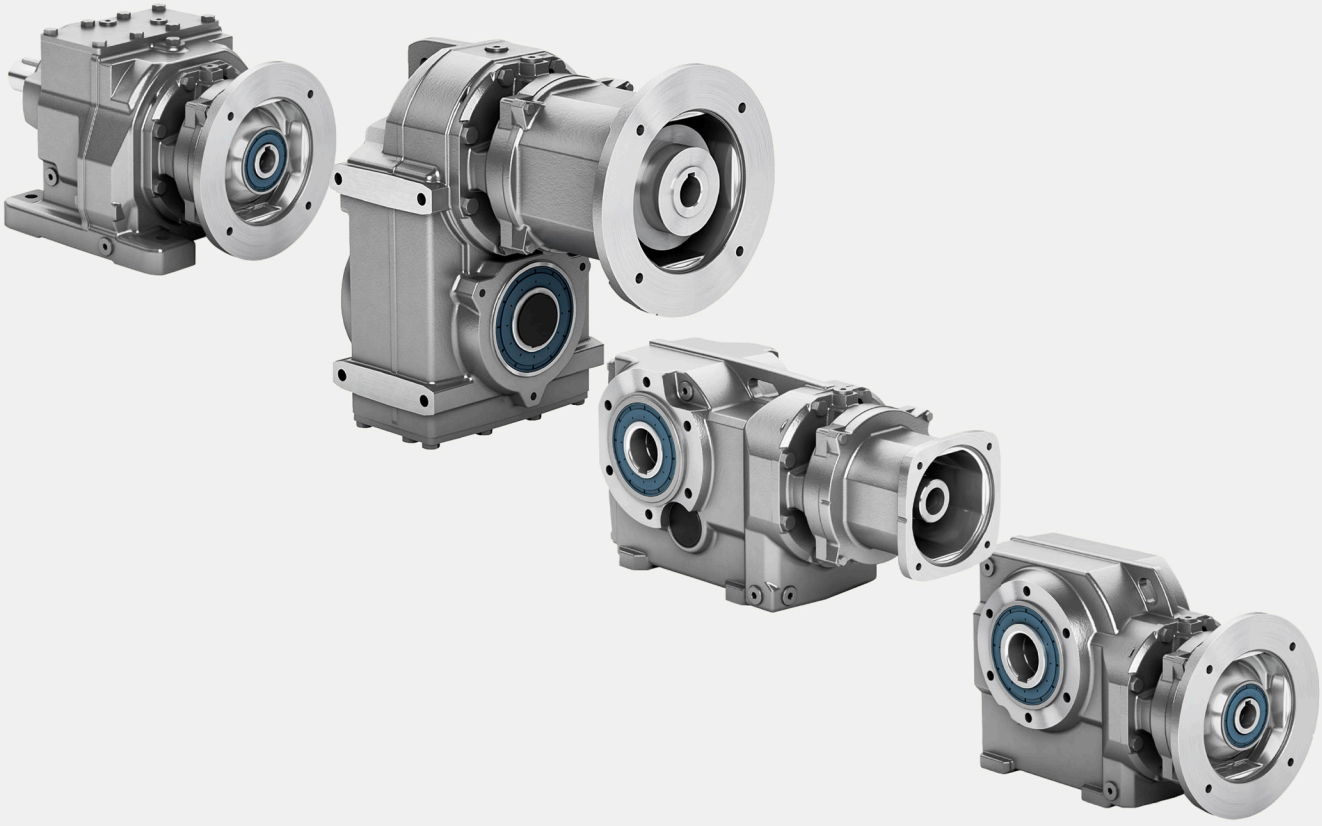
SIEMENS



Edition 12/2022

OPERATING INSTRUCTIONS

SIMOGEAR

Adapter for gearbox

BA 2039 (2KJ4)

www.siemens.com

SIEMENS

SIMOGEAR

Adapter for gearbox BA 2039 (2KJ4)

Operating Instructions

Supplement to the SIMOGEAR gearbox operating instructions BA 2030 (2KJ4)

12/2022

A5E50009089A/RS-AJ

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 Siemens products

Note the following:

⚠**WARNING**
Siemens 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 Siemens. 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 Siemens AG. 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.

Siemens AG
Digital Industries
Postfach 48 48
90026 NÜRNBERG
GERMANY

A5E50009089A/RS-AJ
Ⓟ 12/2022 Subject to change

Introduction

Target group

This manual is aimed at planning, project, and design engineers as well as electricians, fitters, and service personnel.

Avoiding dangers

Avoid dangers. Ensure safe, problem-free operation and a maximum service life:

- Before you start using the motor, you must read these Operating Instructions
- Always follow the safety instructions and notices in these operating instructions.

The warning notice system is explained at the beginning of this document.

This documentation should be kept in a location where it can be easily accessed and made available to the personnel responsible.

About this documentation

These Operating Instructions inform you about the motor and its components. You will learn how to handle the motor properly and safely from delivery to disposal:

- Assembly and mounting
- Connecting
- Commissioning
- Checking
- Operation
- Troubleshooting
- Disassembling
- Transporting and storage
- Disposal

This documentation describes the functionality of the product. The machine builder documents any modifications or changes to the product made by it.

This documentation cannot contain all of the detailed information on all of the product types. Moreover, this documentation cannot take into consideration every possible type of installation, operation, and maintenance.

mySupport

Extensive assistance and more information can be found under the following link:

My Support Links and Tools (https://support.industry.siemens.com/cs/cn/en/my)

You can individually compile your personal library, e.g. for your documentation based on Siemens content, and adapt it for your own machine documentation.

To do so, click "My Documentation".

Note

If you want to use this function, you must register once.

Later, you can log on with your login data.

You can create your own personal library under "mySupport" using the following procedure.

Precondition

You have registered for and logged on to "Siemens Industry Online Support", hereinafter referred to as "SIOS".

SIOS (https://support.industry.siemens.com/cs/cn/en/)

Procedure for creating a personal library

1. Open SIOS and log on.
2. Enter the product you are looking for under "Search for product info" and press "Enter".
3. Select the doc. class you want, e.g. "Manual", under "Entry type".
4. Click on your desired manual under the entries.
5. Click on "Add to mySupport documentation".
6. Enter a title.
7. Press "OK".

❒

The selected manual can be found under "mySupport". To find further functions, click on the icon located to the right of the document.

In this way, you can create your own library and quickly access your documentation.

Provide feedback

Siemens strives continually to improve the quality of information provided in these operating instructions.

Your questions, suggestions and corrections of the technical documentation are welcome. For this purpose, please use the "Send feedback" link in Siemens Industry Online Support at the end of an entry or send an Email (mailto:docu.motioncontrol@siemens.com).

Technical support

If you have any technical questions, contact Technical Support (https://support.industry.siemens.com/cs/cn/en/).

To make a support request, proceed as follows:

Precondition

You have registered for and logged on to "Siemens Industry Online Support", abbreviated "SIOS".

SIOS (https://support.industry.siemens.com/cs/cn/en/)

Procedure

1. Click on "Your direct way to the Support Request" or follow the link Support Request (https://support.industry.siemens.com/cs/cn/en/my).
2. Follow the instructions in the online form.

❒

Websites of third parties

This document includes hyperlinks to websites of third-party companies. Siemens is not responsible for and shall not be liable for these websites and is not responsible for the content or information they provide. Siemens does not control the information on these websites and is not responsible for the content and information provided there. The user bears the risk for their use.

Compliance with the General Data Protection Regulation

Siemens respects the principles of data protection, in particular the data minimization rules (privacy by design).

For this product, this means:
The product does not process neither store any person-related data, only technical function data (e.g. time stamps). If the user links these data with other data (e.g. shift plans) or if he stores person-related data on the same data medium (e.g. hard disk), thus personalizing these data, he has to ensure compliance with the applicable data protection stipulations.

Table of contents

Fundamental safety instructions

1

1.1 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 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" 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.

⚠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 you have a heart pacemaker or implant, maintain the minimum distance specified in chapter "Correct usage" from such motors.

⚠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 you have a heart pacemaker or implant, maintain the minimum distance specified in chapter "Correct usage".
- 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 inadequate cooling

Inadequate cooling can cause the motor to overheat, resulting in smoke and fire. Possible consequences can be serious injury or death. This can also result in increased failures and reduced service lives of motors.

- Comply with the specified cooling requirements for the motor.

⚠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

Burn injuries caused by hot surfaces

In operation, the motor can reach high temperatures, which can cause burns if touched.

- Mount the motor so that it is not accessible in operation.

Measures when maintenance is required:

- Allow the motor to cool down before starting any work.
- Use the appropriate personnel protection equipment, e.g. gloves.

1.2 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).

1.3 Security information

Siemens provides products and solutions with industrial security 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 security 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 security measures that may be implemented, please visit
https://www.siemens.com/industrialsecurity (https://www.siemens.com/industrialsecurity).

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 Security RSS Feed under
https://www.siemens.com/cert
(https://new.siemens.com/global/en/products/services/cert.html#Subscriptions).

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 holistic, state-of-the-art industrial security concept for the installation or machine.
- Make sure that you include all installed products into the holistic industrial security concept.
- Protect files stored on exchangeable storage media from malicious software by with suitable protection measures, e.g. virus scanners.
- On completion of commissioning, check all security-related settings.

1.4 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 installer 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 and/or software errors in the sensors, control system, actuators, and cables 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, including open flames, as well as emissions of light, noise, particles, gases, etc., can occur inside and outside the components under fault conditions caused by, for example:
   - Component failure
   - Software errors
   - Operation and/or environmental conditions outside the specification
   - External influences/damage
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 communication systems, e.g. ripple-control transmitters or data communication via the network

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

Specific safety instructions

2

2.1 General overview

Note

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

Note

European RoHS directive

SIMOGEAR geared motors comply with the stipulations laid down in Directive 2011/65/EU.

These operating instructions are part of the gearbox delivery. Store the operating instructions near the gearbox. Please read the operating instructions prior to handling the gearbox and observe the information they contain. This is the best way of ensuring safe and trouble-free operation.

The operating instructions supplement the SIMOGEAR gearbox operating instructions BA 2030 (2KJ4).

These operating instructions apply to the adapters of the standard SIMOGEAR gearbox version:

- Adapter KS - coupling adapter only for fitting a SIEMENS servomotor of the SIMOTICS S-1FK7/1FT7, SIMOTICS M-1PH8, SIMOTICS S-1FK2, SIMOTICS S-1FL6, SIMOTICS M-1PH1, and SIMOTICS M-1PH3 series
- Adapter K2 - adapter with flexible coupling for fitting an IEC motor
- Adapter K4 - short adapter with plug-in parts for fitting an IEC motor
- Adapter K8 - coupling adapter for fitting a servomotor of the SIMOTICS M-1PH8 series
- Adapter A, AZ - adapter with free drive shaft

Table 2- 1 Article number code

SIMOGEAR adapter	Article number position 12	Supplement
Adapter KS for mounting a SIEMENS servomotor	1	-
Adapter K2 for fitting an IEC motor	2	-
Short adapter K4 for fitting an IEC motor	4	-
Adapter K8 for fitting a servomotor	8	-
Adapter A	9	M1A
Adapter AZ	9	M1B

Example of an article number code for a SIMOGEAR gearbox with coupling adapter KS 2KJ4xxx-xxA01-xxxx.

Note

In addition to these operating instructions, the special designed gearbox and the associated supplementary equipment must also comply with the special contractual agreements and technical documentation.

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/cn/en/ps/27868/man)

- BA 2030 (2KJ4) - operating instructions for SIMOGEAR gearboxes
- BA 2039 (2KJ4) - operating instructions for adapters for mounting on SIMOGEAR gearboxes
- BA 2330 (2KJ4) - operating instructions for LEN/LHN/LJN motors for mounting on SIMOGEAR gearboxes

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

Siemens AG reserves the right to change individual components and accessory parts in the interest of further development. The changes serve to improve the performance and safety. The significant features are retained. The operating instructions are always being updated with new contents.

2.2 Intended use

Note

Gearboxes and geared motors are partly completed machines for installation into machinery, or other partly completed machinery or equipment or plants, within the meaning of the current EC Machinery Directive 2006/42/EC.

Based on the area of validity of these directives, commissioning is prohibited until it has been absolutely identified that the end product is in conformance with these directives.

The SIMOGEAR gearboxes described in these operating instructions have been designed for stationary use in general engineering applications in machinery, other partly completed machinery, or equipment or plants.

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

The gearboxes have been built using state-of-the-art technology and are shipped in an operationally reliable condition. Changes made by users could affect this operational reliability and are forbidden.

The gearboxes have been designed solely for the application described in Technical Data in the BA 2030 (2KJ4) Operating Instructions for SIMOGEAR gearboxes. Do not operate the gearboxes outside the specified power limits. Other operating conditions must be contractually agreed.

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

2.3 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

Poisonous 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 fully in all points in order to:

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

Carefully comply with the 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 oil spills 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. You will find the maximum permissible vibration values in SIMOGEAR gearboxes - E, D, Z, FD, FZ, B, K, C (BA 2030) in Chapter General installation notes.

Technical description

3

3.1 General technical description

The adapters are intended for the mounting of IEC standard motors or SIEMENS servomotors.

The adapters are equipped with grease-lubricated roller bearings. The bearings are permanently lubricated.

The adapters are made of aluminum or gray cast iron.

3.2 Maximum permissible operation

Please observe the maximum values specified on the rating plate. Explanation in BA 2030 (2KJ4), General technical data.

3.3 Flexible coupling

Generally use a flexible coupling for the gearbox input and output.

If a rigid coupling or other input or output elements are to be used that give rise to additional radial and / or axial forces (for example gear wheels, belt pulleys), this must be contractually agreed.

Refer to the relevant operating instructions for details of how to use the coupling.

3.4 Backstop K2X

NOTICE
Service life limited Drive speeds below 1000 r/min or frequent starting and stopping operations (≥ 20 starts / stops per hour) will limit service life. Ensure that the backstop is replaced in time when frequent starting and stopping operations are performed.

NOTICE
Damage or destruction due to incorrect direction of rotation Do not run the motor against the backstop. Note the directional arrow on the motor.

Note

The backstop is not suitable for ambient temperatures under -25 °C.

The gearbox can be fitted with a mechanical backstop in the adapter. The backstop permits only the correct direction of rotation during operation. The adapter is indicated by an arrow pointing in the corresponding direction.

The backstop is fitted with centrifugally operated sprags. When the gearbox is running in the specified direction, the inner ring and the cage with the sprags also rotate while the outer ring remains stationary.

If the drive speed exceeds the speed listed in the table, the sprag rises. The backstop is wear-free.

Table 3- 1 Minimum drive speed when using backstops

Frame size **K2X - IEC**	**Backstop**	**Speed** **[r/min]**
80	RS FXN 46-25 NX	> 820
90		
100	RS FXN 51-25 DX	> 750
112		
132	RS FXN 76-25 NX	> 670
160		
180		
200	RS FXN 61-19 NX	> 610
225		
250	RS FXN 101-25 NX	> 610

Installing

4

4.1 Unpacking

NOTICE
Transport damage impairs the correct function of the geared motor
Never commission faulty or defective devices.

Check the device for completeness and damage. Report any missing parts or damage immediately.

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

4.2 General information on installation

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

NOTICE
Destruction caused by welding
Welding destroys the geared parts and 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 operator 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 may be exceeded if the temperature monitoring equipment is incorrectly set.

An alarm must be output when the maximum permissible oil sump temperature is reached. The geared motor must be switched off when the maximum permissible temperature is exceeded. If the geared motor is shut down, then this can cause the machine to come to a stop.

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

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

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

Provide sufficient lifting gear at the beginning of mounting and fitting work.

Observe the mounting position specified on the rating plate. This ensures that the correct quantity of lubricant is provided.

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

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

4.3 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 4- 1 Tightening torques for fastening bolts

Thread size	Tightening torque for strength 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	1000	1200
M30	1500	2000	2400
M36	2500	3600	4200

4.4 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 any 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 axis displacement to the connecting shaft extensions.

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 impacts or knocks to force the input and output elements to be mounted 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 extension faces.

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

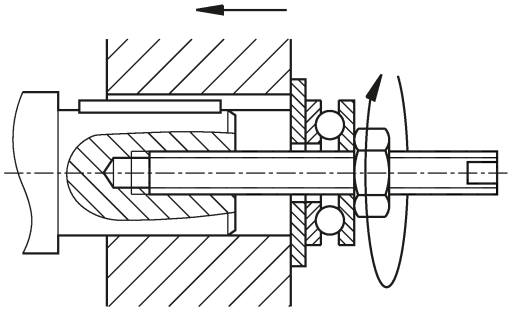
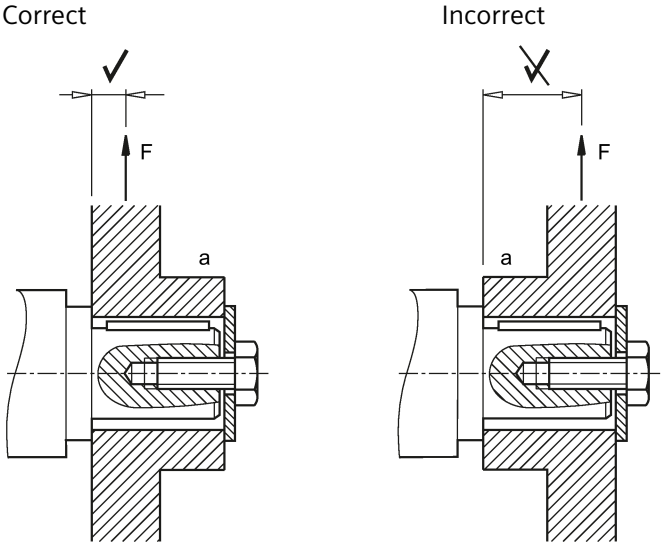


Figure 4-1 Example of a fitting device

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



a Hub
F Force

Figure 4-2 Mounting arrangement for low stress on shafts and bearings

Procedure

1. Use either benzine or solvent to remove the anti-corrosion protection from the shaft extensions and flanges or remove the applied protective skin.
2. Fit the drive input and output elements to the shafts. Fasten the elements when necessary.

You have now fitted the input or output element.

4.5 Mounting the motor

NOTICE

Moisture penetrates an inadequately sealed geared motor

If the geared motor is to be installed outdoors or for an installation requiring a high degree of protection (≥ IP55):

- Seal the flange, bolts 1505 or integrated elements such as proximity switches, using an appropriate sealing compound.
- The flange-mounted motor must be sealed across the entire contact surface.
- Seal the geared motor in the outer area.

Note

The flange-mounted motor must always be sealed using a suitable sealing compound.

4.5.1 Mounting SIEMENS servomotors without feather key onto adapter KS

NOTICE

Damage to the bearing caused by excessive forces

Avoid high axial forces when installing on the motor.

NOTICE

Soiling impairs the torque transmission

Any soiling in the vicinity of the shaft/hub connection will have a detrimental effect on the torque transmission.

Keep the drill hole of the coupling half 1556 completely free from grease.

Do not use soiled cleaning cloths or contaminated solvents.

Note

Dimension z12 applies for standard assignment of the coupling. If a special assignment is required, consult the appropriate special dimension drawing.

Note

Reduce assembling force

Lightly grease or oil the gear ring tooth flanks of the elastomer 1557.

The following are permitted:

- Mineral-oil based oils or greases
- Silicon-based lubricants
- Vaseline

Note

The force required to join the coupling halves is released after mounting, meaning that there is no danger of excessive axial load on the bearings.

Note

The contact surfaces between adapter and motor must always be sealed using a suitable sealing compound.

Mounting servomotors with smooth shafts

The KS adapter has been designed for mounting servomotors with smooth shafts (without feather key).

Permissible	
SIMOTICS S-1FL6	1FL6XXX-XXXXX-XXGX 1FL6XXX-XXXXX-XXHX
SIMOTICS S-1FK2	1FK2XXX-XXXXX-0XXX
SIMOTICS S-1FK7	1FK7XXX-XXXXX-XXGX 1FK7XXX-XXXXX-XXHX
SIMOTICS S-1FT7	1FT7XXX-XXXXX-XXGX 1FT7XXX-XXXXX-XXHX 1FT7XXX-XXXXX-XXKX 1FT7XXX-XXXXX-XXLX
SIMOTICS M-1PH8	1PH8XXX-XXXXX-0XXX
SIMOTICS M-1PH1	1PH1XXX-XXXXX-0XXX
SIMOTICS M-1PH3	1PH3XXX-XXXXX-0XXX

SIMOTICS S-1FT7 Flange-mounted design

Only the classic flange may be used in this version. The recessed version cannot be mounted on the KS adapter.

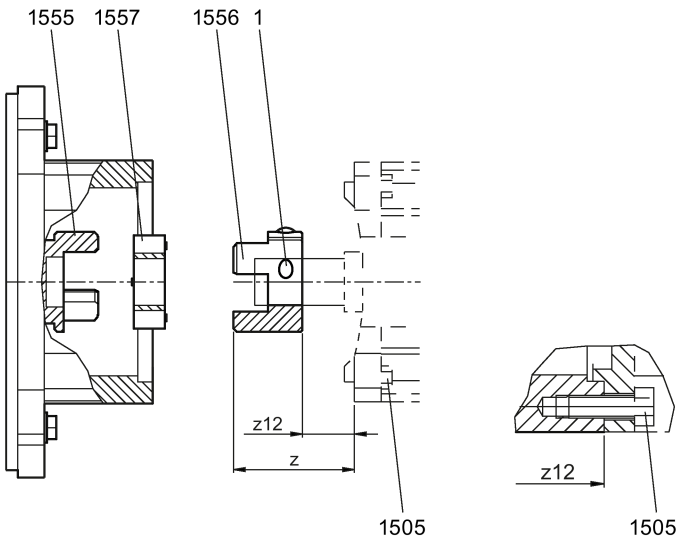
Permissible	
SIMOTICS S-1FT7	1FT7XXX-XXXX1-XXXX 1FT7XXX-XXXX4-XXXX

SIMOTICS S-1FK2 IP65

The IP65 version of SIMOTICS S-1FK2 is mechanically not compatible with the KS adapter. However, the degree of protection IP65 is nevertheless complied with by attaching the motor to the gear.

Permissible	
SIMOTICS S-1FK2	1FK2XXX-XXXX0-XXXX (IP64 without shaft sealing ring)
Not permissible	
SIMOTICS S-1FK2	1FK2XXX-XXXX1-XXXX (IP65 with shaft sealing ring)

Size KS3 to KS10



1	Bolt	1556	Coupling half
1505	Bolt	1557	Elastomer
1555	Coupling half		

Figure 4-3 Adapter KS

Procedure

1. Loosen the bolt 1 slightly.
2. Fit the coupling half 1556 onto the motor shaft extension. See Mounting an input or output element on the gearbox shaft (Page 25).
3. Maintain the clearances z12 and z.
4. Apply adhesive (medium strength, for example Loctite 243) to the bolt 1.
5. Tighten bolt 1 with the specified torque T_A SW.
   In the case of 2 bolts, tighten both alternately in equal steps with the specified tightening torques.
6. Insert the elastomer 1557 in the already assembled coupling half 1556 on the motor shaft extension.
7. Lightly grease or oil the tooth flanks to reduce the mounting force.
8. Apply adhesive (medium strength, for example Loctite 243) to the bolts 1505.
9. Fasten the motor with the bolts 1505 with the prescribed torque. See Thread sizes and tightening torques for fastening bolts (Page 25).
   The claws of the coupling parts must interlock.

You have mounted the SIEMENS servomotor on the KS adapter.

Table 4- 2 Adapter KS

Size	Coupling size	z12	z	Bolt 1	T_ASW	SW	Bolt 1505
		mm	mm		Nm	mm	
KS3.1	16	5	$25.7_{-0.8}$	M4	4.1	3	M5
KS3.2	16	5	$25.7_{-0.8}$	M4	4.1	3	M6
KS4.1	19	5	36_{-1}	M6	10	4	M6
KS4.2	19	5	36_{-1}	M6	10	4	M6
KS5.1	19	5	36_{-1}	M6	10	4	M6
KS5.2	19	5	36_{-1}	M6	10	4	M8
KS6.1	24	8	42_{-1}	M6	10	4	M8
KS6.2	24	8	42_{-1}	M6	10	4	M8
KS8.1	28	2	41_{-1}	M8	25	6	M10
KS10.1	38	5	52_{-1}	M10	49	8	M12
KS10.2	38	5	52_{-1}	M10	49	8	M12

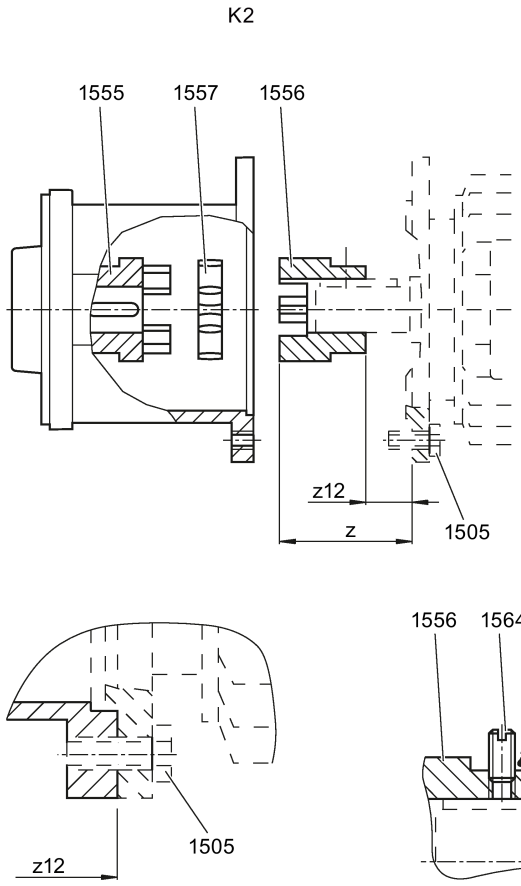
4.5.2 Mounting the standard motor to the K2 adapter

Note

Dimension z12 applies for standard assignment of the coupling. If a special assignment is required, consult the appropriate special dimension drawing.

Note

The contact surfaces between adapter and motor must always be sealed using a suitable sealing compound.



1505	Bolt	1557	Flexible element
1555	Coupling half	1564	Grub screw
1556	Coupling half		

Figure 4-4 Adapter K2

Procedure

1. Fit the coupling half 1556 onto the motor shaft extension. See Mounting an input or output element on the gearbox shaft (Page 25).
2. Maintain the clearances z12 and z.
3. Apply adhesive (medium strength, for example Loctite 243) to the grub screw 1564.
4. Tighten the grub screw 1564 to the specified torque T_A SW and across-flats dimension SW.
5. On motors balanced with half a feather key (code "H"), remove projecting, visible parts of the feather key.
6. Place the flexible element 1557 inside the coupling half 1555.
7. Apply adhesive (medium strength, for example Loctite 243) to the bolts 1505.
8. Fasten the motor with the bolts 1505 with the prescribed torque. See Thread sizes and tightening torques for fastening bolts (Page 25).

You have mounted the standard motor on the K2 adapter.

Table 4- 3 Adapter K2

IEC B5	Coupling size	z12	z	Grub screw 1564	T_ASW	SW	Bolt 1505
		mm	mm		Nm	mm	
80	19	15	54-1	M5	2	2.5	M10
90	19	25	64-1	M5	2	2.5	M10
100	24	30	76-1	M5	2	2.5	M12
112	24	30	76-1	M5	2	2.5	M12
132	28	45	97.5-1.5	M8	10	4	M12
160	38	66	132-1.5	M8	10	4	M16
180	42	59	132-1.5	M8	10	4	M16
200	42	60	133-1.5	M8	10	4	M16
225	48	84	164.5-1.5	M8	10	4	M16
250	55	75	166-1.5	M10	17	5	M16
280	75	51	171-2	M10	17	5	M16
315	90	33.5	173-2	M12	40	6	M20

4.5.3 Mounting the standard motor to the K4 short adapter

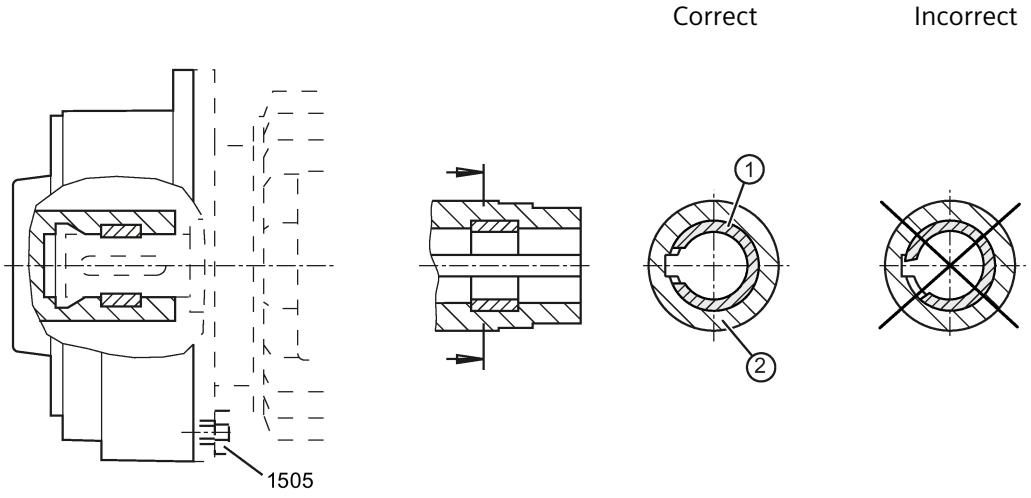
Note

Ensure that the plastic ring ① is located in the correct position.

The plastic ring ① prevents fretting corrosion on the cylinder surface of the motor shaft.
To prevent fretting corrosion on the feather key of the motor shaft, apply a suitable lubricant to
the contact surfaces.

Note

The contact surfaces between adapter and motor must always be sealed using a suitable sealing compound.



① Plastic ring
② Shaft
1505 Bolt

Figure 4-5 Plastic ring for K4

Procedure

1. Check the correct position of the plastic ring ① in the shaft. Correct the position if required.
2. Align the position of the motor shaft so that you can insert it in the shaft ②. The shafts do not need to be greased.
3. Apply adhesive (medium strength, for example Loctite 243) to the bolts 1505.
4. Fasten the motor with the bolts 1505 with the prescribed torque. See Thread sizes and tightening torques for fastening bolts (Page 25).

You have mounted the standard motor on the K4 adapter.

Table 4- 4 Adapter K4

Coupling size	**63**	**71**	**80**	**90**	**100**	**112**	**132**	**160**	**180**	**200**	**225**	**250**
Bolt 1505	M8	M8	M10	M10	M12	M12	M12	M16	M16	M16	M16	M16

4.5.4 Mounting the servomotor with feather key to the K8 adapter

NOTICE
Damage to the bearing caused by excessive forces Avoid axial forces when installing on the motor.

Note

Dimension z12 applies for standard assignment of the coupling. If a special assignment is required, consult the appropriate special dimension drawing.

Note

Reduce assembling force

Lightly grease or oil the gear ring tooth flanks of the flexible element 1557 or the hub.

The following are permitted:

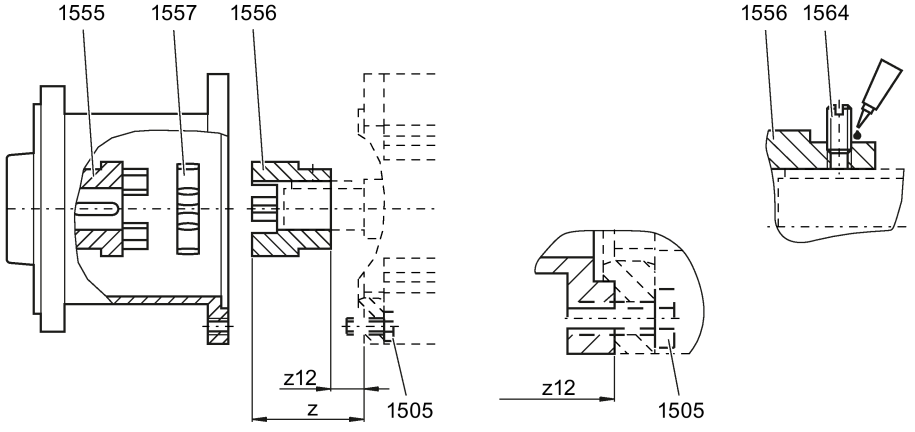
- Mineral-oil based oils or greases
- Silicon-based lubricants
- Vaseline

Note

The force required to join the coupling halves is released after mounting. Therefore, there is no danger of excessive axial load on the bearings.

Note

The contact surfaces between adapter and motor must always be sealed using a suitable sealing compound.



1505 Bolt
1555 Coupling half
1556 Coupling half
1557 Flexible element
1564 Grub screw

Figure 4-6 K8 adapter

Procedure

1. Fit the coupling half 1556 onto the motor shaft extension. See Mounting an input or output element on the gearbox shaft (Page 25).
2. Maintain the clearances z12 and z.
3. Apply adhesive (medium strength, for example Loctite 243) to the grub screw 1564.
4. Tighten the grub screw 1564 to the specified torque T_A SW and across-flats dimension SW.
5. On motors balanced with half a feather key (code "H"), remove projecting, visible parts of the feather key.
6. Place the flexible element 1557 inside the coupling half 1555.
7. Lightly grease or oil the tooth flanks to reduce the mounting force.
8. Apply adhesive (medium strength, for example Loctite 243) to the bolts 1505.
9. Fasten the motor with the bolts 1505 with the prescribed torque. See Thread sizes and tightening torques for fastening bolts (Page 25).

You have mounted the servomotor on the K8 adapter.

Table 4- 5 K8 adapter

Size	**813**	**816**
Coupling size	**42**	**42**
z12 [mm]	60	60
z [mm]	$133_{-1.5}$	$133_{-1.5}$
Grub screw 1564	M8	M8
T_A SW [Nm]	4	4
SW [mm]	4	4
Bolt 1505	M16	M16

Operation

5

⚠ CAUTION

Malfunctions can cause injuries or gearbox damages

In the event of changes during operation, the drive component must be switched off immediately.

Determine the fault as described in Section "Faults, causes and remedies" in the gearbox operating instructions. Remedy faults or have faults remedied.

Check the gear unit during operation for:

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

Service and maintenance

6

6.1 General notes about maintenance

⚠WARNING

Unintentional starting of the drive unit

Switch off the power supply to the drive unit.

Attach a warning notice to the start switch.

NOTICE

Improper maintenance

Only authorized qualified personnel may perform the maintenance and servicing. Only original parts supplied by Siemens AG may be installed.

Only qualified personnel may perform the inspection, maintenance and servicing work. Please observe the Specific safety instructions (Page 17).

6.2 Maintenance of the friction clutch

Note

Check the condition of the friction clutch initially after 500 operating hours and then at least once yearly and after every blockage of the machine.

Note

Friction clutches with proximity switch are not suitable for ambient air temperatures under -20 °C.

If the ambient temperatures differ, contact Technical Support.

If necessary, readjust the friction torque or replace the wearing parts, for example friction lining and bushes. Replace the friction linings only as pair. We recommend replacing worn bushes in sets.

6.3 Lubrication

The bearings of the SIMOGEAR adapters are permanently lubricated up to size 250.

The specified grease service life values are valid for an ambient temperature of up to a maximum of +40 °C. For every 10 °C increase in temperature, the grease service life is reduced by a factor of 0.7 of the value in the table (max. +20 °C = factor 0.5).

At an ambient temperature of +25 °C, the grease service life can be expected to be doubled.

Irrespective of the number of operating hours, renew the roller bearing grease or the bearing (2Z bearing) after 3 or 4 years at the latest.

Table 6- 1 Roller-bearing and shaft-sealing-ring grease

Fields of application	**Ambient temperature**	**Type**
Standard	-20 °C to +60 °C	Fuchs Renolit FWA 160
	-40 °C to +80 °C	Klueber Petamo GHY 133H
Foodstuff-compatible for the food industry	-30 °C to +60 °C	FUCHS CASSIDA GREASE EPS 2
Biologically degradable, for agriculture, forestry and water industries	-35 °C to +60 °C	Plantogel 2 S

Table 6- 2 Grease service life in operating hours [h] with permanent lubrication

Size					**Input speed n_{rated} [r/min]**						**Grease quantity in the bearing**
					3600	**3000**	**1800**	**1500**	**1200**	**≤ 1000**	
KS	**K2**	**K4**	**K8**	**A, AZ**	**Operating hours [h]**						**[g]**
-	-	63	-	-	33000	33000	33000	33000	33000	33000	7
3.1, 3.2, 4.1, 4.2	-	71	-	-							7
-	80	80	-	80							9
5.1, 5.2	90	90	-	90							15
6.1, 6.2	100	100	-	100	24000						20
8.1	112	112	-	112							45
10.1, 10.2	132	132	-	132		24000					75
-	160	160	-	160	17000						90
-	180	180	813	180							110
-	200	200	-	200							
-	225	225	816	225	Grease service live = bearing service life						
-	250	250	-	250							

Spare parts

7

7.1 Stocking of spare parts

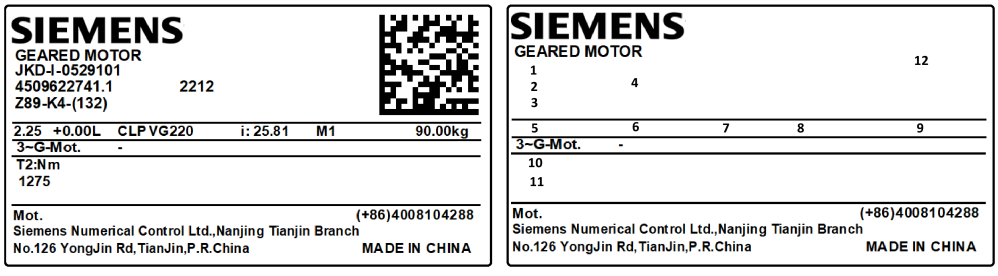
By stocking the most important spare parts and wearing parts on site, you can ensure that the gearboxes or geared motors are ready for use at any time.

NOTICE
Safety impairment caused by inferior products The installation or use of inferior products can have a negative impact on the design characteristics of the geared motor and might consequently impair the active or passive safety features of the machine. Siemens AG states explicitly that only spare parts and optional components supplied by Siemens have been tested and approved by Siemens. If you do not use original spare parts and optional components, Siemens AG excludes every liability and warranty. Siemens AG 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 AG are state-of-the-art and conform to the latest legal regulations.

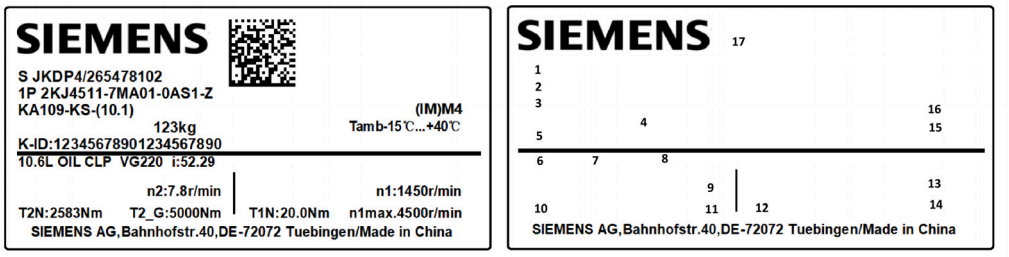
Please state the following data when ordering spare parts:

- Serial number shown on the rating plate 1
- Purchase order number or Article number shown on the rating plate 2
- Type designation shown on the rating plate 3
- Quantity



1	Serial number	7	Total transmission ratio
2	Purchase order number	8	Mounting position
3	Type designation	9	Total weight
4	Year of manufacture	10	Torque unit
5	Oil quantity	11	Output torque
6	Oil type	12	QR code

Figure 7-1 SIMOGEAR rating plate - Standard



1	Serial number	10	Total rated torque
2	Article number	11	Rated torque of gearbox
3	Type designation	12	Rated input torque
4	Weight	13	Input speed
5	Customer ID	14	Maximum input speed
6	Oil quantity	15	Permissible environment temperature
7	Oil type	16	Mounting position
8	Total transmission ratio	17	QR code
9	Output speed		

Figure 7-2 SIMOGEAR rating plate - EU market

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

7.2 Spares on Web

Rapid support around the clock – our SIMOGEAR service

Our service is your partner for comprehensive support and innovative services for increasing your productivity. The original parts and manufacturing expertise we offer help you achieve maximum machine availability and productivity. Our 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).

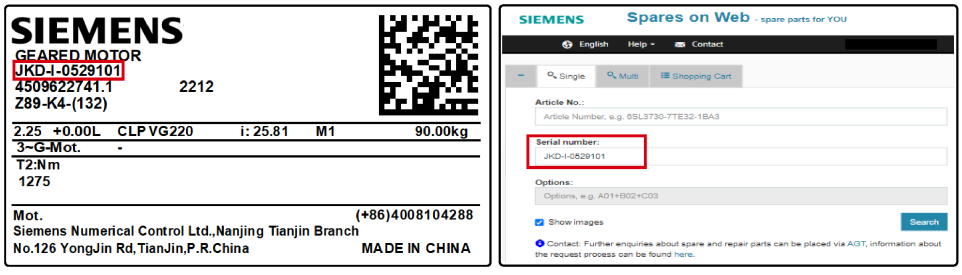


Figure 7-3 Enter a serial number in Spares on Web

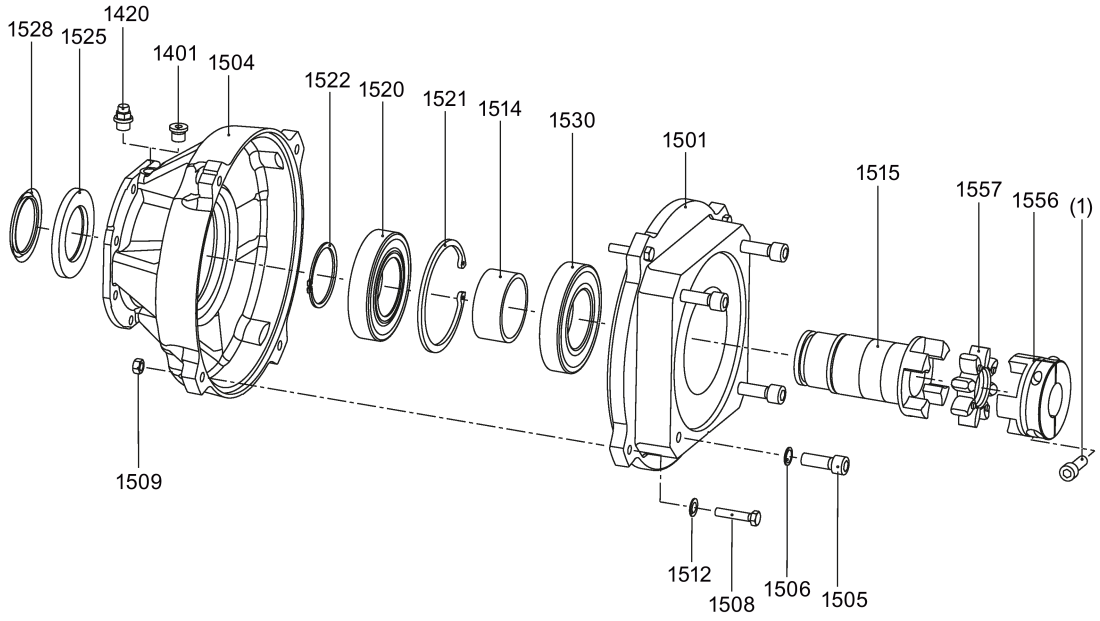
Procedure

1. Open the spare parts list with the link provided.
2. In the field "Serial number", enter the production number starting with JKD on the rating plate.
3. Use the "Search" function to display the spare parts list and technical agreement.

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

7.3 Lists of spare parts

7.3.1 Adapter KS

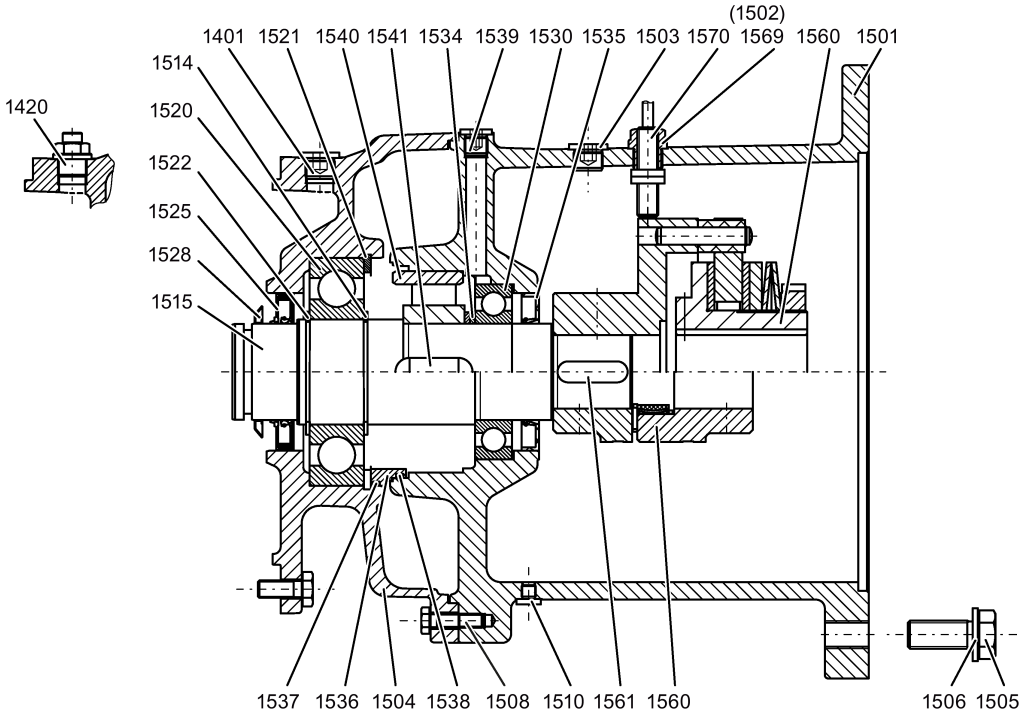


(1)	Bolt	1514	Bush
1401	Bolt plug	1515	Shaft
1420	Vent filter	1520	Bearing
1501	Adapter	1521	Locking ring
1504	Bearing shield	1522	Locking ring
1505	Bolt	1525	Shaft sealing ring
1506	Washer / screw lock	1528	Washer
1508	Bolt	1530	Bearing
1509	Nut	1556	Coupling half
1512	Washer	1557	Elastomer

Figure 7-4 Adapter KS for mounting a SIEMENS servomotor

7.3.2 K2 adapter with elastic coupling

Adapter K2 sizes 80 - 250



1303	Slip-on pinion	1530	Bearing
1304	Feather key	1531	Locking ring
1401	Screw plug	1533	O-ring
1420	Vent filter	1534	Disk
1501	Adapter	1535	Shaft sealing ring
1502	Screw plug	1536	Intermediate ring
1504	Bearing shield	1537	O-ring
1505	Bolt	1538	O-ring
1506	Plate / locking ring	1539	Screw plug
1508	Bolt	1540	Backstop
1510	Screw plug	1541	Feather key
1514	Locking ring	1543	Supporting disk
1515	Shaft	1544	Shim
1519	Sleeve	1545	Shim
1520	Bearing	1546	Shim
1521	Locking ring	1554	Sleeve
1522	Locking ring	1560	Coupling
1524	Locking ring	1561	Feather key
1525	Shaft sealing ring	1569	Reduction piece
1528	Disk	1570	Proximity switch
1529	Bearing		

Figure 7-5 K2 adapter with elastic coupling

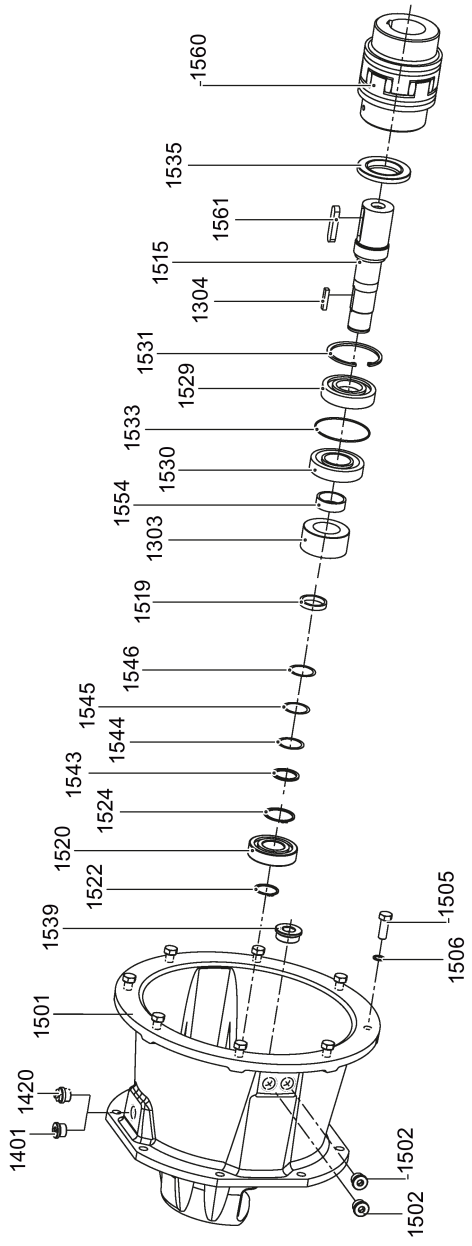
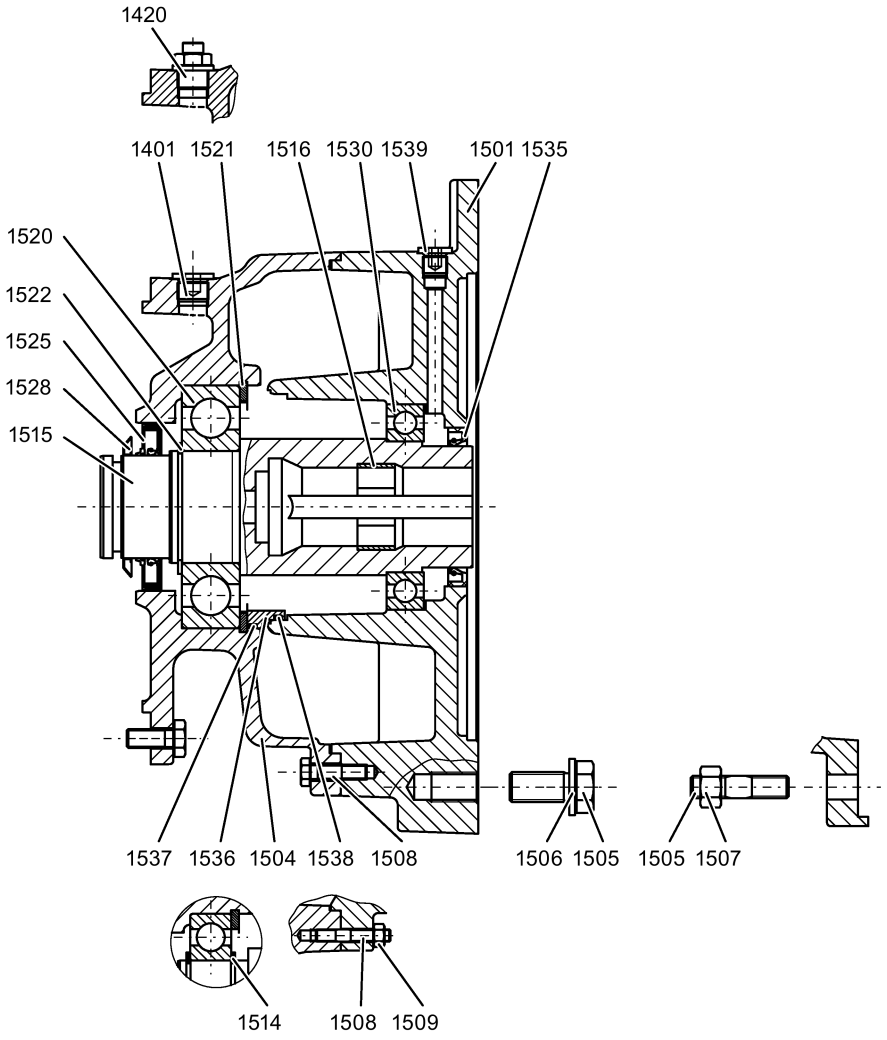


Figure 7-6 Adapter K2 sizes 280 - 315

7.3.3 K4 short adapter with plug-in parts

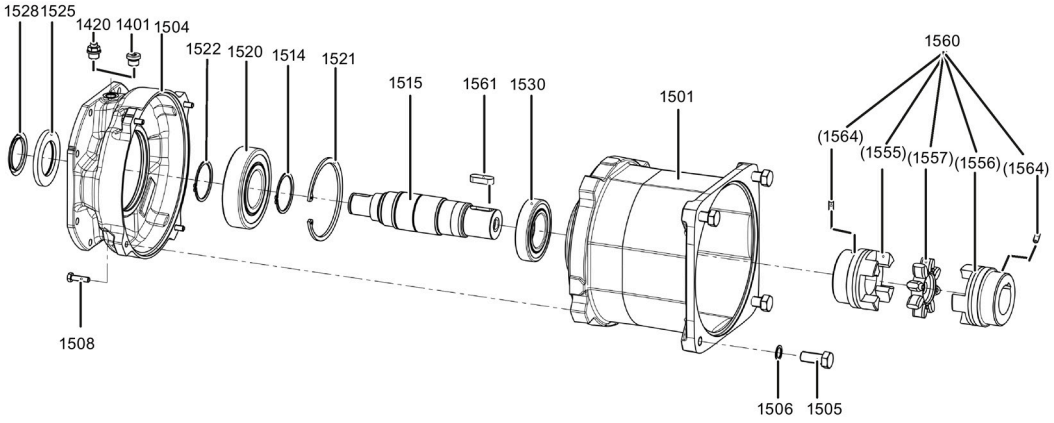


1401	Screw plug	1520	Bearing
1420	Vent filter	1521	Locking ring
1501	Adapter	1522	Locking ring
1504	Bearing shield	1525	Shaft sealing ring
1505	Bolt	1528	Disk
1506	Plate / locking ring	1530	Bearing
1507	Nut	1535	Shaft sealing ring
1508	Bolt	1536	Intermediate ring
1509	Nut	1537	O-ring
1514	Locking ring	1538	O-ring
1515	Shaft	1539	Screw plug
1516	Bush		

Figure 7-7 K4 short adapter with clamp connection

7.3.4 K8 adapter for mounting a servomotor

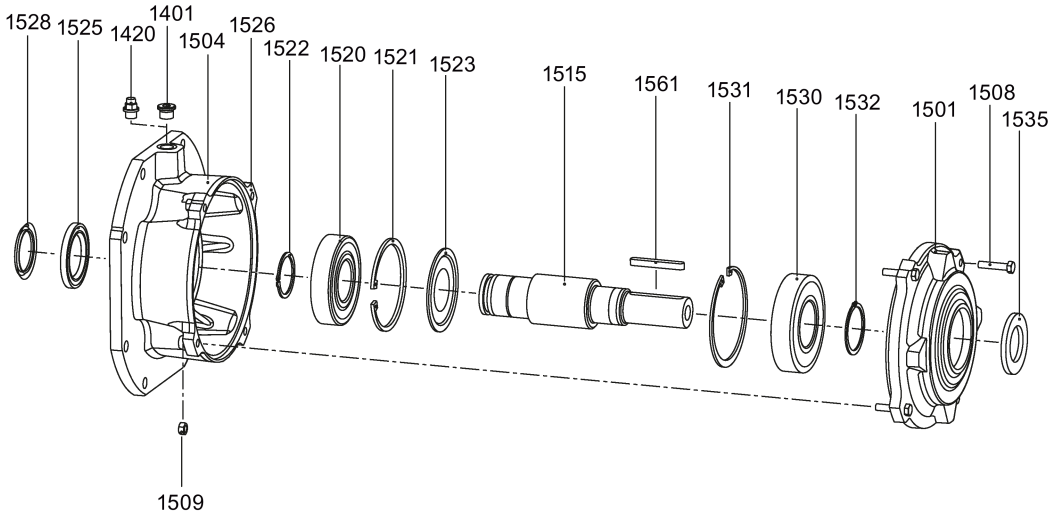
Sizes K8 813, 816



1303	Slip-on pinion	1525	Shaft sealing ring
1304	Feather key	1528	Disk
1401	Screw plug	1529	Bearing
1420	Vent filter	1530	Bearing
1501	Adapter	1531	Locking ring
1502	Screw plug	1533	O-ring
1504	Bearing shield	1535	Shaft sealing ring
1505	Bolt	1536	Intermediate ring
1506	Plate / locking ring	1537	O-ring
1507	Nut	1538	O-ring
1508	Bolt	1539	Screw plug
1514	Locking ring (only for K8 813)	1543	Supporting disk
1515	Shaft	1544	Shim
1517	Flange	1545	Shim
1518	Bolt	1546	Shim
1519	Sleeve	1554	Sleeve
1520	Bearing	1560	Coupling
1521	Locking ring	1561	Feather key
1524	Locking ring		

Figure 7-8 K8 Adapter

7.3.5 A, AZ adapter



1401	Bolt plug	1523	Sealing washer
1420	Vent filter	1525	Shaft sealing ring
1501	Adapter	1526	Seal, Loctite 574
1504	Bearing shield	1528	Washer
1508	Bolt	1530	Bearing
1509	Nut	1531	Locking ring
1515	Shaft	1532	Locking ring
1520	Bearing	1535	Shaft sealing ring
1521	Locking ring	1561	Feather key
1522	Locking ring		

Figure 7-9 A, AZ adapter

Further information

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

Siemens Numerical Control Ltd., Nanjing
Tianjin Branch
No.126 YongJin Rd,
Tianjin, P.R.China

Scan the QR code for more information on SIMOGEAR.