

# Hygienic Design HDV

Operating Manual



## Revision history

| Revision | Date       | Comment                                      | Chapter                         |
|----------|------------|--|---------------------------------|
| 01       | 13.02.2013 | New version                                  | All                             |
| 02       | 19.08.2013 | Technical Data,<br>Cleaning                  | 3.4, 5.1, 5.2, 6.1, 7.4,<br>9.1 |
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## 1 Regarding this manual

This operating manual contains necessary information to safely operate the Hygienic Design — Gearhead HDV, subsequently referred to as gearhead.

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:

|  |   |
|--|---|
|  | <p style="text-align: center;"><b>⚠ DANGER</b></p> <p>This signal word points to an imminent danger that can cause serious injuries and even death.</p> |
|  | <p style="text-align: center;"><b>⚠ WARNING</b></p> <p>This signal word points to a possible danger that can cause serious injuries and even death.</p> |
|  | <p style="text-align: center;"><b>⚠ CAUTION</b></p> <p>This signal word points to a possible danger that can cause slight to serious injuries.</p>      |
|  | <p style="text-align: center;"><b>NOTICE</b></p> <p>This signal word points to a possible danger that can cause material damage.</p>                    |
|  | <p>A note without signal word draws your attention to application tips or especially important information when handling the gearhead.</p>              |

**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



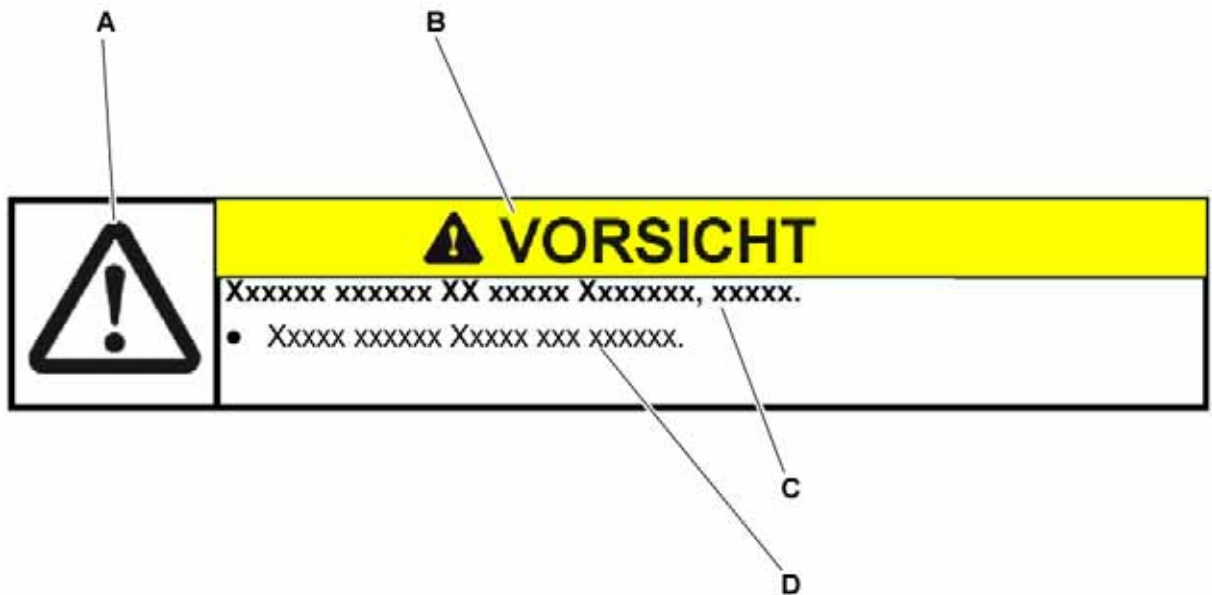
Environment protection



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

## 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 directives

#### 2.1.1 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.

#### 2.1.2 RoHS

The homogeneous materials used in the gearhead fall below the amounts of hazardous materials limited by directive 2011/65/EU Annex II.

- Lead (0.1%)
- Mercury (0.1%)
- Cadmium (0.01%)
- Hexavalent chromium (0.1%)
- Polybrominated biphenyls (PBB) (0.1%)
- Polybrominated diphenyl ether (PBDE) (0.1%)

Installation of the gearhead therefore has no effect on the restriction of using certain hazardous materials in electrical and electronic equipment as required in the 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.

- Read 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 suitable for all industrial applications.

The gearhead may not be operated in areas with potentially explosive atmosphere.

The gearhead can be cleaned easily and is corrosion-resistant. It may basically be used in food processing.

- Note the special information on mounting (Chapter 5 "Assembly") and on cleaning (Chapter 6 "Startup and operation").

The gearhead is intended for installation on motors that:

- Correspond to the design B5 (in the event of deviations, consult our Customer Service department [technical Customer Service department]).
- Have a radial and axial runout tolerance according to DIN EN 50347.
- Have a cylindrical shaft end with tolerance class h6 to k6.

**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 (e.g. test run without secure attachment)
- 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**

**2.7 General safety instructions**

|   |  |
|---|--|
|   | <p style="text-align: center;"><b>⚠ WARNING</b></p> <p><b>Objects flung out by rotating components can cause serious injury and death.</b></p> <ul style="list-style-type: none"> <li>• Remove objects and tools from the gearhead before putting it into operation.</li> <li>• Remove/Secure the shaft key (if available) if the gearhead is operated without attachments on the output/drive side.</li> </ul>  |
|  | <p style="text-align: center;"><b>⚠ WARNING</b></p> <p><b>Rotating components on the gearhead can pull in parts of the body and cause serious injuries and even death.</b></p> <ul style="list-style-type: none"> <li>• Keep a sufficient distance to rotating machinery while the gearhead is running.</li> <li>• Secure the machine against restarting and unintentional movements during assembly and maintenance work (e.g. uncontrolled lowering of lifting axes).</li> </ul> |
|  | <p style="text-align: center;"><b>⚠ WARNING</b></p> <p><b>A damaged gearhead can cause accidents and injury.</b></p> <ul style="list-style-type: none"> <li>• Never use a gearhead that has been overloaded to due misuse or a machine crash (see chapter 2.5 "Reasonably predictable misuse").</li> <li>• Replace the affected gearhead, even if no external damage is visible.</li> </ul>  |
|  | <p style="text-align: center;"><b>⚠ CAUTION</b></p> <p><b>Hot gearhead housing can cause serious burns.</b></p> <ul style="list-style-type: none"> <li>• Touch the gearhead housing only when wearing protective gloves or after the gearhead has been at standstill for some time.</li> </ul>   |

|  |   |
|--|---|
|   | <p style="text-align: center;"><b>NOTICE</b></p> <p><b>Loose or overloaded screw connections can damage the gearhead.</b></p> <ul style="list-style-type: none"> <li>• Use a calibrated torque wrench to tighten and check all screw connections for which a tightening torque has been specified.</li> </ul>   |
|   | <p style="text-align: center;"><b>⚠ WARNING</b></p> <p><b>Lubricants are flammable.</b></p> <ul style="list-style-type: none"> <li>• Do not spray with water to extinguish.</li> <li>• Suitable extinguishing agents are powder, foam, water mist, and carbon dioxide.</li> <li>• Observe the safety instructions of the lubricant manufacturer (see Chapter 7.4 "Notes on the lubricant used").</li> </ul> |
|   | <p style="text-align: center;"><b>⚠ CAUTION</b></p> <p><b>Cleaning agents and lubricants can cause skin irritations.</b></p> <ul style="list-style-type: none"> <li>• Avoid direct skin contact.</li> </ul>   |
|  | <p><b>Cleaning agents and lubricants can pollute soil and water.</b></p> <ul style="list-style-type: none"> <li>• Use and dispose of cleaning agents and lubricants properly.</li> </ul>  |



### 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.

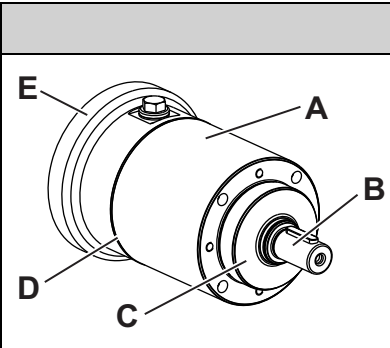
For applications with special safety requirements (e.g. vertical axes, distorted gear inputs) we recommend employing exclusively our products alpheno<sup>®</sup>, RP<sup>+</sup>, SP<sup>+</sup>, TP<sup>+</sup>, TP<sup>+</sup> HIGH TORQUE or consulting WITTENSTEIN alpha.

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

Various types of motors can be accommodated using an adapter flange and a bushing.

The gearhead can be cleaned easily and is corrosion-resistant. It may basically be used in food processing.

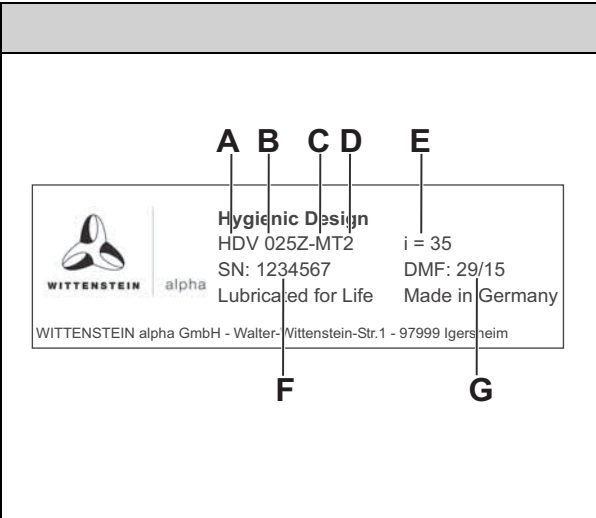
#### 3.1 Overview of the gearhead components

|  |   | Gearhead components              |
|--|---|----------------------------------|
|  | A | Gearhead housing                 |
|  | B | Output shaft                     |
|  | C | Shaft sealing ring at the output |
|  | D | O-ring seal                      |
|  | E | Adapter flange                   |

Tbl-1: Overview of the gearhead components

#### 3.2 Identification plate

The identification plate is attached to the gearhead housing.


|   |   | Designation   |
|---|---|---|
|  | A | Ordering code   |
|   | B | Gearhead size (e.g. 025)  |
|   | C | Version (MF or MT)(see Chapter 5.4 "Components mounted onto the output side") |
|   | D | Stage number (e.g. 2)   |
|   | E | Ratio (e.g. 35)   |
|   | F | Serial number (e.g. 1234567)  |
|   | G | Production date (e.g. 29/15)  |

Tbl-2: Identification plate (sample values)

### 3.3 Performance statistics

For the maximum permitted speeds and torques, refer to

- our catalog,
- our website <http://www.wittenstein-alpha.de>,
- the respective customer-specific performance data (2093–D...).

|   |   |
|---|---|
|  | <p><b>Consult our Customer Service department if the gearhead is older than a year. You will then receive the valid performance data.</b></p> |
|---|---|

### 3.4 Weight

The weights of the gearheads with standard adapter flange are specified "Tbl-3" in the table. If a different adapter flange is mounted, the actual weight can deviate by up to 10%.

| <b>Gearhead size HDV</b> | <b>015</b> | <b>025</b> | <b>035</b> |
|--------------------------|------------|------------|------------|
| <b>1–stage [kg]</b>      | 3.2        | 5.2        | 13.6       |
| <b>2–stage [kg]</b>      | 3.8        | 6.5        | 16.6       |

Tbl-3: Weight

## 4 Transport and storage

### 4.1 Scope of delivery



- Check the completeness of the delivery against the delivery note.
  - ① Immediately notify the carrier, the insurance company, or **WITTENSTEIN alpha GmbH** in writing of any missing parts or damage.

### 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

|  |   |
|--|---|
|   | <p style="text-align: center;"><b>⚠ WARNING</b></p> <p><b>Suspended loads can fall and can cause serious injuries and even death.</b></p> <ul style="list-style-type: none"> <li>• Do not stand under suspended loads.</li> <li>• Secure the gearhead before transport with suitable fasteners (e.g. belts).</li> </ul>   |
|  | <p style="text-align: center;"><b>NOTICE</b></p> <p><b>Hard knocks, because of falling or hard dropping, can damage the gearhead.</b></p> <ul style="list-style-type: none"> <li>• Only use hoisting equipment and transports with sufficient capacity.</li> <li>• The maximum permitted lift capacity of a hoist may not be exceeded.</li> <li>• Lower the gearhead slowly.</li> </ul> |

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. Consult our Customer Service department if the conditions are different.

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

## 5 Assembly

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


|   |  |
|---|--|
|  | NOTICE   |
|   | <p><b>Only a sealed mount guarantees the fault-free function of the gearhead.</b></p> <ul style="list-style-type: none"> <li>• Align the geometry of the seal surfaces before mounting the motor to guarantee a sufficient sealing function. Apply a <b>seal</b> to avoid leaks.                     <ul style="list-style-type: none"> <li>① This seal is not included in the scope of delivery.</li> </ul> </li> <li>• Seal potential gaps when mounting on the machine and when mounting on the output side.                     <ul style="list-style-type: none"> <li>① The <b>WITTENSTEIN alpha GmbH</b> provides corresponding mounting kits for this (see Chapter 5.3 "Mounting the gearhead to a machine")</li> </ul> </li> </ul> |

The gearhead can be cleaned easily and is corrosion-resistant. It may basically be used in food processing.

- Note the special information on mounting (Chapter 5.2 "Mounting the motor onto the gearhead" and Chapter 5.3 "Mounting the gearhead to a machine").

### 5.1 Preparations

The bolts for mounting are not included in the delivery and need to be provided by the customer. Corresponding information can be found in the individual assembly steps.

|   |  |
|---|--|
|  | NOTICE   |
|   | <p><b>Pressurized air can damage the gearhead seals.</b></p> <ul style="list-style-type: none"> <li>• Do not use pressurized air to clean the gearhead.</li> </ul> |

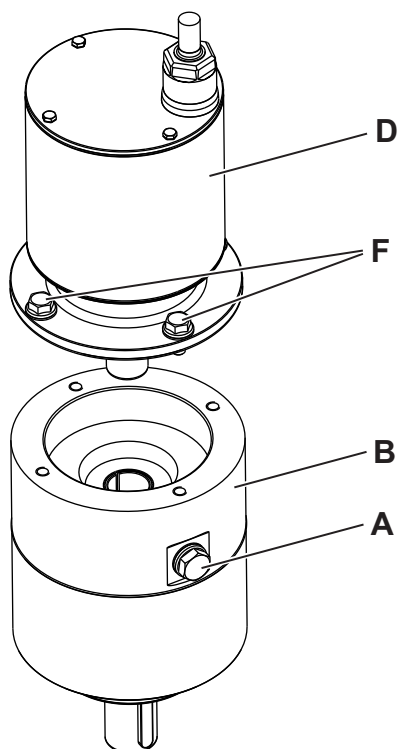
- Clean/De-grease the following components with a clean, lint-free cloth, and grease-dissolving, non-aggressive cleaning agents:
  - All fitting surfaces to neighboring components
  - Centering
  - The motor shaft
  - The inner diameter of the plug receptacle
  - The bushing inside and out
- Check the fitting surfaces additionally for damage and impurities.
- Ensure that the bushing included in the delivery may be slid on the motor shaft with a tight sliding fit.
- Only use a tool that is suitable for working with stainlesssteel.

### 5.2 Mounting the motor onto the gearhead

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

- correspond to the B5 design if possible
- have a radial and axial runout tolerance according to DIN EN 50347
- and if possible, have a smooth shaft.

|  |   |
|--|---|
|  | <ul style="list-style-type: none"> <li>• Observe the specifications and safety instructions of the motor manufacturer.</li> <li>• Observe the safety and processing instructions for the threadlockers to be used.</li> </ul> |
|--|---|



- Ensure that the motor is mounted if possible in a vertical direction.
- If the motor shaft has a shaft key, remove it.
  - ① If recommended by the motor manufacturer, insert a half wedge.
- Remove the plug (A) from the mounting bore in the adapter flange (B).
- Turn the plug receptacle (C) so that the threaded pin (H) can be reached through the mounting bore.
- Insert the seal between the motor (D) and the adapter flange (B).
- Push the motor shaft into the plug receptacle of the gearhead.
  - ① The maximum permitted axial forces may not be exceeded, see Chapter 9.1 "Specifications for mounting onto a motor", Table "Tbl-15". The motor shaft should slip in easily. If this is not the case, the threaded pin needs to be loosened more.
  - ① The slit of the bushing has to line up with the groove (if present) of the motor shaft and be aligned to the marking bore (M), see Table "Tbl-4".
  - ① There should be no gap between the motor (D) and the adapter flange (B).

|  |  | Designation |
|--|--|-------------|
|  |  | C           |
|  |  | H           |
|  |  | J           |
|  |  | K           |
|  |  | L           |
|  |  | M           |

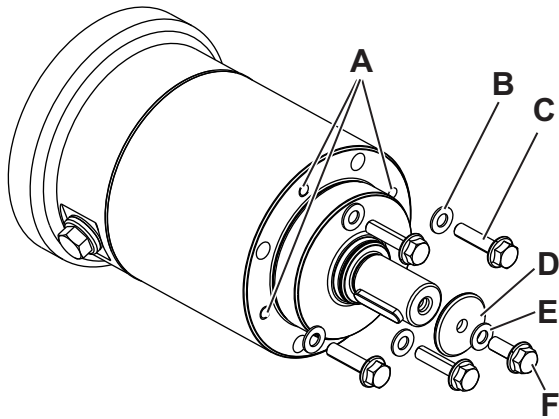
Tbl-4: Arrangement of motor shaft, plug receptacle, and bushing

- Coat the four bolts (F) with a threadlocker (e.g. Loctite® 243).
- Fasten the motor (D) onto the adapter flange (B) with the four screws (F).
- Tighten the threaded pin (H) of the plug receptacle (C).
  - ① For screw sizes and prescribed tightening torques, see Chapter 9.1 "Specifications for mounting onto a motor", Table "Tbl-15".
- Screw in the plug (A) of the adapter flange (B).
  - ① For the screw size and specified tightening torque, see Table "Tbl-5".

| Width across flats [mm] | 10 | 13 | 17  |
|-------------------------|----|----|-----|
| Tightening torque [Nm]  | 3  | 5  | 5.5 |

Tbl-5: Tightening torques for the plug

### 5.3 Mounting the gearhead to a machine



The gearhead housing has four threaded bores (A) for bolting the gearhead to a machine.

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

The bolts need to be provided by the customer. The **WITTENSTEIN alpha GmbH** provides corresponding mounting kits for this (see Table "Tbl-6"). The prescribed screw sizes and tightening torques can be found in Chapter 9.2 "Specifications for mounting onto a machine", Table "Tbl-16".

- Coat four screws (C) with a threadlocker (e.g. Loctite 243).
- Fasten the gearhead on the machine with the four fastening screws through the threaded bores.
  - ① Note that the surface of the machine exhibits little roughness. This makes cleaning easier.
  - ① Install the gearhead so that the plug faces downwards. This makes cleaning easier.
  - ① Use the screw head seals (B) and O-rings (I,J) for sealing.

The following mounting kits are available:

| Size HDV                      | 015      | 025      | 035      |
|-------------------------------|----------|----------|----------|
| Article code for mounting kit | 20058220 | 20058222 | 20058221 |


Tbl-6: Mounting kit

The mounting kits contain the following individual parts:

|  | Designation |   |
|--|-------------|---|
|  | B           | Screw head seal                         |
|  | C           | Screw (machine mounting)                |
|  | D           | Disk (output mounting)                  |
|  | E           | Screw head seals                        |
|  | F           | Screw (output mounting)                 |
|  | G           | Gearhead HDV                            |
|  | H           | Machine (mountable flange for gearhead) |
|  | I           | O-ring                                  |
|  | J           | O-ring                                  |
|  | K           | Mounting part, output side (e.g. gear)  |
|  | L           | O-ring                                  |
|  | M           | O-ring                                  |

Tbl-7: Individual parts in the mounting kit

5.4 Components mounted onto the output side

|   |   |
|---|---|
|  | NOTICE  |
|   | <p><b>Clamping forces during assembly can damage the gearhead.</b></p> <ul style="list-style-type: none"> <li>● Do not use force when mounting gearwheels and toothed belt pulleys onto the output shaft.</li> <li>● Never attempt to assemble by force or hammering!</li> <li>● Only use suitable tools and devices for assembly.</li> <li>● Make sure not to exceed the maximum permissible static axial forces on the output bearing (see Table "Tbl-8") when pulling or shrink-fitting a gear onto the output shaft.</li> </ul> |

| Size HDV  | 015  | 025  | 035  |
|---|------|------|------|
| <b>MF version (with standard bearing)</b>   |      |      |      |
| <b>F<sub>a max</sub>[N]</b>   | 500  | 500  | 1700 |
| <b>MT version (with reinforced bearing)</b>   |      |      |      |
| <b>F<sub>a max</sub>[N]</b>   | 1000 | 1500 | 3000 |
| ⓘ The version (MF or MT) can be found on the identification plate (see Chapter 3.2 "Identification plate"). |      |      |      |

Tbl-8: Maximum permissible static axial forces at static load rating (s0) = 1.8 and radial force (Fr) = 0


- Seal potential gaps when mounting on the output side.
    - ⓘ Ensure that the surface of the mounting parts exhibits little roughness. This makes cleaning easier.
    - ⓘ Use the screw head seals and O-rings for sealing.
- The **WITTENSTEIN alpha GmbH** provides corresponding mounting kits for this (see Chapter 5.3 "Mounting the gearhead to a machine", Table "Tbl-6")

## 6 Startup and operation

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

|  |  |
|--|--|
|  | <p><b>Improper use can cause damage to the gearhead.</b></p> <ul style="list-style-type: none"> <li>• Make sure that             <ul style="list-style-type: none"> <li>- the <b>ambient temperature</b> does not drop below <math>-15\text{ }^{\circ}\text{C}</math> or exceed <math>+40\text{ }^{\circ}\text{C}</math> and</li> <li>- the <b>operating temperature</b> does not exceed <math>+90\text{ }^{\circ}\text{C}</math>.</li> </ul> </li> <li>• Avoid icing, which can damage the seals.</li> <li>• For other conditions of use, consult our Customer Service department.</li> <li>• Only use the gearhead only up to its maximum limit values, see Chapter 3.3 "Performance statistics".</li> </ul> <p><b>The gearhead can be cleaned easily and is corrosion-resistant. It may basically be used in food processing.</b></p> <ul style="list-style-type: none"> <li>• Note the special information on cleaning (Chapter 6 "Startup and operation").</li> </ul> |
|--|--|

### 6.1 Cleaning agents and cleaning process

|  |  |
|--|--|
|  | NOTICE   |
|  | <p><b>The pump effect of a running gearhead can suck cleaning agents into the gearhead.</b></p> <ul style="list-style-type: none"> <li>• Clean the gearhead only when it is at standstill.</li> </ul>  |
|  | <p><b>Aggressive cleaning agents can cause corrosion.</b></p> <ul style="list-style-type: none"> <li>• Use only conventional cleaning agents that are grease-dissolving, but not aggressive (see Table "Tbl-9").</li> </ul>  |
|  | <p><b>A high-pressured water jet or applied medium can damage the seals of the gearhead.</b></p> <ul style="list-style-type: none"> <li>• Use a water jet with a <b>maximum</b> pressure of 28 bar.</li> <li>• Remove applied media within 30 minutes of the sealing.</li> </ul> |
|  | <p><b>A roughened surface cannot be cleaned without leaving traces.</b></p> <ul style="list-style-type: none"> <li>• Take care not to scratch the gearhead.</li> </ul>   |

During cleaning or from the process, the gearhead may be exposed to the following substances or substance mixtures up to a concentration of maximum 3%:

| Substances                                 | Formula                                  |
|--|--|
| Acetyl chloride                            | $\text{CH}_3\text{COCl}$                 |
| Aluminium chloride                         | $\text{AlCl}_3\cdot 6\text{H}_2\text{O}$ |
| Ammonium chloride (Salmiac)                | $\text{NH}_4\text{Cl}$                   |
| Antimony trichloride                       | $\text{SbCl}_3$                          |
| Barium chloride                            | $\text{BaCl}_2\cdot 2\text{H}_2\text{O}$ |
| Chlorine (incl. -water, -lime and benzene) | $\text{Cl}_2$                            |
| Chlorosulfonic acid                        | $\text{HSO}_3\text{Cl}$                  |
| Hydrogen chloride gas                      | $\text{HCl}$                             |
| Chromic acid                               | $\text{CrO}_3$                           |
| Iron (III) chloride                        | $\text{FeCl}_3$                          |



| Substances                          | Formula  |
|-------------------------------------|--|
| Hydrogen fluoride                   | HF   |
| Carnallite                          | KClMgCl <sub>2</sub> ·6H <sub>2</sub> O                  |
| Nitrohydrochloric acid              | HCl + HNO <sub>3</sub>                                   |
| Magnesium chloride                  | MgCl <sub>2</sub> ·6H <sub>2</sub> O                     |
| Chloroacetic acid                   | CH <sub>2</sub> ClCOOH                                   |
| Sodium chloride (common salt)       | NaCl   |
| Sodium hydroxide (soda lye)         | NaOH   |
| Sodium peroxide (sodium superoxide) | Na <sub>2</sub> O <sub>2</sub>                           |
| Sulfuric acid                       | H <sub>2</sub> SO <sub>4</sub>                           |
| Tartaric acid                       | COOH(CHOH) <sub>2</sub> COOH                             |
| Tin II (IV) chloride                | SnCl <sub>2</sub> ·2H <sub>2</sub> O(SnCl <sub>4</sub> ) |

Tbl-9: Cleaning agent positive list

During cleaning or during the process, the gearhead may **not** be exposed to the following substances or substance mixtures regardless of the concentration:

| Substances                          | Formula   |
|-------------------------------------|---|
| Aniline hydrochloride               | C <sub>6</sub> H <sub>5</sub> NH <sub>2</sub> HCl |
| Bromine                             | Br <sub>2</sub>                                   |
| Sodium hypochloride (bleaching lye) | NaClO   |
| Mercury (II) chloride               | HgCl <sub>2</sub>                                 |
| Hydrochloric acid                   | HCl   |

Tbl-10: Cleaning agent negative list

## 7 Maintenance and disposal

- Read 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 seals are subject to wear. Therefore also check the gearhead for leakage during each visual inspection.
  - ① Check at the mounting position that no foreign medium (e.g. oil) has collected on the output shaft.
- Also check the entire gearhead for corrosion.
  - ① For special information on maintenance-related issues, contact our Customer Service department.

#### 7.1.2 Checking the tightening torques

- Check the tightening torque of the fastening screws on the gearhead housing.
  - ① The prescribed tightening torques can be found in Chapter 9.2 "Specifications for mounting onto a machine", Table "Tbl-16".
- Check the tightening torque of the threaded pin on the motor mounting.
  - ① The prescribed tightening torques can be found in Chapter 9.1 "Specifications for mounting onto a motor", Table "Tbl-15".

### 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-11: Maintenance schedule

#### 7.4 Notes on the lubricant used

|   |  |
|---|--|
|  | <p>All gearheads are lubricated for their service life by the manufacturer with a food-safe synthetic grease (oil-type: carbon hydride; consistency agent: aluminum complex soap).</p> <p>Contact our Customer Service department for lubricant type and amount.</p> |
|---|--|

The manufacturer listed below will provide any further information on the lubricants:

| <b>Lubricants for the food industry (USDA-H1 registered)</b>                     |
|--|
| Klüber Lubrication München KG, Munich<br>Tel.: + 49 89 7876-0<br>www.klueber.com |


Tbl-12: Lubricant manufacturers


#### 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.
  - ① Observe the valid national regulations during disposal.

## 8 Malfunctions

|   |  |
|---|--|
|  | NOTICE   |
|   | <p><b>Changed operational behavior can be an indication of existing damage to the gearhead or cause damage to the gearhead.</b></p> <ul style="list-style-type: none"> <li>Do not put the gearhead back into operation until the cause of the malfunction has been rectified.</li> </ul> |

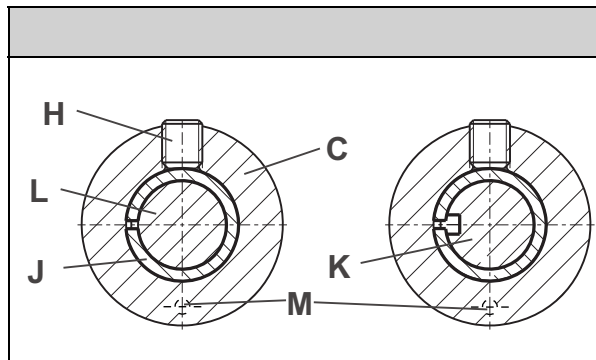
|   |  |
|---|--|
|  | <p>Rectifying of malfunctions may only be done by specially trained technicians.</p> |
|---|--|

| 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-13: Malfunctions

## 9 Appendix

### 9.1 Specifications for mounting onto a motor

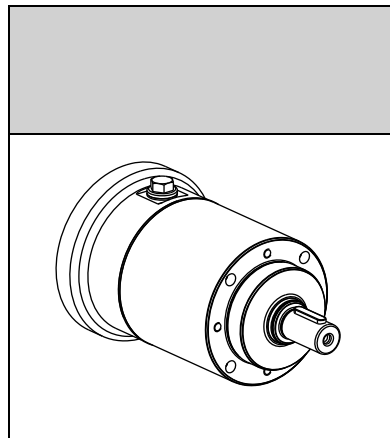
|   |   |                    |
|---|---|--------------------|
|  |   | <b>Designation</b> |
|   | C | Plug receptacle    |
|   | H | Threaded pin       |
|   | J | Bushing            |
|   | K | Keyed shaft        |
|   | L | Smooth shaft       |
|   | M | Marking bore       |

Tbl-14: Arrangement of motor shaft, plug receptacle, and bushing

| Gearhead size HDV | Plug receptacle, inner Ø [mm] | Width across flats, threaded pin (B) [mm] | Tightening torque [Nm] | Max. axial force [N] |
|-------------------|-------------------------------|---|------------------------|----------------------|
| 015               | 14                            | 4   | 14                     | 80                   |
| 025               | 19                            | 5   | 23                     | 100                  |
| 035               | 24                            | 6   | 45                     | 150                  |

Tbl-15: Specifications for mounting onto a motor

### 9.2 Specifications for mounting onto a machine

|  | Gearhead size HDV | Hole circle Ø [mm] | Bolt size / Property class | Tightening torque [Nm] |
|---|-------------------|--------------------|----------------------------|------------------------|
|   | 015               | 62                 | M5 / Ax-80                 | 4.91                   |
|   | 025               | 80                 | M6 / Ax-80                 | 8.42                   |
|   | 035               | 108                | M10 / Ax-80                | 40                     |
|   |                   |                    |                            |                        |

Tbl-16: Threaded bores in gearhead housing

### 9.3 Tightening torques for common thread sizes in general mechanical engineering

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

- Calculation in accordance with VDI 2230 (February 2003 version)
- Friction value for thread and contact surfaces  $\mu=0.10$
- Exploitation of the yield stress 90%
- Torque tools type II classes A and D in accordance with ISO 6789

The settings are values rounded to usual commercial scale gradations or setting possibilities.

- Set these values **precisely** on the scale.

|                               | Tightening torque [Nm] with thread |      |     |      |      |      |      |     |     |     |     |     |      |
|-------------------------------|------------------------------------|------|-----|------|------|------|------|-----|-----|-----|-----|-----|------|
| Property class<br>Screw / nut | M3                                 | M4   | M5  | M6   | M8   | M10  | M12  | M14 | M16 | M18 | M20 | M22 | M24  |
| <b>8.8 / 8</b>                | 1.15                               | 2.64 | 5.2 | 9.0  | 21.5 | 42.5 | 73.5 | 118 | 180 | 258 | 362 | 495 | 625  |
| <b>10.9 / 10</b>              | 1.68                               | 3.88 | 7.6 | 13.2 | 32.0 | 62.5 | 108  | 173 | 264 | 368 | 520 | 700 | 890  |
| <b>12.9 / 12</b>              | 1.97                               | 4.55 | 9.0 | 15.4 | 37.5 | 73.5 | 126  | 202 | 310 | 430 | 605 | 820 | 1040 |

Tbl-17: Tightening torques for headless screws and nuts

### 9.4 Tightening torques for common thread sizes for corrosion-resistant screw connections

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

- Calculation based on VDI 2230 (February 2003 issue)
- Friction value for thread and contact surfaces  $\mu=0.10$
- Exploitation of the yield stress 90%
- Only valid for:
  - Screws according to ISO 4762, ISO 4014, ISO 4017
  - Nuts according to ISO 4032, ISO 4033

The settings are values rounded to usual commercial scale gradations or setting possibilities.

- Set these values **precisely** on the scale.

|                               | Tightening torque [Nm] with thread |       |      |      |      |      |      |      |      |      |     |     |     |
|-------------------------------|------------------------------------|-------|------|------|------|------|------|------|------|------|-----|-----|-----|
| Property class<br>screw / nut | M3                                 | M4    | M5   | M6   | M8   | M10  | M12  | M14  | M16  | M18  | M20 | M22 | M24 |
| <b>Ax-50</b>                  | 0.376                              | 0.868 | 1.72 | 2.95 | 7.2  | 14.0 | 24.0 | 38.5 | 59.0 | 82.0 | 115 | 157 | 199 |
| <b>Ax-70</b>                  | 0.806                              | 1.86  | 3.68 | 6.4  | 15.2 | 30.0 | 51.5 | 83.0 | 127  | 176  | 248 | 336 | 425 |
| <b>Ax-80</b>                  | 1.07                               | 2.48  | 4.91 | 8.4  | 20.5 | 40.0 | 69.0 | 111  | 169  | 234  | 330 | 450 | 570 |

Tbl-18: Tightening torques for screws and nuts made from austenitic steel

9.5 Declaration of Conformity



**EG und FDA-Konformitätserklärung**  
**EC and FDA-Declaration of Conformity**

Wir / We, **WITTENSTEIN alpha GmbH**  
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 D-97999 Igersheim  
 Germany  
 Tel: +49 (0)700 - 493 10020  
 Fax: +49 (0)7931 - 493-200  
 e-mail: info-alpha@wittenstein.de

erklären hiermit in alleiniger Verantwortung, dass die außenliegenden Materialien und Schmierstoffe  
*hereby declare under our sole responsibility, that the external materials and lubricants*

der Erzeugnisse  
*of the products*

Bezeichnung: **Hygienic Design Planetengetriebe**  
*Designation: Hygienic Design Planetary Gear Reducer*

Baugröße / Size: **HDV 015, HDV 025, HDV 035**

konform zu der aktuellen Verordnung (EG) Nr. 1935/ 2004, sowie  
*comply with the current demands on decree (EC) Nr. 1935/ 2004, as well as*

konform zu folgenden aktuellen Vorschriften der Food and Drug Administration (FDA) sind:  
*comply with the current demands on following titles of the Food and Drug Administration (FDA):*

| Material mit (unvorhersehbaren) Lebensmittelkontakt<br><i>Material in (unforeseeable) contact with food</i> | Werkstoffbezeichnung<br><i>material-name</i> | Gruppe von Materialien<br><i>group of materials</i> | Bemerkungen<br><i>comments</i>      |
|---|--|---|-------------------------------------|
| 1.4404 (316 L)  | X2CrNiMo17-12-2                              | Metall<br><i>metal</i>                              | Edelstahl<br><i>stainless steel</i> |
| 1.4418  | X4CrNiMo16-5-1                               | Metall<br><i>metal</i>                              | Edelstahl<br><i>stainless steel</i> |
| 1.4571 (316 Ti)   | X6CrNiMoTi17-12-2                            | Metall<br><i>metal</i>                              | Edelstahl<br><i>stainless steel</i> |
| FFKM  | 75 Fluoroprene XP 40                         | Elastomer<br><i>elastomer</i>                       | CFR Title 21 (FDA) § 177.2600       |
| PTFE  | PTFE Y002                                    | Polymer<br><i>polymer</i>                           | CFR Title 21 (FDA) § 177.1550       |
| Klübersynth UH1-151   | -  | Schmierstoff<br><i>lubricant</i>                    | CFR Title 21 (FDA) § 178.3570       |
| BARRIERA L55/2  | -  | Schmierstoff<br><i>lubricant</i>                    | CFR Title 21 (FDA) § 178.3570       |

Igersheim, 22.08.2014  
 Ort und Datum der Ausstellung  
*Place and Date of Issue*

  
 Dr. Michael Engelbreit  
 Konstruktionsleiter / Design Manager

  
 Rolf Reckels  
 Qualitätsmanagement / Quality Manager

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