

INTELLIGENT DRIVESYSTEMS, WORLDWIDE SERVICES



B 1000 – en

Gear units

Operating and Assembly Instructions





Read the operating and installation instructions

Read this operating and installation manual carefully prior to performing any work on or putting the gear unit into operation. Always observe the instructions in this operating and assembly manual.

Keep this operating and installation manual in the vicinity of the gear unit so that it is available if required.

Please also note the following documents:

- Gear unit catalogues (G1000, G1012, G1014, G1035, G1050, G2000),
- Operating and maintenance instructions for the electric motor,
- Operating instructions for equipment which is attached or provided.

Please contact Getriebebau NORD GmbH & Co. KG if you require further information.

Documentation

Designation: **B 1000**
 Material No.: **6052802**
 Series: Gear units and geared motors
 Type series:
 Gear unit types: **Helical gear units**
 NORDBLOC helical gear units
 Standard helical gear units
 Parallel shaft gear units
 Bevel gear units
 Helical worm gear units
 MINIBLOC worm gear units
 UNIVERSAL worm gear units

Version list

Title, Date	Order number	Remarks
B 1000 , February 2013	6052802 / 0713	-
B 1000 , September 2014	6052802 / 3814	<ul style="list-style-type: none"> • General corrections
B 1000 , April 2015	6052802 / 1915	<ul style="list-style-type: none"> • New gear unit types SK 10382.1 + SK 11382.1
B 1000 , March 2016	6052802 / 0916	<ul style="list-style-type: none"> • General corrections • New bevel gear units SK 920072.1 + SK 930072.1
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B 1000 October 2019	6052802 / 4419	<ul style="list-style-type: none"> • General corrections • Addition of GRIPMAXX™ (Option M)

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1 Safety information

1.1 Intended use

These gear units are used to transmit and transform rotary movements. They are intended for use as part of a drive system in commercially used plant and machinery. The gear units must not be operated until it has been established that the plant or machinery can be safely operated with the gear unit. Suitable protective measures must be provided if failure of a gear unit or a geared motor could result in a risk to persons. The machine or system must comply with local legislation and directives. All applicable health and safety requirements must be met. In particular, the Machinery Directive 2006/42/EC, TR CU 010/2011 and the TR CU 020/2011 must be especially observed in the relevant areas of application.

The gear units may not be used in environments in which an explosive atmosphere can occur.

The gear units may only be used according to the information in the technical documentation from Getriebbau NORD GmbH & Co. KG. Damage to the gear unit may result if the gear unit is not used as intended and according to the information in the operating and assembly manual. This may also result in personal injury.

The base or the gear unit mount must be appropriately designed for the weight and torque. All of the fastenings provided must be used.

Some gear units are equipped with a cooling coil. These gear units may only be operated if the cooling circuit is connected and in operation.

1.2 Do not make any modifications.

Do not make any modifications to the gear unit. Do not remove any protective devices.

1.3 Performing inspection and maintenance work

Due to lack of maintenance and damage, malfunctions may occur which can result in personal injury.

- Carry out all servicing and maintenance work at the specified intervals.
- Also note that servicing is necessary after long storage periods prior to commissioning.
- Do not operate damaged gear units. The gear unit must not have any leaks.

1.4 Personnel qualification

All transport, storage, installation, commissioning and maintenance work must be carried out by qualified specialist personnel.

Qualified specialist personnel are persons who have the training and experience to recognise and avoid any possible risks.

1.5 Safety for particular activities

1.5.1 Check for transport damage

Transport damage may cause malfunctions of the gear unit, which may cause personal injury. Oil which escapes due to leaks may cause a slipping hazard.

- Check the packaging and the gear unit for transport damage.
- Do not operate damaged gear units.

1.5.2 Safety information for installation and maintenance

Before starting work on the gear unit disconnect the drive from the power supply and secure it against accidental switch-on. Allow the gear unit to cool down. Depressurise the cooling circuit lines.

Damaged or defective components, attachment adapters, flanges and covers may have sharp edges. Wear work gloves and work clothing.

1.6 Hazards

1.6.1 Hazards when lifting

Persons may be injured by falling or swinging gear units. Therefore also observe the following information:

- Cordon off a wide area around the hazard area. Take care that there is adequate space to avoid swinging loads.
- Never stand under suspended loads.
- Use adequately dimensioned means of transport which are suitable for the purpose. The weight of the gear unit can be obtained from the type plate.
- Only lift the gear units by the eye bolts which are provided. The eye bolts must be fully screwed in. Only pull on the eye bolts vertically, never cross-wise or at an angle. Only use the eye bolts to lift the gear unit without other components. The eye bolts are not designed for lifting the gear unit with attachments. Use the eye bolts on both the gear unit and the motor to lift a geared motor.

1.6.2 Hazards due to rotating parts

Rotating parts cause a risk of entanglement. Therefore provide a contact guard. In addition to shafts, this also applies to fans as well as drives and drive elements such as belt drives, chain drives, shrink discs and couplings.

For test operation do not switch on the drive without an installed drive element or secure the parallel key.

Take possible run-on of the machine into consideration for the design of protective guards.

1.6.3 Hazards due to high or low temperatures

The gear unit may heat up to 90 °C during operation. Touching hot surfaces or contact with hot oil may result in burns. At very low ambient temperatures freezing may occur on contact.

- Only touch the gear unit when wearing gloves after operation or at very low ambient temperatures.
- Before starting maintenance work, allow the gear unit to cool down sufficiently after operation.
- Provide a contact guard if there is a risk that persons may touch the gear unit when it is in operation.
- Bursts of hot oil mist may be emitted from the pressure vent screw during operation. Provide a suitable guard so that persons cannot be injured by this.
- Do not place any flammable materials on the gear unit.

1.6.4 Hazards due to lubricants and other substances

Chemical substances which are used with the gear unit may be toxic. Eye injuries may result if these substances enter the eyes. Lubricants and adhesives may cause skin irritation.

Oil mist may escape when vent screws are opened.

Due to lubricants and conservation materials, gear units may be slippery and slip out of the hands. There is a slipping hazard from spilled lubricants.

- When working with chemical substances wear chemical-resistant gloves and work clothing. Wash your hands after working.
- Wear protective goggles if there is a possibility of splashed chemicals, for example when filling oil or during cleaning work.
- If chemicals enter the eyes, rinse with large amounts of cold water immediately. Consult a physician in case of symptoms.
- Observe the safety data sheets for the chemicals. Keep the safety data sheets in the vicinity of the gear unit.
- Collect spilled lubricants immediately with a binding agent.

1.6.5 Hazards due to noise

Some gear units or attached components may cause hazardous noise levels during operation. Wear hearing protection if work has to be carried out close to such gear units.

1.6.6 Hazards due to pressurised coolants

The cooling system is under high pressure. Damage or opening a cooling line which is under pressure may result in injury. Depressurise the cooling circuit before working on the gear unit.

1.7 Explanation of markings

 **DANGER**

Indicates an immediate danger, which may result in death or very serious injury if it is not avoided.

 **WARNING**

Indicates a dangerous situation, which may result in death or very serious injury if it is not avoided.

 **CAUTION**

Indicates a dangerous situation, which may result in minor injuries if it is not avoided.

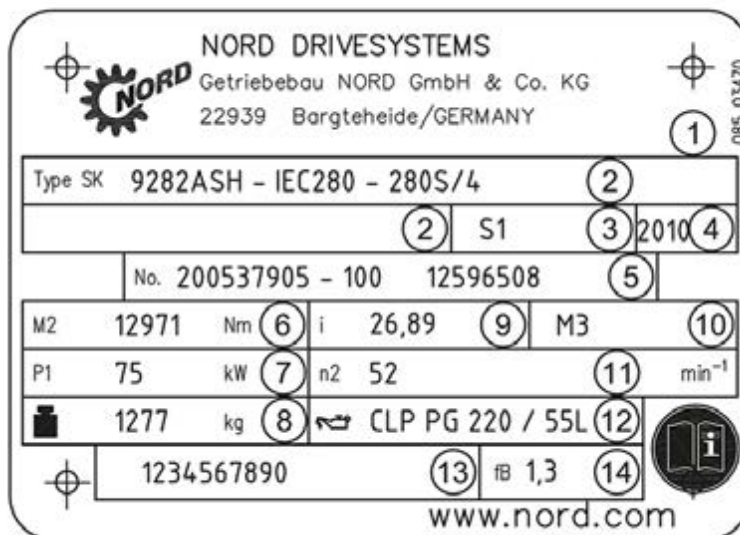
NOTICE!

Indicates a situation, which may result in damage to the product or its environment if it is not avoided.

 **Information**

Indicates hints for use and especially important information to ensure reliability of operation.

2.2 Type plate



Explanation

- 1 Matrix – Barcode
- 2 NORD gear unit type
- 3 Operating mode
- 4 Year of manufacture
- 5 Serial number
- 6 Rated torque of gear unit output shaft
- 7 Drive power
- 8 Weight according to ordered version
- 9 Overall gear unit ratio
- 10 Installation orientation
- 11 Rated speed of gear unit output shaft
- 12 Lubricant type, viscosity and quantity
- 13 Customer's part number
- 14 Operating factor

Figure 1: Type plate (example) with explanation of type plate fields

3 Assembly instructions, storage, preparation, installation

Please note all safety information (please see chapter 1 "Safety information") and warning information in the relevant sections.

3.1 Transporting the gear unit

WARNING

Hazard due to falling loads

- The thread of the eye bolt must be fully screwed in.
 - Do not pull on the eye bolt at an angle.
 - Note the centre of gravity of the gear unit.
-

Only use the eye bolts attached to the gear unit for transport. If geared motors have an additional eye bolt attached to the motor, this must also be used.

Transport the gear unit with care. Use suitable aids such as cross-beams or similar to facilitate transportation of the gear unit. Impacts to the free ends of shafts may cause internal damage to the gear unit.

3.2 Storage

For short-term storage before commissioning, please observe the following:

- Store gear units in the fitting position ((please see chapter 7.1 "Versions and maintenance")) and secure them against falling,
- Lightly oil bare metal housing surfaces and shafts
- Store in a dry place,
- Temperature in the range from – 5 °C to + 50 °C without large fluctuations,
- Relative humidity less than 60 %,
- No direct exposure to sunlight or UV light,
- No aggressive, corrosive substances (contaminated air, ozone, gases, solvents, acids, alkalis, salts, radioactivity etc.) in the immediate vicinity,
- No vibration or oscillation

3.3 Long-term storage

For storage or standstill periods in excess of 9 months, Getriebebau NORD recommends the long-term storage option. With the use of the measures listed below, storage for up to 2 years is possible. As the actual influences on the unit greatly depend on the local conditions, these times should only be regarded as guide values.

Conditions of the gear unit and storage area for long-term storage prior to commissioning:

- Store in the fitting position (please see chapter 7.1 "Versions and maintenance") and secure them against falling.
- Transportation damage to the external paint must be repaired. Check that a suitable rust inhibitor is applied to the flange bearing surfaces. If necessary apply a suitable rust inhibitor to the surfaces.
- Gear units with the long-term storage option are completely filled with lubricant or have VCI corrosion protection agent mixed with the gear oil (see adhesive label on the gear unit, or are not filled with oil, but rather with small quantities of VCI concentrate.
- The sealing band in the vent plug must not be removed during storage. The gear unit must remain sealed tight.
- Store in a dry place.
- In tropical regions the drive unit must be protected against damage by insects.
- Temperature in the range from – 5 °C to + 40 °C without large fluctuations.
- Relative humidity less than 60 %.
- No direct exposure to sunlight or UV light.
- No aggressive, corrosive substances (contaminated air, ozone, gases, solvents, acids, alkalis, salts, radioactivity etc.) in the immediate vicinity.
- No vibration or oscillation

Measures during storage or standstill periods

- If the relative humidity is < 50 % the gear unit can be stored for up to 3 years.

Measures before commissioning

- Inspect the gear unit before commissioning.
- If the storage or standstill period exceeds 2 years or the temperature during short-term storage has greatly deviated from the standard range, the lubricant in the gear unit must be replaced before commissioning.
- If the gear unit is completely filled, the oil level must be reduced before commissioning.
- For gear units without oil filling, the oil level for the version must be filled before commissioning. The VCI concentrate may remain in the gear unit. Lubricant quantities and types must be filled according to the details on the type plate.

3.4 Preparing for installation

Please examine the delivery for transport and packaging damage immediately on receipt. The drive unit must be examined and may only be installed if no damage is apparent. In particular the shaft sealing rings and sealing caps must be inspected for damage. Report any damage to the carrier immediately. Gear units with transport damage must not be commissioned.

All bare metal surfaces and shafts of the gear units are protected against corrosion with oil/grease or corrosion protection agents before shipping.

Thoroughly remove all oil / grease or corrosion protection agents and any dirt from the shafts and flange surfaces before assembly.

In applications where an incorrect rotational direction may result in damage or potential risk, the correct rotational direction of the output shaft must be established by test running the drive when uncoupled and ensured for subsequent operation.

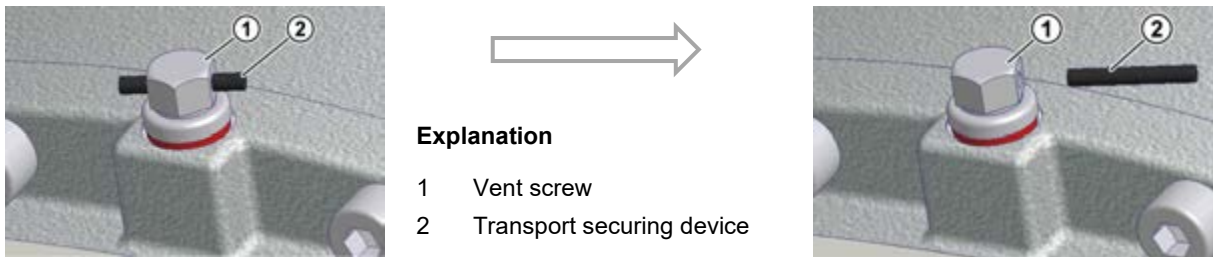
Gears with integrated back stops are marked with arrows on the drive/driven sides. The arrows point in the rotation direction of the gear unit. When connecting the motor and during motor control, it must be ensured that the gear unit can only operate in the direction of rotation. (For further explanations refer to Catalogue G1000 and WN 0000 40.)

Ensure that no aggressive or corrosive substances which attack metal, lubricants or elastomers are present in the area surrounding the installation site or are subsequently expected during operation. Gear units with **nsd tupH** surface treatment must be electrically decoupled by the use of non-conductive intermediate layers. In case of doubt, please contact Getriebebau NORD and take the recommended action.

Oil expansion tanks (Option OA) must be fitted in accordance with works standard WN 0-530 04. For gear units with an M10 x 1 vent plug, document Works Standard WN 0-521 35 must be also be observed during installation.

Oil level tanks (Option OT) must be fitted in accordance with Works Standard WN 0-521 30.

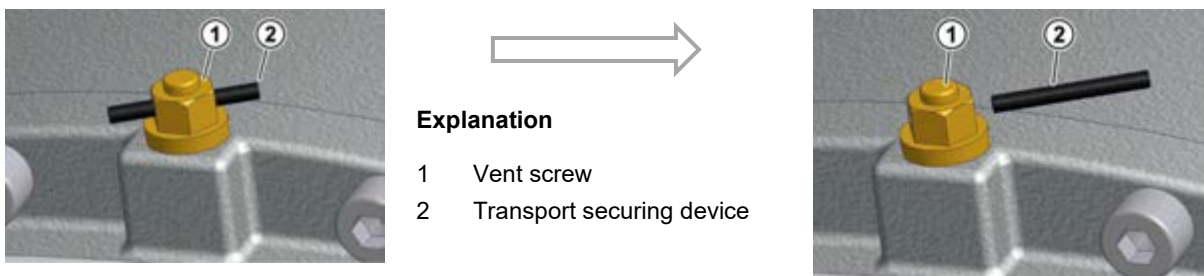
If the gear unit is equipped with venting, the venting or pressure venting must be activated before commissioning. To activate, remove the transport securing devices (sealing cord). Position of the vent screw (please see chapter 7.1 "Versions and maintenance").



Explanation

- 1 Vent screw
- 2 Transport securing device

Figure 2: Activating the vent screw

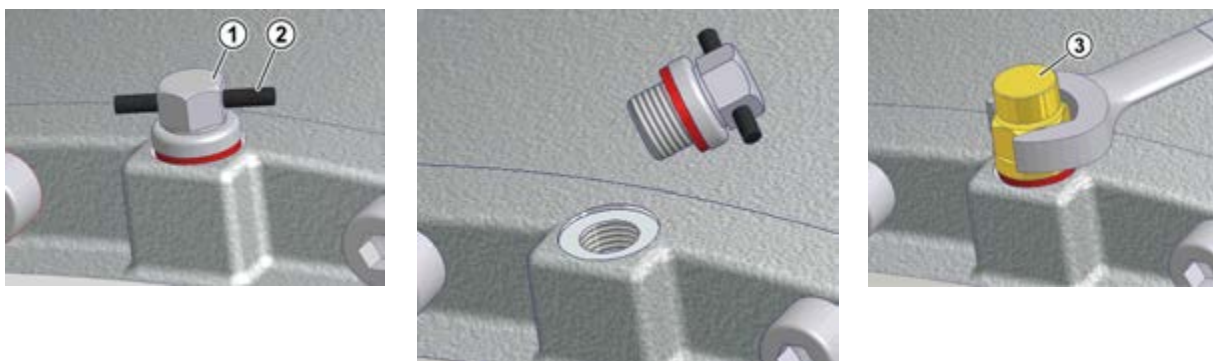


Explanation

- 1 Vent screw
- 2 Transport securing device

Figure 3: Activating the pressure vent screw

Special pressure vents are supplied as loose parts. Before commissioning, the vent screws must be replaced with the special pressure vents which are supplied as loose parts. This is done by unscrewing the vent fitting and replacing it with the special pressure vent and seal (please see chapter 7.1 "Versions and maintenance"). Double gear units consist of two single units and are equipped with 2 oil chambers and possibly 2 pressure vents.



Explanation

- 1 Vent screw
- 2 Transport securing device
- 3 Special vent screw

Figure 4: Removing the vent plug and fitting the special pressure vent

3.8 Fitting shrink discs

3.8.1 Hollow shaft with shrink disc (Option S)

NOTICE!

Damage to the hollow shaft

- Do not tighten the clamping bolts if the solid shaft is not inserted.

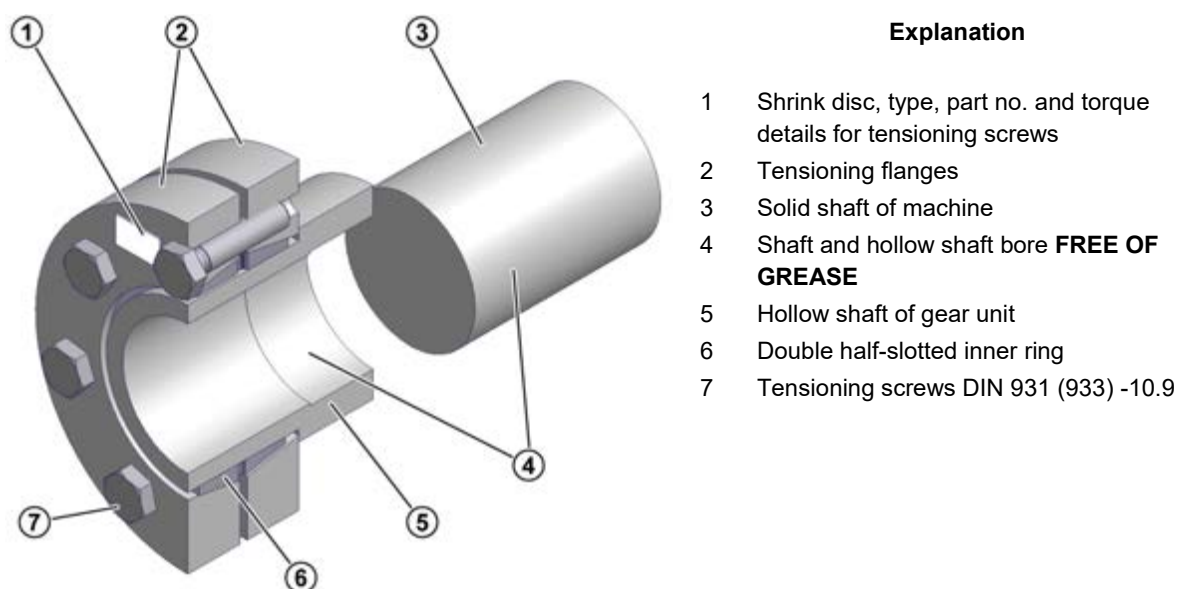


Figure 14: Hollow shaft with shrink disc

The shrink discs are supplied by the manufacturer ready for fitting. They must not be dismantled prior to fitting.

The solid shaft of the machine runs **free of grease** in the hollow shaft of the gear unit.

Assembly sequence

1. Remove any transport securing devices.
2. Loosen but do not remove tightening bolt and tighten gently by hand until there is no play between the flanges and the inner ring.
3. Push the shrink disc onto the hollow shaft until the outer clamping flange is flush with the hollow shaft. The shrink disc is easier to slide on if the bore of the inner ring is lightly greased.
4. Prior to mounting, grease the solid shaft only in the area which will later come into contact with the bronze bush in the hollow shaft of the gear unit. Do not grease the bronze bush, in order to prevent grease penetrating the area around the shrink connection.
5. The hollow shaft of the gear unit must be completely de-greased and **completely free of grease**.
6. In the area of the shrink connection the solid shaft of the machine must be degreased and **completely free** of grease.
7. Insert the solid shaft of the machine into the hollow shaft so as to completely fill the area around the shrink connection.
8. Position the clamping flange by gently tightening the bolts.
9. Tighten the tensioning bolts successively in a clockwise direction by several turns – not crosswise – with approx. $\frac{1}{4}$ rotation per turn. Tighten the bolts with a torque wrench to the torque indicated on the shrink disc.
10. When the tensioning bolts have been tightened, there must be an even gap between the clamping flanges. If this is not the case, the gear unit must be dismantled and the shrink disc connection checked for correct fit.
11. The hollow shaft of the gear unit and the solid shaft of the machine should be marked with a line (felt-tip pen) in order to detect any slippage under load.

Dismantling sequence:

1. Loosen the tensioning bolts successively in a clockwise direction by several turns with approx. $\frac{1}{4}$ rotation per turn. Do not remove the tensioning bolts from their thread.
2. Loosen the clamping flanges from the cone of the inner ring.
3. Remove the gear unit from the solid shaft of the machine.

If a shrink disk has been in use for a long period or is dirty, it must be dismantled, cleaned and the conical surfaces coated with Molykote G Rapid Plus or a similar lubricant before it is refitted. The threads and head surfaces of the screws must be treated with grease without Molykote. Any damaged or corroded elements must be replaced.

3.8.2 Hollow shaft with GRIPMAXX™ (Option M)

NOTICE!

Damage to drive components

- Take all expected peak loads into account when dimensioning the solid shaft or the machine shaft.
- Ensure a minimum yield strength of 360 N/mm² for the machine shaft.
- Observe the tolerances for the machine shaft (refer to the following table).
- Do not tighten the tensioning bolts of the hollow shaft if the solid shaft is not installed.

Installation

Metric machine shafts		
by	to	ISO 286-2 Tolerance h11(-)
Ø [mm]	Ø [mm]	[mm]
10	18	-0.11
18	30	-0.13
30	50	-0.16
50	80	-0.19
80	120	-0.22
120	180	-0.25

Imperial machine shafts		
by	to	ISO 286-2 Tolerance h11(-)
Ø [in]	Ø [in]	[in]
0.4375	0.6875	-0.004
0.7500	1.0625	-0.005
1.1250	1.9375	-0.006
2.0000	3.1250	-0.007
3.1875	4.6875	-0.008
4.7500	7.0625	-0.009

Table 3: Permissible machine shaft tolerances

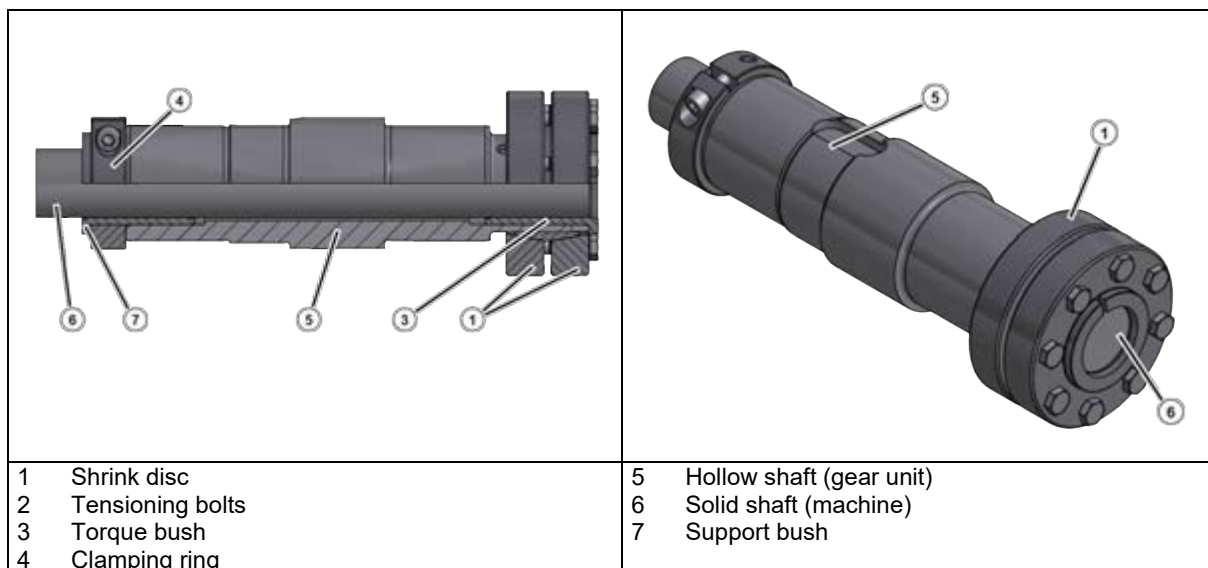


Figure 15: GRIPMAXX™, installed

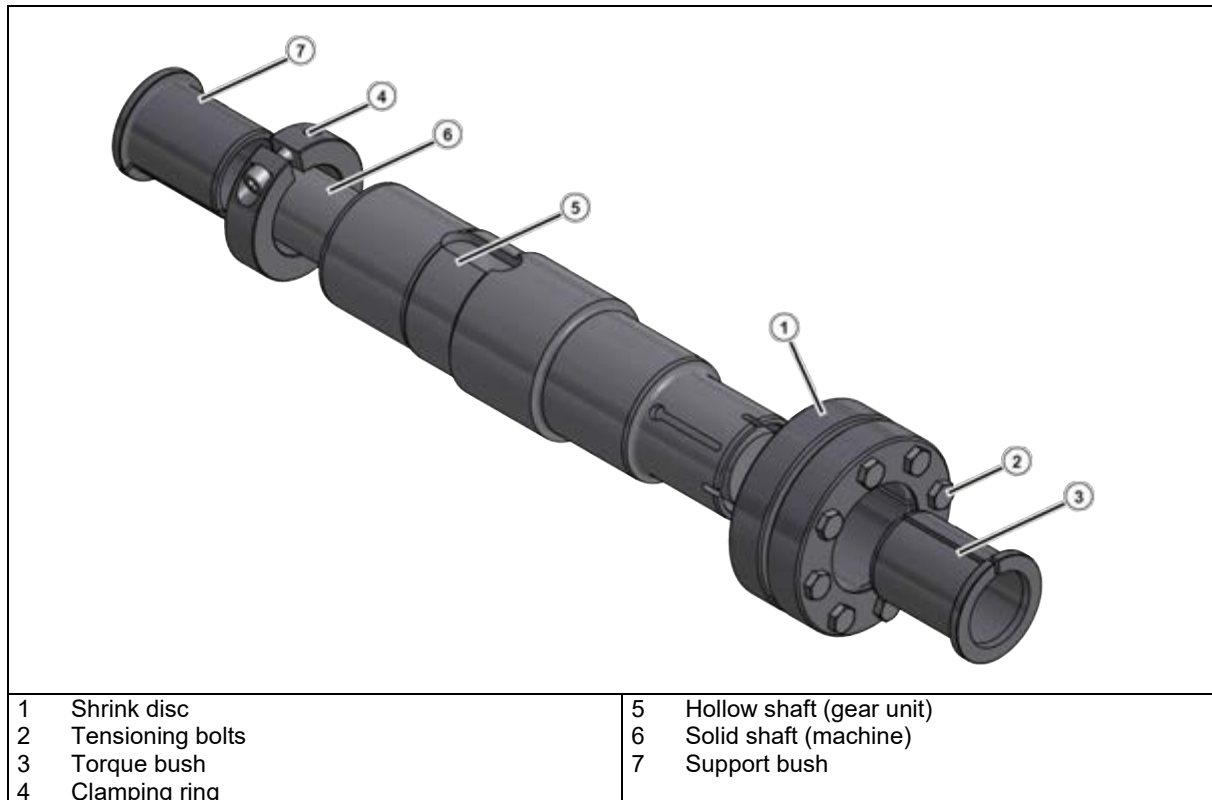


Figure 16: GRIPMAXX™, exploded diagram

1. Carefully examine the solid shaft [6] and remove burrs, rust, corrosion, lubricants or other foreign bodies. Ensure that the diameter is within the tolerances stated in the table above.
2. Determine the correct installation position of the shrink disc [1] on the gear unit. Ensure that the position of the hollow shaft [5] corresponds to the details in the order.
3. Remove all contamination, grease or oil from the hollow shaft [5], the bushes [3], [7], the clamping ring [4] and the shrink disc [1]. **Do not use corrosion protection, assembly paste or other coatings** on the fitting surfaces of the shaft, the bushes, the clamping rings or the shrink disc.
4. Bring the clamping ring [4] and the support bush into the correct position on the solid shaft [6] and ensure that the support bush is in the correct location. Then secure the support bush [7] with the clamping ring [4] and tighten the clamping ring bolt.
5. Push the gear unit up to the stop against the secured support bush [7] on the solid shaft [6].
6. Ensure that the shrink disc [1] and the torque bush [3] are in the correct position. **Only tighten the shrink disc when the solid shaft [6] and the torque bush [3] are in the correct position, as otherwise the hollow shaft [5] will be damaged.** Tighten the 3 or 4 clamping bolts [2] finger tight and ensure that the outer rings of the shrink disc are pulled together parallel. Finally, tighten the remaining bolts.
7. Tighten the tensioning bolts successively in a clockwise direction by several turns - **not crosswise** – with approx. $\frac{1}{4}$ rotation of the bolt per turn. Use a torque wrench to achieve the specified tightening torque on the shrink disc.

When the tensioning bolts have been tightened, there must be an even gap between the clamping flanges. If this is not the case, dismantle the shrink disc connection and check the fit.

Removing the bush set

⚠ WARNING

Danger of injury due to sudden mechanical release

The elements of the shrink disc are under great mechanical tension. Sudden release of the outer rings produces high separating forces and can result in uncontrolled detachment of shrink disc components.

- Do not remove any clamping bolts if you have not ensured that the outer clamping discs of the shrink disc have been released from the inner ring.

1. Unscrew the clamping bolts [2] of the shrink disc in sequence, with approximately half a turn (180°), until the hub of the shrink disc can be moved or until the hub of the shrink disc and the gear unit shaft return to their original position.
2. Remove the outer rings of the shrink disc from the conical inner ring. For this it may be necessary to lightly tap the bolts with a soft-face hammer or to lightly lever the outer rings apart.
3. Pull the gear unit off the machine shaft.

Re-installing

1. Clean all components. Dismantle the shrink disc to do this.
2. Check the bushes and the shrink disc for damage or corrosion. Replace the bushes and the shrink disc if they are not in perfect condition.
3. After cleaning the shrink disc, lubricate the conical seat of the outer rings and the outside of the clamping ring with MOLYKOTE® G-Rapid Plus Paste (manufactured by Dow Corning) or a similar product. Place additional multi-purpose grease on the screw thread and the contact surfaces of the screw heads.

3.9 Fitting the covers

All fixing screws must be used and coated with a securing lubricant e.g. Loctite 242, Loxeal 54-03 prior to use and tightened to the correct torque (please see chapter 7.4 "Screw tightening torques").

For covers with Option H66, press in the new condition closing cap by tapping it lightly with a hammer.

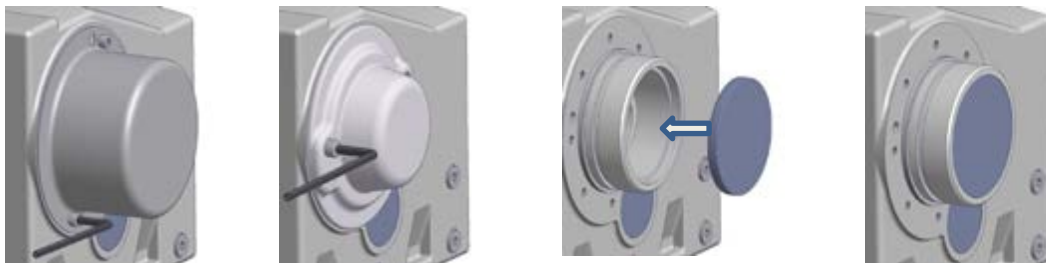


Figure 17: Fitting the covers, Option SH, Option H, and Option H66

3.10 Fitting the covers

Many versions of the universal worm gear unit are supplied with plastic cover caps as standard. These cover caps protect the shaft sealing ring against the entry of dust and other possible contamination. The cover caps can be removed by hand without the use of tools and pushed onto the A or B side.

The cover cap must be removed before installing the universal worm gear unit. After installation is complete, the cover cap must be pushed into the threaded holes on the output flange on the corresponding side. Care must be taken that the cover cap is removed and pushed on vertically, in order not to damage the expansion elements of the cover cap.



Figure 18: Removal and fitting of the cover cap

5 Service and maintenance

5.1 Service and Maintenance Intervals

Service and Maintenance Intervals	Service and maintenance work	Information see Section
At least every six months	<ul style="list-style-type: none"> • Visual inspection • Check running noises • Check the oil level • Visual inspection of hose • Re-grease / remove excess grease (only applicable for free drive shaft / Option W and for agitator bearings / Option VL2 / VL3) • Replace the automatic lubricator / remove excess grease (for operating times < 8 h / day): A replacement interval of 1 year is permissible for the lubricant dispenser) (Only for IEC / NEMA standard motor mounting). Empty or replace the lubricant collection container with every second replacement of the lubricant dispenser. 	5.2
For operating temperatures up to 80 °C every 10000 operating hours, at least every 2 years	<ul style="list-style-type: none"> • Change the oil (if filled with synthetic products, the interval is doubled, with the use of SmartOilChange the interval is specified by SmartOilChange) • Clean or replace the vent screw as necessary • Replace the shaft sealing rings at every oil change 	5.2
Every 20000 operating hours, at least every 4 years	<ul style="list-style-type: none"> • Re-lubricate the bearings in the gear unit 	5.2
At least every 10 years	<ul style="list-style-type: none"> • General overhaul 	5.2

Information

The oil change intervals apply for normal operating conditions and operating temperatures up to 80 °C. The oil change intervals are reduced in the case of extreme conditions (operating temperatures higher than 80 °C, high humidity, aggressive environment and frequent fluctuations in the operating temperature).

6 Disposal

Observe the current local regulations. In particular, lubricants must be collected and disposed of correctly.

Gear unit components	Material
Gear wheels, shafts, rolling bearings, parallel keys, locking rings, ...	Steel
Gear unit housing, housing components, ...	Grey cast iron
Light alloy gear unit housing, light alloy gear unit housing components, ...	Aluminium
Worm gears, bushes, ...	Bronze
Shaft sealing rings, sealing caps, rubber components, ...	Elastomers with steel
Coupling components	Plastic and steel
Flat seals	Asbestos-free sealing material
Gear oil	Additive mineral oil
Synthetic gear oil (adhesive label: CLP PG)	Polyglycol-based lubricants
Synthetic gear oil (adhesive label CLP PG)	Poly-alpha-olefin based lubricants
Cooling spiral, embedding material of the cooling spiral, screw fittings	Copper, epoxy, yellow brass

Table 4: Disposal of materials

7.2 Lubricants

With the exception of types SK 11382.1, SK 12382 and SK 9096.1, the gear units are filled with lubricant for the required installation orientation and are ready for operation as delivered. The initial filling corresponds to a lubricant from the column for the ambient temperatures (standard version) in the lubricant table.

Roller bearing greases

This table shows comparable roller bearing greases from various manufacturers. The manufacturer can be changed within a grease type. Getriebebau NORD be consulted in case of change of the ambient temperature range or the lubricant type, as otherwise no warranty for the functionality of our gear units can otherwise be accepted.






Lubricant type	Ambient temperature					
Grease mineral oil-based	-30 ... 60 °C	Tribol GR 100-2 PD	Renolit GP 2 Renolit LZR 2 H	-	Mobilux EP 2	Gadus S2 V100 2
	-50 ... 40 °C	Optitemp LG 2	Renolit WTF 2	-	-	-
Synthetic grease	-25 ... 80 °C	Tribol GR 4747/220-2 HAT	Renolit HLT 2 Renolit LST 2	PETAMO GHY 133 N Klüberplex BEM 41-132	Mobiltemp SHC 32	
Bio-degradable grease	-25 ... 40 °C	-	Plantogel 2 S	Klüberbio M 72-82	Mobil SHC Grease 102 EAL	Naturelle Grease EP2

Table 5: Roller bearing greases

Lubricant table

This table shows comparable lubricants from various manufacturers. The oil manufacturer can be changed within a viscosity and lubricant type. Getriebebau NORD be consulted in case of change of viscosity or lubricant type, as otherwise no warranty for the functionality of our gear units can otherwise be accepted.

Lubricant type	Details on type plate	DIN (ISO) / Ambient temperature						
Mineral oil	CLP 680	ISO VG 680 0...40 °C	Alpha EP 680 Alpha SP 680 Optigear BM 680 Optigear 1100/680	Renolin CLP 680 Renolin CLP 680 Plus	Klüberoil GEM 1-680 N	Mobilgear 600 XP 680	Omala S2 G 680	Carter EP 680 Carter XEP 680
	CLP 220	ISO VG 220 -10...40 °C	Alpha EP 220 Alpha SP 220 Optigear BM 220 Optigear 1100/220	Renolin CLP 220 Renolin CLP 220 Plus Renolin Gear 220 VCI	Klüberoil GEM 1-220 N	Mobilgear 600 XP 220	Omala S2 G 220	Carter EP 220 Carter XEP 220
	CLP 100	ISO VG 100 -15...25 °C	Alpha EP 100 Alpha SP 100 Optigear BM 100 Optigear 1100/100	Renolin CLP 100 Renolin CLP 100 Plus	Klüberoil GEM 1-100 N	Mobilgear 600 XP 100	Omala S2 G 100	Carter EP 100
Synthetic oil (Polyglycol)	CLP PG 680	ISO VG 680 -20...40 °C	Alphasyn GS 680 Optigear Synthetic 800/680	Renolin PG 680	Klübersynth GH 6-680	Mobil Glygoyle 680	Omala S4 WE 680	Carter SY 680 Carter SG 680
	CLP PG 220	ISO VG 220 -25...80 °C	Alphasyn GS 220 Alphasyn PG 220 Optigear Synthetic 800/220	Renolin PG 220	Klübersynth GH 6-220	Mobil Glygoyle 220	Omala S4 WE 220	-
Synthetic oil (hydrocarbons)	CLP HC 460	ISO VG 460 -30...80 °C	Alphasyn EP 460 Optigear Synthetic PD 460	Renolin Unisyn CLP 460	Klübersynth GEM 4-460 N	Mobil SHC 634	Omala S4 GX 460	Carter SH 460
	CLP HC 220	ISO VG 220 -40...80 °C	Alphasyn EP 220 Optigear Synthetic PD 220 Optigear Synthetic X 220	Renolin Unisyn CLP 220 Renolin Unisyn Gear 220 VCI	Klübersynth GEM 4-220 N	Mobil SHC 630	Omala S4 GX 220	Carter SH 220
Bio-degradable oil	CLP E 680	ISO VG 680 -5...40 °C	-	Plantogear 680 S	-	-	-	-
	CLP E 220	ISO VG 220 -5...40 °C	Performance Bio GE 220 ESS	Plantogear 220 S	Klübersynth GEM 2-220	-	Naturelle Gear Fluid EP 220	-







Lubricant type	Details on type plate	DIN (ISO) / Ambient temperature						
Food-compatible oil	CLP PG H1 680	ISO VG 680 -5...40 °C	Optileb GT 1800/680	Cassida Fluid WG 680	Klübersynth UH1 6-680	Mobil Glygoyle 680		-
	CLP PG H1 220	ISO VG 220 -25...40 °C	Optileb GT 1800/200	Cassida Fluid WG 220	Klübersynth UH1 6-220	Mobil Glygoyle 220		Nevastane SY 220
	CLP HC H1 680	ISO VG 680 -5...40 °C	Optileb GT 680	Cassida Fluid GL 680	Klüberoil 4 UH1-680 N	-		-
	CLP HC H1 220	ISO VG 220 -25...40 °C	Optileb GT 220	Cassida Fluid GL 220	Klüberoil 4 UH1-220 N	Mobil SHC Cibus 220		Nevastane XSH 220
Gear unit - fluid grease	Mineral oil-based	-25 ... 60 °C	Tribol GR 100-00 PD Tribol GR 3020/1000-00 PD Spheerol EPL 00	Renolit Duraplex EP 00	MICROLUBE GB 00	Mobil Chassis Grease LBZ	Alvania EP(LF)2	Multis EP 00
	PG oil based		GP 00 K-30		Renolit LST 00	Klübersynth GE 46-1200	Mobil Glygoyle Grease 00	-

Table 6: Lubricant table

7.3 Lubricant quantities

Information

After changing the lubricant, and in particular after the initial filling, the oil level may change during the first few hours of operation, as the oil galleries and the hollow spaces only fill gradually during operation.

The oil level is still within the permissible tolerance.

If at the express request of the customer, an oil inspection glass is installed at an additional charge, we recommend that the customer corrects the oil level after an operating period of approx. 2 hours, so that when the gear unit is at a standstill and has cooled down, the oil level is visible in the inspection glass. Only then, is it possible to check the oil level by means of the inspection glass.

The filling quantities stated in the following tables are for guidance only. The precise quantities vary depending on the exact gear ratio. When filling, always observe the oil level screw hole as an indicator of the precise quantity of oil.

Gear unit types SK 11282, SK 11382, SK 11382.1, SK 12382 and SK 9096.1 are normally supplied without oil.

7.5 Troubleshooting

WARNING

Danger of slipping in case of leaks

- Clean the soiled floor before starting troubleshooting.

NOTICE!

Gear unit damage

- Shut down the gear unit immediately in case of malfunction.

Gear unit malfunctions		
Fault	Possible cause	Remedy
Unusual running noises, vibrations	Oil too low or bearing damage or gear wheel damage	Consult NORD Service
Oil escaping from gear unit or motor	Defective seal	Consult NORD Service
Oil escaping from pressure vent	Incorrect oil level or incorrect, contaminated oil or unfavourable operating conditions	Oil change, use oil expansion tank (Option OA)
Gear unit becomes too hot	Unfavourable installation conditions or gear unit damage	Consult NORD Service
Shock when switching on, vibrations	Defective motor coupling or loose gear unit mounting or defective rubber element	Replace elastomer gear rim, tighten motor and gear unit fastening bolts, replace rubber element
Output shaft does not rotate although motor is running	Fracture in gear unit or defective motor coupling or shrink disc slippage	Consult NORD Service

Table 15: Overview of malfunctions

7.6 Leakage and leak-tightness

Gear units are filled with oil or grease to lubricate the moving parts. Seals prevent the escape of lubricants. A complete seal is technically not possible, as a certain film of moisture, for example on the radial shaft sealing rings is normal and advantageous for a long-term seal. In the region of vents, moisture due to oil may be visible due to the escape of oil mist because of the function. In the case of grease-lubricated labyrinth seals, e.g. Taconite sealing systems, used grease emerges from the sealing gap due to the principle of operation. This apparent leak is not a fault.

According to the test conditions as per DIN 3761, the leak is determined by the medium which is to be sealed, which in test bench tests exceeds the function-related moisture in a defined test period and which results in dripping of the medium which is to be sealed. The measured quantity which is then collected is designated as leakage.

Definition of leakage according to DIN 3761 and its appropriate use					
Term	Explanation	Location of leak			
		Radial shaft seal	In IEC adapter	Housing joint	Venting
Sealed	No moisture apparent	No reason for complaint	No reason for complaint	No reason for complaint	No reason for complaint
Damp	Moisture film locally restricted (not an area)	No reason for complaint	No reason for complaint	No reason for complaint	No reason for complaint
Wet	Moisture film beyond the extent of the component	No reason for complaint	No reason for complaint	Repair if necessary	No reason for complaint
Measurable leakage	Recognisable stream, dripping	Repair recommended	Repair recommended	Repair recommended	Repair recommended
Temporary leakage	Temporary malfunction of the sealing system or oil leak due to transport *)	No reason for complaint	No reason for complaint	Repair if necessary	No reason for complaint
Apparent leakage	Apparent leakage, e.g. due to soiling, sealing systems which can be re-lubricated	No reason for complaint	No reason for complaint	No reason for complaint	No reason for complaint

Table 16: Definition of leaks according to DIN 3761

*) Previous experience has shown that moist or wet radial shaft sealing rings stop leaking later. Therefore, under no circumstances can replacement be recommended at this stage. The reason for momentary moisture may be e.g. small particles under the sealing lip.

7.7 Repair information

For enquiries to our technical and mechanical service departments, please have the precise gear unit type (type plate) and if necessary the order number (type plate) to hand.

7.7.1 Repairs

The device must be sent to the following address if it needs repairing:

Getriebebau NORD GmbH & Co. KG
Service Department
Getriebebau-Nord-Straße 1
22941 Bargteheide

No guarantee can be given for any attachments, such as encoders or external fans, if a gear unit or geared motor is sent for repair.

Please remove all non-original parts from the gear unit or geared motor.

Information

If possible, the reason for returning the component/device should be stated. If necessary, at least one contact for queries should be stated.

This is important in order to keep repair times as short and efficient as possible.

7.7.2 Internet information

In addition, the country-specific operating and installation instructions in the available languages can be found on our Internet site: www.nord.com

7.8 Warranty

NORD GmbH & Co. KG accepts no liability for damage to persons, materials or assets as a result of failure to observe this operating manual, operating errors or incorrect use. General wearing parts, e.g. radial seals are excluded from the warranty.

7.9 Abbreviations

2D	Dust explosion protected gear units, Zone 21	F_A	Axial force
2G	Gas explosion protected gear units, Zone 1	IE1	Standard efficiency motors
3D	Dust explosion protected gear units, Zone 22	IE2	High efficiency motors
ATEX:	AT mosphères EX plosible	IEC	International Electrotechnical Commission
B5	Flange fastening with through holes	NEMA	National Electrical Manufacturers Association
B14	Flange fastening with threaded holes	IP55	International Protection
CW	Clockwise, right rotation	ISO	International standardisation organisation
CCW	Counter-clockwise, left rotation	pH	pH value
°dH	Water hardness in German hardness degrees 1 dH = 0.1783 mmol/l	PPE	Personal Protective Equipment
DIN	Deutsches Institut für Normung [<i>German Standards Institute</i>]	DIR	Directive
EC	European Community	VCI	Volatile Corrosion Inhibitor
EN	European standard	WN	Document from Getriebebau NORD
F_R	Radial force		

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T: +49 (0) 4532 / 289-0
F: +49 (0) 4532 / 289-22 53
info@nord.com, www.nord.com

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