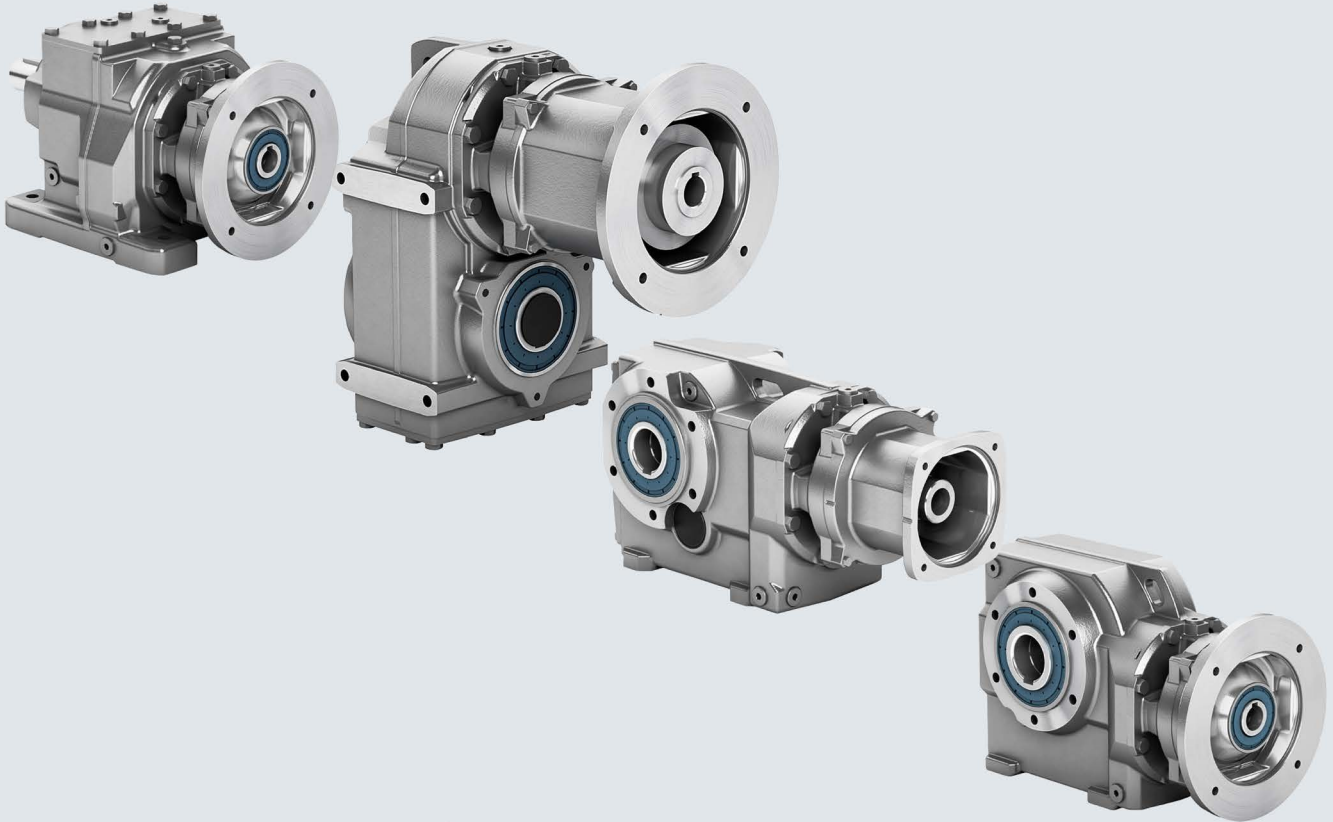


**SIEMENS**



Operating Instructions

# SIMOGEAR

Adapter for gearbox

BA 2039

Edition

04/2018

[siemens.com/simogear](http://siemens.com/simogear)



# SIEMENS

## SIMOGEAR

### Adapter for gearbox BA 2039

#### Operating Instructions

General information and safety notes	1
Technical description	2
Installing	3
Operation	4
Service and maintenance	5
Spare parts	6

Supplement to the SIMOGEAR gearbox operating instructions BA 2030

Translation of the original instructions  
04/2018

A5E37431501A/RS-AD

## 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.

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### 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.

# Table of contents

<b>1</b>	<b>General information and safety notes</b> .....	<b>5</b>
1.1	General Information .....	5
1.2	Copyright.....	7
1.3	Intended use .....	7
1.4	Obligations of the user .....	8
1.5	The five safety rules .....	9
1.6	Particular types of hazards .....	10
<b>2</b>	<b>Technical description</b> .....	<b>11</b>
2.1	General technical description .....	11
2.2	Maximum permissible operation .....	11
2.3	Flexible coupling .....	11
2.4	Backstop K2X, K3X.....	11
<b>3</b>	<b>Installing</b> .....	<b>13</b>
3.1	Unpacking .....	13
3.2	General information on installation .....	13
3.3	Thread sizes and tightening torques for fastening bolts .....	15
3.4	Mounting an input or output element on the gearbox shaft .....	15
3.5	Mounting the motor .....	17
3.5.1	Mounting SIEMENS servomotors without parallel key onto adapter KS .....	18
3.5.2	Fit the standard motor to the K2 or K3 adapter .....	20
3.5.3	Mount the standard motor to the K4 or K5 short adapter .....	23
3.5.4	Mount the servomotor with parallel key to the KQ or K8 adapter .....	24
3.5.5	Mount servomotor without parallel key to the KQS adapter .....	26
<b>4</b>	<b>Operation</b> .....	<b>29</b>
<b>5</b>	<b>Service and maintenance</b> .....	<b>31</b>
5.1	General notes about maintenance.....	31
5.2	Maintenance of the friction clutch .....	31
5.3	Lubrication .....	32
<b>6</b>	<b>Spare parts</b> .....	<b>33</b>
6.1	Stocking of spare parts .....	33
6.2	Lists of spare parts.....	34
6.2.1	Adapter KS.....	34
6.2.2	K2 and K3 adapters with elastic coupling .....	35
6.2.3	K4 and K5 short adapters with plug-in connection .....	37

6.2.4	KQ, K8 and KQS adapters for mounting a servomotor .....	38
6.2.5	A, AZ adapter .....	40

# General information and safety notes

## 1.1 General Information



### ATEX version gearboxes

Instructions and measures applying in particular to ATEX version gearboxes.

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#### Note

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

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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.

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

- Adapter KS - coupling adapter for fitting a SIEMENS servomotor from the SIMOTICS S-1FK7/-1FT7, SIMOTICS M-1PH8, SIMOTICS S-1FK2 and SIMOTICS S-1FL6 ranges
- Adapter K2 - coupling adapter with flexible coupling for fitting an IEC motor
- Adapter K3 - coupling adapter with flexible coupling for fitting a NEMA motor
- Adapter K4 - short adapter with plug-in connection for fitting an IEC motor
- Adapter K5 - short adapter with plug-in connection for fitting a NEMA motor
- Adapter KQ, KQS - coupling adapter for fitting a servomotor of the SIMOTICS S-1FK7/-1FT7 series
- Adapter K8 - coupling adapter for fitting a servomotor of the SIMOTICS M-1PH8 series
- Adapter A, AZ - adapter with free drive shaft

1.1 General Information

Table 1- 1 Article number code

<b>SIMOGEAR adapter</b>	<b>Article number position</b>	<b>Supplement</b>
Adapter KS for mounting a SIEMENS servomotor	1	-
Adapter K2 for fitting an IEC motor	2	-
Adapter K3 for fitting a NEMA motor	3	-
Short adapter K4 for fitting an IEC motor	4	-
Short adapter K5 for fitting a NEMA motor	5	-
Adapter KQ, KQS for fitting a servomotor	7	-
Adapter K8 for fitting a servomotor	8	-
Adapter A	9	M1A
Adapter AZ	9	M1B

**Note**

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

Please refer to the other operating instructions supplied with the product.

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 are designed to improve performance and safety. The significant features are retained. The operating instructions are updated regularly with new contents.

The latest versions of the operating instructions, the declaration of incorporation and the declarations of conformity are available in electronic form in the Industry Online Support (<https://support.industry.siemens.com/cs/ww/de/ps/13424/man>).

You can find technical configuration data, spare parts lists and certificates of compliance on the Intranet at Once Delivered ([https://c0p.siemens.com:8443/sie/1nce\\_delivered](https://c0p.siemens.com:8443/sie/1nce_delivered)).

You can find the contact data of your Technical Support in the Database of contacts at Siemens AG ([www.siemens.com/yourcontact](http://www.siemens.com/yourcontact)).

If you have any technical questions, please contact Technical Support (<https://support.industry.siemens.com/cs/ww/en/sc/2090>).

Europe and Africa  
Telephone: +49 (0) 911 895 7222  
[support.automation@siemens.com](mailto:support.automation@siemens.com)



America  
Telephone: +1 800 333 7421  
support.america.automation@siemens.com

Asia / Australia / Pacific  
Telephone: +86 400 810 4288  
support.asia.automation@siemens.com

#### Valid operating instructions for SIMOGEAR

- BA 2030 - operating instructions for SIMOGEAR gearboxes
- BA 2031 - operating instructions for permissible mounting position deviations of SIMOGEAR gearboxes
- KA 2032 - compact operating instructions for SIMOGEAR worm geared motor S
- BA 2039 - operating instructions for adapters for mounting on SIMOGEAR gearboxes
- BA 2039 - operating instructions for motors for mounting on SIMOGEAR gearboxes
- BA 2535 - operating instructions for SIMOGEAR electric-monorail-gearboxes
- BA 2730 - operating instructions for SIMOGEAR geared motors with encoder for safety-relevant applications

## 1.2 Copyright

The copyright to these operating instructions is held by Siemens AG.

These operating instructions must not be wholly or partly reproduced for competitive purposes, used in any unauthorized way or made available to third parties without agreement of Siemens AG.

## 1.3 Intended use



#### ATEX version gearboxes

The ATEX gearbox fulfills the requirements of the Explosion Protection Directive 2014/34/EU.

In the case of ATEX version gearboxes, please observe the instructions marked with this symbol.

The SIMOGEAR gearboxes described in these operating instructions have been designed for stationary use in general engineering applications.

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

## 1.4 Obligations of the user

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 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.

## 1.4 Obligations of the user

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

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

### **Note the following safety information:**

Shut down the geared motors and disconnect the power before you carry out any work on them.

Make sure that the drive unit cannot be turned on accidentally, e.g. lock the key-operated switch. Place a warning notice at the drive connection point which clearly indicates that work is in progress on the geared motor.

Carry out all work with great care and with due regard to "safety".

For all work, observe the relevant regulations for work safety and environment protection.

Read 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.

In the event of changes during operation, switch off the drive unit immediately.

Take appropriate protective measures to prevent accidental contact with rotating drive parts, such as couplings, gear wheels or belt drives.

Take appropriate protective measures to prevent accidental contact with parts and equipment that heat up to over +70 °C during operation.

When removing protective equipment, keep fasteners in a safe place. Re-attach removed protective equipment before commissioning.

Collect and dispose of used oil in accordance with regulations. Remove oil spillages immediately with an oil-binding agent in compliance with environmental requirements.

Do not carry out any welding work on the geared motor. Do not use the geared motor as a grounding point for welding operations.

Carry out equipotential bonding in accordance with applicable regulations and directives by electrotechnology specialists.

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

Observe the permissible tightening torque of the fastening bolts.

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

Siemens AG accepts the warranty only for original spare parts.

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

## 1.5 The five safety rules

For your own personal safety and to prevent material damage when carrying out any work, always observe the safety-relevant instructions and the following five safety rules according to EN 50110-1 Working in a voltage-free state. Apply the five safety rules in the sequence stated before starting work.

### Five safety rules

1. Disconnect.  
Also disconnect the auxiliary circuits, for example the anti-condensation heating.
2. Secure against reconnection.
3. Verify absence of operating voltage.
4. Ground and short circuit.
5. Cover or safeguard neighboring live parts.

After the work has been completed, undo the measures taken in the reverse order.

## 1.6 Particular types of hazards

 **WARNING**

**Extreme surface temperatures**

Hot surfaces over +55 °C pose a burn risk.

Cold surfaces below 0 °C pose a risk of damage due to freezing.

Do not touch the gearbox without protection.

 **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 in vapors when working with solvents.

Ensure adequate ventilation.

 **WARNING**

**Risk of explosion when working with solvents**

Ensure adequate ventilation.

Do not smoke!

 **WARNING**

**Risk of eye injury**

Rotating parts can throw off small foreign particles such as sand or dust.

Wear protective eyewear!

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

## Technical description

### 2.1 General technical description

The adapters are intended for the mounting of IEC and NEMA 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.

### 2.2 Maximum permissible operation

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

### 2.3 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 (e.g. gear wheels, belt pulleys), this must be contractually agreed.

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

### 2.4 Backstop K2X, K3X



#### **ATEX version gearboxes**

The drive speed in the table "Drive speed when using backstops" must be maintained in continuous operation.

Starting and stopping operations  $\leq 20$  starts / stops per hour are permissible.

<b>NOTICE</b>
<b>Service life limited</b>
Drive speeds below 1,000 rpm 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.

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

The gearbox can be fitted with a mechanical backstop in the coupling 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 2- 1 Minimum drive speed when using backstops

Frame size		Backstop	Speed
K2X - IEC	K3X - NEMA		[rpm]
80	56	FXN46-25DX	> 890
90	140		> 860
100, 112	180	FXN51-25DX	> 860
132	210	FXN76-25DX	> 750
160	250		> 730
180	280		> 670
200	-	FXN101-25/DX	> 670
225, 250	320, 360		> 630

## 3.1 Unpacking

<b>NOTICE</b>
<b>Transport damage impairs the correct function of the geared motor</b> Never commission faulty or defective motors.

Check the motor 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.

## 3.2 General information on installation



### ATEX version gearboxes

Effect on bearings of stray electric currents from electrical equipment.

When mounting the gearbox on or connecting it to the machine, take care to ensure potential equalization. The information on grounding and equipotential bonding provided by the motor supplier must be observed.

<b>WARNING</b>
<b>Operating under load</b> 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.

<b>NOTICE</b>
<b>Destruction caused by welding</b> 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.

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

<b>NOTICE</b>
<b>Malfunction resulting from foreign objects</b> The operator must ensure that no foreign objects impair the function of the gearbox.

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

<b>NOTICE</b>
<b>Violation of the maximum permissible oil sump temperature</b> 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 sufficient 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 sufficient lifting gear at the start 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 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.



### 3.3 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  $\mu = 0.14$ .

Table 3- 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	1 000	1 200
M30	1 500	2 000	2 400
M36	2 500	3 600	4 200

### 3.4 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.

<b>NOTICE</b>
<b>Premature wear or material damage due to misalignment</b>
Misalignment caused by excessive angular or axis displacement to the connecting shaft ends.
Ensure precise alignment of the individual components.

<b>NOTICE</b>
<b>Damage caused by improper handling</b>
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 end faces.
- Use a fitting device to fit the input or output elements.

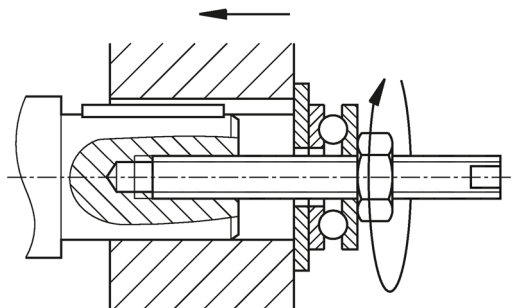


Figure 3-1 Example of a fitting device

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

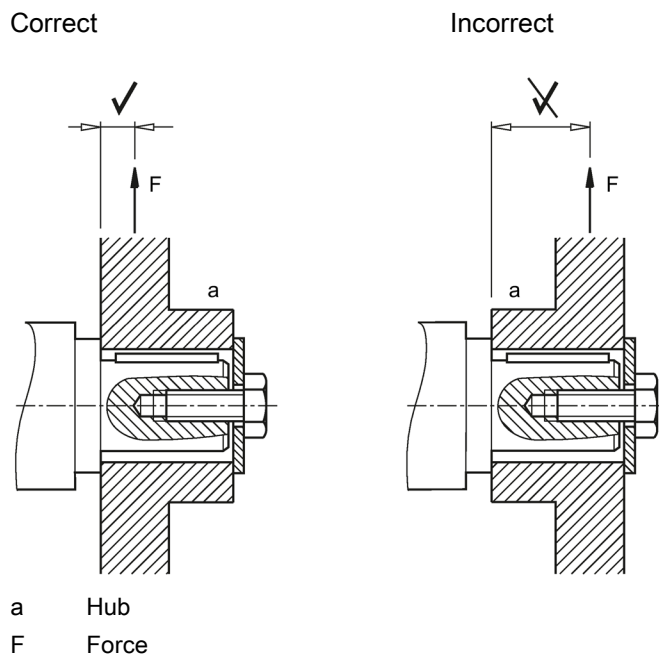


Figure 3-2 Mounting arrangement for low stress on shafts and bearings

## Procedure

1. Use either benzine or solvent to remove the anti-corrosion protection from the shaft ends 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.

## 3.5 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 ( $\geq$  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.

### 3.5.1 Mounting SIEMENS servomotors without parallel key onto adapter KS



**ATEX version gearboxes**

Impacts can cause sparks.

Apply adhesive (medium strength, e.g. Loctite 243) to the bolts 1505 and 1.

**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
- Petroleum jelly.

**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.

Size KS3 to KS10

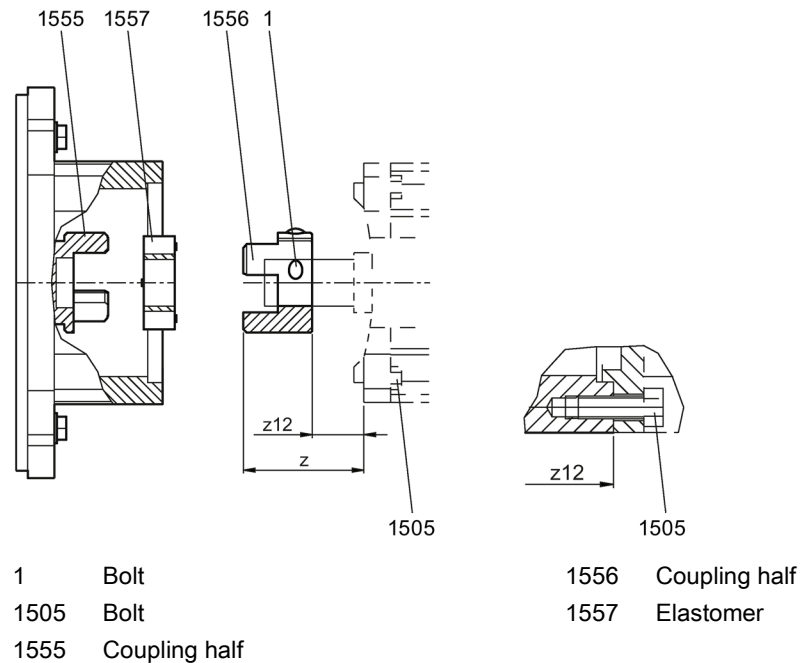


Figure 3-3 Adapter KS

## Procedure

1. Loosen the bolt 1 slightly.
2. Fit the coupling half 1556 onto the motor shaft end. See Mounting an input or output element on the gearbox shaft (Page 15).
3. Maintain the clearances  $z_{12}$  and  $z$ .
4. 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.
5. Fit the elastomer 1557 onto the motor shaft end. Then slide it into the already mounted coupling half 1556.
6. Apply adhesive (medium strength, e.g. Loctite 243) to the bolts 1505.
7. Lightly grease or oil the tooth flanks to reduce the mounting force.
8. Fasten the motor with the bolts 1505 with the prescribed torque. See Thread sizes and tightening torques for fastening bolts (Page 15).  
The claws of the coupling parts must interlock.

You have mounted the SIEMENS servomotor on the KS adapter.

3.5 Mounting the motor

Table 3-2 Adapter KS

Size	KS3.1	KS3.2	KS4.1	KS4.2	KS5.1	KS5.2	KS5.3	KS6.1	KS6.2	KS8.1	KS10.1	KS10.2
<b>Coupling size</b>	<b>16</b>	<b>16</b>	<b>19</b>	<b>19</b>	<b>19</b>	<b>19</b>	<b>19</b>	<b>24</b>	<b>24</b>	<b>28</b>	<b>38</b>	<b>38</b>
z12 [mm]	5	5	5	5	5	5	5	8	8	3	5	5
z [mm]	25.7 <sup>-0.8</sup>	25.7 <sup>-0.8</sup>	36 <sup>-1</sup>	36 <sup>-1</sup>	36 <sup>-1</sup>	36 <sup>-1</sup>	36 <sup>-1</sup>	42 <sup>-1</sup>	42 <sup>-1</sup>	41 <sup>-1</sup>	52 <sup>-1</sup>	52 <sup>-1</sup>
Bolt 1	M4	M4	M6	M6	M6	M6	M6	M6	M6	M8	M10	M10
T <sub>A</sub> SW [Nm]	4.1	4.1	10	10	10	10	10	10	10	25	49	49
SW [mm]	3	3	4	4	4	4	4	4	4	6	8	8
Bolt 1505	M5	M6	M6	M6	M6	M8	M6	M8	M8	M10	M12	M12

3.5.2 Fit the standard motor to the K2 or K3 adapter



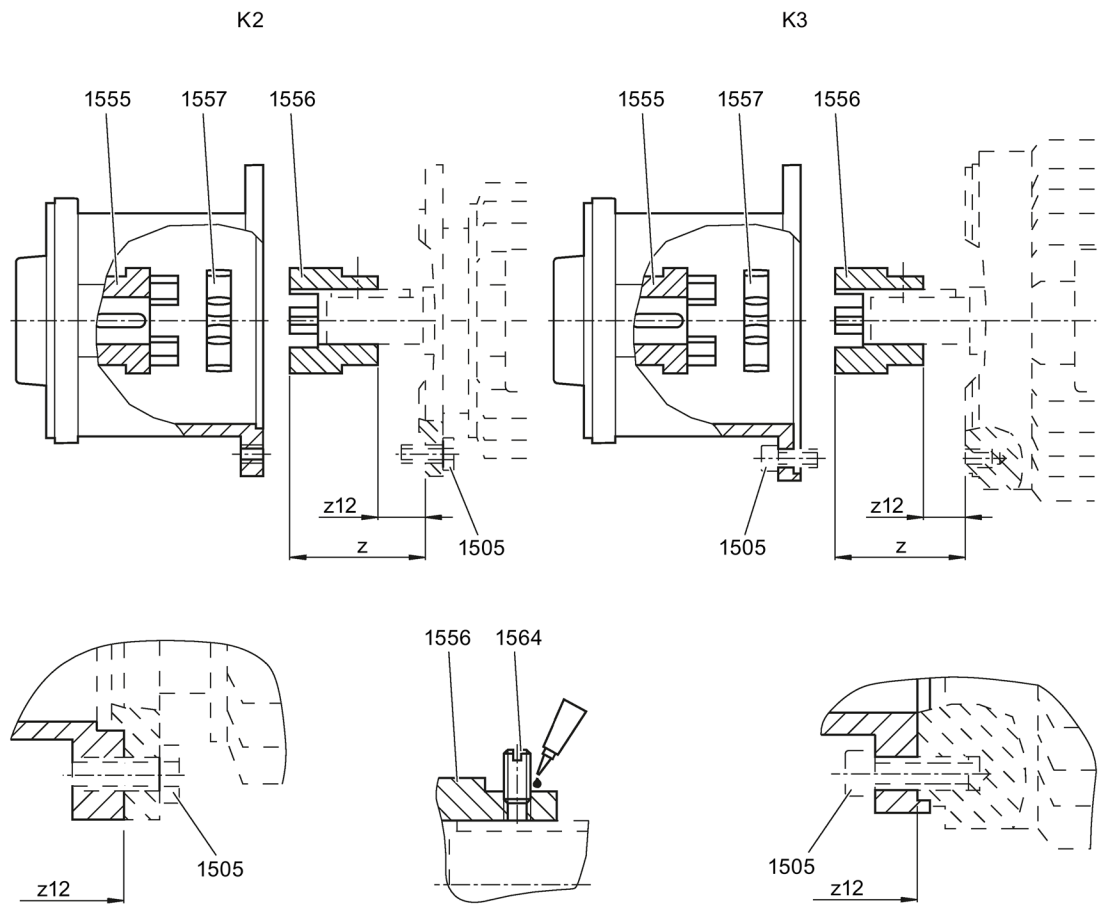
**ATEX version gearboxes**

Impacts can cause sparks.

Apply adhesive (medium strength, e.g. Loctite 243) to the grub screw 1564 and bolts 1505.

**Note**

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



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

Figure 3-4 Adapter K2 and K3

## Procedure

1. Fit the coupling half 1556 onto the motor shaft end. See Mounting an input or output element on the gearbox shaft (Page 15).
2. Maintain the clearances  $z_{12}$  and  $z$ .
3. Secure the coupling half 1556 with the grub screw 1564 to prevent axial movement.
4. On motors balanced with half a parallel key (code "H"), remove projecting, visible parts of the parallel key.
5. Place the flexible element 1557 inside the coupling half 1555.

3.5 Mounting the motor

6. Apply adhesive (medium strength, e.g. Loctite 243) to the grub screw 1564 and bolts 1505.
7. Tighten the grub screw 1564 to the specified torque  $T_A$  SW and across-flats dimension SW.
8. Fasten the motor with the bolts 1505 with the prescribed torque. See Thread sizes and tightening torques for fastening bolts (Page 15).

You have mounted the standard motor on the K2 or K3 adapter.

Table 3- 3 Adapter K2

IEC B5	80	90	100	112	132	160	180	200	225	250	280	315
<b>Coupling size</b>	<b>19</b>	<b>19</b>	<b>24</b>	<b>28</b>	<b>38</b>	<b>42</b>	<b>42</b>	<b>42</b>	<b>48</b>	<b>55</b>	<b>75</b>	<b>90</b>
z12 [mm]	15	25	30	30	45	66	59	60	84	75	51	33,5
z [mm]	54 <sup>-1</sup>	64 <sup>-1</sup>	76 <sup>-1</sup>	76 <sup>-1</sup>	97,5 <sup>-1,5</sup>	132 <sup>-1,5</sup>	132 <sup>-1,5</sup>	133 <sup>-1,5</sup>	164,5 <sup>-1,5</sup>	166 <sup>-1,5</sup>	171 <sup>-2</sup>	173 <sup>-2</sup>
Grub screw 1564	M5	M5	M5	M8	M8	M8	M8	M8	M8	M10	M10	M12
$T_A$ SW [Nm]	2	2	2	10	10	10	10	10	10	17	17	40
SW [mm]	2,5	2,5	2,5	4	4	4	4	4	4	5	5	6
Bolt 1505	M10	M10	M12	M12	M12	M16	M16	M16	M16	M16	M16	M20

Table 3- 4 Adapter K3

NEMA TC	56	140	180	210	250	280	320	360
<b>Coupling size</b>	<b>19</b>	<b>19</b>	<b>24</b>	<b>28</b>	<b>38</b>	<b>42</b>	<b>48</b>	<b>55</b>
z12 [mm]	27,5	28	36,5	44	50	61	71	78
z [mm]	66,5 <sup>-1</sup>	67 <sup>-1</sup>	82,5 <sup>-1</sup>	96,5 <sup>-1</sup>	116,5 <sup>-1,5</sup>	134 <sup>-1,5</sup>	151,5 <sup>-1,5</sup>	169 <sup>-1,5</sup>
Grub screw 1564	M5	M5	M5	M8	M8	M8	M8	M10
$T_A$ SW [Nm]	2	2	2	10	10	10	10	17
SW [mm]	2,5	2,5	2,5	4	4	4	4	5
Bolt 1505	3/8"	3/8"	1/2"	1/2"	1/2"	1/2"	5/8"	5/8"
$T_A$ for 1505 [Nm]	31	31	75	75	75	75	150	150



### 3.5.3 Mount the standard motor to the K4 or K5 short adapter



#### ATEX version gearboxes

Impacts can cause sparks.

Apply adhesive (medium strength, e.g. Loctite 243) to the bolts 1505.

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#### Note

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

The plastic ring ① prevents fretting rust.

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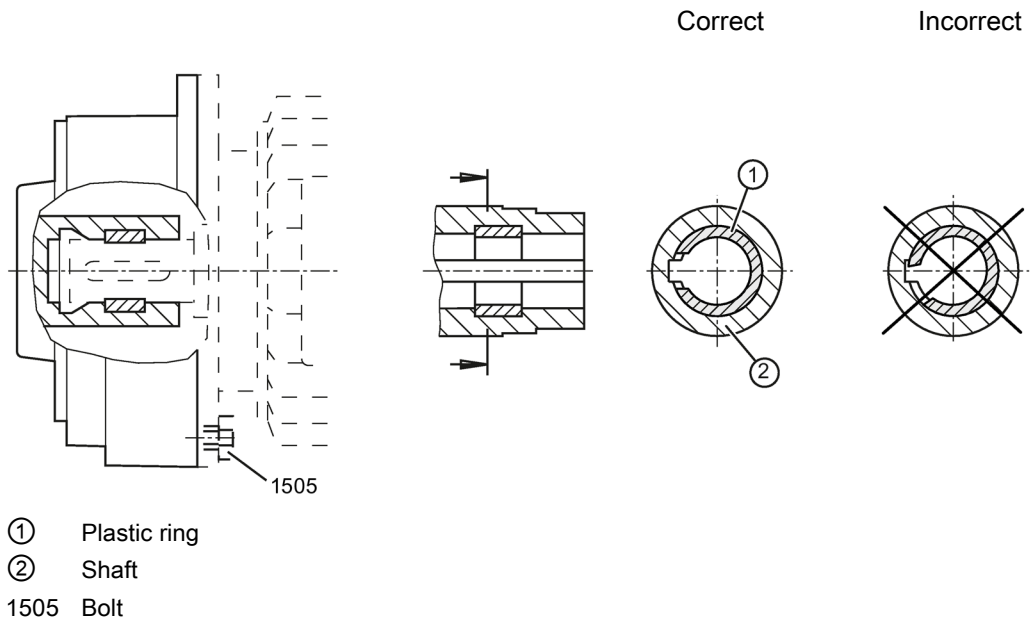


Figure 3-5 Plastic ring for K4 and K5

#### 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, e.g. 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 15).

You have mounted the standard motor on the K4 or K5 adapter.

Table 3- 5 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

Table 3- 6 Adapter K5

Coupling size	56	140	180	210	250	280	320	360
Bolt 1505	3/8"	3/8"	1/2"	1/2"	1/2"	1/2"	5/8"	5/8"
T <sub>A</sub> for 1505 [Nm]	31	31	75	75	75	75	150	150

### 3.5.4 Mount the servomotor with parallel key to the KQ or K8 adapter



**ATEX version gearboxes**

Impacts can cause sparks.

Apply adhesive (medium strength, e.g. Loctite 243) to the grub screw 1564 and bolts 1505.

<b>NOTICE</b>
<b>Damage to the bearing caused by excessive forces</b>
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
- Petroleum jelly.

**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.

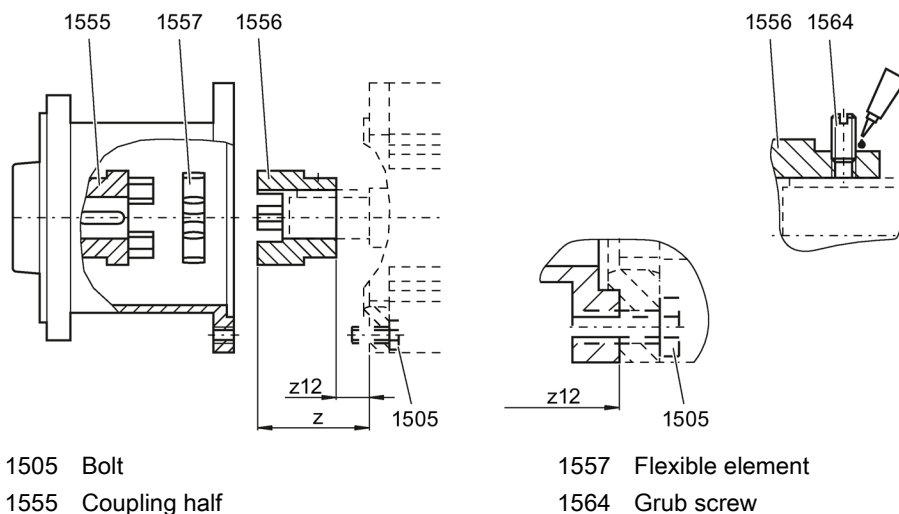


Figure 3-6 KQ and K8 adapters

## Procedure

1. Fit the coupling half 1556 onto the motor shaft end. See Mounting an input or output element on the gearbox shaft (Page 15).
2. Maintain the clearances  $z_{12}$  and  $z$ .
3. Secure the coupling half 1556 with the grub screw 1564 to prevent axial movement.
4. On motors balanced with half a parallel key (code "H"), remove projecting, visible parts of the parallel key.
5. Place the flexible element 1557 inside the coupling half 1555.
6. Apply adhesive (medium strength, e.g. Loctite 243) to the grub screw 1564 and bolts 1505.
7. Tighten the grub screw 1564 to the specified torque  $T_A$  SW and across-flats dimension SW.
8. Lightly grease or oil the tooth flanks to reduce the mounting force.
9. Fasten the motor with the bolts 1505 with the prescribed torque. See Thread sizes and tightening torques for fastening bolts (Page 15).

You have mounted the servomotor on the KQ or K8 adapter.

3.5 Mounting the motor

Table 3- 7 KQ and K8 adapters

Size	703	704	706	708	808	710 / 810	813	816	818	822
<b>Coupling size</b>	<b>14</b>	<b>19</b>	<b>24</b>	<b>28</b>	<b>28</b>	<b>38</b>	<b>42</b>	<b>42</b>	<b>75</b>	<b>90</b>
z12 [mm]	18	14	15	23.5	43.5	33	60	60	51	33.5
z [mm]	40.5-0.5	53-1	61-1	76-1	96-1	99-1.5	133-1.5	133-1.5	171-2	173-2
Grub screw 1564	M4	M5	M5	M8	M8	M8	M8	M8	M10	M12
T <sub>A</sub> SW [Nm]	1.5	2	2	10	10	10	10	10	17	40
SW [mm]	2	2.5	2.5	4	4	4	4	4	5	6
Bolt 1505	M6	M6	M8	M10	M10	M12	M16	M16	M16	M16

3.5.5 Mount servomotor without parallel key to the KQS adapter



**ATEX version gearboxes**

Impacts can cause sparks.

Apply adhesive (medium strength, e.g. Loctite 243) to the bolts 1505 and 1 or 1\*.

**NOTICE**

**Damage to the bearing caused by excessive forces**

Avoid 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 and motor shaft 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 flexible element 1557 or the hub.

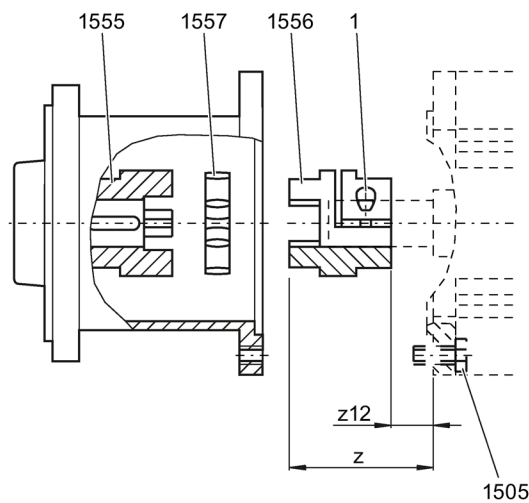
The following are permitted:

- Mineral-oil based oils or greases
- Silicon-based lubricants
- Petroleum jelly.

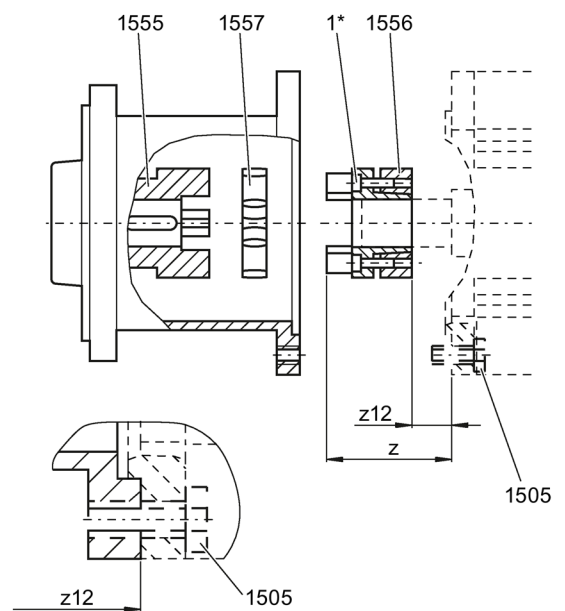
**Note**

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.

Sizes 703 to 708



Size 710



- 1, 1\* Bolt
- 1505 Bolt
- 1555 Coupling half

- 1556 Coupling half
- 1557 Flexible element

Figure 3-7 KQS adapter

**Procedure**

1. Loosen the bolt 1 or 1\* slightly.
2. Fit the coupling half 1556 onto the motor shaft end. See Mounting an input or output element on the gearbox shaft (Page 15).
3. Maintain the clearances z12 and z.
4. Apply adhesive (medium strength, e.g. Loctite 243) to the bolts 1 or 1\*.
5. KQS 703 to 708:  
Tighten bolt 1 with the specified torque  $T_A$  SW and across-flats dimension SW.  
KQS 710:  
Tighten the bolt 1\* with across-flats dimension SW evenly and gradually in a crossways pattern. Repeat the procedure until the specified  $T_A$  SW torque has been reached.
6. Place the flexible element 1557 inside the coupling half 1555.
7. Lightly grease the gear ring tooth flanks of the flexible element 1557 or the hub with the supplied assembly paste.
8. Apply adhesive (medium strength, e.g. 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 15).

You have mounted the servomotor on the KQS adapter.

Table 3- 8 KQS adapter

Size	703	704	706	708	710
<b>Coupling size</b>	<b>14</b>	<b>19</b>	<b>24</b>	<b>28</b>	<b>38</b>
z12 [mm]	18	14	15	23.5	33
z [mm]	40.5-0.5	53-1	61-1	76-1	99-1.5
Bolt 1, 1*	M3	M6	M6	M8	M6
$T_A$ SW [Nm]	1.34	10.5	10.5	25	10
SW [mm]	2	2.5	2.5	4	4
Bolt 1505	M6	M6	M8	M10	M12



## ATEX version gearboxes

The difference between the temperature of the housing and the ambient temperature of max. +40 °C must not exceed 70 K.

Using a suitable temperature sensor, measure the temperature at the lowest point of the housing (oil sump) or at the mounting surface in the case of output units.

Changes are an indication of possible incipient damage.

### 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 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





## Service and maintenance

### 5.1 General notes about maintenance



#### ATEX version gearboxes

All measures, checks, and their results must be documented by the operator and records kept in a safe place for 10 years.

<b>! WARNING</b>
<b>Unintentional starting of the drive unit</b>
Secure the drive unit to prevent it from being started up unintentionally.
Attach a warning notice to the start switch.

<b>NOTICE</b>
<b>Improper maintenance</b>
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 General information and safety notes (Page 5).

### 5.2 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.

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

Refer to the relevant operating instructions for the clutch.

### 5.3 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 5- 1 Roller-bearing and shaft-sealing-ring grease

Fields of application	Ambient temperature	Manufacturer	Type
Standard	-40 °C to +80 °C	Klüber	Petamo GHY 133 N
Foodstuff-compatible for the food industry	-30 °C to +40 °C	Castrol	Optileb GR UF 1 NSF H1
Biologically degradable, for agriculture, forestry and water industries	-35 °C to +40 °C	BP	Biogrease EP 2

Table 5- 2 Grease service life in operating hours [h] with permanent lubrication

Size							Input speed $n_{rated}$ [rpm]						Grease quantity in the bearing	
							3 600	3 000	1 800	1 500	1 200	≤ 1 000		
KS	K2	K3, K5	K4	KQ	K8	A, AZ	Operating hours [h]						[g]	
-	-	-	63	-	-	-	33 000	33 000	33 000	33 000	33 000	33 000	7	
3.1, 3.2, 4.1, 4.2	-	56	71	703	-	-							7	
-	80	-	80	704	-	80							9	
5.1, 5.2, 5.3	90	140	90	706	-	90							15	
6.1, 6.2	100	180	100	-	-	100							24 000	20
8.1	112	-	112	708	808	112							24 000	45
10.1, 10.2	132	210	132	710	810	132								75
-	160	250	160	-	-	160	17 000	90						
-	180	-	180	-	813	180		110						
-	200	280	200	-	-	200								
-	225	320	225	-	816	225	Grease service live = bearing service life							
-	250	360	250	-	-	250								

## Spare parts

### 6.1 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 can have a negative impact on the design characteristics of the geared motor and might consequently impair the active and / or passive safety features of the machine.

Siemens AG states explicitly 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 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 ③
- Type designation shown on the rating plate ⑥
- Part number
  - 4-digit item number from the spare parts list
  - 6-digit object number
  - 7-digit article number
  - 14-digit material number
- Quantity

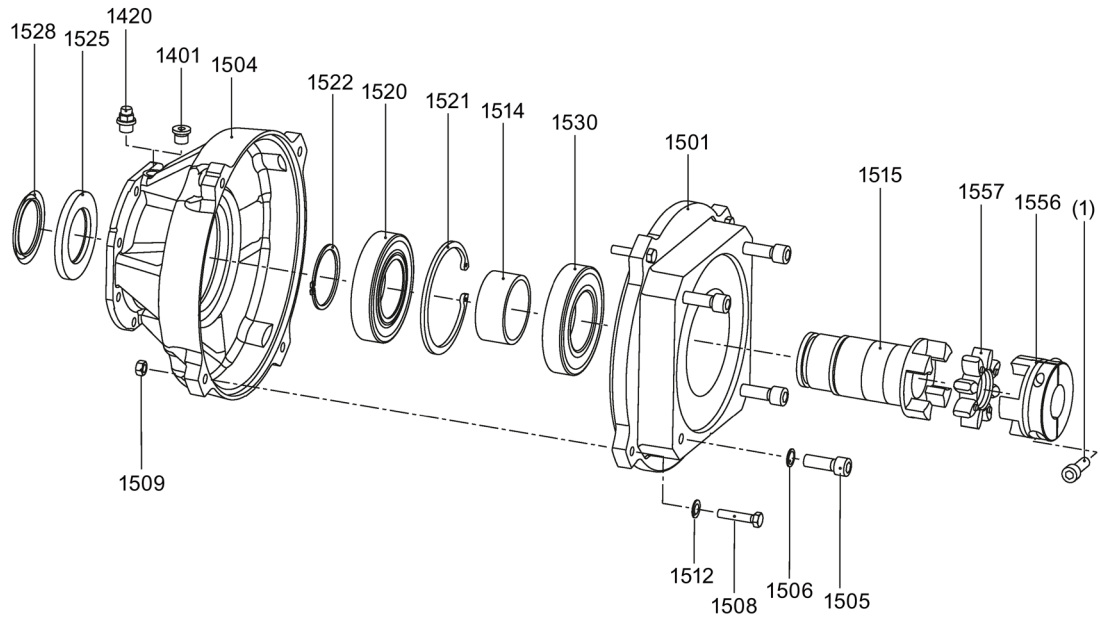
<p><b>SIEMENS</b>  IEC60034          FDU0412/8999999 nnn          2KJ3105-1EM22-2AV1-Z          ZF59-LE90SG4E-L32/14N-IN SI04          IP55 30kg Tamb -15...+40°C          K-ID: 1234567890</p> <hr/> <p>1.5L OIL CLP VG220 i: 28          50Hz n2: 49.3r/min   60Hz n2: 59.7r/min          T2: 213Nm fB: 2.1 T2: 203Nm fB: 2.2</p> <hr/> <p>3-Mot. THCL.155(F)  14Nm 230V ±10% AC          50Hz 230/400V ±10% D/Y   60Hz 460V ±10% Y          4.33/2.5A cosφ 0.78 2.2 A cosφ 0.78          1.1kW S1 IE2-81.4% 1425r/min 1.27kW S1 IE2-81.4% 1725r/min          Mot. 1AV2090B 1LE1001-0EB0          SIEMENS AG, Bahnhofstr. 40, DE-72072 Tübingen</p>	<p><b>SIEMENS</b> 1 2</p> <p>3 4</p> <p>5 6</p> <p>7 8</p> <p>9 10</p> <hr/> <p>11 12 13 14 15 17 20 21</p> <p>16 18 19 22 23</p> <hr/> <p>24 25 26 27 28</p> <p>29 30 31 38 39 40</p> <p>32 33 41 42</p> <p>34 35 36 37 43 44 45 46</p> <p>47 48</p> <p>SIEMENS AG, Bahnhofstr. 40, DE-72072 Tübingen</p>
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Figure 6-1 Example of a SIMOGEAR rating plate

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

## 6.2 Lists of spare parts

### 6.2.1 Adapter KS

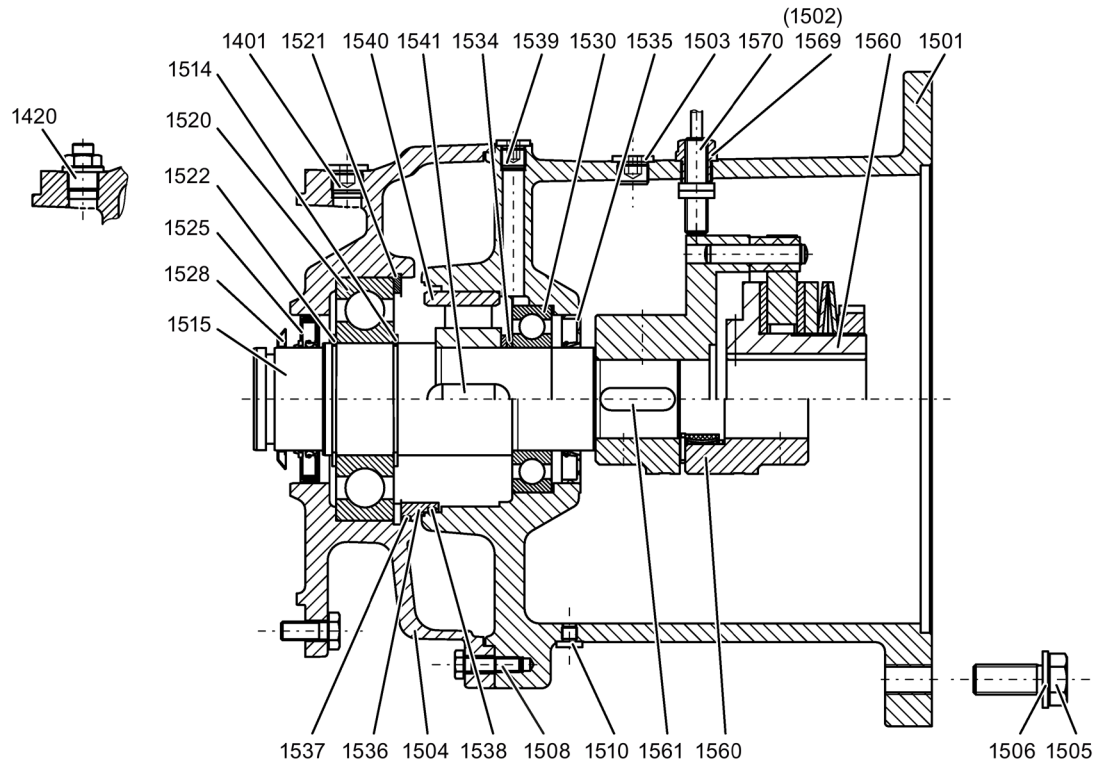


- (1) Bolt
- 1401 Bolt plug
- 1420 Vent filter
- 1501 Adapter
- 1504 Bearing shield
- 1505 Bolt
- 1506 Washer / screw lock
- 1508 Bolt
- 1509 Nut
- 1512 Washer
- 1514 Bush
- 1515 Shaft
- 1520 Bearing
- 1521 Locking ring
- 1522 Locking ring
- 1525 Shaft sealing ring
- 1528 Washer
- 1530 Bearing
- 1556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

Figure 6-2 Adapter KS for mounting a SIEMENS servomotor

## 6.2.2 K2 and K3 adapters with elastic coupling

Adapter K2 sizes 80 - 250, adapter K3 sizes 56 - 360



1303	Slip-on pinion	1530	Bearing
1304	Parallel 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	Parallel 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	Parallel key

6.2 Lists of spare parts

- |      |                    |      |                  |
|------|--------------------|------|------------------|
| 1525 | Shaft sealing ring | 1569 | Reduction piece  |
| 1528 | Disk               | 1570 | Proximity switch |
| 1529 | Bearing            |      |                  |

Figure 6-3 K2 and K3 adapters with elastic coupling

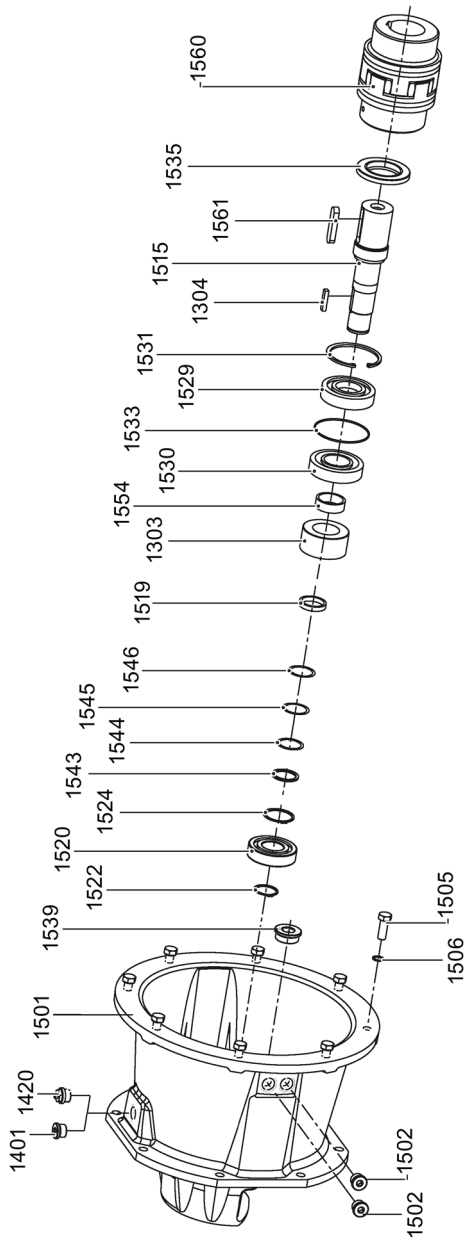
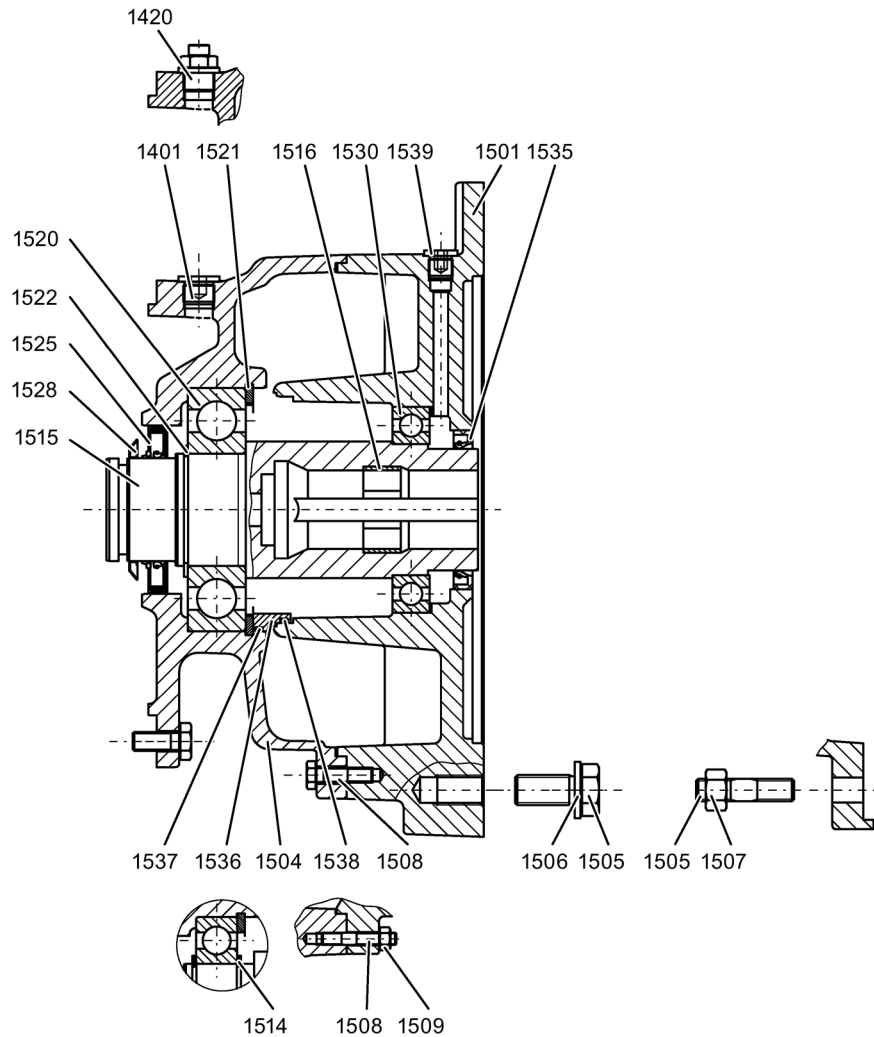


Figure 6-4 Adapter K2 sizes 280 - 315

### 6.2.3 K4 and K5 short adapters with plug-in connection



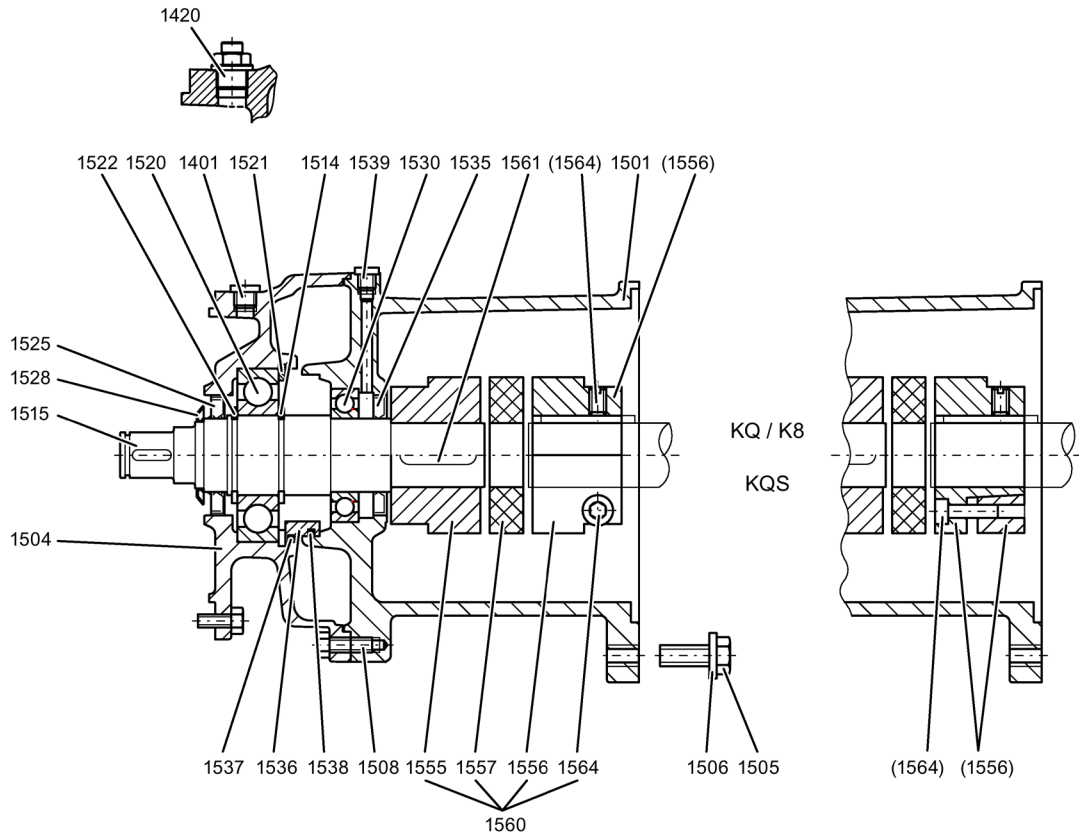
1401	Screw plug	1520	Bearing
1420	Vent filter	1521	Locking ring
1501	Adapter	1522	Locking ring
1504	Bearing shield	1525	Shaft sealing ring
1505	Bolt	1528	Disk
1506	Plate / locking ring	1530	Bearing
1507	Nut	1535	Shaft sealing ring
1508	Bolt	1536	Intermediate ring
1509	Nut	1537	O-ring
1514	Locking ring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

Figure 6-5 K4 and K5 short adapters with clamp connection

6.2.4 KQ, K8 and KQS adapters for mounting a servomotor

Sizes KQ 703, 704, 706, 708 / K8 808, 813, 816

Size KQ 710 / K8 810



- |                           |                         |
|---------------------------|-------------------------|
| 1303 Slip-on pinion       | 1524 Locking ring       |
| 1304 Parallel key         | 1525 Shaft sealing ring |
| 1401 Screw plug           | 1528 Disk               |
| 1420 Vent filter          | 1529 Bearing            |
| 1501 Adapter              | 1530 Bearing            |
| 1502 Screw plug           | 1531 Locking ring       |
| 1504 Bearing shield       | 1533 O-ring             |
| 1505 Bolt                 | 1535 Shaft sealing ring |
| 1506 Plate / locking ring | 1536 Intermediate ring  |
| 1507 Nut                  | 1537 O-ring             |
| 1508 Bolt                 | 1538 O-ring             |
| 1514 Fuse                 | 1539 Screw plug         |
| 1515 Shaft                | 1543 Supporting disk    |
| 1517 Flange               | 1544 Shim               |
| 1518 Bolt                 | 1545 Shim               |
| 1519 Sleeve               | 1546 Shim               |



- |      |              |      |              |
|------|--------------|------|--------------|
| 1520 | Bearing      | 1554 | Sleeve       |
| 1521 | Locking ring | 1560 | Coupling     |
| 1524 | Locking ring | 1561 | Parallel key |

Figure 6-6 KQ, K8 and KQS adapters for servomotor

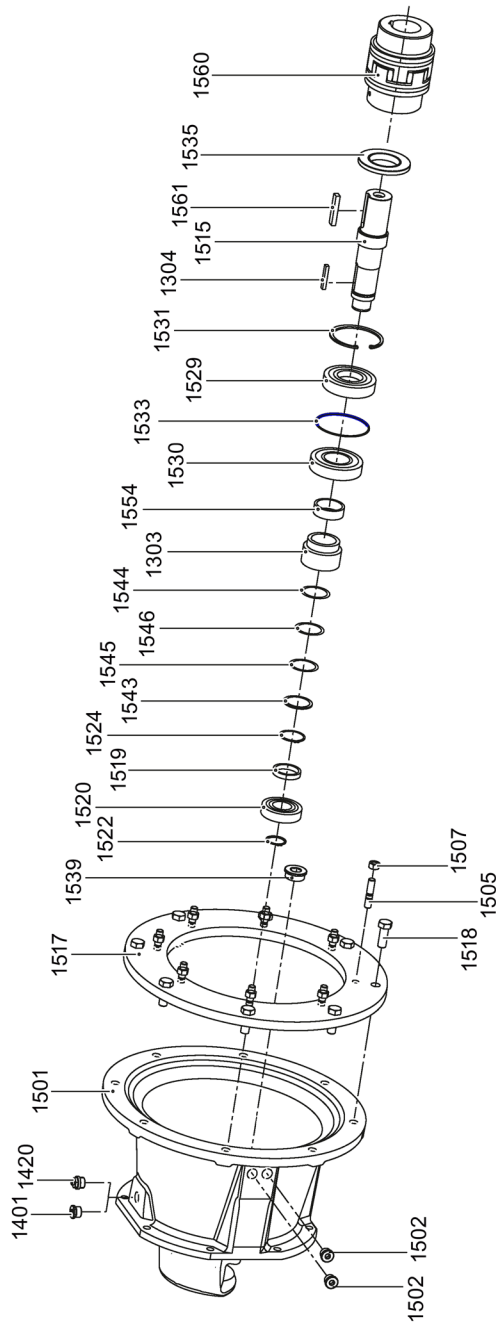
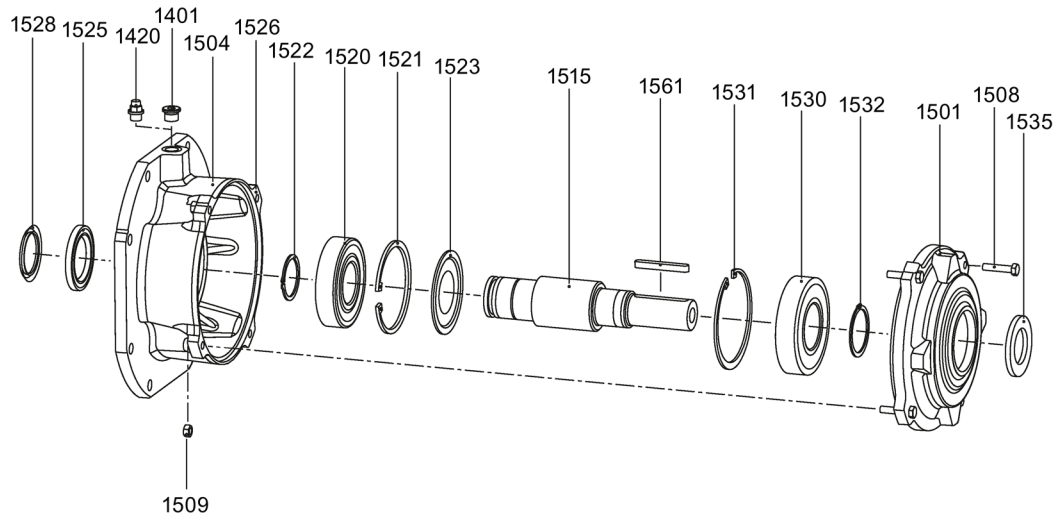


Figure 6-7 K8 sizes 818 - 822

### 6.2.5 A, AZ adapter



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

Figure 6-8 A, AZ adapter



## Further information

SIMOGEAR on the Internet:  
[www.siemens.com/simogear](http://www.siemens.com/simogear)

Siemens AG  
Division Digital Factory  
Motion Control  
Postfach 48 48  
90026 NÜRNBERG  
GERMANY