



# **Instruction Manual**

## **Standard Planetary Gearbox**

**PLS / WPLS / PLV / PLS-HP / PLF-HP**

**PLN / WPLN / WGN / PLFN**

**PSN / PSFN**

**PLE / WPLE / PLFE**

**PLPE / WPLPE / PLHE**



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## 2 About this document

This instruction manual describes the assembly and start-up of the NEUGART standard planetary gearboxes PLS/WPLS, PLV, PLN/WPLN/WGN, PLFN, PSN, PSFN, PLS-HP/PLF-HP, PLE/WPLE, PLPE/WPLPE, PLHE and PLFE. The instruction manual contains technical data and information about intended use/servicing and maintenance.

⇒ Read this instruction manual before operating the gearboxes.

### 2.1 Warning signs

Warning signs point out specific hazards and state measures for avoiding them. There are three levels of warning signs:

Word	Meaning
DANGER	Immediate danger to life and limb
WARNING	Possible danger to life and limb
CAUTION	Possible danger of slight injury or damage to property

Warning signs are structured as follows:



**Hazard**

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**Type and source of hazard**

⇒ Action to avoid the hazard.

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### 2.2 Notes and accentuations

The following signs and symbols are used in this instruction manual:



**Warning symbol.** Indicates hazards and warnings.



**Note symbol.** Gives specially important information, which should be observed to ensure correct and safe installation of the gearbox.

⇒ **Action.** Indicates an action or procedure.

### 2.3 Trademarks

The following product and company names are trademarks or registered trademarks of the respective companies or organisations:

- NEUGART, NIEC®

## 3 Safety

This chapter describes the safety regulations which must be observed to ensure safe and hazard-free use of the standard planetary gearbox. It contains possible sources of danger and the required safety measures.

### 3.1 Intended use

The gearbox is designed for industrial applications.

- ⇒ Do not exceed the permitted operating data.
- ⇒ Only start up the gearbox if the machine into which it is installed complies with the applicable guidelines and legal requirements (refer to Chapter 3.4).

### 3.2 Personnel qualifications

Only qualified technicians may carry out work on the gearbox, and only in accord with current safety norms.

- ⇒ Ensure that the personnel have read and understood the instruction manual.

### 3.3 General safety instructions



#### **Caution**

Incorrect usage, faulty installation and operation, as well as insufficient maintenance can cause heavy damage or serious injury.

- ⇒ Observe the following safety instructions before starting up the gearbox:

- Do not modify/reconfigure the gearbox in any way.
- Do not carry out any work on the gearbox apart from that stated in this instruction manual.
- Ensure that the identification plate is fastened to the gearbox.
- Never remove the identification plate from the gearbox.
- Ensure that all shafts are properly connected before operating the gearbox.
- Ensure that possible sources of danger are covered/secured (e. g. rotating parts).
- Observe the conditions for start-up set by the manufacturer.
- Never operate the gearbox with damaged parts.
- Always ensure sufficient convection for the gearbox during operation.
- The gearbox can get very hot during operation. Let the gearbox cool down before carrying out work on it. Be careful of hot lubricant when opening the gearbox.
- Only work on the gearbox when it is at a standstill and the driving motor is switched off and secured against renewed switching on.
- Only NEUGART may carry out repairs during the warranty period.

### 3.4 Norms/Guidelines

The CE marking as well as the EC Declaration of Conformity are not required, because the gearbox is not a machine in the sense of the EC machinery directive 2006/42/EC, but rather a component.

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

## 4 Description

### 4.1 Technical data

Gearbox series	PLS/WPLS PLV	PLN/WPLN WGN/PLFN PLHE/PSN PSFN	PLS-HP PLF-HP	PLE/WPLE PLPE WPLPE	PLFE
Maximum permitted operating temperature	+100 °C	+90 °C	+110 °C	+90 °C	+90 °C
Degree of protection	IP 65	IP 65	IP 65	IP 54	IP 54
Seals	High quality shaft seals	High quality shaft seals	High quality shaft seals	Sealed bearings	Sealed bearings

For additional technical data refer to our internet page [www.neugart.de](http://www.neugart.de)

### 4.2 NIEC system

NIEC system stands for "Neugart Integrated Expansion Chamber" and has been developed to compensate increased pressure in the gearbox. The system is integrated into the output shaft as standard in the gearbox series PLS-HP and PLF-HP.

**Function** High pressure and temperature cause increased friction and wear on the rotary shaft seal in the gearbox. The NIEC system absorbs the resulting overpressure in the gearbox by increasing the volume. The increase in volume is achieved by the membrane of the NIEC system, which can turn up.

**Advantage** The pressure compensation facilitates a higher drive speed and longer maintenance intervals.

For more information refer to the NEUGART catalogue or directly to NEUGART (see Chapter 10).

### 4.3 Lubrication

All NEUGART gearboxes have life time lubrication (see Chapter 8.1).

## 4.4 Identification plate

The identification plate explicitly identifies the gearbox and must be legible at all times (e. g. for tracing the gearbox back to the factory by NEUGART).

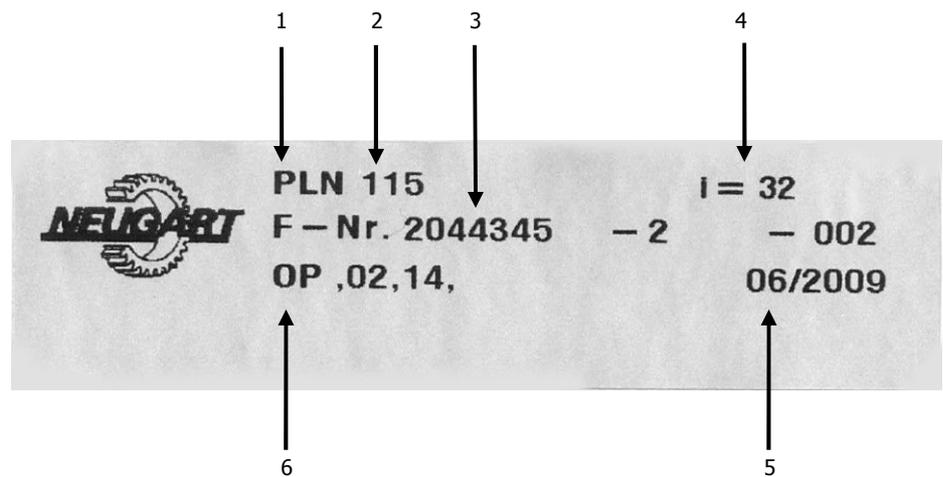


Fig. 1: Example of an identification plate

- |   |                    |   |                         |
|---|--------------------|---|-------------------------|
| 1 | Type               | 4 | Gear transmission ratio |
| 2 | Size               | 5 | Month/model             |
| 3 | Fabrication number | 6 | Options                 |

## 5 Storage, transport, disposal

- Storage** Max. 2 years at temperatures from  $-30\text{ °C}$  to  $+60\text{ °C}$ , dry, in original packaging.
- ⇒ Please note the warranty period as stated in the General Terms & Conditions.
  - ⇒ Keep the storage time as short as possible.



*The seals age if the gearbox is stored at temperatures  $>60\text{ °C}$  or subjected to direct sunlight, UV light and ozone.*

*Storage temperatures up to  $85\text{ °C}$  are permissible for short periods (approx. 2 weeks). However, temperatures  $>60\text{ °C}$  can cause premature aging of the seals even in this very short space of time. For this reason you should check the seals before operating the gearbox.*

### Transport



#### **Caution**

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#### ***Damage to the gearbox through improper transport***

- ⇒ *Do not drop the gearbox.*
  - ⇒ *Only transport the gearbox in its packaging.*
  - ⇒ *Protect the packaging and content from damp.*
- 

- Disposal** To prevent damage to the environment, you should:
- ⇒ Dispose of greases and oils separately.
  - ⇒ Dispose of the gearbox and packaging material properly and in accordance with environmental considerations.
  - ⇒ Observe the applicable regulations for proper disposal.

## 6 Assembly

### 6.1 Location conditions

- ⇒ Observe the following instructions to ensure smooth operation and a long service life of the gearbox:
  - Ensure sufficient convection for the gearbox.
  - Ensure that the gearbox can dissipate sufficient heat via the output flange.
  - The motor and other external heat sources can heat up the gearbox. Ask the respective manufacturer about motor temperatures.
  - Observe the limits set by the degree of protection of the gearbox (see Chapter 4.1, Technical data).

### 6.2 Preparing for assembly

In- and output have been treated with an anti-corrosion agent for protection against corrosion.

- ⇒ Ensure that the assembly instructions accompany the gearbox.
- ⇒ Completely remove the anti-corrosion agent and any residue.

## 6.3 Mounting the motor on the gearbox

- ⇒ Ensure that:
- The motor does not exceed the maximum permissible motor weight for the gearbox.
  - The motor has the correct geometric dimensions.



### Caution

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#### ***Damage to gearboxes with NIEC system (gearbox series PLS-HP and PLF-HP)***

- ⇒ Do not insert sharp or similar objects into the central bore hole of the output shaft.
- ⇒ Do not apply compressed air to the bore hole of the output shaft.
- ⇒ Ensure that the bore holes of the output shaft are open unless NEUGART has designed them differently.
- 



### Caution

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#### ***Thermal length compensation after attachment of WPLN gearboxes***

- ⇒ Thermal length compensation is with respect to the A bearing shield of the motor.
- ⇒ For high motor temperatures, high speeds and a motor with the fixed bearings at the B bearing shield, the deep groove ball bearings in the motor can become overloaded due to thermal linear expansion. In such a case please discuss optional coupling with NEUGART.
- ⇒ For high motor temperatures and a motor with fixed bearings at the B bearing shield, axial displacement of the motor shaft may occur as a result of thermal linear expansion. If this can lead to problems (for instance, for special brakes), please discuss optional coupling with NEUGART in advance.
- 

### Assembly

Follow the assembly instructions in the packaging of the gearbox to mount the motor. The tightening torques specified in the assembly instructions must be observed.

You can also download the assembly instructions at [www.neugart.de](http://www.neugart.de).

## 6.4 Installing the gearbox



*The gearboxes can be installed in any position.*



**Caution**

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***Damage to gearbox through hammering or applying pressure to the shaft***

⇒ *Always use suitable clamping sets to fix couplings, disks, toothed and gear wheels etc. to the shaft.*

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**Caution**

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***Damage to gearbox through leaking seals***

⇒ *Ensure that the seals on the gearbox do not get damaged or soiled during installation.*

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- ⇒ Follow the instructions in the assembly instructions on applying the torques.
- ⇒ Ensure that the mounting seats and contact surfaces of the gearbox are clean and in precise position to the connecting shafts.
- ⇒ Secure the precise position of the shafts that are to be connected.
- ⇒ Secure the gearbox.

## 7 Start-up



*The gearbox can be operated at any surrounding temperature.*

- ⇒ Ensure that all components are connected properly.
- ⇒ Switch the motor on.
- ⇒ Let the motor warm up.
- ⇒ Let the motor run at full throttle and measure the temperature of the gearbox (see Chapter 7.1).
- ⇒ Find out the period of use for the lubricant (see Chapter 8.1.1).

### 7.1 Measuring the surface temperature



**Caution**

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#### ***Damage to gearbox through overheating.***

*The gearbox is damaged if the maximum permitted temperature of the gearbox is exceeded (see Chapter 4.1, Technical data).*

- ⇒ *Ensure that the max. permitted temperature of the gearbox is not exceeded during operation.*
  - ⇒ *Switch the machine off if the max. permitted temperature is exceeded and consult NEUGART.*
- 

⇒ Measure the temperature in the centre of the housing at maximum load. The gearbox has reached thermally stable conditions once the temperature increase does not exceed 2 °C/h.



*You can use the temperature to calculate the period of use for the lubricant (see Chapter 8.1.1).*

## 8 Service/Maintenance

⇒ Inspect the seals of the gearbox for leaks every 2500 h or every half year.

### 8.1 Lubrication



**Caution**

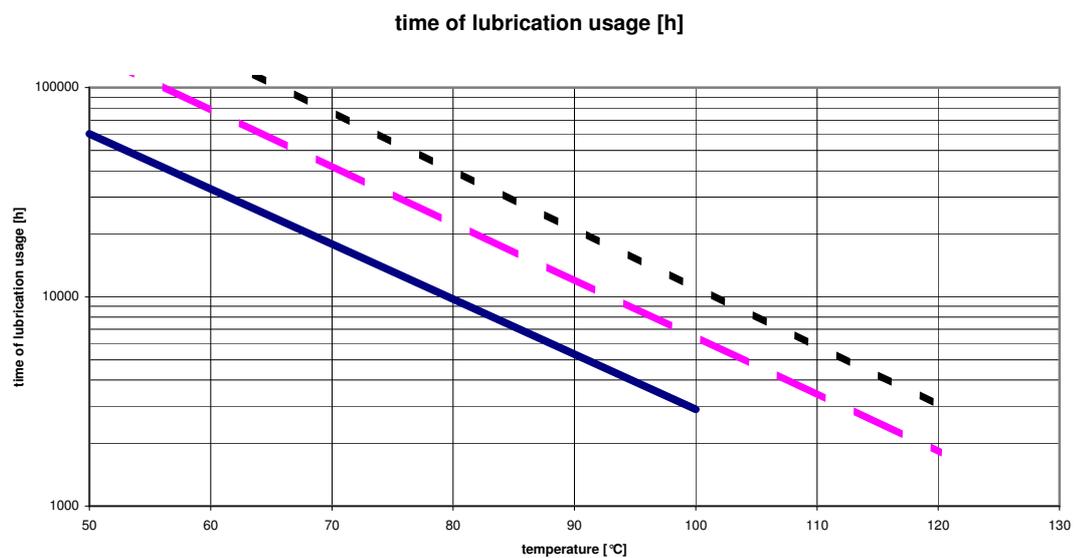
#### ***Damage to gearbox through overheating.***

*The gearbox is damaged if it is insufficiently lubricated.*

- ⇒ Calculate the period of use for the lubricant.
- ⇒ Have the lubricant replaced if necessary.

#### 8.1.1 Calculating the period of use of the lubricant

- ⇒ Measure the temperature as described in Chapter 7.1.
- ⇒ Add 10 °C to the temperature you measured.
- ⇒ Use this value to determine the period of use of the lubricant from Fig. 2.



*Fig. 2: Period of use of the lubricant*

t [h]	Period of use of the lubricant
T [°C]	Operating temperature during continuous operation
	PLE/WPLE/PLFE/PLPE/WPLPE/PLHE
	PLS/WPLS/PLS-HP/PLF-HP/PLV
	PLN/WPLN/WGN/PLFN/PSN/PSFN

⇒ Ask NEUGART to replace the lubricant.

## 8.2 Seals

⇒ Ask NEUGART to replace leaking seals.

Seals can also be changed by the customer upon consultation with NEUGART.  
You must order the original part from NEUGART.



*The service life of the seals depends on the application and ambient conditions.*

## 9 Troubleshooting

- ⇒ Contact NEUGART if malfunctions occur:
  - Unusual running noises
  - Temperature developments
  - Leaks
- ⇒ Have the following information to hand:
  - Identification plate data (complete)
  - Type and extent of malfunction
  - Attendant circumstances of the malfunction
  - Application data (cycle of the torque, speed, forces over time/surrounding conditions)

## 10 Service

⇒ If you have questions or problems please contact NEUGART:

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77971 Kippenheim/Germany

**Tel.** +49 (0)7825-847-0

**Fax** +49 (0)7825-847-2999

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