

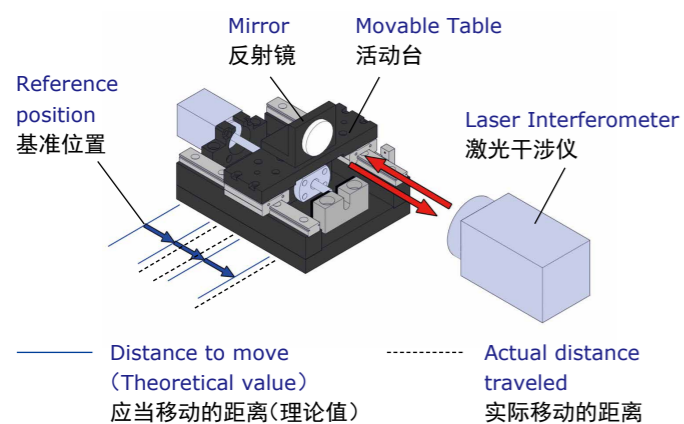
## 执行器的精度和测量方法

## Accuracy of the Actuator and Measurement method

下面介绍在KSS执行器产品的出厂检查时进行的定位相关精度测量和按照客户需求选择进行的测量(收费)。

We introduce the method to inspect the positioning related accuracy, and optional inspection (on demand) as below.

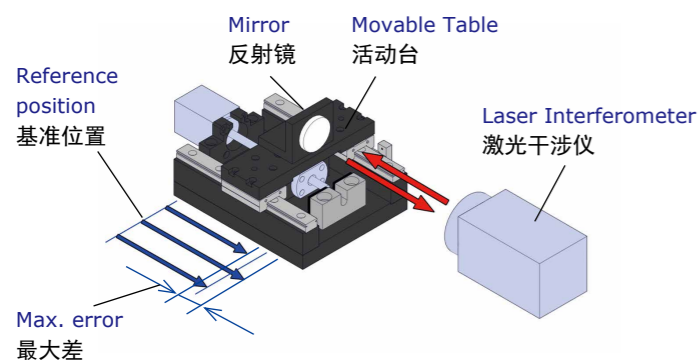
## 【绝对定位精度 / Absolute Positioning Accuracy】



以基准位置为起点,沿固定方向依次定位,在各个位置测量相对于基准位置的实际移动距离与应当移动距离之差。测量基本覆盖整个有效行程,测量间隔按机型分别规定,重复测量5次。在各位置求出的最大差中的最大值即为“绝对定位精度”。

Absolute positioning accuracy is the difference between actual and ideal position in one direction. Measurement is done at several arbitrary points within effective travel range, it should be repeated 5 times under the same points. Maximum difference for each measurement is defined as Absolute Positioning Accuracy.

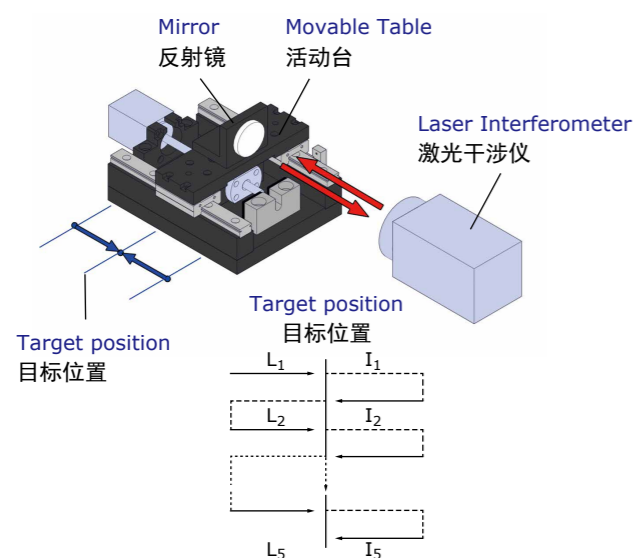
## 【重复定位精度 / Repeatability】



从相同方向对任意1点重复进行5次定位,测量停止位置,读数最大差1/2的±值即为“重复定位精度”。

Repeatability is the difference between actual and ideal position at the arbitrary one point from the same direction. 5 times measurements should be conducted at the same point from the same direction. Half of maximum gap of measurement with  $\pm$  should be defined as Repeatability.

## 【空转 / Lost Motion】



沿正方向对一个位置进行定位,测量其位置。再沿相同方向移动,然后向负方向进行相同量的定位移动,测量位置。再向负方向移动相同量,重新返回正方向测量位置。将这一系列移动进行5次,求出测量位置的平均值。在滑台移动范围的正中央、两端3处进行该测量,将得到的最大值定义为空转。

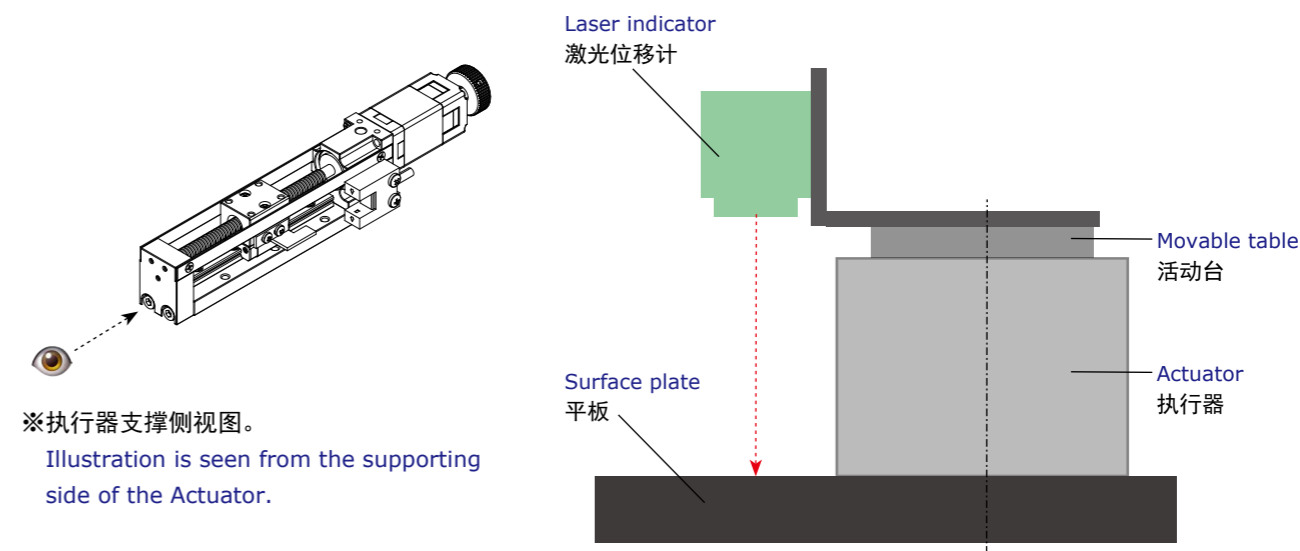
Lost motion is frankly the back and forth positioning error at the arbitrary one point from the different direction. Averaged number of the difference between forward and backward should be obtained for 5 times measurements at the center and both end points. Maximum number from the measurement above is defined as Lost Motion.

## 【移动平行度 / Parallelism】

适用于滑块型执行器 / Applicable for Slider type Actuator

将执行器固定于平板上,在活动台上表面设置激光位移计,测量移动整个行程时的值,其最大值即为移动平行度。

Set the Laser indicator on top of the table of the Actuator which is secured on the surface plate, measure the displacement when moving entire travel range and take the maximum value as Parallelism.

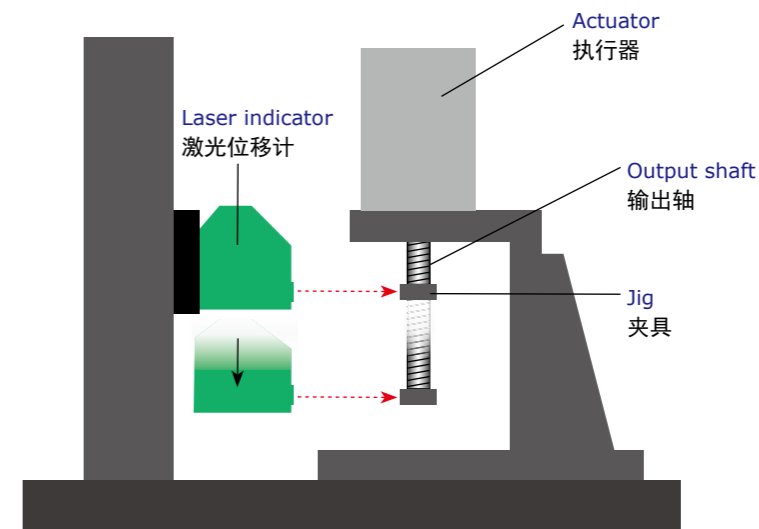


## 【平直度 / Straightness】

适用于电动缸型执行器、Z-θ执行器 / Applicable for Cylinder type Actuator, Z-θ Actuator

使用与输出轴同步直线运动的激光位移计,以原点位置为起点,使输出轴移动全程(往复1次),测量与原点位置的最大差。往复1次后,在错开90°相位的位置进行第2次往复的测量,最大值即为平直度。

By using the Laser indicator which synchronized with output shaft, reciprocate the shaft from home position one time and inspect the maximum value of difference. Do the same inspection by setting the Actuator at 90 degrees of phase, take the maximum value for both measurement as Straightness.



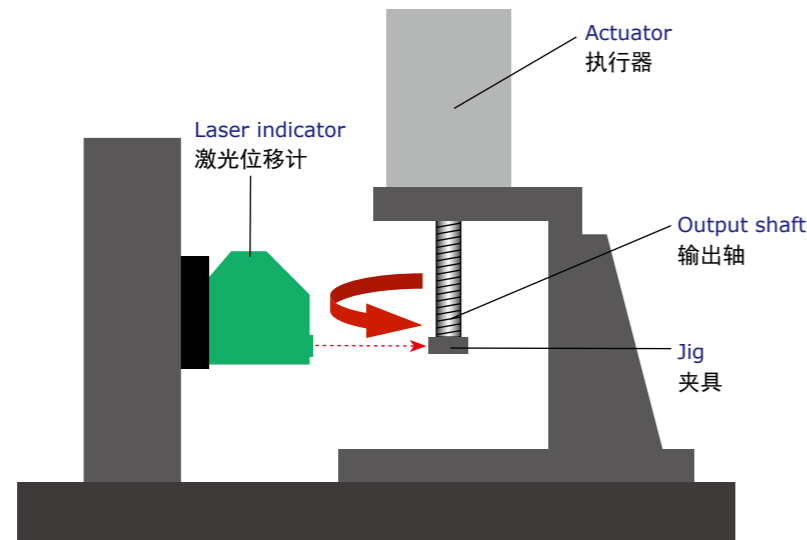
## 【轴前端跳动 / Runout of shaft travel end】

适用于Z-θ执行器 / Applicable for Z-θ Actuator

使输出轴在移动至全行程的位置沿θ方向旋转，轴前端的跳动(位移宽度)即为轴前端跳动。测量范围为360°。

Rotate the Shaft at the position which the shaft moved entirely toward the end of travel, the amount of deflection measured by Laser indicator is defined as Runout of shaft travel end.

Measurement is done for 360 degrees.



## 【关于收费检查 / About optional inspection items with charge】

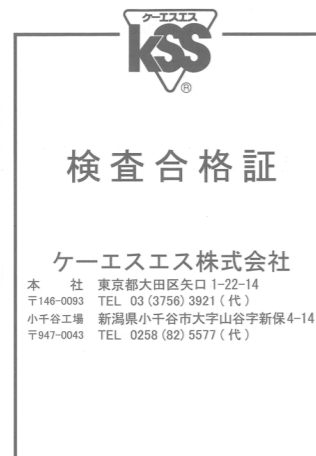
移动平行度、平直度、轴前端跳动为收费测量项目。  
测量数据的实测值记载在检查结果表中，随附于产品。

Parallelism, Straightness, and Runout of Shaft travel end are inspection items that will be charged.  
Inspection data is packing together in the product with the actual measurement value on the inspection certificate.

## 【关于出厂检查 / About shipping inspection】

本公司会在出厂检查时测量定位相关精度，给满足标准值的产品出具以下检查合格证(下图)，随附于产品。如需实测值，可收费出具检查报告表。

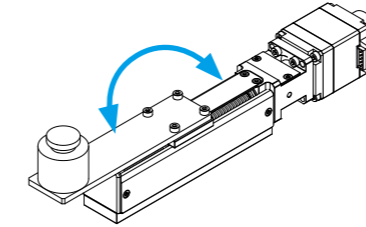
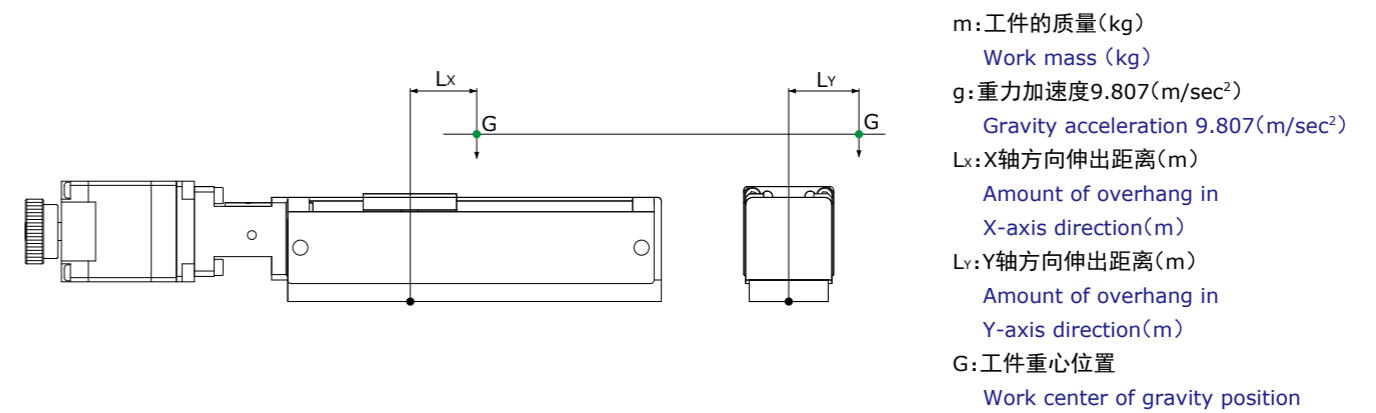
Positioning-related accuracy is executed as shipping inspection, and the Certificate of Inspection shown below is issued for the product that meets the inspection standard. The Certificate of Inspection is shipped with the product. If you require the actual measured value, we will issue the Inspection Report with charge.

关于执行器的允许偏心力矩  
Permissible Moment for the Actuator

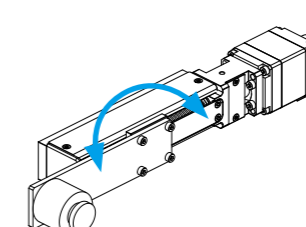
## 【关于滑块型执行器的允许偏心力矩 / Permissible Moment of Slider type Actuator】

作用于滑块型执行器的偏心力矩有Mp(俯仰)、My(偏转)、Mr(侧滚)3个方向，按产品系列设定了允许偏心力矩。请参考以下计算公式，按照客户的使用条件计算负载偏心力矩，确认没有超过允许偏心力矩。使用时若超过允许偏心力矩，可能会导致动作不良、损坏，敬请注意。

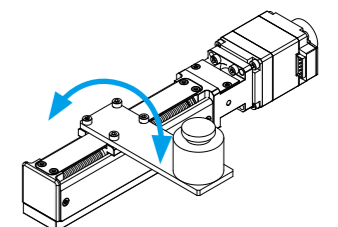
Momentum Load which is applicable for Slider type Actuator is defined in three (3) directions; Mp (pitching) My (yawing) and Mr (Rolling). KSS is setting the Permissible Moment for each series of the Slider type Actuator. Please apply calculation formula below to calculate the value of Moment of Load under operating condition, make sure not to exceed the value of Permissible Moment shown in the table below. Please note that using the Actuator by exceeding the maximum value in each limit may cause the risk of malfunction or breakage of the product.



Formula for Mp(Pitchng)  
Mp(俯仰)计算公式  
 $Mp = m \cdot g \cdot Lx$



Formula for My(Yawing)  
My(偏转)计算公式  
 $My = m \cdot g \cdot Ly$



Formula for Mr(Rolling)  
Mr(侧滚)计算公式  
 $Mr = m \cdot g \cdot Lx$

表 S-1 : 滑块型执行器允许偏心力矩

Table S-1 : Permissible Moment for Slider type Actuator

Unit(单位):Nm

Actuator series 执行器系列	Pitchng 俯仰 (Mp)	Yawing 偏转 (My)	Rolling 侧滚 (Mr)
Flex Actuator 灵活可选执行器	0.10	0.09	0.23
Compact Actuator NEMA 6 size □14紧凑型执行器	0.14	0.12	0.22
MoBo Actuator 魔博执行器	0.16	0.10	0.20

## 关于作用至滚珠丝杠花键(BSSP)的偏心力矩负载 Moment Load to the Ball Screw with Ball Spline(BSSP)

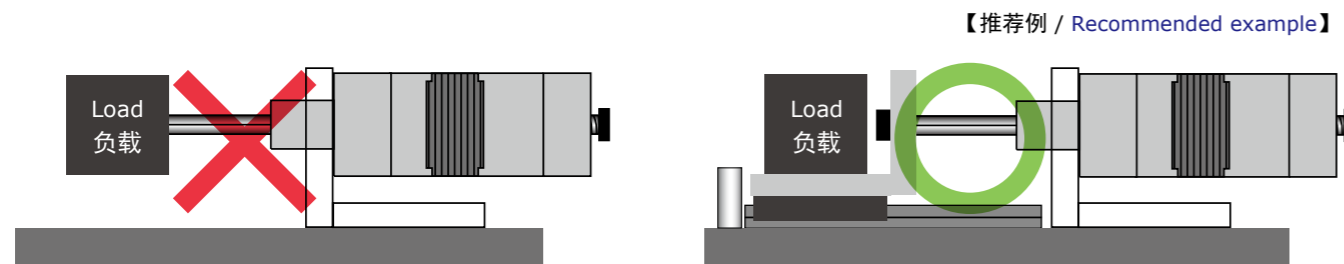
BSSP及配备BSSP的Z-θ执行器、线性执行器不能承受径向负载、偏心力矩负载, 敬请注意。

BSSP与滚珠丝杠和滚珠花键位于同一直线上, 因此, 如果径向、偏心力矩负载对滚珠丝杠产生偏负载作用, 会导致早期磨损或循环部件损坏。

Please be careful that Radial or Momentum Load cannot be applied to those products such as BSSP, Z-θ Actuator or Linear Actuator.

Radial or Momentum Load may affect to Ball Screw's function due to its structure as BSSP, which is Ball Screw and Ball Spline lying on the same axial line. It may cause earlier damage or breakage of the recirculation parts.

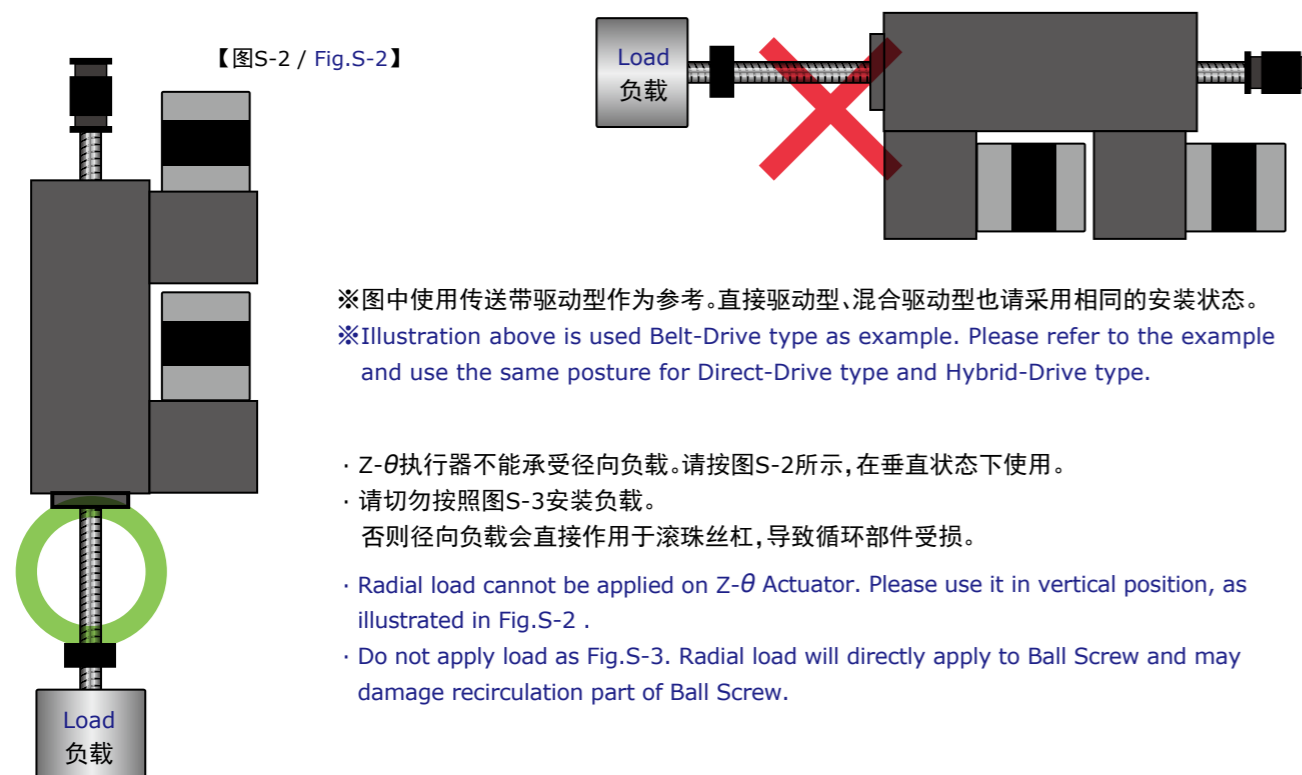
### Captive type的负载安装例 / Captive type Load applying example



- 在水平状态下使用时, 请切勿按照左图安装负载。
- 在水平状态下使用时, 请按【推荐例】所示, 由外部导向结构承受径向负载。
- Do not apply load as illustration shown above left.
- In horizontal position, configure as illustration shown above right as recommended example to apply radial load by Guide rail.

### Z-θ执行器的负载安装例 / Z-θ Actuator Load applying example

【图S-3 / Fig.S-3】



※图中使用传送带驱动型作为参考。直接驱动型、混合驱动型也请采用相同的安装状态。  
※Illustration above is used Belt-Drive type as example. Please refer to the example and use the same posture for Direct-Drive type and Hybrid-Drive type.

- Z-θ执行器不能承受径向负载。请按图S-2所示, 在垂直状态下使用。
- 请切勿按照图S-3安装负载。否则径向负载会直接作用于滚珠丝杠, 导致循环部件受损。
- Radial load cannot be applied on Z-θ Actuator. Please use it in vertical position, as illustrated in Fig.S-2 .
- Do not apply load as Fig.S-3. Radial load will directly apply to Ball Screw and may damage recirculation part of Ball Screw.

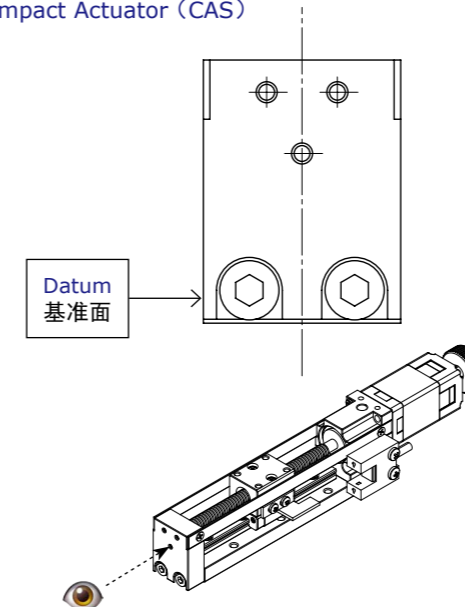
## 执行器的组装方法和注意事项 Assembling method and precautions for the Actuator

### 【滑块型执行器安装基准面 / Datum clamp face of Slider type Actuator】

将滑块执行器向设备上安装时使用。  
不保证与活动台的平行度, 敬请注意。

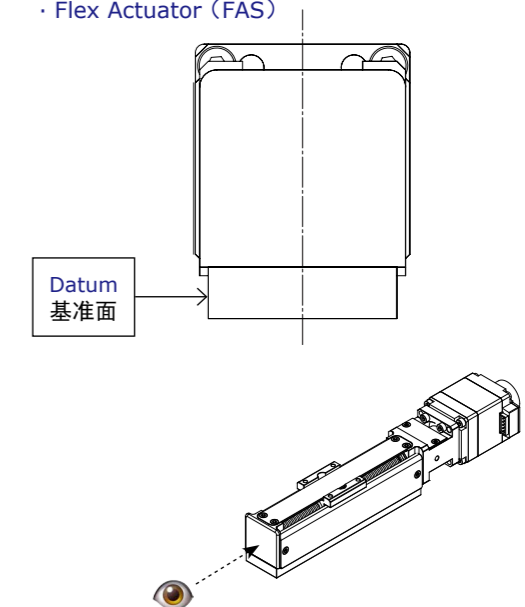
Use the Datum clamp face when assembling the Slider type Actuator to the device.  
Note that Datum clamp face does not guarantee parallelism with the movable table.

- 紧凑型执行器(CAS)
- Compact Actuator (CAS)



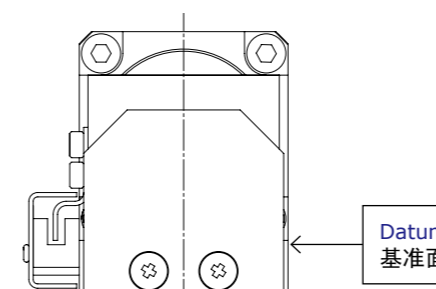
※执行器支撑侧视图。  
Illustration is seen from the supporting side of the Actuator.

- Flex执行器(FAS)
- Flex Actuator (FAS)

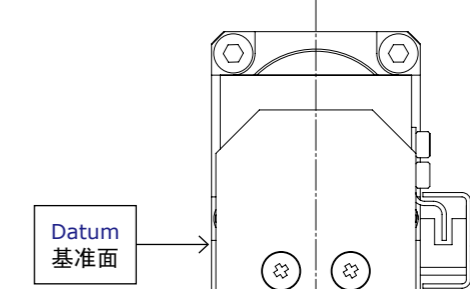


※执行器支撑侧视图。  
Illustration is seen from the supporting side of the Actuator.

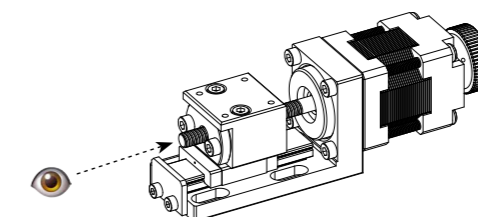
- MoBo 执行器(MAS)
- MoBo Actuator (MAS)



传感器左侧引线时  
Sensor is in the left position.



传感器右侧引线时  
Sensor is in the right position.



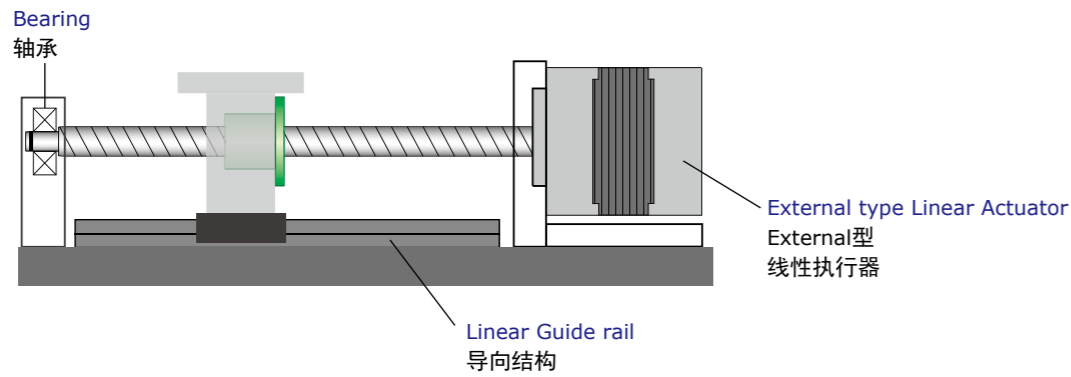
※执行器轴端侧视图。  
Illustration is seen from the shaft end of the Actuator.

## 【线性执行器 / Linear Actuator】

由于KSS线性执行器采用轻量、小型化专用设计,所以客户端设备的安装方法以及使用都需要注意。各类型执行器的组装方法和注意事项不同,请参考以下内容正确设置并使用。

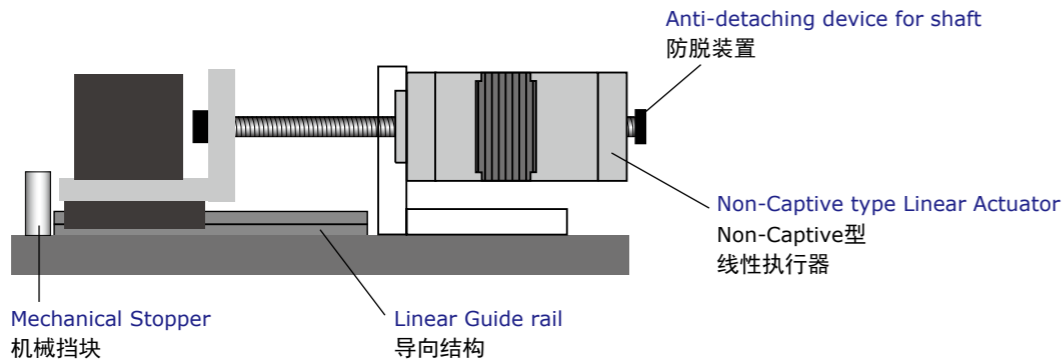
Customer should be careful with assembling and using KSS Actuator due to its compactness and light-weighted design. There are differences of assembling method and precautions depending on each type of Actuator, so please refer to instruction below to assemble and use them properly.

## External type安装例 / External type Assembling example



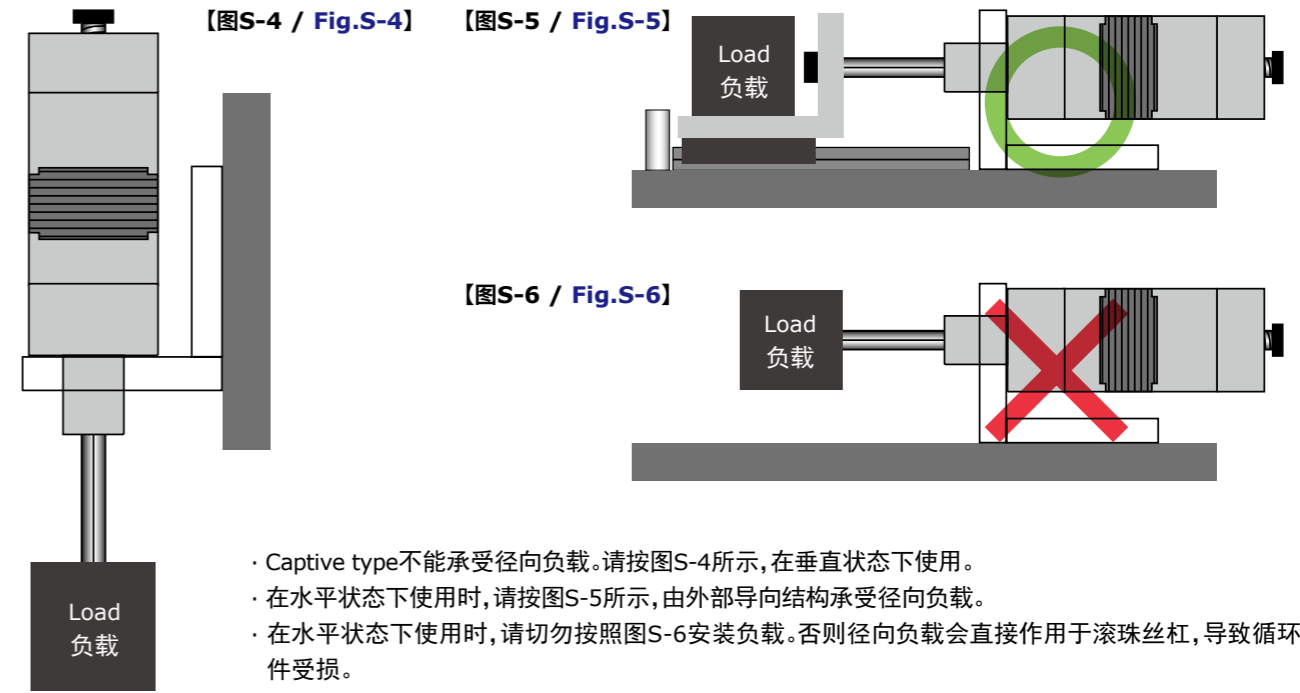
- External type无止转结构。客户使用时需在外部安装止转结构。
- 请务必用轴承支撑轴端。
- External type does not have anti-rotating device. External anti-rotating device, such as Linear Guide rail, should be set up when usage.
- Please support journal end by Bearing.

## Non-Captive type安装例 / Non-Captive type Assembling example



- Non-Captive type未内置止转结构。客户使用时需在外部设置止转结构。而且要使外部止转结构承受径向负载。
- 请勿将执行器的防脱装置用作机械挡块。防脱装置仅用于防止丝杠轴脱落,若向其施加过大的力,执行器可能会损坏。客户使用时需在外部设置机械挡块结构。
- Non-Captive type does not have anti-rotating device. External anti-rotating device, such as Linear Guide rail should be set up when usage. In addition, Radial load should be applied on External anti-rotating device.
- Do not use anti-detaching device for shaft as mechanical stopper for linear movement. It may damage the Actuator by excessive force input. Anti-detaching device is for the shaft not to slip out from the Motor. Please set up mechanical stopper outside body like shown in figure above.

## Captive type安装例 / Captive type Assembling example



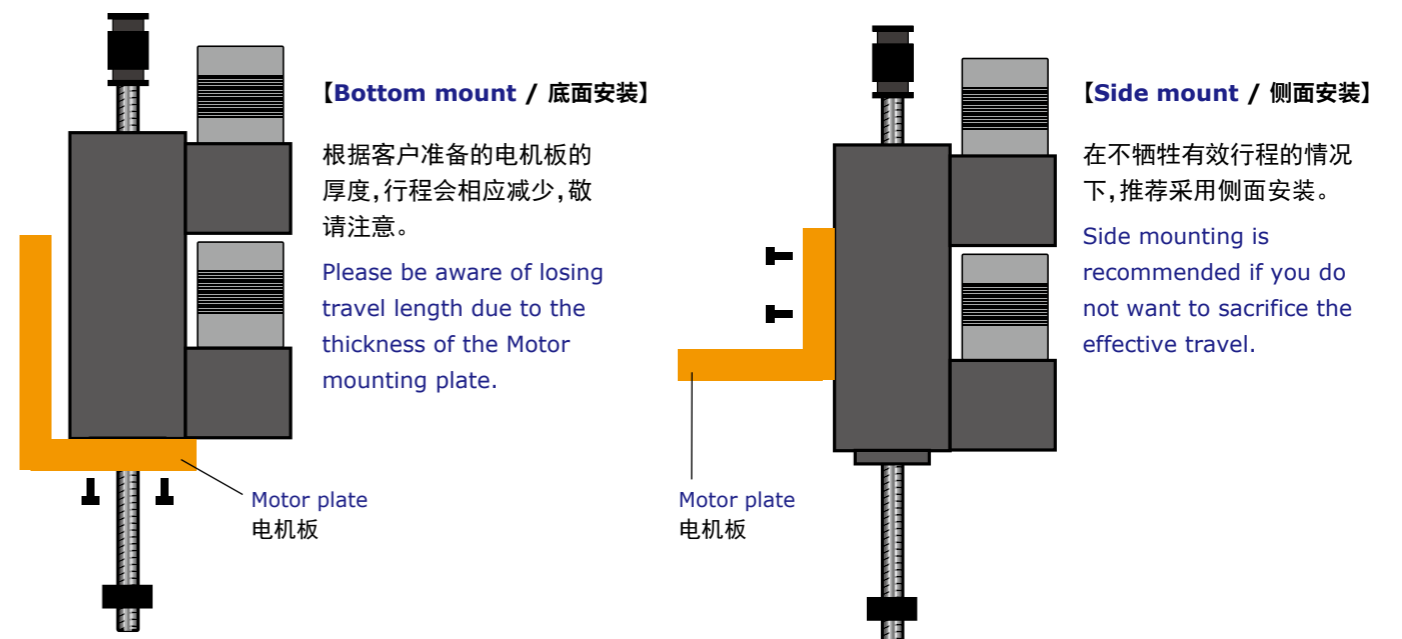
- Captive type不能承受径向负载。请按图S-4所示,在垂直状态下使用。
- 在水平状态下使用时,请按图S-5所示,由外部导向结构承受径向负载。
- 在水平状态下使用时,请切勿按照图S-6安装负载。否则径向负载会直接作用于滚珠丝杠,导致循环部件受损。
- Radial load cannot be applied on Captive type Linear Actuator. Please use Captive type Actuator in vertical position, as illustrated in Fig.S-4 above.
- In horizontal position, configure as Fig.S-5 as to apply radial load by Guide rail.
- Do not apply load as Fig.S-6. Radial load will directly apply to Ball Screw and may damage recirculation part of Ball Screw.

## 【Z-θ执行器组装注意事项 / Precautions for assembling Z-θ Actuator】

使用Z-θ执行器时,根据在客户装置上安装部位的不同,有效行程可能会发生变化。请参考以下内容,根据客户的使用情况选择合适的安装方式。

When using Z-θ Actuator, movable range may vary depending on the area to be assembled on your unit. Please refer to instruction below to select the best mounting method.

## Z-θ执行器安装例 / Z-θ Actuator Assembling example



## 【Bottom mount / 底面安装】

根据客户准备的电机板的厚度,行程会相应减少,敬请注意。

Please be aware of losing travel length due to the thickness of the Motor mounting plate.

## 【Side mount / 侧面安装】

在不牺牲有效行程的情况下,推荐采用侧面安装。

Side mounting is recommended if you do not want to sacrifice the effective travel.

## 线性执行器的允许轴向负载

### Load limit in Vertical Position for Linear Actuator

#### 【External型许用轴向负载 / Load limit in Vertical Position for External type】

线性执行器External型不需要轴承(固定侧支架), 轴向负载直接作用于电机内部。因此, 许用轴向负载不是滚珠丝杠的基本额定动负载(Ca), 而是取决于电机规格, 许用轴向负载因产品系列而异。以下记载了各产品系列的许用轴向负载, 请将其作为选定、使用的参考。

需要在超过许用轴向负载的情况下使用时, 请垂询本公司。

External type Actuator does not require Bearing at fixed side support, therefore the Axial Load will be applied to the inside the Motor directly. So permissible Axial Load is not the same as its Basic Dynamic Load Rating (Ca) of the Ball Screw. It relies on the Motor specifications and may vary depending on each series of Linear Actuator selection. Please use the list below to support your choice for appropriate External Linear Actuator. If you are looking for any Actuators exceeding permissible Axial Load, please contact KSS.

表 S-7 : External型许用轴向负载

Table S-7 : Load limit in Vertical Position for the External type

Actuator series 执行器系列	Motor size 电机尺寸	Load limit in Vertical Position 许用轴向负载(垂直) (N)
DMBR	□20 / NEMA08	43
	□28 / NEMA11	150
	□35 / NEMA14	230
	□42 / NEMA17	
2TMB	□42 / NEMA17	300
TMB	□24 / NEMA10	230
	□42 / NEMA17	300
MB	□20 / NEMA08	230
	□24 / NEMA10	
	□42 / NEMA17	300
MMBR	□28 / NEMA11	150
SiMB	□20 / NEMA08	230
	□42 / NEMA17	300

## 电机附件

### Motor-Attachment

#### 【Flex执行器 / Flex Actuator】

在灵活可选执行器系列上配备非KSS指定的电机型号, 需要使用与各电机制造商的安装尺寸和输出轴长度相匹配的附件。与各电机制造商相匹配的附件的图纸如下所示。

In order to assemble a Motor other than KSS specified in the Flex Actuator series, it is necessary to have an attachment that matches the mounting dimensions and output shaft length of each Motor manufacturer. The drawings of the Motor attachment which matches each Motor manufacturer are shown below.

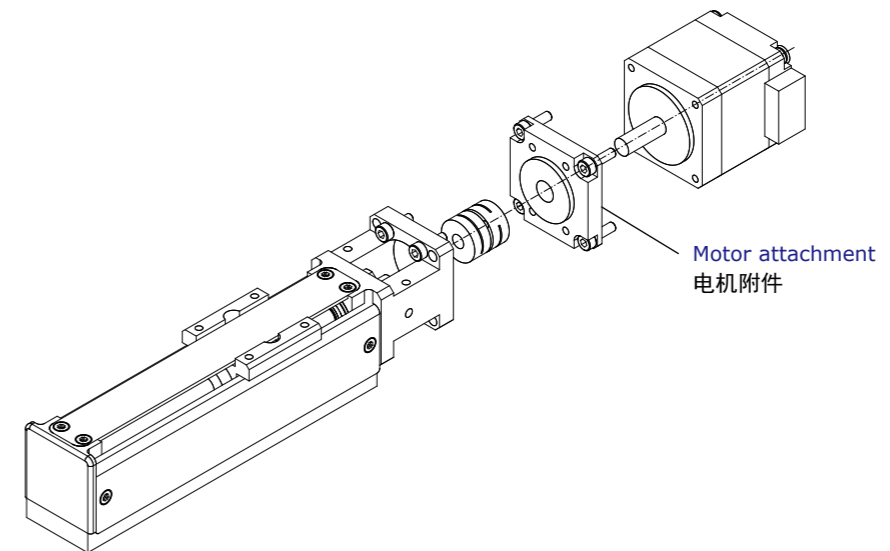
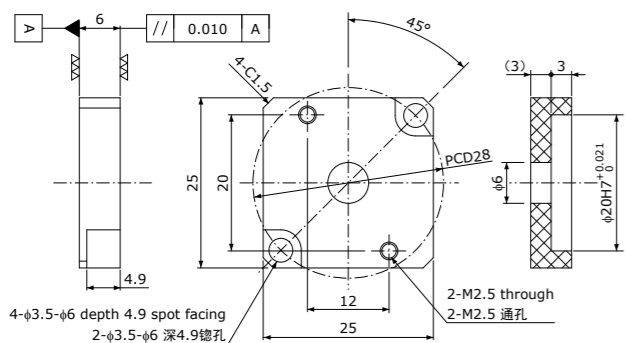


表 S-8 : 电机附件一览表

Table S-8 : Motor-Attachment list

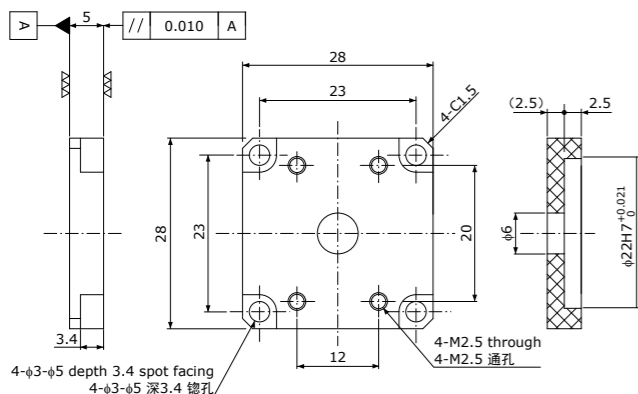
Motor manufacturer 电机制造商	Motor Type 电机种类	Motor Size 电机尺寸	Acceptable Motor 适用电机型号
Mitsubishi 三菱电机	AC Servo Motor AC伺服电机	NEMA 10 □25	HG-AK0 * * *
Yasukawa 安川电机		NEMA 10 □25	SGMMV-A * *
Oriental Motor 东方马达	2 Phase Stepping Motor 2相步进电机	NEMA 11 □28	PKP2 * *
	5 Phase Stepping Motor 5相步进电机	NEMA 11 □28	PKP5 * *
	$\alpha$ Step Motor $\alpha$ 步进电机	NEMA 11 □28	ARM2 * * AZM2 * *
Tamagawa 多摩川精机	2 Phase Stepping Motor 2相步进电机	NEMA 11 □28	TS3641N1 * E2
	5 Phase Stepping Motor 5相步进电机	NEMA 10 □24	TS3664N1 * E2
Sanmei 三明	Stepping Servo Motor 步进伺服电机	NEMA 11 □28	TS3641N61S02
Moons Moons		NEMA 11 □28	TSM11 * *

三菱电机 HG-AK0\*\* / Mitsubishi HG-AK0\*\*  
安川电机 SGMMV-A\*\* / Yasukawa SGMMV-A\*\*

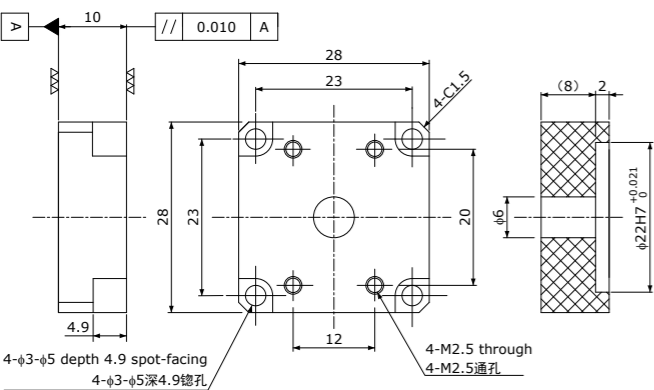


Moons TSM11\*\* / Moons TSM11\*\*

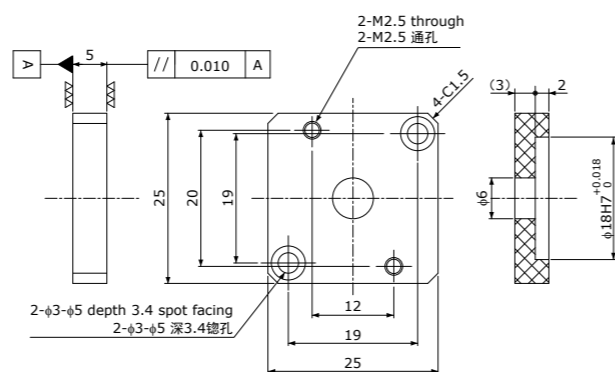
东方马达  
PKP2\*\*、PKP5\*\*、ARM2\*\*、AZM2\*\* /  
Oriental Motor  
PKP2\*\*、PKP5\*\*、ARM2\*\*、AZM2\*\*



多摩川精机 TS3641N\*E2, 三明 TS3641N61S02 / Tamagawa TS3641N\*E2, Sanmei TS3641N61S02



多摩川精机 TS3664N1\*E2 / Tamagawa TS3664N1\*E2

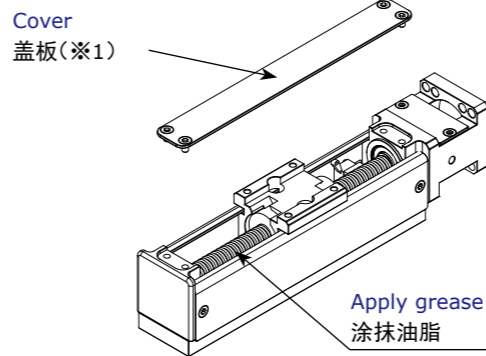


## 关于润滑剂的补充和加注方法 Lubricant and Greasing method

KSS执行器需要油脂维护。维护周期因客户的使用环境、运行频率而异,请大约每3个月确认1次油脂情况,根据需要再次进行加注。各类型执行器的再次加注方法请参考以下内容。

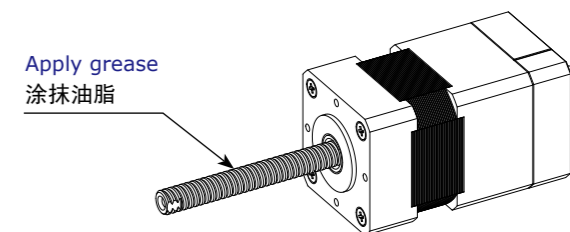
Greasing is required for any KSS Actuators. Maintenance cycle will be depending on your usage and working condition, however in general we recommend that you check the Grease condition in every 3 months, and if required please apply re-Greasing. Please refer to diagram below for how to re-Grease for each Actuator type.

### ●滑块型 / Slider type(FAS, CAS, MAS)



※1) 仅限FAS/ For only FAS  
先拆下盖板,露出轴后再进行加注。  
Remove the cover first and expose the shaft before applying the Grease.

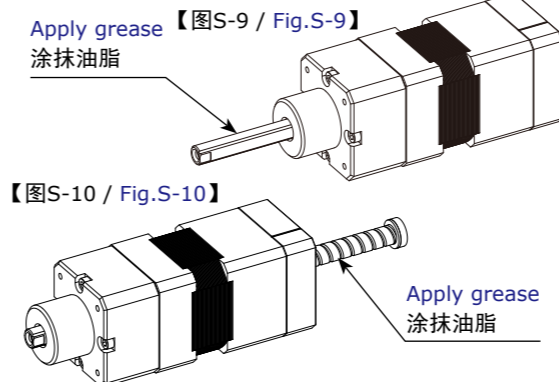
### ●Non-Captive型 / Non-Captive type



丝杠螺母配置在输出轴侧,请使轴按图中所示方向突出,然后进行加注。

The Ball Nut is located on the output-shaft side. Move the shaft in the direction shown by the illustration and then apply the Grease.

### ●Captive型 / Captive type

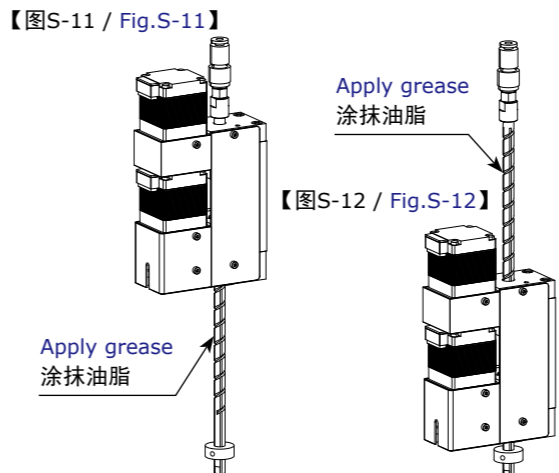


加注在花键和滚珠丝杠两方进行,请按以下步骤进行加注。

Please follow the procedure below to lubricate both the Ball Spline and the Ball Screw.

- 向花键加注 / Applying the Grease for Ball Spline  
请使轴按图S-9所示方向突出,然后进行加注。  
Move the Shaft in the direction shown by the illustration and then apply the Grease (Fig.S-9).
- 向滚珠丝杠加注 / Applying the Grease for Ball Screw  
请使轴按图S-10所示方向突出,然后进行加注。  
Move the Shaft in the direction shown by the illustration and then apply the Grease (Fig.S-10).

### ●Z-θ执行器 / Z-θ Actuator



加注在花键和滚珠丝杠两方进行,请按以下步骤进行加注。

Please follow the procedure below to lubricate both the Ball Spline and the Ball Screw.

- 向花键加注 / Applying the Grease for Ball Spline  
请使轴按图S-11所示方向突出,然后进行加注。  
Move the Shaft in the direction shown by the illustration and then apply the Grease (Fig.S-11).
- 向滚珠丝杠加注 / Applying the Grease for Ball Screw  
请使轴按图S-12所示方向突出,然后进行加注。  
Move the Shaft in the direction shown by the illustration and then apply the Grease (Fig.S-12).

## 【加注油脂注意事项 / Precautions for Grease maintenance】

### ●油脂的检查

如果残留在滚珠丝杠的丝杠轴上的油脂发生了变色(黑色或褐色污垢),应在此时加注油脂。

### ●擦去旧油脂的方法

使用专用巾(金伯利擦拭纸等等)擦去丝杠轴上附着的变脏的油脂。

注):棉纱等会掉屑并附着在滚珠丝杠上,请勿使用。

注):也可能有异物等附着,请仔细擦除。

移动螺母,将残留在螺母内的油脂也尽可能擦除。附着在螺母两端入口附近的油脂也要擦除。

### ●涂抹新油脂的方法

将油脂涂遍整个丝杠轴。

注):请使用专用刷具或佩戴橡胶手套,直接在丝杠轴上涂抹。

注):移动螺母,在丝杠轴上尚未抹到的部分也涂抹油脂。

在整根丝杠轴上移动螺母,将油脂均匀涂抹在整根丝杠轴上。

尽可能使螺母往复移动多次,进行简单的磨合。

### ●定期检查

大约每2~3个月加注一次油脂,具体还要视执行器的运行条件而定。

如果脏污特别严重,建议在上述基础上缩短加注油脂的周期。

### ●注意事项

直接触摸滚珠丝杠时,请务必佩戴橡胶手套,防止生锈。

加注油脂时请注意避免在滚珠丝杠上造成凹痕等。

请避免污渍等异物附着在滚珠丝杠上。

请注意避免涂抹不同的油脂。

### ● Grease maintenance.

If any discoloration (black, brown) are identified in the Grease remaining in the Screw Shaft, please consider that is the appropriate timing for re-Greasing.

### ● How to wipe off old Grease.

Wipe off old Grease by wiping sheet which is specially designed for wiping oil or Grease.

Note) Do not use the waste clothes which may attract fiber or clothes remaining onto the surface of the Shaft.

Note) Wipe off any debris or foreign particles carefully, they may be attached on the surface of the Shaft.

Move the Ball Nut and wipe off all the remaining Grease as much as possible. Wipe the remaining Grease attached on close to the both edge of the Ball Nut.

### ● How to apply new Grease.

Apply Grease entirely throughout the Shaft.

Note) Use designated brush, or apply new Grease directly onto the Shaft surface with rubber gloves.

Note) Move the Ball Nut and apply Grease to make sure that the Grease is applied entirely throughout the surface.

Move the Ball Nut throughout the Shaft to apply Grease entirely on the Shaft.

Run the Ball Nut back and forth several times and perform running-in operation.

### ● Periodic Inspection.

Re-Grease is recommended once every 2~3 months.

If severe discoloration of Grease identified, it is recommended to re-Greasing in a shorter period.

### ● Precautions.

Please wear rubber gloves when handling the Ball Screw to avoid getting rust.

Please be careful of handling the Ball Screw not to make dents or scars when applying Grease.

Avoid collecting foreign particles onto the Ball Screw.

Do not apply different grease from the time of shipping.

## 其他技术信息

### Other technical information

#### 【自重下落 / Free fall】

Z-θ执行器不具备自重下落防止功能。因此,若使用环境不允许关闭电源时发生自重下落,客户需要自行在执行器外部设置防止自重下落的功能。

或选择传送带驱动型执行器,将配备的电机变更为带电磁刹车电机,亦可防止执行器的自重下落。

#### ※注意

仅传送带驱动型执行器可选择带电磁刹车电机。

直接驱动型和混合型执行器不能选择带电磁刹车电机。

Z-θ执行器的自重下落负载如下表所示,仅供参考。

Z-θ Actuator does not equip with anti-free fall device.

If free falling is not allowed when use, external anti-free fall device should be set up.

Or choose the Belt Drive type and customize the Motor equipped with Magnetic brake, the Actuator can hold the Shaft even when it powers off.

#### ※Please note;

The Motor equipped with Magnetic brake can only be chosen for Belt Drive type Actuator.

It is not available with either Direct-Drive type or Hybrid Drive type Actuator.

For your reference, below table shows the free fall weight for each type of the Actuator.

表 S-13 : Z-θ执行器的自重下落负载

Table S-13 : Free-fall load of Z-θActuator

Model 种类	Motor Frame size 电机尺寸	Lead 导程	Free-falling load 自重下落负载
Direct-Drive type 直接驱动型	NEMA11 (□28)	10mm	2N
	NEMA17 (□42)	10mm	5N
Hybrid-Drive type 混合驱动型	NEMA10/11 (□25/28)	10mm	3N
Belt-Drive type 传送带驱动型	NEMA10 (□25)	4mm	18N
	NEMA11 (□28)	10mm	17N
	NEMA14 (□35)	10mm	16N

※注意 数值并非保证值。  
仅供参考。

#### ※Caution

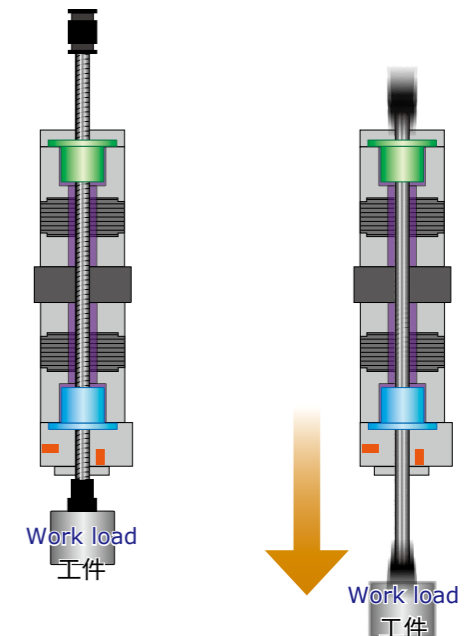
Values are not guaranteed number.

Please take them as reference value.

#### 【自重下落例 / Example of free falling】

电源on / Power on

电源off / Power off



可利用电机的保持力保持位置。  
The Shaft can be held by its retention force of the Motor.

电源off后电机保持力消失,输出轴下落。  
The Shaft will free fall once the Actuator turned off, by the loss of retention force from the Motor.

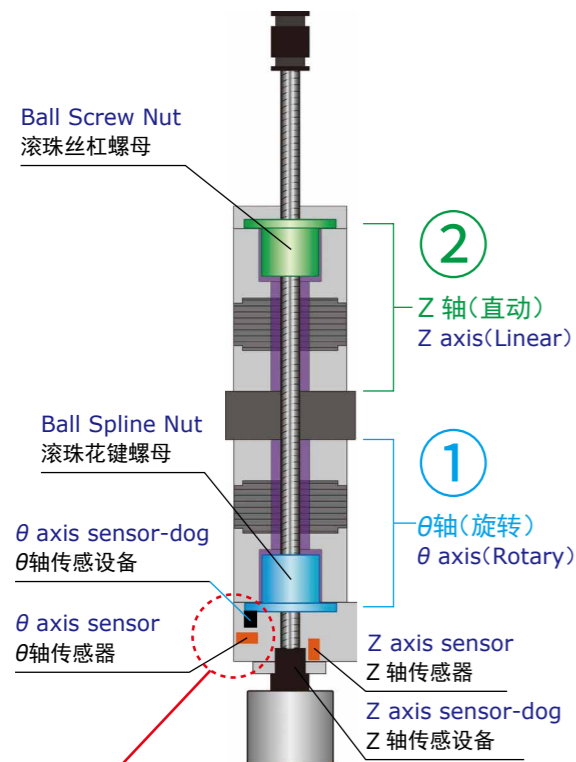
## 【原点复位 / Home positioning】

使用V-Z- $\theta$ 执行器时,需要注意原点复位的顺序。  
作为原点复位的顺序,建议按照 $\theta$ 轴→Z轴的顺序进行原点复位。  
如果顺序颠倒,完成原点定位后,Z轴的位置就会发生偏移。

In order to apply home positioning, we recommend that  $\theta$ -axis should be the first, then followed by Z axis. If Z-axis home positioning is first, then zero position may move after  $\theta$ -axis home positioning.  
The reason is shown below diagram.

### 推荐原点复位顺序

Recommended procedure of home positioning

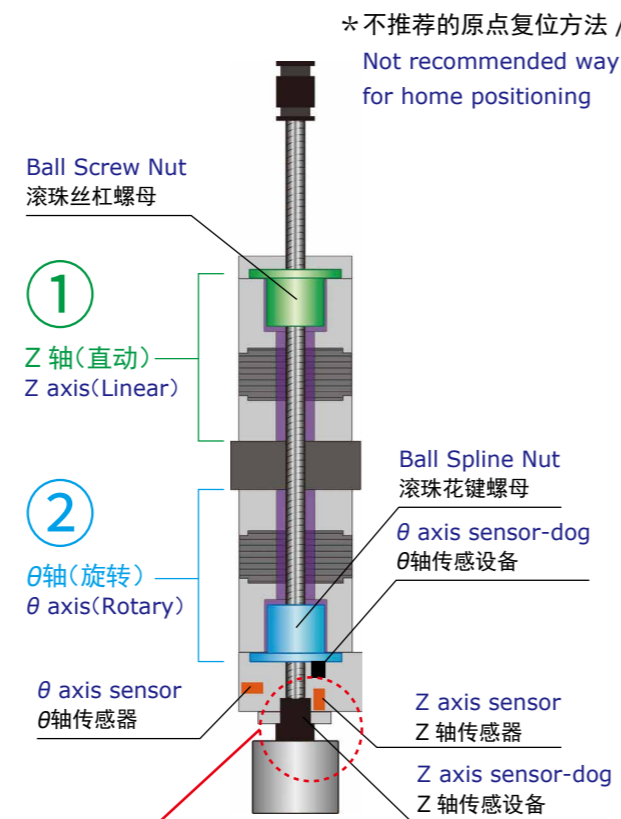


执行 $\theta$ 轴原点复位,已完成 $\theta$ 轴原点定位。  
在该状态下执行Z轴原点,  
 $\theta$ 轴(滚珠花键)只起到直动导向的作用,不会出现旋转方向的位置偏移。

$\theta$ -axis home positioning has been done in zero position. In this situation, Z-axis home positioning should be applied.  $\theta$ -axis will never move because Ball Spline Nut only plays a role of guide for linear motion.

### 原点复位顺序 Z轴→ $\theta$ 轴时

In case of home positioning for Z axis →  $\theta$  axis



\* 不推荐的原点复位方法 /  
Not recommended way  
for home positioning

先执行Z轴原点复位,已完成Z轴原点定位。然后在  
该状态下执行 $\theta$ 轴原点复位。输出轴在旋转的同时上下  
移动。  
( $\theta$ 轴原点复位方向的设定会因CW/CCW而向上下某  
一方向移动)

Z-axis home positioning has been done in zero position. In this situation, if  $\theta$ -axis home positioning is applied. BPPS shaft (Ball Screw with Ball Spline) will move up or down with rotary movement at the same time of CW/CCW home positioning.

## 【Belt-Drive执行器的起尘量数据 / Particle emission of Belt-Drive Actuator】

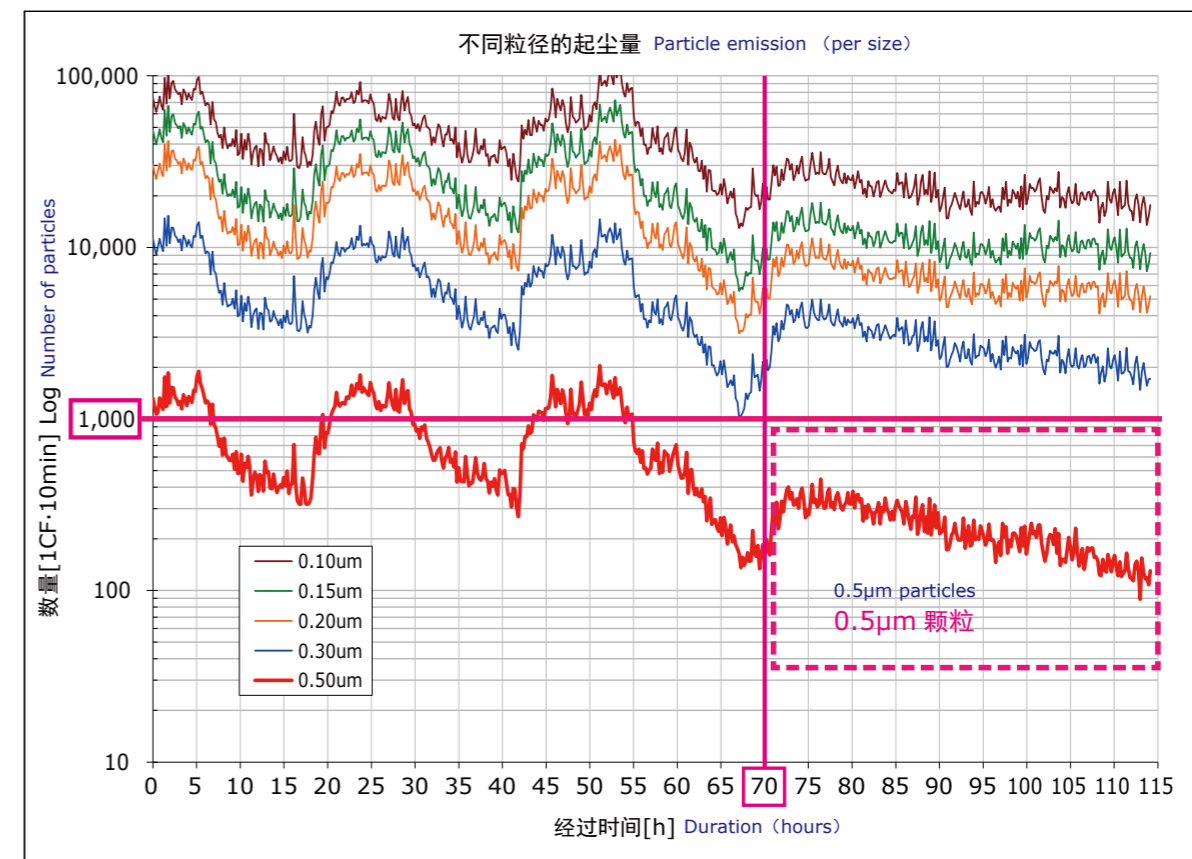
Z- $\theta$ 执行器没有采用适用于无尘室的设计。  
本公司实施的起尘量测量结果如下所示,仅供参考。  
请客户参考以下测量结果,自行判断可否在无尘室中使用。

Z- $\theta$  Actuator is not designed for using in clean room facility or environment.  
Below graph shows the measurement result of dust particle of Belt-Drive Actuator for your example.  
Please refer to the result below when using our Z- $\theta$  Actuator in such facility.



### 测量条件 / Measurement Condition

- |   |  |
|---|--|
| · 工件 : BDVZ06-G10050N02(传送带驱动型)                                   | · Sample : BDVZ06-G10050N02(Belt-Drive type)   |
| · 移动时间 : 115小时  | · Running period : 115 hours   |
| · 速度 : Z轴 200mm/sec (产品目录最高规格)<br>$\theta$ 轴 1080°/sec (产品目录最高规格) | · Speed : Z axis 200mm/sec (Highest spec in Catalogue)<br>$\theta$ axis 1080°/sec(Highest spec in Catalogue) |
| · 动作方式 : 螺旋驱动   | · Operating pattern : Spiral moving (Z & $\theta$ )  |
| · 可搬重量 : 无负载  | · Load : No loading  |



※测量方法:符合FED209D标准  
※上表值并非保证值,仅供参考。

※Measurement Method : Followed with FED209D Standard.

※Above values are not guaranteed values.

Please take them as one of the reference data.

## 【执行器的保修 / Warranty of Actuator products】

产品保修期为出厂之日起1年。在保修期内出现因本公司责任而导致的不良情况,本公司免费提供产品的更换或维修服务。  
对于保修期后发生的不良情况或故障,本公司提供有偿服务。

Product warranty is 1 year from the date of shipment. If any defects or malfunctions originated by KSS responsibility, product will be replaced or repaired without any charge.

Any defects or malfunctions occurred after warranty period, we will required support with charge.