

## 存放、操作及使用注意事项

### ●滚珠丝杠操作注意事项

滚珠丝杠属于精密零件，请遵照下述事项谨慎操作。

#### 存放

存放时，请保持本公司原装包装状态。请勿随意开包或弄破内部包装。否则会有异物进入或生锈，从而导致产品性能下降。

#### 操作

1. 严禁拆分产品。否则会导致异物进入、精度下降或引发事故。
2. 重新组装时，如果组装错误，可能会导致滚珠丝杠的功能丧失。因此，客户请勿自行重新组装。请将产品送回本公司，我们将有偿为您维修并重新组装。
3. 滚珠丝杠的轴和螺母可能会因自重而掉落，请注意避免受伤。如果掉落，可能会因循环部件受损而导致性能下降，因此请务必委托本公司进行检查。请务必将产品送回本公司。我们将有偿为您检查。
4. 如果滚珠丝杠掉落，循环部件、轴的外径以及钢珠等可能会划伤、损坏。这可能会导致产品功能丧失，如回转不良等。

### ●滚珠丝杠使用注意事项

#### 防尘

请在清洁环境下使用滚珠丝杠。请同时使用防尘罩等防止异物、切屑等进入滚珠丝杠中。如果因防尘不当而导致异物、切屑等进入滚珠丝杠，可能会降低滚珠丝杠的性能或损坏循环部件，从而导致产品锁死。

#### 润滑

请在使用前确认润滑状况。如果润滑不良，可能会导致滚珠丝杠在短期内丧失功能。此外，防锈油并非润滑剂，使用前请用精制煤油等清洗滚珠丝杠，去除防锈油后涂上润滑剂（油脂或润滑油）。在常规用途下使用时，请每2~3个月检查一次油脂。使用过程中油脂变脏时，请擦去旧的油脂后涂抹新油脂。

#### 许用转速和许用轴向负载

根据尺寸、材质及安装方式等不同，滚珠丝杠会受到轴向负载和转速的限制。建议在产品的设计阶段就使用条件与本公司充分协商。关于使用条件，请充分利用卷末的技术数据表。

#### 超程

滚珠丝杠螺母发生超程时，可能导致钢珠脱落、循环部件受损或钢珠槽产生压痕等，从而引起动作不良。如果在该状态下继续使用，还可能导致早期磨损或循环部件损坏。因此请务必避免超程。发生超程时，请与本公司联系检查事宜。我们将有偿为您检查。此外，为了防止螺纹端出现螺母超程或从螺纹部脱落，可能会安装O形圈。使用时请拆下O形圈。

#### 使用温度

使用温度的极限通常设计在80°C以下。超过该温度使用时，可能会产生如下现象：

- 钢珠循环性能下降；
- 循环部件损伤或损坏；
- 相对于热处理部位的硬度降低。

如需在超过80°C的条件下使用，请垂询本公司。

#### 偏负载

滚珠丝杠是一种产生轴向推力的机械元件，其结构不能承受径向负载和力矩负载。请注意避免对螺母部施加径向负载和力矩负载。如果滚珠丝杠承受径向负载或力矩负载，将会导致滚珠负载不均，从而显著缩短产品的使用寿命。另外，安装滚珠丝杠时，轴承部与螺母托架之间的偏心也会导致偏负载，敬请注意。

#### 摇摆运动

让滚珠丝杠做摇摆运动（重复进行短行程+正反转）时，由于滚珠的相互挤压，动扭矩有逐渐增大的倾向。这个问题可通过定期使用假行程（全行程）来解决。

## Precaution of storage, handling and operating

### ●Handling precaution for Ball Screws

Ball screws are precision components, and must be handled carefully in accordance with the instruction below.

#### Storage

Ball Screws should be stored unopened in their original KSS packaging. Avoid opening the package or breaking the inner package unnecessarily. This may result in contamination or rusting, and may degrade operating performance.

#### Handling

1. Never disassemble Ball Screws. This will cause contamination, reduce accuracy, and lead to accidents.
2. Customers should not attempt to reassemble Ball Screws by themselves. Incorrect reassembly can easily result in malfunction. Ball Screws should be returned to KSS, where they will be repaired and reassembled for a fee.
3. Take care to avoid injuries due to falling Ball Screw Shafts or Nuts. If dropped, performance may be adversely affected by damage to the recirculating component. Ball Screws must therefore be inspected by KSS for a fee. Please make sure you return dropped Shafts or Nuts.
4. Dropping Ball Screws may cause scratching or impact damage to recirculating components, Shaft outside diameters, Balls, or screw grooves, which may cause malfunction, such as incorrect rotation.

### ●Precaution of Ball Screw for operating

#### Dust proof

Ball Screws must be used in a clean environment. They should be used with a dustproof cover to prevent contamination from dust or swarf. Dust or swarf contamination due to insufficient dust protection may reduce the Ball Screw performance, cause damage to recirculating components, which lead to locking.

#### Lubrication

Check lubrication before use. Insufficient lubrication will rapidly deteriorate the operating performance of the Ball Screw. Since anti-rust oil is not lubricant (Grease/ Oil), Ball Screws should be washed off anti-rust oil with clean Kerosene and apply lubricant before using Ball Screws. Please check the lubricant condition every 2 to 3 months. If Grease is contaminated, remove old Grease, and replace with new Grease.

#### Critical speed and Axial load

Ball Screws have the maximum limit of speed and Axial load depending on its size, material, mounting method etc. when design Ball Screws, KSS would recommend that you consult with KSS engineering about the operating condition and model selection. To release your operating condition, please use Technical Data Sheet at the end of this catalogue.

#### Over-run

Allowing Ball Screw Nuts to overrun may result in malfunctioning due to Balls escaping, damage to recirculation components, and indentation of the Ball grooves. Continued use in this state will lead to rapid wear and damage to recirculation components. Ball Screw Nuts must therefore never be allowed to overrun. If overrunning occurs, contact KSS for an inspection for a fee.

Some products may fit the O-ring on the end of the shaft for the purpose of preventing fall off or overrunning the Ball Nut. Please detach O-ring in such case in prior to use.

#### Temperature

Ball Screws are designed to be used at operating temperatures up to 80°C. Avoid use at higher temperatures. This may result in the following problems .

- Reduced performance of Ball recirculation, and smooth movement.
- Damage to recirculation components.
- Reduced hardness of heat treated components.

If it is necessary to work beyond the recommended temperatures, please consult with KSS first as we may be able to provide a solution.

#### Moment load or Radial load

Ball Screws primarily generate thrusts in the axial direction, and are not designed to withstand Radial loads and Moment loads. Care must be taken not to apply Radial loads and Moment loads to the Nut. If there loads act on the Ball Screws, Ball load uniformity is lost, and the life of Ball Screws is drastically reduced. When installing Ball Screws, misalignment between Ball Screw and Support Bearings or Nut Bracket causes the unbalanced load on Ball Screw, care must be taken.

#### Oscillation

Under the oscillation (short stroke + back & forth operation) of Ball Screws, Drag Torque tends to increase gradually due to the stuck of Balls inside Ball Nut. Dummy stroke (preferably full length stroke) would be effective to release this phenomenon.