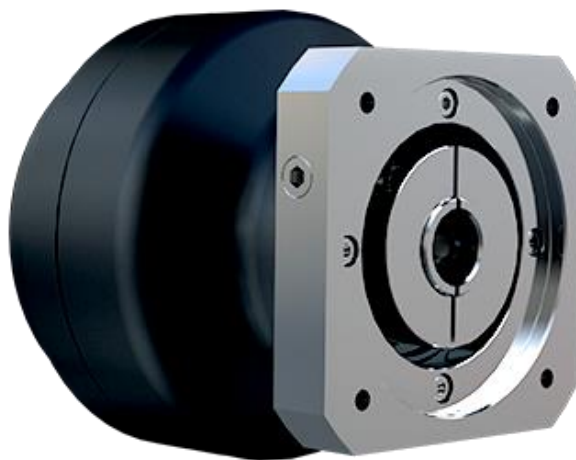


Neco®

# Original Operation and Assembly Manual

Neco® gearbox series

Neco® models 25/42/80/125/160



The corresponding model can be found in your order and delivery documents.

Observe this operation manual at all times, in particular the safety instructions and warnings!  
Keep the operation manual!

## Imprint

### Service contact

Please contact our customer advisor if you have any questions or problems.

We are happy to help you. Please use the following contact:

Address	Nabtesco Precision Europe GmbH Tiefenbroicher Weg 15 D-40472 Düsseldorf, Germany
Phone	+49 211 173790
E-mail	<a href="mailto:info@nabtesco.de">info@nabtesco.de</a>
Internet	<a href="http://www.nabtesco.de">www.nabtesco.de</a>

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# 1 General

## 1.1 Using this operation manual

This operation manual is an integral part of the product and contains all the relevant instructions required to ensure the safe and proper transport, storage, installation, operation, and maintenance of the Neco® gearbox series.

In the following, the Neco® gearbox is referred to simply as the product or gearbox.

The operator of the machine is required to ensure that all personnel tasked with transport, storage, installation, operation, and maintenance have read and understood this operation manual in full.

The operation manual must be kept close to the machine in a legible condition; it must be accessible at all times.

Ensure that the product you are using is an original product manufactured by Nabtesco Precision Europe GmbH.

Extended operation manuals or supplements such as customer drawings are available for special designs. Ensure that you always have all the correct documentation to hand.

If you have any questions, please contact your customer advisor (see the imprint on page 2).

## 1.2 Warnings

Warnings indicate potential hazards and the consequences if the hazards are not avoided as well as measures that can be taken to prevent danger.

### 1.2.1 Grouped warnings

Chapters such as “Safety” consist primarily of warnings.



#### **Risk of injury!**

- These warnings are not emphasised separately but are displayed in the form of a list preceded by a warning triangle.

#### **Crushing hazard!**

- The warnings are grouped according to the type of hazard.

### 1.2.2 Section-specific warnings

Each section-specific warning applies to an individual section, workflow or procedure. They do not just apply to a specific action. The hazard symbols used will indicate either a general or a specific hazard.

Section-specific warnings are structured as follows:

SIGNAL WORD
Type of danger and potential consequences
⇒ Measures to prevent the danger

### 1.2.3 Structure of embedded warnings

Embedded warnings refer to a specific part within a paragraph. These warnings apply to smaller information units than the section-related warnings.

Embedded warnings are structured as follows:

 **SIGNAL WORD!** Instruction on how to avoid a dangerous situation

### 1.2.4 Meaning of the signal words

The following signal words indicate risks of injury or damage to property:

Signal word	Meaning
 <b>DANGER</b>	Impending danger Consequence: death or extremely severe injuries
 <b>WARNING</b>	Possibility of impending danger Consequence: death or extremely severe injuries
 <b>CAUTION</b>	Possibility of impending danger Consequence: slight or minor injuries
<b>ATTENTION</b>	Possibility of impending danger Consequence: damage to property or the environment
<b>NOTE</b>	Reference to important information

### 1.2.5 Figures and tables

Figures and tables are numbered, e.g. Fig. 1-1, Table 1-2.

The first digit corresponds to the chapter, the second is a consecutive number.

## 1.3 Terms used

### Specialist

Specialist personnel/specialists are people who have sufficient knowledge or have acquired the necessary qualifications through training to recognise risks and avoid hazards that may arise from handling the product.

### Servicing

Maintenance is the umbrella term for inspection, servicing, and repair.

- Inspection
  - Inspection refers to determining and documenting the current status.
- Maintenance
  - Restoring the target condition through maintenance work, testing, calibration, recalibration, lubrication, cleaning, preservation.
  - Checking settings, recording measured values.
  - Checking fill levels.
  - Replacing components and operating materials at the end of their service life.
- Repair
  - Replacing a component that was identified as defective during maintenance work.

## 1.4 Disclaimer

Compliance with the operation manual is essential to ensure safe operation of the gearbox and to achieve the product and performance characteristics indicated.

Any injury, damage to property or financial loss caused by a failure to follow the operation manual or by transporting, storing, installing, maintaining or operating the gearbox incorrectly will void all warranty and liability claims against Nabtesco Precision Europe GmbH and Nabtesco Corporation.

## 1.5 Responsibility of the operator

The operator is responsible for providing clear operating, servicing, maintenance, and other operating instructions for the personnel.

Within the European Union, observe the national regulations in accordance with EU Directive 89/391/EEC (in Germany, the Ordinance on Industrial Safety and Health (BetrSichV)). Also take into account the safety data sheets of any hazardous substances used.

Observe the information and recommendations in this operation manual. Please note that the manufacturer has no experience of long-term operation under your operating conditions. Therefore, you should supplement the information in this operation manual with your own experience.

If necessary, observe the information in the manufacturer's documentation for the components installed in this product.

To ensure safe and problem-free operation, the product may only be installed by trained and instructed personnel.

The operator determines which measures are necessary for the safe operation, maintenance, and servicing. The required personal protective equipment (e.g. safety shoes, heat-protective gloves, helmet) is made available to the personnel.

The operator must train and instruct the personnel in proper and intended operation and proper use.

The operation manual must be kept up to date, taking into account the experience gained from the ongoing operation, and must be readily available to the operating personnel.

## 1.6 Intended use

The gearbox is used to modify rotational speeds and torques in mechanical and plant engineering applications and has been designed exclusively for this purpose.

The performance limits described must not be exceeded during use. Information on performance can be found in the technical data sheet.

Obtaining comprehensive advice from Nabtesco Precision Europe GmbH is recommended as a basic principle.



## 1.7 Guidelines

The gearbox is an incomplete machine.

Fundamental safety and health protection requirements were taken into account when the gearbox was designed and manufactured.

The gearbox may not be commissioned until it has been installed in a machine or incomplete machine that complies with the Machinery Directive 2006/42/EC.

Commissioning cannot take place until the end product's compliance with the EU Machinery Directive has been established.

## 1.8 Foreseeable misuse, warranty, and liability exclusions

Warranty and liability claims for personal injury and damage to property are excluded if they are attributable to one or more of the following causes:

- improper use of the product;
- failure to observe the instructions in the operation manual regarding transport, storage, assembly, commissioning, operation, maintenance, and set-up;
- improper installation, commissioning, operation, and maintenance;
- unauthorised changes to the product;
- use of unqualified, untrained, or uninstructed personnel;
- exceeding the design limits;
- the use of non-original spare parts;
- repairs performed improperly;
- disasters caused by foreign bodies and force majeure.

## 1.9 Qualifications of personnel

This operation manual is intended for authorised and trained personnel. Only qualified specialists are permitted to perform work such as installation, commissioning, and maintenance. Ensure that all personnel tasked with transporting, storing, installing, operating, and maintaining the product have fully read and understood the operation manual.

As the operator, you are required to familiarise your personnel and instruct them in the existing legal and accident prevention regulations in the country of operation as well as in your operating instructions.

The corresponding activities and persons are presented in the following matrix.

Activity	Instructed person	Specialist
Packaging/transport	X	
Installation		X
Commissioning		X
Operation	X	X
Cleaning	X	X
Fault finding		X
Fault rectification		X
Maintenance		X
Repair		X
Dismantling		X

## 1.10 Waste disposal and environmental protection

### 1.10.1 Operating materials and cleaning agents

Dispose of operating materials and cleaning agents in accordance with the national regulations in the country of operation.

Observe the safety data sheets of the respective manufacturer for the operating materials and cleaning agents used.

### 1.10.2 System components and spare parts

Separate operating materials, e.g. oil fillings, from the component to be replaced.

Dispose of operating materials and cleaning agents in accordance with the national regulations in the country of operation.

Dispose of the product or parts of the product in accordance with the national regulations in the country of operation.

## 2 Safety

### 2.1 General safety instructions

This operation manual contains detailed descriptions for operating the product safely and correctly and for monitoring it during operation.

The product has been constructed in accordance with the state of the art and the accepted rules of safety technology and is deemed safe to operate.



#### **Warning! Risk of injury!**

Incorrect use, faulty installation or operation, and inadequate maintenance can cause severe injuries or even death. Serious material damage is possible.

- ⇒ Follow the general safety instructions in this operation manual. Ensure that the product is used as intended. Only employ qualified specialist personnel.

Modifications to and work on the product can impair its function and, in the worst case, lead to accidents resulting in severe injury or death.

- ⇒ Do not make any modifications or alterations to the product.
- ⇒ Never use the product if it is damaged.

#### **Attention!**

Lubricants, oils and parts of the gearbox have the potential to pollute the environment.

- ⇒ Ensure that the gearbox is disposed of correctly.
- ⇒ Check the gearbox regularly for leaks.

## 3 Specific safety instructions, residual risks



### **Warning! Crushing hazard!**

- ⇒ Depending on the model, there is a risk of hands and feet being crushed during handling due to the weight of the product.
- ⇒ Wear suitable personal protective equipment (protective boots, protective gloves).

### **Warning! Risk of crushing and shearing!**

Body parts and clothing can be pulled in by rotating components. This can lead to severe injuries or even death.

- ⇒ Only ever work on the gearbox when it is at a standstill.
- ⇒ Keep a sufficiently safe distance from rotating parts of the gearbox during operation.

### **Caution! Risk of burns!**

The gearbox becomes hot during operation. Touching the gearbox case can cause severe burns.

- ⇒ Allow the gearbox to cool down before starting work
- ⇒ Wear suitable personal protective equipment (protective gloves).

## 4 Product description



### NOTE

All the diagrams below are illustrative and serve only to provide an explanation. Deviations in gearbox size and shape are possible at any time.

### 4.1 Structure

Designs that have been customised in terms of their technical specifications and geometrics are possible at any time.

Please contact Nabtesco Precision Europe GmbH without delay if you are unable to follow the operation manual clearly in this case.

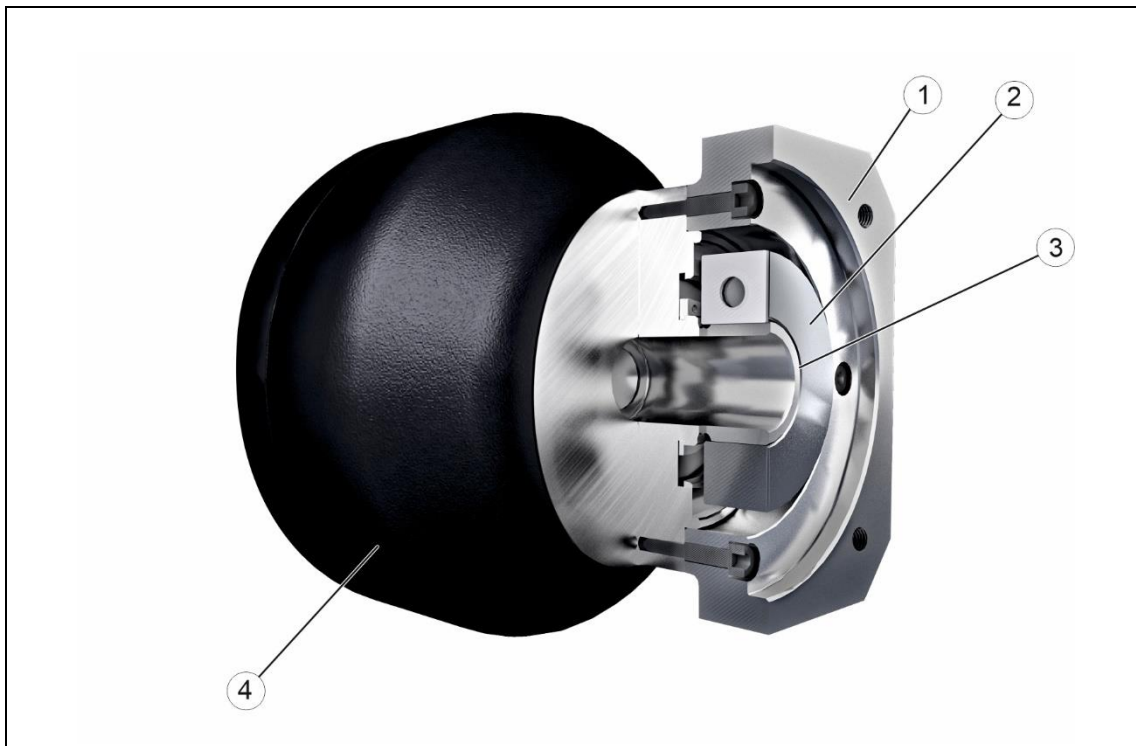


Figure 4-1.: Neco® structure

Pos.	Name
1	Motor flange
2	Radial clamping ring
3	Bushing
4	Gearbox

## 4.2 Product code

Example: G1-125N-A35-041G-ZZZZ-VGFA-RLB

G1	xxxx	x	xx	-	xxx	x	-	xxxx	-	xxxx	-	xxx
Series	Size	Model	Inside diameter of hollow shaft		Transmission (rated)	Internal code		Motor adaptation reducing sleeve		Motor flange design		Lubricant

Please see the product catalogue for more details and descriptions.

## 4.3 Lubricant

### ATTENTION

Damage to the product possible.

- Use the lubricant specified by Nabtesco to optimise the performance of this product. The use of other types of lubricant can lead to reduced performance and premature wear.
- Do not mix the lubricant specified by Nabtesco with other lubricants. Mixing with other lubricants can lead to reduced performance, unusual noises, and premature wear.

### 4.3.1 Standard

Model	Product	Operating temperature (ambient temperature)
Neco®	RV-GREASE LB00 (gear grease)	-10 ... 40 °C

Table 4-2.: specified lubricant

All gearboxes are supplied pre-lubricated in accordance with the specifications. Please refer to the product data sheets.

### 4.3.2 Food-grade lubricant H1

Food-grade H1 lubricants are available as an option. Please contact your customer advisor for more information.



**NOTE**

Food-grade H1 lubricants have different performance characteristics. This can affect the specified performance as well as the properties of the gearbox.

## 4.4 Technical specifications, Declaration of Incorporation

You can find the technical specifications and product characteristics

- in the technical data sheet in the product catalogue
- on the customer drawing
- on the website [www.nabtesco.de/en/downloads](http://www.nabtesco.de/en/downloads)

The Declaration of Incorporation is also available on the website.

Gearbox type	25	42	80	125	160
Approx. weight [kg]	7	12.5	18	26	34.3

Table 4-3.: Weights

## 4.5 Ambient conditions

The following conditions apply for installation and operation:

- Ambient temperature between -10 °C and +40 °C<sup>1</sup>
- Altitude of < 1000 m above sea level<sup>2</sup>
- Humidity < 85%, without condensation
- good ventilation

<sup>1</sup> Ambient temperatures above 40 °C can lead to higher temperatures in the gearbox and change the viscosity of the lubricant

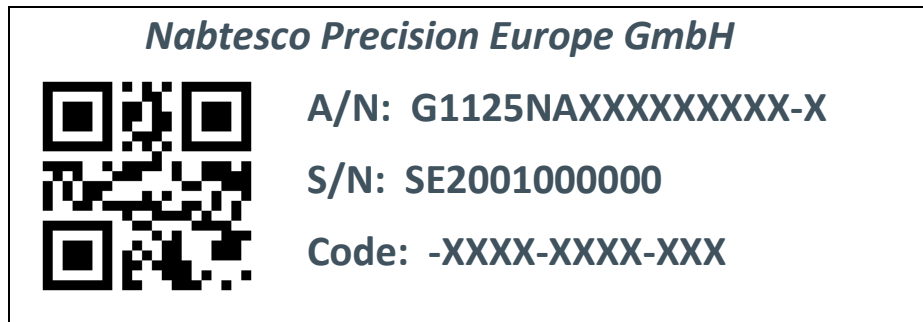
<sup>2</sup> Operation at altitudes above 1000 m changes the pressure conditions and can lead to higher temperatures in the gearbox and change the viscosity of the lubricant




## 4.6 Label

All gearboxes are supplied with a standard Nabtesco Precision Europe GmbH (adhesive) label on the case. A gearbox can be uniquely identified using its serial number. Ensure that the label is not damaged and remains easily legible when installing the gearbox.

The label is structured as follows:



QR code	More information available online
A/N	Article (item) number of the gearbox
S/N	Serial number of the gearbox
Code	Configuration



**NOTE**  
The serial number must be stated in all queries.  
Customised labels may deviate from the example given above.

## 5 Transport, storage, and preparations

Check your delivery for potential damage sustained in transit. If you identify any such damage, submit a complaint to the freight forwarder without delay.

- ⇒ When enquiring about this product, the model, item number and serial number stated on the shipping label are required. Make a note of the above information when unpacking the product and store it in a safe place.  
The model and serial number specified on the label can also be used.

### 5.1 Transport

#### **WARNING**

##### Risk of injury!

- ⇒ Transport the product in a suitable way in accordance with the specified weight restrictions, see chapter 4.4.  
The figures are reference weights. The actual weight may vary depending on the design and packaging.
- ⇒ Only use suitable lifting equipment to move and lift products weighing more than 20 kg.
- ⇒ Avoid any impacts, vibrations or collisions with other objects through slow and controlled handling.

#### **ATTENTION**

Incorrect transport can damage the product.

If the product falls or collides with another object, the high-precision components inside it can be damaged.

- ⇒ In this case, you should not use the product.
- ⇒ Contact your customer advisor.

If this product needs to be lifted after unpacking to move it to another location or store it, please follow the instructions in chapter 5.4.

## 5.2 Storage

### 5.2.1 Storage conditions

Store the product in a location that meets the following criteria:

- If possible, in the original packaging.
- Closed room.
- Room temperature recommended.
- Humidity < 85%, without condensation.
- Not exposed to flammable, explosive or corrosive gases or dust.
- No vibrations.
- Do not store for longer than 12 months after receipt. Keep the time the product spends in storage to a minimum.

#### ATTENTION

##### Damage to the product possible!

Although this product is coated with anti-rust oil before despatch, it is not suitable for long-term storage.

- ⇒ If you intend to store the gearbox for a lengthy period of time, check its condition regularly and take anti-corrosion measures if necessary.
- ⇒ Consider the warranty period in accordance with the general terms and conditions.

### 5.2.2 Storage in original packaging



#### WARNING

##### Risk of injury!

Do not stack cartons!

Stacks can collapse and fall, which can lead to injuries or damage to the product.

- ⇒ Check the alignment of the top and bottom of each packaging box and store it with the correct orientation.  
If the packaging is upside down, this can cause damage to the product.
- ⇒ If you intend to store the gearbox for a lengthy period of time, check its condition regularly and take anti-corrosion measures, if necessary.

## 5.3 Unpacking

The product is coated with anti-rust oil before despatch and may be slippery.

- ⇒ If necessary, wipe off the rust protection oil before transport.
- ⇒ If you use a tool for unpacking, take special care not to damage the product.

## 5.4 Lifting the product



### **WARNING**

**Risk of injury from falling objects!**

- ⇒ Never enter areas under suspended loads.
- ⇒ When lifting this product, be sure to use a lifting device capable of bearing the weight of this product.

## 6 Installation

The customised design may vary depending on the version and scope of the order. Additional assembly steps may be required or others may be omitted.

### 6.1 Assembly environment

The ambient conditions specified in chapter 4.5 apply for installation.

Contact your customer advisor if you cannot achieve the ambient conditions required for installing the gearbox.

Contact your customer advisor if you are using the gearbox in non-standard conditions (e.g. a clean room, high-pressure steam, concentrated alkali or equipment for food technology, medical devices, etc.).

### 6.2 Preparations for assembly

The product is coated with anti-rust oil before despatch. The anti-rust oil could escape from the cylinders, bolt holes or the flange connection surface during operation.

- ⇒ Clean, degrease, and dry the surfaces before starting work.  
Use a silicone-free degreasing detergent and a clean lint-free cloth.
- ⇒ Check all installation surfaces for damage.
- ⇒ If necessary, also clean the installation surface on the motor.
- ⇒ Ensure absolute cleanliness during installation.

## 6.3 Installation on a motor (drive)

The gearbox is suitable for motors with a smooth shaft and suitable diameter tolerances.

### ATTENTION

#### Risk of damage and loss of performance!

Installing the motor incorrectly can damage the gearbox. Deviating tolerance values can impair the performance of the clamping connection. The motor shaft may slip.

The loads (bending torque) generated by the motor's own weight must not exceed the permissible screw force.

⇒ For this reason, only use connecting elements specified for the motor installation.

⇒ The tightening torque limits specified in the operation manual must be observed.

Attention! The size and weight of the motor and other attachments must match the size and weight of the gearbox to ensure secure attachment.

Oils and greases with molybdenum disulphide or other high-pressure additives as well as lubricating grease pastes must not be used!

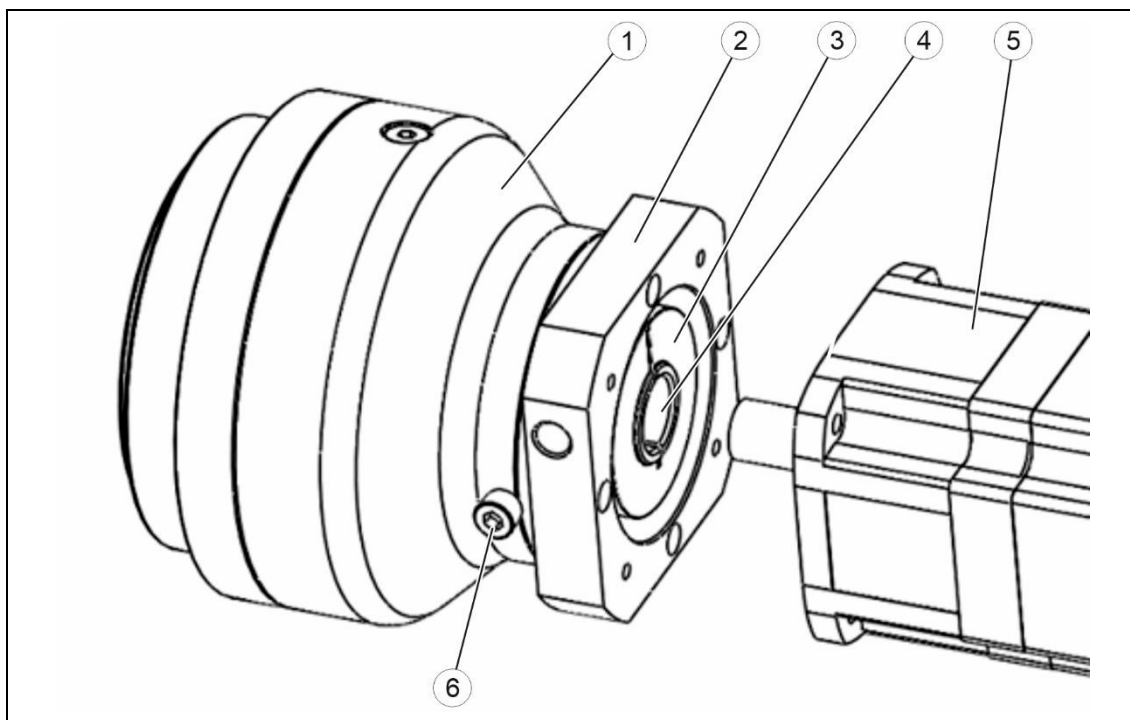
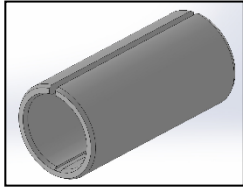


Figure 6-4.: Installation on a servomotor

Pos.	Name
1	Gearbox
2	Motor flange
3	Radial clamping ring
4	Bushing
5	Servomotor
6	Screw plug (followed by the clamping screw of the clamping ring)

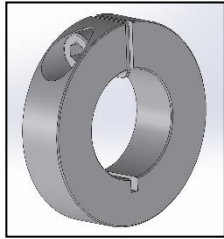
### 6.3.1 Accessories



#### Bushing:

The bushing has been specifically optimised to achieve the desired fitting tolerance. For this reason, only use an original Nabtesco Precision Europe GmbH bushing.

The bushing may not be required depending on the motor adaptation chosen.



#### Radial clamping ring:

Only use an original Nabtesco Precision Europe GmbH radial clamping ring.

Follow the instructions for tightening it and observe the permitted screw tightening torques.

See chapter 6.3.2 for the required tightening torque of the clamping screw.

### 6.3.2 Clamping screw tightening torques

Use the screws and tightening torques specified by Nabtesco when installing this product.

Gearbox size	d x D x W* [mm]	Tightening torque [Nm]
Neco 25	24 x 45 x 11	10 (M5)
Neco 42	32 x 66 x 20	40 (M8)
Neco 80	44 x 82 x 22	84 (M10)
Neco 125		
Neco 160		

Table 6-5.: Tightening torque of the screw plug

\* d = inside diameter / D = outside diameter / W = width



#### NOTE

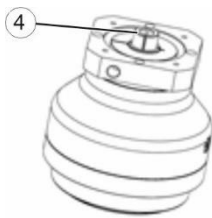
Accessory components are specially manufactured to match the gearbox. Therefore, only use the accessories supplied. Contact your customer advisor if you are unsure.

Uncertified accessories can impair the gearbox performance. Damage to the gearbox caused by incorrect accessories will void the warranty.

## 6.3.3 Installation steps



- ⇒ Remove the screw plug (6) and store it (access radial clamping ring).
- ⇒ If the radial clamping ring is not already pre-assembled, slide it over the hollow shaft as far as it will go. The anti-rotation device (plastic plate) must be inserted into the hollow shaft groove.
- ⇒ Slightly unscrew the clamping screw (6, inside) on the radial clamping ring to allow the motor shaft to be inserted.



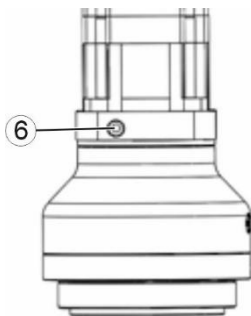
If an optional reducing sleeve (4) is required to bridge the motor and hollow shaft diameters:

- ⇒ Either push the sleeve into the hollow shaft or slide it over the motor shaft (depending on the installation position). It is recommended to mount the sleeve with the groove rotated 90° to the groove of the hollow shaft.



- ⇒ Slowly insert the motor shaft into the hollow shaft until the installation surfaces are parallel to each other. A vertical installation orientation is recommended. Observe the motor manufacturer's specifications regarding the screw type, strength class, and tightening torque.

- ⇒ Tighten the motor screws slightly (approx. 20% of the specified tightening torque) for alignment and fastening. A mechanical screw lock is recommended.



- ⇒ Tighten the clamping screw to the specified tightening torque in three stages (50%/80%/100%) through the opening (6) in the screw school plug, see Table 6-5.
- ⇒ Then tighten all motor screws completely to the tightening torque specified by the manufacturer.
- ⇒ Tighten the locking screw (6) so that it is flush in order to lock the access. Do not force the screw in too far as internal components may be damaged.



## 6.4 Attachment to the end product

### Assembly conditions:

- ⇒ All installation surfaces are burr-free and free of dirt.
- ⇒ Ensure precise centring and positioning of the components.
- ⇒ Note the accessibility of the screw connections to prevent damage during installation.
- ⇒ Use the full complement of screws and make sure that they are long enough (see Tables 6-6. and 6-7.).
- ⇒ Use only grade 12.9 screws when installing the output flange and case, preferably cylinder-head screws in accordance with DIN EN ISO 4762 (DIN 912).
- ⇒ Use locking washers to prevent the screws from coming loose (see Table 6-9.).
- ⇒ Tighten the screws crosswise in several stages to the specified tightening torque (see table 6-10.).

### 6.4.1 Fastening

Hexagon socket screws and serrated lock washers are required for fastening.

Model	Nominal size	Number of screws
Neco 25	M5 x 0.8	16
Neco 42	M6 x 1.0	16
Neco 80	M8 x 1.25	16
Neco 125	M10 x 1.5	16
Neco 160	M10 x 1.5	16

Table 6-6.: Number of screws required for the case

Model	Nominal size	Number of screws
Neco 25	M6 x 1.0	3
	M10 x 1.5	6
Neco 42	M10 x 1.5	9
Neco 80	M8 x 1.25	24
Neco 125	M10 x 1.5	21
Neco 160	M12 x 1.75	18

Table 6-7.: Number of screws on the output side

The screw length depends on the installation dimensions. The installer is responsible for selecting the length.

## Serrated lock washers for the hexagon socket screws

Name	Belleville spring washer (Heiwa Hatsujyo Industry Co., Ltd.)
Order code	CDW-H, CDW-L (only for M5)
Material	S50C-S70C
Hardness	HRC40 up to 48

You must observe the specifications if you use a different serrated lock washer.

- ⇒ When selecting the serrated lock washer, pay particular attention to the outer diameter ( $\phi D$ ) and the washer thickness.

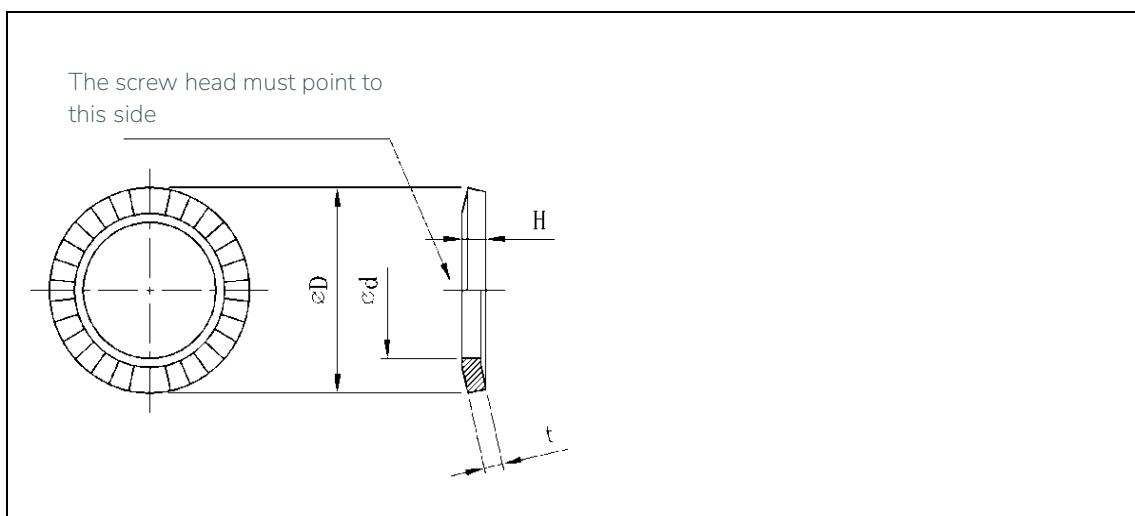


Figure 6-8.

Nominal size	Inner diameter ID	Outer diameter OD	Thickness T	Height H
5	5.25	8.5	0.6	0.85
6	6.4	10	1.0	1.25
8	8.4	13	1.2	1.55
10	10.6	16	1.5	1.9
12	12.6	18	1.8	2.2

Table 6-9.: Serrated lock washer sizes [mm]

Nominal size x increase [mm]	Tightening torque* [Nm]	Tightening force [N]
M5 x 0.8	9.01 ± 0.49	9310
M6 x 1.0	15.6 ± 0.78	13180
M8 x 1.25	37.2 ± 1.86	23960
M10 x 1.5	73.5 ± 3.43	38080
M12 x 1.75	129 ± 6.37	55100

Table 6-10.: Tightening torques for 12.9 cylinder-head screws

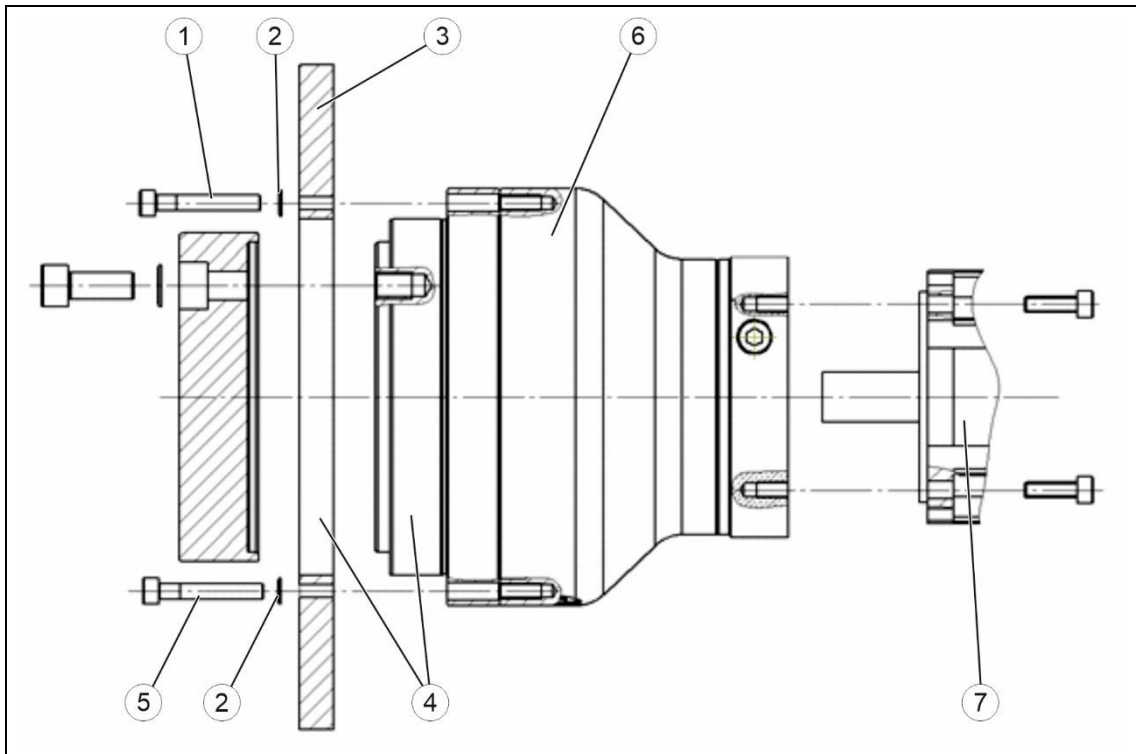


Figure 6-11.: Gearbox design A

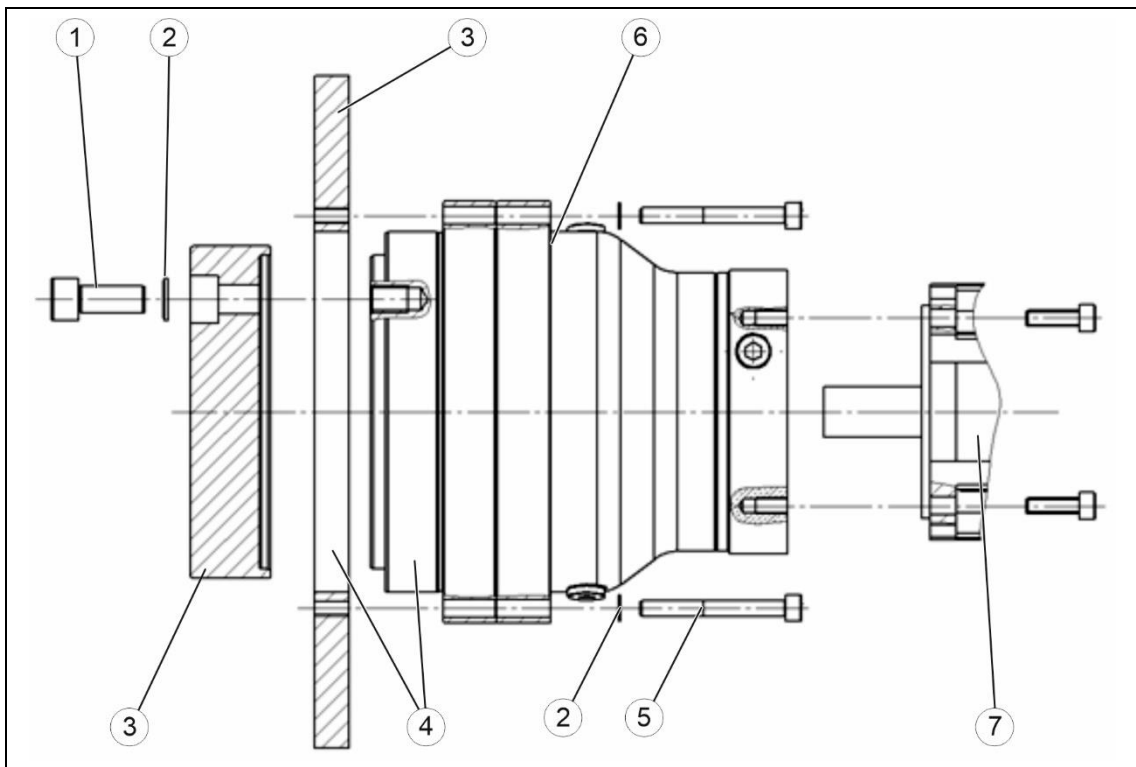


Figure 6-12.: Gearbox design B

Pos.	Name	Pos.	Name
1	Output drive screw connection	5	Case screw connection
2	Locking washer	6	Gearbox
3	Use/application	7	Motor with screw connection
4	Installation surfaces		

## 7 Commissioning

### **WARNING**

Observe the following safety instructions to prevent accidents and protect your health:

- ⇒ Use the personal protective equipment provided, see chapter 1.5.
- ⇒ When handling oils, greases, cleaning agents, and other hazardous substances, observe the manufacturer's safety regulations and the safety data sheets applicable to the product.

### 7.1 Checks prior to initial commissioning

Before commissioning, check that

- lubricant is available,
- all components are connected correctly,
- the fastening screws are tight.

### 7.2 Function check

The gearbox needs to be run in without load for at least 30 minutes at a reduced rotational speed.

- ⇒ Check for unusual noises and vibrations during the running-in process.
- ⇒ Check operating temperature and screw strength.

### 7.3 Protective measures for operation

#### **WARNING**

##### **Risk of being pulled in!**

Body parts and clothing can be pulled in by rotating components. This can lead to severe injuries or even death.

- ⇒ Keep a sufficiently safe distance from rotating parts of the gearbox during operation.

##### **Risk of injury! Risk of burns!**

The product can become very hot during operation.

- ⇒ Always wait until it has cooled down sufficiently before touching it.
- ⇒ Do not exceed the permissible load capacity and maximum speed.



## NOTE

The temperature of the gearbox is normally 40 °C. Premature wear occurs at temperatures of 60 °C and higher. In this case, the lubricant must be changed more frequently than specified in chapter 8.5 .

If this product is operated over a longer period of time or at high load cycles, the temperature of the product increases and this can have a negative effect on the service life or operation. Use the product safely, taking into account the ambient temperature and ventilation cooling.

### 7.3.1 Recommissioning after a longer period of time

- ⇒ If the gearbox not been operated for a longer period of time, check that no corrosion is present before recommissioning it.  
Operating the gearbox without performing these checks can damage the gearbox.



## NOTE

The commissioning process must be repeated if the gearbox has not been operated for a longer period of time. Repeating the running-in process is also recommended.

## 8 Cleaning, maintenance, and inspection

### 8.1 Planning, implementation, documentation

You must check the maintenance and cleaning intervals specified in this operation manual and, if necessary, adjust these your company's specific requirements. Ensure that the intervals are complied with.

Document maintenance and repair work in a maintenance logbook.

During maintenance, all components must be checked for wear and damage. Damaged or worn components must be replaced with original spare parts.

### 8.2 Precautionary measures for cleaning and maintenance

#### **WARNING**

##### Risk of injury!

If the drive system starts up unintentionally while work is being carried out on the gearbox, this can cause severe injuries or even death.

- ⇒ De-energise the gearbox motor before starting work.
- ⇒ Ensure that it cannot be switched on unintentionally.
- ⇒ Disconnect the power supply if necessary.

#### **CAUTION**

Risk of burns due to a hot gearbox and hot lubricant. Touching the gearbox case can cause severe burns.

- ⇒ Before starting work, allow the gearbox sufficient time to cool down.

- ⇒ Wear suitable clothing and protective equipment.
- ⇒ Organise the surroundings and ensure safety to prevent secondary accidents.

### 8.3 Cleaning

When installed correctly, the gearbox is protected against moisture and dirt.

#### If required

- ⇒ Remove any dirt adhering to the outside using water and, if necessary, a cloth or sponge.

## 8.4 Inspections

Vehicle condition	Inspection	Description
During operation	Noises	No unusual or changing noises
During operation	Vibrations	No extreme/disruptive vibrations
Stopped	Surface temperature	Warm but not hot
Stopped	Screws	Screws are tight
Stopped	Lubricant leakage	No leaks

Table 8-13.: Inspection list

- ⇒ If one of the defects listed here is found on the gearbox: Cease operation and contact Nabtesco (contact details can be found on page 2).
- unusual noises,
  - unusual vibrations,
  - strong heat development,
  - leakage.



## 8.5 Changing the lubricant

- ⇒ Observe the safety data sheet of the lubricant.
- ⇒ Wear the necessary protective clothing.

### 8.5.1 Change interval

A lubricant change is recommended after 20,000 hours (after installation in the application).



**NOTE**

If the surface temperature of the gearbox consistently exceeds 40 °C during operation, the condition of the lubricant should be checked on a regular basis. If necessary, the operator must specify a shorter change interval.

### 8.5.2 Lubricant quantities

Check the lubricant type and quantity required for each product on the basis of the final specification drawings. If you have any questions, please your Nabtesco customer advisor. Only use the lubricant specified in chapter 4.3.

Model	Quantity Gearbox design A	Quantity Gearbox design B
Neco 25	357	320
Neco 42	579	523
Neco 80	919	853
Neco 125	1138	1048
Neco 160	1357	1318

Table 8-14.: Lubricant quantity [ccm]

## 8.6 Troubleshooting checklist

Check the following points if problems such as unusual noises, vibrations or malfunctions occur. You can copy the checklists on this and the following page and tick them off during examinations.

The problem occurs immediately after installing this product

Issue	Inspection
Ensure that there is no interference with other components (interfering edges, overlaps, blockages).	
Ensure that a load exceeding the permissible value (permissible load capacity or maximum speed) is not applied.	
Ensure that the required number of screws have been tightened evenly to the specified tightening torque.	
Ensure that the specified quantity of the lubricant specified by Nabtesco has been filled.	
Ensure that there are no problems with the parameter settings of the motor.	
Ensure that no components vibrate with each other.	
Ensure that the input shaft is correctly installed on the motor.	

The problem occurs during operation (immediately or after a longer period of time)

Issue	Inspection
Ensure that this product has not been in operation for longer than the calculated service life. It may be necessary to replace components	
Ensure that the surface temperature of this product is not higher than normal during operation.	
Ensure that the operating conditions have not been changed.	
Ensure that no screws are loose or missing.	
Ensure that a load exceeding the permissible value (permissible load capacity or maximum speed) is not applied.	
Ensure that there is no interference with other components (interfering edges, overlaps, blockages).	
Ensure that an oil leak does not lead to a reduction in the lubricant quantity.	
Ensure that there is no external contamination or moisture in the equipment.	
Ensure that no lubricant other than that specified is used.	

Please contact our customer advisor if you have any questions or problems, see page 2.

Please provide the following information:

- Label data
- Type of fault
- Time of fault
- Suspected cause

## 9 Decommissioning

- ⇒ Carry out disassembly.
- ⇒ Drain the lubricant.
- ⇒ Dispose of lubricant in accordance with the data sheet.
- ⇒ Dispose of the product/parts of the product in accordance with the national regulations in the country of operation.