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This installation guide describes the installation and start-up of the item axial planetary Gearboxes and bevel planetary Gearboxes in three transmission ratios and three sizes: AP 40; AP 60; AP 80 and WP 40; WP 60; WP 80

Art. No.	Product
0.0.666.05	Gearbox AP 40-3
0.0.666.06	Gearbox AP 40-5
0.0.666.07	Gearbox AP 40-7
0.0.666.11	Gearbox AP 60-3
0.0.666.12	Gearbox AP 60-5
0.0.666.13	Gearbox AP 60-7
0.0.666.17	Gearbox AP 80-3
0.0.666.18	Gearbox AP 80-5
0.0.666.19	Gearbox AP 80-7
0.0.666.08	Gearbox WP 40-3
0.0.666.09	Gearbox WP 40-5
0.0.666.10	Gearbox WP 40-7
0.0.666.14	Gearbox WP 60-3
0.0.666.15	Gearbox WP 60-5
0.0.666.16	Gearbox WP 60-7
0.0.666.20	Gearbox WP 80-3
0.0.666.21	Gearbox WP 80-5
0.0.666.22	Gearbox WP 80-7

In the following general descriptions, these products are referred to collectively as the Gearbox.

## General safety information

The details and information in the Notes on Use and Installation are provided solely for the purpose of describing the product and its assembly. This information does not discharge the user from the obligation to carry out his own assessments and checks. It is important to bear in mind that our products are subject to a natural process of wear and ageing.

These notes contain important information that will enable you to use the product safely and appropriately. When sold, rented out or otherwise passed on to another party, this product must be handed over with the Notes on Use and Installation.

When installing, operating and maintaining the Gearbox, it is important to ensure that all moving elements are secured so that they cannot be switched on and moved unintentionally.

Rotating and moving parts can cause serious injury! You must therefore read and follow the safety instructions set out below.

All work on and with the Gearbox must be performed with "safety first" in mind.

Do not place your hand near the moving parts of the Gearbox when they are unlocked.

Observe the regulations pertaining to accident prevention and environmental protection that apply in the country and place of work where the product is being used.

Use only item products that are in perfect working order. Failure to use original spare parts will invalidate the product warranty!

Check the product for obvious defects. Use the product only within the performance range described in the technical data.

Ensure that all the safety equipment associated with the product is present, properly installed and in full working order. Do not alter the position of safety equipment, circumvent it or render it ineffective.

The Gearbox described here corresponds to the state of the art and takes into account the general principles of safety applicable at the time this installation guide was published. Nevertheless, failure to observe the safety instructions and warning notices in these Notes on Use

and Installation may result in personal injury and damage to property.

We will assume no liability for any resulting damage or injury. We reserve the right to make technical changes that represent technical advances. Keep these installation notes in a place where they can be easily accessed by all users. Observe the directions contained in the main user guide for a system. The general safety information applies to the entire lifecycle of the Gearbox.

## During transportation

Observe the handling instructions on the packaging. Until it is installed, the product must be stored in its original packaging, protected from moisture and damage. Ensure that moving parts are secured when in transit and cannot cause any damage. Suspended loads can fall during transport if load-bearing equipment is not fit for purpose or is incorrectly secured, thus leading to serious injuries (including fatal injuries).

- Keep clear of suspended loads.
- Use lifting gear with sufficient load-bearing capacity (see delivery paperwork for product weight).
- Carefully secure lifting gear.
- Attach lifting gear to the product only at sufficiently stable points.
- Observe environmental regulations.

## During installation

Avoid areas that pose slip, trip, fall and jamming hazards.

## During commissioning

Allow the product to acclimatise for a few hours before starting it up. Ensure that the completed machine satisfies internal company requirements. Only start up a product that has been installed in full.

## During operation

Ensure that only persons who have been authorised by the operator have access to the immediate operating area of the Gearbox. This also applies when the system is not in operation. It must not be possible to actuate moving parts unintentionally. Ensure that nobody can step below suspended loads.

## During cleaning

Close all openings with suitable protective equipment to ensure that cleaning agents cannot penetrate the system. Do not use aggressive cleaning substances. Do not use a high-pressure cleaner when cleaning the system.

## During maintenance and servicing work

Carry out the prescribed maintenance work at the intervals stipulated in the user guide. Ensure that no cables, connections or components are detached or removed. Secure the Gearbox to prevent uncontrolled movement.

## During disposal

Dispose of the product in accordance with the national and international regulations that apply in your country.

## 1.1 Correct use

The Gearbox must only be used in accordance with the technical data and safety requirements set out in this document. The Gearbox is intended exclusively for use in industrial applications.

If major alterations are made to the Gearbox, compliance with the applicable regulations will need to be renewed and the documentation supplemented accordingly.

The Gearbox is a mechanical component that provides a suitable transmission ratio to influence the speed and drive torque between a Linear Unit and a motor.

The Gearbox may be started up only when it has been integrated safely into the system.

Internal company requirements and the regulations that apply to the user and in the country where the product is being used must be observed. You must not make any design modifications to the Gearbox yourself. We will assume no liability for any resulting damage or injury.

You may only install, operate and maintain the Gearbox if:

- You integrate the Gearbox into its surroundings in a proper and safe manner. The operator is responsible for ensuring proper and safe installation,
- You have carefully read and understood the installation guide,
- You are appropriately qualified,
- You are mentally and physically capable of doing so,
- You are authorised to do so by your company,
- You are using only original equipment from the manufacturer.

Unsafe or inappropriate operation and the functional characteristics of the Gearbox pose a risk of serious injuries and contusions.

## 1.2 Improper use

Improper use is defined as any use of the product for purposes other than those authorised in the Notes on Use and Installation and under the definition of correct

use. We will assume no liability for any resulting damage or injury.

## 1.3 Personnel qualifications

Assembly, commissioning, operation, disassembly and maintenance work (including servicing and care) require an adequate knowledge of mechanical engineering and an understanding of the relevant technical terminology. To ensure operational safety, these activities must therefore be carried out only by a qualified person or by personnel under the instruction and guidance of a qualified person

A qualified person is an individual who – by virtue of his or her specialist training, know-how, experience and knowledge of pertinent regulations – is able to assess the work that is assigned to him or her, identify potential hazards and put in place appropriate safety measures. A qualified person must comply with the applicable specialist regulations.

## 1.4 Warning symbols



Attention, Warning



Information

## 2. Product description



High-precision planetary gearboxes are used to transmit and translate motion, energy and forces. They are suitable for numerous applications. These high-quality drive elements are utilised in an innovative and specialised way.

The compact design and outstanding performance characteristics satisfy complex requirements in all areas of mechanical engineering.

## 3. Operating data

	Gearbox AP 40-3	Gearbox AP 40-5	Gearbox AP 40-7
	0.0.666.05	0.0.666.06	0.0.666.07
Gear ratio	3	5	7
Rated output torque [Nm]	11 Nm	14 Nm	8.5 Nm
Max. output torque	17,6 Nm	22 Nm	13.6 Nm
Max. mechanical input speed [1/min]	18000	18000	18000
Mass moment of inertia [Kgcm <sup>2</sup> ]	0.014 - 0.027	0.014 - 0.027	0.014 - 0.027
Torsional rigidity [Nm/arcmin]	0.7 - 1 Nm/arcmin	0.7 - 1 Nm/arcmin	0.7 - 1 Nm/arcmin
Backlash [arcmin]	15 '	15 '	15 '
Weight	0.3	0.3	0.3
Lifetime	30000 h	30000 h	30000 h

	Gearbox AP 60-3	Gearbox AP 60-5	Gearbox AP 60-7
	0.0.666.11	0.0.666.12	0.0.666.13
Gear ratio	3	5	7
Rated output torque [Nm]	28 Nm	40 Nm	25 Nm
Max. output torque	45 Nm	64 Nm	40 Nm
Max. mechanical input speed [1/min]	13000	13000	13000
Mass moment of inertia [Kgcm <sup>2</sup> ]	0.359 - 0.654	0.359 - 0.654	0.359 - 0.654
Torsional rigidity [Nm/arcmin]	1.7 - 2.3 Nm/arcmin	1.7 - 2.3 Nm/arcmin	1.7 - 2.3 Nm/arcmin
Backlash [arcmin]	10 '	10 '	10 '
Weight	0.9	0.9	1.6
Lifetime	30000 h	30000 h	30000 h

	Gearbox AP 80-3	Gearbox AP 80-5	Gearbox AP 80-7
	0.0.666.17	0.0.666.18	0.0.666.19
Gear ratio	3	5	7
Rated output torque [Nm]	85 Nm	110 Nm	65 Nm
Max. output torque	136 Nm	176 Nm	104 Nm
Max. mechanical input speed [1/min]	7000	7000	7000
Mass moment of inertia [Kgcm <sup>2</sup> ]	0.359 - 0.654	0.359 - 0.654	0.359 - 0.654
Torsional rigidity [Nm/arcmin]	4.3 - 5.8 Nm/arcmin	4.3 - 5.8 Nm/arcmin	4.3 - 5.8 Nm/arcmin
Backlash [arcmin]	7 '	7 '	7 '
Weight	2.0	2.0	2.0
Lifetime	30000 h	30000 h	30000 h

	Gearbox WP 40-3	Gearbox WP 40-5	Gearbox WP 40-7
	0.0.666.08	0.0.666.09	0.0.666.10
Gear ratio	3	5	7
Rated output torque [Nm]	3.96 Nm	6.6 Nm	7.48 Nm
Max. output torque	7 Nm	12 Nm	13.6 Nm
Max. mechanical input speed [1/min]	18000	18000	18000
Mass moment of inertia [Kgcm <sup>2</sup> ]	0.032 - 0.049	0.032 - 0.049	0.032 - 0.049
Torsional rigidity [Nm/arcmin]	0.6-0.8 Nm/arcmin	0.6-0.8 Nm/arcmin	0.6-0.8 Nm/arcmin
Backlash [arcmin]	21 '	21 '	21 '
Weight	0.5	0.5	0.5
Lifetime	30000 h	30000 h	30000 h

	Gearbox WP 60-3	Gearbox WP 60-5	Gearbox WP 60-7
	0.0.666.14	0.0.666.15	0.0.666.16
Gear ratio	3	5	7
Rated output torque [Nm]	12.32 Nm	21.12 Nm	22 Nm
Max. output torque	22 Nm	38 Nm	40 Nm
Max. mechanical input speed [1/min]	13000	13000	13000
Mass moment of inertia [Kgcm <sup>2</sup> ]	0.221 - 0.376	0.221 - 0.376	0.221 - 0.376
Torsional rigidity [Nm/arcmin]	1.5-2 Nm/arcmin	1.5-2 Nm/arcmin	1.5-2 Nm/arcmin
Backlash [arcmin]	16 '	16 '	16 '
Weight	1.6	1.6	1.6
Lifetime	30000 h	30000 h	30000 h

	Gearbox WP 80-3	Gearbox WP 80-5	Gearbox WP 80-7
	0.0.666.20	0.0.666.21	0.0.666.22
Gear ratio	3	5	7
Rated output torque [Nm]	35.2 Nm	58.96 Nm	57.2 Nm
Max. output torque	64 Nm	107 Nm	104 Nm
Max. mechanical input speed [1/min]	7000	7000	7000
Mass moment of inertia [Kgcm <sup>2</sup> ]	0.917 - 1.409	0.917 - 1.409	0.917 - 1.409
Torsional rigidity [Nm/arcmin]	3.8-5.1 Nm/arcmin	3.8-5.1 Nm/arcmin	3.8-5.1 Nm/arcmin
Backlash [arcmin]	13 '	13 '	13 '
Weight	3.7	3.7	3.7
Lifetime	30000 h	30000 h	30000 h



It is important to bear in mind that our products are subject to a natural process of wear and ageing. When exposed to unfavourable environmental conditions such as temperatures over 60°C, UV radiation or the influence of ozone, the seals in particular age at an accelerated rate. We recommend that the seals are checked before the Gearbox is used. Fundamentally, this Gearbox is intended for use in areas that are protected from the weather.

- The area should be free from mould and fungus and show no traces of rodents or other pests.
- Do not install or use in close proximity to industrial plants that produce chemical emissions.
- Do not install or use near sources of sand or dust.
- Do not install or use in an area that is regularly

exposed to high-energy surges such as those caused by presses or heavy machinery, for example.

- Resistant to many of the substances usually encountered in the production area, such as water, mineral oil, grease and detergents. In case of doubt regarding resistance to certain chemicals such as test oil, alloyed oils, aggressive cleaning substances, solvents or brake fluid, we advise that you consult your specialist representative.
- Avoid long periods of contact with highly acidic or alkaline substances.
- Consult the manufacturer if using in very salty air.

## 4. Installation and operation

Faults may occur as a result of incorrect start-up and the service life may be shortened.



- Load values must not be exceeded.
- Safety instructions must be followed under all circumstances!

- Inappropriate use of the system can pose hazards to people and equipment.
- The product warranty is valid only when the product is used correctly.



To ensure smooth running and a long service life, we advise that the recommendations below are followed:

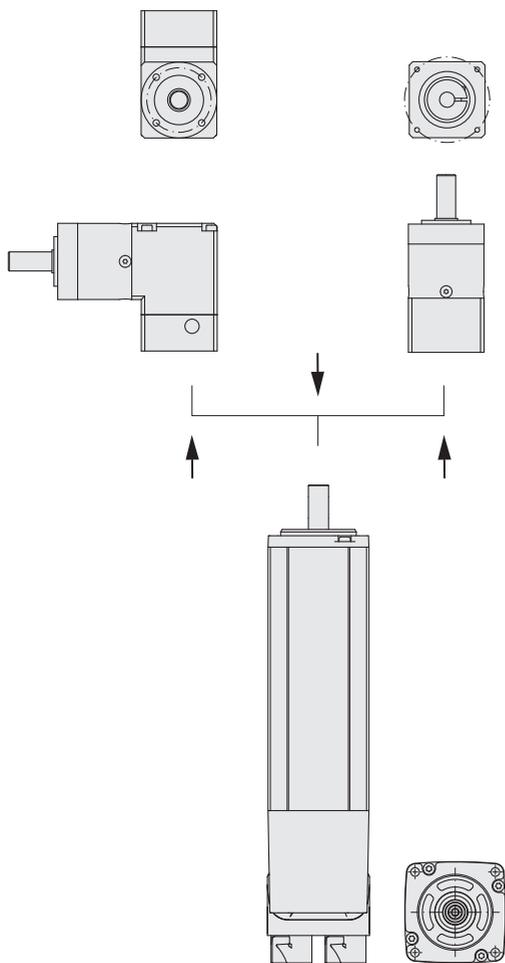
- Ensure adequate heat extraction for the Gearbox.
- Ensure the Gearbox can dissipate sufficient heat via the output flange.

- Bear in mind that the motor or other external heat sources can cause the Gearbox to heat up.
- Work within the limitations required by the relevant protection class of the Gearbox.
- Prior to installation, remove and clean the Gearbox, particularly the shaft, leaving no residues of dirt and corrosion inhibitor.

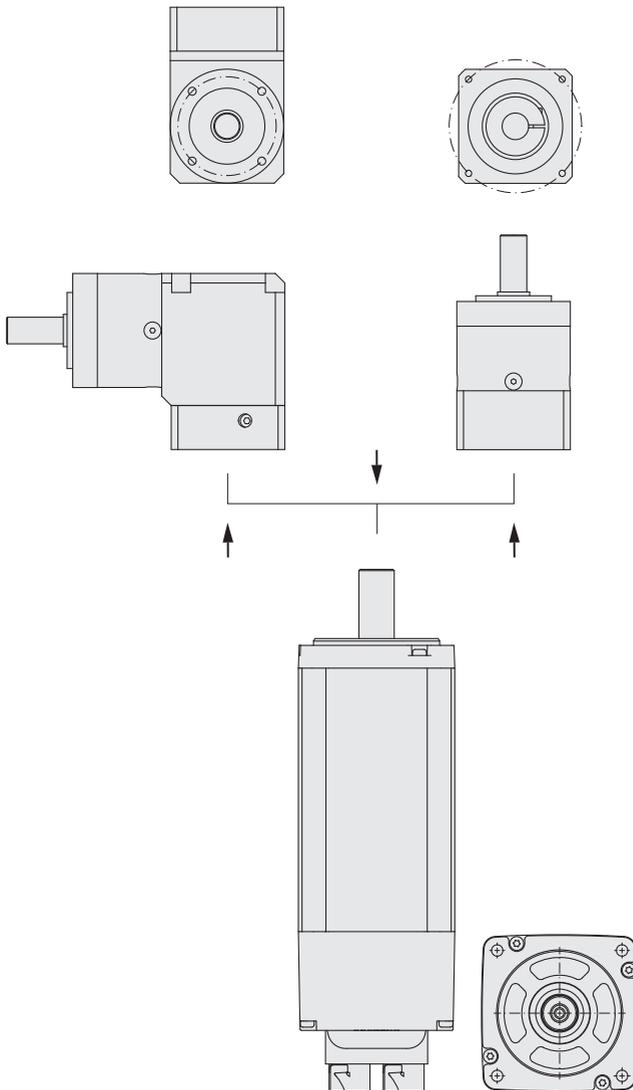


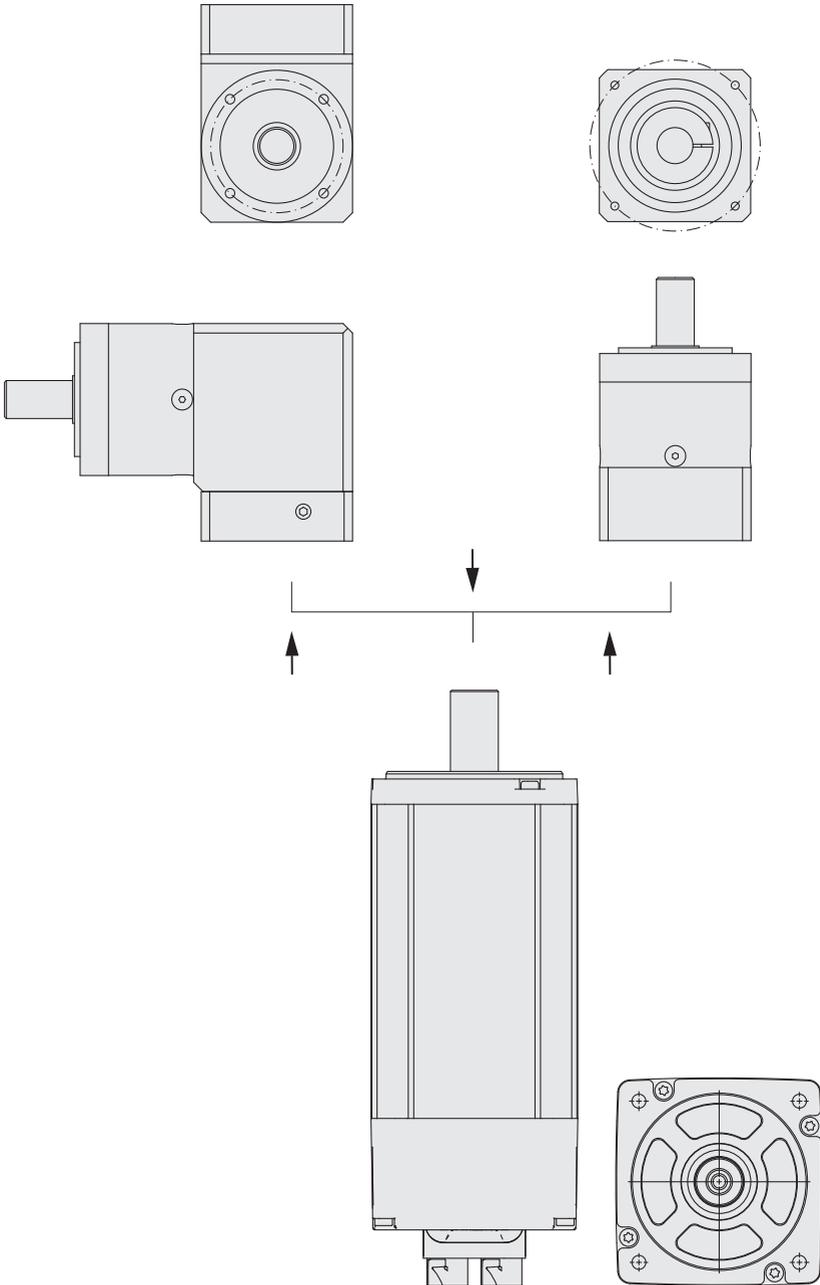
Ensure the correct combination of Gearbox and motors is used. Suitable components can be clearly identified by their flange dimension and by

name. The size also reflects the performance of the components.



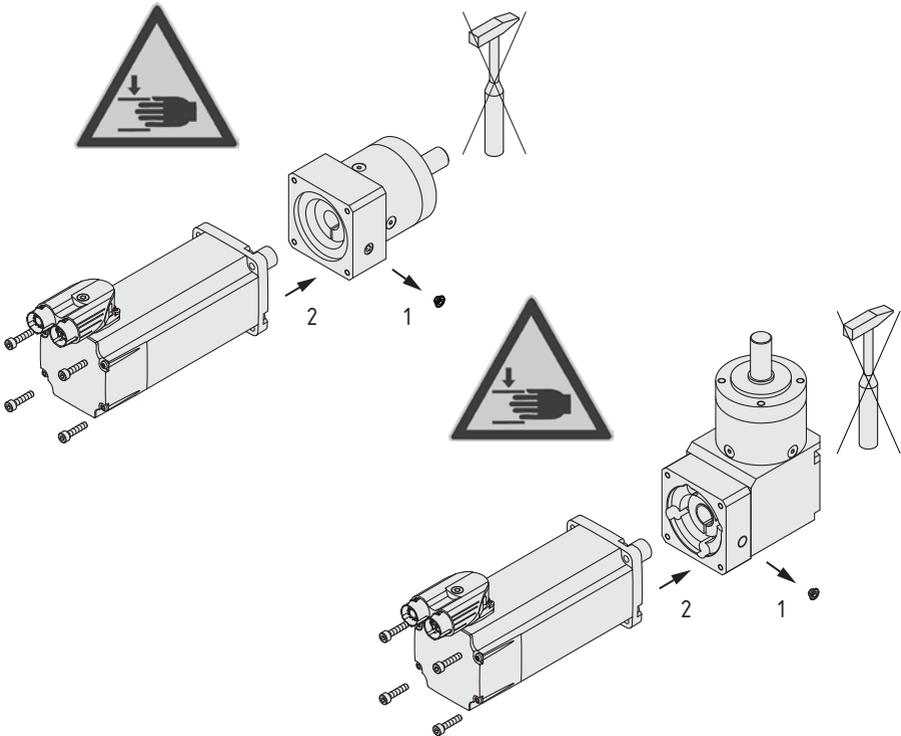
Gearbox-motor combination, size 60mm





After thoroughly cleaning the relevant corresponding components, simply fit them together – there is no need to use any tools. Exercise caution, as there is a risk that hands could get jammed between the components.

1. Remove the grub screw that covers the clamping screw.
2. Insert the motor and Gearbox into each other and then screw into place.



Ensure that no radial stress is generated when tightening the screw connections. The hexagon socket head cap screws are only included in the scope of supply for the relevant item Drive Sets.

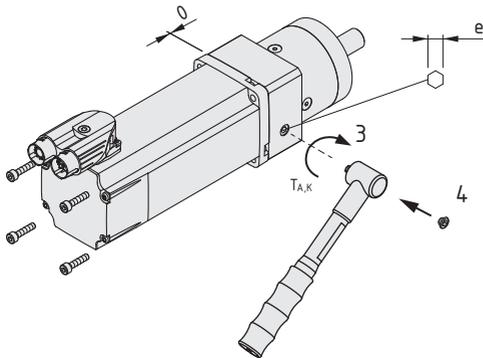
Observe the orientation of the motor relevant to the Gearbox. The components can be aligned

and screwed in place in 90° increments, as per the gauge of the screw holes on the flange. This means that the position of cables or the accessibility of the grub screw and the clamping screw (see 1) can be planned in advance.

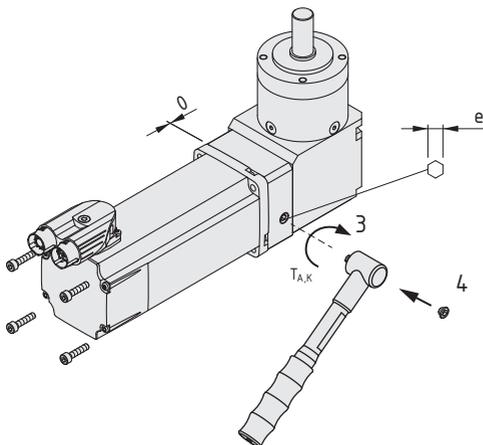
		Tightening torque
Screw DIN EN ISO 4762 M3	Gearbox AP 40	2 Nm
	Gearbox WP 40	
Screw DIN EN ISO 4762 M4	Gearbox AP 60	3 Nm
	Gearbox WP 60	
Screw DIN EN ISO 4762 M5	Gearbox AP 80	6 Nm
	Gearbox WP 80	

In the next step, screw the motor shaft and the clamp coupling of the Gearbox firmly into place:

3. Use a torque spanner to tighten the clamping screw. Use the following table to check the correct tightening torque for the relevant size.
4. Replace the grub screw cover and tighten.



Gearbox	AP 40		AP 60		AP 80	
$T_{A,K}$ (Nm)	2	4.5	4.5	9.5	9.5	16.5
e (mm)	2.5	3	3	4	4	5



## 5. Maintenance and servicing work

This information does not discharge the user from the obligation to carry out his own assessments and checks. It is important to bear in mind that our products are subject to a natural process of wear and ageing. When maintaining the Gearbox, it is important to ensure that all moving elements are secured so that they cannot be switched on and moved unintentionally. Rotating and moving parts can cause serious injury! All work on and with the Gearbox must be performed with "safety first" in mind.

All Gearboxes supplied by item GmbH are lubricated for life.

Visual checks and functional tests should be performed regularly according to the level of utilisation and environmental conditions.

Check the seals of the Gearbox for leaks every 2500 hours or half-yearly.



Gearbox damage caused by overheating – if the Gearbox is not adequately lubricated, it will be damaged.

- Ensure that the maximum permissible temperature for the Gearbox is not exceeded during operation.
- If the maximum permissible temperature is exceeded, deactivate the system and consult item GmbH.
- Measure the temperature under the maximum load state at the centre of the housing.
- The temperature of the Gearbox has stabilised when the temperature increase does not exceed 2°C per hour.

## 6. Disposal

The materials used are environmentally friendly. The product can be recycled or re-used (if necessary after refurbishment and the replacement of parts).

Dispose of the Gearbox in accordance with the national regulations that apply in your country.

## 7. Annex

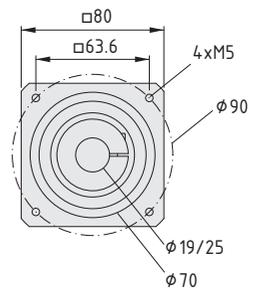
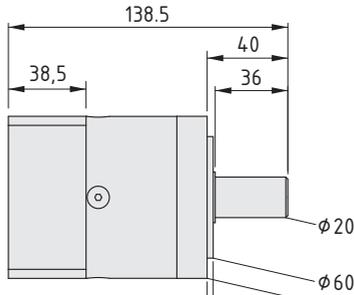
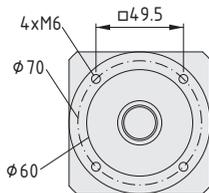
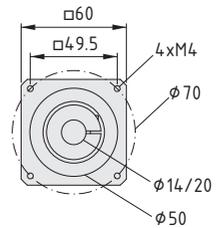
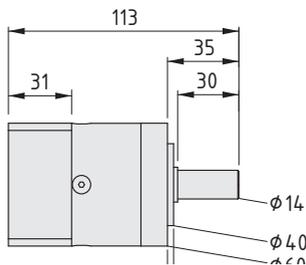
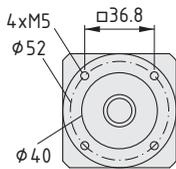
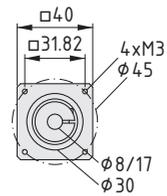
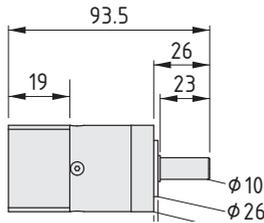
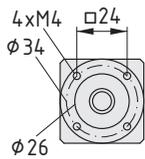
Technical data for the Axial Planetary Gearboxes:

Transmission ratio  $i=3$   
 0.0.666.05 AP 40  
 0.0.666.11 AP 60  
 0.0.666.17 AP 80

Transmission ratio  $i=5$   
 0.0.666.06 AP 40  
 0.0.666.12 AP 60  
 0.0.666.18 AP 80

Transmission ratio  $i=7$   
 0.0.666.07 AP 40  
 0.0.666.13 AP 60  
 0.0.666.19 AP 80

Axial Planetary Gearboxes:



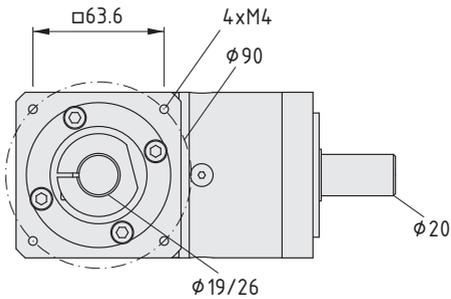
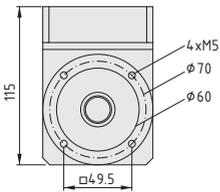
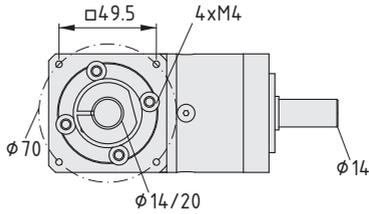
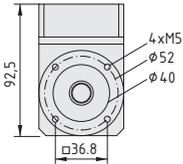
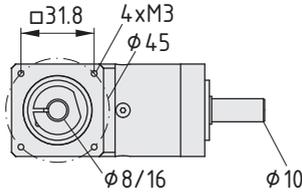
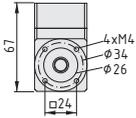
Technical data for the Bevel Planetary Gearboxes:

Transmission ratio  $i=3$   
 0.0.666.08 WP 40  
 0.0.666.14 WP 60  
 0.0.666.20 WP 80

Transmission ratio  $i=5$   
 0.0.666.09 WP 40  
 0.0.666.15 WP 60  
 0.0.666.21 WP 80

Transmission ratio  $i=7$   
 0.0.666.10 WP 40  
 0.0.666.16 WP 60  
 0.0.666.22 WP 80

Bevel Planetary Gearboxes:



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