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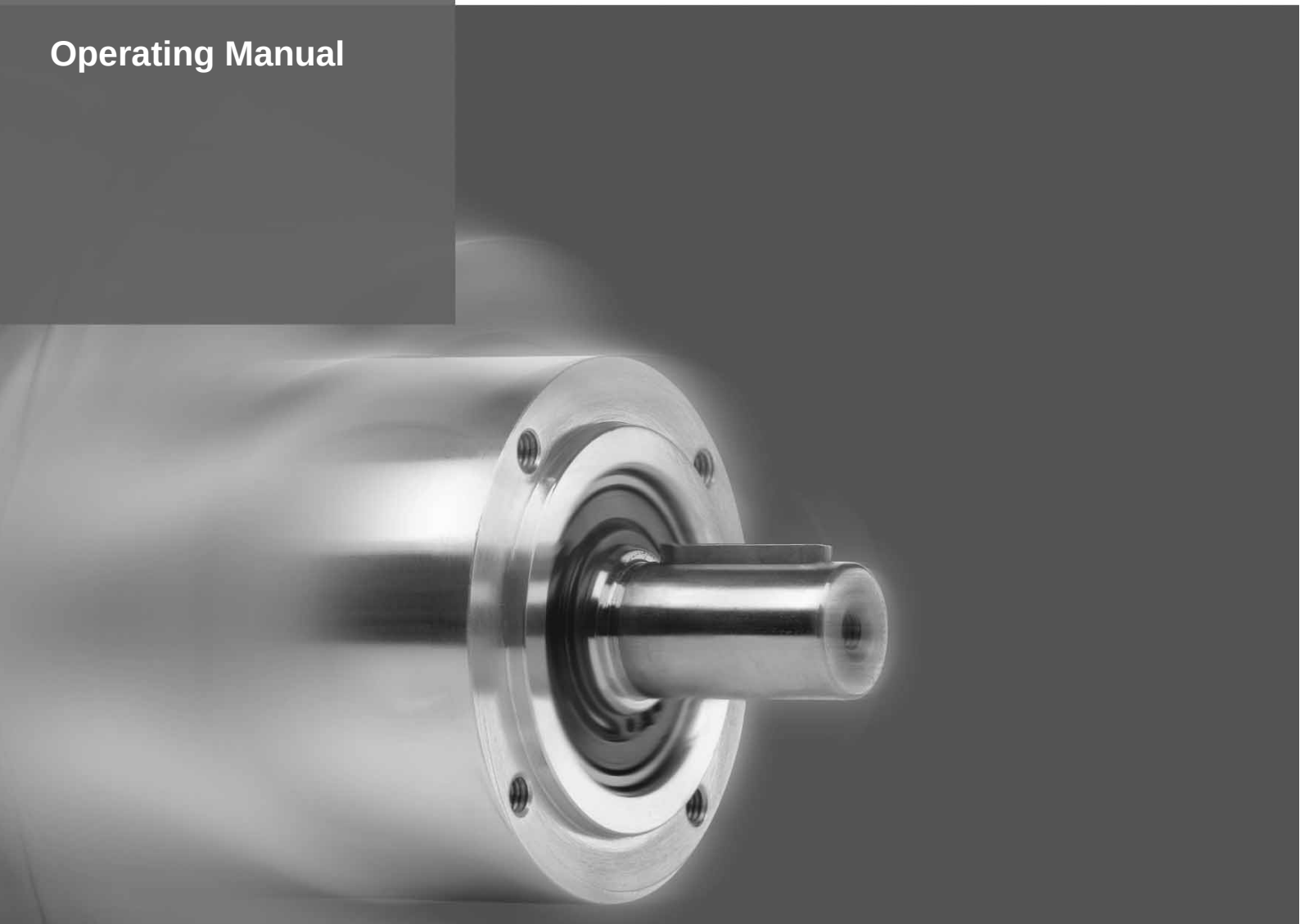
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WITTENSTEIN | alpha

CP

Operating Manual



2022-D020863 Revision: 05

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Revision history

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02	01.07.2008	Layout WITTENSTEIN	All
03	01.08.2009	Machinery Directive	2, 3, 4, 5, 7
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05	12.12.2017	Identification CP	All

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1 Regarding this manual

This manual contains information that is necessary for using the planetary gearhead CP, subsequently referred to as gearhead, in a safe manner.

If this manual is supplied with an amendment (e.g. for special applications), then the information in the amendment is valid. Contradictory specifications in this manual thereby become obsolete.

The operator must ensure that these instructions are read through by all persons assigned to install, operate, or maintain the gearhead, and that they fully comprehend them.

Store these instructions within reach of the gearhead.

These **safety instructions** should be shared with colleagues working in the vicinity of the device to ensure individual safety.

The original instructions were prepared in German; all other language versions are translations of these instructions.

1.1 Signal words

The following signal words are used to bring your attention to dangers, prohibitions, and important information:

	⚠ DANGER **This signal word points to an imminent danger that can cause serious injuries and even death.**
	⚠ WARNING **This signal word points to a possible danger that can cause serious injuries and even death.**
	⚠ CAUTION **This signal word points to a possible danger that can cause slight to serious injuries.**
	NOTICE **This signal word points to a possible danger that can cause material damage.**
	A note without signal word draws your attention to application tips or especially important information when handling the gearhead.

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1.2 Safety symbols

The following safety symbols are used to bring your attention to dangers, prohibitions, and important information:


General danger


Hot surface


Suspended loads

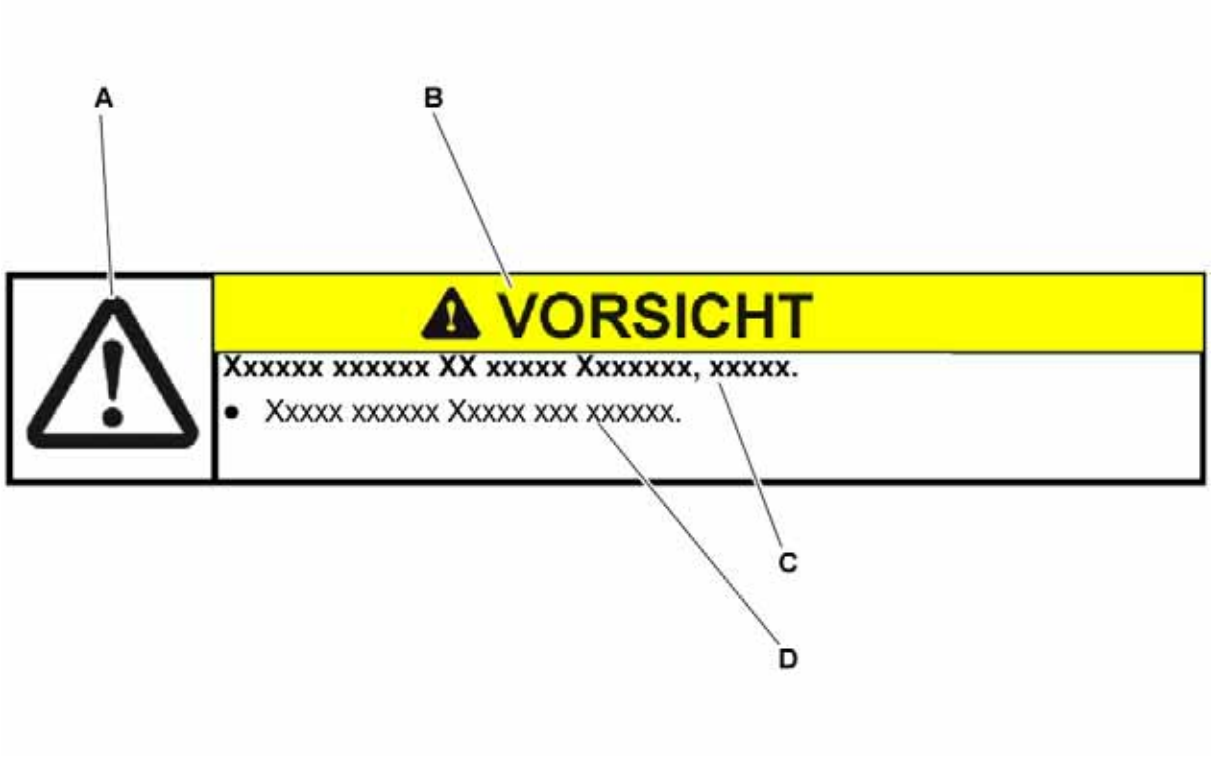

Danger of being pulled in


Environment protection


Information

1.3 Design of the safety instructions

The safety instructions of these instructions are designed according to the following pattern:



A = Safety symbol (see Chapter 1.2 "Safety symbols")
B = Signal word (see Chapter 1.1 "Signal words")
C = Type and consequence of the danger
D = Prevention of the danger

1.4 Information symbols

The following information symbols are used:

- Indicates an action to be performed
  ➲ Indicates the results of an action

ⓘ Provides additional information on handling

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2 Safety

These instructions, especially the safety instructions and the rules and regulations valid for the operating site, must be observed by all persons working with the gearhead.

In addition to the safety specifications mentioned in this operating manual, the general and also the local regulations on the prevention of accidents (for instance, personal safety equipment) and on environmental protection should be observed.

2.1 EC – Machinery directive

The gearhead is considered a "machine component" and is therefore not subject to the EC Machinery Directive 2006/42/EC.

Operation is prohibited within the area of validity of the EC directive until it has been determined that the machine in which this gearhead is installed corresponds to the regulations within this directive.

2.2 Dangers

The gearhead has been constructed according to current technological standards and accepted safety regulations.

To avoid danger to the operator or damage to the machine, the gearhead may be put to use only for its intended usage (see chapter 2.4 "Intended use") and in a technically flawless and safe state.

- Be informed of the general safety instructions before beginning work.
  (see Chapter 2.7 "General safety instructions").

2.3 Personnel

Only persons who have read and understood these instructions may carry out work on the gearhead.

2.4 Intended use

The gearhead serves to convert torques and speeds. It is built for industrial applications that do not fall under article 2 of the directive 2002/95/EU (usage restriction of certain dangerous materials on electro and electronic equipment).

The gearhead is specified for installment on motors that:

- correspond to the design B5 (for any divergences, consult our Customer Service Department [technical customer service])
- show a radial and axial runout tolerance of at least “N” according to DIN 42955 and
- have a smooth shaft

2.5 Reasonably predictable misuse

Any usage that exceeds the maximum permitted speeds, torques and temperature is considered a misuse and is therefore prohibited.

2.6 Guarantee and liability

Guarantee and liability claims are excluded for personal injury and material damage in case of

- Ignoring the information on transport and storage
- Improper use (misuse)
- Improper or neglected maintenance and repair
- Improper assembly / disassembly or improper operation
- Operation of the gearhead when safety devices and equipment are defective
- Operation of the gearhead without lubricant
- Operation of a heavily soiled gearhead
- Modifications or reconstructions that have been carried out without the approval of **WITTENSTEIN alpha GmbH**

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2.7 General safety instructions



⚠ WARNING

Objects flung out by rotating components can cause serious injuries.

- Remove objects and tools from the gearhead before putting it into operation.



⚠ WARNING

Rotating components on the gearhead can pull in parts of the body and cause serious injuries and even death.

- Keep a sufficient distance to rotating machinery while the gearhead is running.
- Secure the machine against restarting and unintentional movements during assembly maintenance work.



⚠ CAUTION

Hot gearhead housing can cause serious burns.

- Touch the gearhead housing only when wearing protective gloves or after the gearhead has been at standstill for some time.



NOTICE

Loose or overloaded screw connections can damage the gearhead.

- Use a calibrated torque wrench to tighten and check all screw connections for which a tightening torque has been specified.



Solvents and lubricants can pollute soil and water.

- Use and dispose of cleaning solvents as well as lubricants appropriately.

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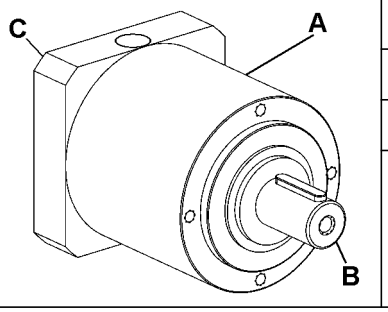
3 Description of the gearhead

The gearhead is a single or multistage planetary gearhead which is manufactured in the version "M" (motor-mounted) by default. The output shaft bearing is realized in such a manner that it can accommodate extensive tilting moments and axial forces.

The motor centering is realized via the held receptacle for tabs, and not via the adapter plate. Radial clamping of the motor is avoided.

An adaptation to various motors is realized via an adapter plate and a bushing.

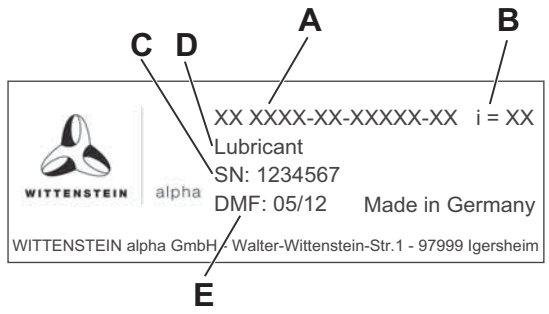
3.1 Overview of the gearhead components

		Gearhead components CP
	A	Housing
	B	Output shaft
	C	Adapter plate

Tbl-1: Overview of the gearhead components

3.2 Type plate

The type plate is attached to the housing.

		Identification
	A	Ordering code
	B	Ratio
	C	Serial number
	D	Lubricant
	E	Production date

Tbl-2: Type plate (example values)

3.3 Performance statistics

Refer to our catalogue or our Internet page for the maximum permitted speeds and torques: http://www.wittenstein-alpha.de



Consult our Customer Service department if the gearhead is older than a year. You will then receive the valid performance data.

3.4 Weight

The weights of the gearheads with a medium-sized adapter plate are detailed in table "Tbl-3". If another adapter plate has been assembled, the actual weight may deviate up to 10%.

Gearhead size CP	040	060	080	115
1 stage [kg]	0.31	0.88	2.1	5.2
2 stages [kg]	0.52	1.1	2.8	6.9

Tbl-3: Weight

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4 Transport and storage

4.1 Scope of delivery

- Check the completeness of the delivery against the delivery note.

  ⓘ Missing parts or damage must be notified immediately in writing to the carrier, the insurance, or **WITTENSTEIN alpha GmbH**.

4.2 Packaging

The gearhead is delivered packed in foil and cardboard boxes.

- Dispose of the packaging materials at recycling sites intended for that. Observe the locally valid regulations for disposals.

4.3 Transport



NOTICE

Hard knocks, because of falling or hard dropping, can damage the gearhead.

- Only use hoisting equipment and transports with sufficient capacity.
- The maximum permitted lift capacity of a hoist may not be exceeded.
- Lower the gearhead slowly.



⚠ WARNING

Suspended loads can fall and can cause serious injuries and even death.

- Do not stand under suspended loads.

No special transport mode is prescribed for transporting the gearhead.

Specifications on the weights, refer to Chapter 3.4 "Weight".

4.4 Storage

Store the gearhead in horizontal position and dry surroundings at a temperature of 0 °C to +40 °C in the original packaging. Store the gearhead for a maximum of 2 years.

For storage logistics, we recommend the "first in – first out" method.

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5 Assembly

- Be informed of the general safety instructions before beginning work.
  (see Chapter 2.7 "General safety instructions").

5.1 Preparations

The screws for fastening are not included in the scope of delivery and must be provided by the customer. You may find related information in the individual assembly steps.



NOTICE

Pressurized air can damage the gearhead seals.

- Do not use pressurized air to clean the gearhead.

- Clean / de-grease the following components with a clean and lint-free cloth as well as a grease-dissolving, non-aggressive cleaning agent:
  - All fitting surfaces to neighboring components
  - The centering
  - The motor shaft
  - The inner diameter of the plug receptacle
  - The bushing on the inside and outside
- Also check the fitting surfaces for damage and impurities.
- Ensure that the bushing included in the delivery may be slid on the motor shaft with a tight sliding fit.

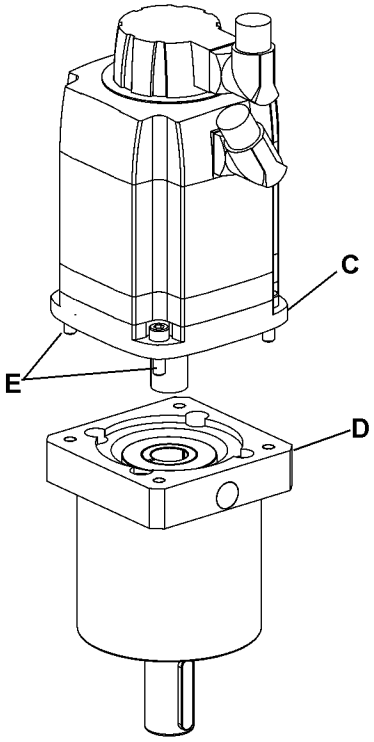
5.2 Mounting the motor to the gearhead

The standard delivery of a gearhead does not include a motor. The motor to be mounted must:

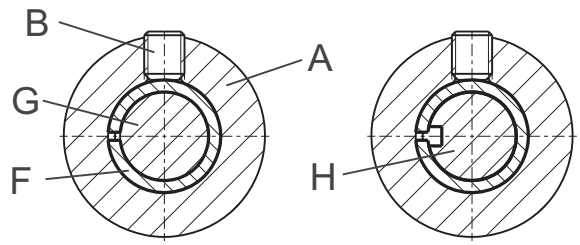
- Conform to design B5
- have a radial and axial runout tolerance according to DIN EN 50347
- And exhibit a shaft that is as smooth as possible.

- Observe the general information and safety instructions of the motor manufacturer.
- Observe the safety and processing instructions of the screw-bonding agents to be used.

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- Ideally perform the motor mounting in vertical direction.
- If the motor shaft includes a shaft key, remove it.
  - ⓘ Use a half wedge if recommended by the motor manufacturer.
- Turn the plug receptacle (A) until the threaded pin (B) may be reached via the mounting bore.
- Slide the motor shaft into the plug receptacle of the gearhead.
  - ⓘ The max. permissible axial forces may not be exceeded, ref. chapter 9.1 "Details regarding the attachment to a motor", table "Tbl-10". The motor shaft must be easy to insert. If this is not the case, the threaded pin must be loosened further.
  - ⓘ The slot of the bushing must align with the groove of the motor shaft (if available) and be positioned with a 90° offset to the threaded pin, ref. table "Tbl-4".
  - ⓘ There may be no gap between the motor (C) and the adapter plate (D).

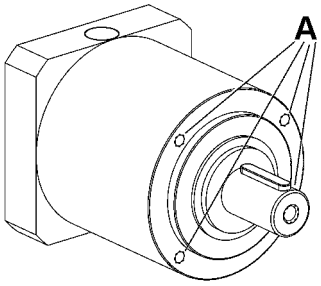
		Identification
	A	Plug receptacle
	B	Threaded pin
	F	Bushing
	G	Smooth shaft
	H	Keyed shaft

Tbl-4: Arrangement of the motor shaft, plug receptacle, and bushing

- Coat the four screws (E) with a threadlocker (e.g. Loctite 243).
- Fasten the motor (C) by means of the four screws (E) to the adapter plate (D).
- Tighten the threaded pin (B) of the plug receptacle (A).
  - ⓘ Screw sizes and prescribed tightening torques, ref. chapter 9.1 "Details regarding the attachment to a motor", table "Tbl-10".
- Push the enclosed stopper plug to the stop of the stopper plug into the mounting bore of the adapter plate (D).

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5.3 Mounting the gearhead to a machine



Four threaded bores are available in the gear unit housing for bolting it to your machine.

- Thoroughly clean the output shaft, centering, and fitting surface.

The bolts need to be provided by the customer. You can find the prescribed screw sizes and tightening torques in Chapter 9.2 "Details regarding the attachment to a machine", table "Tbl-11".

- Smear screw-bonding agent (for example Loctite 243) onto the four bolts.
- Fasten the gearhead on the machine with the fastening bolt through the holes.
  - ⓘ Mount the gearhead in such a way that the type plate remains legible.
  - ⓘ Do not use washers (e.g. plain washers, tooth lock washers).

5.4 Mounted components at the output side

NOTICE

Clamping forces during the assembly may damage the gearhead.

- Assemble the gears and the toothed belt pulleys without force on the output shaft.
- Do not attempt an assembly by driving or hammering under any circumstances!
- Only use suitable tools or mechanisms for the assembly.
- if you fit or shrink-fit a gear on the output shaft, you must ensure that the maximum permissible static axial forces of the output bearing will not be exceeded (ref. table "Tbl-5").

Size CP	040	060	080	115
$F_{a\ max}$[N]	230	750	1600	2100

Tbl-5: Maximum permissible static axial forces for the static load rating (s0) = 1.8 and the radial force (Fr) = 0

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6 Startup and operation

- Be informed of the general safety instructions before beginning work. (see Chapter 2.7 "General safety instructions").

	Improper use can cause damage to the gearhead. ● Make sure that - the **ambient temperature** does not drop below –15 °C or exceed +40 °C and - the **operating temperature** does not exceed +90 °C. ● Avoid icing, which can damage the seals. ● For other conditions of use, consult our Customer Service Department. ● Only use the gearhead only up to its maximum limit values, see Chapter 3.3 "Performance statistics". ● Only use the gearhead only in a clean, dust-free and dry environment.

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7 Maintenance and disposal

- Be informed of the general safety instructions before beginning work. (see Chapter 2.7 "General safety instructions").

7.1 Maintenance work

7.1.1 Visual inspection

- Check the entire gearhead for exterior damage.
- The sealings are subject to wear. Therefore also check the gearhead for leakage during each visual inspection.
  ⓘ Check the mounting position, so that no foreign medium (e.g. oil) has collected on the output shaft.

7.1.2 Control of the tightening torques

- Check the tightening torque of the fastening screws at the housing.
  ⓘ You may find the prescribed tightening torques in chapter 9.2 "Details regarding the attachment to a machine", table "Tbl-11".
- Check the tightening torque of the threaded pin at the motor mount.
  ⓘ You may find the prescribed tightening torques in chapter 9.1 "Details regarding the attachment to a motor", table "Tbl-10".

7.2 Startup after maintenance work

- Clean the outside of the gearhead.
- Attach all safety devices.
- Do a trial run before releasing the gearhead again for operation.

7.3 Maintenance schedule

Maintenance work	At startup	First time after 500 operating hours or 3 months	Every 3 months	Yearly
Visual inspection	X	X	X	
Checking the tightening torques	X	X		X

Tbl-6: Maintenance schedule

7.4 Notes on the lubricant used



All gearheads are lubricated for their service life by the manufacturer with a mineral oil-based lithium soap grease or with a food-safe synthetic grease (carbon hydride oil, aluminum complex soap) (see type plate). All bearings are permanently lubricated by the company.

You can receive further information on the lubricants directly from the manufacturer:

Standard lubricants	Lubricants for the food industry (USDA-H1 registered)
Castrol Industrie GmbH, Mönchengladbach Tel.: + 49 2161 909-30 www.castrol.com	Klüber Lubrication München KG, Munich Tel.: + 49 89 7876–0 www.klueber.com

Tbl-7: Lubricant manufacturers

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7.5 Disposal

Additional information regarding the disassembly and the disposal of the gearhead is available from our Customer Service department.

- Dispose of the gearhead at the recycling sites intended for this purpose.

  ⓘ Observe the valid national regulations during disposal.

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8 Malfunctions



NOTICE

Changed operational behavior can be an indication of existing damage to the gearhead or cause damage to the gearhead.

- Do not put the gearhead back into operation until the cause of the malfunction has been rectified.



Rectifying of malfunctions may only be done by specially trained technicians.

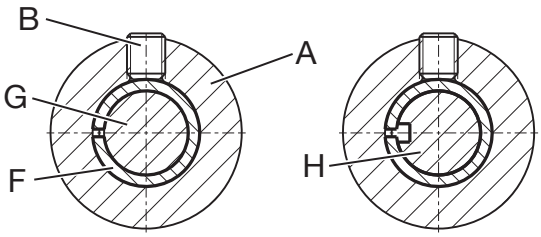
Fault	Possible cause	Solution
Increased operating temperature	The gearhead is not suited for the task.	Check the technical specifications.
	Motor is heating the gearhead.	Check the wiring of the motor.
		Ensure adequate cooling.
		Change the motor.
	Ambient temperature too high.	Ensure adequate cooling.
Increased noises during operation	Distortion in motor mounting	Please consult our Customer Service Department.
	Damaged bearings	
	Damaged gear teeth	
Loss of lubricant	Lubricant quantity too high	Wipe off discharged lubricant and continue to watch the gearhead. Lubricant discharge must stop after a short time.
	Seals not tight	Please consult our Customer Service Department.

Tbl-8: Malfunctions

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9 Appendix

9.1 Details regarding the attachment to a motor

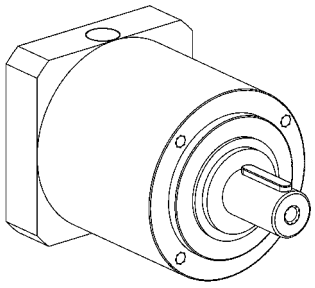
		Identification
	A	Plug receptacle
	B	Threaded pin
	F	Bushing
	G	Smooth shaft
	H	Keyed shaft

Tbl-9: Arrangement of the motor shaft, plug receptacle, and bushing

Gearhead size CP	Inner plug receptacle Ø [mm]	Width across flats threaded pin (B) [mm]	Tightening torque [Nm]	Max. axial force [N]
040	9	3	5.6	45
060	14	4	14	80
080	19	5	23	100
115	24	6	45	150

Tbl-10: Details regarding the attachment to a motor

9.2 Details regarding the attachment to a machine

	Gearhead size CP	Pitch circle Ø [mm]	Screw size / property class	Tightening torque [Nm]
	**040**	34	M4 / 10.9	3.88
	060	52	M5 / 10.9	7.69
	080	70	M6 / 10.9	13.2
	115	100	M10 / 10.9	62.7

Tbl-11: Tapped bores in the housing

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9.3 Tightening torques for common thread sizes in general mechanics

The specified tightening torques for headless screws and nuts are calculated values and are based on the following conditions:

- Calculation acc. VDI 2230 (Issue February 2003)
- Friction value for thread and contact surfaces μ=0.10
- Exploitation of the yield stress 90 %

	Tightening torque [Nm] for threads												
Property class Bolt / nut	**M3**	**M4**	**M5**	**M6**	**M8**	**M10**	**M12**	**M14**	**M16**	**M18**	**M20**	**M22**	**M24**
8.8 / 8	1.15	2.64	5.24	8.99	21.7	42.7	73.5	118	180	258	363	493	625
10.9 / 10	1.68	3.88	7.69	13.2	31.9	62.7	108	173	265	368	516	702	890
12.9 / 12	1.97	4.55	9.00	15.4	37.3	73.4	126	203	310	431	604	821	1042

Tbl-12: Tightening torques for headless screws and nuts

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