible during operation.

Measures when maintenance is required:

- Allow drive components to cool off before starting any work.
- Use appropriate personnel protection equipment, e.g. gloves.

2.2 Equipment damage due to electric fields or electrostatic discharge

Electrostatic sensitive devices (ESD) are individual components, integrated circuits, modules or devices that may be damaged by either electric fields or electrostatic discharge.

NOTICE

Equipment damage due to electric fields or electrostatic discharge

Electric fields or electrostatic discharge can cause malfunctions through damaged individual components, integrated circuits, modules or devices.

- Only pack, store, transport and send electronic components, modules or devices in their original packaging or in other suitable materials, e.g conductive foam rubber of aluminum foil.
- Only touch components, modules and devices when you are grounded by one of the following methods:
  - Wearing an ESD wrist strap
  - Wearing ESD shoes or ESD grounding straps in ESD areas with conductive flooring
- Only place electronic components, modules or devices on conductive surfaces (table with ESD surface, conductive ESD foam, ESD packaging, ESD transport container).

2.3 Cybersecurity information

Siemens provides products and solutions with industrial cybersecurity functions that support the secure operation of plants, systems, machines and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial cybersecurity concept. Siemens' products and solutions constitute one element of such a concept.

Customers are responsible for preventing unauthorized access to their plants, systems, machines and networks. Such systems, machines and components should only be connected to an enterprise network or the internet if and to the extent such a connection is necessary and only when appropriate security measures (e.g. firewalls and/or network segmentation) are in place.

For additional information on industrial cybersecurity measures that may be implemented, please visit
https://www.siemens.com/cybersecurity-industry.

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends that product updates are applied as soon as they are available and that the latest product versions are used. Use of product versions that are no longer supported, and failure to apply the latest updates may increase customer's exposure to cyber threats.

To stay informed about product updates, subscribe to the Siemens Industrial Cybersecurity RSS Feed under
https://new.siemens.com/cert.

Further information is provided on the Internet:

Industrial Security Configuration Manual (https://support.industry.siemens.com/cs/ww/en/view/108862708)

⚠ WARNING

Unsafe operating states resulting from software manipulation

Software manipulations, e.g. viruses, Trojans, or worms, can cause unsafe operating states in your system that may lead to death, serious injury, and property damage.

- Keep the software up to date.
- Incorporate the automation and drive components into a state-of-the-art, integrated industrial cybersecurity concept for the installation or machine.
- Make sure that you include all installed products in the integrated industrial cybersecurity concept.
- Protect files stored on exchangeable storage media from malicious software by with suitable protection measures, e.g. virus scanners.
- Carefully check all cybersecurity-related settings once commissioning has been completed.

2.4 Residual risks of power drive systems

When assessing the machine or system-related risk in accordance with the respective local regulations (e.g. EC Machinery Directive), the machine manufacturer or system integrator must take into account the following residual risks emanating from the control and drive components of a drive system:

1. Unintentional movements of driven machine or system components during commissioning, operation, maintenance, and repairs caused by, for example,
   - Hardware faults and/or software errors in the sensors, control system, actuators, and connections
   - Response times of the control system and of the drive
   - Operation and/or environmental conditions outside the specification
   - Condensation/conductive contamination
   - Parameterization, programming, cabling, and installation errors
   - Use of wireless devices/mobile phones in the immediate vicinity of electronic components
   - External influences/damage
   - X-ray, ionizing radiation and cosmic radiation
2. Unusually high temperatures inside and outside the components, including open flames, as well as emissions of light, noise, particles, gases, etc. due to fault conditions, e.g.:
   - Component failure
   - Software errors
   - Operation and/or environmental conditions outside the specification
   - External influences/damage
   - Short circuits or ground faults in the intermediate DC circuit of the converter
3. Hazardous shock voltages caused by, for example:
   - Component failure
   - Influence during electrostatic charging
   - Induction of voltages in moving motors
   - Operation and/or environmental conditions outside the specification
   - Condensation/conductive contamination
   - External influences/damage
4. Electrical, magnetic and electromagnetic fields generated in operation that can pose a risk to people with a pacemaker, implants or metal replacement joints, etc., if they are too close
5. Release of environmental pollutants or emissions as a result of improper operation of the system and/or failure to dispose of components safely and correctly

6. Influence of network-connected and wireless communications systems, e.g. ripple-control transmitters or data communication via the network or mobile radio, WLAN or Bluetooth.
7. Motors for use in potentially explosive areas:
   When moving components such as bearings become worn, this can cause enclosure components to exhibit unexpectedly high temperatures during operation, creating a hazard in areas with a potentially explosive atmosphere.

For more information about the residual risks of the drive system components, see the relevant sections in the technical user documentation.

Specific safety instructions

3

3.1 General overview

Note

Siemens does not accept any liability for damage and operating faults that result from the non-observance of these operating instructions.

Note

EU RoHS Directive and UK Directive

The SIMOGEAR series of geared motors comply with the stipulations laid down in Directive 2011/65/EU and the UK Directive "The Restriction of the Use of certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012".

These operating instructions are included with the gearbox when delivered or you can find them in SIOS (https://support.industry.siemens.com/cs/ww/en/ps/13424/man). Read the operating instructions before handling the gearbox. Carefully follow the instructions. This is how you secure safe and disturbance-free function.

These operating instructions apply to the standard version of the SIMOGEAR electric monorail gearbox.

Note

In addition to these operating instructions, special contractual agreements and technical documentation apply to a special gearbox design and the associated supplementary equipment.

When using additional components, carefully observe the notes in the associated documentation.

Refer to the other operating instructions and safety instructions supplied with the product.

Valid operating instructions for SIMOGEAR

Can be found in SIOS (https://support.industry.siemens.com/cs/ww/en/ps/13424/man)

- BA 2030 - operating instructions for SIMOGEAR gearboxes
- BA 2031 - operating instructions for permissible mounting position deviations of SIMOGEAR gearboxes
- BA 2039 - operating instructions for adapters for mounting on SIMOGEAR gearboxes
- BA 2330 - operating instructions for motors LA/LE/LES for mounting on SIMOGEAR gearboxes
- BA 2331 - operating instructions for geared motors with DRIVE-CLiQ safety-related encoder for safety-related applications
- BA 2332 - operating instructions for geared motors with holding brake for safety-related applications

- BA 2535 - operating instructions for SIMOGEAR electric-monorail-gearboxes
- BA 2730 - operating instructions for SIMOGEAR geared motors with encoder for safety-relevant applications

The described gearboxes correspond to the state-of-the-art at the time that these operating instructions were printed.

Siemens reserves the right to change individual components and accessory parts in the interest of ongoing development. The changes are designed to improve performance and safety. The significant features are retained. The operating instructions are updated regularly to include new content.

The new versions of the operating instructions, the declaration of incorporation and the Declarations of Conformity are available in SIOS (https://support.industry.siemens.com/cs/ww/en/ps/13424/man).

3.2 Installation notes

NOTICE
Impermissible housing loadings when unevenness present
Ensure that the housing feet and flanges are screwed together without distortion.
The foundation structure must be low-vibration, level and torsionally rigid. The evenness of the mounting surface for gearboxes in foot and flange design must be according to DIN ISO 2768-2. Max. deviations are to be taken from the tolerance class K.
Thoroughly remove any dirt from the foundation and the screw mounting surface of the gearbox.

NOTICE
Impermissible external forces
No additional external forces resulting from customer-specific attachments, support of other components on the gearbox or geared motor are permitted.
The installation of original attachments (oil expansion unit, cover hoods, etc.) and the resulting forces are permitted.

Prerequisites for smooth, vibration-free running

- Stable foundation design
- Precise alignment of the machine
- Correct balancing of the parts to be mounted on the shaft extension
- Compliance with vibration severity values according to ISO 20816-1

Vibration severity

Due to the influencing variables listed below, the vibration response of the system at the location of use can lead to increased vibration severity on the drive unit:

- Transmission elements
- Installation conditions
- Alignment and installation
- Effects of external and internal oscillation

The vibration severity values specified in accordance with ISO 20816-1 must not be exceeded at any point on the surface of the drive. This ensures problem-free operation and a long service life.

Maximum permissible vibration severity

Observe the values for the maximum permissible radial and axial oscillation vibration severity in the following table. Radial/axial refers to the motor axes.

Maximum permissible radial vibration levels

Vibration frequency	Vibration value
< 6.3 Hz	Vibration displacement$_s$ ≤ 0.16 mm
6.3 Hz to 250 Hz	Vibration velocity v_{rms} ≤ 4.5 mm/s
> 250 Hz	Vibration acceleration a_{peak} ≤ 10 m/s^2

Maximum permissible axial vibration severity

Vibration velocity	Vibration acceleration
Vibration velocity v_{rms} ≤ 4.5 mm/s	Vibration acceleration a_{peak} ≤ 10 m/s^2

Resonant frequencies

Resonance can occur in the speed range of the geared motor depending on the machine to be driven.

Operation in resonance causes increased noise and vibration levels.

Adherence to the maximum permissible vibration severity is always required.

Operation in the resonant frequency leads to a reduced service life of the geared motor, irrespective of adherence to the maximum vibration severity.

Continuous operation in the resonant frequency must be avoided.

3.3 Specific hazard types and fundamental obligations

⚠ **WARNING**
Hot, escaping oil
Before starting any work wait until the oil has cooled down to below +30 °C.

⚠ WARNING
Poisonous vapors when working with solvents
Avoid breathing vapors when working with solvents.
Ensure adequate ventilation.

⚠ WARNING
Risk of explosion when working with solvents
Ensure adequate ventilation.
Do not smoke.

The company operating the unit must ensure that all persons assigned to work on the geared motor have read and understood these operating instructions and that they comply with them in all points in order to:

- Eliminate the risk to life and limb of users and others
- Ensure the operational safety of the geared motor.
- Avoid disruptions and environmental damage through incorrect use.

Comply with the following safety instructions:

In addition to the specified personal protection gear, also wear suitable protective gloves and safety glasses.

Comply with the instructions on the rating plates attached to the geared motor. The rating plates must be kept free from paint and dirt at all times. Replace any missing rating plates.

Collect and dispose of used oil in accordance with regulations. Immediately remove any spilt oil with an oil-binding agent.

Do not use high-pressure cleaning equipment or sharp-edged tools to clean the geared motor.

The machine OEM who installs the geared motors in a plant must include the regulations contained in these operating instructions in its own operating instructions.

During operation, comply with the vibration levels according to ISO 20816-1. Maximum permissible vibration values can be found in Installation notes (Page 26).

Technical description

4

4.1 General technical description

The BH gearbox has 2 transmission stages; the KH gearbox has 3 transmission stages. The gearbox is equipped with a mechanical clutch. The clutch separates the power flow between the drive and the conveyor system.

The gearbox is suitable for various mounting positions. Carefully observe the correct oil level.

Gearbox housing

The housing is made of cast iron.

Geared components

The geared components are hardened and ground.

The bevel gear stage of the bevel gearbox is lapped in pairs.

Lubrication

The intermeshing parts are supplied with lubricant using splash lubrication.

Shaft bearings

All shafts are mounted in roller bearings. The roller bearings are lubricated using splash lubrication or oil-spray lubrication. Bearings that are not supplied with lubricant are closed and grease-lubricated.

Shaft seals

The shaft sealing rings on the output side prevent lubricant from escaping from the housing at the shaft outlet and prevent pollution from entering the housing.

The optimum use of the seals depends on the ambient conditions and the lubricant being used.

Radial shaft sealing ring

A high-quality radial shaft sealing ring is used as standard seal. The ring is provided with an additional dust lip to protect against contaminants from outside.

4.2 Cooling

NOTICE
Dust deposits prevent heat radiation
Dust deposits prevent heat radiation and cause a high housing temperature.
Keep the gearbox free from dirt, dust, etc.

The gearbox does not normally require additional cooling. The generously dimensioned housing surface is sufficient for dissipating heat losses where there is free convection. If the housing temperature exceeds a value of +80 °C, please contact Technical Support.

4.3 Clutch

Actuating the clutch lever interrupts the force flow in the positively driven claw coupling on the output shaft. The output shaft can then freely rotate while the motor is stopped or in no-load operation.

4.4 Rating plate

The rating plate of the gearbox or geared motor is printed on a labeled polyester film or optionally on a stainless steel rating plate. The rating plate is glued using a special masking film. The film ensures permanent resistance to UV radiation and media of all kinds, such as oils, greases, salt water and cleaning agents.

The adhesive and material ensure firm adhesion and long-term readability throughout the operating temperature range of the gearbox and geared motor.

The edges of the rating plate are paint-finished to match the color of the gearbox or motor to which it is affixed.

4.5 Surface treatment

4.5.1 General information on surface treatment

All paint finishes are sprayed on.

NOTICE
Failure of the external protection If the paint finish is damaged, the geared motor may corrode. Do not damage the paint finish.

Note

Information about the ability to be repainted does not guarantee the quality of the paint product supplied by your supplier.

Only the paint manufacturer is liable for the quality and compatibility.

Note

C1 paints are not suitable for ambient air temperatures under -20 °C.

4.5.2 Painted version

The corrosion protection system is classified according to the corrosiveness categories in DIN EN ISO 12944-2.

Paint according to corrosiveness categories

Paint system	Description
Corrosiveness category C1, unpainted for gearbox and motor housings made of aluminum	
-	• Indoor installation • Heated buildings with neutral atmospheres • Resistance to greases and some resistance to mineral oils, aliphatic solvents • Standard

Paint system	Description
Corrosiveness category C1 for normal environmental stress	
1-component hydro paint, top coat	• Indoor installation • Heated buildings with neutral atmospheres • Resistance to greases and some resistance to mineral oils, aliphatic solvents • Standard paint for gearbox housings made of cast iron

Paint system	Description
Corrosiveness category C2 for low environmental stress	
2-component - polyurethane top coat	• Indoor and outdoor installation • Unheated buildings with condensation, production areas with low humidity, e.g. warehouses and sports facilities • Atmospheres with low levels of pollution, frequently rural areas • Resistance to greases, mineral oils and sulfuric acid (10 %), caustic soda (10 %) and is conditionally resistant to aliphatic solvents

Paint system	Description
Corrosiveness category C3 for medium environmental stress	
2-component epoxy zinc phosphate base coat, 2-component polyurethane top coat	• Indoor and outdoor installation • Production areas with high humidity and some air contamination, e.g. food production areas, dairies, breweries and laundries • Urban and industrial atmospheres, moderate contamination from sulfur dioxide, coastal areas with low salt levels • Resistance to greases, mineral oils, aliphatic solvents, sulfuric acid (10 %), caustic soda (10 %)

Paint system	Description
Corrosiveness category C4 for high environmental stress	
2-component epoxy zinc phosphate base coat, 2-component polyurethane top coat	• Indoor and outdoor installation • Chemical plants, swimming pools, wastewater treatment plants, electroplating shops, and boathouses above seawater • Industrial areas and coastal areas with moderate salt levels • Resistance to greases, mineral oils, aliphatic solvents, sulfuric acid (10 %), caustic soda (10 %)

Paint system	Description
Corrosiveness category C5 for very high environmental stress	
2-component epoxy zinc phosphate base coat, 2-component polyurethane intermediate coat, 2-component polyurethane top coat	• Indoor and outdoor installation • Buildings and areas with almost constant condensation and high levels are contamination, e.g. malt factories and aseptic areas • Industrial areas with high humidity and aggressive atmosphere, coastal areas and offshore environments with high salt levels • Resistance to greases, mineral oils, aliphatic solvents, sulfuric acid (10 %), caustic soda (20 %)

In case of corrosiveness category C1, overpainting with a 1-component hydrosystem after prior rubbing down is possible.

In case of corrosiveness categories C2 to C5, overpainting with 2-component polyurethane paint, 2-component epoxide paint and 2-component acrylic paint after prior rubbing down is possible.

4.5.3 Primed version

Primer according to corrosiveness category

Paint system	Can be overpainted with
Unpainted corrosiveness category C1	
Cast iron parts immersion primed, steel parts primed or zinc-plated, aluminum and plastic parts untreated	• Synthetic paint, synthetic resin paint, oil paint • 2-component polyurethane paint • 2-component epoxy paint

Paint system	Can be overpainted with
Primer according to corrosiveness category C2 G	
2-component epoxy zinc phosphate, specified coat thickness 60 µm	• 2-component - polyurethane paint • 2-component - epoxy paint • 2-component - acrylic paint • Acid-hardening paint

Paint system	Can be overpainted with
Primer according to corrosiveness category C4 G	
2-component epoxy zinc phosphate, desired coat thickness 90 µm	• 2-component - polyurethane paint • 2-component - epoxy paint • 2-component - acrylic paint • Acid-hardening paint

Incoming goods, transport, and storage 5

5.1 Incoming goods

NOTICE
Transport damage
Neither install nor commission damage products

Note

If you do not install the product immediately, do not remove or damage any of the packaging because this serves as preservation and/or corrosion protection

Note

Check that the technical specifications are in accordance with the purchase order.

Inspect the delivery immediately on arrival for completeness and any transport damage.

When you receive the goods, immediately check them for any transport damage. Immediately report any transport damage that is identified to the transport company.

The gearbox or geared motor is delivered in a fully assembled condition. Additional items are shipped in separate packaging if applicable.

The products supplied are listed in the dispatch papers.

5.2 Transport

5.2.1 General information on transport

NOTICE
The use of force will damage the gearbox or geared motor
Transport the gearbox or geared motor carefully. Avoid knocks.
Before putting the drive into operation, remove any transport fixtures and keep them safe or render them ineffective. You can then use them again for transporting further items or you can apply them again.

Different forms of packaging may be used, depending on the size of the gearbox or geared motor and the method of transport. Unless contractually agreed otherwise, the seaworthy

packaging complies with HPE Packaging Guidelines (Bundesverband Holzpackmittel Paletten Exportverpackungen e.V., the German Federal Association for wooden packaging, pallets, and export packaging).

Note the symbols which appear on the packaging. These have the following meanings:


This way up


Center of gravity


Fragile


Do not use hand hook


Keep dry


Attach here


Keep cool

5.2.2 Fastening for suspended transport

⚠ WARNING

Inadequately secured gearboxes or geared motors can break loose

Use only the transport eye of the gearbox to transport the gearbox or geared motor. The transport eye is only designed to hold the weight of the gearbox or geared motor, and it is not permissible to add additional loads.

Do not rig eyebolts to the front threads at the shaft ends for transportation purposes.

Do not use the integrally cast lifting eyes on the motor for transport because of the risk of breaking.

Use additional, suitable load suspension equipment when transporting or installing.

When attaching using several chains and ropes, 2 cable/chain strands must be sufficient to carry the complete load. Secure the load suspension equipment so that it cannot slip.

5.3 Storage

5.3.1 General information for storage

⚠ WARNING
Danger of serious injuries caused by falling objects
Danger of damage to the gearbox when stacked
Do not stack gearboxes or geared motors on each other.

NOTICE
Failure of the external protection
Mechanical damage, chemical damage and thermal damage, such as scratches, acids, alkalis, sparks, welding beads and heat cause corrosion.
Do not damage the paint finish.

Unless contractually agreed otherwise, the guarantee period for the standard preservative lasts 6 months from the date of delivery.

In the case of storage in transit over 6 months, special arrangements must be made for preservation. Contact Technical Support.

Store the gearbox or geared motor in dry, dust-free rooms that are maintained at a constant temperature.

The storage location must be vibration- and shock-free.

The free shaft ends, sealing elements and flange surfaces must have a protective coating.

Do not store the geared motor on the fan cover.

5.3.2 Storage up to 36 months with long-term preservation (optional)

5.3.2.1 General notes for storage up to 36 months

Store the gearbox or geared motor in dry, dust-free rooms that are maintained at a constant temperature. Special packing is then not necessary.

If such premises are not available, pack the gearbox or the geared motor in plastic film or air-tight sealed film and materials. The films and materials must be able to accept moisture. Cover them to provide protection against heat, direct sunlight and rain.

The permissible ambient temperature is -25 °C to +50 °C.

The life of the corrosion protection is 36 months from delivery.

5.3.2.2 Gearbox filled with operating oil and anti-corrosive agent

NOTICE
Damage to the gearbox caused by incorrect oil quantities
Check the oil level before commissioning.
Observe the information and procedures for Checking the oil level (Page 54).

The gearbox is filled with oil corresponding to the mounting position so that it is ready for operation, and is sealed airtight using a screw plug or with a pressure breather valve with transport fixture.

For storage up to 36 months, a VCI anti-corrosion agent (**V**olatile **C**orrosion **I**nhibitor) is added.

5.3.2.3 Gearbox completely filled with oil

NOTICE
Damage to the gearbox caused by incorrect oil quantities
Prior to commissioning, remove excessive oil until it has the correct oil level.
Observe the information and procedures for Correcting the oil level (Page 54).

When biodegradable oils or oils for the food-processing sector are used, the gearbox is filled completely with operating oil. The gearbox is closed air-tight with a sealing plug or a pressure venting with transport fixture.

Do not lower the oil level during short-time commissioning for 10 minutes in no-load operation.

Mounting

6

6.1 Unpacking

Remove and dispose of the packaging material and transport equipment in compliance with regulations.

6.2 General information concerning the installation

⚠ WARNING
Assembly work with the system under load
Under load, the system can start or reverse in an uncontrolled fashion.
The entire system must be load-free so that there is no danger during this work.

NOTICE
Destruction caused by welding
Welding destroys the geared components and the bearings.
Do not weld on the gearbox. The gearbox must not be used as a grounding point for welding operations.

NOTICE
Overheating caused by solar radiation
Overheating of the gearbox due to exposure to direct sunlight.
Provide suitable protective equipment such as covers or roofs. Prevent heat accumulation.

NOTICE
Malfunction resulting from foreign objects
The company operating the equipment must ensure that no foreign objects impair the function of the gearbox.

NOTICE
Damaged components impair the correct function of the gearbox
If any components are damaged, the correct function of the gearbox will no longer be ensured.
Do not install any damaged gearbox components.

NOTICE
Violation of the maximum permissible oil sump temperature
The oil sump temperature will be exceeded if the temperature monitoring equipment is incorrectly set.
A warning must be given when the maximum permissible oil sump temperature is reached. The geared motor must be switched off when the maximum permissible temperature is exceeded. The machine will come to a standstill if the geared motor is shut down.

Exercise particular care when mounting and installing. The manufacturer cannot be held liable for damage caused by incorrect mounting and installation.

Ensure that there is space around the gearbox or geared motor for mounting, maintenance and repair.

On geared motors with a fan, leave sufficient free space for the entry of air. Observe the installation conditions for the geared motor.

Provide adequate hoisting gear at the start of mounting and installation work.

Observe the mounting position specified on the rating plate. This ensures that it will be provided with the correct quantity of lubricant.

Use all the fastening means that have been assigned to the particular mounting position and mounting type.

Cap bolts cannot be used in some cases due to a lack of space. In such cases, please contact Technical Support quoting the type of gearbox.

6.3 Thread sizes and tightening torques for fastening bolts

The general tolerance for the tightening torque is 10%. The tightening torque is based on a friction coefficient of μ = 0.14.

Table 6-1 Tightening torques for fixing screws

Thread size	**Tightening torque for property class**		
	8.8	**10.9**	**12.9**
	Nm	**Nm**	**Nm**
M4	3	4	5
M5	6	9	10
M6	10	15	18
M8	25	35	41
M10	50	70	85
M12	90	120	145
M16	210	295	355
M20	450	580	690
M24	750	1 000	1 200

Thread size	Tightening torque for property class		
	8.8	10.9	12.9
	Nm	Nm	Nm
M30	1 500	2 000	2 400
M36	2 500	3 600	4 200

6.4 Mounting an input or output element on the gearbox shaft

⚠ WARNING

Risk of burns caused by hot parts

Do not touch the gearbox without protection.

NOTICE

Damage to shaft sealing rings caused by solvent

Avoid contact of solvent or benzine with the shaft sealing rings.

NOTICE

Damage to shaft sealing rings caused by heating

Use thermal shields to protect shaft sealing rings from heating above 100 °C due to radiant heat.

NOTICE

Premature wear or material damage due to misalignment

Misalignment caused by excessive angular or axial misalignment of the shaft ends to be joined.

Ensure precise alignment of the individual components.

NOTICE

Damage caused by improper handling

Bearings, housing, shaft and locking rings are damaged due to improper handling.

Do not use impact or knocks to mount input and output elements onto the shaft.

Note

Deburr the parts of elements to be fitted in the area of the hole or keyways.

Recommendation: 0.2 x 45°

Where couplings are to be fitted in a heated condition, observe the specific operating instructions for the coupling. Unless otherwise specified, apply the heat inductively using a torch or in a furnace.

Use the center holes in the shaft end faces.

Use a fitting device to fit the input or output elements.

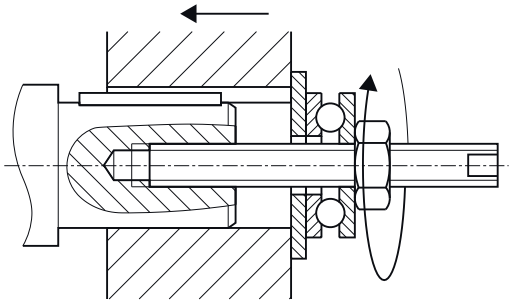
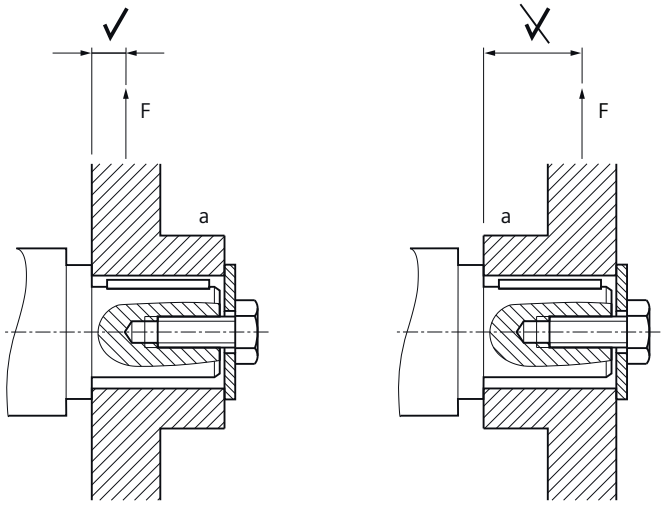


Figure 6-1 Example of a fitting device

Observe the correct mounting arrangement to minimize stress on shafts and bearings due to lateral forces.



✓ Correct

✗ Incorrect

a Hub

F Force

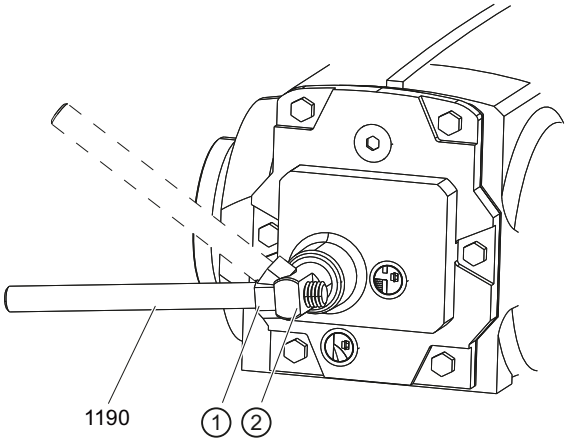
Figure 6-2 Mounting arrangement for low stress on shafts and bearings

Procedure

1. Use benzine or a solvent to remove the anti-corrosion protection from the shaft ends and flanges. Or remove the existing protective skin.
2. Fit the drive input and output elements to the shafts. Lock the elements.

You have now attached the input or output element.

6.5 Mounting the clutch lever



1190 Clutch lever
① Nut
② Contact arm

Figure 6-3 Mounting the clutch lever

Mount the separately supplied clutch lever on gearbox types BH29 and BH39.

Procedure

1. Fit the nut ① onto the clutch lever 1190.
2. Screw the clutch lever 1190 into the contact arm ②.
3. Tighten the M12 nut ① to a torque of 40 Nm.

You have now mounted the clutch lever.

Commissioning 7

7.1 General information about commissioning

⚠ WARNING
Unintentional starting of the drive unit
Secure the drive unit to prevent it from being started up unintentionally.
Attach a warning notice to the start switch.

⚠ WARNING
Risk of slipping on oil
Remove any oil spillage immediately with an oil-binding agent in compliance with environmental requirements.

Checking the pressure breather valve

Check that the breather valve is activated.

If the breather valve has a transport fixture, it must be removed before commissioning.

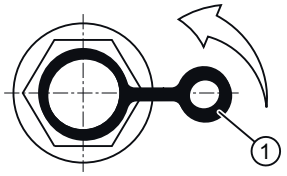


Figure 7-1 Pressure breather valve with securing clip

Remove the transport fixture by pulling the securing clip ① in the direction of the arrow.

7.2 Checking the oil level prior to commissioning

Check the oil level before commissioning. Correct the oil level.

Siemens recommends a complete oil change after a storage time longer than 24 months:

- For gearboxes with long-term preservation.
- For gearboxes supplied completely filled with oil.

Follow Checking and changing lubricants (Page 54).

Operation 8

8.1 General information about operation

⚠ CAUTION
Malfunctions can cause injuries or gearbox damage
In the event of changes during operation, the drive unit must be switched off immediately.
Determine the cause of the fault using the fault table (Page 49). Remedy faults or have faults remedied.

Check the gear unit during operation for:

- Excessive operating temperature
- Smooth and vibration-free operation
- Changes in gear noise
- Possible oil leakage at the housing and shaft seals

8.2 Operating the clutch

⚠ WARNING
Unintentional movement of the travelling gear
Once the clutch is disengaged, the motor brake is inoperative and no power transmission is possible.
Lock the travel drive so that it cannot move unintentionally.

NOTICE
Damage to gearboxes caused by impact of acceleration
Avoid impact of acceleration when engaging the clutch.
Engage the clutch when the motor is at standstill or at low speed.

The gearbox can be disengaged during operation under load.

The clutch can be engaged when:

- The motor and output shaft are stationary.
- The output speed and weights are low.
- Low speed differentials before and after shifting.
  E.g. when extending and retracting at low speed into a chain-pulled conveyor when the clutch is shifted via the shifting guides.

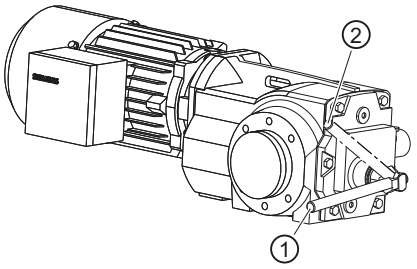
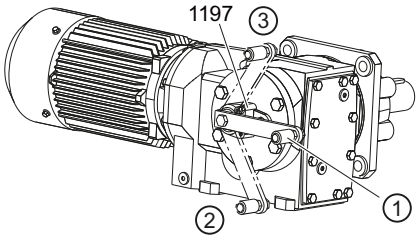


Figure 8-1 Position of the clutch lever for BH. 29 - 39

To disengage the clutch: Move the clutch lever from position ① to position ②.

To engage the clutch: Move the clutch lever from position ② to position ①.



1197 End stop bolt

Figure 8-2 Position of the clutch lever for KHF 49 - 79

To disengage the clutch: Move the clutch lever from position ① to position ② or ③.

To engage the clutch: Move the clutch lever from position ② or ③ to position ①.

The end stop bolt position 1197 limits the operating travels from position ① to ② or from position ① to ③.
If you change the thread position then the operating travel changes. The position of the operating travel is specified with the order.

Shift force needed on clutch lever

The specified shift forces F apply at standstill. The values provided in the following table are reference values. If a torque is transferred to the output shaft as the clutch is shifted, the required shift forces may increase by a multiple.

Gearbox type	BHZ 29	BH. 39	KHF 49	KHF 69	KHF 79
F in N	70	90	120	140	150

Faults, causes and remedies

9

Note

Faults and malfunctions that occur during the warranty period and requiring repair work on the gearbox must be remedied only by Technical Support. If faults occur without a clearly identifiable cause after the warranty period has elapsed, Siemens recommends the services provided by Technical Support.

If you need the help from the Technical Support, please have the following information ready:

- Rating plate data
- Nature and extent of the fault
- Suspected cause

Table 9-1 Faults, causes and remedies

Faults	Causes	Remedy
Unusual noise on the gearbox.	Oil level too low.	Check the oil level (Page 54).
	Foreign objects in the oil (irregular noise).	Checking the oil quality (Page 56). Cleaning the gearbox or geared motor (Page 66). Change the oil (Page 54).
	Excessive bearing play and / or bearing defective.	Check the bearings and if required replace.
	Defective gearing.	Check the gearing and if required replace.
	Fastening bolts loose.	Checking the tightness of fastening bolts (Page 67).
	Excessive external load on the drive input and output.	Check the load against rated data (you might need to correct the belt tension, for example).
	Transport damage.	Check the gearbox for damage in transit.
	Damage due to blockage during commissioning.	Call Technical Support.
Unusual noise from the drive unit.	Drive unit bearing not lubricated (motor size 160 and higher).	Regrease the bearings, comply with the BA 2039 operating instructions
	Excessive bearing play and / or bearing defective.	Check the bearings and if required replace.
	Fastening bolts loose.	Checking the tightness of fastening bolts (Page 67).
Unusual motor noise.	Excessive bearing play and / or bearing defective.	Check the bearings and if required replace.
	Motor brake is rubbing.	Check the air gap, if required readjust.
	Inverter parameterization.	Correct the parameterization.

Faults	Causes	Remedy
Oil escapes.	Incorrect oil level for the mounting position being used.	Check the mounting position (Page 76) and the oil level (Page 54).
	Gearbox leaks.	Checking the gearbox for leaks (Page 65).
	Overpressure due to lack of venting.	Mount the venting as appropriate for the mounting position (Page 76).
	Overpressure due to soiled venting.	Clean the venting (Page 66).
	Shaft sealing rings defective.	Replace the shaft sealing rings.
	Cover / flange bolts loose.	Checking the tightness of fastening bolts (Page 67). Monitor gearbox.
	Surface sealing defective (e.g. on cover, flange).	Reseal.
	Damage in transit (e.g. hairline cracks).	Check the gearbox for damage in transit.
Oil leak at the gearbox vent.	Incorrect oil level for the mounting position used and / or incorrect venting position.	Check the venting position, mounting position (Page 76) and the oil level (Page 54).
	Frequent cold starts during which the oil foams up.	Call Technical Support.
Gearbox overheats.	Motor fan cover and / or gearbox very dirty.	Clean the fan cover and surface of the geared motor (Page 66).
	Incorrect oil level for the mounting position being used.	Check the mounting position (Page 76) and the oil level (Page 54).
	Incorrect oil being used (e.g. incorrect viscosity).	Checking the oil quality (Page 56).
	Oil is too old.	Check when the oil was last changed. If required, change the oil (Page 54).
	Excessive bearing play and / or bearing defective.	Check the bearings and if required replace.
Output shaft does not turn when the motor is running.	Force flow interrupted by breakage in gearbox.	Call Technical Support.
Geared motor only starts with difficulty or not at all.	Incorrect oil level for the mounting position being used.	Check the mounting position (Page 76) and the oil level (Page 54).
	Incorrect oil being used (e.g. incorrect viscosity).	Checking the oil quality (Page 56).
	Excessive external load on the drive input and output.	Check the load against rated data (you might need to correct the belt tension, for example).
	Motor brake is not released.	Check the circuit / connection of the brake. Check brake for wear and re-adjust brake if required.
	Geared motor runs against backstop.	Change the direction of motor or backstop rotation.
Excessive play at drive input and output.	Flexible elements worn (e.g. on couplings).	Replace flexible elements.
	Positive connection disrupted by overload.	Call Technical Support.

Faults	Causes	Remedy
Increased play at clutch lever.	Clutch lever has become loose.	Tighten fastening nut at clutch lever.
	After engagement, the clutch is out of mesh.	Turn the output shaft until the clutch engages.
After actuating the clutch lever, the clutch does not disengage / engage.	Clutch has been displaced.	Call Technical Support. Clutch must be readjusted or serviced.

Service and maintenance 10

10.1 General notes about maintenance work

⚠ WARNING
Unintentional starting of the drive unit Secure the drive unit to prevent it from being started up unintentionally. Attach a warning notice to the start switch.

NOTICE
Improper maintenance Only authorized qualified personnel may perform the maintenance and servicing. It is only permissible to install original parts supplied by Siemens.

Only qualified personnel may perform the inspection, maintenance and servicing work. Carefully comply with the specific safety instructions (Page 25).

Table 10-1 Maintenance measures

Remedy	Interval	Description of work
Monitor and check the geared motor for unusual noise, vibrations, and changes.	Daily; if possible, more frequently during operation.	Operation (Page 47)
Check the housing temperature.	After 3 hours, on the first day, thereafter monthly.	
Check the oil level.	After the first day, and then every 3 000 operating hours, or at the latest after 6 months.	Checking and changing lubricants (Page 54)
Check the oil quality.	Every 6 months.	Checking the oil quality (Page 56)
First oil change after commissioning.	After 10 000 operating hours, at the latest after 2 years	Checking and changing lubricants (Page 54)
Subsequent oil changes.	Every 2 years or 10 000 operating hours [1].	
Visually inspect the gearbox and shaft sealing ring for any leakage.	After the first day, thereafter monthly.	Checking the gearbox for leaks (Page 65)
If required, replace the vent valve	Once a year.	Replacing the vent valve (Page 66)
Clean the gearbox.	Depending on degree of soiling, at least every 6 months.	Cleaning the gearbox or geared motor (Page 66)
Carry out a complete inspection of the geared motor.	Every 12 months.	Inspecting the gearbox (Page 68)

Remedy	Interval	Description of work
Check that fastening bolts on gearboxes and add-on elements are securely tightened. Check that covers and plugs are securely fastened.	After 3 hours, and then every 2 years.	Checking the tightness of fastening bolts (Page 67)
Change the roller bearing grease.	When the oil is changed.	Change the roller bearing grease (Page 61)
Replace the bearing.	-	Replace bearings (Page 65)
[1] When using synthetic oils, the intervals can be doubled. The data specified is valid for an oil temperature of +80° C. See the figure titled "Guide values for oil change intervals" for the intervals for other temperatures.		

10.2 Checking and changing lubricants

10.2.1 General safety instructions

⚠ WARNING

Danger of scalding from escaping hot oil

Before starting any work wait until the oil has cooled down to below +30 °C.

⚠ WARNING

Risk of slipping on oil

Remove any oil spillage immediately with an oil-binding agent in compliance with environmental requirements.

NOTICE

Damage to the gearbox caused by incorrect oil quantities

The oil quantity and the position of the sealing elements are determined by the mounting position.

After removing the oil level screw, the oil level may not be below the specified fill level.

NOTICE

Damage to the gearbox due to open oil holes

Close the gearbox immediately after checking the oil level or changing the oil. Dirt and harmful substances in the atmosphere can penetrate through open oil holes.

Note

Information about oil

Refer to the rating plate for the type of oil, oil viscosity and quantity of oil required.

For oil compatibility, comply with Specific safety instructions (Page 25).

Note

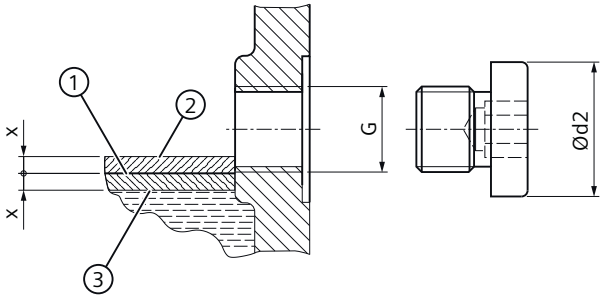
Sizes 29 and 39

Gearbox sizes 29 and 39 are lubricated for life. An oil change is not required.

For mounting positions M2 and M4, the gearboxes have a breather valve. There is no opening to check the oil level.

10.2.2 Checking the oil level

NOTICE
The gearbox oil volume changes depending on the temperature If the temperature rises, the volume increases. Where temperature differences and filling quantities are significant, the volume difference can amount to several liters. The oil level must therefore be checked while still slightly warm, approximately 30 minutes after switching off the drive unit.



① Specified oil level
② Maximum oil level
③ Minimum oil level

Figure 10-1 Oil level in the gearbox housing

Table 10-2 Minimum and maximum fill levels x

Oil level hole	**Ød2**	**Fill level x**	**Tightening torque**
	mm	**mm**	**Nm**
G 1/8"	14	2.5	10
G 1/4"	18	3	10

Oil level hole	Ød2	Fill level x	Tightening torque
	mm	mm	Nm
G 3/8"	22	4	25
G 3/4"	32	7	50

Procedure

1. Switch off the power supply to the drive unit.
2. Unscrew the oil level screw, see Mounting positions and oil quantities (Page 76). Oil escapes if the maximum fill level is above the plug hole.
3. Check the oil level. Observe the fill level x.
4. Top up the oil level if necessary and check it again.
5. Check the state of the sealing ring on the sealing element. If the sealing ring is damaged, replace the sealing element with a new one.
6. After checking, seal the gearbox immediately using the sealing element.

You have now checked the oil level in the gearbox housing.

10.2.3 Checking the oil level using the oil sight glass (optional)

If there is an oil sight glass to check the oil level ①, the oil must be visible in the center of the sight glass when the oil is cool. When the oil is hot, the oil level ① is above the center of the sight glass. The oil level ① of cold oil is below the center of the sight glass.

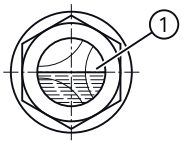


Figure 10-2 Oil level in the oil sight glass

Top up the oil level ① if necessary, and check it again.

10.2.4 Checking the oil quality

Visible signs show effects on the oil. Fresh oil is clear to the eye, and has a typical smell and a specific product color. Clouding or a flocculent appearance indicates water and / or contamination. A dark or black color indicates residue, serious thermal decomposition or contamination.

Follow the symbols in the diagrams of the Mounting positions and oil quantities (Page 76).

Venting

Oil level

Procedure

1. Allow the geared motor to run for a short time. Wear and contaminant particles are visible in the oil shortly after shutting down.
2. Switch off the power supply to the drive unit.
3. Unscrew the sealing element at one of the points marked with the symbols listed above.
4. Remove some oil, using a suction pump and a flexible hose, for example.
5. Check the state of the sealing ring on the sealing element. If required, replace the sealing ring.
6. Seal the gearbox with the sealing element.
7. Check the oil for abnormalities. Change the oil immediately if you determine any abnormalities, as described in Changing the oil (Page 57).

You have now checked the oil quality.

10.2.5 Changing the oil

10.2.5.1 General safety notes for changing the oil

NOTICE
Impermissible mixing of oils leads to damage Impermissible mixing of oils leads to: • Darkening • Sediment • Foam formation • Change of the viscosity or reduced corrosion protection • Wear protection. When changing oil of the same type, the residual volume of oil in the gearbox should be kept as low as possible. Generally speaking, a small residual volume will cause no particular problems. Gear oils of different types and by different manufacturers must not be mixed. Have the manufacturer confirm that the new oil is compatible with the remaining volume of used oil. If very different types of oil or oils with very different additives are changed, always flush out the gearbox with the new oil. When changing from mineral oil to polyglycol oil (PG) or vice versa, it is vital to flush the gearbox twice. All traces of old oil must be completely removed from the gearbox.

NOTICE
Contaminations of the oil impair the lubricity
Do not mix the gearbox oil with other substances.
Do not flush with paraffin or other solvents, as traces of these substances will always remain inside the gearbox.

Note

The oil must be warm because insufficient viscosity caused by oil that is too cold impairs correct emptying.

If necessary, run the gearbox for 15 to 30 minutes to become warm.

10.2.5.2 Draining the oil

Observe the symbols in the diagrams of the Mounting positions and oil quantities (Page 76):


Venting


Oil level


Oil drain

Procedure

1. Switch off the power supply to the drive unit.
2. Unscrew the vent plug.
3. Place a suitable and sufficiently large receptacle underneath the oil drain plug.
4. Remove the oil drain plug. Drain all the oil into the receptacle.
5. Check the state of the sealing ring on the sealing element. If the sealing ring is damaged, replace the sealing element with a new one.
6. After draining the oil, seal the gearbox immediately using the sealing element.

You have now drained the oil from the gearbox.

10.2.5.3 Flushing the gearbox when changing between incompatible oils

⚠ WARNING

Impermissible mixing of oils leads to damage

Residual quantities of original oil can impair the specific properties of the new oil.

A flushing process is required with biodegradable and physiologically safe oils.

The residual corrosion protection oil must amount to no more than 1% of the operating oil volume.

Note

Polyglycol oil has a higher density than mineral oil. Therefore, it sinks down towards the oil drain and the mineral oil floats on top.

This makes the required complete draining of mineral oil from the gearbox extremely difficult.

Note

After the second flush, we recommend that an appropriate analysis institute checks the quality of the flushed fluid.

Observe the symbols in the diagrams of the Mounting positions and oil quantities (Page 76):

Venting

Oil drain

Procedure

1. After the oil has been drained, wipe the gearbox clean of any remaining mineral oil using a cloth.
2. Unscrew the vent plug.
3. Fill the gearbox with a flushing oil, using a filter (filter mesh max. 25 µm). For the flushing oil, use either the new oil or one that is compatible with the new oil and is less expensive.
4. Operate the gearbox for 15 to 30 minutes under a low load.
5. Place a suitable and sufficiently large receptacle underneath the oil drain plug.
6. Remove the oil drain plug. Drain all the oil into the receptacle.
7. After flushing, immediately seal the gearbox using the sealing element.
8. Repeat this step for the second flushing.

You have now flushed the gearbox twice and can pour in the new oil.

10.2.5.4 Filling in oil

NOTICE
Mixing of different oils impairs the lubricity
When adding oil, use the same oil type and viscosity. If changing mutually incompatible oils, see Flushing the gearbox (Page 59).

Observe the symbols in the diagrams of the Mounting positions and oil quantities (Page 76):

Venting

Procedure

1. Unscrew the vent plug.
2. Fill the gearbox with fresh oil. Use a filler filter with mesh of max. 25 µm.
3. Check the oil level.
4. Correct the oil level if necessary and check it again.
5. Check the state of the sealing ring on the sealing element. If the sealing ring is damaged, replace the sealing element with a new one.
6. After filling with oil, seal the gearbox immediately using the sealing element.

You have now filled up the gearbox with oil.

10.2.6 Topping up with oil

If the mounting position of the gearbox is changed or oil lost because of leakage, check the oil level. If you notice oil escaping, locate the leak, and seal the affected area. Top up and check the oil level.

At the time of going to print, the following types of oil are being used when the gearbox is filled for the first time:

CLP ISO VG220: Fuchs Renolin CLP220

CLP ISO PG VG220: Fuchs Renolin PG220

CLP ISO PG VG460: Fuchs Renolin PG460

CLP ISO PAO VG68: Fuchs Renolin Unisyn XT68

CLP ISO PAO VG220: Fuchs Renolin Unisyn XT220

CLP ISO PAO VG460: Fuchs Renolin Unisyn CLP460

CLP ISO E VG220: Fuchs Plantogear S220

CLP ISO H1 VG100: Klüber Klübersynth UH1 6 100

CLP ISO H1 VG460: Castrol Optileb GT 1800/460

If, following agreement, the gearbox is filled at the factory with special lubricant for the special applications referred to above, the lubricant must be shown on the rating plate.

10.2.7 Change the roller bearing grease

The roller bearings are lubricated in the factory with the greases listed in the table.

Renew the grease quantify for grease-lubricated bearings with each oil change.

Clean the bearing before filling the bearing with fresh lubricant.

In the case of bearings on the output shaft or intermediate shafts, the grease quantity must fill 2/3, and in the case of bearings on the input side, 1/3 of the space between the rolling elements.

Table 10-3 Roller-bearing and shaft-sealing-ring grease

Fields of application	Ambient temperature	Manufacturer	Type
Standard	-40 °C to +80 °C	Klüber Fuchs	Petamo GHY 133 N Renolit CX-Tom 15[1)]
Foodstuff-compatible for the food industry	-30 °C to +60 °C	Bremer & Leguil	Cassida Grease GTS 2
Biologically degradable, for agriculture, forestry and water industries	-35 °C to +60 °C	Fuchs	Plantogel 2 S
[1)] Rolling-bearing grease based on a semi-synthetic base oil.			

10.2.8 Service life of the lubricants

Note

In case of ambient conditions deviating from normal conditions, e.g. high ambient temperatures, high relative humidity, aggressive ambient media, the intervals between changes should be shorter. In such cases, contact Technical Support for assistance in determining the individual lubricant change interval.

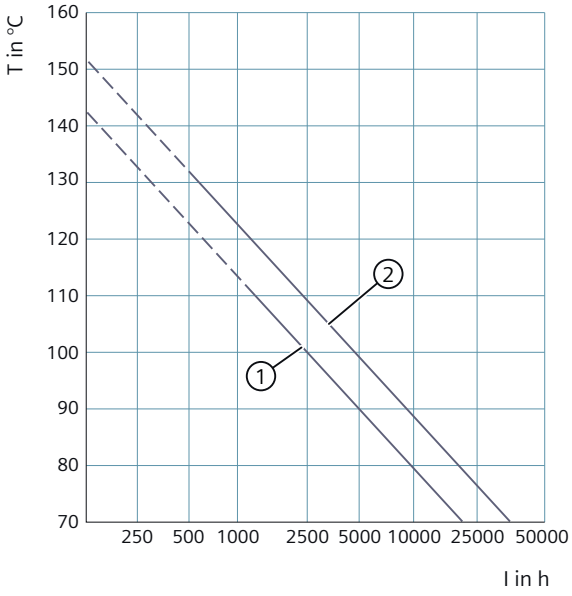
Note

Oil sump temperatures above +80 °C can reduce service life. A temperature increase by 10 K halves the service life by the amount as shown in the figure titled "Guide values for oil change intervals".

For a +80 °C oil sump temperature, the following service life can be expected when observing the properties specified by Siemens:

Table 10-4 Service life of the oils

Type of oil	Service life
Mineral oil	10 000 operating hours or 2 years
Biodegradable oil	
Physiologically safe oil according to USDA-H1/-H2	
Synthetic oil	20 000 operating hours or 4 years



① Mineral oil
② Synthetic oil
T Oil bath steady-state temperature in °C
I Oil change interval in operating hours in h

Figure 10-3 Guide values for oil change intervals

Grease service life of roller bearing greases

Roller bearings and the clearance in front are filled with sufficient grease.

Under approved operating conditions and ambient temperatures, no regreasing is required.

We recommend that the grease in the bearings is also renewed when the oil or shaft sealing rings are replaced.

10.2.9 Recommended lubricants

The released and recommended lubricants are listed in the table NT 7300 (https://support.industry.siemens.com/cs/ww/en/view/109753864).

⚠ DANGER

Used lubricants only have conditional approval

The used lubricants are not or only conditionally approved for use in the foodstuff or pharmaceutical industry.

Use only lubricants with USDA (United States Department of Agriculture) H1 / H2 approval for deployment in the foodstuff or pharmaceutical industry.

NOTICE

Incorrect operating temperatures impair lubricity of the gearbox oil

Operating temperatures outside the permitted range impair the lubricating property of the gearbox oil.

Carefully comply with the permissible oil sump temperatures listed in the lubricant table.

The oil used must be approved for use in the ambient temperature range given on the rating plate.

When changing the oil, comply with the operating temperature range of the new oil as specified by the oil manufacturer.

Note

As standard, the lubricants and shaft seals are harmonized and coordinated with one another corresponding to the prevailing operating conditions.

Contact Technical Support for:

- Change of the operating conditions
- Change in oil grade
- Deployment of new shaft seals.

Note

The lubricants used are not at all or only conditionally biodegradable. If biologically degradable lubricants are required, use only gearbox lubricants with the appropriate classification listed in the NT 7300 table.

Note

SIEMENS recommends the use of CLP ISO PG oils for gearboxes of sizes 169 and 189 with a service factor f_B<1.2.

Note

These recommendations are not a guarantee of the lubricant quality provided by your supplier. All lubricant manufacturers are responsible for the quality of their own products.

The oil viscosity is decisive for the oil selection (ISO VG class). The viscosity is specified on the rating plate of the gearbox. The viscosity class indicated applies for the contractually agreed operating conditions.

In the case of different operating conditions, contact Technical Support.

If, following agreement, the gearbox is filled at the factory with special lubricant for the special applications referred to above, the lubricant is shown on the rating plate.

The oil quality must meet the gearbox lubricant requirements specified in the NT 7300 table. The SIEMENS warranty is otherwise null and void. We recommend the use of one of these gearbox lubricants. These gearbox oils are subject to constant testing and meet the specified requirements. The recommended oils are possibly removed or replaced by oils that have been further developed at a later point in time. Regularly check that the selected lubricating oil is still recommended by SIEMENS. Otherwise change the product.

10.2.10 BA 2535 lubricant table

Table 10-5 Lubricant table

Operating range	**Oil grade designation according to DIN 51502**	**Permissible oil sump temperature range in operation °C**	**Ambient temperature °C**				
Electric-monorail-gearboxes, bevel gearboxes KH			-15 ... +40°	-20 ... +40°	-25 ... +40°	-30 ... +40°	-40 ... +40°
Standard	CLP ISO VG220	-15 ... +80°	✓	-	-	-	-
	CLP ISO PAO VG220	-30 ... +100°	✓	✓	✓	✓	✓1)
	CLP ISO PAO VG68	-40 ... +60°	-	-	✓	✓	✓
	CLP ISO PG VG460	-25 ... +110°	✓	✓	✓	-	-
	CLP ISO PG VG220	-25 ... +110°	✓	✓	✓	-	-
Food sector (USDA) NSF-H1	CLP ISO H1 VG460	-25 ... +100°	✓	✓	✓	-	-
	CLP ISO H1 VG100	-30 ... +90°	✓	✓	✓	✓	-
Biodegradable oil	CLP ISO E VG220	-20 ... +100°	✓	✓	-	-	-
Electric-monorail-gearboxes, bevel gearboxes KH			-20 ... +45°	-20 ... +50°	-20 ... +60°		
Standard	CLP ISO VG220	-15 ... +80°	-	-	-		
	CLP ISO PAO VG220	-30 ... +100°	✓	✓	✓		
	CLP ISO PAO VG68	-40 ... +60°	-	-	-		
	CLP ISO PG VG460	-25 ... +110°	✓	✓	✓		
	CLP ISO PG VG220	-25 ... +110°	✓	✓	✓		
Food sector (USDA) NSF-H1	CLP ISO H1 VG460	-25 ... +100°	✓	✓	✓		
	CLP ISO H1 VG100	-30 ... +90°	✓	✓	✓		
Biodegradable oil	CLP ISO E VG220	-20 ... +100°	✓	✓	✓		

Operating range	**Oil grade designation according to DIN 51502**	**Permissible oil sump temperature range in operation °C**	**Ambient temperature °C**			
Electric-monorail-gearboxes, bevel gearboxes BH			-20 ... +40°	-25 ... +40°	-30 ... +40°	-40 ... +40°
Standard	CLP ISO PG VG220	-25 ... +110°	✓	✓	-	-
	CLP ISO PAO VG460	-25 ... +110°	✓	✓	-	-
	CLP ISO PAO VG220	-30 ... +100°	✓	✓	✓	✓1)
	CLP ISO PAO VG68	-40 ... +60°	-	✓	✓	✓
	CLP ISO PG VG460	-25 ... +110°	✓	✓	-	-
Food sector (USDA) NSF-H1	CLP ISO H1 VG460	-25 ... +100°	✓	✓	-	-
	CLP ISO H1 VG100	-30 ... +90°	✓	✓	-	-
Electric-monorail-gearboxes, bevel gearboxes BH			-20 ... +45°	-20 ... +50°	-20 ... +60°	
Standard	CLP ISO PG VG220	-25 ... +110°	✓	✓	✓	
	CLP ISO PAO VG460	-25 ... +110°	✓	✓	✓	
	CLP ISO PAO VG220	-30 ... +100°	✓	✓	✓	
	CLP ISO PAO VG68	-40 ... +60°	-	-	-	
	CLP ISO PG VG460	-25 ... +110°	✓	✓	✓	
Food sector (USDA) NSF-H1	CLP ISO H1 VG460	-25 ... +100°	✓	✓	✓	
	CLP ISO H1 VG100	-30 ... +90°	✓	✓	✓	

1) To ensure optimum lubricating properties, preheat the drive to an operating temperature above -30 °C.

CLP = mineral oil

CLP PG = polyglycol oil

E = ester oil, organic oil (bio oil / risk of water pollution, class WGK1)

PAO = poly-alpha-olefin oil

CLP H1 = physiologically safe oil (USDA-H1 approval)

10.3 Replace bearings

The bearing service life is finite, greatly depends on the operating conditions and therefore cannot be calculated reliably. In the operating conditions specified by the operator, bearing life can be calculated. Changes in vibration and noise pattern are an indication that an immediate bearing replacement is necessary.

10.4 Checking the gearbox for leaks

Note

Due to the inherent principle of operation, oil mist can escape from a breather valve or labyrinth seal.

Oil or grease escaping in small quantities from the shaft sealing ring should be regarded as normal during the running-in phase of 24 hours operating time.

Avoid consequential damage: If the leakage quantities are significant or leaking continues after the running-in phase, then replace the shaft sealing ring.

Table 10-6 Description and measures

Status	Description	Measures	Notes
Film of moisture on the shaft sealing ring	Film of moisture as a result of the inherent principle of operation (apparent leakage)	Remove using a clean cloth and continue to observe.	This does not represent a fault; frequently, in the course of operation, the sealing ring dries off.
Leakage at the shaft sealing ring	Identifiable small trickle, formation of drops, also after the running-in phase	Replace the sealing ring, determine the possible cause of the sealing ring failure and rectify.	During the run-in period, the shaft sealing ring beds into the shaft. A visible track can be seen on the shaft. Optimum preconditions for a perfect seal are obtained after the run-in period.

10.5 Replacing the vent valve

To ensure correct functioning, renew the breather valve yearly.

When replacing, prevent dirt and damaging atmospheres from entering the gearbox.

If too much oil is contained in the gearbox, oil will escape from the breather valve. Correct the oil quantity and replace the breather valve.

10.6 Cleaning the gearbox or geared motor

⚠ WARNING

Explosion hazard due to overheating of the machine caused by a layer of dust

Deposits of dust have a thermally insulating effect, causing the machine to overheat. The maximum surface temperature of the machine is not adhered to. The dust is ignited as a result, causing an explosion. Death, serious injury and material damage will result.

- Regularly remove dust from the machine.
- Do not allow dust layers thicker than 5 mm to build up.
- Only switch the machine on when the dust has been removed.

NOTICE
Dust deposits cause higher housing temperatures
Dust deposits prevent heat from being radiated.
Keep the drive free from dirt and dust.

NOTICE
Cleaning with a high-pressure cleaning appliance
Water penetrates the geared motor. Seals are damaged.
Do not use a high-pressure cleaning appliance to clean the geared motor.
Do not use tools with sharp edges.

De-energize the drive unit when cleaning the drive unit.

10.7 Checking the tightness of fastening bolts

Note

Replace damaged headless bolts with new bolts of the same type and strength class.

Switch off the power supply to the drive unit. Check all fastening bolts for tightness using a torque wrench.

10.8 Thread sizes and tightening torques for fastening bolts

The general tolerance for the tightening torque is 10%. The tightening torque is based on a friction coefficient of μ = 0.14.

Table 10-7 Tightening torques for fixing screws

Thread size	Tightening torque for property class		
	8.8	10.9	12.9
	Nm	Nm	Nm
M4	3	4	5
M5	6	9	10
M6	10	15	18
M8	25	35	41
M10	50	70	85
M12	90	120	145
M16	210	295	355
M20	450	580	690

Thread size	**Tightening torque for property class**		
	8.8	**10.9**	**12.9**
	Nm	**Nm**	**Nm**
M24	750	1 000	1 200
M30	1 500	2 000	2 400
M36	2 500	3 600	4 200

10.9 Inspecting the gearbox

Carry out a scheduled inspection of the gearbox once a year in accordance with the possible criteria listed in General notes about maintenance work (Page 53).

Check the gearbox in accordance with the criteria set out in Specific safety instructions (Page 25).

Touch up damaged paintwork carefully.

Disposal

11

Recycling and disposal of SIMOGEAR geared motors

For environmentally compliant recycling and disposal of your discarded device, please contact a company certified for the disposal of old electrical and electronic devices. Dispose of the device in accordance with the regulations valid in your country.

⚠ WARNING
Incorrect disposal of used oil
Incorrect disposal of used oil is a threat to the environment and health.
After use, oil must be taken to a used oil collection point. The addition of foreign substances such as solvents, brake and cooling fluid is prohibited.
Avoid prolonged contact with the skin.

Empty the used oil from the gearbox. The used oil must be collected, stored, transported and disposed of in accordance with regulations. Do not mix polyglycols with mineral oil. Dispose of polyglycols separately.

Strictly observe country-specific rules and regulations. Under German law, to allow optimal treatment of the oil (§ 4 VI Used Oil), oils with different disposal codes must not be mixed with one another.

Collect and dispose of used oil in accordance with regulations.

Immediately remove any spilt oil with an oil-binding agent.

Dispose of the housing parts, gears, shafts, and rolling bearings of the geared motor as scrap metal.

Dispose of packaging material in accordance with regulations.

Table 11-1 Disposal codes for gear oils

Oil grade	Designation	Disposal code
Mineral oil	CLP ISO VG220	13 02 05
Polyglycols	CLP ISO PG VG220, CLP ISO PG VG460, CLP ISO H1 VG100, CLP ISO H1 VG460	13 02 08
Poly-Alpha-Olefines	CLP ISO PAO VG68, CLP ISO PAO VG220, CLP ISO PAO VG460	13 02 06
Biologically degradable oils	CLP ISO E VG220	13 02 07

Technical data

12

12.1 Type designation

Table 12-1 Example of the article number structure

SIMOGEAR gearbox	Article number position				
	1	2	3	4	5
Electric-monorail-gearboxes BH, KH	2	K	J	3	8

Table 12-2 Example of the type designation structure

Example:	Main gearbox		
	BH	Z	39
Gearbox type	BH		
Fixing		Z	
Size			39

Table 12-3 Type designation code

Gearbox type	
BH	Electric-monorail-gearboxes, bevel gearboxes, two-stage
KH	Electric-monorail-gearboxes, bevel gearboxes, three-stage
Fixing	
(-)	Foot-mounted design
Z	Housing flange (C type)
F	Flange-mounted design (A type)

12.2 Rating plate data

12.2.1 General technical data

⚠ WARNING

Exceeding the power limits

Exceeding the power limits (max. speeds, max. torque etc.) of the gearbox or motor can damage the geared motor.

Maintain the permissible operating ranges and power limits of the motor and gearbox.

The max. speeds and torque shown indicate the mechanical limits of the geared motor. Depending on the application, also take into account thermal limits. In applications with long max. speed components, high pressure build-up may occur in the gearbox, which can cause damage to the gearbox (e.g. leakage).

The most important technical data appears on the rating plate of the gearboxes and geared motors.

This data, together with the contractual agreements for the geared motors, determines the limits of intended use.

In the case of geared motors, a rating plate attached to the motor indicates the data for the entire drive.

In certain cases separate rating plates are attached to the gearbox and the motor. Maintain the operating ranges and power limits on all rating plates.

The degree of protection according to EN 60034-5 (IEC 60034-5) specified on the nameplates only applies to the motor of the unit.

When selecting higher degrees of protection, also take into consideration the equipping on the gearbox side (seals, vents).

12.2.2 Rating plate SIMOGEAR geared motors without a UL/CSA design

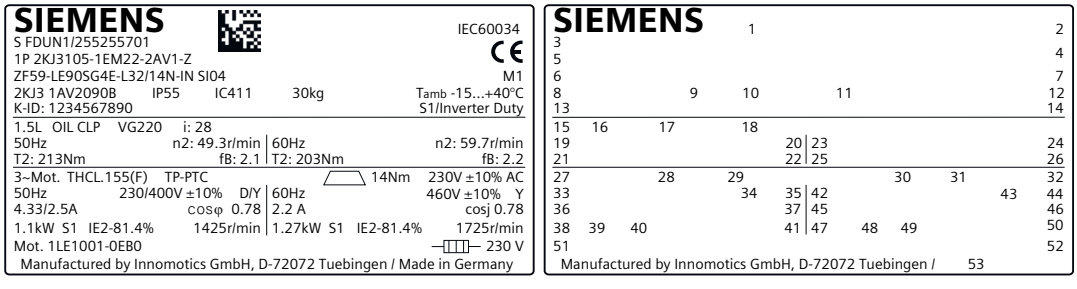


Figure 12-1 Example of a SIMOGEAR rating plate for geared motors without UL-CSA

1 Data matrix code
2 Underlying standard
3 Serial number
4 CE marking or other marking, if required
5 Article number
6 Type designation with marking of the (functionally safe) rotary encoder
7 Mounting position
8 Geared motor type
9 Degree of protection acc. to IEC 60034-5
10 Ventilation type acc. to IEC 60034-6
11 Weight *m* in kg
12 Ambient temperature
13 Customer ID
14 Motor operating mode
15 Oil quantity in l, main gearbox / intermediate gearbox
16 Oil grade
17 Oil viscosity ISO VG class according to DIN 51519 / ISO 3448
18 Total transmission ratio i

Frequency 1

19 Rated frequency *f* in Hz
20 Gearbox output speed n_2 in rpm
21 Geared motor output torque T_2 in Nm
22 Service factor f_B

Frequency 2

23 Rated frequency *f* in Hz
24 Gearbox output speed n_2 in rpm
25 Geared motor output torque T_2 in Nm
26 Service factor f_B

Motor and brake data

27 Phase number and type of current for the motor
28 Temperature class Th. Cl.
29 Thermal motor protection
30 Symbols (IEC 60617-2): ⏢ = brake
31 Rated braking torque T_{Br} in Nm
32 Brake supply voltage *U* in V

Frequency 1

33 Rated frequency *f* in Hz
34 Rated voltage / range *U* in V
35 Circuit, circuit symbols according to DIN EN 60617 Part 6 / IEC 60617-6
36 Rated current I_N in A
37 Power factor cos φ

38 Rated power P_N in kW
39 Operating mode for motor and brake (if ≠ S1)
40 For induction motors: Efficiency class marking according to IEC 60034-30 with efficiency data
For synchronous-reluctance motors/VSD 4000: Efficiency class marking according to IEC TS 60034-30-2 without efficiency data
41 Rated speed n_N in rpm

Frequency 2

42 Rated frequency *f* in Hz
43 Rated voltage / range *U* in V
44 Circuit, circuit symbols according to DIN EN 60617 Part 6 / IEC 60617-6
45 Rated current I_N in A
46 Power factor cos φ
47 Rated power P_N in kW
48 Operating mode for motor and brake (if ≠ S1)
49 Efficiency class marking according to IEC 60034-30
50 Rated speed n_N in rpm
51 Motor designation
52 Anti-condensation heating
53 Manufacturer's address and country of origin

12.2.3 Rating plate SIMOGEAR geared motors with a UL/CSA design

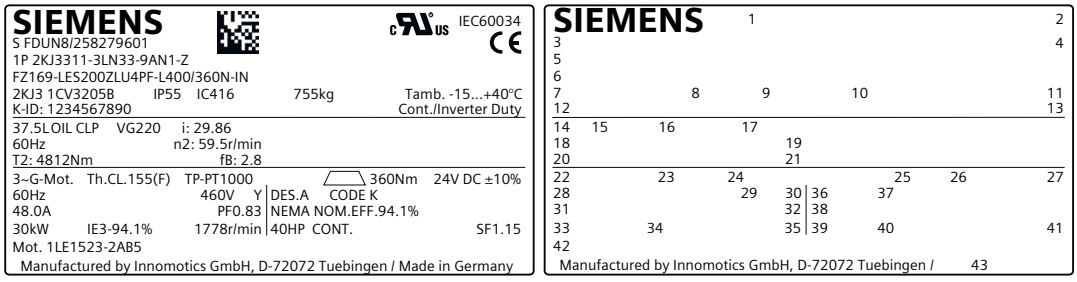


Figure 12-2 Example of a SIMOGEAR rating plate for geared motors with UL/CSA approval

1 Data matrix code
2 Underlying standard
3 Serial number
4 CE marking or other marking, if required
5 Article number
6 Type designation with marking of the (functionally safe) rotary encoder
7 Geared motor type
8 Degree of protection acc. to IEC 60034-5
9 Ventilation type acc. to IEC 60034-6
10 Weight *m* in kg

11 Ambient temperature
12 Customer ID
13 Motor operating mode according to UL
14 Oil quantity in l, main gearbox / intermediate gearbox
15 Oil grade
16 Oil viscosity ISO VG class according to DIN 51519 / ISO 3448
17 Total transmission ratio i

Frequency 1

18 Rated frequency *f* in Hz
19 Gearbox output speed n_2 in rpm
20 Geared motor output torque T_2 in Nm
21 Service factor f_B

Motor and brake data

22 Phase number and type of current for the motor
23 Temperature class Th. Cl.
24 Thermal motor protection
25 Symbols (IEC 60617-2): ⏢ = brake
26 Rated braking torque T_{Br} in Nm
27 Brake supply voltage *U* in V

Frequency 1

28 Rated frequency *f* in Hz
29 Rated voltage / range *U* in V
30 Circuit, circuit symbols according to DIN EN 60617 Part 6 / IEC 60617-6
31 Rated current I_N in A
32 Performance factor
33 Rated power P_N in kW
34 For induction motors: Efficiency class marking according to IEC 60034-30 with efficiency data
For synchronous-reluctance motors/VSD 4000: Efficiency class marking according to IEC TS 60034-30-2 without efficiency data
35 Rated speed n_N in rpm
36 Design letter
37 Code letter
38 NEMA energy efficiency
39 Rated power P_N in HP
40 NEMA operating mode
41 Service factor
42 Motor designation
43 Manufacturer's address and country of origin

12.3 Weight

The weight of the entire geared motor is given in the shipping papers.

The weight is stated on the rating plate of the motor, gearbox or geared motor.

The weight specification refers only to the product in the delivery state.

12.4 Sound energy level

SIMOGEAR geared motors have noise levels below the permissible noise levels defined for gearboxes in VDI guideline 2159 and for motors in IEC 60034-9. Interaction with gearboxes causes the motor noise values L_{pfA} or L_{WA} to increase on average by 3 to 5 dB (A).

The circumferential velocity of the motor pinion has a significant influence on the additional gearbox noise level. As a consequence, higher speeds or lower ratios result in higher noise.

SIMOGEAR geared motors provide a decisive advantage here, since the motor plug-on pinion allows transmission ratios of up to 12 in the input stage.

Code	Description	Unit
L_{pfA}	A-weighted enveloping surface sound pressure level	dB (A)
L_{WA}	Sound power level	dB (A)

External noise

Noise not generated by the gearbox but emitted from it are not taken into consideration.

Noise emitted by the drive and driven machines or the base are also not taken into consideration. Even when the noise from the gearbox have been transferred there.

12.5 Mounting positions and oil quantities

Only operate the gearbox in the mounting position specified on the rating plate. This ensures that it will be provided with the correct quantity of lubricant.

Note

Sizes 29 and 39

Gearbox sizes 29 and 39 are lubricated for life. An oil change is not required.

For mounting positions M2 and M4, the gearboxes have a breather valve. There is no opening to check the oil level.

Description of the symbols:

Venting

Oil level

Oil drain

① Engaged
② Disengaged
③ Disengaged

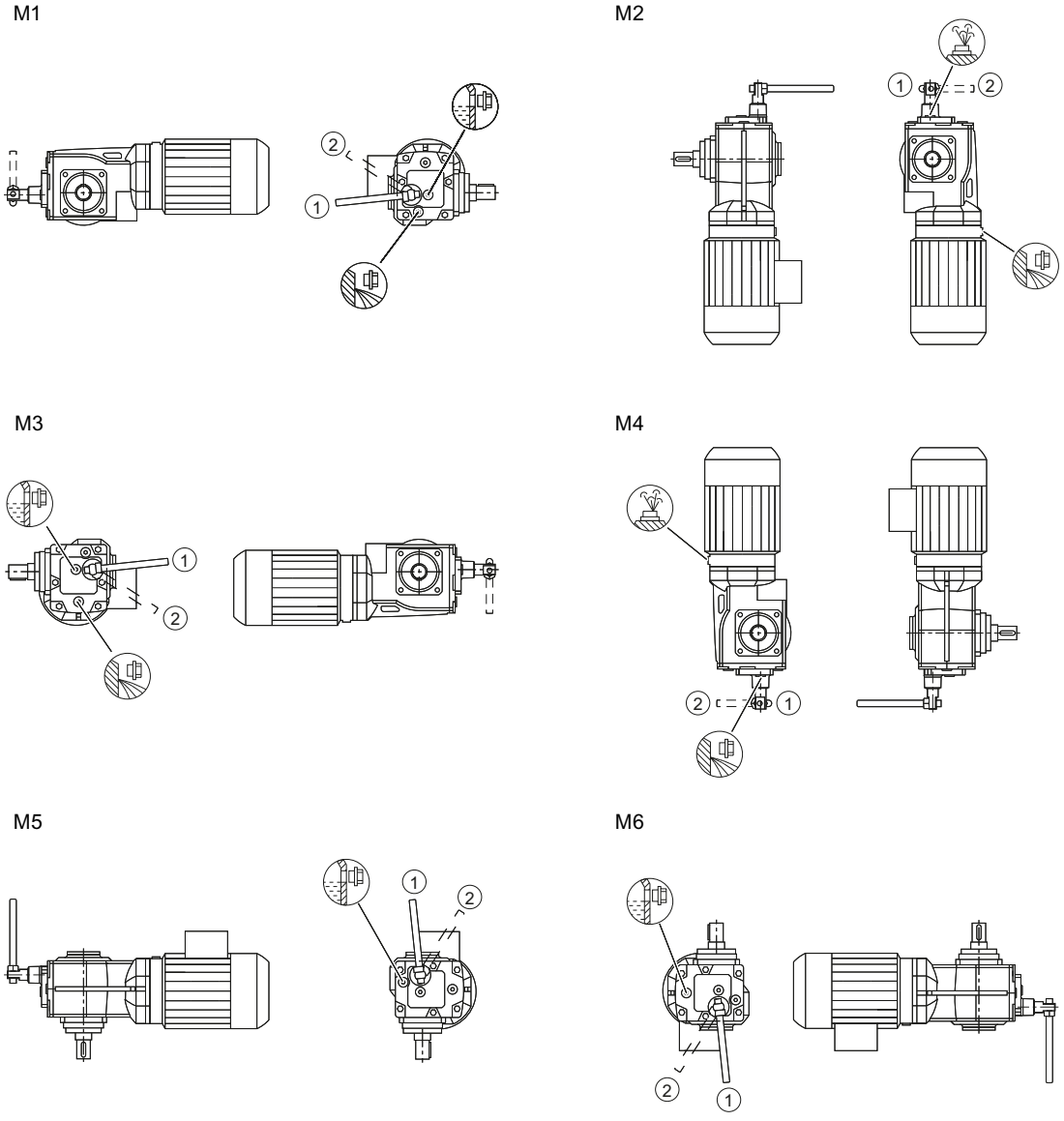


Figure 12-3 Mounting positions for electric monorail gearboxes BHZ 29, BH 39, BHZ 39

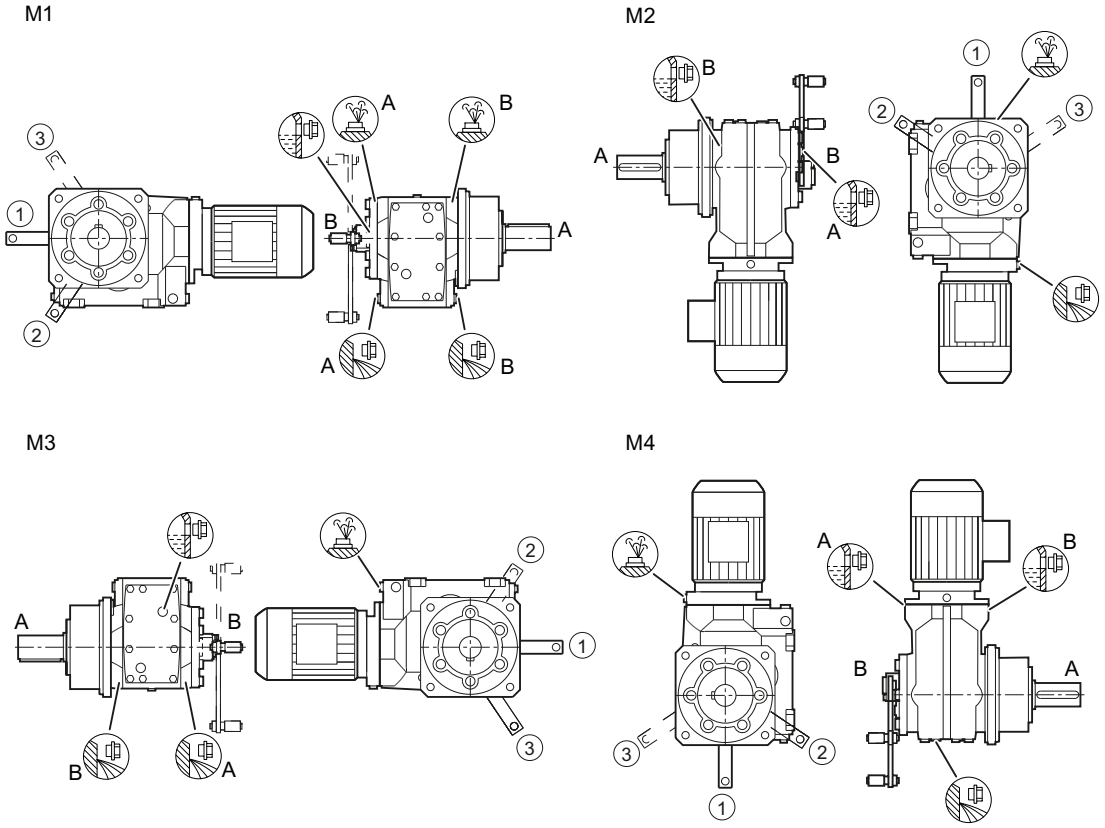


Figure 12-4 Mounting positions for electric monorail gearboxes KHF 49 - 79

NOTICE
Damage to the gearbox caused by incorrect oil quantities
The oil quantities listed in the tables are guide values for changing the oil. They are used, for example, for lubricant storage and procurement.
The precise values depend on the number of stages and transmission ratio of the gearbox.
The specified oil quantities are valid for the standard mounting position.

Table 12-4 Oil quantities in l for BH. 29 - 39, KHF 49 - 79

Type	**Mounting position**					
	M1	**M2**	**M3**	**M4**	**M5**	**M6**
BH 29	0.4	0.65	0.85	1.2	0.8	0.4
BH. 39	0.6	0.95	1.1	1.6	0.9	0.75
KHF 49	1.5	2.2	1.9	2.2	-	-
KHF 69	2.4	3	2.9	3.4	-	-
KHF 79	2.8	3.5	3.1	3.8	-	-

Spare parts

13

13.1 Stocking of spare parts

By stocking the most important spare and wearing parts on site, you can ensure that the gearbox or geared motor is ready for use at any time.

NOTICE
Safety impairment caused by inferior products The installation and / or use of inferior products has a negative impact on the design characteristics of the geared motor. As a consequence, active and / or passive safety is diminished. Siemens explicitly states that only spare parts and accessories supplied by Siemens have been tested and approved by Siemens. If you do not use original spare parts and original accessories, Siemens excludes any liability and warranty. Siemens accepts the warranty only for original spare parts.

Note that special manufacturing and delivery specifications often apply to individual components. All spare parts offered by Siemens are state-of-the-art and conform to the latest legal regulations.

Please state the following data when ordering spare parts:

- Serial number shown on the rating plate ③
- Type designation shown on the rating plate ⑥
- Part number
  - 3-digit and/or 4-digit position number from the spare parts list
  - 6-digit object number
  - 7-digit article number
  - 14-digit material number
- Quantity

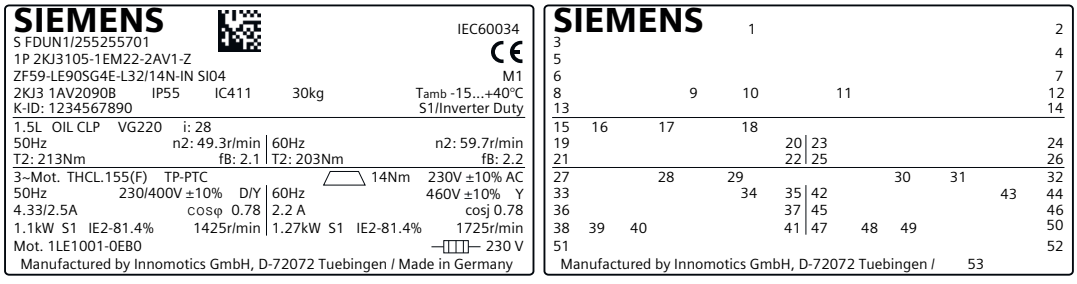


Figure 13-1 Example of a SIMOGEAR rating plate

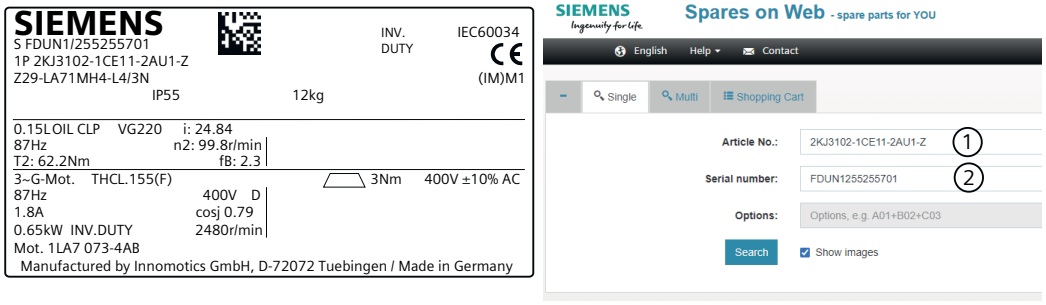
For motors with their own rating plate, the spare parts documentation in the original operating instructions applies.

13.2 Spares on Web

Rapid support around the clock – SIMOGEAR Service

Service is your partner for comprehensive support and innovative services for increasing your productivity. The original parts and manufacturing expertise help you achieve maximum machine availability and productivity. The proven services therefore contribute to reducing the total cost of ownership for you, as well as to creating sustainable values and solutions.

The technical product lists are provided in Spares on Web (https://www.sow.siemens.com/?lang=en).



① Article number

② Serial number

Figure 13-2 Enter a sample article and serial number in Spares on Web

Procedure

1. Open the spare parts list with the link provided.
2. In the field ①, enter the "Article No." stated on the rating plate or SIMOGEAR.
   Example: 2KJ3102-1CE11-2AU-Z or SIMOGEAR
3. In the field ② "Serial number", enter the production number stated on the rating plate or only the abbreviated number.
   Example: FDUN1/255255701 or 2552557
4. You can directly access the operating instructions via "Industry Online Support (SIOS)".
5. Use the "Search" function to display the spare parts list.
6. The installation positions of the listed spare parts can be determined based on the position numbers specified in column "BKZ" (equipment marking) and the spare part drawings in Chapter Spare parts lists (Page 81) .

You have opened the spare parts list through Spares on Web.

13.3 Spare parts lists

13.3.1 Electric-monorail-gearboxes BHZ29, BH39, BHZ39

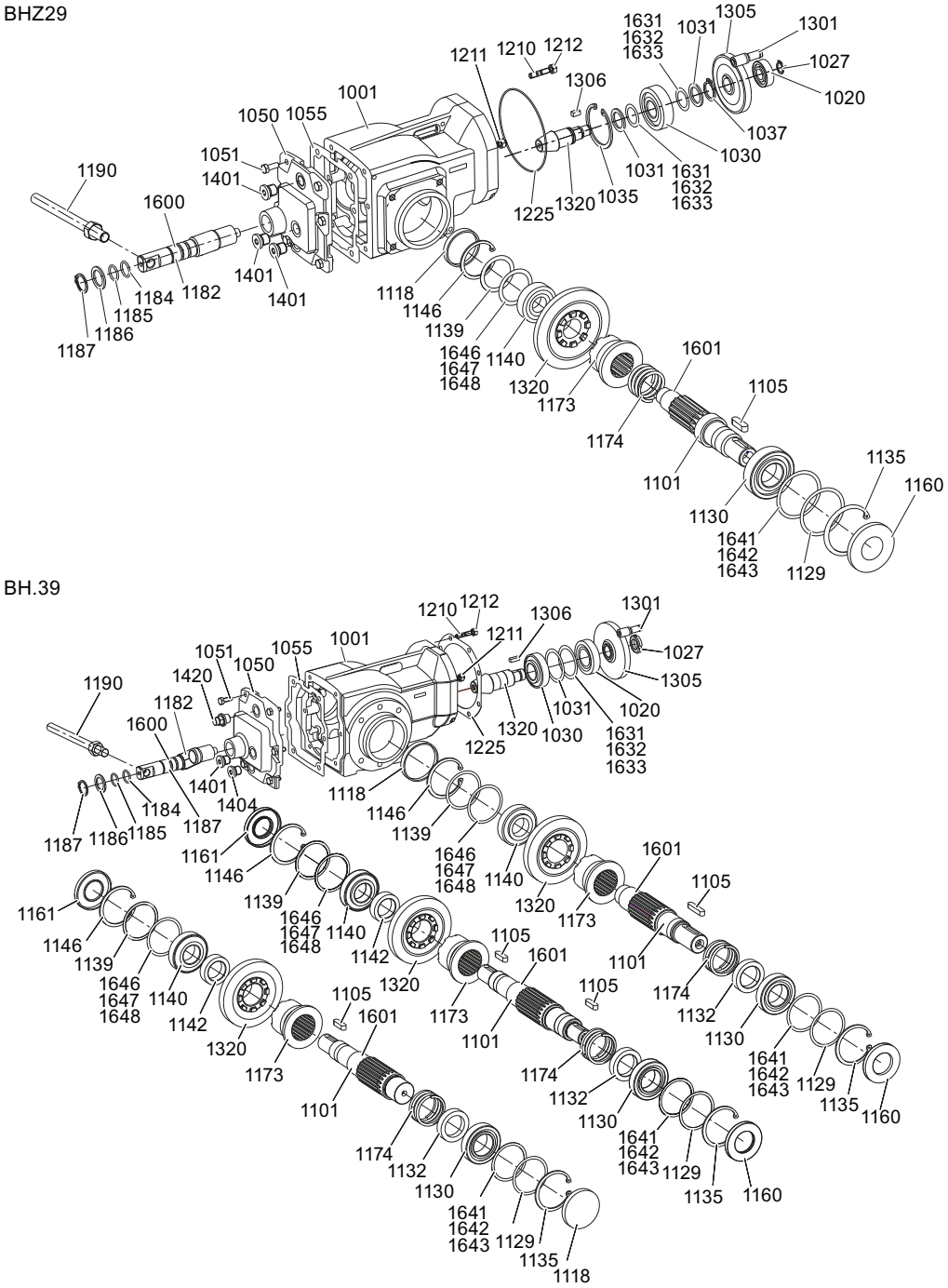


Figure 13-3 Electric monorail gearboxes BHZ 29, BH 39, BHZ 39

1001	Gearbox housing
1020	Bearings
1027	Locking ring / nut
1030	Bearings
1031	Supporting disk
1035	Locking ring
1037	Locking ring
1050	Housing cover
1051	Screw
1055	Seal
1101	Output shaft
1105	Feather key
1118	Plug / sealing cap
1129	Supporting disk
1130	Bearings
1132	Supporting ring / shim
1135	Locking ring
1139	Supporting disk
1140	Bearings
1142	Bushing
1146	Locking ring
1160	Shaft sealing ring
1161	Shaft sealing ring
1173	Coupling
1174	Compression spring
1182	Contact arm
1184	O-ring
1185	O-ring
1186	Supporting disk
1187	Locking ring
1190	Clutch lever
1210	Screw
1211	Screw lock washer
1212	Nut
1225	Seal
1301	Plug-in pinion
1305	Helical
1306	Feather key
1320	Bevel gear pair
1401	Screw plug
1420	Vent / breather filter
1600	Lubricant
1601	Lubricant
1631	Shim
1632	Shim
1633	Shim
1641	Shim
1642	Shim
1643	Shim
1646	Shim
1647	Shim
1648	Shim

13.3.2 Electric-monorail-gearboxes KHF 49 - 79

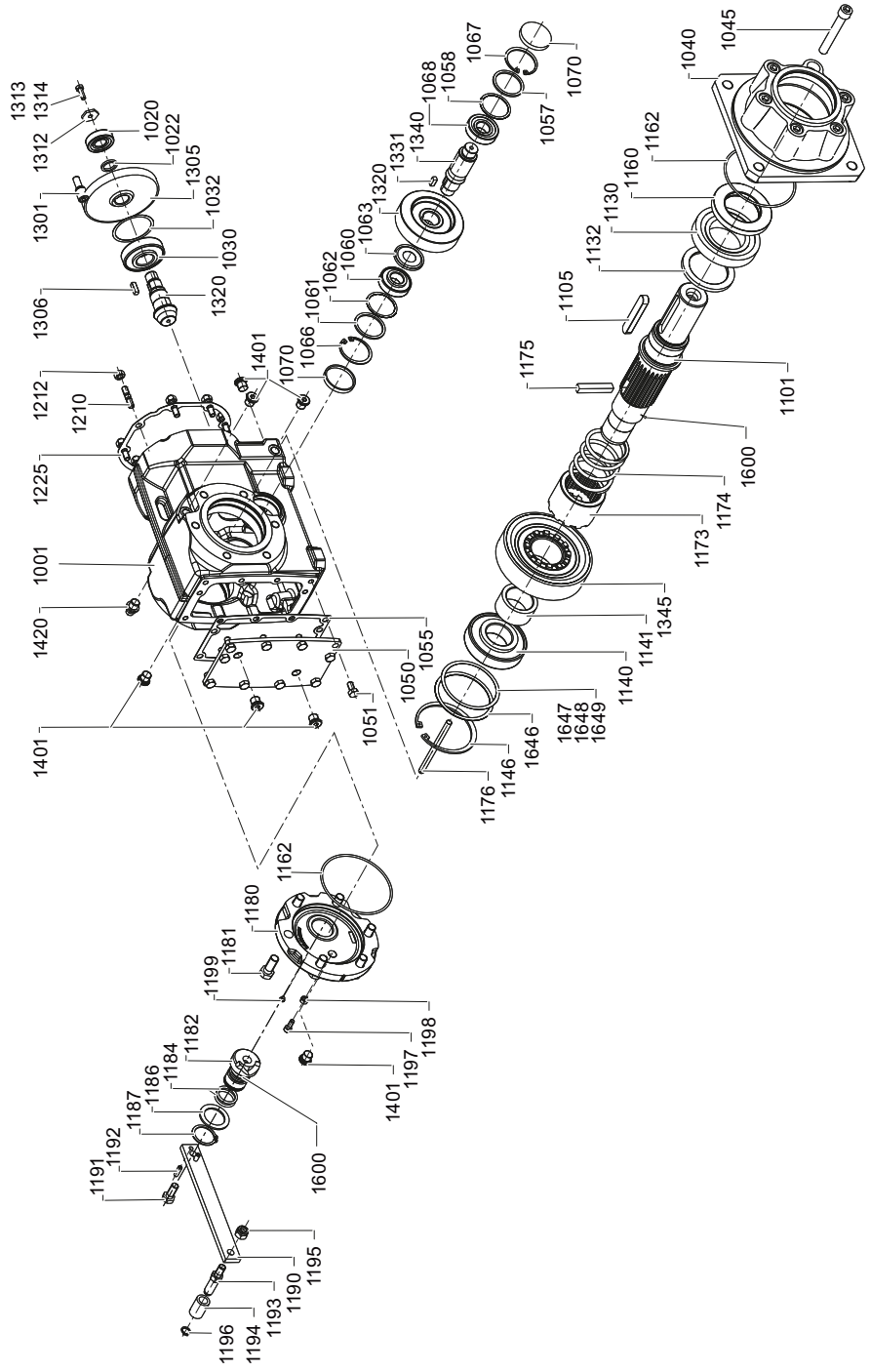


Figure 13-4 Electric monorail gearbox KHF 49 - 79

1001	Gearbox housing	1182	Cam part
1020	Bearing	1184	O-ring
1022	Supporting ring / shim	1186	Supporting ring / shim

1030	Bearing
1032	Shim
1040	Output flange
1045	Screw
1050	Housing cover
1051	Screw
1055	Seal
1057	Supporting disk
1060	Bearing
1061	Supporting disk
1063	NILOS ring
1066	Locking ring
1067	Locking ring
1068	Bearing
1070	Sealing cap
1101	Output shaft
1105	Feather key
1130	Bearing
1132	Bushing
1140	Bearing
1141	Supporting ring / shim
1146	Locking ring
1160	Shaft sealing ring
1162	O-ring
1165	Seal
1173	Coupling
1174	Compression spring
1175	Feather key / pin
1176	Pressure pin
1180	Cover
1181	Screw
1187	Locking ring
1190	Clutch lever
1191	Screw
1192	Pin
1193	Threaded bolt
1194	Bushing
1195	Nut
1196	Locking ring
1197	Screw
1198	Nut
1199	Plug
1210	Screw
1212	Nut
1225	Seal
1301	Plug-in pinion
1305	Helical
1306	Feather key
1312	Disk
1313	Screw
1314	Screw lock washer
1320	Bevel gear pair
1331	Feather key
1340	Pinion shaft
1345	Helical
1401	Screw plug
1420	Vent / breather filter
1600	Lubricant
1646	Supporting ring / shim
1647	Shim
1648	Shim
1649	Shim

Declaration of incorporation of partly completed machinery, Declaration of Conformity

14

Einbauerklärung / EU-Konformitätserklärung
Declaration of incorporation / EU-declaration of conformity

Nr. / *No.* A5E36964102AM

Produktbezeichnung: *Product identification:*	Getriebemotor 2KJ3... *Geared motor 2KJ3...*
Typ: *Type:*	A... – BCD... EF... – G... – H... – I... – J...
Getriebe: *Gearbox:*	A... = [A = E, Z, D, F, B, K, C, S]
Motor: *Motor:*	BCD... EF... = [B = L, M; C = E, B; D = _, I, S; E = _, M; F = _, F, I, U]
Bremse: *Brake:*	G... = [G = _, L, F]
Drehgeber: *Encoder:*	H... = [H = _, I, S, M]
Funktionale Sicherheit: *Functional safety:*	I... = [I = _, S]
ATEX-Ausführung: *ATEX-Version:*	J... = [J = _, 1]
Hersteller: *Manufacturer:*	Innomotics GmbH
Anschrift: *Address:*	Bahnhofstraße 40 DE-72072 Tübingen

Name, Anschrift bevollmächtigte Person für technische Unterlagen: *Name, address of authorised person for technical file:*	Innomotics GmbH Xingjian Chen Bahnhofstraße 40 DE-72072 Tübingen

Die alleinige Verantwortung für die Ausstellung dieser Erklärung trägt der Hersteller.

This declaration is issued under the sole responsibility of the manufacturer.

Der oben beschriebene Gegenstand der Erklärung erfüllt die einschlägigen Harmonisierungsrechtsvorschriften der Union:

The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:

Maschinenrichtlinie:

2006/42/EG Richtlinie des Europäischen Parlaments und des Rates vom 17. Mai 2006 über Maschinen und zur Änderung der Richtlinie 95/16/EG; Amtsblatt der EU L157, 9/6/2006, S. 24–86

Machinery Directive:

2006/42/EC *Directive of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC; Official Journal of the EU L157, 9/6/2006, p. 24–86*

EMV-Richtlinie:

2014/30/EU Richtlinie des Europäischen Parlaments und des Rates vom 26. Februar 2014 zur Harmonisierung der Rechtsvorschriften der Mitgliedstaaten über die elektromagnetische Verträglichkeit; Amtsblatt der EU L96, 29/03/2014, S. 79–106

EMC Directive:

2014/30/EU *Directive of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility; Official Journal of the EU L96, 29/03/2014, p. 79–106*

Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, ist jedoch keine Beschaffenheits- oder Haltbarkeitsgarantie.
Die Sicherheitshinweise der mitgelieferten Produktdokumentation sind zu beachten.

This declaration is an attestation of conformity with the indicated Directive(s) but does not imply any guarantee of quality or durability.
The safety instructions of the accompanying product documentation shall be observed.

Einbauerklärung / EU-Konformitätserklärung
Declaration of incorporation / EU-declaration of conformity

Nr. / *No.* A5E36964102AM

RoHS-Richtlinie:

2011/65/EU Richtlinie des Europäischen Parlaments und des Rates vom 8. Juni 2011 zur Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten; Amtsblatt der EU L174, 1/7/2011, S. 88–110

Verordnung (EU) Nr. 2019/1781*:

Verordnung der Kommission vom 1. Oktober 2019 zur Festlegung von Ökodesign-Anforderungen an Elektromotoren und Drehzahlregelungen gemäß der Richtlinie 2009/125/EG des Europäischen Parlaments und des Rates; Amtsblatt der EU L272, 25/10/2019, S. 74–94

Verordnung (EU) Nr. 327/2011:

Verordnung der Kommission vom 30. März 2011 zur Durchführung der Richtlinie 2009/125/EG des Europäischen Parlaments und des Rates im Hinblick auf die Festlegung von Anforderungen an die umweltgerechte Gestaltung von Ventilatoren, die durch Motoren mit einer elektrischen Eingangsleistung zwischen 125 W und 500 kW angetrieben werden; Amtsblatt der EU L90, 6/4/2011, S. 8–21

Weitere Angaben über die Einhaltung dieser Richtlinie(n) enthalten Anhang MR1 und MR2, die ein integraler Bestandteil dieser Erklärung sind.

RoHS Directive:

2011/65/EU *Directive of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment; Official Journal of the EU L174, 1/7/2011, p. 88–110*

Regulation (EU) No. 2019/1781*:

Commission Regulation of 1 October 2019 laying down ecodesign requirements for electric motors and variable speed drives pursuant to Directive 2009/125/EC of the European Parliament and of the Council; Official Journal of the EU L272, 25/10/2019, p. 74–94

Regulation (EU) No. 327/2011:

Commission Regulation of 30 March 2011 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for fans driven by motors with an electric input power between 125 W and 500 kW; Official Journal of the EU L90, 6/4/2011, p. 8–21

Further information about the conformity to this Directive(s) is given in Annex MR1 and MR2 which are integral parts of this declaration.

* - Die Verordnung (EU) Nr. 2019/1781 wird nur für die Produkte erklärt, welche in deren Anwendungsbereich fallen. Erfasst sind Motoren, die gemäß den Angaben auf dem jeweiligen Typenschild für den Betrieb mit einer Frequenz von 50Hz, 60Hz, 50/60Hz, mit einer Nennspannung UN von mehr als 50 V und bis zu 1000 V sowie einer Nennausgangsleistung PN von 0,12 kW bis einschließlich 1000 kW in der Betriebsart Dauerbetrieb ausgelegt sind sowie zwei, vier, sechs oder acht Pole aufweisen und nicht vollständig geschlossen unbelüftet (TENV) sind.

** - Regulation (EU) No. 2019/1781 is declared only for the products that fall within its scope. Covered are motors that, according to the information on the respective nameplate, are designed to operate at a frequency of 50Hz, 60Hz, 50/60Hz, with a nominal voltage UN of more than 50 V and up to 1000 V and a nominal output power PN of 0.12 kW up to and including 1000 kW in the continuous operation mode and have two, four, six or eight poles and are not totally enclosed non-ventilated (TENV).*

Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, ist jedoch keine Beschaffenheits- oder Haltbarkeitsgarantie.
Die Sicherheitshinweise der mitgelieferten Produktdokumentation sind zu beachten.

This declaration is an attestation of conformity with the indicated Directive(s) but does not imply any guarantee of quality or durability.
The safety instructions of the accompanying product documentation shall be observed.

Einbauerklärung
Declaration of incorporation

Nr. / *No.* A5E36964102AM

Das bezeichnete Produkt ist eine unvollständige Maschine im Sinne von Art. 2 g) der Richtlinie 2006/42/EG. Sie ist nur dazu bestimmt, in andere Maschinen oder in andere unvollständige Maschinen oder Ausrüstungen eingebaut oder mit ihnen zusammengefügt zu werden.
The designated product is a partly completed machinery in the sense of Art 2 g) of Directive 2006/42/EC. It is only intended to be incorporated into or assembled with other machinery or other partly completed machinery or equipment.

Die relevanten, angewendeten und eingehaltenen grundlegenden Anforderungen nach Anhang I der Richtlinie 2006/42/EG sind im Anhang MR2 zu dieser Erklärung aufgeführt.
The relevant, applied and fulfilled essential requirements of Annex I of Directive 2006/42/EC are listed in Annex MR2 of this declaration.

Die speziellen technischen Unterlagen nach Anhang VII, B der Richtlinie 2006/42/EG wurden erstellt und werden den Behörden auf begründete Anforderung in ☒ elektronischer / ☐ Papierform zur Verfügung gestellt.
The relevant technical documentation according to Annex VII, B of Directive 2006/42/EC has been compiled and will be provided to the authorities upon request in ☒ electronic / ☐ paper form.

Die unvollständige Maschine darf erst dann in Betrieb genommen werden, wenn gegebenenfalls festgestellt wurde, dass die Maschine, in die die unvollständige Maschine eingebaut werden soll, den Bestimmungen der Maschinenrichtlinie 2006/42/EG entspricht.
The partly completed machinery must not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with the provisions of Directive 2006/42/EC, where appropriate.

Unterzeichnet für und im Namen von: / *Signed for and on behalf of:*
Innomotics GmbH

Tübingen, 18. September 2023
Ort / *place*, Datum der Ausstellung / *date of issue*

Tasarsu Kaan Takuma
Digital unterschrieben von Tasarsu Kaan Takuma
Datum: 2023.10.19 18:20:31 +02'00'

i. V. Kaan Tasarsu
Head GM

Chen Xingjian
Digital signiert von Chen Xingjian
DN: cn=Chen Xingjian, o=Siemens, email=xingjian.chen@siemens.com
Grund: Ich bin mit den angegebenen Teilen dieses Dokuments einverstanden
Datum: 2023.09.20 18:35:10 +02'00'

i. V. Xingjian Chen
Head Research & Development GM

Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, ist jedoch keine Beschaffenheits- oder Haltbarkeitsgarantie.
Die Sicherheitshinweise der mitgelieferten Produktdokumentation sind zu beachten.

This declaration is an attestation of conformity with the indicated Directive(s) but does not imply any guarantee of quality or durability.
The safety instructions of the accompanying product documentation shall be observed.

Anhang MR1 / Annex MR1
zur Einbauerklärung / EU-Konformitätserklärung
to the declaration of incorporation / EU-declaration of conformity

Nr. / *No.* A5E36964102AM

Produktbezeichnung: Getriebemotor 2KJ3...
Product identification: Geared motor 2KJ3...

Die Übereinstimmung des bezeichneten Produkts mit den Vorschriften der angewandten Richtlinie(n) wird nachgewiesen durch die vollständige Einhaltung folgender Normen / Vorschriften:
The conformity of the designated product with the provisions of the applied Directive(s) is proved by full compliance with the following standards / regulations:

Harmonisierte Normen / *Harmonized standards*:

Referenznummer *Reference number*	Ausgabedatum *Date of issue*	Referenznummer *Reference number*	Ausgabedatum *Date of issue*
EN ISO 12100	2010	EN 60034-1*	2010+AC:2010.
EN 61800-5-2**	2017		
EN ISO 13849-1**	2015		
EN 61800-3***	2004+A1:2012		
EN IEC 63000	2018		

* - und alle relevanten Teile und Ergänzungen / and all relevant parts and supplements
** - trifft nur zu bei Typ / applies to type only: I = S, M
*** - trifft nur zu bei Typ / applies to type only: H = I, S, M; E = M

Sonstige technische Normen, Spezifikationen / *other technical standards, specifications*:

Referenznummer *Reference number*	Ausgabedatum *Date of issue*	Referenznummer *Reference number*	Ausgabedatum *Date of issue*

Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, ist jedoch keine Beschaffenheits- oder Haltbarkeitsgarantie.
Die Sicherheitshinweise der mitgelieferten Produktdokumentation sind zu beachten.

This declaration is an attestation of conformity with the indicated Directive(s) but does not imply any guarantee of quality or durability.
The safety instructions of the accompanying product documentation shall be observed.

Anhang MR2
zur Einbauerklärung

Nr. A5E36964102AM

Produktbezeichnung: Getriebemotor 2KJ3...

Die folgenden grundlegenden Sicherheits- und Gesundheitsschutzanforderungen der Richtlinie 2006/42/EG, Anh. I, sind für die oben genannte unvollständige Maschine relevant und wurden entsprechend der Angabe in Spalte 3 erfüllt bzw. zeigen noch Restgefahren, die vom Hersteller der Gesamtmaschine zu beachten sind. Die für das Produkt nicht relevanten Risiken sind nicht aufgeführt.

2006/42/EG Anh. I	**Bezeichnung**	**Anforderung erfüllt**	
		j/n	**Weitere Hinweise**
1	**Grundlegende Sicherheits- und Gesundheitsschutzanforderungen**		
1.1.2	Grundsätze für die Integration der Sicherheit	j	
1.1.3	Materialien und Produkte	j	
1.1.5	Konstruktion der Maschine im Hinblick auf die Handhabung	j	
1.3	**Schutzmaßnahmen gegen mechanische Gefährdungen**		
1.3.1	Risiko des Verlusts der Standsicherheit	j	
1.3.2	Bruchrisiko beim Betrieb	j	
1.3.3	Risiken durch herabfallende oder herausgeschleuderte Gegenstände	j	
1.3.4	Risiken durch Oberflächen, Kanten und Ecken	j	
1.3.8.1	Bewegliche Teile der Kraftübertragung	j	
1.4	**Anforderungen an Schutzeinrichtungen**		
1.4.1	Allgemeine Anforderungen	j	
1.4.2	Besondere Anforderungen an trennende Schutzeinrichtungen	j	
1.4.2.1	Feststehende trennende Schutzeinrichtungen	j	
1.5	**Risiken durch sonstige Gefährdungen**		
1.5.1	Elektrische Energieversorgung	j	Einhaltung der Schutzziele Richtlinie 2014/35/EU
1.5.2	Statische Elektrizität	j	
1.5.4	Montagefehler	j	
1.5.5	Extreme Temperaturen	j	
1.5.6	Brand	j	
1.5.8	Lärm	j	
1.5.9	Vibrationen	j	
1.5.13	Emission gefährlicher Werkstoffe und Substanzen	j	

Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, ist jedoch keine Beschaffenheits- oder Haltbarkeitsgarantie.
Die Sicherheitshinweise der mitgelieferten Produktdokumentation sind zu beachten.

This declaration is an attestation of conformity with the indicated Directive(s) but does not imply any guarantee of quality or durability.
The safety instructions of the accompanying product documentation shall be observed.

Anhang MR2
zur Einbauerklärung

Nr. A5E36964102AM

1.6	**Instandhaltung**		
1.6.1	Wartung der Maschine	j	
1.6.2	Zugang zu den Bedienungsständen und den Eingriffspunkten für die Instandhaltung	j	
1.7	**Informationen**		
1.7.1	Informationen und Warnhinweise an der Maschine	j	
1.7.2	Warnung vor Restrisiken	j	
1.7.3	Kennzeichnung der Maschinen	j	
1.7.4	Betriebsanleitung	j	
1.7.4.1	Allgemeine Grundsätze für die Abfassung der Betriebsanleitung	j	
1.7.4.2	Inhalt der Betriebsanleitung	j	
1.7.4.3	Verkaufsprospekte	j	

Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, ist jedoch keine Beschaffenheits- oder Haltbarkeitsgarantie.
Die Sicherheitshinweise der mitgelieferten Produktdokumentation sind zu beachten.

This declaration is an attestation of conformity with the indicated Directive(s) but does not imply any guarantee of quality or durability.
The safety instructions of the accompanying product documentation shall be observed.

Annex MR2
to the declaration of incorporation

No. A5E36964102AM

Product identification: Geared motor 2KJ3...

The following essential health and safety requirements of Directive 2006/42/EG, Annex I are relevant for the identified uncompleted machinery. According to the remarks in column 3 they have been solved respectively bear residual hazards which have to be covered by the manufacturer of the final machinery. Risks, not being relevant for the uncompleted machinery are not listed.

2006/42/EC Annex I	**Denotation**	**Requirement fulfilled**	
		y/n	**Additional remark**
1	**Essential health and safety requirements**		
1.1.2	*Principles of safety integration*	*y*	
1.1.3	*Materials and products*	*y*	
1.1.5	*Design of machinery to facilitate its handling*	*y*	
1.3	**Protection against mechanical hazards**		
1.3.1	*Risk of loss of stability*	*y*	
1.3.2	*Risk of break-up during operation*	*y*	
1.3.3	*Risks due to falling or ejected objects*	*y*	
1.3.4	*Risks due to surfaces, edges or angles*	*y*	
1.3.8.1	*Moving transmission parts*	*y*	
1.4	**Required characteristics of guards and protective devices**		
1.4.1	*General requirements*	*y*	
1.4.2	*Special requirements for guards*	*y*	
1.4.2.1	*Fixed guards*	*y*	
1.5	**Risks due to other hazards**		
1.5.1	*Electricity supply*	*y*	*Fulfillment of safety objectives of Directive 2014/35/EC*
1.5.2	*Static electricity*	*y*	
1.5.4	*Errors of fitting*	*y*	
1.5.5	*Extreme temperatures*	*y*	
1.5.6	*Fire*	*y*	
1.5.8	*Noise*	*y*	
1.5.9	*Vibrations*	*y*	
1.5.13	*Emissions of hazardous materials and substances*	*y*	

Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, ist jedoch keine Beschaffenheits- oder Haltbarkeitsgarantie.
Die Sicherheitshinweise der mitgelieferten Produktdokumentation sind zu beachten.

This declaration is an attestation of conformity with the indicated Directive(s) but does not imply any guarantee of quality or durability.
The safety instructions of the accompanying product documentation shall be observed.

Annex MR2
to the declaration of incorporation

No. A5E36964102AM

1.6	***Maintenance***		
1.6.1	*Machinery maintenance*	*y*	
1.6.2	*Access to operating positions and servicing points*	*y*	
1.7	***Information***		
1.7.1	*Information and warnings on the machinery*	*y*	
1.7.2	*Warning of residual risks*	*y*	
1.7.3	*Marking of machinery*	*y*	
1.7.4	*Instructions*	*y*	
1.7.4.1	*General principles for the drafting of instructions*	*y*	
1.7.4.2	*Contents of the instructions*	*y*	
1.7.4.3	*Sales literature*	*y*	

Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, ist jedoch keine Beschaffenheits- oder Haltbarkeitsgarantie.
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The safety instructions of the accompanying product documentation shall be observed.

More information

SIMOGEAR on the Internet:
www.siemens.com/simogear

Industry Online Support (Service and Support):
www.siemens.com/online-support

IndustryMall:
www.siemens.com/industrymall