Mounting Instructions

Servo-Worm Reducers
Five mounting faces with tapped holes are provided for mounting in any position. In order to accommodate all external forces (see page 22), we recommend mounting the unit on the largest contact face, i.e. one of the two cover sides. Mounting the unit so the input worm shaft is vertical or under the output shaft is ideal for lubrication; mounting the unit so the input worm shaft is above the output shaft will reduce the driving capacity of the unit by about 10%.

Input Motor Coupling
The input motor coupling is delivered pre-assembled. Before attaching it to the motor shaft, all contact surfaces must be cleaned and protected by applying a thin oil film. An internal snap ring inside the coupling positions it on the motor shaft, preventing any axial movement of the coupling. To assemble the coupling onto the motor shaft, following these recommendations:

1. Slide the coupling onto the motor shaft until it bottoms out on the snap ring.
2. Tighten the clamping screws slightly and check the coupling for runout.
3. Tighten the screws alternating crosswise using the torque value shown in the table opposite, ensuring that the gap between the coupling and contact face remains even.
4. A final check of the runout is recommended at the end of the coupling.

<table>
<thead>
<tr>
<th>Order Code</th>
<th>Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>65 43 ..</td>
<td>5.2 lb.ft.</td>
</tr>
<tr>
<td>65 44 ..</td>
<td>7.4 lb.ft.</td>
</tr>
<tr>
<td>65 46 ..</td>
<td>7.4 lb.ft.</td>
</tr>
<tr>
<td>65 47 ..</td>
<td>18.5 lb.ft.</td>
</tr>
</tbody>
</table>

Servo-Motor
Insert the motor with the mounted coupling into the pilot diameter of the motor mounting flange and bolt it to the gearbox. This should be done with the gearbox input shaft vertically up and the motor shaft vertically down.

Output Pinion Shafts
Clean the pinion shaft and hollow shaft extension and then grease or oil them lightly.

For output shafts with the key connection, the internal snap ring, washer and screw provided serve to lock the output shaft axially. Insert the internal snap ring in the groove of the hollow shaft and slide the output drive shaft into the desired side of the hollow shaft until it bottoms out. The washer and screw are attached to the output shaft from the other side of the gearbox. The internal snap ring must be clamped between the washer and the end of the output shaft.

Compression Coupling
Slide the compression coupling onto the hollow shaft extension of the gearbox (do not tighten the screws beforehand!). Insert the output shaft into the desired side of the hollow shaft until it bottoms out. Tighten the screws one after the other (not alternating crosswise) in several passes to the torque indicated in the table.

<table>
<thead>
<tr>
<th>Order Code</th>
<th>Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>80 83 030</td>
<td>3 lb.ft.</td>
</tr>
<tr>
<td>80 84 036</td>
<td>9 lb.ft.</td>
</tr>
<tr>
<td>80 85 050</td>
<td>9 lb.ft.</td>
</tr>
<tr>
<td>80 86 062</td>
<td>9 lb.ft.</td>
</tr>
<tr>
<td>80 87 080</td>
<td>22 lb.ft.</td>
</tr>
</tbody>
</table>
Maintenance

Adjustment of Angular Backlash of Gearbox

The units are assembled at the factory with the minimum amount of backlash. After prolonged use, the backlash level may increase due to wear. It can be reset to the factory setting by moving the eccentrically supported output shaft (the worm wheel). To achieve this, we recommend the following:

1. Unscrew the hexagon socket head screws of the two end covers, without removing the screws, in order to avoid oil leakage.
2. Turn both end covers towards the next higher number marked on the housing, ensuring that both covers are moved by the same amount.
3. Check the backlash by turning the worm shaft until the worm wheel has made at least one complete revolution. If necessary, adjust the end covers further by one step.
4. Evenly retighten the hexagon socket head screws alternately crosswise. A slight change in the gear center distance (in relation to the rest of the unit) must be compensated by adjusting the mounting of the gearbox.

Lubricant Change

At the factory, the units are filled with a synthetic lubricant and test run. They are delivered ready for use. A check of the lubricant level once a month – more frequently during the first weeks of operation – is recommended. Under normal load conditions and with single shift working, it is recommended that the lubricant be changed every four years; with 2 or 3 shift working, the lubricant should be changed annually. To do this, the unit must be emptied, flushed through and then refilled to the oil-level hole approximately in the middle of the gearbox, using one of the lubricants listed below. Important: Synthetic lubricants must not be mixed with mineral oils. For oil quantities, see table below.

We recommend the following synthetic lubricants: Shell Tivela WB, BP Energol SG-XP 220, ARAL Degol GS 220, Klüber Synth GH 6 – 220.

Shell Tivela WB, 1 liter – Order Code: 65 90 000.

<table>
<thead>
<tr>
<th>Center distance</th>
<th>Oil quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>ao = 50 mm</td>
<td>0.3 liter</td>
</tr>
<tr>
<td>ao = 63 mm</td>
<td>0.5 liter</td>
</tr>
<tr>
<td>ao = 80 mm</td>
<td>1.2 liters</td>
</tr>
<tr>
<td>ao = 100 mm</td>
<td>2.0 liters</td>
</tr>
<tr>
<td>ao = 125 mm</td>
<td>4.0 liters</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Input Radial seal</th>
<th>Output Radial seal</th>
<th>Special angular contact ball bearing</th>
<th>Deep groove ball bearing</th>
<th>Tapered roller bearing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pieces per unit</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>a = 50 Order code</td>
<td>A20x47x7 921 33 069</td>
<td>A40x62x7 921 33 122</td>
<td>7204 B 911 92 001</td>
<td>6303 911 04 030</td>
<td>32008 911 41 040</td>
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<tr>
<td>a = 63 Order code</td>
<td>A25x62x10 921 33 086</td>
<td>A45x72x8 921 03 133</td>
<td>7305 B 911 92 002</td>
<td>6205 911 03 050</td>
<td>33109 911 39 001</td>
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<tr>
<td>a = 80 Order code</td>
<td>A50x90x10 921 33 144</td>
<td>A50x80x8 921 03 143</td>
<td>7308 B 911 92 003</td>
<td>6307 911 04 070</td>
<td>33210 911 40 090</td>
</tr>
<tr>
<td>a = 100 Order code</td>
<td>A50x90x10 921 33 144</td>
<td>A70x100x10 921 03 186</td>
<td>7308 B 911 92 003</td>
<td>6307 911 04 070</td>
<td>33014 911 38 005</td>
</tr>
<tr>
<td>a = 125 Order code</td>
<td>A45x65x10 921 33 132</td>
<td>A85x130x10 921 00 202</td>
<td>7311 B 911 92 011</td>
<td>6310 911 04 100</td>
<td>33217 911 43 085</td>
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