安装、使用、润滑说明

一般说明

减速机的安装、操作、维护保养和修理人员均需阅读和理解本说明书并遵守其中的规定。若因违反本说明书的规定而造成任何损伤和停机，本公司概不负责。

注意事项

■ 一定不能用高压清洗设备清洗减速机。
■ 对减速机进行修理、保养、维护和安装都必须在减速机不工作的情况下进行。
■ 在减速机上不得进行焊接工作，焊接作业会导致焊接过程的焊接部位受损，焊接会产生光滑表面和轴承的不可修复的损坏。
■ 如果在减速机的运行过程中发现了任何异常现象（如过热或不正常的噪声等），应立即停机检查。
■ 凡是旋转的零件必须配备合适的防护罩以防止人员的意外接触，例如联轴器，液力偶合器，齿轮，驱动皮带轮等。
■ 一定要遵守减速机上所附有的说明，例如铭牌，指示方向的箭头等。这些铭牌和标记是不要有灰尘和油渍。
■ 在安装或者解体工作时损坏的螺栓一定要用同等强度和类型的螺栓更换。
■ 安装升降机时，台架上的孔，在满足矢量均能通过的前提下，应尽可能小。
■ 根据减速机的操作条件，减速机的润滑油和润滑油可能会达到相当高的温度，小心烫伤！
■ 当更换润滑脂的时候，要谨慎小心不要被热油烫伤。
■ 减速机应该放在在无振动的干燥木制基座上并遮盖好。当储存减速机和任何单独的零件的时候一定要做好防腐措施，以免生锈，储存时不得将减速机叠放在一起。
■ 除订货合同中另外所规定，否则减速机不得储存在或工作在强酸、强碱、低温、高温和湿度的空气污染、潮湿，具有化学物品的场所。
■ 在搬运减速机时，一定要特别小心，应防止撞击和碰伤，因为这样有可能造成减速机的损坏，在吊运减速机时，不得将吊环螺钉挂在轴端处的螺纹上。
■ 除订货合同中另外所规定，减速机和无螺纹减速机工作环境温度不超过40摄氏度，温升低于40摄氏度。
■ MB无级变速机出厂时，调速限位螺钉已经调整在极限位置，不得任意调整，以免损坏零件。
■ MB无级变速机必须在开机情况下方可调速，否则会损坏零件。

安装、使用、润滑说明

General

It must be read and understood by operators, maintenance and repair persons. And they must comply with all regulations in this manual. Any damages and stop of machine caused by wrong operation will be buyer’s responsibility.

Notes

■ Gear units can not be cleaned by high-pressure cleaning machine.
■ Repair, maintenance, installation must be made with gear unit powered off.
■ No welding can be made on gear units, and it cannot be a welding ground point. Welding will cause irreparable of precision gears and shafts.
■ During running, gear units must be stopped immediately for check once any problem (such as over heated and high noise) occurs.
■ Any rotating parts will be equipped with appropriate shields in order to keep it from accidental touch. Such as couplings, hydraulic couplings, gears, driving belt wheels.
■ Please note the instructions attached on gear units, such as label, arrow indicating direction. And they will be kept clean without dust and oil.
■ The bolts damaged in installation or dismantlement should be replaced with new one of the same tension and type.
■ When installing screw jacks, the screw holes in mounting plate should be as small as possible up to bolts' diameter.
■ When gear units running, its temperature may get up to a high point, please take care, there is a danger of seal.
■ When changing lubrication, please be careful not to be scalded by hot oil.
■ Gear units should be put on dry wooden non-vibration base and be covered. When storing gear units and their components, we should take rust-proof measures, and we cannot pile up gear units.
■ Unless there are special requirements in contracts, gear units cannot be stored or work in places with acid, alkali, low temperature, high temperature, heavy air pollution, damp, chemical products.
■ When removing gear units, please be careful to avoid knocking shaft end and damaging; when swinging them, bolts of swinging rings cannot put in screw holes in the shaft ends.
■ Unless there are special requirements in contracts, ambient temperature of gear units and variable speed drives is below 40℃, and temperature rise should lower 40℃.
■ Before delivery of MB series, speed-limiting screw has been adjusted to an extreme point to protect spare parts. And speed adjustment must be done after the drives start up, or the drives will damage.
安装与拆卸

关于安装的综合信息：在户外安装时应避免阳光的直射，一定要避免热力集中影响减速机的正常性能。

整机安装
1. 准备刚性好的基础或牢固的台架来安装传动装置，同时也需充分考虑即使加上最大载荷也不至于改变装配后各部件的位置。
2. 底座式安装应校准中心高，联轴器联接时应校准两轴的同轴度；柔性联轴器时浮动量不超过允许范围，刚性连接时应保证各安装联接的形位公差，长轴联接还要考虑轴的自偏角度。
3. 法兰式安装，凸缘（或法兰）应配合好，以免错位。法兰式安装并配空心轴联接时，特别应保证联接处的形位公差。
4. 拉力臂安装，空心轴与工作轴应配合好，工作轴的浮动或设备振动应小于弹性块允许的范围，力臂应固定并绷紧。
5. 在减速机上安装驱动零件时（如联轴器、齿轮、链轮等），如果需要预热，则必须保持好轴上的油封，要用防热屏减少热辐射。
6. 输出轴加载联轴器、皮带轮、齿轮、链轮等时，请勿重击，应用输出轴外端螺孔，压入连接件，皮带轮、链轮、搅拌器还需考虑径向力。

安装与拆卸

安装齿轮和MB应符合许可扭力，安全设备应配备，避免过载损坏。
1. Gear units and MB should run under permissible torque, safety devices should be equipped to avoid damage if load is larger permissible torque.
2. Gear units and MB can run continuously and are permitted to rotate in both directions.
3. If mounting position changes, the positions of breather screw, oil level, oil drain plug will be change with each other as usual.
4. Spare parts must be purchased from BLKN.
7) 空心轴与实心轴连接时，应清理干净并涂防锈油(空心轴一定要稍对中)。除了图中所示的螺母和螺杆以外，还可以使用其它类型的装置例(如液压提升装置)。

7) When connecting hollow shaft and solid shaft, please clean the surface and put anti-corrosive oil on it. When connecting, besides nuts and threads illustrated in the drawing below, other installing tools such as oil hydraulic devices can be used.

8) 当空心轴配置收缩盘时，为了安全起见在收缩盘上应加防护罩; 空心轴的孔和工作轴在收缩盘的区域里面一定不能有润滑油脂。在安装机器的轴之前不要拧紧螺栓。

8) When hollow shaft equipped with shrink disk, protect shield should be installed on shrink disk for safety. Connecting area (equipped shrink disk) of hollow shaft and solid shaft must not be put lubrication cream. Before installing solid shaft, not tighten binding bolts.

9) 安装螺栓一般情况下采用 8.8 级，如果有高温或者振动冲击等情况，请在螺纹连接处作好防松措施。各个紧固螺栓的拧紧扭力见下表：

9) Generally fixing bolts adopt GBT8.8. In case of high temperature and vibration, please take anti-loose measures. The tightening torques of binding bolts as follows:

<table>
<thead>
<tr>
<th>螺栓大小 (mm)</th>
<th>预紧力矩 (N·m)</th>
<th>螺栓大小 (mm)</th>
<th>预紧力矩 (N·m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter of bolt</td>
<td>Pre-binding-torque</td>
<td>Length of bolt</td>
<td>Pre-binding torque</td>
</tr>
<tr>
<td>M6</td>
<td>15</td>
<td>M30</td>
<td>2000</td>
</tr>
<tr>
<td>M8</td>
<td>36</td>
<td>M36</td>
<td>3560</td>
</tr>
<tr>
<td>M10</td>
<td>72</td>
<td>M42</td>
<td>5720</td>
</tr>
<tr>
<td>M12</td>
<td>123</td>
<td>M48</td>
<td>8640</td>
</tr>
<tr>
<td>M16</td>
<td>295</td>
<td>M56</td>
<td>13850</td>
</tr>
<tr>
<td>M20</td>
<td>580</td>
<td>M64</td>
<td>14300</td>
</tr>
<tr>
<td>M24</td>
<td>1000</td>
<td>M72</td>
<td>20800</td>
</tr>
</tbody>
</table>
拆卸
1) 空心轴的拆卸
根据现场实际可使用的设备，可以用端板上的螺杆（参见下图）中心螺杆或者液压提升装置将减速机从机器轴上拆下来。空心轴的每个面都配备了2个螺丝孔可以拧入固定端板的螺钉。

2) 当空心轴配置收缩盘时，在首次受力之前一定不能拆下来。拆卸时严禁按照相邻的顺序松开螺栓。

润滑与冷却
润滑
1) 润滑油的选择：

<table>
<thead>
<tr>
<th>系列</th>
<th>Ambient temperature</th>
<th>ISO粘度与NLGI粘度</th>
<th>Eso</th>
<th>Mobil</th>
<th>GB牌号</th>
</tr>
</thead>
<tbody>
<tr>
<td>R.V, S</td>
<td>-50°C -15°C 0°C 25°C 50°C 100°C</td>
<td>V1220</td>
<td>SPARTAN EP 220</td>
<td>Mobilgear 680</td>
<td>Shell Tella O T22</td>
</tr>
</tbody>
</table>

2) 变更润滑油

要有和原来的润滑油同一牌号，同一厂家的润滑油。更换润滑油品种时，要用清洁的油箱将减速机箱体里面的沉积物、金属颗粒和残油的润滑油都冲洗干净。

对于升降机及其正常工作前，都必须对丝杆表面涂抹润滑脂，将丝杆升到最大行程，然后在丝杆表面涂抹润滑脂。

3) 润滑方式：
A. 油池润滑：一般情况下减速机都采用油池激溅润滑；
B. 浸油润滑：所有的齿轮和轴承都浸没在润滑油里面；
C. 强制润滑：是将齿轮箱内对轴承和齿轮进行强制的；
D. 喷油箱集中润滑：客户可以根据实际情况自配润滑系统。

Dismantlement
1) Dismantle hollow shaft
According to tools available on the spot, bolts on pressure plate, center bolt, oil hydraulic device are available to dismantle gear units from driven solid shaft. There are two screw holes in the end surface of hollow shaft for tightening bolts fixing pressure plate.

2) When hollow shaft equipped with shrink disk, it is prohibited to loosen bolts one by one in a round way.

Lubricationcooling
Lubrication
1) Choosing lubrication oil, as following table:

2) Change of lubrication oil

Changing lubrication oil, it must be the same type and produced by the same factory. If type is different, must completely remove deposits, metal grains, residues of the old oil in housing with new lubrication oil.

Before screw jacks running, must lubricate screw threads with lubrication cream. Let threads get up to highest point and lubricate threads.

3) Lubrication methods
A. Splash lubrication: generally gear units adopt or splash lubrication.
B. Oil-bath lubrication: all gears and bearings must immerse in oil.
C. Forced lubrication: attached devices press oil into housing to lubricate gears and bearings.
D. Oil tank lubrication: Customers can equip lubrication system accordingly.