

g500

Helical gearboxes / helical gearboxes with servo motors

H45 ... H450 | 45 Nm ... 450 Nm

Mounting Instructions

EN



13532329

Lenze



Please read these instructions before you start working!
Follow the enclosed safety instructions.

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1 About this documentation

Document history

Contents

- This documentation serves for safety-relevant operations on and with the gearboxes. It contains safety instructions which must be observed.
- All personnel working on and with the gearboxes must have the documentation available during the work and observe the information and notes relevant for them.
- The documentation must always be complete and in a perfectly readable state.

Target group

This documentation is directed at qualified skilled personnel according to IEC 60364.

Qualified skilled personnel are persons who have the required qualifications to carry out all activities involved in installing, mounting, commissioning, and operating the product.



Tip!

Information and tools concerning the Lenze products can be found in the download area at www.lenze.com

1.1 Document history

Material number	Version	Description		
13478458	1.0	12/2014	TD09	First edition for the pilot series
13511351	2.0	04/2016	TD09	New chapter: Servo adapter
13532329	3.0	04/2017	TD09	Properties of the machine shaft added Table: lubricant properties added

1.2 Conventions used

This documentation uses the following conventions to distinguish different types of information:

Type of information	Writing	Example/notes
Numeric notation		
Decimal	Standard notation	Example: 1234
Decimal separator	Point	The decimal point is always used. For example: 1234.56
Icons		
Page reference		Reference to another page with additional information For instance: 16 = see page 16
Documentation reference		Reference to another documentation with additional information Example: EDKxxx = see EDKxxx documentation
Wildcard		Wildcard for options, selection data

1.3 Terminology used


Term	In the following text used for
Gearboxes	Gearboxes of the g500 product family
Drive system	Drive systems with g500 gearboxes and other Lenze drive components

1.4 Notes used

The following pictographs and signal words are used in this documentation to indicate dangers and important information:




Safety instructions

Layout of the safety instructions:






Danger!
(characterises the type and severity of danger)

Note
(describes the danger and gives information about how to prevent dangerous situations)

Pictograph and signal word	Meaning
 Danger!	Danger of personal injury through dangerous electrical voltage Reference to an imminent danger that may result in death or serious personal injury if the corresponding measures are not taken.
 Danger!	Danger of personal injury through a general source of danger Reference to an imminent danger that may result in death or serious personal injury if the corresponding measures are not taken.
 Stop!	Danger of property damage Reference to a possible danger that may result in property damage if the corresponding measures are not taken.

Application notes

Pictograph and signal word	Meaning
 Note!	Important note to ensure trouble-free operation
 Tip!	Useful tip for easy handling
	Reference to another document

2 Safety instructions

General safety instructions for drive components

2.1 General safety instructions for drive components



Danger!

Disregarding the following basic safety measures may lead to severe personal injury and damage to material assets!

- Store in dry, low-vibration environment without aggressive atmosphere; if possible in the manufacturer's packaging.
 - Protect against dust and impacts.
 - Observe the climatic conditions according to the technical data, ☺ catalogue.
- Lenze drive and automation components ...
 - ... must only be used as intended.
 - ... must never be commissioned despite noticeable damage.
 - ... must never be technically changed.
 - ... must never be commissioned in an incompletely mounted state.
 - ... must never be operated without the required covers.
 - ... may have live, moving or rotary parts during and after operation - corresponding to their type of protection. Surfaces may be hot.
 - ... must not be operated with large vibrations.
 - ... must not be operated in the frequency range of a plant or the drive system.
- All specifications of the corresponding enclosed documentation must be observed.

This is vital for safe and trouble-free operation and for achieving the specified product features.
- Only qualified skilled personnel are permitted to work with or on Lenze drive and automation components.

According to IEC 60364 or CENELEC HD 384, these are persons ...

 - ... who are familiar with the installation, assembly, commissioning and operation of the product,
 - ... possess the appropriate qualifications for their work,
 - ... and are acquainted with and can apply all the accident prevent regulations, directives and laws applicable at the place of use.

Transport, storage

- Transport and storage in a dry, low-vibration environment without aggressive atmosphere; preferably in the packaging provided by the manufacturer.
 - Protect against dust and impacts.
 - Observe climatic conditions according to the technical data.
- Use load carrying equipment for transport! (📖 15)

If you do not install the motor immediately, ensure proper storage conditions.

- Up to one year:
 - Shafts and uncoated surfaces are delivered in a protected against rust status. Aftertreatment is required where the corrosion protection has been damaged.
 - Remove the plug for motors with condensation drain holes (special version).
- More than one year, up to two years:
 - Apply a long-term corrosion preventive (e.g. Anticorit BW 366 from the Fuchs company) to the shafts and uncoated surfaces before storing the motor away.

Corrosion protection

Lenze offers paints with different resistance characteristics for drive systems. Since the resistance may be reduced when the paint coat is damaged, defects in paint work (e.g. through transport or assembly) must be removed professionally to reach the required corrosion resistance.

Mechanical installation

- Provide for careful handling and avoid mechanical overload. During handling neither bend components, nor change the insulation distances.

Electrical installation

- Carry out the electrical installation according to the relevant regulations (e. g. cable cross-sections, fusing, connection to the PE conductor). Additional notes are included in the documentation.
- The Instructions contain notes concerning wiring according to EMC regulations (shielding, earthing, filters and cable routing). The compliance with limit values required by the EMC legislation is the responsibility of the manufacturer of the machine or system.

Warning: The inverters are automation components which can be used in industrial environment according to EN 61000-6-4. These products may cause radio interference in residential areas. If this happens, the operator may need to take appropriate action.

- Only plug in or remove pluggable terminals in the deenergised state!

Commissioning

- If required, you have to equip the system with additional monitoring and protective devices in accordance with the respective valid safety regulations (e. g. law on technical equipment, regulations for the prevention of accidents).
- Before commissioning remove transport locking devices and keep them for later transports.

2 Safety instructions

Application as directed

2.2 Application as directed

Low-voltage machines are not household appliances, but are intended as components that are only applied for re-use for industrial or professional purposes in terms of IEC/EN 61000-3-2.

They meet the requirements of the Low-Voltage Directive 2006/95/EC and the harmonised standards of the IEC/EN 60034 series.

It is permissible to use low-voltage machines with IP23 protection or less outdoors only if special protective measures are taken.

Do not use the integrated brakes as fail-safe brakes. It cannot be ruled out that the braking torque will be reduced due to disruptive factors that cannot be influenced.

- Drives
 - ... must only be operated under the operating conditions and power limits specified in this documentation.
 - ... comply with the protection requirements of the EC Low-Voltage Directive.

Any other use shall be deemed inappropriate!

2.3 Foreseeable misuse

- Do not operate the motors
 - ... in explosion-protected areas
 - ... in aggressive environments (acid, gas, vapour, dust, oil)
 - ... in water
 - ... in radiation environments



Note!

Increased surface and corrosion protection can be achieved by using adapted coating systems.

2.4 Residual hazards

Protection of persons

- Risk of burns!
 - Hot surfaces up to 140 °C during operation! Provide protection against contact.
- High-frequency voltages can be capacitively transferred to the motor housing through the inverter supply.
 - Earth motor housing carefully.
- Risk of injury due to rotating shaft!
 - Before working on the motor ensure that the motor is at standstill.
- Danger of unintentional starting or electrical shocks!
 - Connections must only be made when the equipment is deenergised and the motor is at standstill.
 - Installed brakes are no fail-safe brakes.
- Dangerous voltages at the power terminals, even if the plug is removed: residual voltage >60 V!

Motor protection

- Installed thermal detectors do **not offer full protection** to the machine.
 - If required, limit the maximum current, parameterise the inverter so that it will be switched off after some seconds of operation with $I > I_N$, especially if there is the danger of blocking.
 - Installed overload protection does not prevent an overload under any conditions.
- Installed brakes are **no fail-safe brakes**.
 - The torque can be reduced due to disruptive factors that cannot be influenced, e.g. by ingressing oil due to a defect shaft sealing ring on the A side.
- Fuses are no motor protection.
 - Use current-dependent motor protection switches at an average operating frequency.
 - Use installed thermal detectors at a high operating frequency.
- Excessive torques lead to a break of the motor shaft or demagnetisation.
 - The maximum torques according to catalogue must not be exceeded.
- Lateral forces from the motor shaft may occur.
 - Align shafts of motor and driving machine exactly to each other.
- If deviations from normal operation occur, e.g. increased temperature, noise, vibration, determine the cause and, if necessary, contact the manufacturer. If in doubt, switch off the motor.
- Design with plug:
 - Never disconnect plug when energised! Otherwise, the plug can be destroyed.
 - Switch off power supply and inhibit controller prior to disconnecting the plug.

2 Safety instructions

Disposal

Fire protection

- Fire hazard
 - Prevent contact with flammable substances.

2.5 Disposal

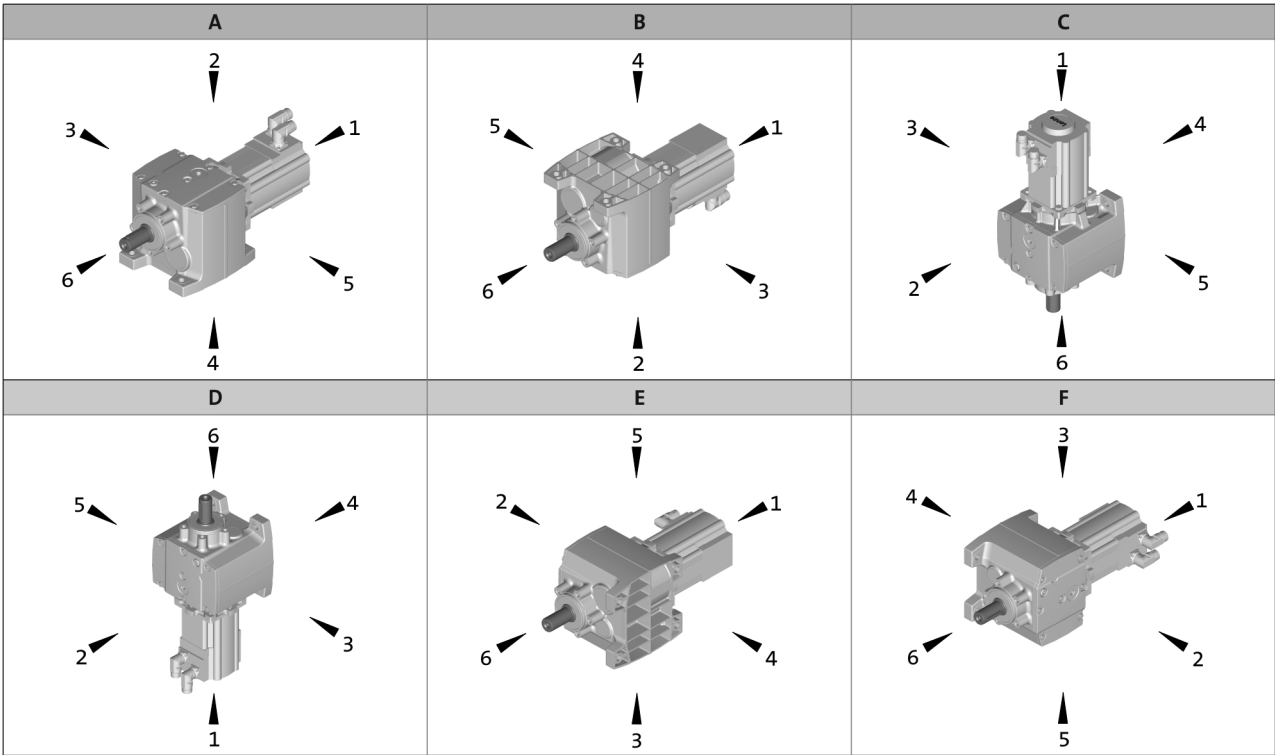
Sort individual parts according to their properties. Dispose of them as specified by the current national regulations.

3.1 Important notes

- The most important technical data is given on the nameplate.
- The product catalogues contain further technical data.

3.2 Identification

Mounting position (A-F) and position of system modules (1-6)



Connector / terminal box: 2, 3, 4, 5

3 Product description

Nameplate

3.2.1 Nameplate

Gearbox				
Lenze	1	DE		
3	18	6		
5.2	5.3	5.4	38	
7.1		7.2		
5.1	10.2	10.3	27	
11				
10.1		20.1		

Asynchronous and synchronous servo motors				
Lenze	1	15		
2	4			
5.5	5.8	5.2	5.4	5.3
5.6	5.9	5.10	16.6	22
5.7	14.2	14.1	27	14.3
9			12	
8.1	8.2	8.3		
10.2	10.3	18	11	

Pos.	Contents
1	Manufacturer / production location
2	Type of motor / standard
3	Gearbox type
4	Motor type
5	Technical data
5.1	Ratio
5.2	Rated torque
5.3	Rated speed
5.4	Rated frequency
5.5	Rated voltage
5.6	Rated current
5.7	Maximum current
5.8	Rated power [kW]
5.9	Rated power [HP]
5.10	Continuous standstill torque
6	Mounting position / position of the system blocks
7	Lubricant details
7.1	Lubricant amount
7.2	Lubricant type
8	Brake data
8.1	Type
8.2	AC/DC brake voltage
8.3	Braking torque, electrical power input
9	For feedback / pulse encoder or resolver data
10	Production data
10.1	Order number
10.2	Material number
10.3	Serial number
11	Bar code
12	Motor number
14	Additional motor specifications
14.1	Temperature class
14.2	Enclosure
14.3	Motor protection
16	Rated data for various frequencies
16	16.6 $\cos \varphi =$ motor power factor for M□A
16	$U_{in} [V] =$ induced voltage for M□□
18	Year of manufacture / week of manufacture
20	Customer data
20.1	Additional customer data
21	UL category (e.g. inverter duty motor)
22	C86 = motor code for inverter parameterisation (code 0086)
27	Permissible ambient temperature (e.g. $T_a \leq 40^\circ\text{C}$)
38	Load capacity (specified if $c < 1.0$)

3 Product description

Transport weights

3.3 Transport weights

Gearbox with motor type MCA

Gearbox		Motor frame size			
Code	Type	10	13	14	17
G50BH110	g500-H100	< 15	< 20	< 25	
G50BH114	g500-H140	< 15	< 20	< 30	
G50BH121	g500-H210	< 15	< 25	< 30	< 35
G50BH132	g500-H320	< 20	< 25	< 30	< 40
G50BH145	g500-H450	< 25	< 30	< 35	< 45

Tab. 1 Weights in kg

Gearbox with motor type MCS

Gearbox code		Motor frame size			
Code	Type	06	09	12	14
G50AH045	g500-H45	< 10			
G50BH110	g500-H100	< 10	< 15	< 25	
G50BH114	g500-H140	< 10	< 15	< 25	< 40
G50BH121	g500-H210	< 15	< 20	< 25	< 40
G50BH132	g500-H320	< 15	< 20	< 30	< 45
G50BH145	g500-H450	< 25	< 25	< 30	< 50

Tab. 2 Weights in kg

4.1 Important notes

Before transport

- Make sure that all components are securely mounted;
- Make sure that all components with a loose fastening are secured or removed;
- Tighten all transport aids (eye bolts or support plates).

Use lifting devices for the transport! (📖 15)



Stop!

Danger by tipping or falling loads!

Observe carrying capacities!

- The carrying capacity of the hoists and load handling devices must be at least the weight of the load, weights (📖 14).
- Secure the load to prevent it from tipping over or falling down.
- Standing beneath suspended loads is prohibited!

Risk of breakage!

The motors mounted to the gearbox are partly equipped with transport eyebolts that are **solely** intended for mounting/dismounting the motor to/from the gearbox and that **must not** be used for transport of the geared motor!

4.2 Transport equipment for gearboxes



Danger!

The motors attached to the gearbox are partially equipped with eyebolts. They are **exclusively** determined for mounting/dismounting the motor to the gearbox and must **not** be used for the complete geared motor!



Danger!

Completely screw in transport aids (such as eye bolts or bearing plates), they must be flat and applied over their entire surface!

If possible, the transport aids (such as eye bolts or bearing plates) must be stressed vertically in the direction of the screw axis! Angular tension or tension to the sides reduces the payload! Observe the information provided in DIN 580!

Use additional appropriate lifting aids, if required, to achieve a direction of loading which is as vertical as possible (highest payload). Secure lifting aids against shifting!



Stop!

Observe load carrying capacity!

Standing beneath floating loads is prohibited!

4 Mechanical installation

Preparation
General information about the assembly of drive systems

The following figures show the position of the transport threads. As a standard, gearboxes from size G50BH121 onwards come with a transport thread for eye bolts in compliance with DIN 580 in the gearbox cover. In the case of smaller drives, the thread in the output shaft can be used. The eye bolt is not included in the scope of supply!

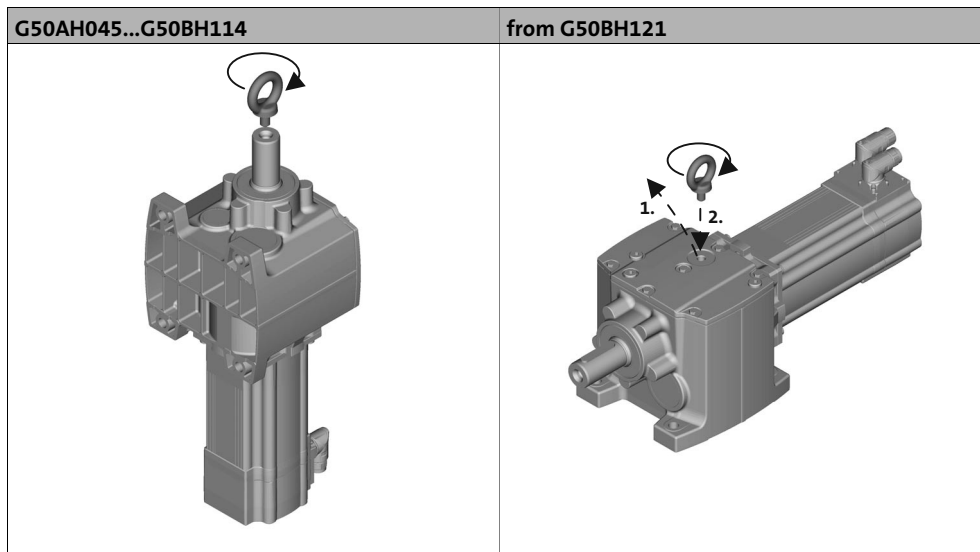



Fig. 1 Eye bolt position

Gearbox Code	Type	Thread	Max. load carrying capacity	Eye bolt as specified by DIN 580
G50AH045	g500-H45	M6	80	
G50BH110	g500-H100	M6	80	
G50BH114	g500-H140	M8	140	
G50BH121	g500-H210	M8	140	
G50BH132	g500-H320	M10	230	
G50BH145	g500-H450	M12	340	

Tab. 3 Load carrying capacity of eye bolt in kg

4.3 Preparation



Note!

Thoroughly remove anticorrosion agents from output shafts and flange faces.

4.4 Mounting

4.4.1 General information about the assembly of drive systems



Stop!

The lubricant fill quantity of the gearboxes is matched to the mounting position. The mounting position indicated on the nameplate must be observed to avoid damage to the gearbox.

4.4.2 Mounting the gearboxes



Stop!

Shocks and impacts on the shaft damage the roller bearings.

- Draw the transmission elements onto the output shaft only by using the centering thread.
- Align the gearbox shaft and transmission elements in an accurate fashion in order to prevent tensioning.
- Mount belt pulleys, sprockets, or gear wheels as closely as possible to the gearbox in order to keep the bending load of the shaft and the bearing forces at a minimum level.

4.4.3 Mounting of g500 short/servo adapters with clamping connection

Important notes

- The transmission is made in a force-fitting manner via a clamping connection. Greases, oils and other substances which reduce the friction factor reduce the torque to be transmitted which is why these should be avoided in the connection.
- The motor shaft diameter must be designed with fit k6.
- The motor centering diameter must be designed with fit j6.
- With regard to smooth running tolerance of the motor shaft, concentricity of the centering and axial runout of the mounting flange, the motor must fulfil the requirements according to DIN 42955 R (reference values for smooth running < 0.025 mm; axial runout and concentricity < 0.05 mm).

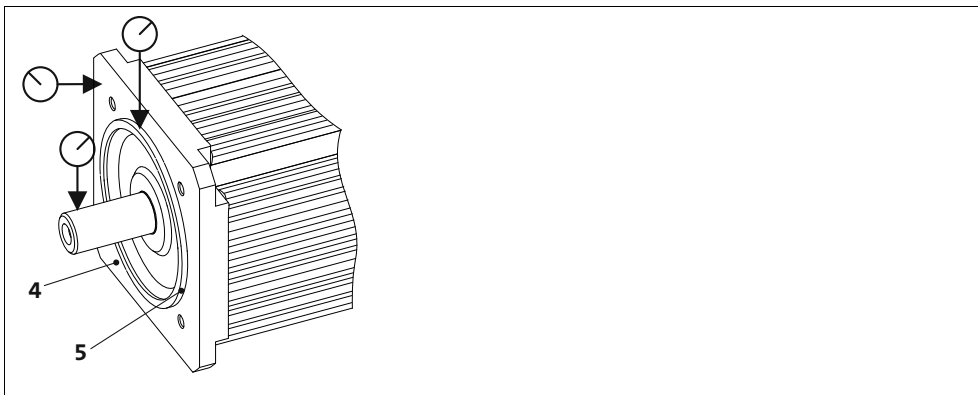


Fig. 2 Measurement of the surfaces of smooth running, axial runout and concentricity

- 4 Motor flange
- 5 Centering

4 Mechanical installation

Mounting of g500 short/servo adapters with clamping connection
Mounting the gearboxes

Preparation

- Ensure standstill of the drive system and prevent any machine movement.
- The drive system must have cooled down.
- The motor must be deenergised.



Note!

Lenze recommends the use of smooth motor shafts without slots!

1. Check:

- If the drill depth in the hollow drive shaft is sufficient for the motor shaft.
 - For this purpose, compare the drill depth from the flange face with the distance of motor shaft front side to the motor flange.
- Check of the motor shaft journal, the hollow shaft bore of the gearbox drive shaft, the flange faces and the centering at the motor and gearbox for damages. In the event of irregularities, parts have to be reworked or sorted out.

2. Cleaning:

- Thoroughly clean and degrease hollow shaft bore and motor shaft journal, Fig. 3.

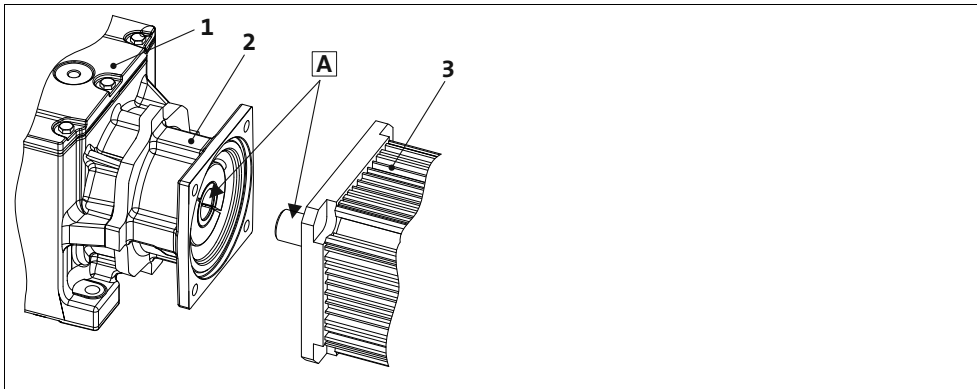


Fig. 3 Shaft surfaces

- 1 Gearbox
- 2 Bell housing
- 3 Motor

A degrease

Mounting

1. Install the gearbox vertically so that the drive end is on top and securely fasten it.
2. Locate the position of the mounting hole and remove the plug (5) from the bell housing (2) and keep it!

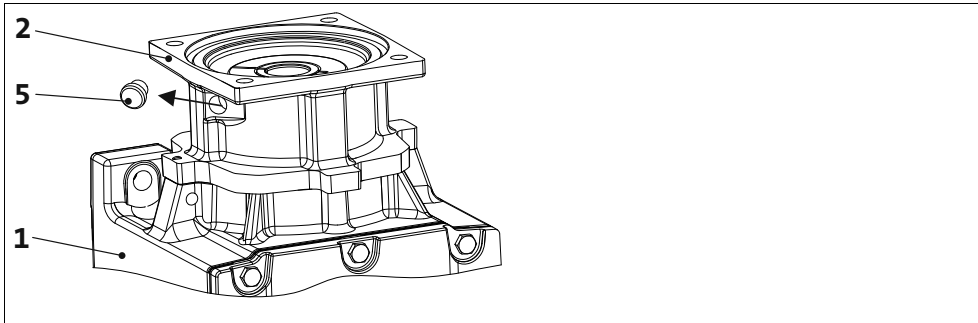


Fig. 4 Removing the plug from the bell housing

- | | | | |
|---|--------------|---|------|
| 1 | Gearbox | 5 | Plug |
| 2 | Bell housing | | |

3. Align the slots of the gearbox drive hollow shaft and the clamping ring to each other and to the mounting hole (Fig. 5).

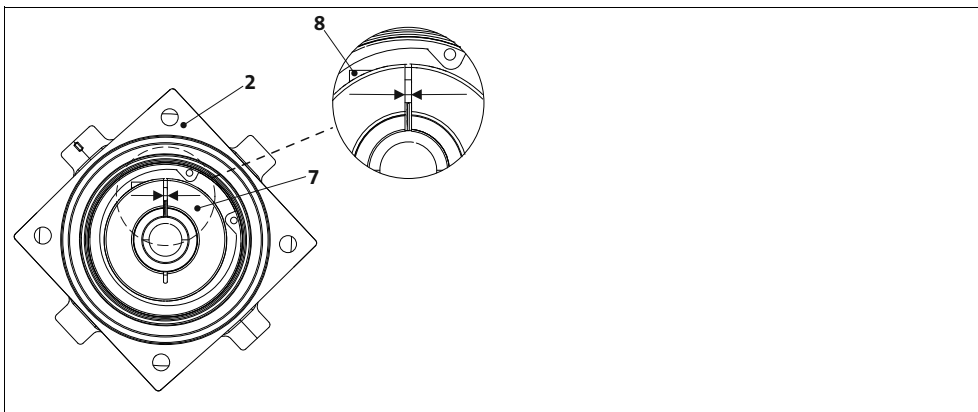


Fig. 5 Assignment: Motor shaft, clamping ring and mounting hole

- | | | | |
|---|----------------|---|---------------|
| 2 | Bell housing | 7 | Clamping ring |
| 8 | Terminal screw | | |

4. Afterwards, insert the wrench (9) into the terminal screw (8) of the clamping ring (7) and leave it there (Fig. 6). The terminal screw (8) must only be tightened to such a degree that the clamping ring (7) does not move but the shaft is not tightened yet!

4 Mechanical installation

Mounting of g500 short/servo adapters with clamping connection
Mounting the gearboxes

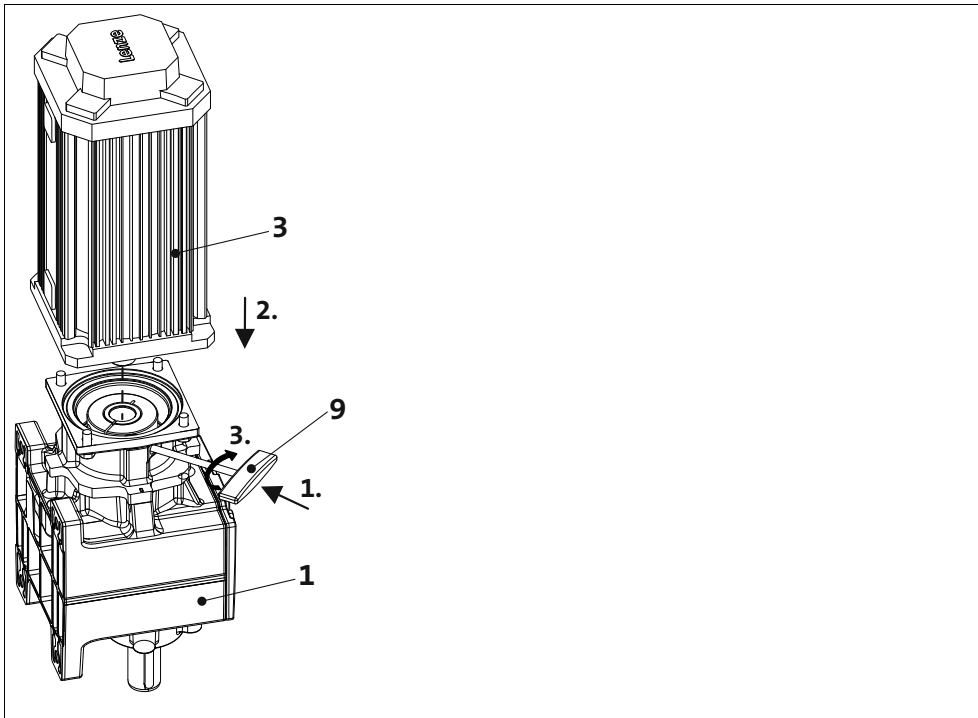


Fig. 6 Mounting of motor and gearbox

- | | | | |
|---|---------|---|--------|
| 1 | Gearbox | 9 | Wrench |
| 3 | Motor | | |



Stop!

If the motor shaft is provided with a keyway, align the motor shaft in such a way that the keyway is located opposite to the terminal screw.



Note!

Lenze recommends the use of smooth motor shafts without slots!

- Position the motor shaft vertically and centrally to the hollow drive shaft and insert it carefully into the hollow drive shaft. Exert only little force in order to prevent damage to the ball bearing in the bell housing and the motor. Never assemble the parts by applying blows! If it is difficult to put the parts together, check if the terminal screw (8) has not been tightened too much. If required, loosen it.
- Only when the flange of bell housing (2) and motor (3) lie flat on top of each other, the fixing screws may be mounted for the motor (screw strength at least 8.8, tightening torques according to strength 8.8). Secure the screw connections with medium-strength screw locking adhesive.
- Tighten terminal screw (8). Tightening torque according to table $\pm 10\%$.

Mounting of g500 short/servo adapters with clamping connection Mounting of motors on gearboxes with mounting flange

Screw [mm]	Width across flats [mm]	Tightening torque [Nm]
M5	4	6
M6	5	10
M8	6	25

8. Close the mounting hole in the bell housing (2) with the plug (5).
9. Install the geared motor into the machine / system.
 - Correct mechanical fixing and a professionally implemented electrical connection must be ensured.
10. Perform a test run;
 - Pay attention to unusual noises and vibrations.
 - Overheating is not permissible!

4.4.4 Mounting of motors on gearboxes with mounting flange and flexible coupling (drive-end version N)

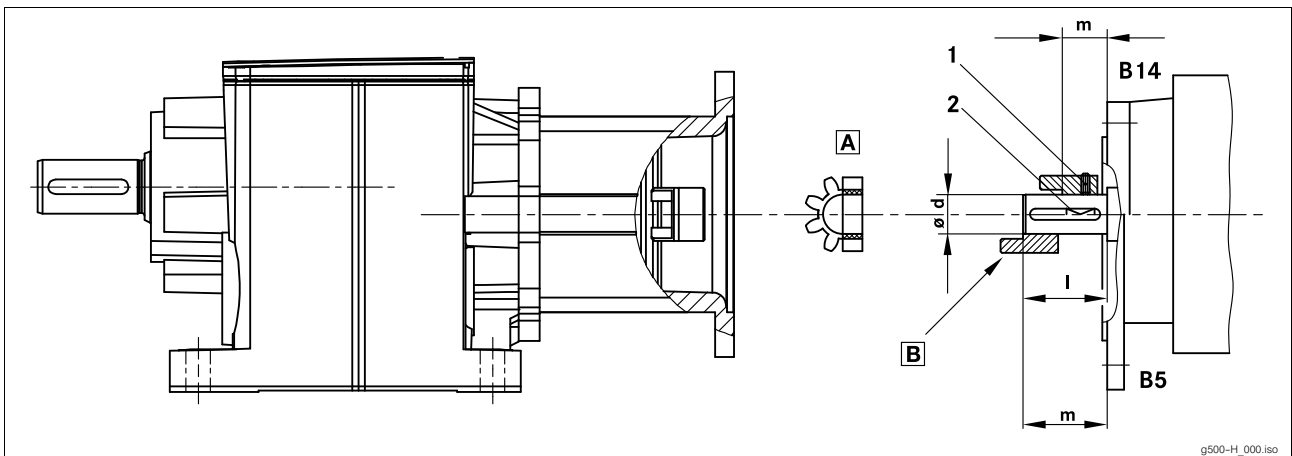


Fig. 7 Input side design N

- | | |
|----------------------------|-----------------|
| A Spider / gear rim | 1 Locking screw |
| B Coupling hub | 2 Keyway |

Drive size	Motor shaft		Assembly dimension M [mm]	Standard hub Locking screw		Clamping hub		Key ¹⁾ DIN 6885/1 [mm]	Clamping ring hub	
	D [mm]	max. l [mm]		Thread [mm]	Tightening torque [Nm]	Thread [mm]	Tightening torque [Nm]		Thread [mm]	Tightening torque [Nm]
1A	11	23	23	M4	1.5	M3	1.34	*	M3	1.34
1B	14	40	25	M5	2.0	M6	10.5	B5 x 5 x 16	M4	2.9
2B	11	23	23	M4	1.5	M3	1.34	*	M3	1.34
1C	19	40	25	M5	2.0	M6	10.5	B6 x 6 x 16	M4	2.9
2C	14	40	25							
3C	14	40	25							
4C	14	40	25							
6C	11	40	25	---	---	M6	10.5	*	---	---
7C	19	40	25	M5	2.0			M6	10.5	B6 x 6 x 16
1D	24	60	30							
2D	19	60	30							
1E	28	60	30							
2E	24	60	30							
3E	19	60	30							
4E	24	50	50							
								B6 x 6 x 18		
								*		

Tab. 4 Attachment of motors to gearboxes with mounting flange

* Use original key for the motor

¹⁾ Key for standard hub and clamping hub

4 Mechanical installation

Mounting of g500 short/servo adapters with clamping connection
Mounting of motors on gearboxes with mounting flange

4.4.4.1 Assembly of clamping ring hub

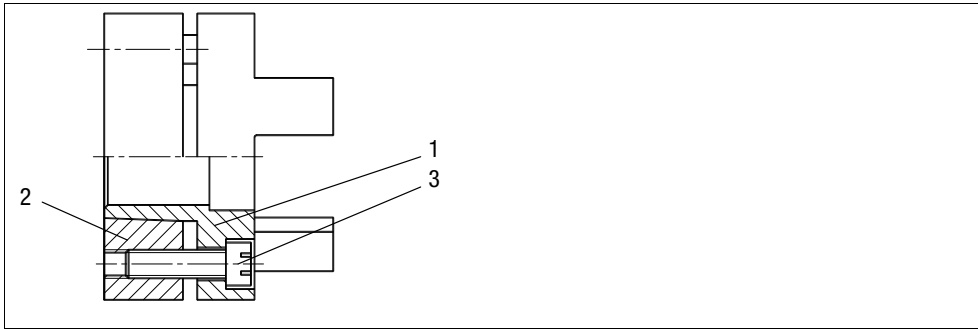


Fig. 8 Coupling
1 Clamping ring hub
2 Clamping ring
3 Clamping screws (DIN912)



Note!

The motor shaft must be designed with fit k6.

1. Grease the contact surfaces of the motor shaft using a thin-bodied oil, e. g. "Castrol 4 in 1" or "Klüber Quitsch Ex"!



Stop!

Do not use oil or grease with molybdenum-disulphide or high-pressure additives, or grease pastes!

2. Push the coupling hub over the motor shaft, mounting dimension "m" (see Fig. 7 and Tab. 4) must be observed.
3. Align the hub and tighten the clamping screws until they have contact.
4. Tighten the clamping screws evenly and crosswise with gradually rising torque until the indicated tightening torque (see Tab. 4) is reached at all clamping screws. In the intermediate steps, this procedure should also be repeated until the indicated tightening torque is reached at all clamping screws.
5. Lay spider in the coupling claw on the gearbox side.
6. Align claws of the motor-side coupling hub with its counterpart.
7. Slowly push on motor, and bolt on to the gearbox flange.

4.4.4.2 Disassembly of clamping ring hub

1. Loosen the clamping screws evenly one after the other.

**Stop!**

Each screw must only be loosened by half a revolution per pass! Unscrew all clamping screws by 3 - 4 threads.

2. Remove the screws next to the forcing threads and screw them into the other threads until they have contact.
3. Tighten the screws in the forcing threads crosswise and step-by-step so that the clamping ring is loosened.
4. Clean and grease all contact surfaces including threads and head of the clamping screws before reassembly.

4.4.5 Gearboxes with breathers**Stop!**

Do not place gearbox onto breather valve!

The G50AH045 ... G50BH121 gearboxes do not require any ventilation measures. Gearboxes that are delivered with a ventilation unit are provided with a label.

Remove the transport locking device on the vent valve before initial commissioning.

**Note!**

Loosely enclosed vent valves must be mounted in accordance with the mounting position, (📖 27).

4 Mechanical installation

Electrical connection
Gearboxes with breathers

4.5 Electrical connection



Danger!

Electrical connections must only be carried out by skilled personnel!



Note!

The notes for the electrical connection can be found in...

- in the terminal box (in the case of motors with terminal box).
- in the connection plan (in the case of motors with plugs).

5.1 Important notes



Stop!

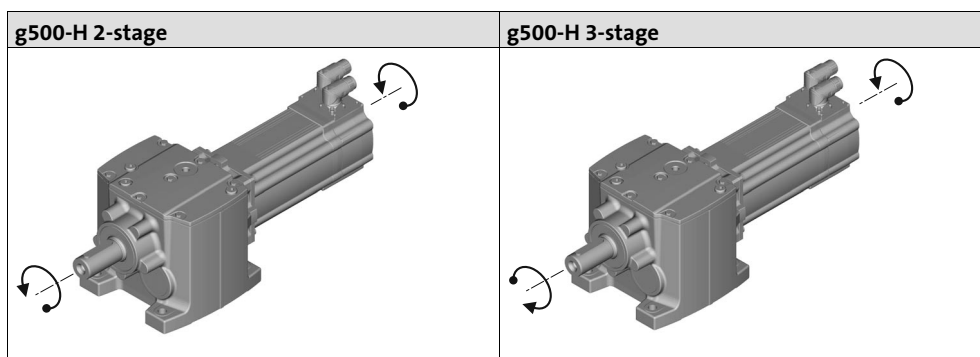
The drive may only be commissioned by skilled personnel!

- Before commissioning remove transport locking devices and keep them for later transports.
- Take safety measures prior to any operation:
 - Disconnect the machine from the mains, ensure standstill of the drive system and avoid any machine movement.

5.2 Before switching on

Please check:

- Drive function - machine function assignment
- The direction of rotation of the drive shaft



- Does the drive appear undamaged?
- Is the mechanical fixing o.k.?
- Is the electrical connection correct?
- Are all rotating parts and surfaces that may become hot protected against contact?
- For gearboxes with breathing elements:
 - Has the transport locking device been removed?



Stop!

At drive speeds below 200 rpm the amount of lubricant may need to be increased. Consultation with Lenze is required.

5 Commissioning and operation

During operation

5.3 During operation

During operation, check the drive periodically and take special care of:

- changes compared to normal operation, like
 - unusual noise, stronger vibrations or increased temperatures,
 - leakages,
 - loose fixing elements,
 - the condition of the electrical cables.
- In the event of faults:
 - shut down the drive,
 - check the troubleshooting table.

If the fault cannot be remedied, please contact the Lenze customer service.

6.1 Important notes



Note!

- Gearboxes below 200 Nm are lubricated for life.
- The mechanical power transmission system is maintenance-free.

6.2 Maintenance intervals

- In the case of gearboxes that are not lubricated for life, the lubricant must be replaced at regular intervals.
 - The type of lubricant is indicated on the nameplate. Replace the lubricant only with the same type of lubricant.
 - The lubricant change depends on the lubricant temperature, see Fig. 9.
1. Measure the lubricant temperature at the drain plug,
 2. Add 10 °C,
 3. Read the changing interval from the diagram.



Stop!

With drive systems: observe the maintenance intervals for the other drive components!

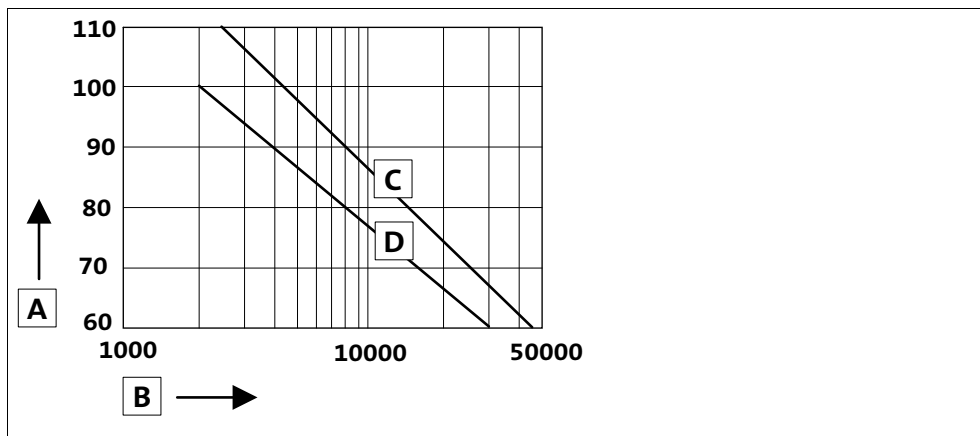


Fig. 9 Lubricant diagram

- | | |
|---|-------------------------------|
| Ⓐ Oil sump temperature [°C] | Ⓒ Synthetic oil CLP HC/CLP PG |
| Ⓑ Oil life/changing intervals [operating hours h] | Ⓓ Mineral oil CLP |



Stop!

Irrespective of the operating hours, an oil change must be carried out every three years at the latest!

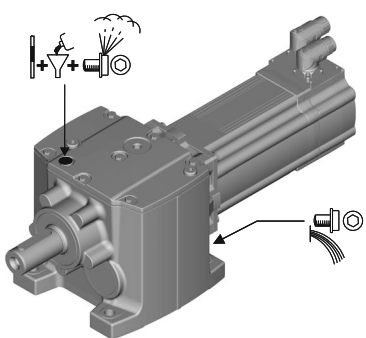
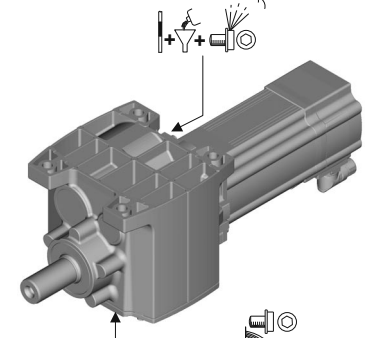
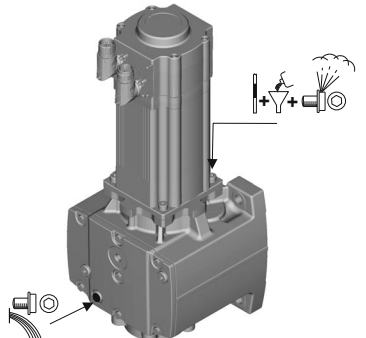
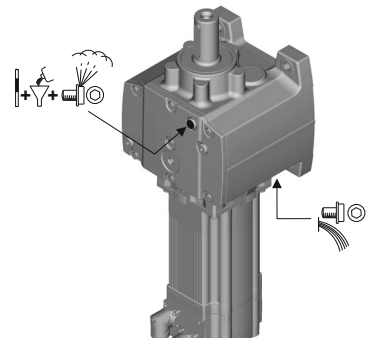
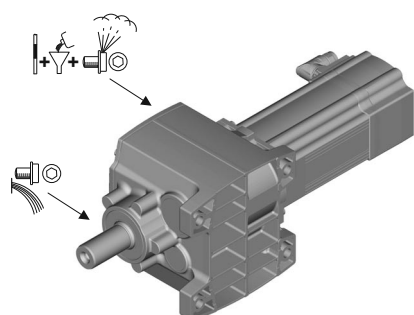
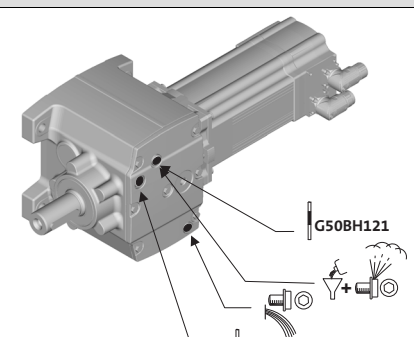




6 Maintenance

Maintenance operations

6.3 Maintenance operations

The gearboxes are ready to use on delivery and filled by Lenze with the lubricant type and lubricant quantity indicated on the nameplate. The initial filling corresponds to the mounting position and design indicated on the nameplate.

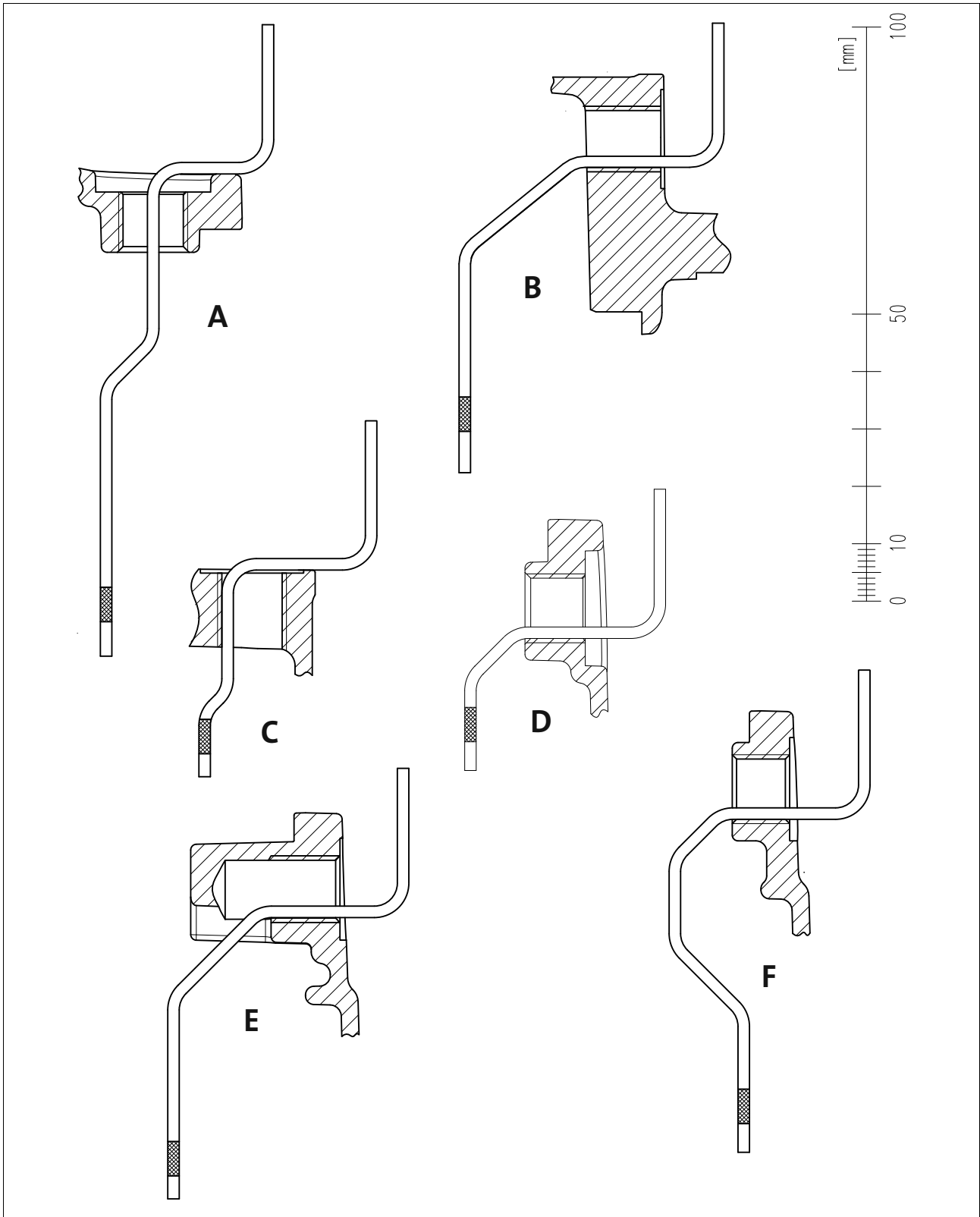
Breather position, oil filling screw and drain plug

<p>A</p> 	<p>B</p> 
<p>C</p> 	<p>D</p> 
<p>E</p> 	<p>F</p> 
 Filler	 Drain
 Breather element	 Check

Oil-level inspection

Check the oil level by means of the displayed dipsticks. Manufacture them according to the mounting position.

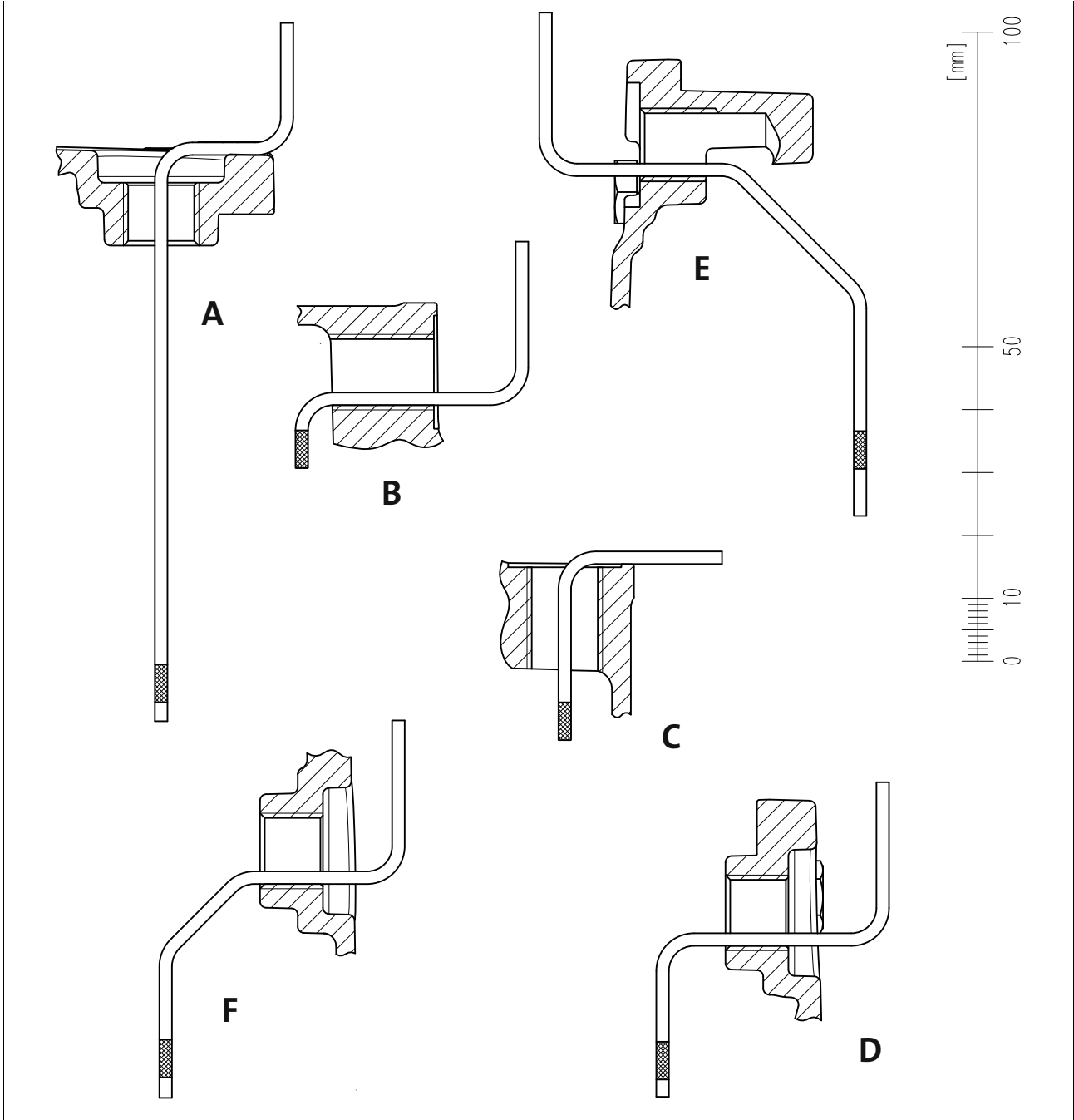
Form template: dipsticks for G50BH121



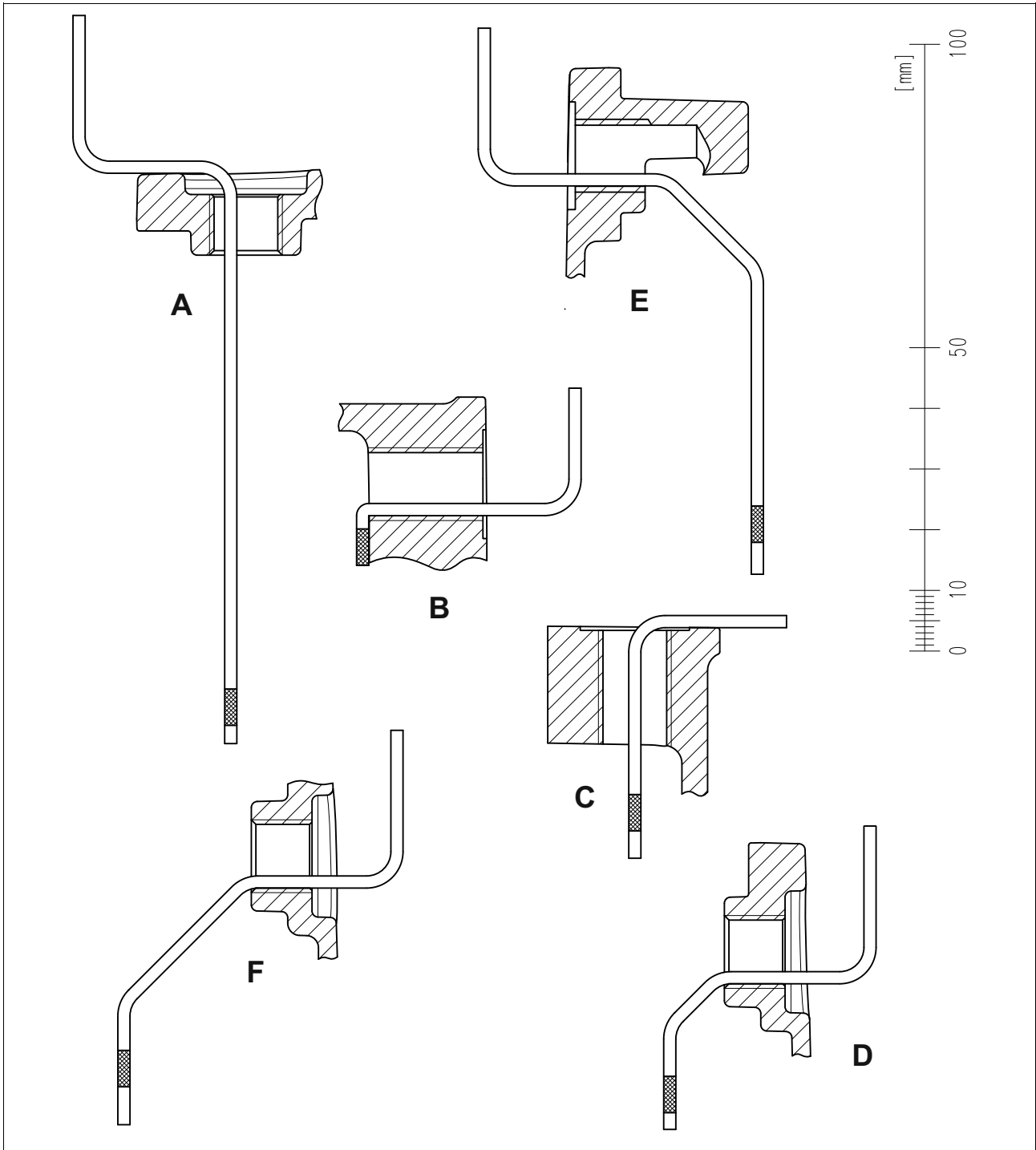
6 Maintenance

Maintenance operations

Form template: dipsticks for G50BH132



Form template: dipsticks for G50BH145



6 Maintenance

Repair


Changing the lubricant



Stop!

- The gearbox should be lukewarm in order that the oil flows well but there is no risk of scalding.
- Secure the drive system and machinery against unintended movement or mains power-up.

The type of lubricant indicated on the nameplate by the following manufacturers is approved.

Shell	Klüber	Fuchs
		

Version	Lubricants		
	CLP 460	CLP HC 320	CLP HC 220 USDA H1
Ambient temperature [°C]	0 °C ... + 40	-25 °C ... + 50	-20 °C ... + 40
Specification	Mineral oil with additive compounds	Synthetic oil (synthetic hydrocarbon/poly-alpha-olefin oil)	
Fuchs	Fuchs Renolin CLP 460	Fuchs Renolin Unisyn CLP 320	
Klüber	Klüberoil GEM1-460 N	Klübersynthl GEM4-320 N	Klüberoil 4 UH1-220 N
Shell	Shell Omala S2 G 460	Shell Omala S4 GX HD 320	
bremer & leguil			Cassida Fluid GL 220

1. Place receptacle under oil drain plug.
2. Remove breathing / oil filler plug.
3. Completely drain lubricant by removing the oil drain plug.
4. Reinsert drain plug (if necessary, replace seal).
5. Fill in lubricant through filler hole (quantities see nameplate).
6. Screw in breathing / oil filler plug.
7. Dispose of waste oil according to the applicable regulations.

6.4 Repair

- We recommend having all repairs carried out by the Lenze Service department.

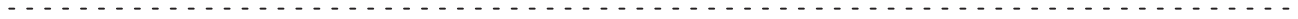
If any malfunctions should occur during operation of the drive system, please check the possible causes using the following table. If the fault cannot be eliminated by one of the listed measures, please contact the Lenze Service.

Fault	Possible cause	Remedy
Drive is not running	Voltage supply interrupted	Check connection
	Faulty electrical connection	Check that supply voltage matches nameplate data
	Excessive load	Reduce load Check drive-machine assignment
Motor is running, but gearbox is not running	Coupling components are missing or defective	Check mounting
	Gearbox is defective	Inform Lenze Service
	Clutch disengaged	Engage the clutch
Unusual running noises	Overload	Reduce load Check drive-machine assignment
	Damage to the gearbox or motor	Inform Lenze Service
Excessive temperature	Overload	Reduce load Check drive-machine assignment
	Inadequate heat dissipation	Improve cooling air flow Clean gearbox / motor
	Lack of lubricant	Top up lubricant according to regulations
Vibrations, noise	Loose fixing elements	Tighten fixing elements
Oil is leaking	Wrong oil level for the applied mounting position	Check mounting position (see nameplate) and oil level
	Initial insignificant leakage at the shaft sealing ring	Optimum sealing conditions only develop after the run-in period
	Overpressure due to lacking ventilation	Install ventilation according to the mounting position
	Overpressure due to polluted ventilation	Clean ventilation
	Worn-out shaft sealing rings	Change shaft sealing rings
	Cover / flange screws are loose	Check that the fixing screws are tightly fastened. Continue to monitor the gearbox



Notes







Lenze Drives GmbH
Postfach 10 13 52
D-31763 Hameln
Germany

☎ +49 5154 82-0

📠 +49 5154 82-2800

@ Lenze@Lenze.com

🌐 www.Lenze.com



Lenze Service GmbH
Breslauer Straße 3
D-32699 Extertal
Germany

☎ 0080002446877 (24 h helpline)

📠 +49 5154 82-1396

@ Service@Lenze.com

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