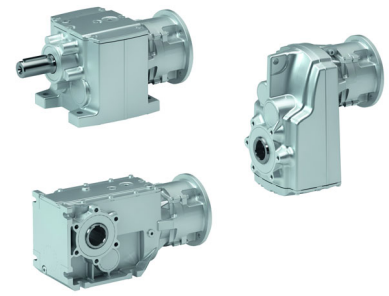


ATEX-g500

Gearboxes



B45 ... B4300
H45 ... H3000
S130 ... S4500

Operating Instructions

EN



13588038

Lenze



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

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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.



Tip!

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

Validity

These instructions apply to the following gearbox types:

Type	Type code	Name
g500-B45 ... B4300	g50BB111 ... g50BB243	Bevel gearbox
g500-H45 ... H3000	g50BH110 ... g50BH230	Helical gearbox
g500-S130 ... S4500	g50BS133 ... g50BS245	Shaft-mounted helical gearbox

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.

1 About this documentation






Document history

1.1 Document history

Material number	Version			Description
13505327	1.0	01/2016	TD09	First edition for the pilot series
13505327	1.1	01/2016	TD09	Terminology was changed in various chapters
13513442	2.0	05/2016	TD09	Declaration of Conformity renewed
13554768	3.0	06/2018	TD09	Array of products extended
13554768	3.1	08/2018	TD29	View of the Declaration of Conformity modified
13588038	4.0	10/2019	TD09	Various chapters were revised or added
13588038	4.1	12/2019	TD09	Position designations of mounting positions updated

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

Important notes

2.1 Important notes

- These operating instructions only apply in connection with the g500-B / g500-H / g500-S mounting instructions!
- Observe operating instructions for devices with individual ignition protection, e.g. motor!
- If the data are inconsistent, these operating instructions have priority.
- Pay attention to an installation according to EMC, especially for frequency inverter operation!

If these operating instructions are disregarded, especially the inspection and maintenance intervals, the EU declaration of conformity will become void.

For the evaluation of the product, the following versions of the standards are taken into account:

- EN ISO 80079-36:2016
- EN ISO 80079-37:2016
- TRGS 727:2016

2.2 Application as directed

The gearboxes / geared motors are intended for use in machinery and systems and may only be used in accordance with these operating instructions, the nameplate and the text of the order confirmation. They correspond to existing standards and regulations and meet the requirements of EU directive 2014/34/EU.

Explosive gas, fog, vapour, or dust atmospheres can cause severe injuries or death when getting in contact with hot and / or sparking parts of the geared motor.

All operations concerning mounting, connection, commissioning as well as maintenance and repairs on the gearbox /geared motor and the electrical supplementary equipment must only be carried out by qualified personnel!

- For installation, observe EN 60079-14 for locations with potentially explosive atmospheres!

The machines can be used as follows:

- A In zone 2 (gas Ex, category 3G, EPL Gc) in explosion groups IIA, IIB and IIC.
- B In zone 22 (dust Ex, category 3D, EPL Dc) in explosion groups IIIA and IIIB.
- C In zone 1 (gas Ex, category 2G, EPL Gb) in explosion groups IIA, IIB and IIC.
- D In zone 21 (dust Ex, category 2D, EPL Db) in explosion groups IIIA and IIIB.



Note!

Observe nameplate data with regard to the category and explosion group!

2.3 Disposal

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

2.4 General requirements

The gearboxes/geared motors have been designed for industrial applications. Any other use is improper use.

- To ensure safe operation, the gearboxes/geared motors are only to be used in accordance with the information in the operating instructions and the technical data sheet. During use, the required legal and safety instructions for the respective application are also to be observed. This also applies analogously to the use of accessories.
- We cannot be held liable if the notes specified in this extract are not observed or in the event of improper handling of the product. Furthermore, the warranty for products and spare parts shall be considered null and void.
- The products are not safety elements in the context of the intended use.

2.5 General safety information

The gearboxes/geared motors correspond to the state of the art and are safe to operate. The product may be a source of residual hazards if it is used and operated improperly by untrained personnel.

Every person commissioned with the installation, commissioning, maintenance, or repair of the gearboxes/geared motors must have read and understood the customer documentation and, in particular, the safety-related notes.

- When selecting and operating a product, comply with generally accepted engineering rules.
 - All connected electrical and mechanical equipment must be suitable for the respective application.
- Observe the notes in these operating instructions as well as the operating conditions and permissible data specified on the labels/nameplates of the respective products.
 - Ensure that only the types of protection for products corresponding to the respective zones are installed!
 - The product is only approved for proper and intended use in normal industrial atmospheres.
 - Ensure that no falling objects can strike the products. In connection with rust, light metals, and kinetic energy, an exothermic ignitable reaction may be triggered.
 - The operator is to ensure lightning protection for the entire system in compliance with local regulations.
- Note that live conductors must never be disconnected! This may result in danger to life if an explosive atmosphere is present at that point in time.
- Take suitable measures to rule out impermissible interferences.


2 Safety instructions

General safety information

- The surface on which the products are mounted must be load-bearing and clean.
- The gearboxes/geared motors (surface) and the connecting cable must not be damaged.
- All cables must be laid such that they are protected against external mechanical influences.
- Electrical cables/equipment must only be installed by a qualified electrician and must fulfil the requirements of any additional applicable standards (e.g. EN 60079-14).
- The manufacturer of the motors should be informed of the issue of "Shaft voltages in frequency inverter mode"; in his operating instruction, the operation of the motors with frequency inverters must be explicitly permitted. The shaft voltages generate significant currents which irreparably damage the ball bearings in standard machines. This situation can only be remedied by using ceramic balls in the bearings (expensive variant) or by using insulated bearings (simpler variant).
- Ventilation equipment is to be kept free and clear.
- Simple electrical equipment may be installed in mounting boxes; they may be used in intrinsically safe electric circuits. In all cases, the manufacturer is to draft a control drawing for this purpose (proof of intrinsic safety) and attach it to the delivery documents.
- When assembling the motor and gearbox (except for products which are delivered by the manufacturer in an already combined fashion), the permissible angle error is to be observed.
- Ensure that the air velocity of the fans in dusty atmospheres does not exceed a value of 20 m/sec.

3.1 Identification

3.1.1 Gearbox / geared motor product code

 The information for identification by gearbox code is included in the mounting instructions for g500-B / g500-H / g500-S.

ATEX classification

Example		Ⓔ	II	2	G	Ex h	IIB	T3
Meaning	Variant	ATEX classification						
Classification	Explosion protection symbol	Ⓔ						
Device group	Above-ground use		II					
Category	Zone 1, 21			2				
	Zone 2, 22			3				
Drive design	Explosive atmosphere caused by gas				G			
	Explosive atmosphere caused by dust				D			
Ignition protection type	Constructional safety/liquid immersion					Ex h		
Explosion group: Areas exposed to gases	High ignition power required						IIA	
	Medium ignition power required						IIB	
	Low ignition power required						IIC	
Exposed to dust	Lint						IIIA	
	Non-conductive dust						IIIB	
	Conductive dust						IIIC	
Temperature class/temperature limits for the zones	≤450°C							T1
	≤ 300°C							T2
	≤ 200°C							T3
	≤ 135°C							T4
	≤ 100°C							T5
	≤85°C							T6

3.2 Short overview of the new mounting positions

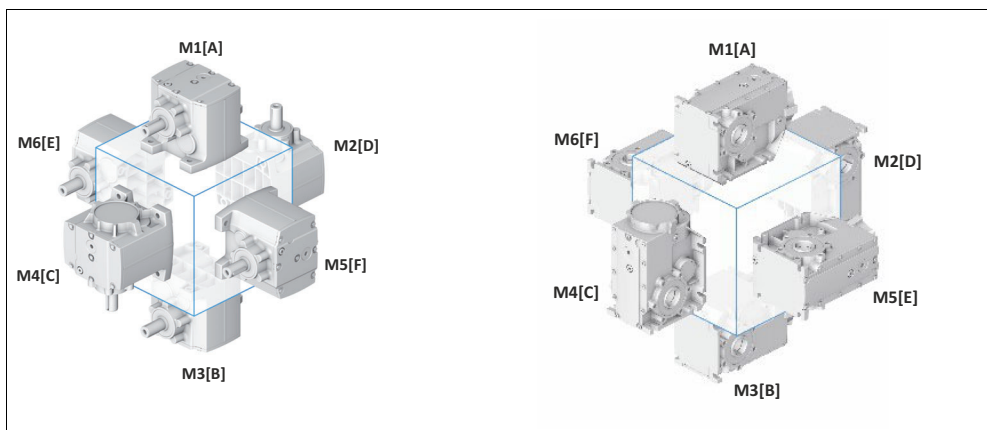


Fig. 1 Example of mounting positions on a H gearbox: new designation [old designation]

3 Product description

Nameplate

3.2.1 Nameplate

ATEX gearbox - nameplate with serial no. and bar code

Lenze			1	15
42			6	
5.1	7.2	28		
5.2	5.3/5.4	38 1)		
10.1	39.4	5.11		
⊕ 39.5			18	39.7
⊕ 39.6			10.2/10.3	
40			11	

GT-ATEX-001.des

1) Data only for gearboxes with a motor

Pos.	Contents
1	Manufacturer / production location
5	Technical data
5 5.1	Ratio
5 5.2	Rated torque
5 5.3	Rated speed
5 5.4	Rated frequency
5 5.11	Maximum input speed
6	Mounting position / position of the system blocks
7	Lubricant details
7 7.2	Lubricant type
10	Production data
10 10.1	Order number
10 10.2	Material number
10 10.3	Serial number
11	Bar code
15	Applicable conformities, approvals and certificates
18	Year of manufacture / week of manufacture
28	Degree of protection of the gearbox / geared motor
38	Load capacity
39	ATEX details on the gearbox
39.4	ATEX temperature range (only specified if deviating from -20 °C ... +40 °C)
39.5	Explosion protection specification for gas
39.6	Explosion protection specification for dust
39.7	ATEX file number
40	Additional data
42	Gearbox/geared motor type

4.1 Important notes



Observe the "Important notes" chapter of the mounting instructions.

Depending on the model, various temperature classes may be specified on the nameplate; for T4 / T3 the qualification is in regard to the surface temperature; for all gases, vapours, and mists with an ignition temperature $> 135\text{ °C} / 200\text{ °C}$, the equipment is not an ignition source. In dust Ex atmospheres, $125\text{ °C} / 140\text{ °C}$ is the reference temperature for further considerations regarding the safety distance of 75 K from the glow temperature, only 2/3 of the ignition temperature, dust thickness $< 5\text{ mm}$, etc.

Generally, the geared motors from 0.06 to 45 kW are operated in a temperature range of $-20\text{ °C} \dots 40\text{ °C}$ without power reduction. At higher ambient temperatures, a reduction of the rated power is necessary. As the standard for gas explosion protection, the explosion group IIB is specified; IIC requires a special routine test, inter alia for equipotential bonding and the film thickness of paints.

4.2 Preparation

- It must be checked that the data given on the nameplate of the gearbox/motor and in the order confirmation text comply with the permissible explosion-proof application conditions on site:
 - Explosion group
 - Category
 - Zone
 - Temperature class
 - Maximum surface temperature
- Mount the gearbox only in the mounting position indicated on the nameplate!
- The max. input speed and the max. rated torque given on the nameplate must not be exceeded!
- The application limits for temperature class T4 (gas Ex) and T125 °C (dust Ex) are specified in the chapter 6.3 "Surface temperature limit". In particular, for input speeds $< 200\text{ rpm}$, a consultation with Lenze is required.
- The application of the gearboxes is only permissible at an ambient temperature of -20 °C to $+40\text{ °C}$ unless the nameplate bears another temperature.

Tighten all screw connections with the torques given and lock them with standard screw locking adhesive!

4 Mechanical installation

Ambient conditions

Strength	Thread												
	M3	M4	M5	M6	M8	M10	M12	M16	M20	M24	M27	M30	M36
4.8	0.7	1.4	2.8	4.8	12	23	-	-	-	-	-	-	-
8.8	1.3	3.0	5.9	10.1	24.6	48	84	206	415	714	1050	1428	2482
10.9	1.9	4.6	8.6	14.9	36.1	71	123	302	592	1017	1496	2033	3535

Tab. 1 Tightening torques for friction factor $\mu = 0.12$; tolerance of the tightening torque $\pm 10\%$

Please note: increase the tightening torque by 10% for screwed connections with flat gaskets.

4.3 Ambient conditions

The following must be ensured:

- During mounting there must be no explosive atmospheres, oils, gases, vapours, combustible dusts etc.
- The lubricant must be adapted to the ambient temperature.
- If the site contains substances that act in a chemically aggressive fashion (which, for instance, affect elastomer materials), it must be examined whether the gearbox/geared motor is stable with regard to the substance!
For this purpose, consult Lenze.
- All processes which may cause an impermissibly high electrostatic charge of the varnish coating of the gearbox / geared motor must be avoided.
- In explosive atmospheres due to the presence of dust, highly charge-generating processes (which lead to propagating brush discharges) must be avoided.

4.4 Installation / mounting condition



Danger!

The installation of the gearbox onto/into the customer machine must be made in such a way that no clearances may develop where dust can deposit which may come into contact with moving parts (risk of heat development).

The gearboxes are filled in the factory with the required quantity of oil.



Danger!

- A change in mounting position may only be carried out after consultation with Lenze. The ATEX approval no longer applies when Lenze is not consulted!
- Parts of the gearbox can be made of aluminium and must be protected against external shocks in order to prevent shock sparks!
- The gearboxes/geared motors must **not** be used in systems with cathodic protection!
- The gearboxes and motors must be included in the equipotential bonding of the system.
- Placing an installation above hot parts on which, for instance, leaking oil may ignite is not permissible. If required, install an oil collecting trough.
- For use in the areas of explosion group IIC, the total thickness of all paint layers must not exceed 0.18 mm. For explosion group IIB, the maximum is 1.5 mm.

Repair paint damages in order to avoid corrosion.

Protect uncoated steel / cast iron surfaces against corrosion by the use of suitable anticorrosive agents.

4 Mechanical installation

Mounting of input and output elements
Mounting with belt pulleys

4.5 Mounting of input and output elements

Only suitable input and output elements must be used for the application in areas with increased danger of explosion!

The applicability can be proven by:

- A an own ATEX approval or
- B a standardised evaluation of the danger of ignition.

Mount transmission elements only by means of a pusher tool and / or the tapped centre hole at the end of the shaft.

The forces of the transmission elements must not exceed the permissible radial and axial forces.



Danger!

- Avoid blows and impacts on the shaft at all costs. Damages could result at the roller bearing, housing and shaft.
- Tighten all screw connections with the torques given and lock them with standard screw locking adhesive!
- The assembly of the single components tested by ATEX must be checked for new ignition danger.

4.5.1 Mounting with belt pulleys

In the case of belt pulleys, the correct tension of the belt specified by the manufacturer must be observed, in order to prevent the belt from slipping, which entails an increase in temperature.



Danger!

Belt drives are permissible in potentially explosive atmospheres under the following conditions.

- The belt drive is only to be outfitted with conductive belts in accordance with TRGS 727.
- The belt drive is equipped with a pre-tensioning device.
- The belt drive is designed for at least 50 K above the maximum ambient temperature.
- The supporting frames and/or connections with the belt drive are only to be operated when earthed.
- The power of the transmission, the maximum belt speed, the correct belt tension range and how it is measured, and the alignment tolerance are defined in the original operating instructions.
- In explosion group IIC, no belt drives are permissible in category 2!
- Approval is only given in explosion groups IIA/IIB for circumferential belt speeds of ≤ 30 m/s.

4.6 Information on gearboxes with shrink disc

**Danger!**

All screw connections must be locked with standard screw locking adhesive!

The customer shaft must meet the following requirements:

- Sufficient material strength, yield point $R_e > 360 \text{ N/mm}^2$ (use e. g. C45 or 42 CrMo4)
- Medium surface roughness $R_z < 15 \mu\text{m}$
- Shaft fit in quality h6

**Danger!**

Stainless steel connections must be checked by Lenze due to the modified friction factors.

It is absolutely necessary to ensure that the shrink disc is mounted correctly (Ⓢ g500-B /-S mounting instructions). A shrink disc connection that is not mounted correctly may slip, and the heat generated in this process may produce a potential ignition source.

The maximum permissible torques of shrink disc connections must not be exceeded! Observe the following table.

4 Mechanical installation

Information on gearboxes with shrink disc
Shrink disc and hollow shaft cover

Gearbox type	Gearbox code	Hollow shaft bore [mm]	Max. torque [Nm]
g500-B110	g50BB111	20	200
g500-B240	g50BB124	30	380
		35	750
g500-B450	g50BB145	35	660
		40	1030
g500-B600	g50BB160	40	1030
g500-B820	g50BB182	40	1450
g500-B1500	g50BB215	50	2900
g500-B2700	g50BB227	65	5200
g500-B4300	g50BB243	75	9000
		80	10600
g500-S130	g50BS113	25	200
g500-S220	g50BS122	25	300
		30	420
g500-S400	g50BS140	35	660
		40	1030
g500-S660	g50BS166	40	1030
g500-S950	g50BS195	40	1450
g500-S2100	g50BS221	50	2900
g500-S3100	g50BS231	65	5200
g500-S4500	g50BS245	75	9000
		80	10600

Tab. 2 Torques of the shrink disc connections



Danger!

The torque values in Tab. 2 apply to a true torque stress. If a radial or axial force is at work, it is necessary to consult Lenze.

4.6.1 Shrink disc and hollow shaft cover



Danger!

If the cover is supplied with a seal, it must be installed to prevent the ingress of dust.

After mounting the cover it must be ensured by means of a test run that the shrink disc or the plugged-in machine shaft does not rub against the cover.

The cover must be protected against impact and falling objects using suitable measures. Any attached protective devices must be electrically conductive and integrated in the equipotential bonding.

If the cover is damaged, the cover and seal must be replaced to avoid ingress of dust. The dispersion of dust which might have ingressed must be prevented. Thus, if ingress of dust is suspected, the shrink disc cover must be removed and cleaned according to the local conditions. Covers that are no longer firmly seated must be replaced by new ones.

4.7 Shaft sealing rings



Note!

If the site contains material that might affect elastomer materials, the stability of the shaft sealing rings with regard to the material has to be inspected.

For this, please consult Lenze.

Lenze uses shaft sealing rings of fluoro rubber (FKM) or acrylonitrile butadiene rubber (NBR).

Shaft sealing rings seal the gap between the housing and the rotating shafts. These are wearing parts whose replacement is required after reaching the wear limit.

In the case of abrasive environmental conditions, protect shaft sealing rings against contact with the abrasive material.

The service life of shaft sealing rings is influenced by many parameters including the following:

- Circumferential speed at the sealing lip
- Temperature
- Internal pressure in the gearbox
- Lubricant viscosity
- Chemical composition and additivation of lubricants
- Installation (lubricant supply of the sealing lip)
- Particles or metallic abrasion in the lubricant
- Material of shaft sealing ring

Due to this multitude of influencing parameters, without tests that are tailored to the application it is almost impossible to make an exact statement with regard to the service life. Since the service life of the shaft sealing rings is subject to the variations described above, regular inspections are absolutely required. This is the only way of avoiding an unnoticed loss of lubricant in the gearbox (time intervals (📖 29)).

During the renewal of the shaft sealing ring, the condition of the sealing lip contact areas on the shaft must also be checked. If grooves are noticeable, the shaft must be serviced or replaced. Alternatively, the shaft sealing ring can be mounted slightly moved in axial direction so that the sealing lip runs on a new location.

4 Mechanical installation

Lubricants
Shrink disc and hollow shaft cover

4.8 Lubricants

A sufficient amount of lubricant in the gearbox is essential to ensure its reliable function. The lubricant prevents dry running in the metallic contacts as well as resulting impermissible surface temperatures or mechanical sparks. The main risk in this respect is an unnoticed loss of lubricant. Therefore the gearboxes must be monitored at regular intervals with regard to the loss of lubricant (📖 29). For this purpose a leakage inspection and oil-level inspection must be carried out.



Danger!

- The lubricant must be changed at defined intervals (📖 29).
- The gearbox must be inspected for leakage at regular intervals!

4.9 Roller bearings

The roller bearings in the gearboxes also have a finite service life under perfect operating conditions. This so-called fatigue life is a purely statistical value for roller bearings. The actual service life that a single bearing reaches may differ greatly. For this reason, a regular inspection and/or monitoring of the roller bearings is necessary.

The following measurements are carried out for monitoring:

- Running noises
- Temperature
- Vibration diagnosis
- Frequency analysis

A combination of several measurements is frequently applied. During the measurements, the periodic change is generally checked, i.e. reference values are determined after a short run-in period and compared with the subsequent measurements. This allows for determining changes in the operational performance that point to a forthcoming loss or a necessary maintenance.

The roller bearing industry offers appropriate devices for monitoring (e.g. from SKF or FAG). The roller bearing industry also offers the possibility of having their experts perform the monitoring. Please contact the roller bearing industry concerning an appropriate measure for your specific situation.



Note!

In order to make it easier to assess at which point in time a preventive replacement is advisable, a calculation should be carried out at Lenze if the precise operating conditions are known. This recalculation makes it possible to provide recommendations with regard to the changing intervals of the roller bearings.

4.10 Mounting of motors on gearboxes with mounting flange




Stop!

- In frequency inverter operation, the motor must be provided with a corresponding ATEX approval.
- In frequency inverter operation in explosion group IIC, stray currents must be ruled out, since very low stray currents are already potentially explosive.
- Operation of the gearbox must be permissible for all working points! If required, consult Lenze.



Note!

The IP enclosure specified may be only obtained by mounting a motor to the mounting flange.

- The motor flange must fully cover the access to the interior of the bearing flange/adaptor and prevent the ingress of dust and liquids. Use a suitable surface sealing compound on the contact area of the motor flange and bearing flange for sealing purposes.
- Mount coupling hub on the motor side,  documentation for the respective gearbox.
- Lock screws at the clutch hubs with adhesive for medium-strength screw locking.
- Tighten all screw connections with the torques given and lock them with standard screw locking adhesive!
- Clamping hubs must only be used together with a featherkey, otherwise the hubs may slip in the event of sudden torque changes!
- Check the clutch in the prescribed maintenance intervals.
- Observe maximum permissible load at the mounting flange according to the mounting instructions.

5 Electrical installation

Motor connection

5.1 Motor connection



Note!

Please observe the operating instructions for the explosion-protected motor!



Danger!

Hazardous electrical voltage

The electrical installation has to be carried out by skilled personnel in compliance with electrotechnical regulations and standards.



Stop!

- In frequency inverter operation, the motor must be provided with a corresponding ATEX approval for frequency inverter operation.
- In frequency inverter operation in explosion group IIC, stray currents must be ruled out, since very low stray currents are already potentially explosive.

The manufacturer of the motors must grant approval for frequency inverter mode. Only flameproof motors are permitted in this case!

The N-end bearing of the motors must be outfitted with an insulated bearing.

- Exceptions are permissible for flameproof motors IF an insulating coupling is used at the motor shaft; this is the case for Lenze ATEX gearboxes / geared motors with bearing flange with jaw coupling.
- Alternatives:
 - The installing party evaluates the influence of the vagrant currents under its own responsibility.
 - Note: For smaller motors up to approx. 6 kW and an impedance $< 10 \text{ M}\Omega$ between the drive end and N-end bearing, dangerous external vagrant currents are generally not to be expected.

The gearboxes/geared motors are to be installed in a higher-level system. Depending on the degree of protection, the time for the cleaning of the equipment (dust deposits) is to be defined. It must be ensured that only the types of protection for the device which correspond to the zones/categories are installed! During installation, the valid national installation regulations, e.g. EN 60079-14 must be observed.

Important facts

- In zone 1 and/or zone 2 (category 2G; EPL Gb and 3G; EPL Gc) and zone 21 (category 2D; EPL Db) and/or Zone 22 (category 3D; EPL Dc) - be sure to observe restrictions indicated on the nameplate and/or the accompanying documentation! - the product is only to be put into operation by specialists with a qualification similar to a qualified person pursuant to TRBS 1203. The category 2 gearboxes can be combined with category 3 drives; however, they will then only be usable in the associated zone.
 - When doing so, the information on the nameplate and in the order confirmation must be observed.
 - Observe the notes in these operating instructions as well as the operating conditions and permissible data specified on the labels/nameplates of the respective products.
- The gearboxes/geared motors may only be used in conventional industrial atmospheres. If aggressive substances are present in the air, Lenze must always be consulted first.
 - The operation of the product is only permissible in a completely assembled and intact state. In the event of any possible leaks in the system, the operator must note the possibility of any changes in zone classification caused by this.
 - The ambient conditions specified in the operating instructions must always be observed and protected accordingly against adverse ambient conditions. Heat radiation from foreign products/components are also to be taken into account.
 - Some components may be made of light metals. These must be protected against external impacts.
 - The gearboxes/geared motors are to be protected against the impermissible ingress of liquids and/or pollution.

5 Electrical installation

Motor connection

- The gearboxes/geared motors are only to be operated with the lubricants specified in chapter 7.3. The solidification/freezing point and/or the flow temperature, inter alia, are also to be observed. Sufficient lubricant must be present.
- Stuck parts (e.g. due to frost or corrosion) must not be released with force if an explosive atmosphere is present. Hence, freezing conditions must be avoided.
- The gearboxes/geared motors must only be exposed to minimal vibrations. Operation is not permitted in the resonance range of the system or the Lenze drive system.
- Equipotential bonding is to be established. It is to be handled in accordance with installation regulations in the user country (VDE 0100 Part 540, IEC 364-5-54). This is to be checked before commissioning. An insulated structure is not permissible!
 - Ensure that the equipotential bonding includes all conductive parts.
 - The gearboxes/geared motors must not be used in systems with cathodic corrosion protection; in borderline cases, consult the manufacturer.
 - Pay particular attention to ensure that no compensating currents (generated e.g. by motors which are operated with frequency inverters, welding systems and/or cathodic corrosion protection systems) are carried via the drives.
 - Check separately that any possible electrostatic hazards are minimised via the use and putting up of warning signs. Electrostatic charges are to be avoided.
- Direct high-energy electrostatic discharge to the equipment is not permissible (generally cannot be generated by human contact).
- To ensure that electrostatic charges are drained, the national requirements are to be observed.
 - In particular, insulated built-up capacitances are to be avoided. The gearboxes/geared motors are to be electrostatically earthed. The earthing resistance is not to exceed a limit value of 1 MΩ.
 - The effectiveness of the drainage of the equipotential bonding is to be verified annually.
- The permissible ignition temperature of a gas must have a safety distance of at least 10 K to the temperature class; the greater the better. In individual cases, after special consideration and evaluation, this limit may be lowered to 5 K.
 - Coatings/paints with a thickness of up to 0.18 mm are permissible in the explosion group IIC.
 - In IIB, a thickness of 1.5 mm is never to be exceeded; where necessary, a reduction to e.g. 0.5 ... 1 mm may need to be performed depending on the quality of the coating/paint.
 - The operator is not to apply paint!

-
- Accessory components used in potentially explosive areas must fulfil all requirements of the European directives and national legislation.
 - Electrical equipment in zone 1 must possess an EU type examination certificate and is only to be installed by specialists according to their operating instructions.
 - Particular attention is to be paid to ensuring that electrical equipment – or mechanical equipment with its own approval – is not included in the inspection scope of the products. The ignition protection of these products is to be evaluated separately; installation is permissible within the framework approved by the manufacturer. This may reduce the application area of the products.
 - Installation in potentially explosive atmospheres is only to be performed when local installation regulations are observed. The following notes are to be observed (list is incomplete):
 - Installation and maintenance are only to be conducted in the absence of potentially explosive atmospheres and in compliance with regulations in the user country.
 - Additional precautionary measures are to be taken when the presence of hydrogen sulphide, ethylene oxide, and/or carbon monoxide is to be expected. These substances have a very low ignition power!
 - For these substances and all substances in the explosion group IIC, only spark-free tools are to be used if the presence of a potentially explosive atmosphere is to be expected nonetheless!

6 Commissioning

Checklist for commissioning

6.1 Checklist for commissioning






Stop!

The drive must not be commissioned until everything is checked and answered with "yes"!

Before you start

Check the following	Checked
Supply: <ul style="list-style-type: none"> Does the scope of supply comply with the accompanying papers? <ul style="list-style-type: none"> Claim visible transport damages immediately to the forwarder. Claim visible deficiencies/incompleteness immediately to your Lenze representative. 	
Ex application: <ul style="list-style-type: none"> Do the following data on the nameplate of the gearbox/motor comply with the permissible Ex application on site? <ul style="list-style-type: none"> Explosion group Category Zone Temperature class Maximum surface temperature 	
Ambient temperature: <ul style="list-style-type: none"> Is the ambient temperature range adhered to according to the data given in the lubricant table? <ul style="list-style-type: none"> A maximum ambient temperature of 40 °C must not be exceeded during the entire operating time, unless the gearbox nameplate contains a different maximum temperature. 	
Ventilation: <ul style="list-style-type: none"> Is a sufficient ventilation of the gearbox guaranteed? 	
Mounting position: <ul style="list-style-type: none"> Does the mounting position comply with the mounting position given on the nameplate of the gearbox? <ul style="list-style-type: none"> Please observe: Changing the mounting position may only be performed after consultation with Lenze. Without consultation, the ATEX approval no longer applies! 	
Oil level for drives of category 2: <ul style="list-style-type: none"> Was the oil-level control carried out in the correct mounting position? Is the oil level correct? 	
Oil control and oil drain plugs /breather elements: <ul style="list-style-type: none"> Are all oil control screws and drain screws as well as breather screws and valves freely accessible? <ul style="list-style-type: none"> For gearboxes with ventilation remove the transport locking device of the ventilation or mount the breather element. 	
Input and output elements: <ul style="list-style-type: none"> Are all input and output elements to be installed suitable for this explosion-protected application? 	
Nameplate data: <ul style="list-style-type: none"> Are the data given on the nameplate of the gearboxes not exceeded? 	
Gearbox with hollow shaft and shrink disk: <ul style="list-style-type: none"> Has the cover been mounted correctly? (☞ 18) 	
Mains-operated geared motors: <ul style="list-style-type: none"> Do the data given on the nameplate of the gearbox and motor comply with the ambient conditions on site? 	
Inverter-operated geared motors: <ul style="list-style-type: none"> Is the geared motor permitted for inverter operation? <ul style="list-style-type: none"> The parameter setting of the inverter must prevent an overload of the gearbox (gearbox nameplate). 	
Drives in mounting position C (motor at the top): <ul style="list-style-type: none"> Is the protection for the fan cover mounted? 	
Equipotential bonding: <ul style="list-style-type: none"> Is equipotential bonding of the motor and gearbox guaranteed in the mounted state? Has it been ensured that all conductive components have been included in the equipotential bonding? 	
State: <ul style="list-style-type: none"> Is the gearbox closed and undamaged? 	


During commissioning

Check the following	Checked
Ambient area: – It must be ensured that there are no explosive atmospheres, oils, acids, gases, vapours, or combustible dusts!	
Temperature measurement: • The temperature must be measured after 3 hours of operation at the maximum load of the corresponding application! – The temperature must be measured at points that are protected against the cooling air flow, in the area of the drive. It is useful to carry out measurements at several points in order to determine the maximum,  27. – An absolute housing surface temperature of 90 °C should not be exceeded to keep the thermal stress of shaft sealing rings and lubricant low; this contributes positively to the service life.	
Temperature class T4 in zones 1 and 2: – The temperature limit for temperature class T4 in zones 1 and 2 must not be exceeded,  28. When the drive gets warmer it has to be decommissioned.	
Absolute temperature: • Is the maximum permissible absolute temperature of 90 °C exceeded? – If this is the case, the drive must be put out of operation and Lenze must be contacted.	
Oil change: – The oil change depends on the oil temperature,  29	

6.2 Measurement of surface temperature

During the commissioning of the gearbox it is absolutely necessary to perform a measurement of the surface temperature under maximum load condition at thermal equilibrium. The maximum surface temperature is reached after approx. 3 hours.

The temperature measurements must be performed in points in the area of the drive that are protected against the cooling air flow. It is useful to take measurements in several points to determine the maximum.

The maximum permissible absolute temperature is 90 °C at the hottest point. For temperature class T4 in zone 1 or 2, the temperature limit ( 28) must be observed!



Danger!

If the temperature is higher than the value given, the drive must immediately be stopped and Lenze must be contacted!

6 Commissioning

Surface temperature limits for temperature class T4 in area 1 and 2

6.3 Surface temperature limits for temperature class T4 in area 1 and 2

Since the application and installation conditions for the geared motors can differ significantly, it must be ensured that a maximum temperature of 135°C is not exceeded in the gearbox, even under adverse conditions. The maximum temperature measured at the housing in chap. 6.2 must not exceed the values listed in the following tables.

Input speeds up to 1500 rpm

Mounting positions M1[A], M3[B], M2[D], M6[E] and M5[F]		Mounting position M4[C]	
Drive size [-]	Temperature limit [°C]	Drive size [-]	Temperature limit [°C]
<input type="checkbox"/> A	90	<input type="checkbox"/> A	90
<input type="checkbox"/> B		<input type="checkbox"/> B	
<input type="checkbox"/> C		<input type="checkbox"/> C	
<input type="checkbox"/> D		<input type="checkbox"/> D	
<input type="checkbox"/> E		<input type="checkbox"/> E	
<input type="checkbox"/> F		<input type="checkbox"/> F	
<input type="checkbox"/> G		<input type="checkbox"/> G	
<input type="checkbox"/> H		<input type="checkbox"/> H	
<input type="checkbox"/> K	80	<input type="checkbox"/> K	80

Tab. 3 Detailed explanation of the mounting positions: "Adjustment made easy" documentation (see Lenze homepage)

Input speeds 1501 to 3000 rpm

Mounting positions M1[A], M3[B], M2[D], M6[E] and M5[F]		Mounting position M4[C]	
Drive size [-]	Temperature limit [°C]	Drive size [-]	Temperature limit [°C]
<input type="checkbox"/> A	90	<input type="checkbox"/> A	90
<input type="checkbox"/> B		<input type="checkbox"/> B	
<input type="checkbox"/> C		<input type="checkbox"/> C	
<input type="checkbox"/> D		<input type="checkbox"/> D	
<input type="checkbox"/> E		<input type="checkbox"/> E	85
<input type="checkbox"/> F		<input type="checkbox"/> F	
<input type="checkbox"/> G		80	<input type="checkbox"/> G
<input type="checkbox"/> H	<input type="checkbox"/> H		70
<input type="checkbox"/> K	<input type="checkbox"/> K		65

Tab. 4 Detailed explanation of the mounting positions: "Adjustment made easy" documentation (see Lenze homepage)



Note!

Mounting position M2[D] does not permit input speeds higher than 1500 rpm due to the high stress on the shaft sealing ring!

6.4 Measurement of oil temperature

The oil temperature is measured in the lower area of the gearbox (on the level of the oil sump). In the case of gearboxes with an oil drain plug, the temperature must be measured on the oil drain plug. 10 K are added to the temperature measured and, on the basis of the diagram (32), the lubricant change (29) is determined.



Danger!

If there are unusual operating noises, vibrations, or increased temperatures in the gearboxes/geared motors during or between the prescribed checks, the geared motor must be stopped immediately and maintenance work must be performed!

The guidelines and standards as for instance the "berufsgenossenschaftliche Vorschriften, BGV A2" (guidelines of German Professional Associations), operating instructions (EN 50110) and the instructions for installation (EN 60079-14 and EN 50281-1-2) and maintenance (EN 60079-17) must always be observed!

Plastic parts must be damp-cleaned only to prevent electrostatic charge.

7.1 Maintenance intervals

Based on EN 60079-17, the following terms are used in this chapter:

Visual inspection

Inspection which identifies, without the use of access equipment or tools, those defects, such as missing bolts, which will be apparent to the eye.

Close inspection

Inspection which encompasses those aspects covered by a visual inspection and, in addition, identifies those defects, such as loose bolts, which will be apparent only by the use of access equipment, for example steps, and tools.

Detailed inspection

Inspection which comprises those aspects covered by a close inspection and, in addition, identifies those defects, such as loose terminations, which will only be apparent by opening the enclosure, and/or using tools and test equipment, where necessary.

Inspection

Action comprising careful scrutiny of an item carried out either without dismantling or with the addition of partial dismantling as required, supplemented by means such as a measurement, in order to arrive at a reliable conclusion as to the condition of an item.

Maintenance and repair

Combination of any actions carried out to retain an item in, or restore it to conditions in which it is able to meet the requirements of the relevant specification and perform its required functions.



Danger!

The maintenance intervals must be adhered to for safe operation with respect to explosion protection!

Non-adherence to the maintenance intervals voids the EU Declaration of Conformity!

Maintenance measures involving disassembly of the machine are only to be performed in/upon the absence of potentially explosive atmospheres.

7 Maintenance

Maintenance intervals
Periodic inspections

7.1.1 Periodic inspections

For use in zone 2 or 22 and mounting positions M1[A], M3[B], M4[C], M6[E] and M5[F] (⚙️ "Adjustment made easy" documentation; see Lenze homepage) the following specified time intervals can be doubled for close and detailed inspections.

If the checks show any irregularities or items of damage, the cause has to be determined immediately and the damage has to be repaired.

Stop!

A check with regard to leakage, unusual operating noises, vibrations, and impermissibly high temperatures is to be additionally performed within the first days after commissioning.

	Type of inspection		
	Visual	Close	Detailed
Inspection to be carried out within the time interval of operating hours:	100 h	500 h	3000 h
But at the latest:	Once a week	3 months	6 months
Actions			
Visual inspection of the geared motor.	•		
Inspection regarding unusual operating noises, vibrations and inadmissibly high temperatures.			
Dust deposits must be cleaned according to the amount of dust. We recommend removing the dust cover when the thickness exceeds 1.0 mm.			
When the entry of dust is suspected, covers are to be removed and cleaned, 18.		•	
Examination with regard to oil leakage, 34.			
Visual inspection and backlash check of the elastic ring gear, 41.			
Check rubber buffer of the torque arm and replace it in the event of visible wear or damage.			
Check oil level (only drives for category 2)			•
For gearboxes with ventilation: Check the air passage of the breather element and clean it, if necessary (e.g. blow through) or replace it.			
Check whether earthing / equipotential bonding is still ensured.			
Check mounting of the gearbox (foot, flange and shrink disk mounting).			
Inspections of the electric motors	As specified in the operating instructions for the motor		

7.1.2 Inspection to be made only in area 1 and/or 21

	Type of inspection
Inspection to be carried out once after:	Visual
Not later than after:	2000 h
	3 months
Actions	
Visual inspection and backlash check of the elastic ring gear, 41.	•

7.2 Maintenance and repair



Danger!

Maintenance or repair operations under ex conditions are not permissible!

The repair work of explosion-protected electrical machines must only be performed by the manufacturer or qualified personnel, in compliance with the Ordinance for Industrial Safety and Health, in a workshop equipped for these tasks. Only use the respective original spare parts from Lenze. The operating steps must be performed in accordance with the instructions given by the manufacturer.

Equipment which has been changed or repaired at parts that guarantee explosion protection must only be started again if a qualified person in accordance with the Ordinance for Industrial Safety and Health has confirmed the compliance with the valid technical regulations.

	Type of inspection Maintenance/repair	
Maintenance/repair to be made in the time interval of operating hours:	Acc. to diagram ¹⁾	Immediately if any irregularities are detected during monitoring, or as a preventive measure after a calculated changing interval ²⁾
But at the latest after:	3 years	---
Actions		
Change oil		
Replace shaft seals, check condition of sealing lip contact area and repair it, if necessary.		
Replace roller bearing grease	●	
For gearboxes with ventilation - replace breather element.		
Check of state of all gearbox parts - replacement in the case of damage.		
Replacement of roller bearings		●
Maintenance of the electric motors used	According to company's own operating instructions	

- 1) Determination of the period by means of temperature measurement, 28 and using the oil change diagram.
- 2) For better assessment of the roller bearing changing interval, a calculation taking the real operating conditions into consideration should be carried out at Lenze, 20



Note!

Since it is not possible to reliably calculate the service life of an individual roller bearing (20), it is absolutely essential that the roller bearings are checked at regular intervals. A difference in the noise or vibration response or rising temperatures indicate the immediate necessity for replacing the bearings.

7 Maintenance

Maintenance and repair
Inspection to be made only in area 1 and/or 21



Note!

An oil analysis presents a more detailed procedure for determining the necessity of an oil change, analysing the state of the gearbox oil on the basis of an oil sample.

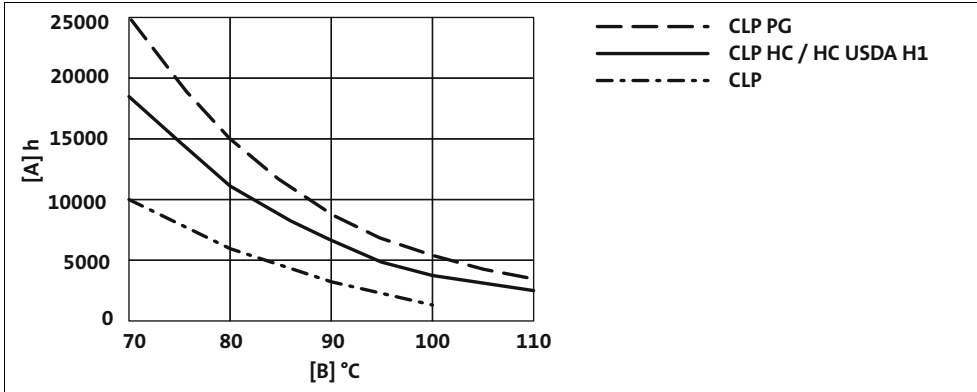





Fig. 2 "Lubricant change" diagram

- A** Operating hours
- B** Oil temperature

7.3 Lubricant table for ATEX geared motors

The lubricants listed in the following table are approved for Lenze ATEX gearboxes.

	Ambient temperature [°C]				DIN 51517-3: CLP ISO 12925-1: CKC/CKD		Gearbox type g500-B/ -H / -S
	-50	0	+50				
	-25			+50 ³⁾	CLP HC	VG 320	Omala S4 GX 320 Omala S4 GXV 320
	-20			+40	CLP PG	VG 220	
	-25			+50 ³⁾	CLP HC	VG 320	Klübersynth GEM 4-320 N
	-20			+40	CLP PG	VG 220	
	-20			+40	CLP HC	VG 220	Klüberoil 4 UH1-220 N
	-30		0 ⁴⁾		CLP PG	VG 32	
	-40		0 ⁴⁾		CLP HC	VG 46	
	-25			+50 ³⁾	CLP HC	VG 320	Renolin Unisyn CLP HC 320 Renolin Unisyn XT 320
	-20			+40	CLP PG	VG 220	

For the lubricant selection observe the following legend relating to the lubricant table!

CLP PG	⇒	Polyglycol oil
CLP HC	⇒	Synthetic hydrocarbons or poly-alpha-olefin oil
1)	⇒	Currently no test results are provided yet for the efficiency of the specified lubricants for worm gearbox lubrication. If these oils are used, the permissible torque must be reduced to 80% of the catalogue values.
2)	⇒	Polyglycol oils cannot be mixed with other types of oil
3)	⇒	For ambient temperatures above 40°C please consult us and specify the exact operating conditions!
4)	⇒	Observe critical starting performance at low temperatures! At temperatures below -20 °C, special measures must be implemented! In this case, contact Lenze!
	⇒	Low-temperature oils, observe critical starting performance at low temperatures!

7.3.1 Lubricate roller bearings

For regreasing the roller bearings and lubricating the shaft sealing lip in the Lenze ATEX gearboxes with an ambient temperature range of -30°C to + 50°C use the following lubricant: Klüber Petamo 133N.

The following lubricant quantities are required:

- For fast-running bearings (drive-end gearbox): fill approx. one-third of the hollow space between rolling bodies with grease.
- For slow-running bearings (within gearbox and driven side of gearbox): fill approx. two-thirds of the hollow space between roller bearings with grease.

7 Maintenance

How to check for oil leakages

7.4 How to check for oil leakages

The operator must check the gearboxes and geared motors for oil leakages according to the maintenance intervals given in chapter 7.1 et seqq..

A visual inspection for leakages must be performed on the complete gearbox / geared motor. A lubricant leakage can be recognised, for example, by means of flow traces on the gearbox / geared motor, drop formation and/or lubricant spots under the gearbox / geared motor.

The occurrence of a leakage can usually be expected at the shaft sealing rings. Other possible locations include the parting lines between housing components, flanges, covers, caps and similar.

Gearboxes with a mounting flange for IEC standard motors are provided with a leakage check bore hole in order to be able to detect leakages of the drive shaft sealing ring at an early stage. The position of the bore hole depends on the mounting position ordered.

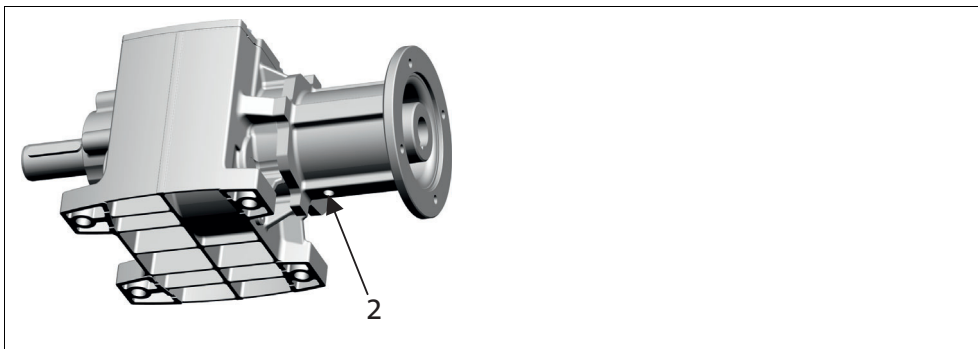


Fig. 3 GNA standard motor flange; position of the leakage check bore hole

For every leakage test, the screw plug (item 2) in the bearing flange must be removed and checked whether leakage oil can be found behind the screw. Afterwards, the bore must be closed again.

If a leakage is detected, the lubricant filling level in the gearbox must be checked immediately and, if necessary, adjusted to the prescribed value.

- If the leakage quantity consists of only a few drops of lubricant, continued operation is possible. However, continued operation presupposes that a more frequent monitoring must take place to rule out an unnoticed increase of leakage amount. Short-term plans for a repair to stop the leakage must be made.
- With higher leakage quantities the leakage must be repaired immediately.

During the replacement of the shaft sealing ring, the condition of the sealing lip contact areas on the shaft must also be checked. If grooves are noticeable, the shaft must be serviced or replaced. Alternatively, the shaft sealing ring can be mounted slightly moved in axial direction so that the sealing lip runs on a new location.

7.4.1 Oil level check for gearboxes (geared motors)

For gearboxes (geared motors) that are used in zone 1 or 21, a check of the oil level is required in addition to a check for oil leakage. The check must be performed before the initial commissioning and subsequently at regular intervals (☞ 29).

For the **G50BB111**, **G50BB124**, **G50BH110**, and **G50BH114** gearbox types, the mounting cover must be removed to perform the lubricant check.

The remaining gearboxes are equipped with one or several oil-level plugs. Depending on the oil-level inspection device used, the oil-level inspection must be performed as follows.

7 Maintenance

How to check for oil leakages
Oil level check for gearboxes (geared motors)

7.4.1.1 Inspection of gearboxes with cast iron housing and oil-level plugs

- from g500-B600 / G50BB160
- from g500-H600 / G50BH160
- from g500-S950 / G50BS195

i Note!
 Deviating oil level must be corrected.
 The data of the filled in oil is given on the nameplate. Only use the same oil as already contained in the gearbox.
 Observe the approved oil manufacturer's oil types. (📖 33)

1. Disconnect the geared motor from the mains and protect it from unintentional switch-on.
2. Wait a few minutes until all of the oil has accumulated in the oil sump.
3. Determine position of the oil-level plug. The position of the oil-level bores is indicated in the respective standard mounting instructions for the gearbox types in the "Maintenance" chapter.
4. Remove oil-level plug.
5. Oil-level inspection.
 - Max. oil level: bottom edge of oil-level bore
 - Min. oil level: X mm below bottom edge of oil-level bore (see Fig. 4 and Tab. 5).
6. If necessary, correct oil level to the correct value. Use the same oil grade as the one already in the gearbox.
7. Close oil-level bore again; for tightening torque of the screw see Tab. 6.

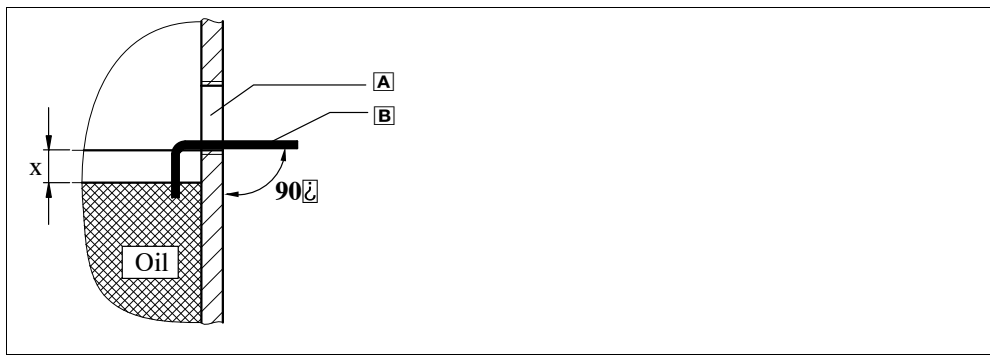


Fig. 4 Oil-level check with auxiliary tool

- A** Oil check bore hole
- B** Auxiliary tool, e. g. angled wire (not included in the scope of supply)

Thread size	M10 x 1	M12 x 1.5	M16 x 1.5	M20 x 1.5
Dimension X [mm]	2	2	3	4

Tab. 5

Thread size	M10 x 1	M12 x 1.5	M16 x 1.5	M20 x 1.5
Tightening torque M_a [Nm]	10	20	34	50

Tab. 6 Tightening torques of the oil-level plugs

7.4.1.2 Inspection of gearboxes with aluminium housing and oil-level plugs



Note!

Deviating oil level must be corrected.

The data of the filled in oil is given on the nameplate. Only use the same oil as already contained in the gearbox.

Observe the approved oil manufacturer's oil types. (📖 33)

1. Disconnect the geared motor from the mains and protect it from unintentional switch-on.
2. Wait a few minutes until all of the oil has accumulated in the oil sump.
3. Determine position of the oil-level plug. The position of the oil-level bores can be gathered from the respective standard mounting instructions for the g500 gearbox types in the "Maintenance" chapter.
4. Remove oil-level plug.
5. Check oil level using dipsticks that are to be manufactured depending on the mounting position. The dipsticks are shown in the standard mounting instructions for the g500 gearbox types in the "Maintenance" chapter.
 - The oil level must be within the marked area on the dipstick.
6. If necessary, correct oil level to the correct value. Use the same oil grade as the one already in the gearbox.
7. Close oil-level bore again; for tightening torque of the screw see Tab. 6.

Thread size	M10 x 1	M12 x 1.5	M16 x 1.5	M20 x 1.5
Tightening torque M_a [Nm]	10	20	34	50

Tab. 7 Tightening torques of the oil-level plugs

7 Maintenance

How to check for oil leakages
Oil level check for gearboxes (geared motors)

Gearbox B111 / g50BB110 mounting position M4[C]

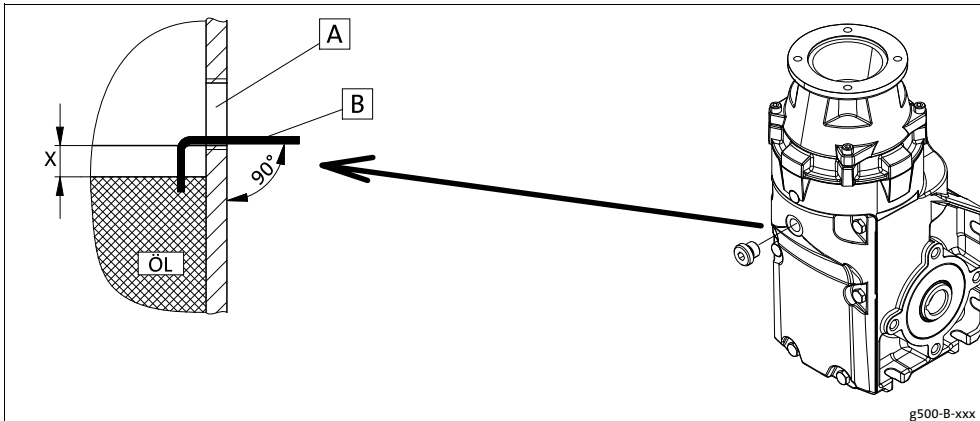


Fig. 5 Oil-level check with auxiliary tool

- A** Oil check bore hole
- B** Auxiliary tool, e. g. angled wire (not included in the scope of supply)

Remove the oil-level plug shown.

- Max. oil level: bottom edge of the oil-level bore.
- Min. oil level: 2 mm below the bottom edge of the oil-level bore, see Fig. 4

If the oil level deviates from this, it muss be corrected!

Use the same oil for this as is already filled in the gearbox, see nameplate data. The oil manufacturers' approved lubricant types can be found in the lubricant table, (📖 33).

Close oil-level bore again, tightening torque of the screw, 20 Nm \pm 10%.

7.4.1.3 How to check the oil level of gearboxes without oil-level plugs

For the **G50BB111**, **G50BB124**, **G50BH110**, and **G50BH114** gearbox types, the mounting cover must be removed to perform the lubricant check.



Danger!

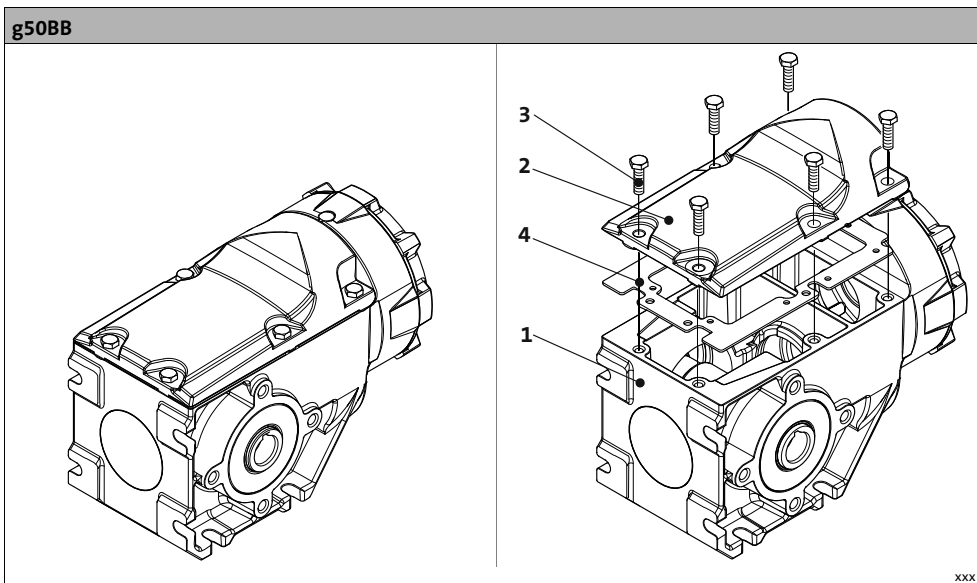
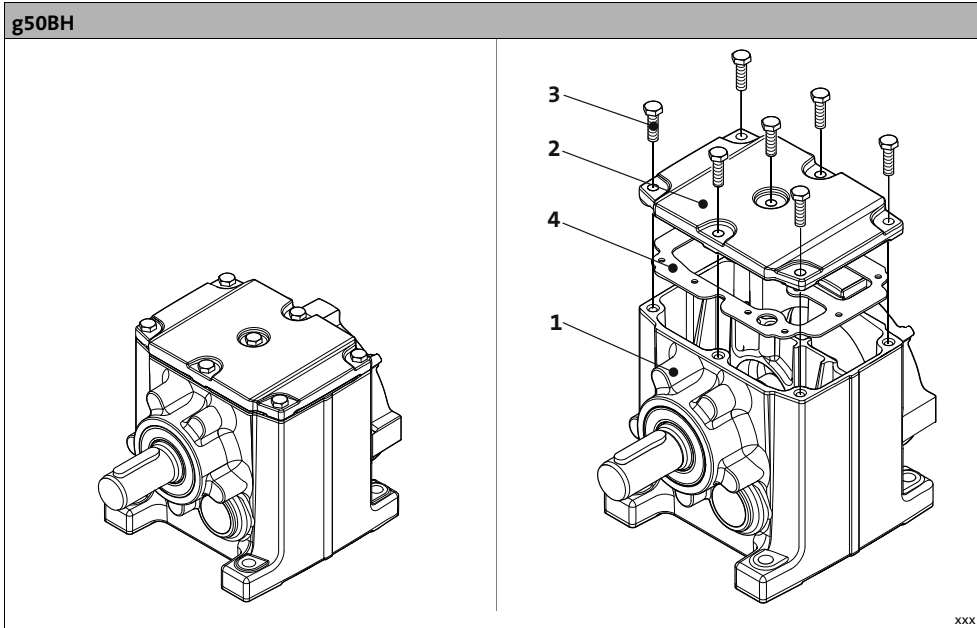
The following steps must not be executed under explosive conditions!

Preparation

- Ensure standstill of the drive system and prevent any machine movement.
- Disconnect the geared motor from the mains and protect it from unintentional switch-on.
- The gearbox must have cooled down.

Dismounting

1. Bring the gearbox into mounting position A so that the mounting cover is located on the top side. The installation surface must be even and level.



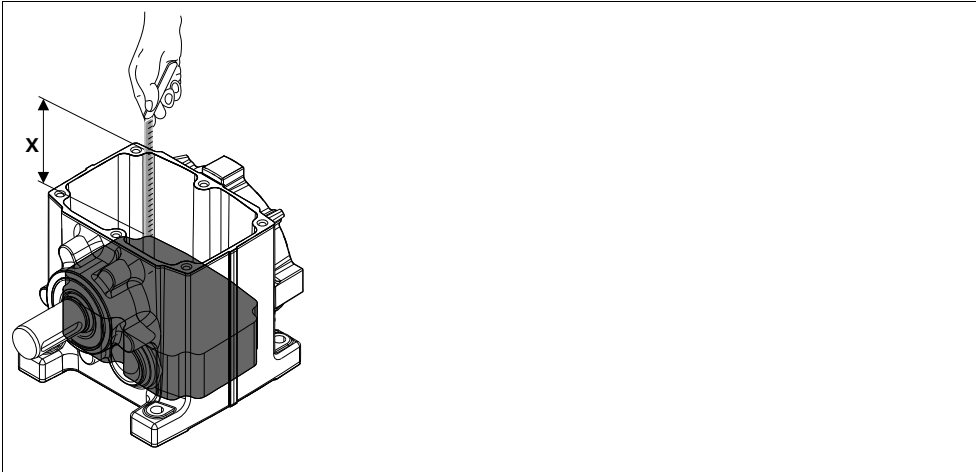
2. Loosen fixing screws (3) on the cover (2).
3. Remove cover (2) and gasket (4). Do not damage gasket (4)!
4. Check the state of the lubricant. If it shows clearly visible pollution, a lubricant change must be carried out, Ⓜ general mounting instructions for the respective gearbox type.

7 Maintenance

How to check for oil leakages
Oil level check for gearboxes (geared motors)

Check

Use a level gauge to measure the distance X from the housing sealing surface to the oil level, holding the gauge at right angles to the sealing surface.



Use the following table to determine the height of the setpoint oil level T on the basis of the gearbox/geared motor type and the mounting position during operation.

Housing types AK / AL / AR / BR - gearbox housing with foot

Mounting position	Distance T [mm]			
	g50BH110 H100 - foot	g50BH114 H140 - foot	g50BB111 B110	g50BB124 B240
M1[A] 2-stufig	49	61	54	74
M1[A] 3-stufig	-----	-----	-----	48
M3[B]	16	15	15	24
M4[C]	26	37	*	3
M2[D]	16	15	22	30
M5[F]	49	48	-----	-----
M6[E]	26	26	-----	-----
M5[E]	-----	-----	29	19
M6[F]	-----	-----	41	42

* Oil-level inspection B110 in mounting position C

Housing types CR / CK / CP / DR - gearbox housing without foot

Mounting position	Distance T [mm]	
	g50BH110 H100 - flange	g50BH114 H140 - flange
M1[A]	52	66
M3[B]	18	20
M4[C]	28	42
M2[D]	18	20
M6[E]	28	31
M5[F]	52	66

The difference between table value T and the measured distance X must be between 0.0 and 3.0 mm; $0.0 < (T-X) < 3.0$ mm.


If the oil level deviates from this range of values, it must be corrected!

Use the same oil for this as is already filled in the gearbox, see nameplate data. The oil manufacturers' approved lubricant types can be found in the lubricant table, (📖 33).

Check intervals for clutches in potentially explosive atmospheres
Oil level check for gearboxes (geared motors)



Mounting

1. Check the sealing surfaces of the housing and cover as well as the gasket for damage. Damaged parts must be replaced.
2. Then mount the seal, cover, and screws, paying special attention to the correct position and arrangement of the seal.
The tightening torque of the M6 screws is 10 Nm ± 10%. It may be required to tighten the screws several times until the torque is achieved at all screws.
3. Bring the gearbox back to the original operation mounting position. Correct mechanical fixing and a professionally implemented electrical connection must be ensured.

 **Note!**
Leakage check: monitor the gearbox in the next days in order to make sure that it is sealed.

7.5 Check intervals for clutches in potentially explosive atmospheres

Explosion group	Check intervals
II 2G Ex h IIB T4	<p>After commissioning the clutch, the backlash check and visual inspection of the elastic ring gear must be first carried out after 3000 operating hours, after six months at the latest.</p> <p>If no or only negligible wear of the ring gear is detected at this first inspection, further inspection intervals can be carried out after every 6000 operating hours, after 18 months at the latest, provided that the same operating parameters are applied.</p> <p>If there is an increased wear after the first inspection calling for a replace of the ring gear, the cause must be detected.</p> <p>In this case, the maintenance intervals must be adapted to the changed operating parameters.</p>
II 2G Ex h IIC T4	<p>After commissioning the clutch, the backlash check and visual inspection of the elastic ring gear must be first carried out after 2000 operating hours, after three months at the latest.</p> <p>If no or only negligible wear of the ring gear is detected at this first inspection, further inspection intervals can be carried out after every 4000 operating hours, after 12 months at the latest, provided that the same operating parameters are applied.</p> <p>If there is an increased wear after the first inspection calling for a replace of the ring gear, the cause must be detected.</p> <p>In this case, the maintenance intervals must be adapted to the changed operating parameters.</p>

 **Stop!**
When the wear limit of max. abrasion is reached ( 42) the ring gear must be replaced immediately!

7 Maintenance

Check intervals for clutches in potentially explosive atmospheres
Wear and backlash check

7.5.1 Wear and backlash check

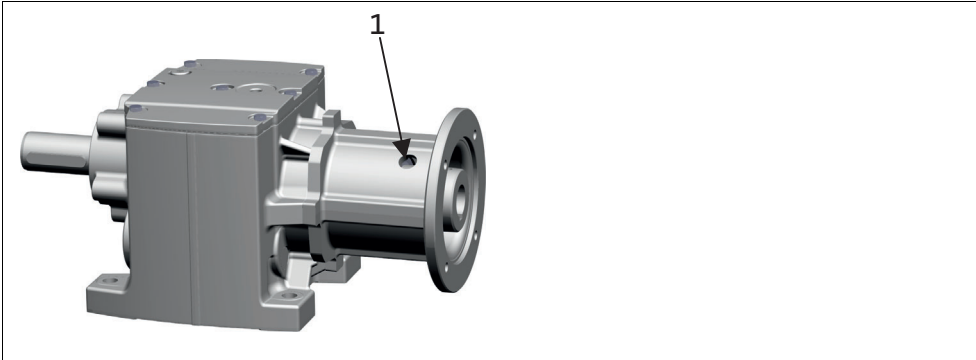


Fig. 6 GNA standard motor with flange; position of the locking screw (1)

1. Remove the screw plug (item 1) for the wear and backlash check.
2. Check the clearance between clutch hub and elastic ring gear with a feeler gauge (Fig. 7).
3. If the wear limit “ $X_{max.}$ ” (Tab. 8) is exceeded, the ring gear must be replaced. If the hub shows damages, the complete clutch must be replaced.
4. After performing the test, the opening (item 1) must be closed again with the screw plug.

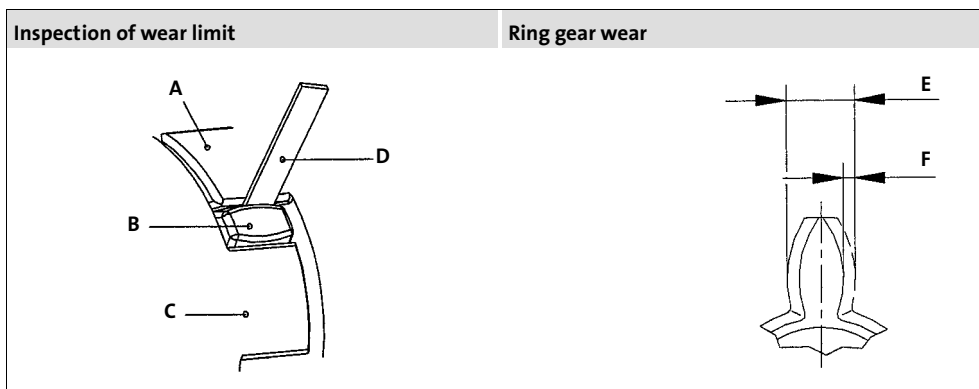


Fig. 7 Inspection: wear

- A Hub 1
- B Ring gear
- C Hub 2
- D Feeler gauge
- E B = new condition
- F X = wear (guide value/backlash)

Drive size	Wear limits $X_{max.}$ [mm]
xA	2
xB	2
xC	3
xD	3
xE	3
xF	3
xG	3
xH	4
xK	4

Tab. 8 Wear limits for Rotex coupling ring gear

EU-KONFORMITÄTSERKLÄRUNG

EU DECLARATION OF CONFORMITY

LENZE Drives GmbH, Breslauer Strasse 3, 32699 Extertal GERMANY

erklärt in alleiniger Verantwortung die Übereinstimmung der Produkte

declares under sole responsibility compliance of the products:

Getriebe/Getriebemotoren mit mechanisch konstanter Übersetzung L-force GST, GFL, GKS, GKR, GSS und Serie g500 G50BB, G50BH, G50BS

Gear/gearedmotor units with constant ratio L-force GST, GFL, GKS, GKR, GSS and Serie g500 G50BB, G50BH, G50BS

Kennzeichnung mechanischer Ausrüstung:

Marking mechanical equipment:

CE  II 2G Ex h IIB / IIC T4 / T3 Gb oder / or  II 2D Ex h IIIB T125 °C / T140 °C Db oder / or
CE  II 3G Ex h IIB / IIC T4 / T3 Gc oder / or  II 3D Ex h IIIB T125 °C / T140 °C Dc

Die spezifische Kennzeichnung und die Seriennummer ist auf dem Typenschild angegeben

The specific identification and serial number is indicated on the nameplate

mit der

with the

ATEX-Richtlinie
2014/34/EU

ATEX-Directive
2014/34/EU

Angewandte harmonisierte Normen der Union:

Applied Union harmonized legislation:

EN ISO 80079-36:2016 Explosionsfähige Atmosphären – Teil 36:

Nicht-elektrische Geräte für den Einsatz in explosionsfähigen Atmosphären - Grundlagen und Anforderungen / Explosive atmospheres - Part 36: Non-electrical equipment for use in explosive atmospheres - Basic method and requirements

EN ISO 80079-37:2016 Explosionsfähige Atmosphären – Teil 37:

Nicht-elektrische Geräte für den Einsatz in explosionsfähigen Atmosphären - Schutz durch konstruktive Sicherheit "c", Zündquellenüberwachung "b", Flüssigkeitskapselung "k" / Explosive atmospheres - Part 37: Non-electrical equipment for use in explosive atmospheres - Non electrical type of protection constructional safety "c", control of ignition source "b", liquid immersion "k"

Ebenfalls mit folgenden Europäischen und nationalen Normen und technischen Vorschriften übereinstimmt:

Also complies with the following European and National Standards and technical provisions:

Die Sicherheitshinweise der Betriebsanleitung sind zu beachten.

The safety instructions of the manual are to be considered.

Ort / Datum
Place / date

Profit Center Leiter
Head of Profit Center

Ex-Beauftragter
Test officer for explosion protection


Unterzeichnet für und im Namen der Lenze Drives GmbH
Signed for and on behalf of Lenze Drives GmbH


Extertal 23.09.2019


ppa. Ulrich Möller


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