

## **Operating- and Maintenance Instructions Planetary Gearboxes Series ESP**

### **OPERATING INSTRUCTIONS**

#### **1. Introduction**

Eisele planetary gearboxes ESP060 – ESP180 are low backlash planetary gearboxes for applications in the machine tool industry, robotics, and handling and automation equipment.

The accuracy of the gears is high and the tolerances are very narrow in planetary gearboxes ESP 60 – 180. The mounting and installation position of the motor pinion inside the planetary gearbox must be very accurate in order to achieve low operating noise, efficiency and wear.

This is why the concentricity of the motor shaft and the coaxiality and axial runout of the servomotor's mounting flange must comply with German industry standard DIN 42955-R.

#### **Caution:**

Higher operating noise and wear will occur if the mounting flange does not comply with German DIN 42955-R. This will also lead to a reduction of the gearbox's lifetime. In this case, the technical data given in the Eisele catalogue will no longer be binding.

#### **2. State at Delivery**

The planetary gearboxes (for motor mounts K and P and free input shafts) are equipped with lifetime lubrication at the state of delivery. The sun gear is integrated into the gearbox, and a separate assembly on the motor shaft is not required.

#### **3. Assembly of couplings, crown gears, etc.**

Couplings, crown gears, sprockets, gears, etc. need to be assembled on the cleaned or slightly greased output shaft via the axial threaded hole in the output shaft or by heating up the parts. Assembly by pressing or hammering can damage the bearings and should be strictly avoided.

#### **4. Installation**

The planetary gearboxes of the ESP series can operate in installation position H (horizontal), VU (vertical, output shaft downwards) or VO (vertical, output shaft upwards), according to the order.

The centering diameter and locating surfaces must be clean and free from burrs and any damage. The connecting shafts must be in perfect positional accuracy to the contact surfaces in order to avoid any damaging impacts and stresses on the whole system from misalignment or offsets of bearings, shafts and housing.

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### **5. Lubrication**

Oil used: EG 4-220  
Producer: Klüber (Klübersynth®)

The oil used in the gearboxes is a permanent lubrication at regular operating conditions for 15,000 operating hours or 3 years. If the temperature at continuous operation is higher than 90°C, or if intensive fluctuations in temperature occur through extreme operating cycles, the oil must be changed after 10,000 operating hours.

The gearboxes must be checked and repaired in factory if oil leakage occurs due to damaged shaft seals.

### **6. Operating Temperature**

The operating temperature of standard gearboxes is in the range off -20°C to +90°C. Operating temperatures above or below the given range are only permissible with special arrangements. Please contact us with exact information on the overall conditions.

### **7. Operating Speed**

Maximum input speed: 6500 rpm (short-term)  
Nominal input speed: 2500 rpm

### **8. Instructions for Motor Mounting**

- (a) Ensure that motor flange and motor shaft comply with DIN 42955-R.
- (b) Check all parts for damage and remove all potential damage and burrs.
- (c) Slide planetary gearbox carefully with light pressure on the motor.
- (d) Tighten connecting bolts between motor and gearbox crosswise.
- (e) Tighten clamping hub bolt with correct torque.

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### **MAINTENANCE**

Sliding-, and rolling friction cause wear on certain parts of the gearbox (bearings, seals, gears, etc.). This wear is reduced to a minimum by the lubricant used, which increases the lifetime of all parts of the gearbox.

The selection of the gearbox size depends on the power to be transmitted and the load rating of the bearings. The load of the gears will be in the endurance stress range of the material if the gearbox is selected correctly. This prevents pitting or fatigue fracture of the gears.

Operational life time of the bearings will correlate with the life time of the gearbox if the gearbox is selected correctly. The elements relevant for maintenance purposes are thus narrowed down to lubrication and shaft seals.

The life time of the shaft seals used depends on various factors, e.g. rotational speed, temperature, grease quality and ambient conditions. After 10,000 operating hours, we recommend carrying out a visual examination of the gearbox every 5,000 operating hours. If there is leakage at the input or output side an exchange will be necessary.