

灵活可选执行器系列 Flex Actuator Series



精度(进给丝杠)、速度(导程)、移动距离(行程)、负载(电机)的组合打造了丰富的产品系列的KSS灵活可选执行器系列!!!

Many variation of KSS Flex Actuator became reality. Various choices among accuracy (Lead Screw type), speed (Screw Lead), Travel length and power (Motor type) are available.



●特点

- 最大限度地发挥微型滚珠丝杠厂商的特点, 设计出了终极紧凑型执行器。
- 根据执行器上所使用的进给丝杠的种类, 可在广范围内选择定位相关的精度。
- 每件进给丝杠上配备了几种导程和行程, 可在广范围内选择进给速度。
- 以无电机型为标准品, 准备了几种电机作为可选方案。从而能够安装符合使用规格的电机。
- 能够与最适合所选电机的标准驱动配套采购。
- 具有充实的外装光电传感器及刹车单元等可选功能。

●Features

- We make full use of features of Miniature Ball Screw manufacturer and super compact design Actuator can be achieved.
- Depending on kinds of Lead Screws, wide range of choices related to positioning accuracy are available.
- Several variations of Screw Lead & Travel for each Screw type are standardized. So wide variety of choice for speed is available.
- Motor-less type is our standard, but a couple of Motors are in stock as an option. Suitable Motor and Actuator would be assembled in accordance with your specifications.
- Recommended Motor Drivers for each Motors are also in stock.
- Accessories can be provided as special design, such as outside photo-sensor, Brake unit and so on.



丰富的产品系列
Wide range of choices



无电机型的标准品
Motor-less is standard



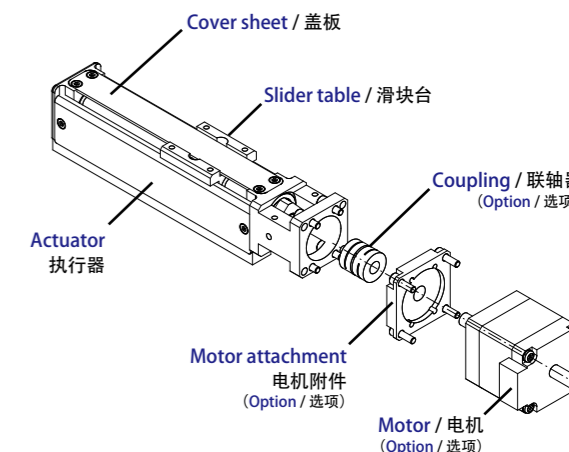
众多丝杠产品
Wide variety of Drive Screw type

●构造 / Structure

KSS灵活可选执行器系列是组合了小径的进给丝杠和导程的台面型执行器。以无电机型作为标准形状, 被设计成为根据使用条件能够安装最适合的电机。

KSS Flex Actuator is the slider type Actuator, which is built in small size Lead Screw / Ball Screw and Slide Guide in it.

KSS Flex Actuator series are standardized without Motor. It is designed to set the appropriate Motor easily based on the required specifications.



●种类与特点

根据所使用的进给丝杠, KSS灵活可选执行器系列有以下种类。

请根据所要求的精度选择进给丝杠的种类。详情请参照规格一览表(第G106页)。

- 1) 树脂螺母滑动丝杠型
采用了低廉的树脂导程丝杠(含油型), 因此能够在通常的使用环境下无须维护而长期使用。
- 2) 冷轧滚珠丝杠型
采用了冷轧滚珠丝杠, 因此确保了合理的价格和精度。
- 3) 精密滚珠丝杠型
采用了精密滚珠丝杠, 因此重复定位精度和空转都实现了高精度。

表G-1: 进给丝杠的定位精度

Table G-1: Positioning accuracy for each Drive Screw

Drive Screw type / 驱动丝杠种类	Repeatability 重复定位精度 (mm)	Lost motion 空转 (mm)
Resin Lead Screw / 树脂螺母滑动丝杠	±0.05 max.	0.05 max.
Rolled Ball Screw / 冷轧滚珠丝杠	±0.01 max.	0.01 max.
Precision Ball Screw / 精密滚珠丝杠	±0.005 max.	0.005 max.

注) 使用标准电机时的参考值。
Note) These numbers are obtained with standard Motor.

作为电机选项为KSS灵活可选执行器系列准备了以下选择方案。执行器和电机组合时的详细规格请参照第G106页。

Motor type 电机种类	Manufacturer 电机厂商	Model number 电机型号	Rated Current 额定电流
2-phase / 2相 □25	Minebea Motor 美蓓亚电机	10PM-K202B Single shaft / 单轴	0.7A / Phase 0.7A / 相
2-phase / 2相 □28	TAMAGAWA SEIKI 多摩川精机	TS3641N11E2 Double shaft / 双轴	0.95A / Phase 0.95A / 相
5-phase / 2相 □28	Oriental Motor 东方马达	PK523HPB Double shaft / 双轴	0.75A / Phase 0.75A / 相

●Variation & Features

There are several kinds of KSS Flex Actuators shown below. Each Actuator has a different kinds of Ball Screw / Lead Screw inside. Please choose appropriate type depending on your required accuracy. For further information, please refer to Table G-3 in page G106.

- 1) Resin Lead Screw type
High cost performance type Actuator installed Resin Lead Screw. It can be used without oiling in normal environment for long term, because lubricating agent is incorporated in Resin Nut.
- 2) Rolled Ball Screw type
Reasonable price and accuracy have been achieved by using Rolled Ball Screw.
- 3) Precision Ball Screw type
High accuracy in both Repeatability and Lost motion by using Precision Ball Screw.

There are several choices of Motor as option shown below. Specifications for each combination of Actuator and Motor are shown in page G106.

FA S — G 020 — 080 M N R SBU
 1 2 3 4 5 6 7 8 9

- 1 系列编号
FA: KSS灵活可选执行器系列
- 2 构造编号
S : 滑块型
- 3 进给丝杠种类
Re: 树脂螺母滑动丝杠
R : 冷轧滚珠丝杠
G : 精密滚珠丝杠
- 4 导程 / 间距 (mm) : 020表示为2mm
- 5 行程 (mm) : 080表示为80mm
- 6 电机类型
无编号: 无电机 (标准品)
M: 美蓓亚电机制造 2相步进电机 (□25 & 0.7A / 相)
T: 多摩川精机制造 2相步进电机 (□28 & 0.95A / 相)
E: 东方马达制造 5相步进电机 (□28 & 0.75A / 相)
S: 其它
- 7 连接器类型
N: 裸线
H: 广濑RP17
E: EI连接器 (Tyco Electronics制造)
- 8 导线方向
R: 右侧引线 (从轴侧看是右侧)
L: 左侧引线
- 9 选项编号
无编号: 无选项
S: 外装光电传感器
B: 电磁刹车单元
U: 电机周边套件

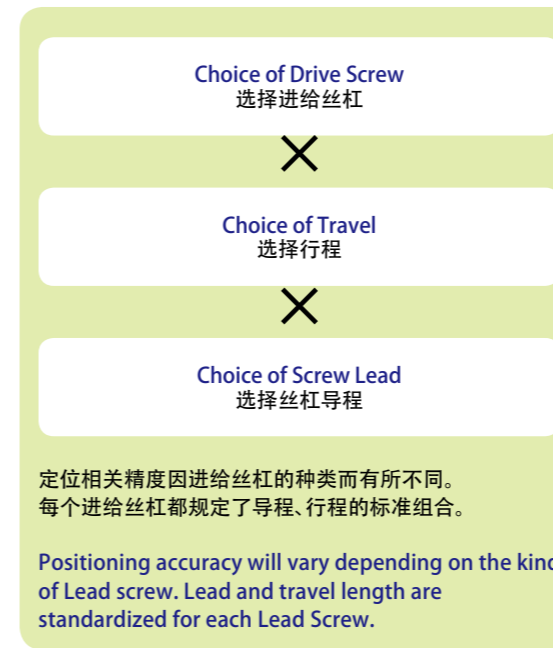
- 1 Series No.
FA: KSS Flex Actuator Series
- 2 Actuator type
S : Slider type
- 3 Lead Screw / Ball Screw type
Re: Resin Lead Screw
R : Rolled Ball Screw
G : Precision Ball Screw
- 4 Lead / Pitch (mm) : 020 means 2mm
- 5 Travel (mm) : 080 means 80mm
- 6 Motor type
None : No Motor (Standard)
M : Minebea Motor 2-phase Stepping Motor (□25 & 0.7A / phase)
T : TAMAGAWA SEIKI 2-phase Stepping Motor (□28 & 0.95A / phase)
E : Oriental Motor 5-phase Stepping Motor (□28 & 0.75A / phase)
S : Other
- 7 Connector type
N : No connector (Bare)
H : HIROSE RP17
E : EI connector (Tyco Electronics)
- 8 Direction of Motor leads
R : Right (from Shaft end side)
L : Left
- 9 Option
None : no optional design
S : Photo micro Sensor outside
B : Solenoid Brake Unit
U : Side Motor mounting kit



KSS灵活可选执行器能够组合选择进给丝杠的种类(定位精度)、丝杠导程以及行程。
 无电机型为标准品,但是作为选项准备了3种电机。
 由于这些组合,扩大了客户的选择余地,从而能够选定符合使用条件的执行器。
 进给丝杠的种类与电机选择(选项)请参照以下组合一览表(表G-2)。
 决定组合后,详细的尺寸与规格请参照各自刊登的页面。
 需要表G-2以外组合的执行器时,请咨询KSS。

KSS Flex Actuator has a lot of combinations with Lead screws (positioning accuracy), Screw Lead, and travel length. Motor-less type is our standard, but 3 types of Motor can be provided as an optional order. Standard combination and Motor choices make design flexibility enlarge widely based on your specifications. Combination of Lead screw and Motor are shown in Table G-2. The detail specifications and dimensions are described in each dimension table. If other combination in Table G-2 is required, please ask KSS representative.

标准规格的组合 / Standard Combination



电机选项 / Motor Option



表G-3 参照
Refer to Table G-3

决定组合后,详细尺寸请参照各自的页面。
刊登页面一览请参照表G-2。
The detail specifications for each combination are shown in dimension Table. Page index is shown in Table below.

表G-2: 各组合的刊登页面一览
Table G-2: Page index for each combination

Motor / 电机		Resin Lead Screw 树脂螺母滑动丝杠	Rolled Ball Screw 冷轧滚珠丝杠	Precision Ball Screw 精密滚珠丝杠
Standard 标准	Motor: None 无	See page G107~G108 参照第G107~G108页	See page G109~G110 参照第G109~G110页	See page G111~G112 参照第G111~G112页
Option 选项	M Minebea Motor / 美蓓亚电机制造 2-phase Stepping Motor (□25 & 0.7A / phase) 2相步进电机 (□25 & 0.7A / 相) Bi-polar type / 双极	See page G113~G114 参照第G113~G114页	See page G115~G116 参照第G115~G116页	See page G117~G118 参照第G117~G118页
	T TAMAGAWA SEIKI / 多摩川精机製 2-phase Stepping Motor (□28 & 0.95A / phase) 2相步进电机 (□28 & 0.95A / 相) Uni-polar type / 单极	See page G119~G120 参照第G119~G120页	See page G121~G122 参照第G121~G122页	See page G123~G124 参照第G123~G124页
	E Oriental Motor / 东方马达制造 5-phase Stepping Motor (□28 & 0.75A / phase) 5相步进电机 (□28 & 0.75A / 相)	See page G125~G126 参照第G125~G126页	See page G127~G128 参照第G127~G128页	See page G129~G130 参照第G129~G130页

●选定的标准

KSS灵活可选执行器的进给丝杠的种类、丝杠导程、行程、电机的种类等组合特别丰富。鉴于此,有时选定合理的组合的流程会变得复杂。为了让客户便于选定执行器,在此刊登了从各种选择方案中选定的标准。

Drive Screw selection guide 选定进给丝杠的标准	Positioning related accuracy 定位相关精度	Price 价格
Resin Lead Screws 树脂螺母滑动丝杠	Low 低	Less expensive 低价
Rolled Ball Screws 冷轧滚珠丝杠	Middle 中	Reasonable 一般
Precision Ball Screws 精密滚珠丝杠	High 高	Costly 高价

Screw Lead selection guide 选定导程的标准	Speed 进给速度	Resolution 分解度	Load Capacity 可搬负载
1mm	Slow 慢	High 高	High 高
2mm	↑↓	↑↓	↑↓
6mm	↑↓	↑↓	↑↓
9mm or 10mm	Fast 快	Low 低	Low 低

Motor selection guide 选定电机的标准	Fine step 微小进给	Acceleration 加速性	Rotational speed 转速	Price 价格
2-phase □25 2相 □25	Middle 中	Middle 中	Middle 中	Less expensive 低价
2-phase □28 2相 □28	Middle 中	Middle 中	Relatively low speed is available 涵盖相对较低的速度	Reasonable 一般
5-phase □28 5相 □28	Fine 微小	High 高	Low & high speed 涵盖低速和高速	Costly 高价

与KSS执行器相连时的性能。并非是电机单体的性能。详情请参照下一页的规格一览表。
The table above shows the functional comments when the Motor is built in KSS Flex Actuators.
Please note that the table above is not the function of Motor itself. For more detail, please see the table of specifications in next page.

●Selection guide

KSS Flex Actuator has a lot of combinations with Drive screws, Screw Lead, Travel length and Motor as an option. Therefore, when you try to select the suitable combination, its procedure may be complicated. KSS shows the selection guide below from the various approach of choices.

表G-3 : 规格一览表

Table G-3 : Specifications for each combination

Drive Screw type / 驱动丝杠种类	Resin Lead Screw 树脂螺母滑动丝杠	Rolled Ball Screw 冷轧滚珠丝杠	Precision Ball Screw 精密滚珠丝杠
Repeatability / 重复定位精度 (mm)	±0.05 max.	±0.01 max.	±0.005 max.
Lost motion / 空转 (mm)	0.05 max.	0.01 max.	0.005 max.
Permissible Moment / 容许负荷力矩 (Nm) Mp (Pitching / 俯仰)	0.10 ** In case of no load in My & Mr direction **My, Mr方向没有负荷时		
Permissible Moment / 容许负荷力矩 (Nm) My (Yawing / 偏转)	0.09 ** In case of no load in Mp & Mr direction **Mp, Mr方向没有负荷时		
Permissible Moment / 容许负荷力矩 (Nm) Mr (Rolling / 滚压)	0.23 ** In case of no load in Mp & My direction **Mp, My方向没有负荷时		

Spec. for each Motor / 按电机规格一览		Resin Lead Screw 树脂螺母滑动丝杠			Rolled Ball Screw 冷轧滚珠丝杠				Precision Ball Screw 精密滚珠丝杠				
Motor 电机	Lead / 导程 (mm)	2	6	9	1	2	6	10	1	2	6	10	
	H: Horizontal / 水平 V: Vertical / 垂直												
Standard 标准	Max. Load Capacity (N) 最大可搬负载 (N)	H	9.8	9.8	9.8	29.4	29.4	19.6	19.6	29.4	29.4	19.6	19.6
		V	4.9	4.9	4.9	19.6	19.6	9.8	4.9	19.6	19.6	9.8	4.9
Motor-less 无电机	Permissible speed (mm / sec) 容许速度 (mm / sec)	0~30	0~90	0~135	0~25	0~50	0~150	0~250	0~25	0~50	0~150	0~250	
Motor : M 2-phase / 2相 □25 0.7A / phase	Max. Load Capacity (N) 最大可搬负载 (N)	H	9.8	9.8	9.8	29.4	29.4	19.6	19.6	29.4	29.4	19.6	19.6
		V	2.94	2.94	2.94	19.6	19.6	2.94	2.94	19.6	19.6	2.94	2.94
Motor : T 2-phase / 2相 □28 0.95A / phase	Max. Load Capacity (N) 最大可搬负载 (N)	H	9.8	9.8	9.8	29.4	29.4	19.6	19.6	29.4	29.4	19.6	19.6
		V	4.9	4.9	4.9	19.6	19.6	9.8	4.9	19.6	19.6	9.8	4.9
Motor : E 5-phase / 5相 □28 0.75A / phase	Max. Load Capacity (N) 最大可搬负载 (N)	H	9.8	9.8	9.8	29.4	29.4	19.6	19.6	29.4	29.4	19.6	19.6
		V	4.9	4.9	4.9	19.6	19.6	4.9	4.9	19.6	19.6	4.9	4.9
**Motor mounting is option **带电机为选项。	Travel / 行程 (mm)	20				○				○			
		40	○	○	○	○	○	○	○	○	○	○	
		80	○	○	○	○	○	○	○	○	○	○	
		120		○	○			○	○			○	○
		160		○	○			○	○			○	○
		200		○	○			○	○			○	○

注1) 无电机时重复定位精度、空转为参考值;容许速度、可搬负载为推荐值。

注2) 详情请参照尺寸表。

Note 1) In case of Standard (Motor-less), Repeatability & Lost motion are reference value, Permissible speed & Load Capacity are recommended value.

Note 2) For more detail, please refer to dimension table.