Advanced Technology of "Miniature"

Master Catalogue of KSS Products

综合产品目录 Vol.11.3

Ball Screws & Actuators

综合产品目录 Master Catalogue of KSS Products

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前言
Introduction

承蒙客户长期以来对KSS产品的惠顾，在此深表谢意。
近几年来，随着机电一体化设备的飞速发展，
对各种机械装置也同样提出了高精度化、小型化的要求。
本公司自1960年成立以来，
以在螺纹量规（标准）生产中培育起来的超精密仪器领域制造技术为基础，
将生产范围扩大到了精密进给丝杠、微型精密滚珠丝杠的生产。
随后，又率先把握时代需求，进一步将生产领域扩大到了微型标准滚珠丝杠的生产。
这正是本公司对超精密技术不懈追求的精神与社会需求不谋而合，孜孜以求的结果。

Thank you for your interest in KSS products.
With the recent rapid development of mechatronics products, there is an ever-increasing demand for greater precision and reduced size for a wide range of mechanisms.
Since its founding in 1960, KSS has widened its manufacturing scope from a base of manufacturing technology in the ultra-precision field. Beginning with thread gauges, our product line has grown to include Precision Lead Screws, Precision Miniature Ball Screws, as well as Standard Miniature Ball Screws,
that have anticipated later demand.
We are confident that such developments have resulted from our diligence in the field of ultra precision technology, which has fulfilled the needs of society.

本次，我们全新编写了KSS综合产品目录。
除了对以往标准库存品进行升级换代以外，
还增加了一些新的产品型号，除了进给丝杠、树脂导程丝杠以外，滚珠丝杠的支架、模组、Z-Q复合执行器等成套产品等，
大幅提高了客户的使用便利性。

希望您能够从这些丰富多彩的产品中找到最适合您使用的产品，
也希望这些产品能够帮助您实现满足时代需求的高精密定位、驱动技术的小型化和降低成本，
并为您各种产品的设计和开发助一臂之力！

今后，为了满足客户更高的需求，
本公司将一如既往，不断积累各种技术、充分利用各种经验专长，
为开发新技术和新产品而奋勇向前。
欢迎广大客户惠顾！

With the release of this new Catalog, both standardized & customized new models have been added.
In addition, Lead Screws, Resin Lead Screws have been combined as well as Unit-products.
This catalogue is focused on the usability by including index table over the whole series.

We trust that you will be able to find all of the products you require among the comprehensive range of KSS products in this catalog, and we are sure that these products will play a vital role in meeting today's needs in precision positioning, further miniaturization in drive technology, cost reductions, and assisting in the design and development of a wide variety of products.

We will continue to apply our expertise and technology to the development of new technology and new products, as we work to satisfy our customers' most advanced needs.
We hope you find our new catalog, featuring the latest products from KSS, be helpful.

公司标志的三条边表示：

制造部门
专业技术（Know How）
卓越品质（Super Quality）
安全运作（Safety Motion）

营业部门
热情（Kindness）
速度（Speed）
服务（Service）

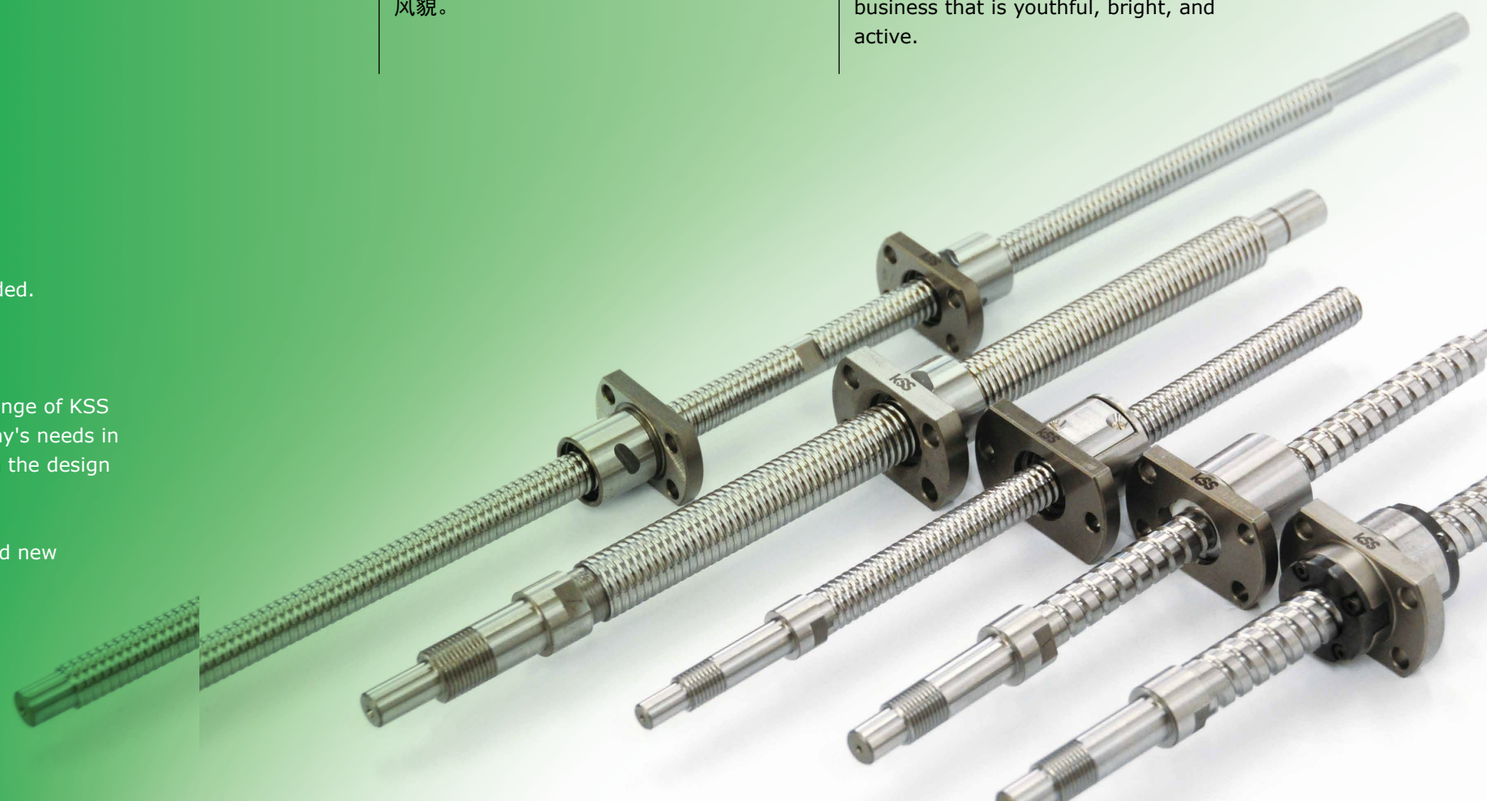
KSS这三个字母凸出三角形之外，
寓意打破陈规、锐意创新。
企业标准色为**绿色**，
体现了年轻、活泼、朝气蓬勃的企业的风貌。

What dose the KSS logo signify?

Manufacturing Division:
Know-How
Superior Quality
Safety Motion

Sales Division:
Kindness
Speed
Service

The letters KSS extend out from the triangular logo, symbolizing our constant technological breakthroughs.
The **green** corporate color signifies a business that is youthful, bright, and active.



KSS产品简介
Outline of KSS Products

■滚珠丝杠 / Ball Screws

标准库存品
精密滚珠丝杠 / 冷轧滚珠丝杠(A101～)
Standard products
Precision Ball Screws / Rolled Ball Screws (A101～)

齐备有标准滚珠丝杠(精密滚珠丝杠/冷轧滚珠丝杠),只需对轴端进行加工,即可按所需形状在短期内供货。
轴端形状也根据安装方式不同而实现了标准化。

These series are KSS standard Ball Screws, Precision & Rolled type. These types of products can be delivered shortly with end-journal machining.
End-journal profile is also standardized.

接单生产
精密滚珠丝杠 / 冷轧滚珠丝杠(A501～)
Customized products
Precision Ball Screws / Rolled Ball Screws (A501～)

为了满足客户的各种设计需求,除标准品以外,本公司还承接接单生产。为节省客户的设计时间,我们对各种螺母类型进行了标准化。

In order to meet the needs of customer's requested design, we offer customized products.
To reduce design process at customer, each Nut type is standardized.

■油脂 / Grease

微型滚珠丝杠专用油脂 (B101～)
Original Grease for Miniature Ball Screws (B101～)

无损微型滚珠丝杠的动作性、润滑性能卓越的原装油脂。还备有无尘室专用油脂。

This grease has high lubrication performance without deteriorating Ball Screw function.
The original Grease for Clean room usage is also available.

■精密进给丝杠 / Precision Lead Screws

精密进给丝杠(C301～)
Plecision Lead Screws (C301～)

可选择进给丝杠特有的小间距产品。螺纹面采用精密加工技术,是一款表面粗糙度低、导程误差小,低扭矩和低磨损的三角丝杠。

Ultra Fine Pitch is available, which only Lead Screws achieve. With precise grinding technology on flank surface, fine surface roughness and low wobble become reality. This is the triangular Screw with low torque and less wear.

■树脂螺母滑动丝杠 / Lead Screws with Plastic Nuts

树脂导程丝杠(D101～)
Resin Lead Screws(D101～)

该系列采用不锈钢轴与树脂螺母的组合,实现了卓越的耐腐蚀性。
是最适于轻负载搬运的经济型产品。

This series have good corrosion resistance by a combination of Stainless Shaft and Plastic Nut. It is reasonable price and suitable for transport with light Load.

■滚珠丝杠花键 / Ball Screw with Ball Spline

微型滚珠丝杠花键(F101～)
Miniature Ball Screw with Ball Spline(F101～)

仅使用单件产品,即可实现直线运动(Z)、旋转(θ)、吸附的复合产品。
通过微型滚珠丝杠和微型滚珠花键的重叠,最大限度地实现了小型化。

This is a combined product which is possible for linear and rotary motion as well as suction at the same time with one unit.
Achieved developing very compact product as “Overlap type" using Miniature Ball Screws and Miniature Ball Splines .

■执行器 / Actuator

滚珠丝杠线性执行器(P101～)
Ball Screw Linear Actuators(P101～)

步进电机与滚珠丝杠一体的紧凑型电动线性执行器。
推出了External、Captive、Non-Captive三种类型的产品。

This is a Ball Screw type compact electric Linear Actuator which combined with Stepping Motor.
3 types of Linear Actuators, External, Captive and Non-Captive type are available for customer usage.

单轴执行器(Q101～)
Single axis Actuators(Q101～)

KSS单轴执行器是安装有微型滚珠丝杠、导轨的滑台式紧凑型执行器。
具有充实的外装光电传感器及刹车单元等可选功能。

Single axis Actuator is the stage-type compact Actuator which is made of small sized Ball Screw and Linear Guide.
Variety of options are available such as External photo-sensor or Brake unit.

V-Z-θ 执行器(R101～)
V-Z-θ Actuators(R101～)

配备微型滚珠丝杠花键(BSSP),仅使用单件产品,即可实现直线运动(Z)、旋转(θ)、吸附(Vacuum)3项功能的成套产品。
V-Z-θ执行器有直接驱动型、混合驱动型、传送带驱动型3种类型。

This is our state of the art product which applied the KSS miniature Ball Screw with Ball Spline(BSSP), and realized three functions, linear (Z), rotary (θ) and vacuum (V) with one product.
KSS provides 3-types of multi-functional VZθ Actuator, which are Direct Drive type, Hybrid Drive type and Belt Drive type.

■外围设备 / Attachements related KSS products

滚珠丝杠支撑单元 (E101～)
Ball Screw Support Units (E101～)

KSS推出了最适合微型滚珠丝杠轴端的支撑单元系列产品。请务必与滚珠丝杠配合使用。

KSS Support Units are suitable for Miniature Ball Screw end journal.
Several types of Support Units are available with Ball Screws.

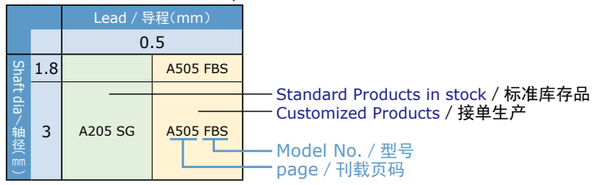
目录

Contents

滚珠丝杠　轴径与导程速查表

Table of Shaft dia. and Lead combination

【表中各符号的含义 / Description】



按螺母形状分类的精密滚珠丝杠及冷轧滚珠丝杠的型号一览表 / Nut style list for Precision Ball Screws & Rolled Ball Screws.

Nut style/螺母形状	Precision Ball Screws 精密滚珠丝杠		Precision Rolled Ball Screws 精密冷轧滚珠丝杠	Rolled Ball Screws 冷轧滚珠丝杠	
	Standard Products 标准库存品	Customized Products 接单生产	Standard Products 标准库存品	Standard Products 标准库存品	Customized Products 接单生产
Single Nut with Flange/带法兰单螺母	SG	FKB FBS FDB FEB	PSR PSRT	SR SSR SRT SSRT	MRB
Sleeve type Single Nut/套筒型单螺母	—	BS		—	BSR
Single Nut with M-thread/带公制螺纹单螺母	—	MS		—	MSR
Square type Single Nut/方型单螺母	—	KS		—	—
Bi-directional Nut with Flange/双向螺母	SD	FBS* FKB*		—	—

※标准库存品的详情请参照第A201页。 注)*表示双向螺母。

※Please refer to page A201 regarding the detail of Standard Products Note)* means Bi-directional Nut with Flange.

轴径-导程速查表(按型号分类) / Table of Shaft dia. and Lead combination(Model distinction)

Shaft dia.～轴径(mm)	Lead / 导程(mm) 0.5	1	1.5	2	2.5	3	4	5	6	8	10	12	15	20	30
1.8	A505 FBS														
3	A207 SG A505 FBS	A208 SG A505 FBS A529 BS													
4	A505 FBS	A209 SG A239 SD A247 SR A248 SR(K) A289 SRT A290 SRT(K) A323 PSR A324 PSRT A325 PSR(K) A326 PSRT(K) A505 FKB A505 FBS A529 BS A539 MS A545 FKB* A551 MRB A551 MRB(K) A559 BSR A563 MSR		A210 SG A249 SR A291 SRT A505 FBS A529 BS A551 MRB A559 BSR			A505 FEB			A505 FEB					
5	A507 FBS	A507 FKB A507 FBS A529 BS A545 FKB*					A211 SG A250 SR A292 SRT A507 FBS A529 BS A551 MRB A559 BSR								
6	A509 FBS	A212 SG A240 SD A251 SR A252 SR(K) A281 SSR A293 SRT A294 SRT(K) A315 SSRT A327 PSR A328 PSRT A329 PSR(K) A330 PSRT(K) A509 FKB A509 FBS A529 BS A543 KS A545 FKB* A551 MRB A551 MRB(K) A559 BSR	A509 FBS A529 BS	A213 SG A253 SR A295 SRT A509 FBS A529 BS A539 MS A543 KS A551 MRB A559 BSR	A214 SG A509 FBS A529 BS				A215 SG A254 SR A296 SRT A509 FEB A551 MRB		A216 SG A255 SR A297 SRT A509 FEB A551 MRB	A509 FEB			
8	A511 FBS	A217 SG A241 SD A256 SR A257 SR(K) A282 SSR A298 SRT A299 SRT(K) A316 SSRT A331 PSR A332 PSRT A333 PSR(K) A334 PSRT(K) A511 FKB A511 FBS A531 BS A543 KS A545 FKB* A553 MRB A553 MRB(K) A559 BSR	A511 FKB A511 FBS A531 BS A539 MS A545 FKB*	A218 SG A242 SD A258 SR A259 SR(K) A283 SSR A300 SRT A301 SRT(K) A317 SSRT A335 PSR A336 PSRT A337 PSR(K) A338 PSRT(K) A511 FKB A511 FBS A531 BS A539 MS A545 FKB* A553 MRB A553 MRB(K) A559 BSR A563 MSR	A219 SG A260 SR A302 SRT A513 FDB A513 FBS A531 BS A539 MS A553 MRB A559 BSR A563 MSR	A513 FBS A531 BS A539 MS	A220 SG	A513 FBS A531 BS A539 MS	A221 SG A261 SR A303 SRT A513 FBS A531 BS A539 MS A553 MRB A559 BSR A563 MSR		A222 SG A262 SR A304 SRT A513 FEB A553 MRB	A263 SR A513 FEB A553 MRB A223 SG A264 SR A305 SRT A339 PSR A340 PSRT	A513 FEB A553 MRB			
10	A224 SG	A515 FKB A515 FBS A533 BS A543 KS A545 FKB*	A515 FKB A515 FBS A533 BS A545 FKB*	A225 SG A243 SD A265 SR A266 SR(K) A284 SSR A306 SRT A307 SR(K) A318 SSRT A341 PSR(K) A342 PSRT(K) A515 FKB A515 FBS A533 BS A541 MS A543 KS A545 FKB* A555 MRB A555 MRB(K) A561 BSR A563 MSR	A515 FKB A515 FBS A533 BS A545 FKB*	A517 FBS A533 BS A545 FBS* A555 MRB A561 BSR A563 MSR	A226 SG A267 SR	A517 FBS A533 BS A545 FBS* A555 MRB A561 BSR	A227 SG A268 SR A308 SRT A517 FDB A517 FBS A533 BS A545 FBS* A555 MRB A561 BSR	A555 MRB A561 BSR		A228 SG A269 SR A309 SRT A517 FEB A555 MRB		A555 MRB	A229 SG A270 SR A310 SRT A517 FEB A555 MRB A271 SR A311 SRT A517 FEB A555 MRB	A517 FEB
12		A519 FKB A519 FBS A535 BS A547 FKB*		A230 SG A244 SD A272 SR A273 SR(K) A312 SRT A313 SRT(K) A343 PSR(K) A344 PSRT(K) A519 FKB A519 FBS A535 BS A541 MS A547 FKB* A555 MRB A555 MRB(K) A561 BSR A563 MSR	A519 FKB A519 FBS A535 BS A547 FKB*	A519 FKB A519 FBS A535 BS A547 FKB*		A519 FBS A535 BS A541 MS A547 FBS*		A519 FBS A535 BS		A231 SG A274 SR A314 SRT A521 FEB A521 FBS A555 MRB				
13													A521 FEB A557 MRB		A521 FEB A557 MRB		A521 FEB A557 MRB	
14		A523 FBS A535 BS A547 FBS*		A232 SG A275 SR A523 FKB A523 FBS A535 BS A541 MS A547 FKB* A557 MRB A561 BSR A563 MSR	A523 FKB A523 FBS A535 BS A547 FKB*	A523 FKB A523 FBS A535 BS A547 FKB*	A233 SG A276 SR A523 FKB A523 FBS A535 BS A541 MS A547 FKB* A547 MRB A561 BSR A563 MSR		A523 FBS A535 BS A547 FBS*						
15							A525 FBS	A234 SG A277 SR	A525 FEB A525 FBS A557 MRB			A235 SG A278 SR	A525 FEB A525 FBS A557 MRB		A236 SG A279 SR	A525 FEB A525 FBS A557 MRB	A525 FEB
16		A527 FBS A537 BS A549 FBS*		A527 FKB A527 FBS A537 BS A549 FKB*		A527 FKB A527 FBS A537 BS A549 FKB*	A527 FKB A527 FBS A537 BS A549 FKB*	A527 FBS A537 BS A549 FBS*							

滚珠丝杠篇　Ball Screws

序言
Outline

自1978年开始生产、销售滚珠丝杠以来，作为微型滚珠丝杠行业的先锋，本公司一直积极致力于各种产品的开发。此外，本公司还致力于使用了滚珠丝杠的成套产品的开发，将迄今为止开发的产品整合到了一本产品目录中。

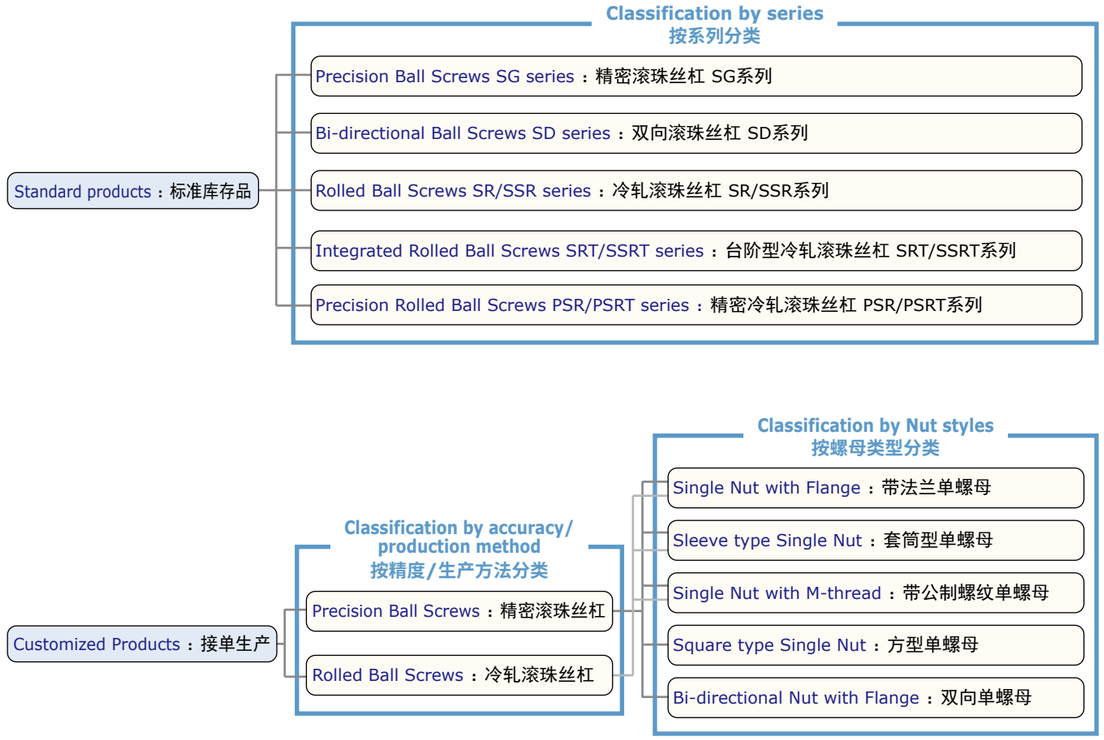
Since KSS started production and sales of Ball Screw in 1978, we have been working on product development as a pioneer of Miniature Ball Screws. In addition, we developed Unit Products related Ball Screw. At this time, we have combined developed products until now into one catalogue for more usability.

●KSS滚珠丝杠的分类

为了让您进一步深入了解KSS滚珠丝杠，以下对本公司滚珠丝杠的种类和分类进行了说明。

●Classification of KSS Ball Screws

For better understanding of KSS Ball Screws, kinds and classification of KSS Ball Screws are as follows.



图A-11：滚珠丝杠的分类
Fig. A-11：Classification of KSS Ball Screws

●标准库存品

为满足客户要求，实现短期交货，本公司备有特定型号的标准库存品。
轴端形状实现了标准化，可有效缩减客户的设计时间。此外，凭借本公司独有的追加加工技术，可对轴端进行高精度加工。
如图A-11所示，标准库存品种类繁多，精密滚珠丝杠、冷轧滚珠丝杠均可从中选择。

●Standard Products

To meet customer's request of quick delivery, KSS has specified model type in stock.
The end-journal configuration is standardized and it is possible to reduce numbers of design process by customer. Moreover, since we have end machining knowhow, high accurate end machining is possible.
Standard products can be chosen from many kinds of Precision Ball Screws and Rolled Ball Screws shown in Fig. A-11.

●接单生产

对于标准库存品以外的型号，本公司承接各种接单生产。为减少客户在设计方面花费的时间，螺母尺寸按照图A-11所示的螺母类型，实现了不同型号尺寸的标准化。
对于非标准化的型号、形状、尺寸，如果您有需求，可随时咨询洽谈。
此外，本公司还提供不锈钢、特殊材料的产品及表面处理等，欢迎垂询。

●Customized products

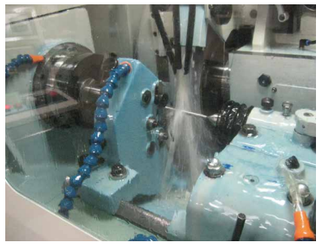
Products other than standardized model are customized products. To reduce numbers of design process by customer, dimensions of each model are standardized as Nut type shown in Fig. A-11
Please consult KSS if you need products which are not standardized model, configuration, dimension are requested.
Please also inquire KSS when stainless steel products, special material, surface treatment are needed.

●精密滚珠丝杠和冷轧滚珠丝杠

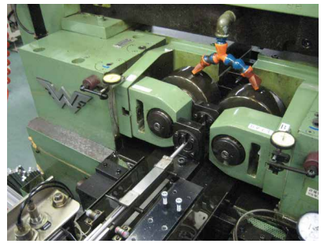
本公司的滚珠丝杠生产工序因客户的精度要求而异。大体可分为采用研磨加工制成的高精度精密滚珠丝杠和采用滚丝模形成螺纹槽的冷轧滚珠丝杠。
C5以上精度等级的滚珠丝杠一般采用研磨加工（精密滚珠丝杠），C7、C10级的滚珠丝杠则采用冷轧加工。
对于无滚丝模（冷轧加工模具）的型号，也可采用研磨加工生产C7、C10级产品。

●Precision Ball Screws and Rolled Ball Screws

Production procedures vary by accuracy requested from customers. Precision Ball Screws with high accuracy by Grinding process and Rolled Ball Screws with formed groove by Rolling dies（Tooling for Rolling process）can be classified.
Generally, C5 or higher grade is manufactured by Grinding process and accuracy of C7, C10 are manufactured by Rolling process. It is also possible to produce C7, C10 by Grinding when Rolling dies do not exist.



通过螺纹磨床进行的高精度螺纹槽加工
High accurate shaft groove process by Grinding machine



通过滚丝模进行的冷轧加工
Rolling process by Rolling dies

●质量和环保活动　Approach of quality and environment

JQA-QM4131（小千谷工厂）

KSS滚珠丝杠包括设计、制造在内，通过了ISO-9001认证，并具备完善的出厂检查、可追溯性等质量管理体制，可放心使用。
KSS Ball Screws including design, production are qualified by ISO-9001. Since quality management system such as shipping inspection, traceability is organized, KSS products can be used with safety.

JQA-EM4583（小千谷工厂）

在环境方面，本公司不仅通过了ISO-14001认证，还积极使用符合RoHS指令的零件，致力于环保型设计和削减CO_2排量。
For environmental side, KSS is qualified by ISO-14001. We make an effort to reduce CO_2 and take care of environmentally friendly design by using parts, which conform to RoHs regulation.

●出口管理

本公司的产品、技术出口均以遵守外汇法、外贸法及其他相关法令为基本方针。因此，若使用目的为军事用途（大规模杀伤武器、武器与兵器相关领域），除部分国家外，本公司谢绝出口产品。
关于本公司产品是否属于出口管理法中管制物品清单的管制对象，请登录KSS网站查看。
http://www.kssballscrew.com/cn/index.htm
此外，希望获取KSS受管与否判断资料时，请在KSS网站上填写受管与否判断委托书后与本公司联系。

●Export administration

Our policy is to comply with Foreign Exchange, Foreign Trade Act, and other related lows when KSS products and technologies are exported. Therefore ifthe purpose of using our products is military use（weapon of mass destruction, things related with arms）, we decline to export our products except specific country. Please refer to KSS homepage regarding list regulation by Export administration.
http://www.kssballscrew.com

标准库存品
Standard Products

KSS滚珠丝杠标准库存品分为以下几类。如选择这些标准库存品，即可在短期内供货。

KSS has several varieties of standard products as follows. It is possible to make quick delivery to customers by using standard products.

●精密滚珠丝杠　Precision Ball Screws

SG系列（精密滚珠丝杠）
SG series（Precision Ball Screws）

- 通过将固定侧轴端形状标准化、支撑侧轴端自由化，设定标准行程。
- 支撑侧轴端未进行加工，因此可根据所需行程进行追加加工。
- 分为C3（轴向间隙为0）、C5（轴向间隙为5μm以下）两种。

- Configuration of fixed side end-journal is standardized, supported side end-journal is free type and standard travel is set up.
- Since supported side end-journal is unfinished, it is possible to do additional end machining with your requested thread length.
- There are C3（Axial play 0）, C5（Axial play 5μm or less）available.

SD系列（精密双向滚珠丝杠）
SD series（Bi-directional Ball Screws）

- 可单轴左右开闭的经济型滚珠丝杠。
- 库存品的固定侧、支撑侧轴端均未进行加工，提高了设计自由度。
- 分为C3（轴向间隙为0）、C5（轴向间隙为5μm以下）两种。

- These are economical Ball Screws because a shaft has bi-directional thread.
- Since fixed and supported side end-journal are unfinished, design flexibility is enlarged.
- There are C3（Axial play 0）, C5（Axial play 5μm or less）available.

●冷轧滚珠丝杠　Rolled Ball Screws

SR系列（冷轧滚珠丝杠）/SSR系列（不锈钢冷轧滚珠丝杠）
SR series（Rolled Ball Screws）/SSR series（Stainless Rolled Ball Screws）

- 通过槽冷轧加工制成的经济型库存品。
- 库存品的固定侧、支撑侧轴端均未进行加工，提高了设计自由度。
- 分为Ct7（轴向间隙20μm以下）、Ct10（轴向间隙50μm以下）两种。
- 不锈钢材质的冷轧滚珠丝杠（SSR系列）也备有的标准库存品。

- Standard and reasonable price products by Rolling formed process.
- Since fixed and supported side end-journal are unfinished, design flexibility is enlarged.
- There are Ct7（Axial play 20μm or less）, Ct10（Axial play 50μm or less）available.
- There are also Rolled Ball Screws made of stainless steel（SSR series）in stock.

SRT

SSRT

SRT系列（台阶型冷轧滚珠丝杠）/SSRT系列（台阶型不锈钢冷轧滚珠丝杠）
SRT series（Integrated Rolled Ball Screws）
SSRT series（Integrated stainless Rolled Ball Screws）

- 冷轧滚珠丝杠库存品的固定侧轴端较粗，未进行加工。
- 与传统冷轧滚珠丝杠相比，进一步提高了设计自由度。
- 轴端形状采用可与SG系列兼容的设计。
- 备有台阶型不锈钢冷轧滚珠丝杠（SSRT系列）的标准库存品。

- Fixed side end-journal is set up bigger than Shaft nominal diameter and unfinished.
- More design flexibility compared to current Rolled Ball screws.
- It is possible to design end-journal configuration compatible with SG series.
- There are also Integrated Rolled Ball Screws made of stainless steel（SSRT series）in stock.

●精密冷轧滚珠丝杠　Precision Rolled Ball Screws

PSR系列（精密冷轧滚珠丝杠）/PSRT系列（精密冷轧滚珠丝杠满）
PSR series（Precision Rolled Ball Screws）
PSRT series（Integrated Precision Rolled Ball Screws）

- 以前的冷轧加工只能加工到Ct7、Ct10的普通级，现在已经实现了精密级（JIS C5）加工。
- 轴端加工产品PSR系列和对轴端进行了加粗的台阶型（PSRT）系列均备有库存，进一步提高了客户设计的自由度。
- 轴向间隙设定在5μm以下，但可根据客户需求消除轴向间隙（预压）。
- 台阶型的固定侧轴端已实现标准化，可直接安装KSS支架组件。

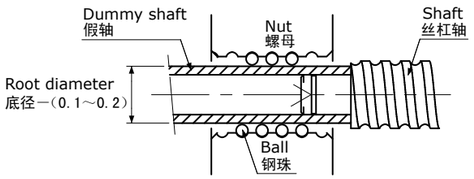
- KSS newly developed the high grade accuracy（JIS C5）Rolled Ball Screws, which surpasses the conventional type of Ct7 or Ct10 grade.
- PSR series with unfinished end-journal and PSRT series with integrated end-journal are in stock, so wide variety of design choices are available.
- The axial play is set at 5um or less, but zero backlash is possible by your request.
- For integrated type, fixed side end-journal is standardized and finished, KSS Compact Support Unit can be installed.

●轴端追加加工

凭借本公司独有的追加加工技术，可进行无精度劣化的轴端加工。如需轴端追加加工，请与本公司联系。追加加工时的注意事项如下所示。

1）建议由本公司进行轴端追加加工。如果由其他公司进行轴端追加加工，本公司将不能保证追加加工后的精度，敬请谅解。
2）对于产品目录中所示标准形状以外的追加加工，请附上追加加工指示图（示意图）进行指示。
3）由于不进行螺母的追加加工，因此请对照尺寸表设计法兰形状等。
4）润滑
使用滚珠丝杠时，请务必涂抹润滑剂。
KSS标准库存品以长期存放为前提，因此在涂抹防锈油后进行了真空包装。
如果在委托追加加工时指定了润滑剂，交货时将在滚珠丝杠上涂抹该指定润滑剂。
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，去除防锈油后涂抹润滑剂（油脂或润滑油）。
请每隔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。
5）螺母的自重下落
以间隙规格使用滚珠丝杠时，螺母会因自重而下落，敬请注意。
6）由客户进行的追加加工
对于客户自行进行的追加加工，本公司将不予保证精度。不得已而由客户自行进行追加加工时，除上述注意事项外，还应注意以下各点。
· 防止粉尘进入螺母内部
追加加工时，请注意防止粉尘进入螺母内部。
不拆下螺母而直接对丝杠轴进行追加加工时，请用塑料袋等包住螺母、或用胶带密封螺母两端，切实保护螺母。
· 拆下螺母时
拆下螺母时，请按照图A-21所示使用假轴。假轴根据客户要求提供。
通过假轴拆卸或重新组装螺母时，请在确认钢珠与螺纹槽啮合的同时，
沉着缓慢地进行操作。
· 追加加工后的清洗
追加加工后，请用清洁的精制煤油将附着在滚珠丝杠上的脏物清洗干净。
· 涂抹润滑剂
使用追加加工后的产品之前，请先涂抹润滑剂。
· 存放
追加加工后需长期存放时，请切实进行防锈处理。

图A-21：拆卸假轴和螺母

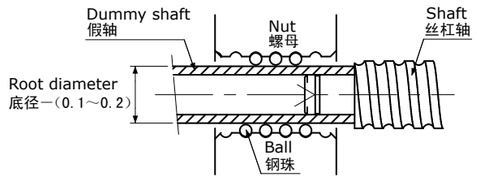


●Additional end-journal machining

Technology of KSS end-journal machining enables to keep high accuracy of Ball Screws after re-works. Please ask for end-journal machining to us. Precautions of end-journal machining are as follows.

1）We recommend additional end-journal machining is done by KSS. We do not guarantee accuracy after re-works done by other than KSS.
2）When additional end-journal machining other than standard configuration in catalogue is requested, please send us drawing with end-journal profile on it.
3）Additional machining is not applied to the Nut. Please design flange configuration according to our dimension table.
4）Lubrication
In Ball Screws use, lubricant should be applied on them.
KSS Ball Screws are in vacuum wrapping with anti-rust oil due to purpose for long term stock.
If you need specified lubricant, we will supply Ball Screws with lubricant you requested when requesting additional end-journal machining.
Since anti-rust oil is not lubricant, Ball Screws should be washed off anti-rust oil with clean Kerosene and apply lubricant (Grease or lubricating oil).
Please check the lubricant condition every 2 or 3months. If grease is contaminated, remove old grease, and replace with the new one.
5）Ball Nut falling by weight
If Ball Screw is not preloaded, Ball Nut will fall down due to its own weight. Care must be taken.
6）Additional end-journal machining by customer
Additional end-journal machining done by customer is out of our guarantee, but in case of unavoidably conducting, please take caution regarding above precautions as well as following points.
· Invasion of dust inside Nut
Care must be taken regarding invasion of dust inside Nut when additional end-journal machining.
If additional end-journal machining is being done to the Shaft with Ball Nut, wrap the Nut with vinyl, sealing up both ends and surely protect it from dust.
· Nut removal
In case of Nut removal, please use dummy shaft shown in Fig. A-21. We can supply dummy shaft with products if you request.
Make sure Balls and Screw Shaft groove are meshing correctly and remove the Nut slowly as well as re-assembling.
· Cleaning after additional end-journal machining
After additional end-journal machining, Ball Screws should be washed dust off with clean Kerosene.
· Applying lubrication
After additional end-journal machining, apply lubricant before using Ball Screw.
· Storage
After additional end-journal machining, surely conduct anti-rust treatment when Ball Screws are in long term stock.

Fig. A-21 : Dummy shaft and Nut removal



SG系列　精密滚珠丝杠标准库存品
SG series　Standardized Precision Ball Screws

齐备有C3级、C5级精密滚珠丝杠，固定侧轴端事先经过标准化加工。
只要对支撑侧轴端进行加工，便可按所需形状在短期内供货。

Precision Ball Screws which are accuracy C3, C5 and have machined shaft end at fixed side in advance are available. Short delivery is available by machining supported end in accordance with customer's request.

●丝杠轴公称外径与导程的组合　Combination of Shaft nominal dia. & Lead

Unit(单位):mm

Shaft dia. 公称外径 \ Lead 导程	0.5	1	2	2.5	4	5	6	8	10	12	15	20
3	A207	A208										
4		A209	A210									
5					A211							
6		A212	A213	A214			A215		A216			
8		A217	A218	A219	A220	A221		A222		A223		
10		A224	A225		A226	A227			A228		A229	
12			A230						A231			
14			A232		A233							
15						A234			A235			A236

注1）表中的数字表示产品刊载页码。
Note 1）The number in a table：showing a page in this catalogue.

●精度等级和轴向间隙

SG系列（精密滚珠丝杠标准库存品）的精度等级有C3和C5（JIS B 1192-3）两种。轴向间隙根据精度等级不同备有0mm（预压：C3）和0.005mm以下（C5）两种。

●材质和表面硬度

SG系列（精密滚珠丝杠标准库存品）的丝杠轴和螺母均采用SCM415（渗碳淬火），滚珠丝杠部分的表面硬度为HRC58～62。

●润　滑

为防止生锈，未对轴端进行加工的SG系列（精密滚珠丝杠标准库存品）产品均涂抹有防锈油。由于防锈油不具备润滑性，因此在使用前请另行涂抹润滑剂。
如无特殊指定，建议使用KSS原装润滑油脂（MSG No.2）。

●接单生产

上述标准品以外的产品均为接单生产。详情请垂询本公司。

●Accuracy Grade & Axial play

Accuracy grade of SG series（Standardized Precision Ball Screws）are based on C3 and C5（JIS B 1192-3）. According to accuracy grade, Axial play 0（Preload：C3）and 0.005mm or less（C5）are in stock.

●Material & Surface hardness

SG series（Standardized Precision Ball Screws）consists of Shaft and Nut materials SCM415（Carburizing and quenching）and Surface hardness is HRC58～62.

●Lubrication

SG series（Standardized Precision Ball Screws）without end-journal machining will be applied with anti-rust oil for rust prevention.
Anti-rust oil does not have lubricating function so that please apply Grease or lubrication oil when using the Ball Screws.
If there is no specific instruction, KSS would recommend our original Grease（MSG No.2）as standard lubricant.
Please feel free to contact us.

●Customized products

It will be a customized product other than the above. Please ask KSS.

●公称型号的构成

希望对SG系列进行追加加工时，请用以下公称型号进行指示。

●Model number notation

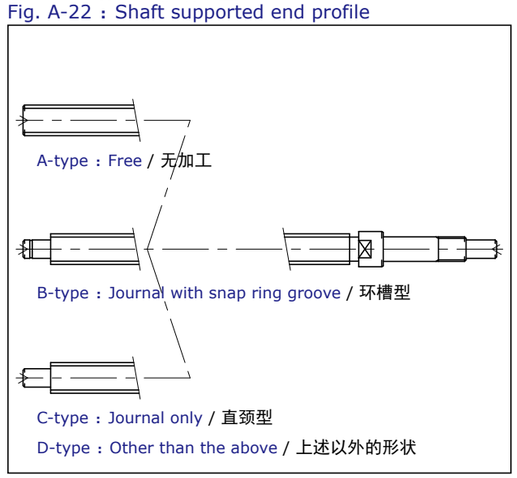
Please use model number below when additional end-journal machining is requested.

SG　04　01　—　046　R　085　C3　B　1　X
①　②　③　④　⑤　⑥　⑦　⑧　⑨　⑩

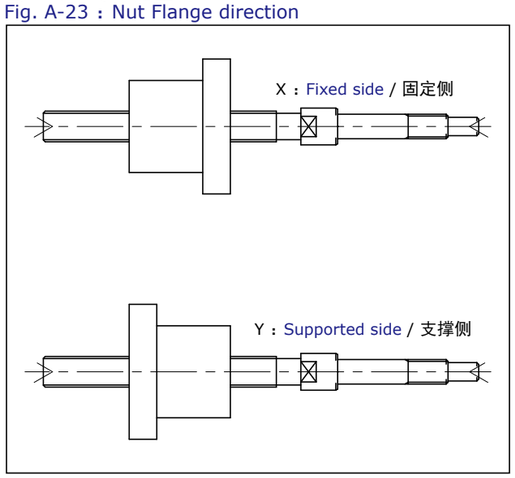
①系列符号
②丝杠轴公称外径(mm)
③导程(mm)
④螺纹部长度(mm)
（追加加工后以1mm为单位指定）
⑤螺纹旋向(R=右旋)
⑥丝杠轴总长(mm)
（以1mm为单位指定）
⑦精度等级(C3或C5)
⑧支撑侧轴端加工型
（参照图A-22：A型、B型、C型、D型(其他)）
⑨涂抹的油脂
0：本公司推荐的润滑脂(MSG No.2)
1：防锈油(Non Ruster PZ2)
2：Multemp PS2
3：其他
⑩螺母法兰朝向(参照图A-23)

①Ball Screws Series No.
②Screw Shaft nominal diameter(mm)
③Lead(mm)
④Screw thread length(mm)
(Specify in 1mm units after end-journal machining)
⑤Thread direction(R=Right-hand)
⑥Screw Shaft total length(mm)
(Specify in 1mm units)
⑦Accuracy grade(C3 or C5)
⑧Shaft supported end profile
Refer to Fig. A-22 below： A-type,B-type,C-type,D-type(other)
⑨Anti-rust oil or Lubricant
0：KSS grease（MSG No.2）
1：Anti-rust oil(Non Ruster PZ2)
2：Multemp PS2 grease
3：Other
⑩Nut Flange direction（Refer to Fig. A-23 below）

图A-22：支撑侧轴端加工型
Fig. A-22：Shaft supported end profile



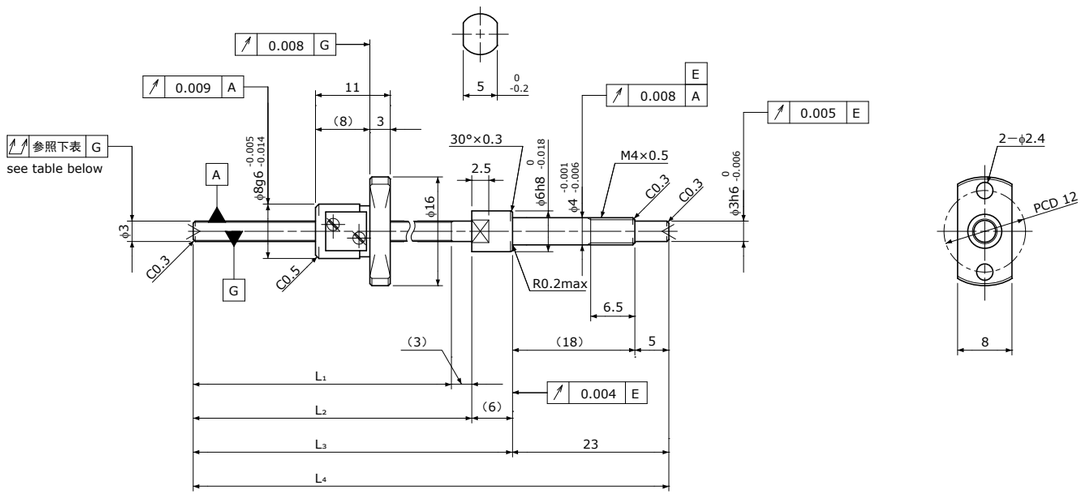
图A-23：螺母法兰朝向
Fig. A-23：Nut Flange direction



●注释
1)各种规格的轴端形状在各页中有详细介绍。
2)不受理螺母的追加工。
3)本规格若有变更，恕不另行通告。
4)希望进行A、B、C以外的轴端加工时，请垂询本公司。

●Note
1)The detail of end-journal dimension for each size is shown from next page.
2)KSS does not make additional Nut machining.
3)The specification is subject to change without notice.
4)If the other configuration except (A,B,C)is requested, please contact KSS.

SG0300.5 | Shaft dia.(轴径)φ3 Lead(导程)0.5mm | C3

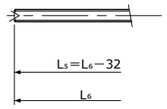


Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ0.4
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ2.6
Number of circuit 循环数	2.7×1
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Supported-side end-journal profile 支撑侧轴端加工形状

A-type



L5:Thread length after end-journal machining. 追加加工后的螺纹部长度
L6:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side 支撑侧	:	—
	Fixed-side 固定侧	:	MSU-4C/4G

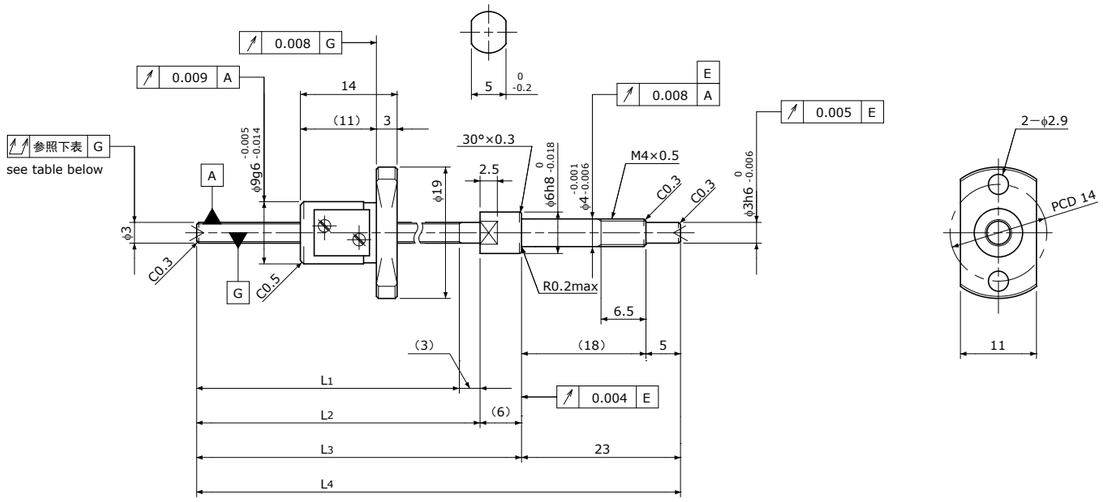
D-type : Other than the above. 上述以外的形状

Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	L4	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 Vu	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SG0300.5-038R070C3	25	C3	38	41	47	70	±0.008	0.008	0.025	～0.005	—	150	220

Note)Please refer to page A206 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A206页。

SG0301 | Shaft dia.(轴径)φ3 Lead(导程)1mm | C3

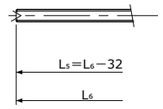


Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ0.6
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ2.4
Number of circuit 循环数	3.7×1
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Supported-side end-journal profile 支撑侧轴端加工形状

A-type



L5:Thread length after end-journal machining. 追加加工后的螺纹部长度
L6:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side 支撑侧	:	—
	Fixed-side 固定侧	:	MSU-4C/4G

D-type : Other than the above. 上述以外的形状

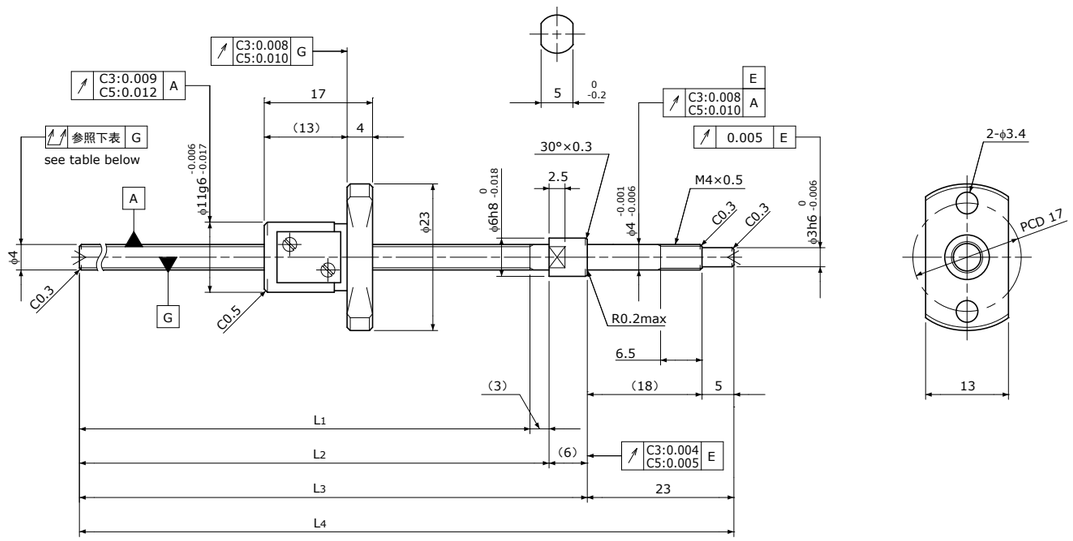
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	L4	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 Vu	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SG0301-038R070C3	20	C3	38	41	47	70	±0.008	0.008	0.025	～0.005	—	330	440

Note)Please refer to page A206 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A206页。

Standard products in stock SG series 标准库存品 SG系列

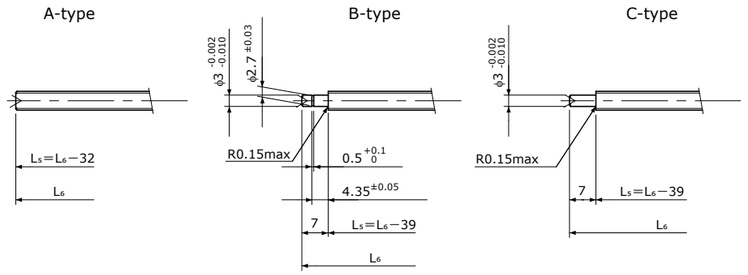
SG0401 | Shaft dia.(轴径)φ4 Lead(导程)1mm | C3&C5



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ0.8
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ3.3
Number of circuit 循环数	3.7×1
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Supported-side end-journal profile 支撑侧轴端加工形状



Ls:Thread length after end-journal machining. 追加加工后的螺纹部长度
L6:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side 支撑侧	:	MSU-4CS/4GS
	Fixed-side 固定侧	:	MSU-4C/4G

D-type : Other than the above. 上述以外的形状

Unit(单位):mm

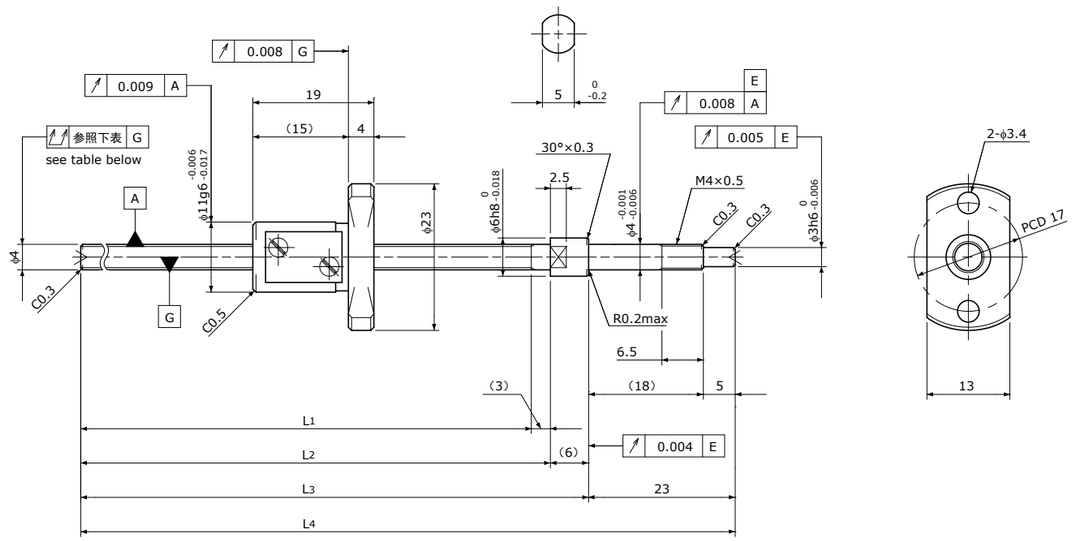
Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	L4	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 Vu	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SG0401-063R095C3	45	C3	63	66	72	95	±0.008	0.008	0.025	0 Spacer Ball 间隔钢珠 (1:1)	～0.004	350	400
SG0401-083R115C3	65	C3	83	86	92	115	±0.008	0.008	0.025				
SG0401-103R135C3	85	C3	103	106	112	135	±0.010	0.008	0.035				
SG0401-063R095C5	45	C5	63	66	72	95	±0.018	0.018	0.035	～0.005	—	560	790
SG0401-083R115C5	65	C5	83	86	92	115	±0.018	0.018	0.035				
SG0401-103R135C5	85	C5	103	106	112	135	±0.020	0.018	0.050				

Note)Please refer to page A206 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A206页。

Ball Screw 滚珠丝杠
Standard products in stock SG series 标准库存品 SG系列

Standard products in stock SG series 标准库存品 SG系列

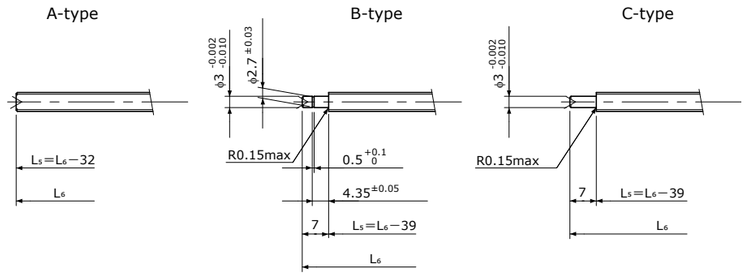
SG0402 | Shaft dia.(轴径)φ4 Lead(导程)2mm | C3



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ0.8
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ3.3
Number of circuit 循环数	2.7×1
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Supported-side end-journal profile 支撑侧轴端加工形状



Ls:Thread length after end-journal machining. 追加加工后的螺纹部长度
L6:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side 支撑侧	:	MSU-4CS/4GS
	Fixed-side 固定侧	:	MSU-4C/4G

D-type : Other than the above. 上述以外的形状

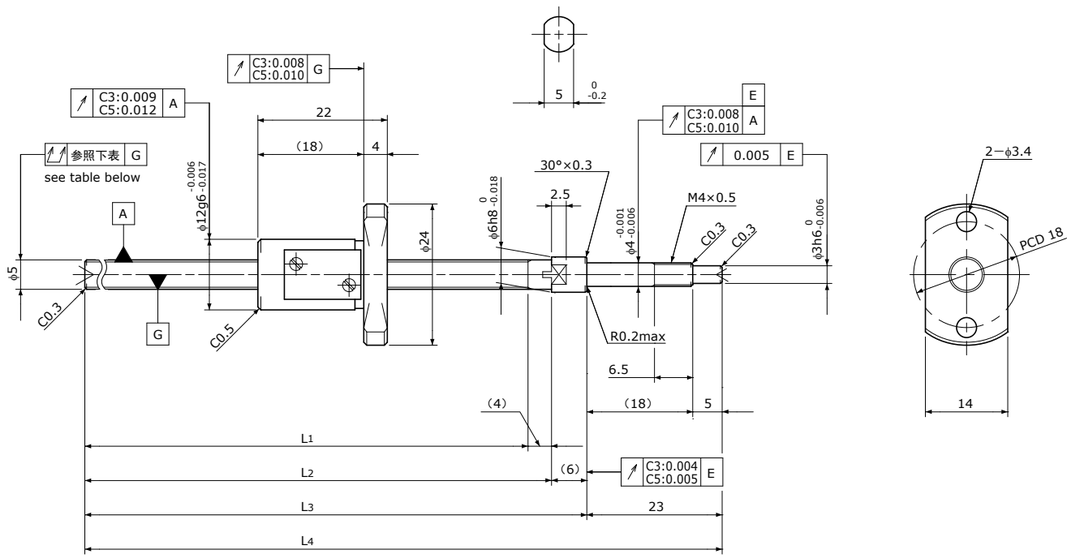
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	L4	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 Vu	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SG0402-103R135C3	80	C3	103	106	112	135	±0.010	0.008	0.035	～0.005	—	420	570

Note)Please refer to page A206 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A206页。

Standard products in stock SG series 标准库存品 SG系列

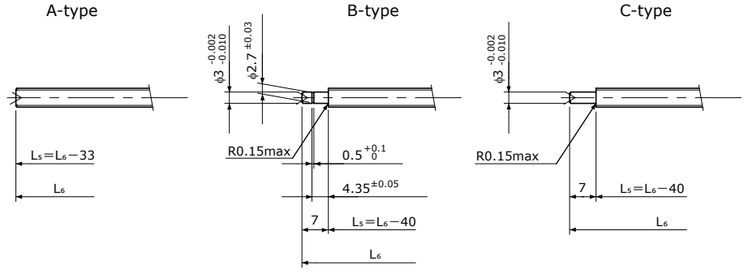
SG0504 | Shaft dia.(轴径)φ5 Lead(导程)4mm | C3&C5



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ0.8
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ4.3
Number of circuit 循环数	2.7×1
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Supported-side end-journal profile 支撑侧轴端加工形状



L5:Thread length after end-journal machining. 追加加工后的螺纹部长度
L6:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side 支撑侧	:	MSU-4CS/4GS
	Fixed-side 固定侧	:	MSU-4C/4G

D-type : Other than the above. 上述以外的形状

Unit(单位):mm

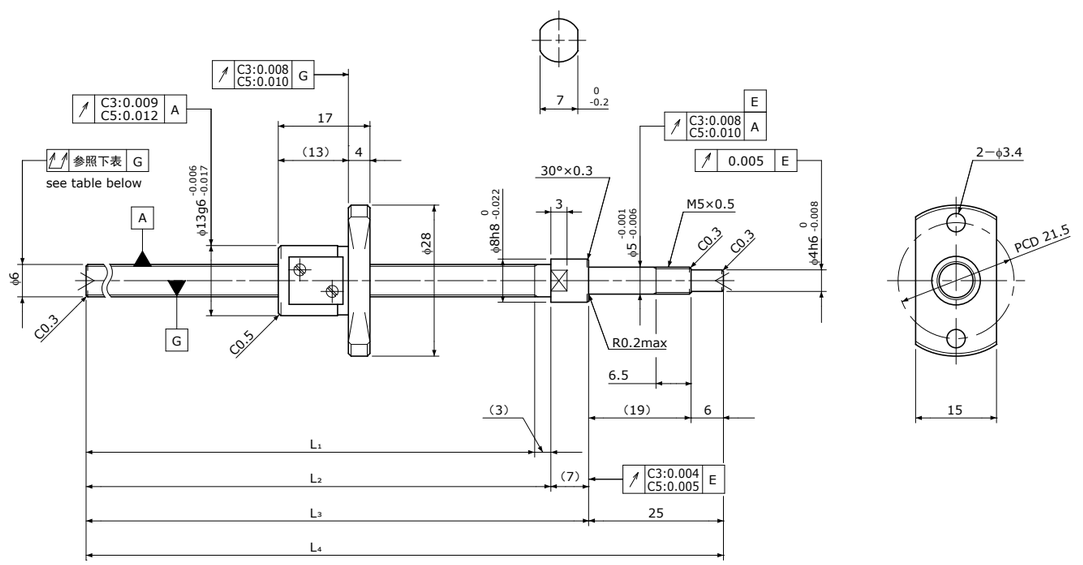
Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	L4	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 Vu	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SG0504-062R095C3	40	C3	62	66	72	95	±0.008	0.008	0.025	0 Spacer Ball 间隔钢珠 (1:1)	～0.005	300	360
SG0504-112R145C3	90	C3	112	116	122	145	±0.010	0.008	0.035				
SG0504-062R095C5	40	C5	62	66	72	95	±0.018	0.018	0.035	～0.005	—	470	720
SG0504-112R145C5	90	C5	112	116	122	145	±0.020	0.018	0.050				

Note)Please refer to page A206 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A206页。

Ball Screw 滚珠丝杠
Standard products in stock SG series 标准库存品 SG系列

Standard products in stock SG series 标准库存品 SG系列

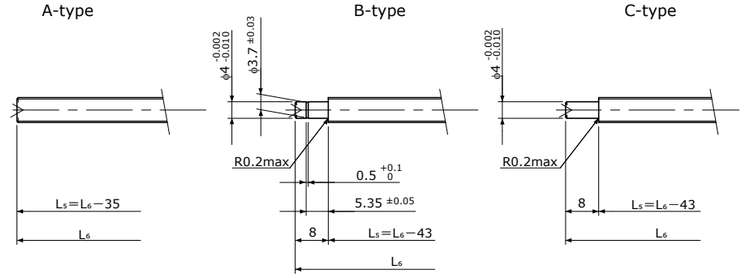
SG0601 | Shaft dia.(轴径)φ6 Lead(导程)1mm | C3&C5



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ0.8
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ5.3
Number of circuit 循环数	3.7×1
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Supported-side end-journal profile 支撑侧轴端加工形状



L5:Thread length after end-journal machining. 追加加工后的螺纹部长度
L6:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side 支撑侧	:	MSU-5CS/5GS
	Fixed-side 固定侧	:	MSU-5C/5G

D-type : Other than the above. 上述以外的形状

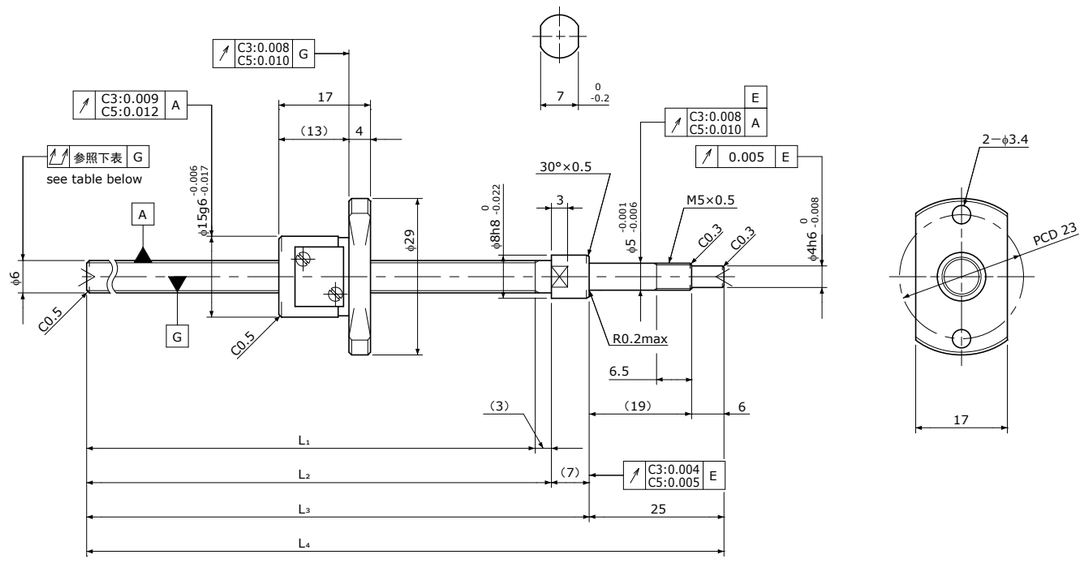
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	L4	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 Vu	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SG0601-085R120C3	65	C3	85	88	95	120	±0.008	0.008	0.025	0 Spacer Ball 间隔钢珠 (1:1)	～0.006	430	610
SG0601-110R145C3	90	C3	110	113	120	145	±0.010	0.008	0.035				
SG0601-135R170C3	115	C3	135	138	145	170	±0.010	0.008	0.035				
SG0601-085R120C5	65	C5	85	88	95	120	±0.018	0.018	0.035	～0.005	—	680	1200
SG0601-110R145C5	90	C5	110	113	120	145	±0.020	0.018	0.050				
SG0601-135R170C5	115	C5	135	138	145	170	±0.020	0.018	0.050				

Note)Please refer to page A206 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A206页。

Standard products in stock SG series 标准库存品 SG系列

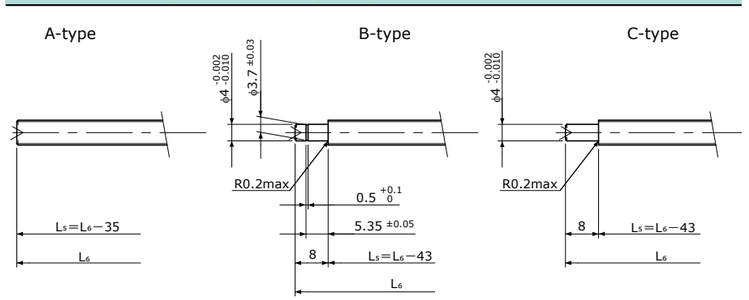
SG0602 | Shaft dia.(轴径)φ6 Lead(导程)2mm | C3&C5



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ1.0
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ5.1
Number of circuit 循环数	2.7×1
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Supported-side end-journal profile 支撑侧轴端加工形状



Ls:Thread length after end-journal machining. 追加加工后的螺纹部长度
L6:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side 支撑侧	:	MSU-5CS/5GS
	Fixed-side 固定侧	:	MSU-5C/5G

D-type : Other than the above. 上述以外的形状

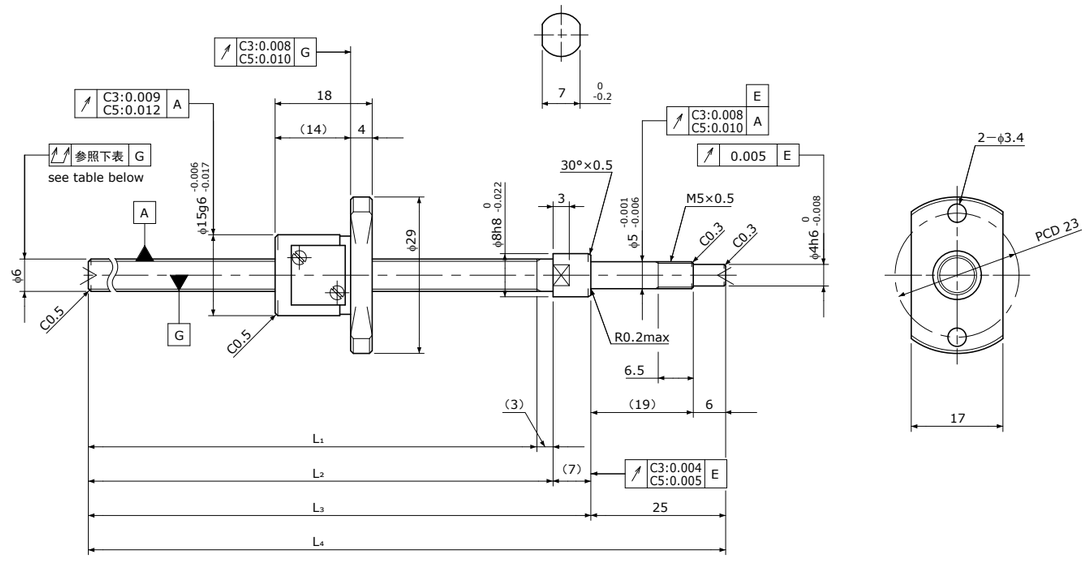
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	L4	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 Vu	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SG0602-085R120C3	65	C3	85	88	95	120	±0.008	0.008	0.025	0 Spacer Ball 间隔钢珠 (1:1)	0.003～0.007	470	590
SG0602-135R170C3	115	C3	135	138	145	170	±0.010	0.008	0.035				
SG0602-085R120C5	65	C5	85	88	95	120	±0.018	0.018	0.035	～0.005	—	750	1200
SG0602-135R170C5	115	C5	135	138	145	170	±0.020	0.018	0.050				

Note)Please refer to page A206 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A206页。

Standard products in stock SG series 标准库存品 SG系列

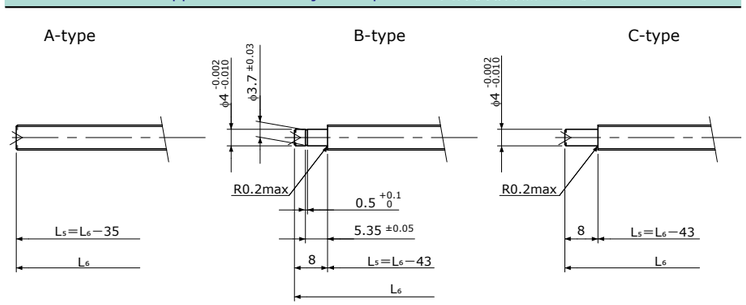
SG0602.5 | Shaft dia.(轴径)φ6 Lead(导程)2.5mm | C3&C5



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ1.0
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ5.1
Number of circuit 循环数	2.7×1
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Supported-side end-journal profile 支撑侧轴端加工形状



Ls:Thread length after end-journal machining. 追加加工后的螺纹部长度
L6:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side 支撑侧	:	MSU-5CS/5GS
	Fixed-side 固定侧	:	MSU-5C/5G

D-type : Other than the above. 上述以外的形状

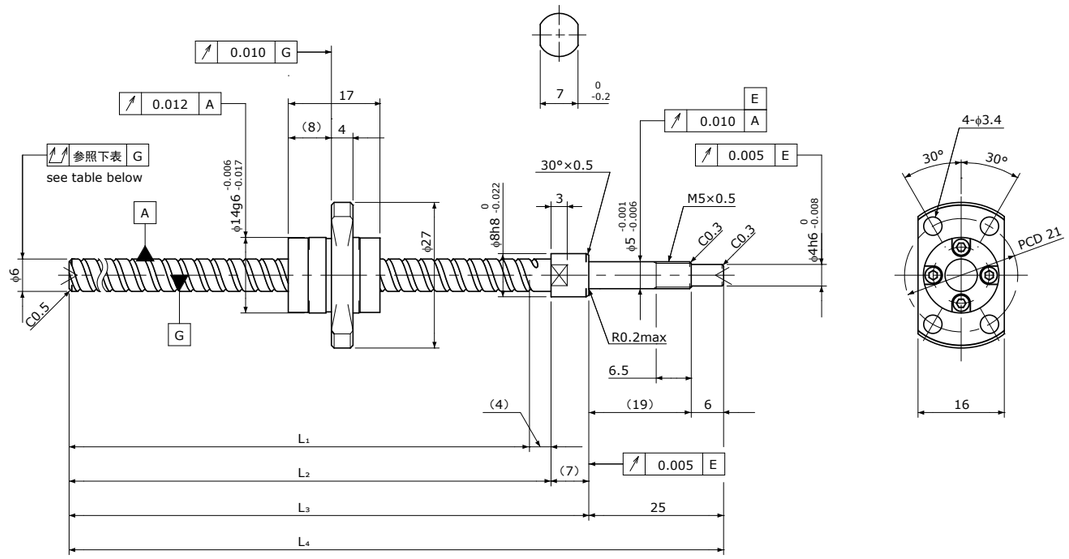
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	L4	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 Vu	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SG0602.5-085R120C3	65	C3	85	88	95	120	±0.008	0.008	0.025	0 Spacer Ball 间隔钢珠 (1:1)	0.003～0.007	470	590
SG0602.5-135R170C3	115	C3	135	138	145	170	±0.010	0.008	0.035				
SG0602.5-085R120C5	65	C5	85	88	95	120	±0.018	0.018	0.035	～0.005	—	750	1200
SG0602.5-135R170C5	115	C5	135	138	145	170	±0.020	0.018	0.050				

Note)Please refer to page A206 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A206页。

Standard products in stock SG series 标准库存品 SG系列

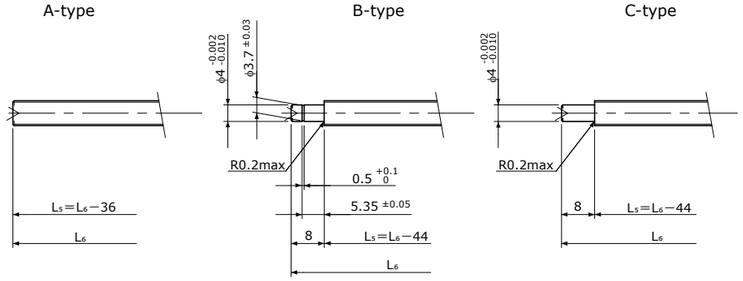
SG0606 | Shaft dia.(轴径)φ6 Lead(导程)6mm | C5



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ1.0
Number of thread 螺纹条数	2
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ5.2
Number of circuit 循环数	1.6×2
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Supported-side end-journal profile 支撑侧轴端加工形状



L5:Thread length after end-journal machining. 追加加工后的螺纹部长度
L6:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side 支撑侧 :	MSU-5CS/5GS
	Fixed-side 固定侧 :	MSU-5C/5G

D-type : Other than the above. 上述以外的形状

Unit(单位):mm

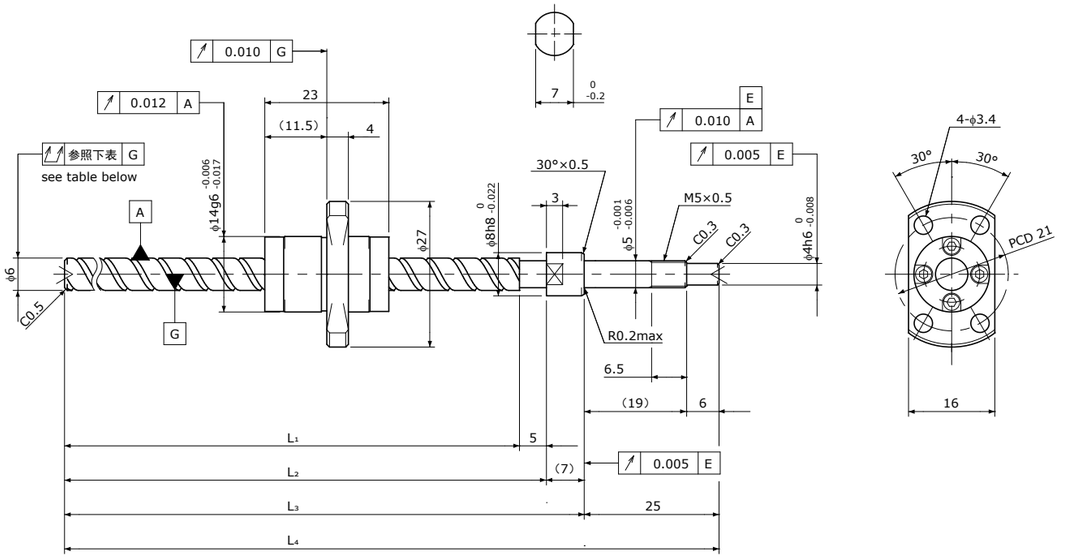
Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	L4	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 Vu	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SG0606-084R120C5	65	C5	84	88	95	120	±0.018	0.018	0.035	～0.005	—	870	1450
SG0606-134R170C5	115	C5	134	138	145	170	±0.020	0.018	0.050				

Note)Please refer to page A206 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A206页。

Ball Screw 滚珠丝杠
Standard products in stock SG series 标准库存品 SG系列

Standard products in stock SG series 标准库存品 SG系列

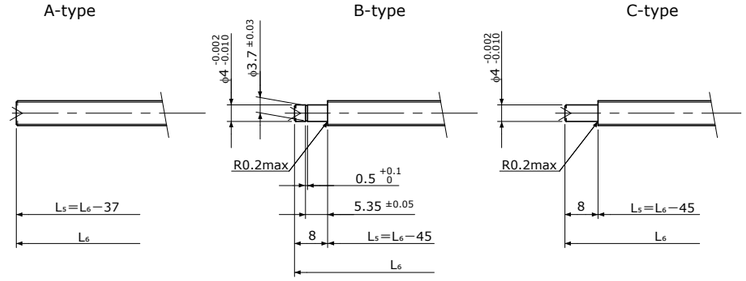
SG0610 | Shaft dia.(轴径)φ6 Lead(导程)10mm | C5



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ1.2
Number of thread 螺纹条数	2
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ5.0
Number of circuit 循环数	1.2×2
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Supported-side end-journal profile 支撑侧轴端加工形状



L5:Thread length after end-journal machining. 追加加工后的螺纹部长度
L6:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side 支撑侧 :	MSU-5CS/5GS
	Fixed-side 固定侧 :	MSU-5C/5G

D-type : Other than the above. 上述以外的形状

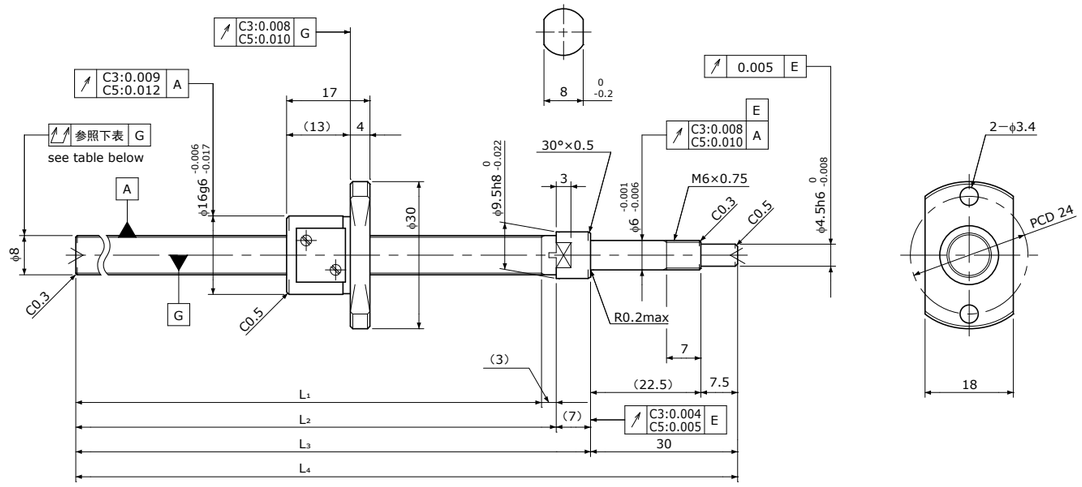
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	L4	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 Vu	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SG0610-133R170C5	110	C5	133	138	145	170	±0.020	0.018	0.050	～0.005	—	950	1600

Note)Please refer to page A206 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A206页。

Standard products in stock SG series 标准库存品 SG系列

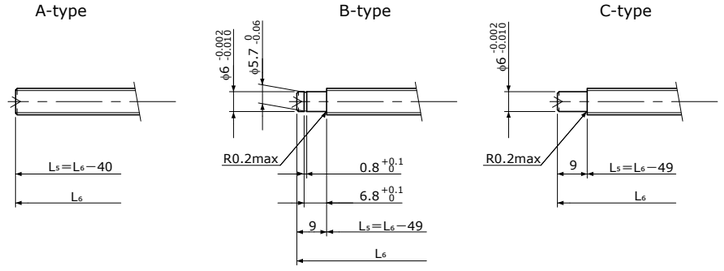
SG0801 | Shaft dia.(轴径)φ8 Lead(导程)1mm | C3&C5



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ0.8
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ7.3
Number of circuit 循环数	3.7×1
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Supported-side end-journal profile 支撑侧轴端加工形状



Ls:Thread length after end-journal machining. 追加加工后的螺纹部长度
L6:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side 支撑侧	:	MSU-6CS/6GS
	Fixed-side 固定侧	:	MSU-6C/6G

D-type : Other than the above. 上述以外的形状

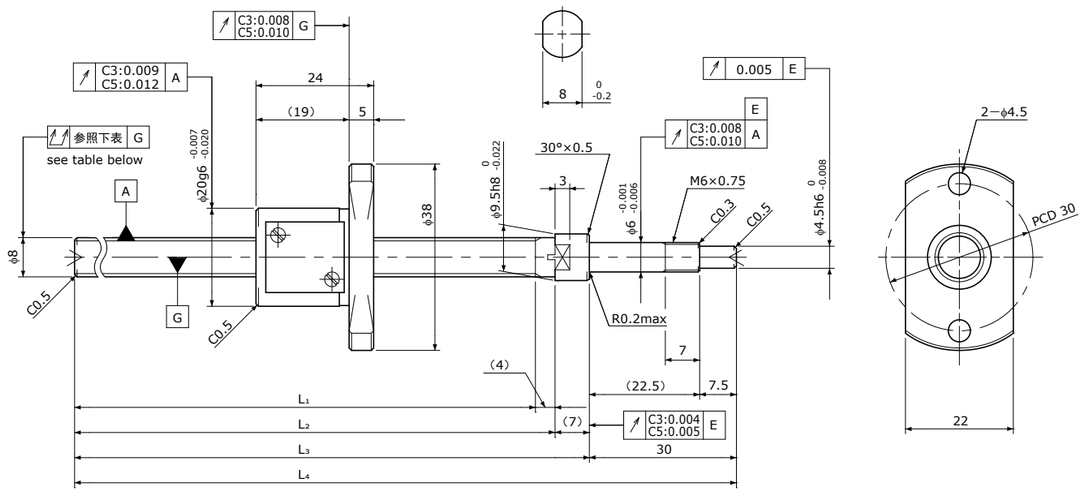
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	L4	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 Vu	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SG0801-100R140C3	80	C3	100	103	110	140	±0.008	0.008	0.035	0 Spacer Ball 间隔钢珠 (1:1)	0.002～0.008	490	820
SG0801-130R170C3	110	C3	130	133	140	170	±0.010	0.008	0.035				
SG0801-160R200C3	140	C3	160	163	170	200	±0.010	0.008	0.035				
SG0801-210R250C3	190	C3	210	213	220	250	±0.012	0.008	0.050				
SG0801-100R140C5	80	C5	100	103	110	140	±0.018	0.018	0.050	～0.005	—	780	1650
SG0801-130R170C5	110	C5	130	133	140	170	±0.020	0.018	0.050				
SG0801-160R200C5	140	C5	160	163	170	200	±0.020	0.018	0.050				
SG0801-210R250C5	190	C5	210	213	220	250	±0.023	0.018	0.065				

Note)Please refer to page A206 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A206页。

Standard products in stock SG series 标准库存品 SG系列

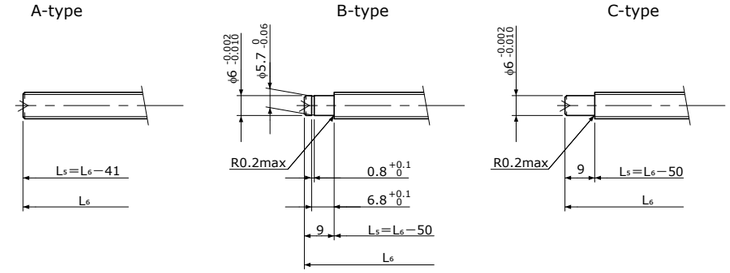
SG0802 | Shaft dia.(轴径)φ8 Lead(导程)2mm | C3&C5



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ1.5875
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ6.6
Number of circuit 循环数	3.7×1
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Supported-side end-journal profile 支撑侧轴端加工形状



Ls:Thread length after end-journal machining. 追加加工后的螺纹部长度
L6:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side 支撑侧	:	MSU-6CS/6GS
	Fixed-side 固定侧	:	MSU-6C/6G

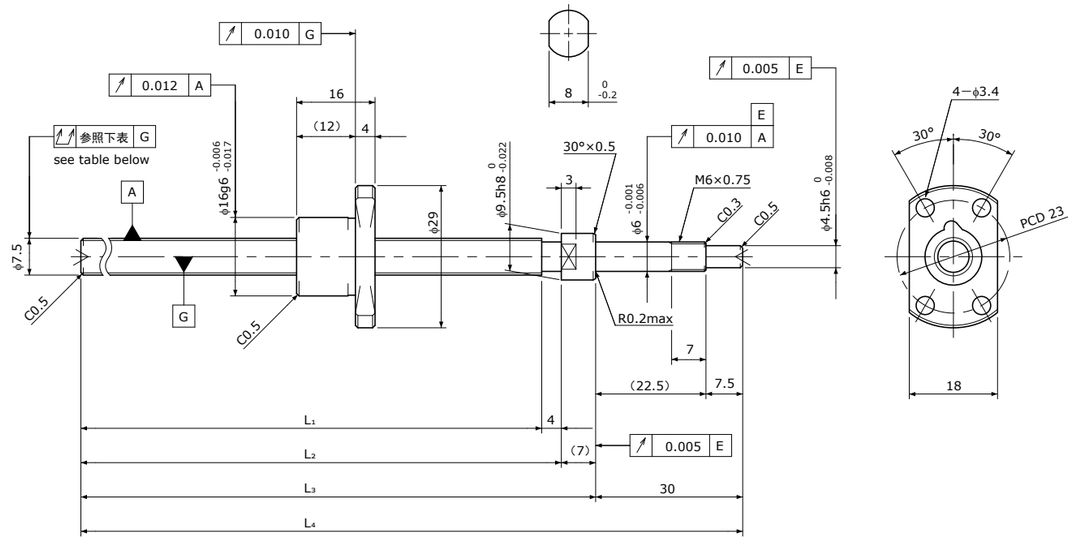
D-type : Other than the above. 上述以外的形状

Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	L4	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 Vu	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SG0802-099R140C3	75	C3	99	103	110	140	±0.008	0.008	0.035	0 Spacer Ball 间隔钢珠 (1:1)	0.004～0.020	1550	2100
SG0802-129R170C3	105	C3	129	133	140	170	±0.010	0.008	0.035				
SG0802-159R200C3	135	C3	159	163	170	200	±0.010	0.008	0.035				
SG0802-209R250C3	185	C3	209	213	220	250	±0.012	0.008	0.050				
SG0802-099R140C5	75	C5	99	103	110	140	±0.018	0.018	0.050	～0.005	—	2400	4100
SG0802-129R170C5	105	C5	129	133	140	170	±0.020	0.018	0.050				
SG0802-159R200C5	135	C5	159	163	170	200	±0.020	0.018	0.050				
SG0802-209R250C5	185	C5	209	213	220	250	±0.023	0.018	0.065				

Note)Please refer to page A206 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A206页。

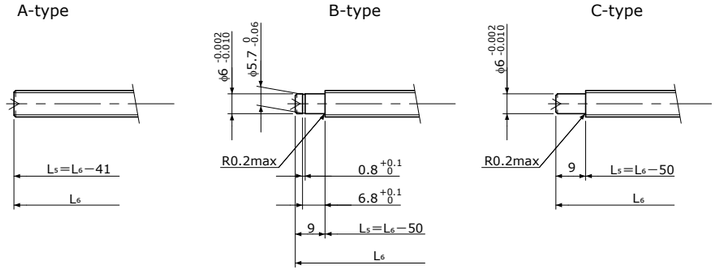
SG0802.5 | Shaft dia.(轴径)φ8 Lead(导程)2.5mm | C5



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ1.5875
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ6.3
Number of circuit 循环数	2.7×1
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Supported-side end-journal profile 支撑侧轴端加工形状



Ls:Thread length after end-journal machining. 追加加工后的螺纹部长度
L6:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side	支撑侧 :	MSU-6CS/6GS
	Fixed-side	固定侧 :	MSU-6C/6G

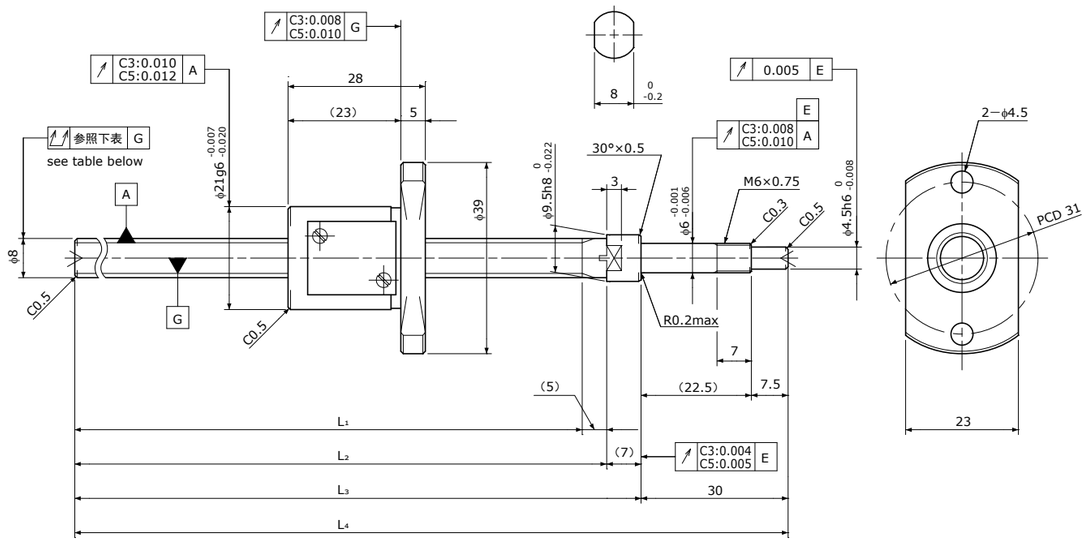
D-type : Other than the above. 上述以外的形状

Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	L4	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 Vu	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SG0802.5-129R170C5	110	C5	129	133	140	170	±0.020	0.018	0.050	～0.005	—	1850	3000
SG0802.5-209R250C5	190	C5	209	213	220	250	±0.023	0.018	0.065				

Note)Please refer to page A206 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A206页。

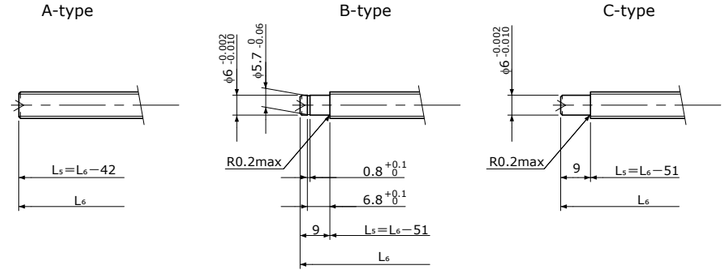
SG0804 | Shaft dia.(轴径)φ8 Lead(导程)4mm | C3&C5



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ2.0
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ6.2
Number of circuit 循环数	2.7×1
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Supported-side end-journal profile 支撑侧轴端加工形状



Ls:Thread length after end-journal machining. 追加加工后的螺纹部长度
L6:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side	支撑侧 :	MSU-6CS/6GS
	Fixed-side	固定侧 :	MSU-6C/6G

D-type : Other than the above. 上述以外的形状

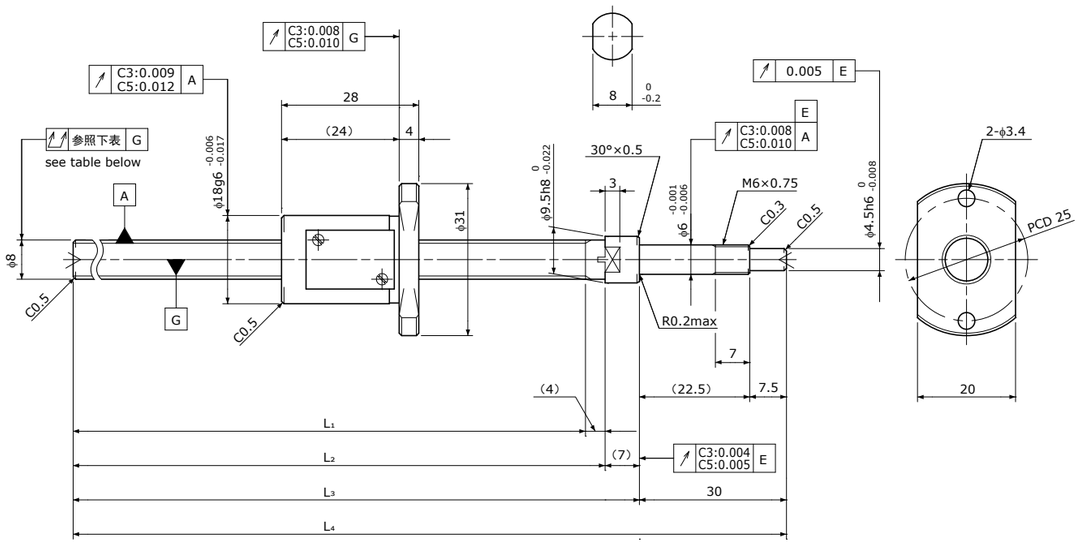
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	L4	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 Vu	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SG0804-098R140C3	70	C3	98	103	110	140	±0.008	0.008	0.035	0 Spacer Ball 间隔钢珠 (1:1)	～0.015	1650	2100
SG0804-208R250C3	180	C3	208	213	220	250	±0.012	0.008	0.050				
SG0804-098R140C5	70	C5	98	103	110	140	±0.018	0.018	0.050	～0.005	—	2600	4200
SG0804-208R250C5	180	C5	208	213	220	250	±0.023	0.018	0.065				

Note)Please refer to page A206 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A206页。

Standard products in stock SG series 标准库存品 SG系列

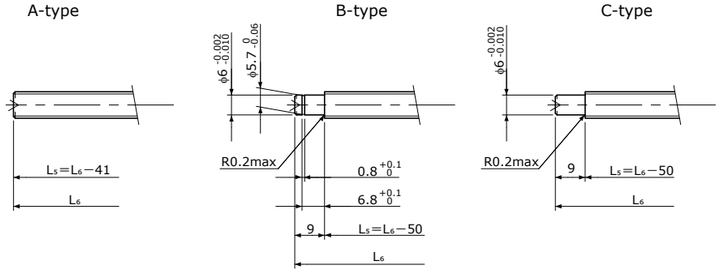
SG0805 | Shaft dia.(轴径)φ8 Lead(导程)5mm | C3&C5



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ1.5875
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ6.6
Number of circuit 循环数	2.7×1
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Supported-side end-journal profile 支撑侧轴端加工形状



Ls:Thread length after end-journal machining. 追加加工后的螺纹部长度
L6:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side	支撑侧 :	MSU-6CS/6GS
	Fixed-side	固定侧 :	MSU-6C/6G

D-type : Other than the above. 上述以外的形状

Unit(单位):mm

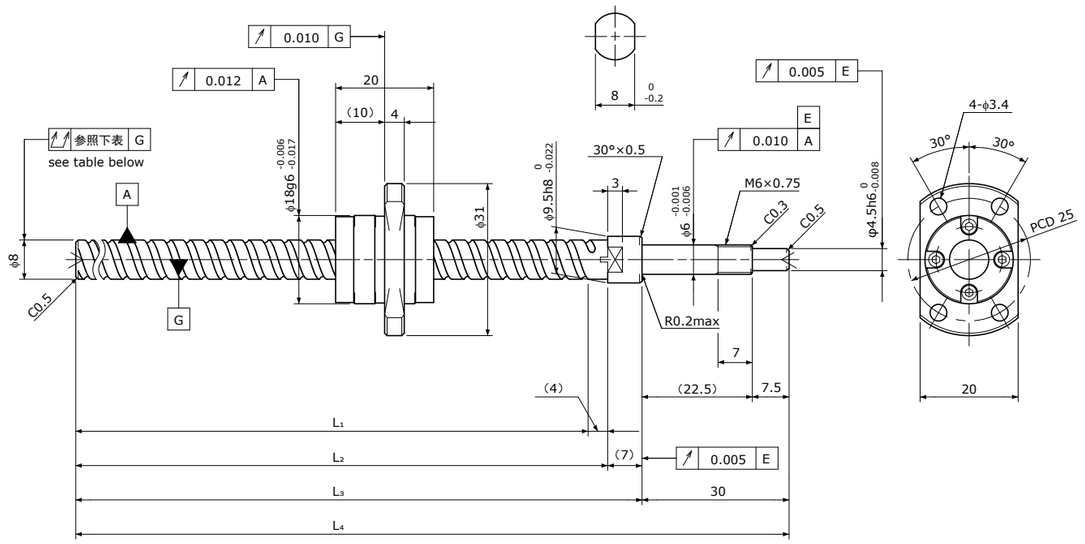
Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	L4	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 Vu	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SG0805-099R140C3	70	C3	99	103	110	140	±0.008	0.008	0.035	0 Spacer Ball 间隔钢珠 (1:1)	～0.015	1150	1500
SG0805-209R250C3	180	C3	209	213	220	250	±0.012	0.008	0.050				
SG0805-099R140C5	70	C5	99	103	110	140	±0.018	0.018	0.050	～0.005	—	1850	3000
SG0805-209R250C5	180	C5	209	213	220	250	±0.023	0.018	0.065				

Note)Please refer to page A206 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A206页。

Ball Screw 滚珠丝杠
Standard products in stock SG series 标准库存品 SG系列

Standard products in stock SG series 标准库存品 SG系列

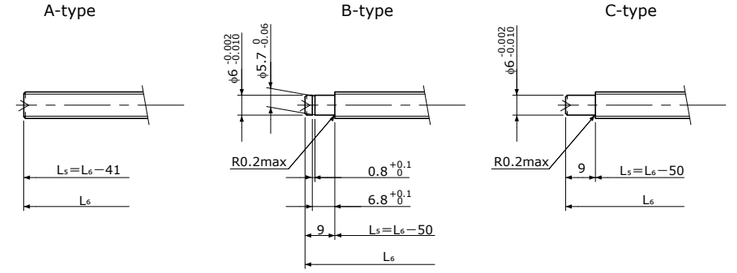
SG0808 | Shaft dia.(轴径)φ8 Lead(导程)8mm | C5



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ1.5875
Number of thread 螺纹条数	2
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ6.7
Number of circuit 循环数	1.6×2
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Supported-side end-journal profile 支撑侧轴端加工形状



Ls:Thread length after end-journal machining. 追加加工后的螺纹部长度
L6:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side	支撑侧 :	MSU-6CS/6GS
	Fixed-side	固定侧 :	MSU-6C/6G

D-type : Other than the above. 上述以外的形状

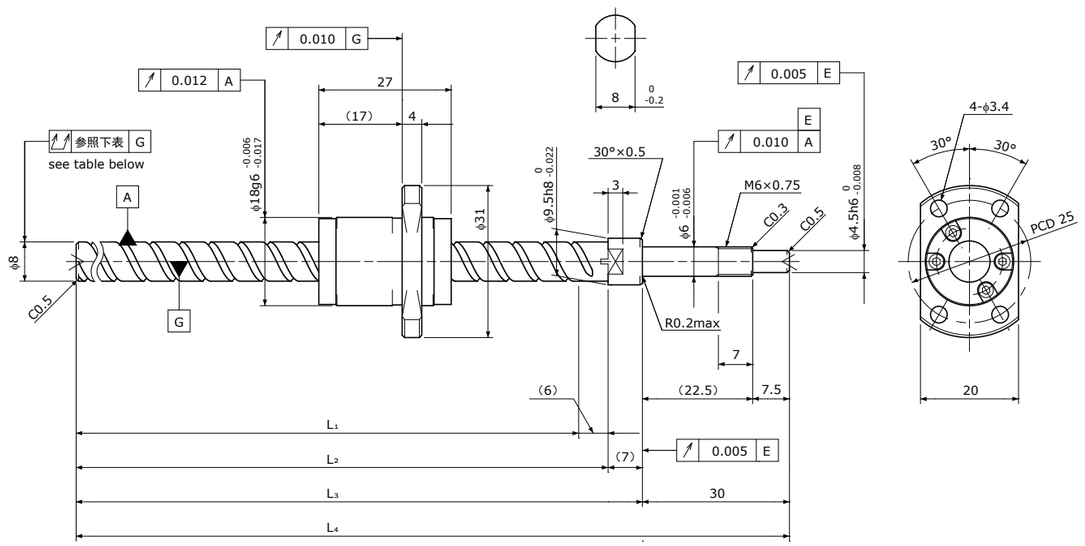
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	L4	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 Vu	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SG0808-099R140C5	75	C5	99	103	110	140	±0.018	0.018	0.050	～0.005	—	2200	3800
SG0808-209R250C5	185	C5	209	213	220	250	±0.023	0.018	0.065				

Note)Please refer to page A206 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A206页。

Standard products in stock SG series 标准库存品 SG系列

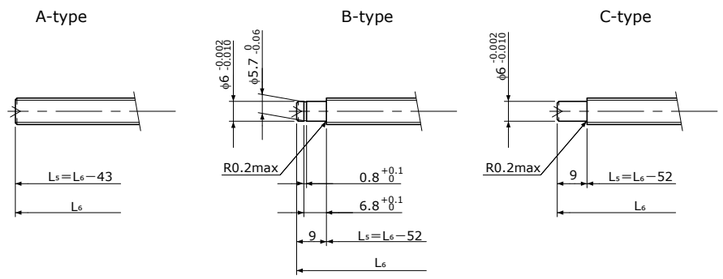
SG0812 | Shaft dia.(轴径)φ8 Lead(导程)12mm | C5



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ1.5875
Number of thread 螺纹条数	2
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ6.7
Number of circuit 循环数	1.6×2
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Supported-side end-journal profile 支撑侧轴端加工形状



L5:Thread length after end-journal machining. 追加加工后的螺纹部长度
L6:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side	支撑侧 :	MSU-6CS/6GS
	Fixed-side	固定侧 :	MSU-6C/6G

D-type : Other than the above. 上述以外的形状

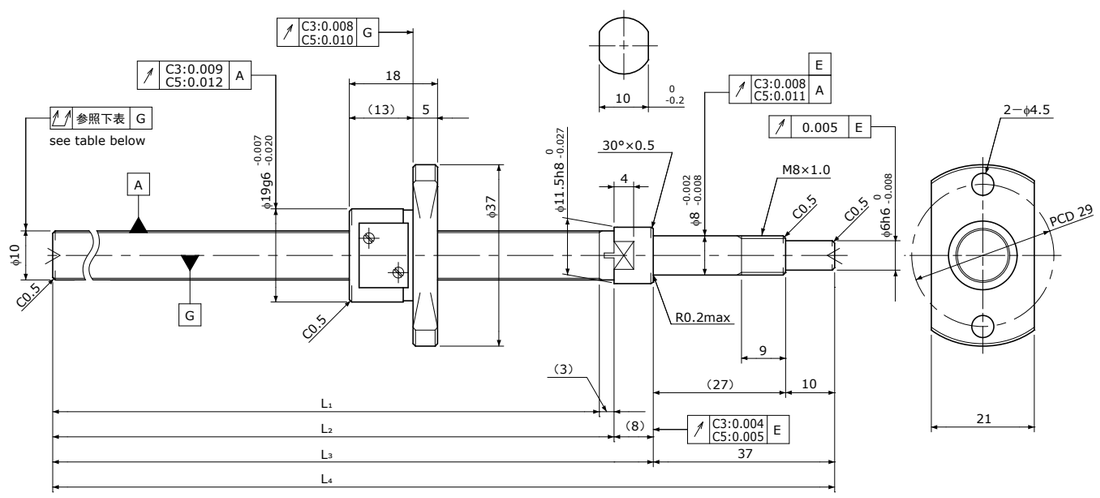
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	L4	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 Vu	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SG0812-097R140C5	70	C5	97	103	110	140	±0.018	0.018	0.050	～0.005	—	2200	4000
SG0812-207R250C5	180	C5	207	213	220	250	±0.023	0.018	0.065				

Note)Please refer to page A206 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A206页。

Standard products in stock SG series 标准库存品 SG系列

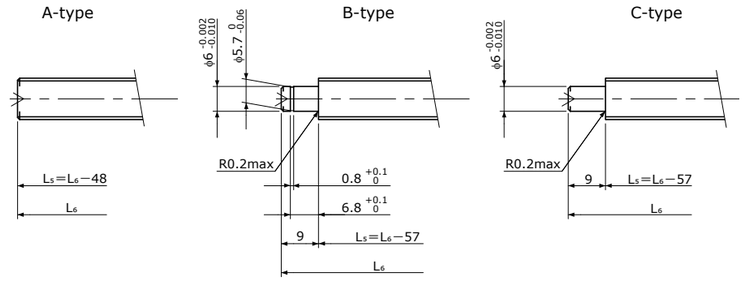
SG1001 | Shaft dia.(轴径)φ10 Lead(导程)1mm | C3&C5



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ0.8
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ9.3
Number of circuit 循环数	3.7×1
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Supported-side end-journal profile 支撑侧轴端加工形状



L5:Thread length after end-journal machining. 追加加工后的螺纹部长度
L6:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side	支撑侧 :	MSU-8CS/8GS
	Fixed-side	固定侧 :	MSU-8C/8G

D-type : Other than the above. 上述以外的形状

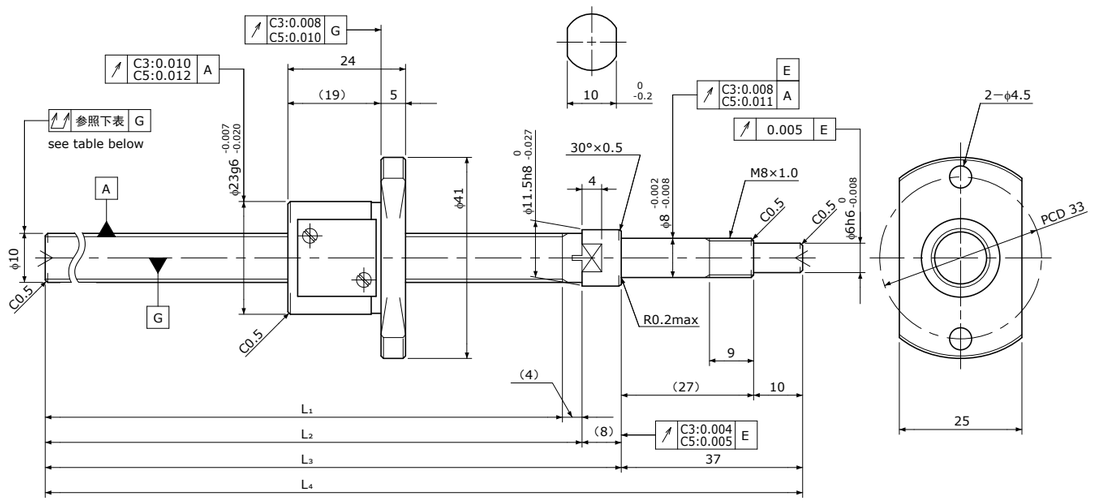
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	L4	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 Vu	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SG1001-112R160C3	90	C3	112	115	123	160	±0.010	0.008	0.035	0 Spacer Ball 间隔钢珠 (1:1)	～0.020	530	1000
SG1001-162R210C3	140	C3	162	165	173	210	±0.010	0.008	0.040				
SG1001-212R260C3	190	C3	212	215	223	260	±0.012	0.008	0.040				
SG1001-262R310C3	240	C3	262	265	273	310	±0.012	0.008	0.040				
SG1001-112R160C5	90	C5	112	115	123	160	±0.020	0.018	0.040	～0.005	—	840	2000
SG1001-162R210C5	140	C5	162	165	173	210	±0.020	0.018	0.055				
SG1001-212R260C5	190	C5	212	215	223	260	±0.023	0.018	0.055				
SG1001-262R310C5	240	C5	262	265	273	310	±0.023	0.018	0.055				

Note)Please refer to page A206 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A206页。

Standard products in stock SG series 标准库存品 SG系列

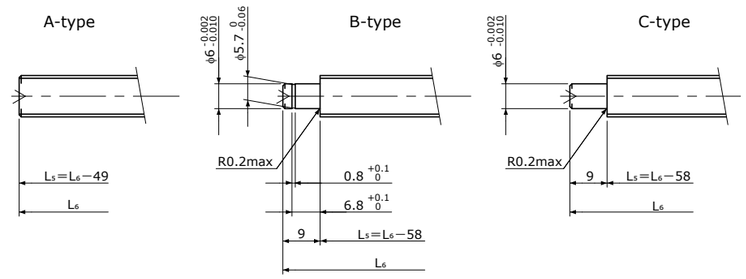
SG1002 | Shaft dia.(轴径)φ10 Lead(导程)2mm | C3&C5



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ1.5875
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ8.6
Number of circuit 循环数	3.7×1
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Supported-side end-journal profile 支撑侧轴端加工形状



Ls:Thread length after end-journal machining. 追加加工后的螺纹部长度
L6:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side	支撑侧 :	MSU-8CS/8GS
	Fixed-side	固定侧 :	MSU-8C/8G

D-type : Other than the above. 上述以外的形状

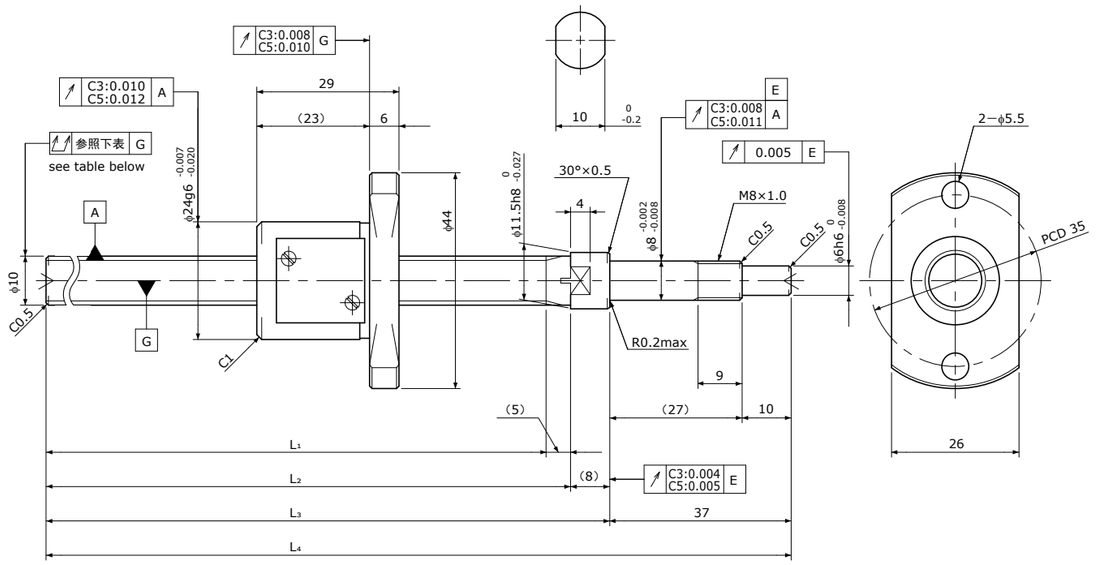
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	L4	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 Vu	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SG1002-111R160C3	85	C3	111	115	123	160	±0.010	0.008	0.035	0 Spacer Ball 间隔钢珠 (1:1)	0.006～0.030	1750	2700
SG1002-161R210C3	135	C3	161	165	173	210	±0.010	0.008	0.040				
SG1002-211R260C3	185	C3	211	215	223	260	±0.012	0.008	0.040				
SG1002-261R310C3	235	C3	261	265	273	310	±0.012	0.008	0.040				
SG1002-111R160C5	85	C5	111	115	123	160	±0.020	0.018	0.040	～0.005	—	2700	5300
SG1002-161R210C5	135	C5	161	165	173	210	±0.020	0.018	0.055				
SG1002-211R260C5	185	C5	211	215	223	260	±0.023	0.018	0.055				
SG1002-261R310C5	235	C5	261	265	273	310	±0.023	0.018	0.055				

Note)Please refer to page A206 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A206页。

Standard products in stock SG series 标准库存品 SG系列

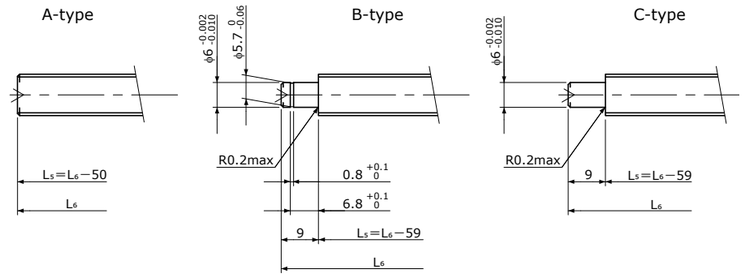
SG1004 | Shaft dia.(轴径)φ10 Lead(导程)4mm | C3&C5



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ2.0
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ8.2
Number of circuit 循环数	2.7×1
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Supported-side end-journal profile 支撑侧轴端加工形状



Ls:Thread length after end-journal machining. 追加加工后的螺纹部长度
L6:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side	支撑侧 :	MSU-8CS/8GS
	Fixed-side	固定侧 :	MSU-8C/8G

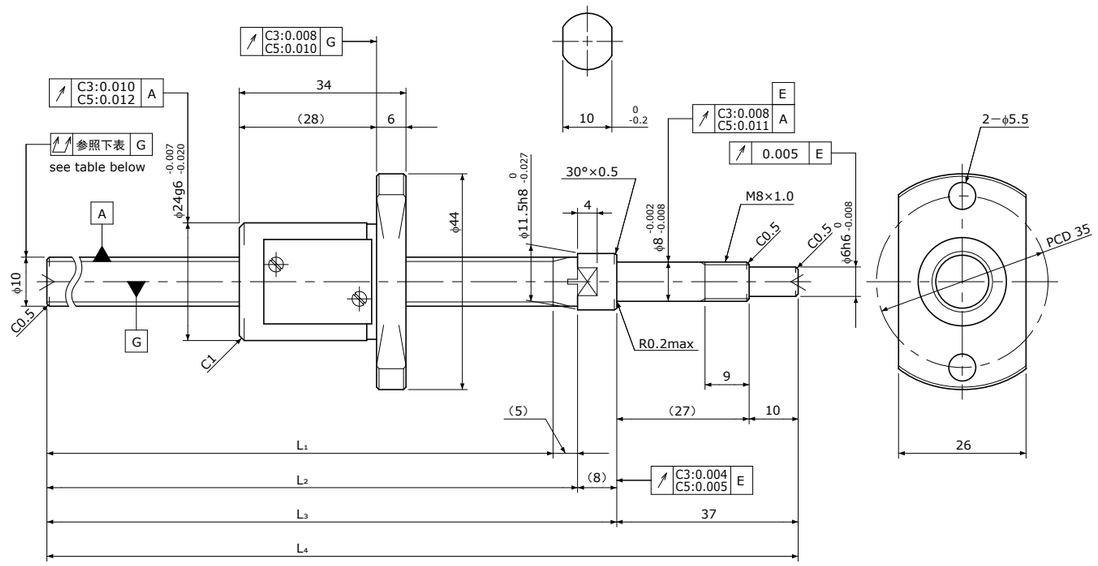
D-type : Other than the above. 上述以外的形状

Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	L4	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 Vu	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SG1004-110R160C3	80	C3	110	115	123	160	±0.010	0.008	0.035	0 Spacer Ball 间隔钢珠 (1:1)	0.005～0.040	1800	2600
SG1004-260R310C3	230	C3	260	265	273	310	±0.012	0.008	0.040				
SG1004-110R160C5	80	C5	110	115	123	160	±0.020	0.018	0.040	～0.005	—	3000	5200
SG1004-260R310C5	230	C5	260	265	273	310	±0.023	0.018	0.055				

Note)Please refer to page A206 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A206页。

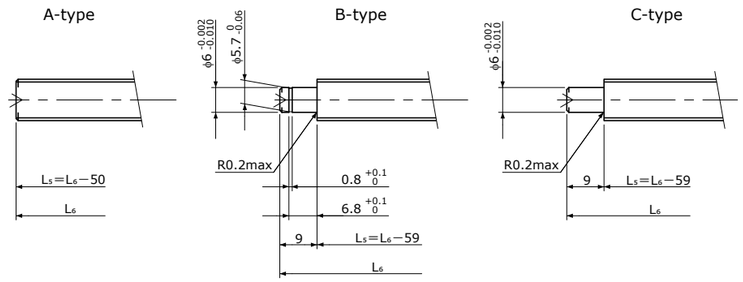
SG1005 | Shaft dia.(轴径)φ10 Lead(导程)5mm | C3&C5



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ2.0
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ8.2
Number of circuit 循环数	2.7×1
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Supported-side end-journal profile 支撑侧轴端加工形状



Ls:Thread length after end-journal machining. 追加加工后的螺纹部长度
L6:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side	支撑侧 :	MSU-8CS/8GS
	Fixed-side	固定侧 :	MSU-8C/8G

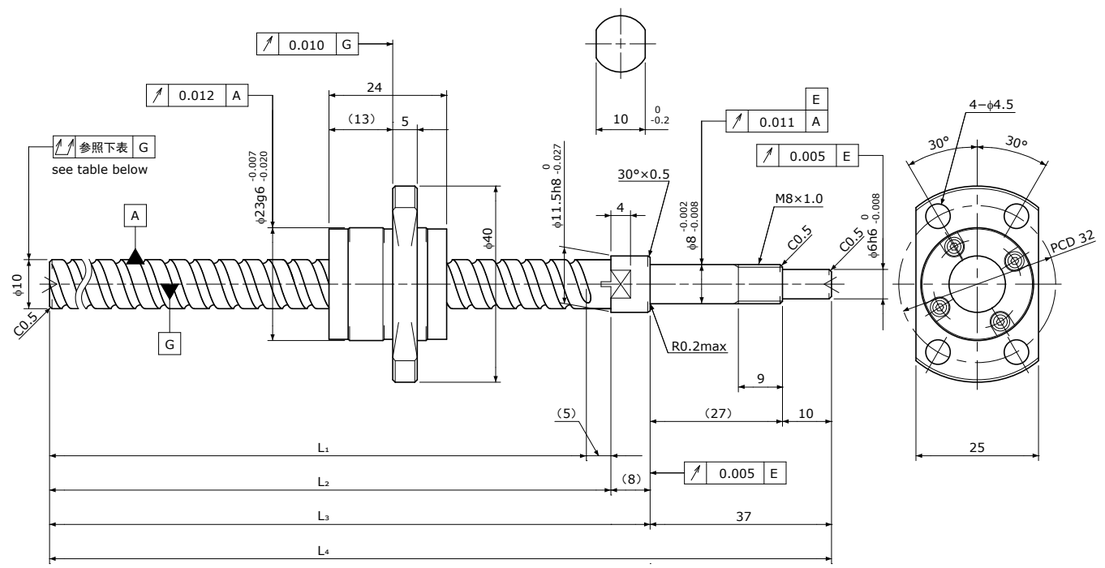
D-type : Other than the above. 上述以外的形状

Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	L4	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 Vu	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SG1005-110R160C3	75	C3	110	115	123	160	±0.010	0.008	0.035	0 Spacer Ball 间隔钢珠 (1:1)	0.005～0.040	1800	2600
SG1005-260R310C3	225	C3	260	265	273	310	±0.012	0.008	0.040				
SG1005-110R160C5	75	C5	110	115	123	160	±0.020	0.018	0.040	～0.005	—	3000	5200
SG1005-260R310C5	225	C5	260	265	273	310	±0.023	0.018	0.055				

Note)Please refer to page A206 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A206页。

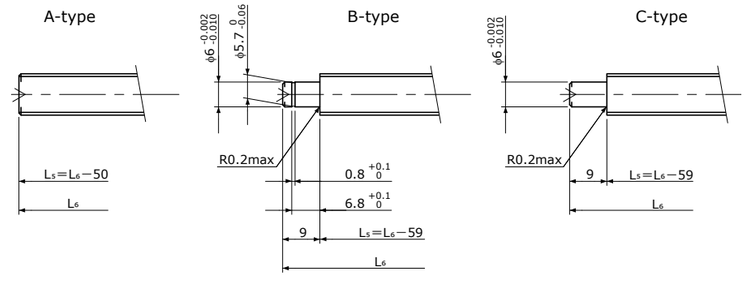
SG1010 | Shaft dia.(轴径)φ10 Lead(导程)10mm | C5



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ2.0
Number of thread 螺纹条数	2
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ8.4
Number of circuit 循环数	1.6×2
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Supported-side end-journal profile 支撑侧轴端加工形状



Ls:Thread length after end-journal machining. 追加加工后的螺纹部长度
L6:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side	支撑侧 :	MSU-8CS/8GS
	Fixed-side	固定侧 :	MSU-8C/8G

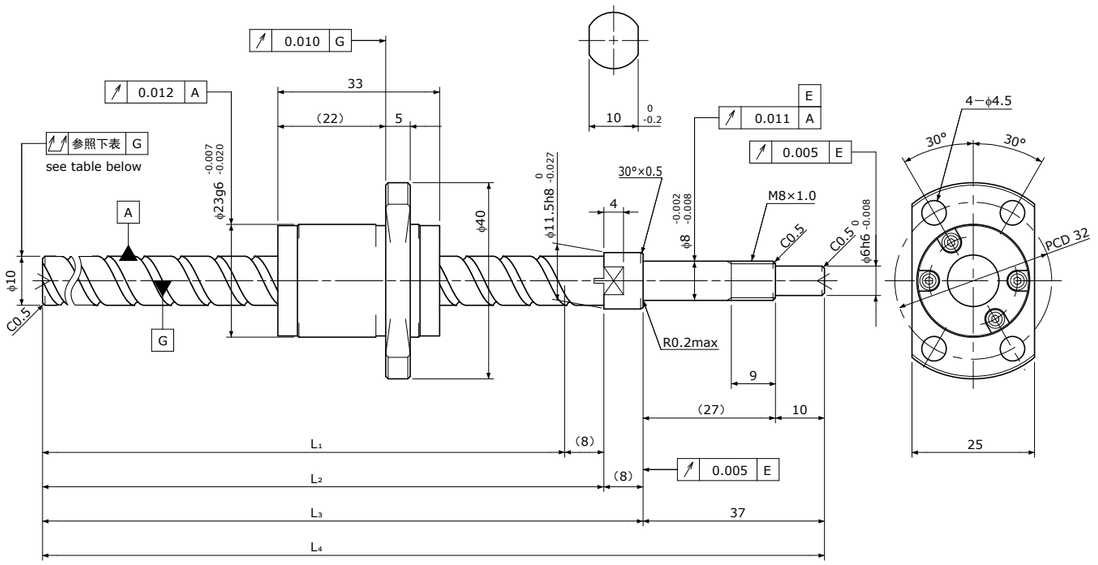
D-type : Other than the above. 上述以外的形状

Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	L4	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 Vu	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SG1010-110R160C5	85	C5	110	115	123	160	±0.020	0.018	0.040	～0.005	—	3300	5900
SG1010-260R310C5	235	C5	260	265	273	310	±0.023	0.018	0.055				

Note)Please refer to page A206 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A206页。

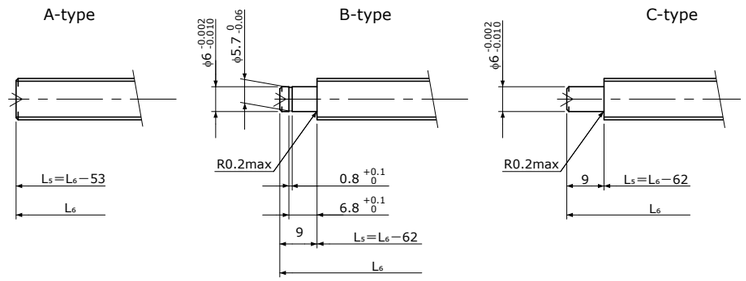
SG1015 | Shaft dia.(轴径)φ10 Lead(导程)15mm | C5



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ2.0
Number of thread 螺纹条数	2
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ8.4
Number of circuit 循环数	1.6×2
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Supported-side end-journal profile 支撑侧轴端加工形状



L5:Thread length after end-journal machining. 追加加工后的螺纹部长度
L6:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side	支撑侧 :	MSU-8CS/8GS
	Fixed-side	固定侧 :	MSU-8C/8G

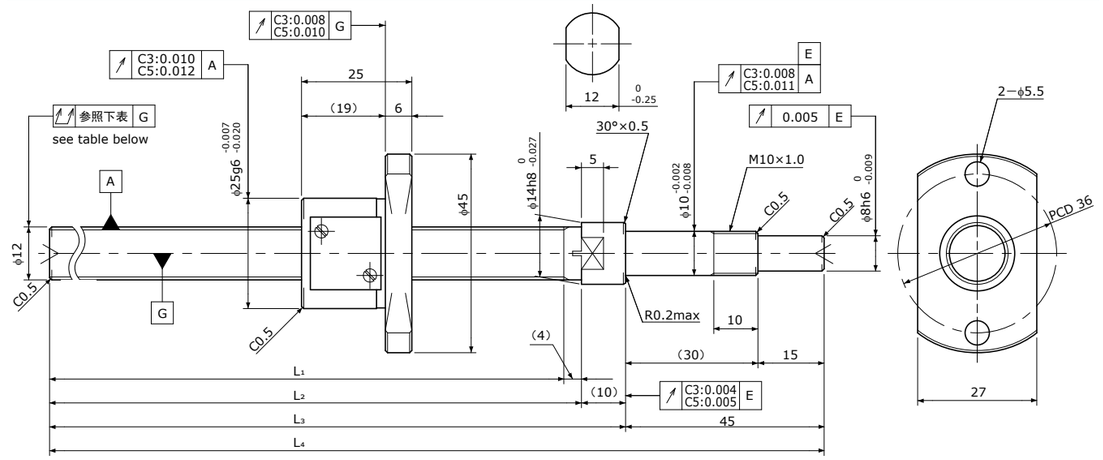
D-type : Other than the above. 上述以外的形状

Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	L4	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 Vu	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SG1015-107R160C5	70	C5	107	115	123	160	±0.020	0.018	0.040	～0.005	—	3300	6400
SG1015-257R310C5	220	C5	257	265	273	310	±0.023	0.018	0.055				

Note)Please refer to page A206 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A206页。

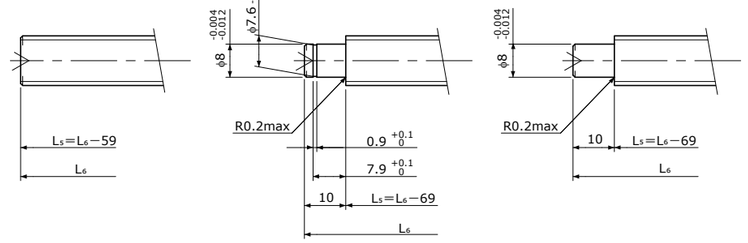
SG1202 | Shaft dia.(轴径)φ12 Lead(导程)2mm | C3&C5



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ1.5875
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ10.6
Number of circuit 循环数	3.7×1
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Supported-side end-journal profile 支撑侧轴端加工形状



L5:Thread length after end-journal machining. 追加加工后的螺纹部长度
L6:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side	支撑侧 :	—
	Fixed-side	固定侧 :	—

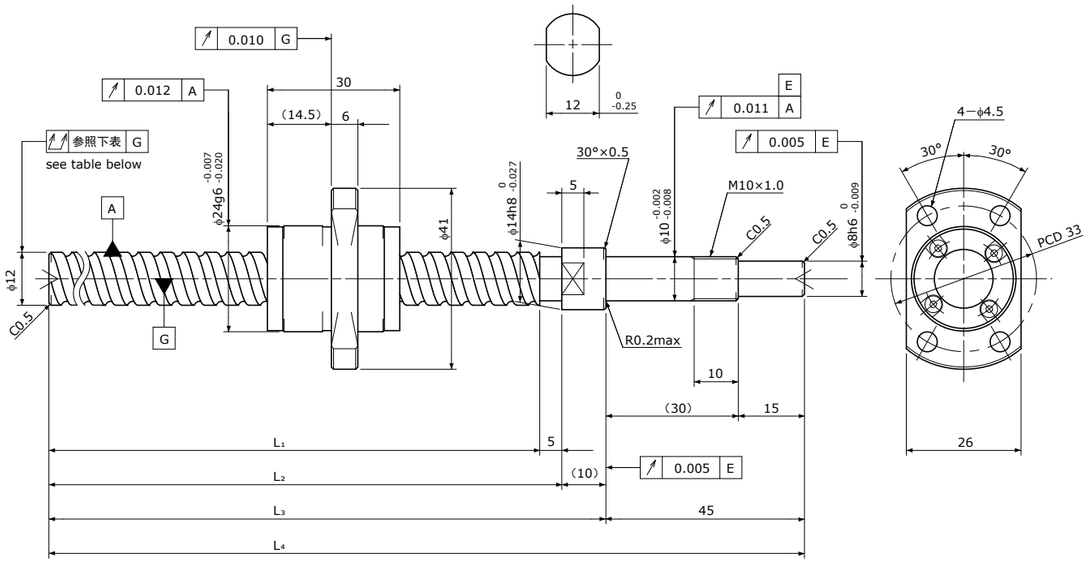
D-type : Other than the above. 上述以外的形状

Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	L4	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 Vu	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SG1202-141R200C3	115	C3	141	145	155	200	±0.010	0.008	0.035	0 Spacer Ball 间隔钢珠 (1:1)	0.008～0.040	1900	3200
SG1202-191R250C3	165	C3	191	195	205	250	±0.010	0.008	0.040				
SG1202-241R300C3	215	C3	241	245	255	300	±0.012	0.008	0.040				
SG1202-291R350C3	265	C3	291	295	305	350	±0.012	0.008	0.050				
SG1202-341R400C3	315	C3	341	345	355	400	±0.013	0.010	0.050				
SG1202-141R200C5	115	C5	141	145	155	200	±0.020	0.018	0.040	～0.005	—	3000	6400
SG1202-191R250C5	165	C5	191	195	205	250	±0.020	0.018	0.055				
SG1202-241R300C5	215	C5	241	245	255	300	±0.023	0.018	0.055				
SG1202-291R350C5	265	C5	291	295	305	350	±0.023	0.018	0.065				
SG1202-341R400C5	315	C5	341	345	355	400	±0.025	0.020	0.065				

Note)Please refer to page A206 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A206页。

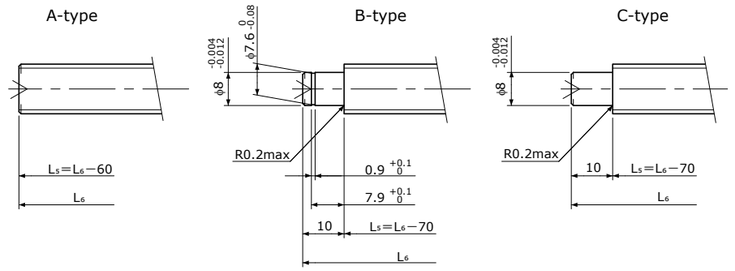
SG1210 | Shaft dia.(轴径)φ12 Lead(导程)10mm | C5



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ2.381
Number of thread 螺纹条数	2
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ10.2
Number of circuit 循环数	1.7×2
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Supported-side end-journal profile 支撑侧轴端加工形状



Ls:Thread length after end-journal machining. 追加加工后的螺纹部长度
L6:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件		
	Supported-side 支撑侧 :	—
	Fixed-side 固定侧 :	—

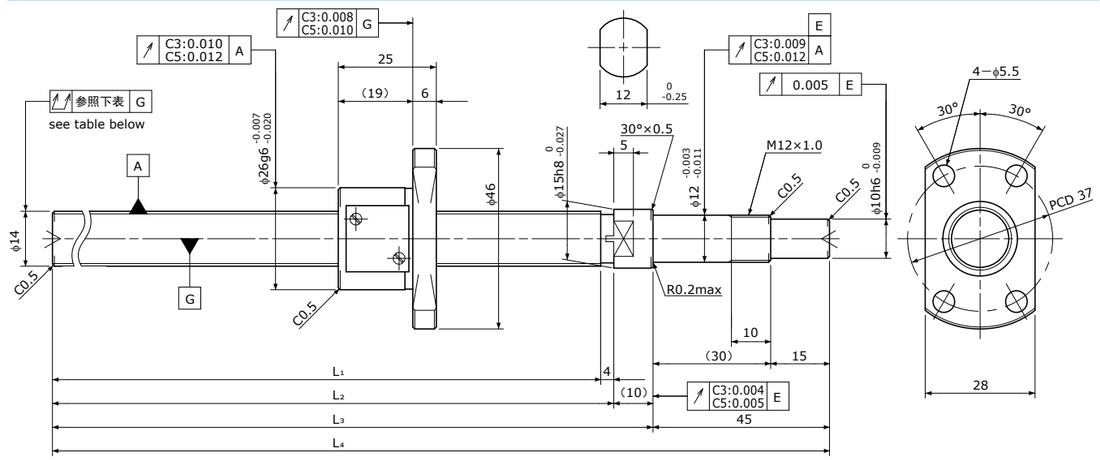
D-type : Other than the above. 上述以外的形状

Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	L4	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 Vu	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SG1210-240R300C5	210	C5	240	245	255	300	±0.023	0.018	0.055	～0.005	—	5100	9800
SG1210-340R400C5	310	C5	340	345	355	400	±0.025	0.020	0.065				

Note)Please refer to page A206 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A206页。

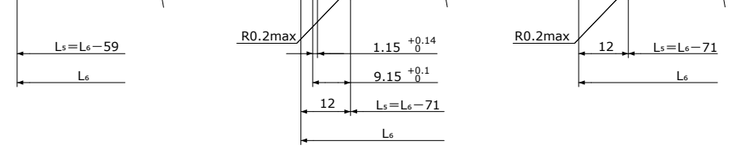
SG1402 | Shaft dia.(轴径)φ14 Lead(导程)2mm | C3&C5



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ1.5875
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ12.6
Number of circuit 循环数	3.7×1
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Supported-side end-journal profile 支撑侧轴端加工形状



Ls:Thread length after end-journal machining. 追加加工后的螺纹部长度
L6:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件		
	Supported-side 支撑侧 :	—
	Fixed-side 固定侧 :	—

D-type : Other than the above. 上述以外的形状

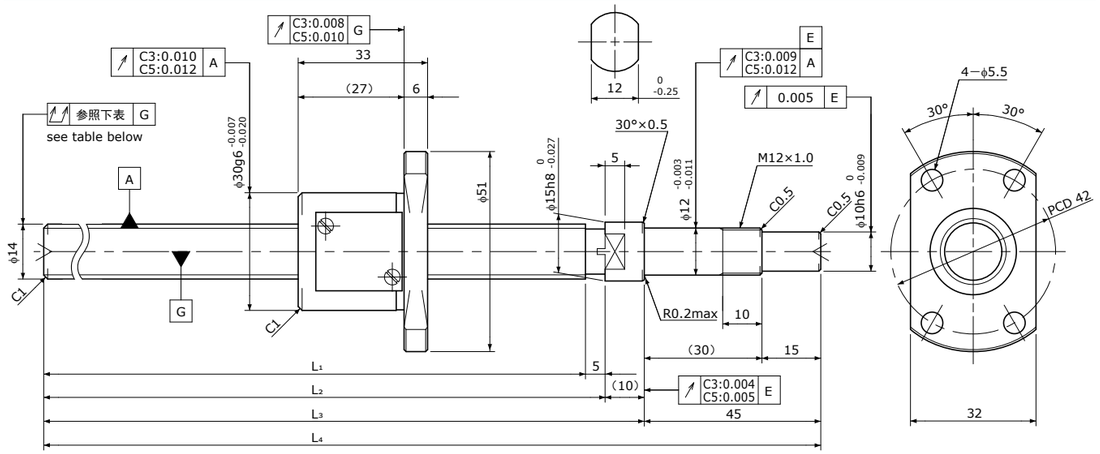
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	L4	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 Vu	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SG1402-141R200C3	115	C3	141	145	155	200	±0.010	0.008	0.025	0 Spacer Ball 间隔钢珠 (1:1)	0.010～0.050	2000	3800
SG1402-191R250C3	165	C3	191	195	205	250	±0.010	0.008	0.030				
SG1402-241R300C3	215	C3	241	245	255	300	±0.012	0.008	0.030				
SG1402-291R350C3	265	C3	291	295	305	350	±0.012	0.008	0.040				
SG1402-391R450C3	365	C3	391	395	405	450	±0.013	0.010	0.050				
SG1402-141R200C5	115	C5	141	145	155	200	±0.020	0.018	0.040	～0.005	—	3200	7500
SG1402-191R250C5	165	C5	191	195	205	250	±0.020	0.018	0.045				
SG1402-241R300C5	215	C5	241	245	255	300	±0.023	0.018	0.045				
SG1402-291R350C5	265	C5	291	295	305	350	±0.023	0.018	0.055				
SG1402-391R450C5	365	C5	391	395	405	450	±0.025	0.020	0.060				

Note)Please refer to page A206 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A206页。

Standard products in stock SG series 标准库存品 SG系列

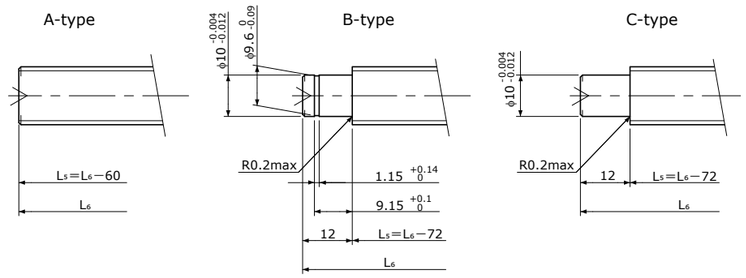
SG1404 | Shaft dia.(轴径)φ14 Lead(导程)4mm | C3&C5



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ2.381
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ11.8
Number of circuit 循环数	3.7×1
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Supported-side end-journal profile 支撑侧轴端加工形状



Ls:Thread length after end-journal machining. 追加加工后的螺纹部长度
L6:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side	支撑侧 :	—
	Fixed-side	固定侧 :	—

D-type : Other than the above. 上述以外的形状

Unit(单位):mm

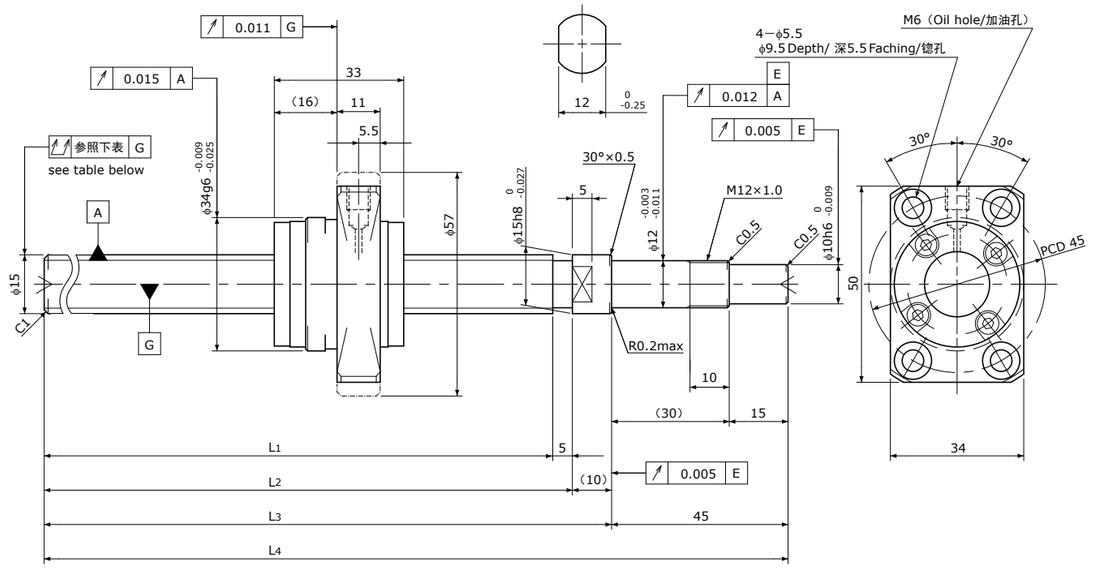
Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	L4	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 Vu	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SG1404-190R250C3	155	C3	190	195	205	250	±0.010	0.008	0.030	0 Spacer Ball 间隔钢珠 (1:1)	0.020～0.070	3600	5800
SG1404-240R300C3	205	C3	240	245	255	300	±0.012	0.008	0.030				
SG1404-290R350C3	255	C3	290	295	305	350	±0.012	0.008	0.040				
SG1404-390R450C3	355	C3	390	395	405	450	±0.013	0.010	0.050				
SG1404-490R550C3	455	C3	490	495	505	550	±0.015	0.010	0.055				
SG1404-190R250C5	155	C5	190	195	205	250	±0.020	0.018	0.045	～0.005	—	5700	11600
SG1404-240R300C5	205	C5	240	245	255	300	±0.023	0.018	0.045				
SG1404-290R350C5	255	C5	290	295	305	350	±0.023	0.018	0.055				
SG1404-390R450C5	355	C5	390	395	405	450	±0.025	0.020	0.060				
SG1404-490R550C5	455	C5	490	495	505	550	±0.027	0.020	0.075				

Note)Please refer to page A206 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A206页。

Ball Screw 滚珠丝杠
Standard products in stock SG series 标准库存品 SG系列

Standard products in stock SG series 标准库存品 SG系列

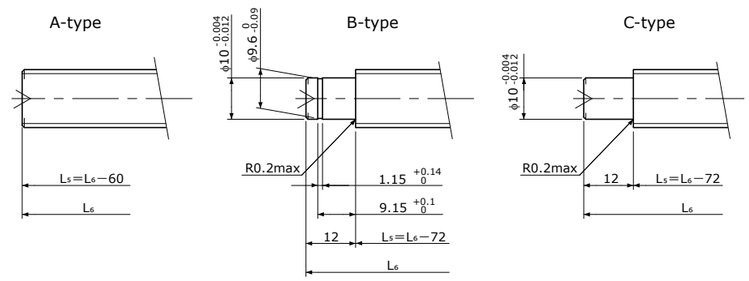
SG1505 | Shaft dia.(轴径)φ15 Lead(导程)5mm | C5



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ3.175
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ12.2
Number of circuit 循环数	3.7×1
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Supported-side end-journal profile 支撑侧轴端加工形状



Ls:Thread length after end-journal machining. 追加加工后的螺纹部长度
L6:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side	支撑侧 :	—
	Fixed-side	固定侧 :	—

D-type : Other than the above. 上述以外的形状

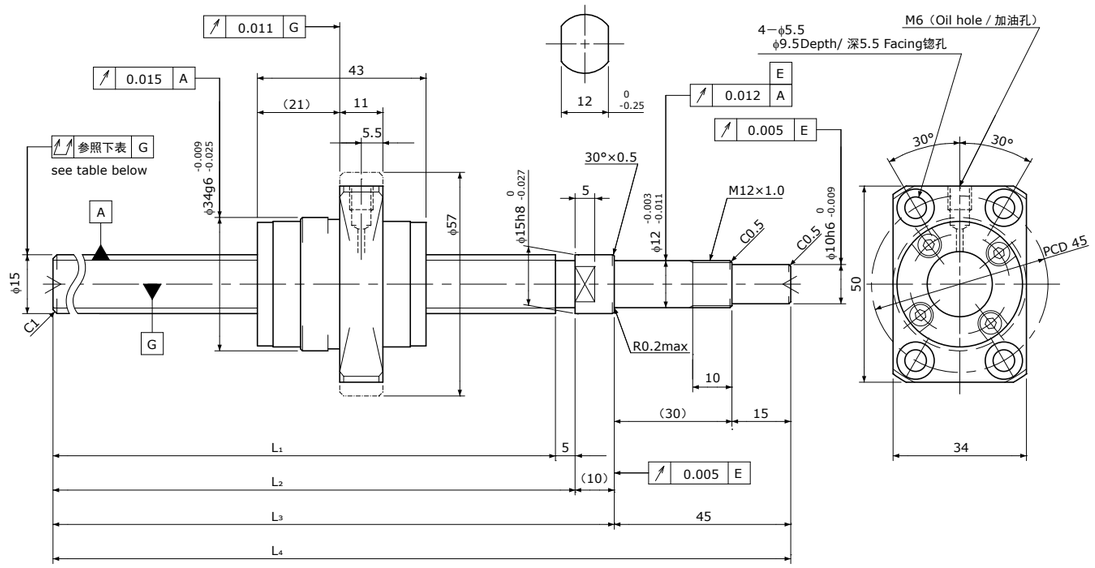
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	L4	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 Vu	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SG1505-340R400C5	305	C5	340	345	355	400	±0.025	0.020	0.055	～0.005	—	8900	17000
SG1505-540R600C5	505	C5	540	545	555	600	±0.030	0.023	0.075				

Note)Please refer to page A206 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A206页。

Standard products in stock SG series 标准库存品 SG系列

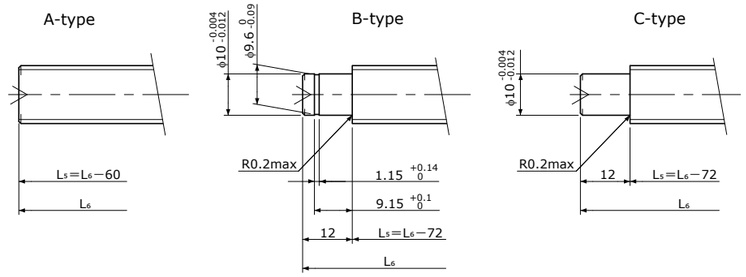
SG1510 | Shaft dia.(轴径)φ15 Lead(导程)10mm | C5



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ3.175
Number of thread 螺纹条数	2
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ12.2
Number of circuit 循环数	2.7×2
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Supported-side end-journal profile 支撑侧轴端加工形状



Ls:Thread length after end-journal machining. 追加加工后的螺纹部长度
L6:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件	Supported-side 支撑侧 : —
	Fixed-side 固定侧 : —

D-type : Other than the above. 上述以外的形状

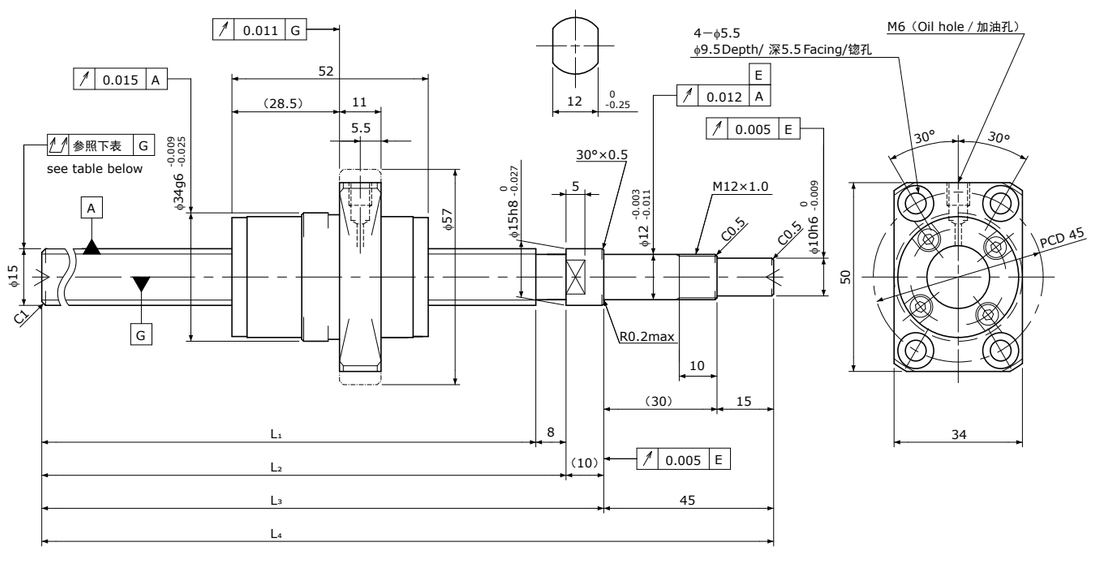
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	L4	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 Vu	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SG1510-340R400C5	295	C5	340	345	355	400	±0.025	0.020	0.055	～0.005	—	12000	25000
SG1510-540R600C5	495	C5	540	545	555	600	±0.030	0.023	0.075				

Note)Please refer to page A206 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A206页。

Standard products in stock SG series 标准库存品 SG系列

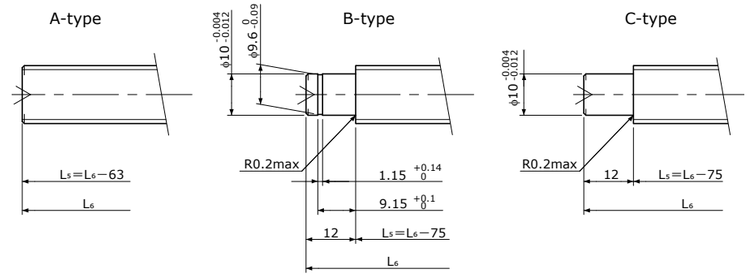
SG1520 | Shaft dia.(轴径)φ15 Lead(导程)20mm | C5



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ3.175
Number of thread 螺纹条数	2
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ12.4
Number of circuit 循环数	1.7×2
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Supported-side end-journal profile 支撑侧轴端加工形状



Ls:Thread length after end-journal machining. 追加加工后的螺纹部长度
L6:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件	Supported-side 支撑侧 : —
	Fixed-side 固定侧 : —

D-type : Other than the above. 上述以外的形状

Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	L4	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 Vu	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SG1520-337R400C5	285	C5	337	345	355	400	±0.025	0.020	0.055	～0.005	—	8000	16000
SG1520-537R600C5	485	C5	537	545	555	600	±0.030	0.023	0.075				

Note)Please refer to page A206 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A206页。

SD系列　精密双向滚珠丝杠标准库存品
SD series　Standardized Bi-directional Ball Screws

通过单轴即可进行左右开闭、定心、精密定位的经济型滚珠丝杠。
齐备有C3级、C5级研磨滚珠丝杠。

SD series are economical Ball Screws which moves bi-directionally with a shaft, and perform centering, precise positioning. There are Precision Ball Screws C3, C5 grade.

●丝杠轴公称外径与导程的组合
Combination of Shaft nominal dia. & Lead

Unit(单位):mm

Shaft dia. 公称外径 \ Lead 导程	1	2
4	A239	
6	A240	
8	A241	A242
10		A243
12		A244

注1)表中的数字表示产品刊载页码。
Note 1)The numbers in a table：showing a page in this catalogue.

●精度等级和轴向间隙

SD系列(精密双向滚珠丝杠标准库存品)的精度等级有C3和C5(JIS B 1192-3)两种。
轴向间隙根据精度等级不同备有0mm(预压:C3)和0.005mm以下(C5)两种。

●Accuracy Grade & Axial play

Accuracy grades of SD series(Standardized Bidirectional Precision Ball Screws) are 2 kinds, C3 and C5(JIS B 1192-3). Axial play are 0(Preload : C3)and 0.005mm or less(C5) corresponding to accuracy grades in stock.

●材质和表面硬度

SD系列(精密双向滚珠丝杠标准库存品)的丝杠轴和螺母均采用SCM415(渗碳淬火),滚珠丝杠部分的表面硬度为HRC58～62。

●Material & Surface hardness

Shafts and Nuts of SD series(Standardized Bi-directional Precision Ball Screws) adopts SCM415 (carburizing and quenching), surface hardness of Ball Screw part is HRC58-62.

●润滑

为防止生锈,未对轴端进行加工的SD系列(精密双向滚珠丝杠标准库存品)产品均涂抹有防锈油。由于防锈油不具备润滑性,因此在使用前请另行涂抹润滑剂。
如无特殊指定,建议使用KSS原装润滑油脂(MSG No.2)。

●Lubrication

SD series(Standardized Bi-directional Precision Ball Screws) are applied with anti-rust oil for rust prevention when unfinished end journal. Since anti-rust oil is not lubricant, apply Grease or lubrication oil before using Ball Screws.
If there is no specific instruction, KSS would recommend our original Grease (MSG No.2) as standard lubricant.
Please feel free to contact us.

●轴端形状

SD系列(精密双向滚珠丝杠标准库存品)的轴端形状未进行标准化。
委托KSS进行追加加工时,请附上指示轴端形状的图纸。

●End-journal profile

End-journal configuration of SD series (Standardized Bi-directional Precision Ball Screws) is not standardized. Please ask for KSS regarding additional machining with a drawing which shows end-journal profile.

●公称型号的构成

SD系列(精密双向滚珠丝杠标准库存品)的公称型号构成如下所示。

●Model number notation

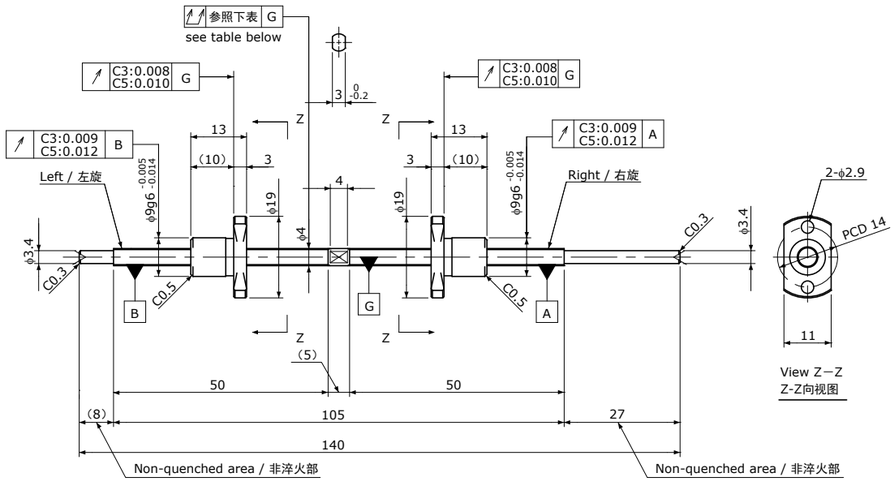
Model number notation of SD series(Standardized Bi-directional Precision Ball Screws) is as follows.

SD　08　01　—　120　L　120　R　300　C5
①　②　③　④　⑤　⑥　⑦　⑧　⑨

①双向滚珠丝杠的系列符号
②丝杠轴公称外径(mm)
③导程(mm)
④左旋螺纹部长度(mm)
⑤左旋符号
⑥右旋螺纹部长度(mm)
⑦右旋符号
⑧丝杠轴总长(mm)
⑨精度等级(C3或C5)

①Bi-directional Ball Screws series No.
②Screw Shaft nominal diameter(mm)
③Lead(mm)
④Left-side thread length(mm)
⑤Left-hand
⑥Right-side thread length(mm)
⑦Right-hand
⑧Screw Shaft total length(mm)
⑨Accuracy grade(C3 or C5)

SD0401 | Shaft dia.(轴径)φ4 Lead(导程)1mm | C3&C5



Unit(单位):mm

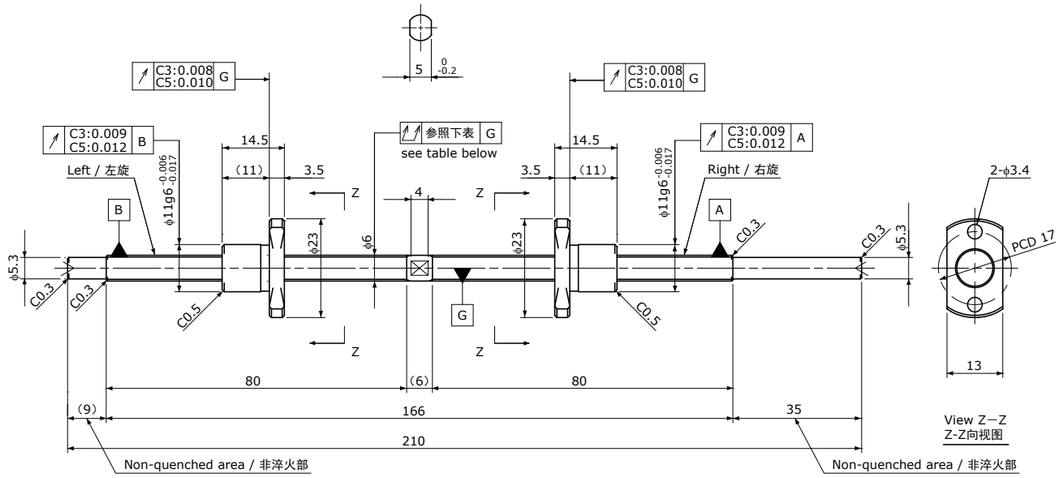
Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ0.6
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Left&Right 左右
Shaft root dia. 丝杠轴底径	φ3.4
Number of circuit 循环数	1×3
Shaft,Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			Travel deviation 代表移动量误差 e_p	Variation 波动 V_u				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SD0401-50L50R140C3	35	C3	±0.008	0.008	0.035	0	～0.010	300	430
SD0401-50L50R140C5	35	C5	±0.018	0.018	0.050	～0.005	—		

Note 1) Please designate end-journal profile with your sketch.
Note 2) Absolute position of both Nuts related to the Screw Shaft is not under the control.
注1)轴端的追加加工请结合图纸进行指示。
注2)未规定左右螺母相对于丝杠轴的绝对位置。

SD0601 | Shaft dia.(轴径)φ6 Lead(导程)1mm | C3&C5



Unit(单位):mm

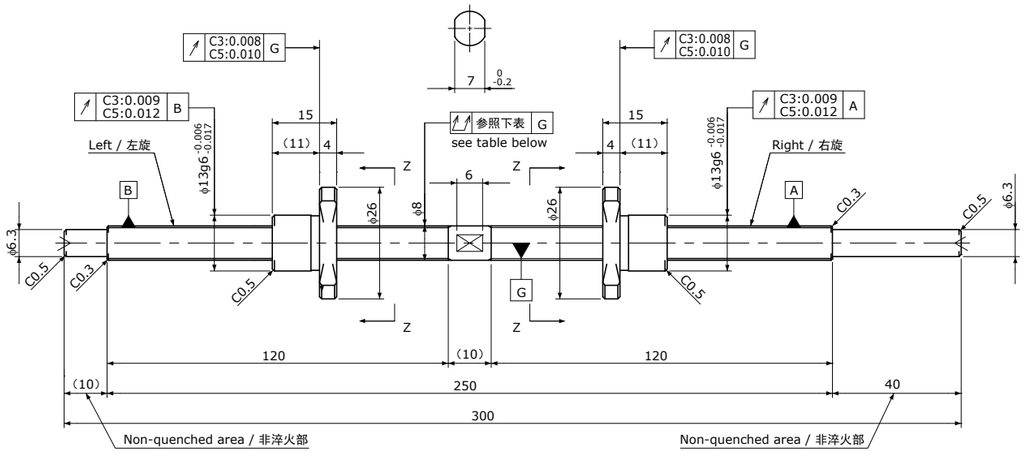
Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ0.8
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Left&Right 左右
Shaft root dia. 丝杠轴底径	φ5.3
Number of circuit 循环数	1×3
Shaft,Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			Travel deviation 代表移动量误差 e_p	Variation 波动 V_u				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SD0601-80L80R210C3	65	C3	±0.008	0.008	0.050	0	～0.013	550	1000
SD0601-80L80R210C5	65	C5	±0.018	0.018	0.065	～0.005	—		

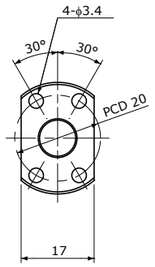
Note 1) Please designate end-journal profile with your sketch.
Note 2) Absolute position of both Nuts related to the Screw Shaft is not under the control.
注1)轴端的追加加工请结合图纸进行指示。
注2)未规定左右螺母相对于丝杠轴的绝对位置。

SD0801 | Shaft dia.(轴径)φ8 Lead(导程)1mm | C3&C5



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ0.8
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Left&Right 左右
Shaft root dia. 丝杠轴底径	φ7.3
Number of circuit 循环数	1×3
Shaft,Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油



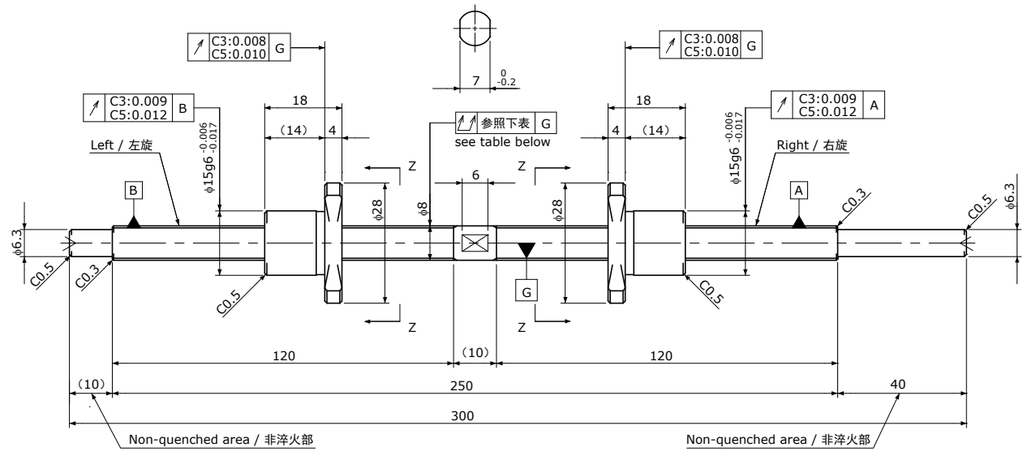
View Z—Z
Z-Z向视图

Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			Travel deviation 代表移动量误差 e_p	Variation 波动 V_u				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SD0801-120L120R300C3	105	C3	±0.010	0.008	0.050	0	～0.018	650	1300
SD0801-120L120R300C5	105	C5	±0.020	0.018	0.065	～0.005	—		

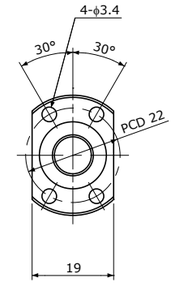
Note 1) Please designate end-journal profile with your sketch.
Note 2) Absolute position of both Nuts related to the Screw Shaft is not under the control.
注1)轴端的追加加工请结合图纸进行指示。
注2)未规定左右螺母相对于丝杠轴的绝对位置。

SD0802 | Shaft dia.(轴径)φ8 Lead(导程)2mm | C3&C5



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ1.2
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Left&Right 左右
Shaft root dia. 丝杠轴底径	φ7.0
Number of circuit 循环数	1×3
Shaft,Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油



Vies Z-Z
Z-Z向视图

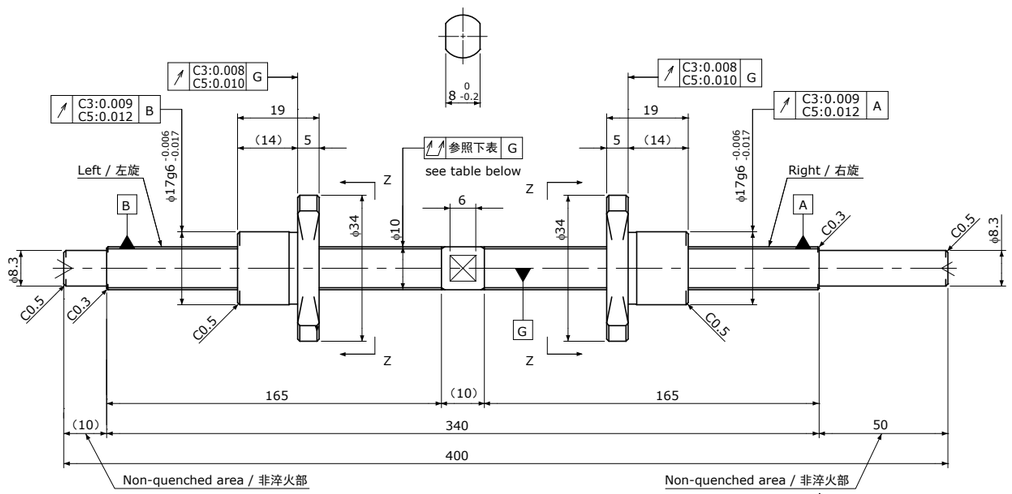
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			Travel deviation 代表移动量误差 e_p	Variation 波动 V_u				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SD0802-120L120R300C3	100	C3	±0.010	0.008	0.050	0	～0.020	1300	2300
SD0802-120L120R300C5	100	C5	±0.020	0.018	0.065	～0.005	—		

Note 1) Please designate end-journal profile with your sketch.
Note 2) Absolute position of both Nuts related to the Screw Shaft is not under the control.
注1)轴端的追加加工请结合图纸进行指示。
注2)未规定左右螺母相对于丝杠轴的绝对位置。

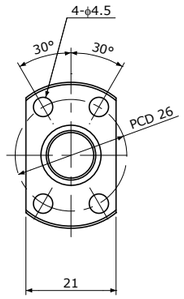
Standard products in stock SD series 标准库存品 SD系列

SD1002 | Shaft dia.(轴径)φ10 Lead(导程)2mm | C3&C5



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ1.2
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Left&Right 左右
Shaft root dia. 丝杠轴底径	φ9.0
Number of circuit 循环数	1×3
Shaft,Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油



View Z-Z
Z-Z向视图

Unit(单位):mm

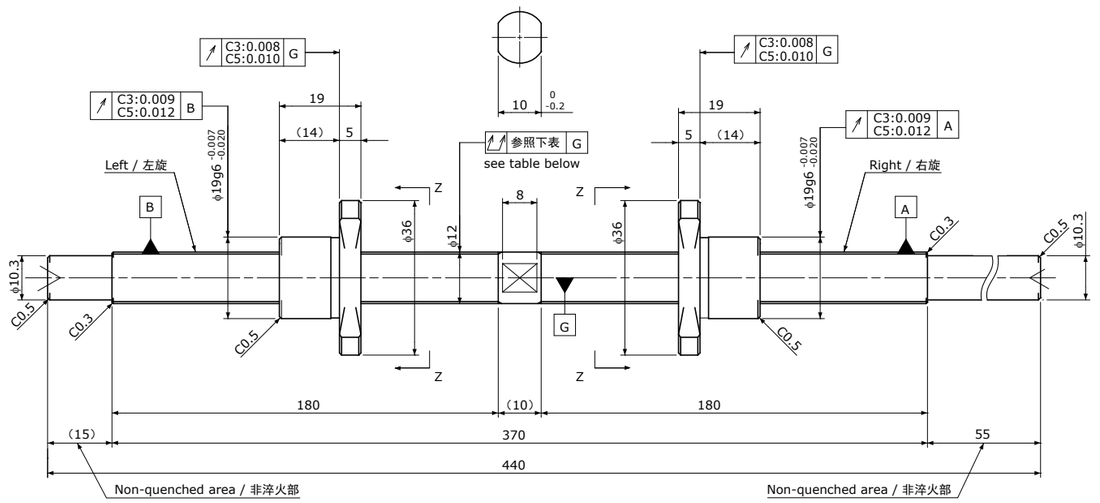
Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			Travel deviation 代表移动量误差 e_p	Variation 波动 V_u				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SD1002-165L165R400C3	145	C3	±0.010	0.008	0.050	0	～0.025	1450	3000
SD1002-165L165R400C5	145	C5	±0.020	0.018	0.065	～0.005	—		

Note 1) Please designate end-journal profile with your sketch.
Note 2) Absolute position of both Nuts related to the Screw Shaft is not under the control.

注1)轴端的追加加工请结合图纸进行指示。
注2)未规定左右螺母相对于丝杠轴的绝对位置。

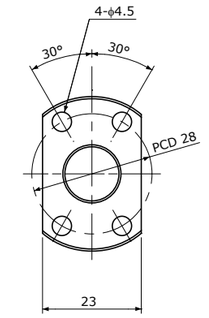
Standard products in stock SD series 标准库存品 SD系列

SD1202 | Shaft dia.(轴径)φ12 Lead(导程)2mm | C3&C5



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ1.2
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Left&Right 左右
Shaft root dia. 丝杠轴底径	φ11.0
Number of circuit 循环数	1×3
Shaft,Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油



View Z-Z
Z-Z向视图

Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			Travel deviation 代表移动量误差 e_p	Variation 波动 V_u				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SD1202-180L180R440C3	160	C3	±0.010	0.008	0.065	0	～0.035	1600	3700
SD1202-180L180R440C5	160	C5	±0.020	0.018	0.080	～0.005	—		

Note 1) Please designate end-journal profile with your sketch.
Note 2) Absolute position of both Nuts related to the Screw Shaft is not under the control.

注1)轴端的追加加工请结合图纸进行指示。
注2)未规定左右螺母相对于丝杠轴的绝对位置。

SR/SSR系列　冷轧滚珠丝杠标准库存品
SR/SSR series　Standardized Rolled Ball Screws

齐备有Ct7级、Ct10级冷轧滚珠丝杠的标准库存品。最适用于经济型设计，只需对轴端进行加工，即可在短期内供货。
此外，还可选用不锈钢冷轧滚珠丝杠系列。

Rolled Ball Screws with accuracy Ct7 and Ct10 are available in stock. It is suitable for low cost design. Rolled Ball Screws with end-journal machining are available for short delivery.
Stainless Rolled Ball Screws are also available.

●丝杠轴公称外径与导程的组合　Combination of Shaft nominal dia. & Lead

Unit(单位)：mm

Shaft dia. 公称外径 \ Lead 导程	1	2	2.5	4	5	6	8	10	12	15	20
4	A247 A248	A249									
5				A250							
6	A251 A252 A281	A253				A254		A255			
8	A256 A257 A282	A258 A259 A283	A260		A261		A262	A263	A264		
10		A265 A266 A284		A267	A268			A269		A270	A271
12		A272 A273						A274			
14		A275		A276							
15					A277			A278			A279

注1)用红色标示的型号可提供不锈钢冷轧滚珠丝杠。
注2)表中的数字表示产品刊载页码。

Note 1)The models marked red are available for Stainless Rolled Ball Screws.
Note 2)The numbers in a table : showing a page in this catalogue.

●公称型号的构成　Model number notation

SR　06　01　K　—　200　R　200　C7
①　②　③　④　⑤　⑥　⑦　⑧

①系列符号
　SR ：冷轧滚珠丝杠
　SSR:不锈钢冷轧滚珠丝杠
②丝杠轴公称外径(mm)
③导程(mm)
④螺母类型
　无符号 ：普通型
　K ：紧凑型
⑤螺纹部长度(mm)
⑥螺纹旋向(R=右旋)
⑦丝杠轴总长(mm)
⑧精度等级(C7或C10)

①Rolled Ball Screws Series No.
　SR : Rolled Ball Screws
　SSR : Stainless Rolled Ball Screws
②Screw Shaft nominal diameter(mm)
③Lead(mm)
④Ball Nut type
　None : Standard
　K : Compact type
⑤Screw thread length(mm)
⑥Thread direction(R=Right-hand)
⑦Screw Shaft total length(mm)
⑧Accuracy grade(C7 or C10)

●精度等级和轴向间隙

SR系列(冷轧滚珠丝杠标准库存品)及SSR系列(不锈钢冷轧滚珠丝杠标准库存品)的精度等级有Ct7及Ct10(JIS B 1192-3)两种。
轴向间隙根据精度等级不同备有0.020mm以下(Ct7)及0.050mm以下(Ct10)两种。

●Accuracy Grade & Axial play

Accuracy grade of SR series (Standardized Rolled Ball Screws) and SSR series(Standardized Stainless Rolled Ball Screws) are based on Ct7 andCt10(JIS B 1192-3). According to accuracy grade, Axial play 0.020mm or less(Ct7) and 0.050mm or less(Ct10) are in stock.

●材质和表面硬度

SR系列(冷轧滚珠丝杠标准库存品)及SSR系列(不锈钢冷轧滚珠丝杠标准库存品)的材质和表面硬度如下所示。

●Material & Surface hardness

Materials and Surface hardness of SR series (Standardized Rolled Ball Screws) and SSR series (Standardized Stainless Rolled Ball Screws) are as follows.

Products 产品类别	Material 材质	Heat treatment 热处理	Surface hardness 丝杠部分的表面硬度
Rolled Ball Screws (SR series) 普通冷轧（SR系列）	Shaft/丝杠轴： SCM415 S55C SUJ2	Carburizing 渗碳淬火 Induction Hardening 高频淬火 Quench & Temper 淬火回火	HRC58 or more HRC58以上
	Nut / 螺母：SCM415	Carburizing and Quenching 渗碳淬火	
Stainless Rolled Ball Screws (SSR series) 不锈钢冷轧（SSR系列）	Shaft/丝杠轴：SUS440C	Induction hardening 高频淬火	HRC55 or more HRC55以上
	Nut / 螺母：SUS440C	Vacuum hardening 真空淬火	

●润　滑

为防止生锈，未对轴端进行加工的SR系列(冷轧滚珠丝杠标准库存品)及SSR系列(不锈钢冷轧滚珠丝杠标准库存品)产品均涂抹有防锈油。由于防锈油不具备润滑性，因此在使用前请另行涂抹润滑剂。
如无特殊指定，建议使用KSS原装润滑油脂(MSG No.2)。

●Lubrication

SR series (Standardized Rolled Ball Screws) and SSR series (Standardized Stainless Rolled Ball Screws) without end-journal machining are applied with anti-rust oil for rust prevention.
Anti-rust oil does not have lubricating function so that please apply the Grease or lubrication oil when using the Ball Screws.
If there is no specific instruction, KSS would recommend our original Grease (MSG No.2) as standard lubricant.
Please feel free to contact us.

●精密冷轧滚珠丝杠

也可生产实现了高精度(JIS C5)的冷轧滚珠丝杠(PSR/PSRT系列)。请参照A319页。

●Precision Rolled Ball Screws

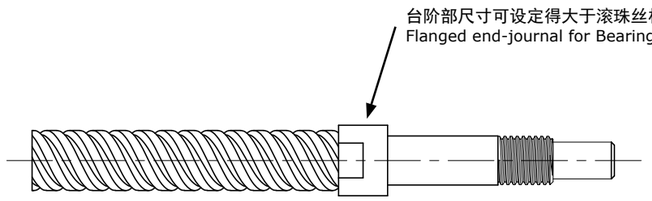
High accuracy(JIS C5) can be produced by Rolled process, what we call Precision Rolled Ball Screws (PSR/PSRT series). Please see page A319.

●其他

SR系列(冷轧滚珠丝杠标准库存品)及SSR系列(不锈钢冷轧滚珠丝杠标准库存品)的轴端形状未进行标准化。联系本公司进行追加加工时，请客户提供规格图。
此外，固定侧轴端可设计得大于丝杠轴外径的“台阶型冷轧滚珠丝杠”(参照下图)也实现了产品系列化，详情请参照第A285页或垂询本公司。

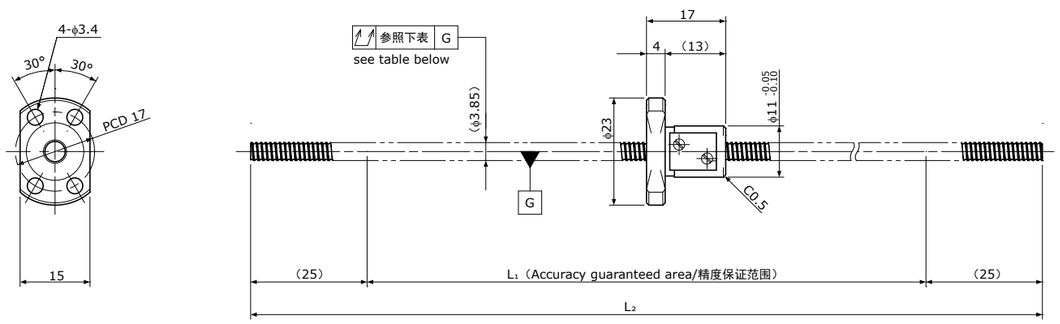
●Others

End-journal configuration of SR series (Standardized Rolled Ball Screws) and SSR series (Standardized stainless Rolled Ball Screws) are not standardized. When you request additional machining, please send us a drawing with end-journal profile.
Rolled Ball Screws with Integrated end-journal, which is bigger Bearing face than supported seat, are available (SRT/SSRT series) as shown below.
Please refer to page A285 or ask KSS.



Standard products in stock SR series
标准库存品 SR系列

SR0401 | Shaft dia.(轴径)φ4 Lead(导程)1mm | Ct7&Ct10



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ0.8
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ3.3
Number of circuit 循环数	3.7×1
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

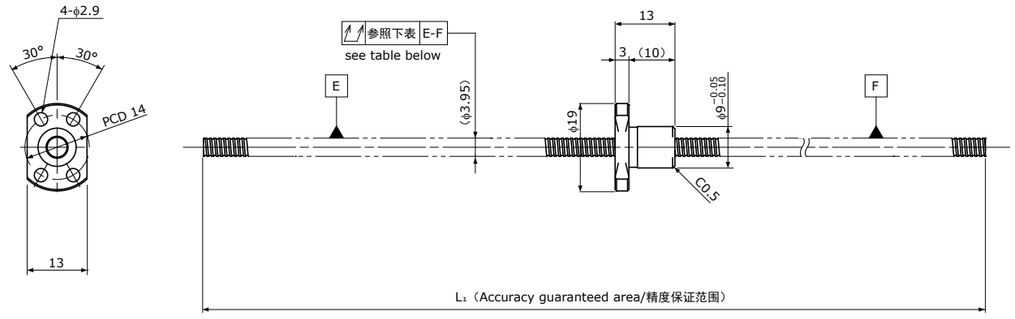
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度		Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			L_1	L_2	Travel deviation 代表移动量误差 e_p	Variation 波动 V_{300}				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SR0401-250R250C7	180	Ct7	200	250	±0.03	—	0.200	～0.020	—	560	790
SR0401-250R250C10	180	Ct10	200	250	±0.14	—	0.400	～0.050			

Note)Please designate end-journal profile with your sketch. 注)轴端的追加加工请结合图纸进行指示。

Standard products in stock SR series
标准库存品 SR系列

SR0401K | Compact Nut / 紧凑型螺母 | Shaft dia.(轴径)φ4 Lead(导程)1mm | Ct7&Ct10



Unit(单位):mm

Ball Screw Specifications 主要技术参数		
Ball size 钢珠直径		φ0.6
Number of thread 螺纹条数		1
Thread direction 螺纹旋向		Right 右旋
Shaft root dia. 丝杠轴底径		φ3.4
Number of circuit 循环数		1×3
Material 材质	Shaft 轴	S55C
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

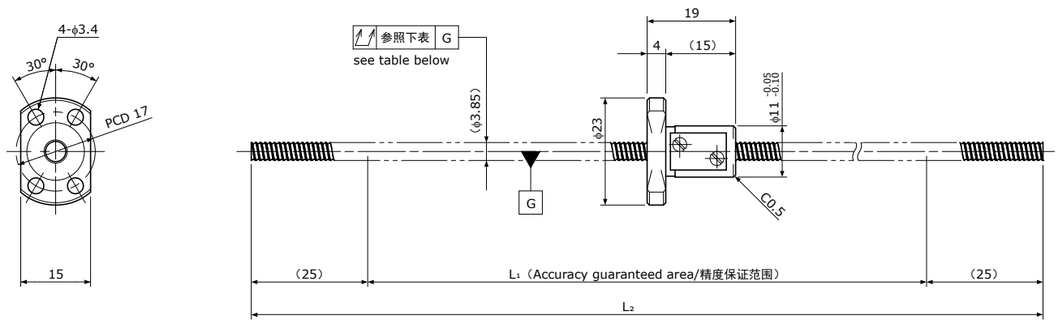
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度		Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			L_1	L_2	Travel deviation 代表移动量误差 e_p	Variation 波动 V_{300}				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SR0401K-100R100C7	80	Ct7	100	—	±0.02	—	0.080	～0.020	—	300	430
SR0401K-100R100C10	80	Ct10	100	—	±0.07	—	0.160	～0.050			

Note)Please designate end-journal profile with your sketch. 注)轴端的追加加工请结合图纸进行指示。

Standard products in stock SR series 标准库存品 SR系列

SR0402 | Shaft dia.(轴径)φ4 Lead(导程)2mm | Ct7&Ct10



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ0.8
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ3.3
Number of circuit 循环数	2.7×1
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

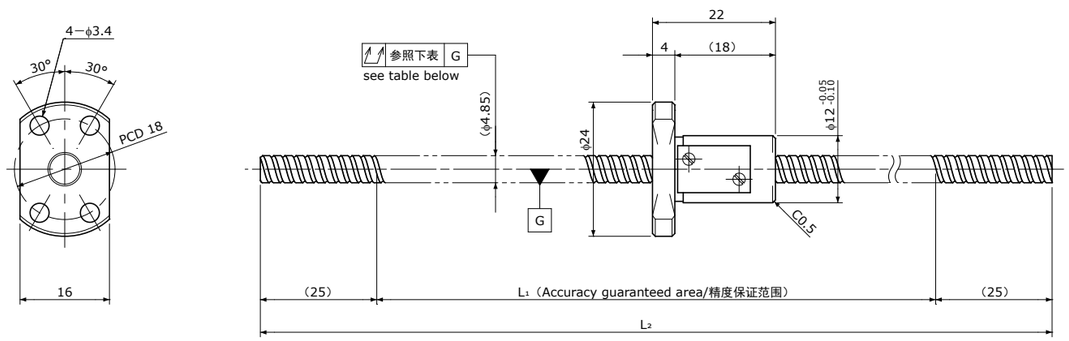
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度		Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			L_1	L_2	Travel deviation 代表移动量误差 e_p	Variation 波动 V_{300}				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SR0402-250R250C7	180	Ct7	200	250	±0.03	—	0.200	～0.020	—	420	570
SR0402-250R250C10	180	Ct10	200	250	±0.14	—	0.400	～0.050			

Note)Please designate end-journal profile with your sketch. 注)轴端的追加加工请结合图纸进行指示。

Standard products in stock SR series 标准库存品 SR系列

SR0504 | Shaft dia.(轴径)φ5 Lead(导程)4mm | Ct7&Ct10



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ0.8
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ4.3
Number of circuit 循环数	2.7×1
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Unit(单位):mm

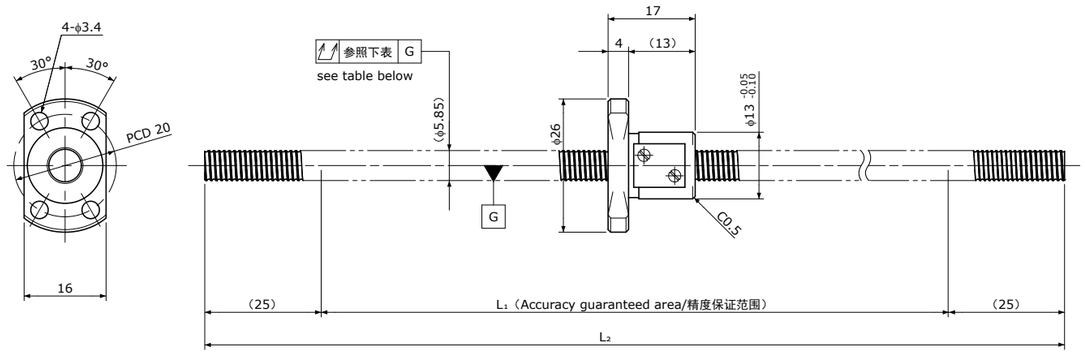
Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度		Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			L_1	L_2	Travel deviation 代表移动量误差 e_p	Variation 波动 V_{300}				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SR0504-250R250C7	175	Ct7	200	250	±0.03	—	0.120	～0.020	—	470	720
SR0504-250R250C10	175	Ct10	200	250	±0.14	—	0.240	～0.050			

Note)Please designate end-journal profile with your sketch. 注)轴端的追加加工请结合图纸进行指示。

SR0601

Shaft dia.(轴径)φ6 Lead(导程)1mm | Ct7&Ct10

＊Please refer to page A281 for stainless steel type.
※不锈钢型请参照第A281页。



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ0.8
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ5.3
Number of circuit 循环数	3.7×1
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Unit(单位):mm

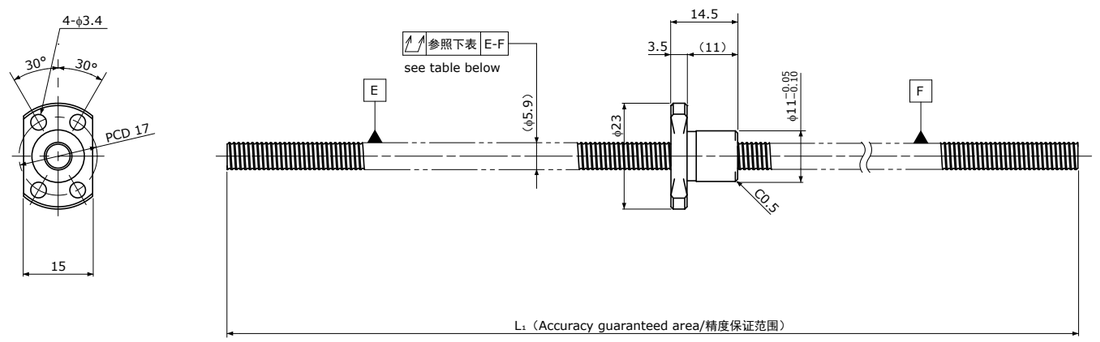
Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度		Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			L_1	L_2	Travel deviation 代表移动量误差 e_p	Variation 波动 V_{300}				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SR0601-300R300C7	230	Ct7	250	300	±0.04	—	0.120	～0.020	—	680	1200
SR0601-300R300C10	230	Ct10	250	300	±0.17	—	0.240	～0.050			

Note)Please designate end-journal profile with your sketch. 注)轴端的追加加工请结合图纸进行指示。

SR0601K

Compact Nut / 紧凑型螺母

Shaft dia.(轴径)φ6 Lead(导程)1mm | Ct7&Ct10



Unit(单位):mm

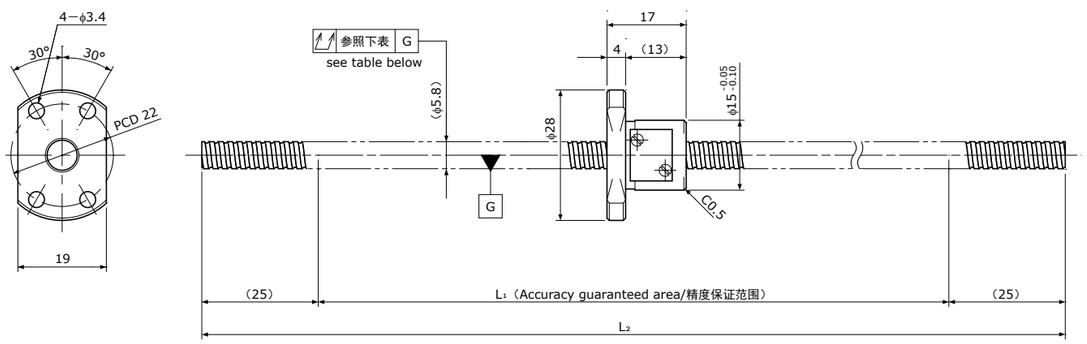
Ball Screw Specifications 主要技术参数		
Ball size 钢珠直径		φ0.8
Number of thread 螺纹条数		1
Thread direction 螺纹旋向		Right 右旋
Shaft root dia. 丝杠轴底径		φ5.3
Number of circuit 循环数		1×3
material 材质	Shaft 轴	S55C
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度		Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			L_1	L_2	Travel deviation 代表移动量误差 e_p	Variation 波动 V_{300}				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SR0601K-200R200C7	175	Ct7	200	—	±0.03	—	0.080	～0.020	—	560	950
SR0601K-200R200C10	175	Ct10	200	—	±0.14	—	0.160	～0.050			

Note)Please designate end-journal profile with your sketch. 注)轴端的追加加工请结合图纸进行指示。

SR0602 | Shaft dia.(轴径)φ6 Lead(导程)2mm | Ct7&Ct10



Unit(单位):mm

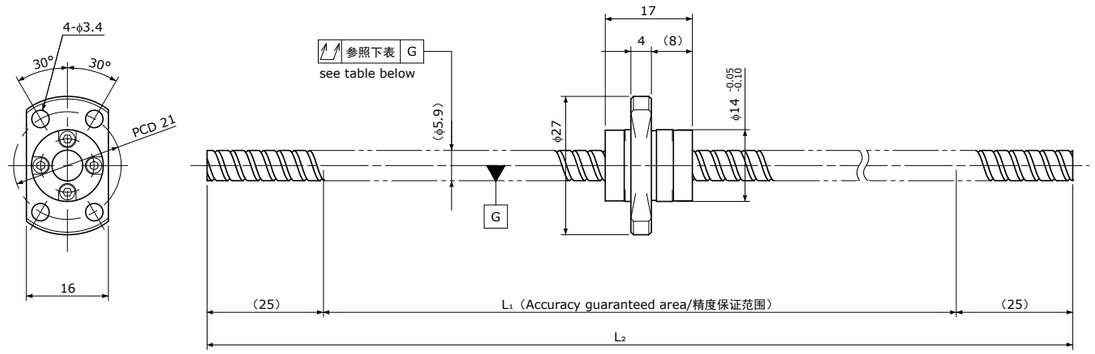
Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ1.0
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ5.1
Number of circuit 循环数	2.7×1
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度		Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			L_1	L_2	Travel deviation 代表移动量误差 e_p	Variation 波动 V_{300}				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SR0602-300R300C7	230	Ct7	250	300	±0.04	—	0.120	～0.020	—	750	1200
SR0602-300R300C10	230	Ct10	250	300	±0.17	—	0.240	～0.050			

Note)Please designate end-journal profile with your sketch. 注)轴端的追加加工请结合图纸进行指示。

SR0606 | Shaft dia.(轴径)φ6 Lead(导程)6mm | Ct7&Ct10



Unit(单位):mm

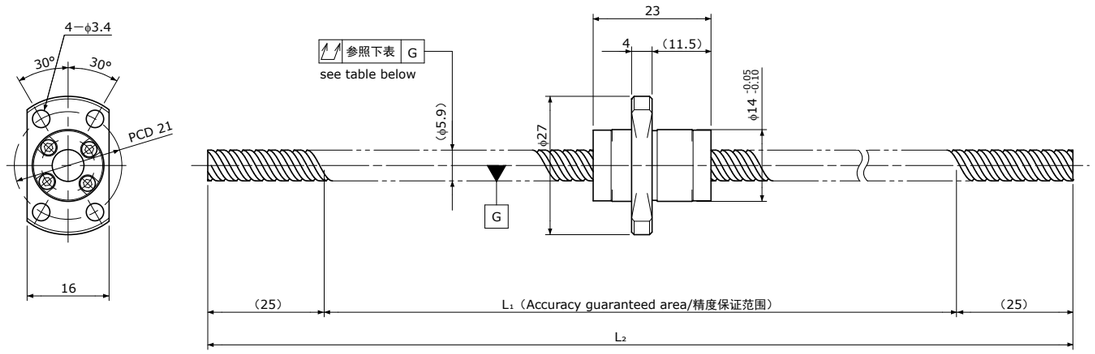
Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ1.0
Number of thread 螺纹条数	2
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ5.2
Number of circuit 循环数	1.6×2
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度		Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			L_1	L_2	Travel deviation 代表移动量误差 e_p	Variation 波动 V_{300}				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SR0606-300R300C7	230	Ct7	250	300	±0.04	—	0.120	～0.020	—	870	1450
SR0606-300R300C10	230	Ct10	250	300	±0.17	—	0.240	～0.050			

Note)Please designate end-journal profile with your sketch. 注)轴端的追加加工请结合图纸进行指示。

SR0610 | Shaft dia.(轴径)φ6 Lead(导程)10mm | Ct7&Ct10



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ1.2
Number of thread 螺纹条数	2
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ5.0
Number of circuit 循环数	1.2×2
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

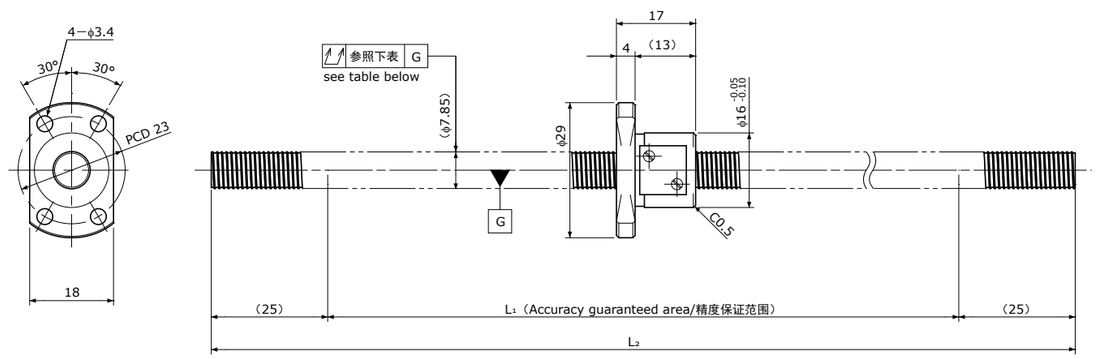
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度		Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			L_1	L_2	Travel deviation 代表移动量误差 e_p	Variation 波动 V_{300}				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SR0610-300R300C7	225	Ct7	250	300	±0.04	—	0.120	～0.020	—	950	1600
SR0610-300R300C10	225	Ct10	250	300	±0.17	—	0.240	～0.050			

Note)Please designate end-journal profile with your sketch. 注)轴端的追加加工请结合图纸进行指示。

SR0801 | Shaft dia.(轴径)φ8 Lead(导程)1mm | Ct7&Ct10

＊Please refer to page A282 for stainless steel type.
※不锈钢型请参照第A282页。



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ0.8
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ7.3
Number of circuit 循环数	3.7×1
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度		Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			L_1	L_2	Travel deviation 代表移动量误差 e_p	Variation 波动 V_{300}				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SR0801-400R400C7	330	Ct7	350	400	±0.06	0.05	0.120	～0.020	—	780	1650
SR0801-400R400C10	330	Ct10	350	400	±0.24	0.21	0.240	～0.050			

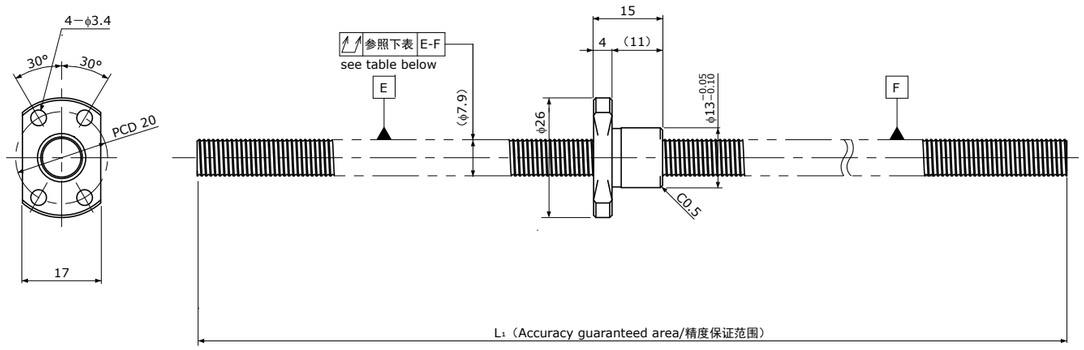
Note)Please designate end-journal profile with your sketch. 注)轴端的追加加工请结合图纸进行指示。

SR0801K

Compact Nut / 紧凑型螺母

Shaft dia.(轴径)φ8 Lead(导程)1mm

Ct7&Ct10



Unit(单位):mm

Ball Screw Specifications 主要技术参数		
Ball size 钢珠直径		φ0.8
Number of thread 螺纹条数		1
Thread direction 螺纹旋向		Right 右旋
Shaft root dia. 丝杠轴底径		φ7.3
Number of circuit 循环数		1×3
material 材质	Shaft 轴	S55C
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度		Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			L_1	L_2	Travel deviation 代表移动量误差 e_p	Variation 波动 V_{300}				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SR0801K-230R230C7	200	Ct7	230	—	±0.03	—	0.080	～0.020	—	650	1300
SR0801K-230R230C10	200	Ct10	230	—	±0.16	—	0.160	～0.050			

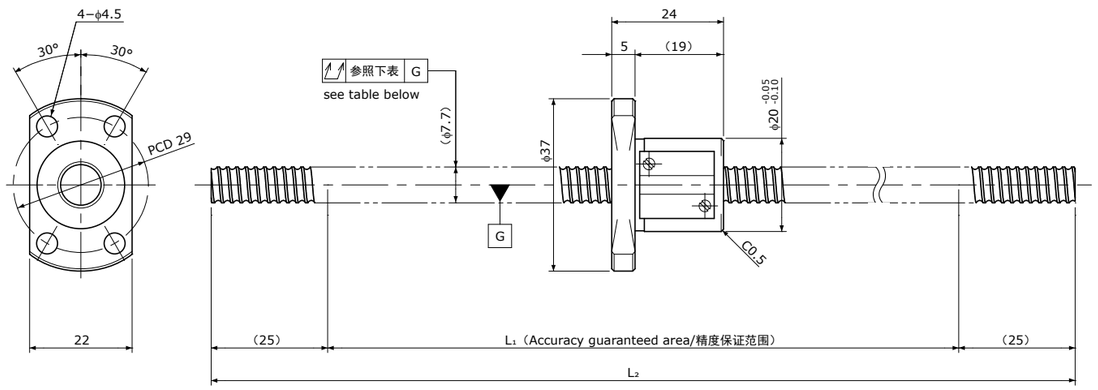
Note)Please designate end-journal profile with your sketch. 注)轴端的追加加工请结合图纸进行指示。

SR0802

Shaft dia.(轴径)φ8 Lead(导程)2mm

Ct7&Ct10

＊Please refer to page A283 for stainless steel type.
※不锈钢型请参照第A283页。



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ1.5875
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ6.6
Number of circuit 循环数	3.7×1
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

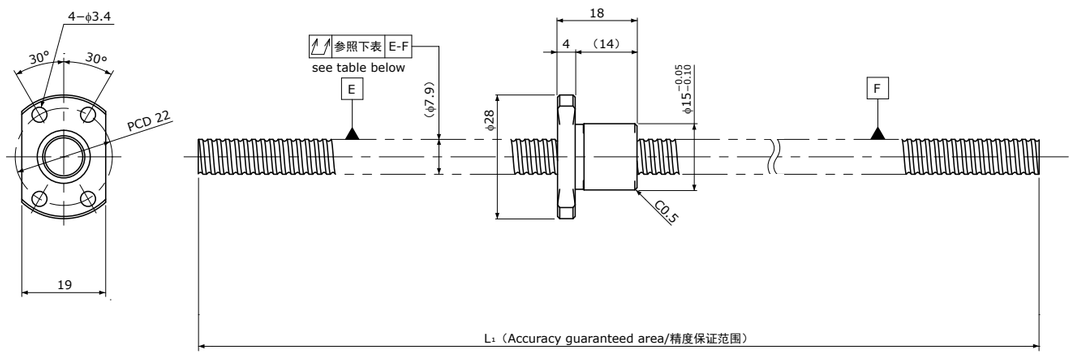
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度		Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			L_1	L_2	Travel deviation 代表移动量误差 e_p	Variation 波动 V_{300}				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SR0802-400R400C7	325	Ct7	350	400	±0.06	0.05	0.120	～0.020	—	2400	4100
SR0802-400R400C10	325	Ct10	350	400	±0.24	0.21	0.240	～0.050			

Note)Please designate end-journal profile with your sketch. 注)轴端的追加加工请结合图纸进行指示。

Standard products in stock SR series 标准库存品 SR系列

SR0802K | Compact Nut / 紧凑型螺母 | Shaft dia.(轴径)φ8 Lead(导程)2mm | Ct7&Ct10



Unit(单位):mm

Ball Screw Specifications 主要技术参数		
Ball size 钢珠直径		φ1.2
Number of thread 螺纹条数		1
Thread direction 螺纹旋向		Right 右旋
Shaft root dia. 丝杠轴底径		φ7.0
Number of circuit 循环数		1×3
Material 材质	Shaft 轴	S55C
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

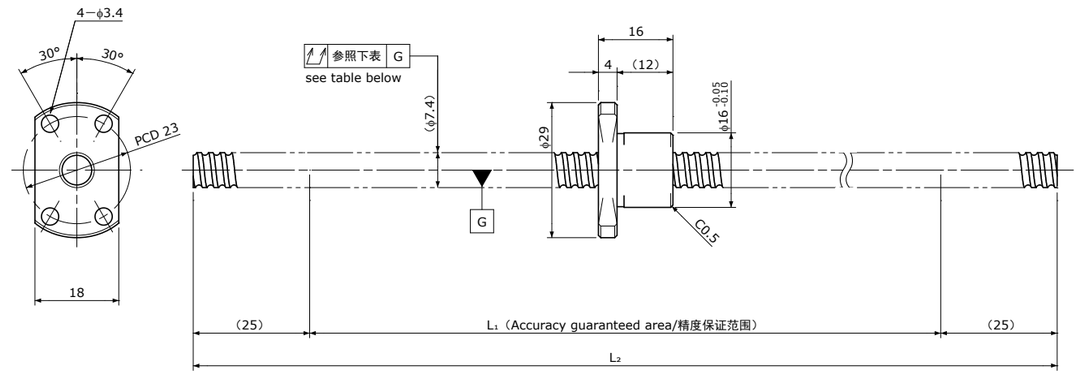
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度		Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			L_1	L_2	Travel deviation 代表移动量误差 e_p	Variation 波动 V_{300}				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SR0802K-230R230C7	200	Ct7	230	—	±0.03	—	0.080	～0.020	—	1300	2300
SR0802K-230R230C10	200	Ct10	230	—	±0.16	—	0.160	～0.050			

Note)Please designate end-journal profile with your sketch. 注)轴端的追加加工请结合图纸进行指示。

Standard products in stock SR series 标准库存品 SR系列

SR0802.5 | Shaft dia.(轴径)φ8 Lead(导程)2.5mm | Ct7&Ct10



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ1.5875
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ6.3
Number of circuit 循环数	2.7×1
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

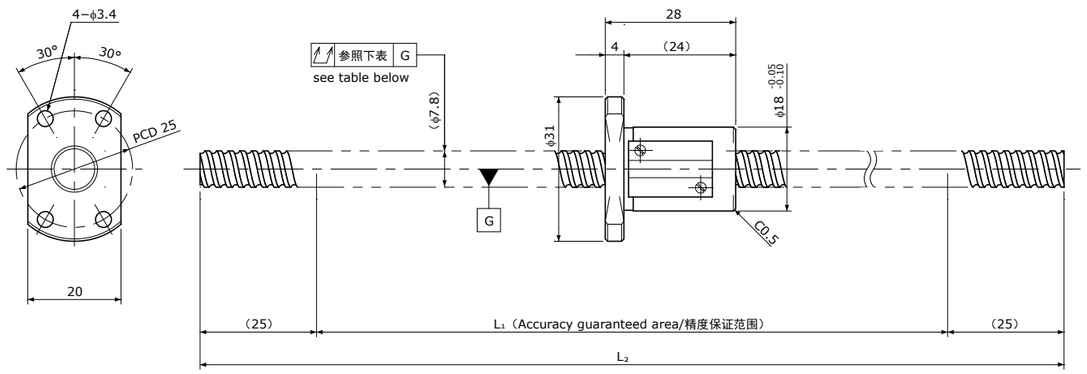
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度		Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			L_1	L_2	Travel deviation 代表移动量误差 e_p	Variation 波动 V_{300}				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SR0802.5-400R400C7	330	Ct7	350	400	±0.06	0.05	0.120	～0.020	—	1850	3000
SR0802.5-400R400C10	330	Ct10	350	400	±0.24	0.21	0.240	～0.050			

Note)Please designate end-journal profile with your sketch. 注)轴端的追加加工请结合图纸进行指示。

Standard products in stock SR series 标准库存品 SR系列

SR0805 | Shaft dia.(轴径)φ8 Lead(导程)5mm | Ct7&Ct10



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ1.5875
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ6.6
Number of circuit 循环数	2.7×1
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

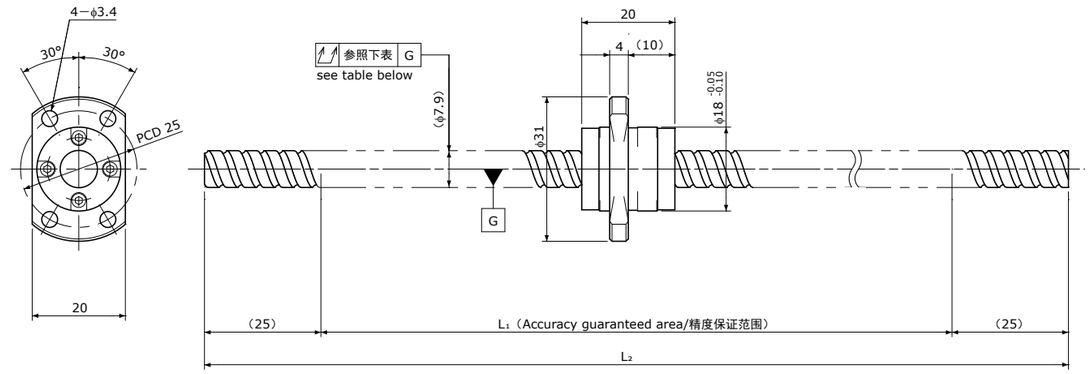
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度		Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			L_1	L_2	Travel deviation 代表移动量误差 e_p	Variation 波动 V_{300}				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SR0805-400R400C7	320	Ct7	350	400	±0.06	0.05	0.120	～0.020	—	1850	3000
SR0805-400R400C10	320	Ct10	350	400	±0.24	0.21	0.240	～0.050			

Note)Please designate end-journal profile with your sketch. 注)轴端的追加加工请结合图纸进行指示。

Standard products in stock SR series 标准库存品 SR系列

SR0808 | Shaft dia.(轴径)φ8 Lead(导程)8mm | Ct7&Ct10



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ1.5875
Number of thread 螺纹条数	2
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ6.7
Number of circuit 循环数	1.6×2
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

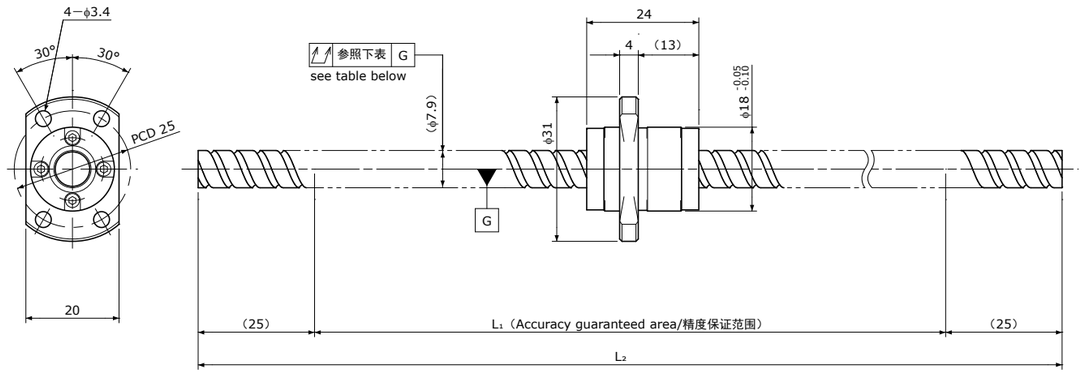
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度		Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			L_1	L_2	Travel deviation 代表移动量误差 e_p	Variation 波动 V_{300}				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SR0808-400R400C7	330	Ct7	350	400	±0.06	0.05	0.120	～0.020	—	2200	3800
SR0808-400R400C10	330	Ct10	350	400	±0.24	0.21	0.240	～0.050			

Note)Please designate end-journal profile with your sketch. 注)轴端的追加加工请结合图纸进行指示。

Standard products in stock SR series 标准库存品 SR系列

SR0810 | Shaft dia.(轴径)φ8 Lead(导程)10mm | Ct7&Ct10



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ1.5875
Number of thread 螺纹条数	2
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ6.7
Number of circuit 循环数	1.6×2
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

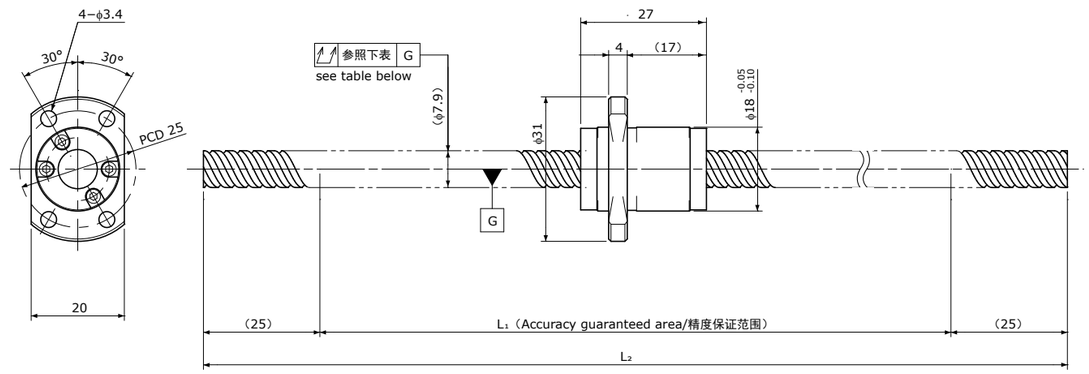
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度		Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			L_1	L_2	Travel deviation 代表移动量误差 e_p	Variation 波动 V_{300}				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SR0810-400R400C7	325	Ct7	350	400	±0.06	0.05	0.120	～0.020	—	2200	3800
SR0810-400R400C10	325	Ct10	350	400	±0.24	0.21	0.240	～0.050			

Note)Please designate end-journal profile with your sketch. 注)轴端的追加加工请结合图纸进行指示。

Standard products in stock SR series 标准库存品 SR系列

SR0812 | Shaft dia.(轴径)φ8 Lead(导程)12mm | Ct7&Ct10



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ1.5875
Number of thread 螺纹条数	2
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ6.7
Number of circuit 循环数	1.6×2
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Unit(单位):mm

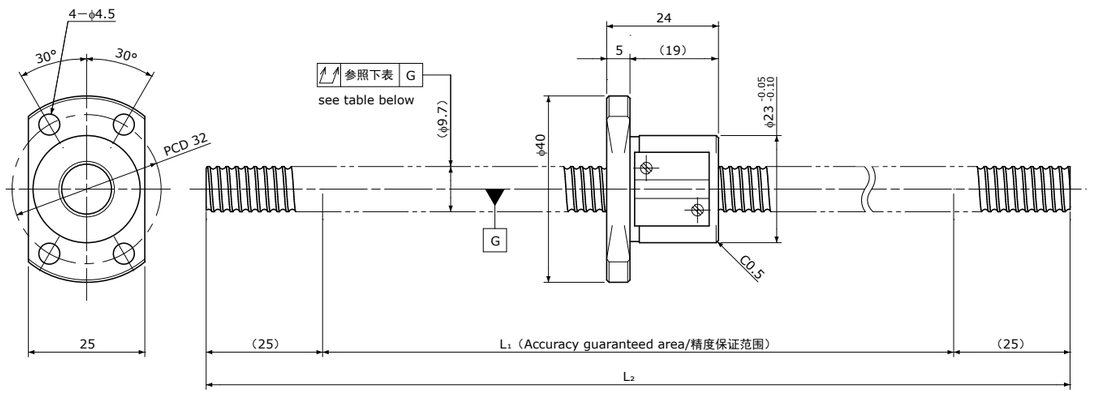
Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度		Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			L_1	L_2	Travel deviation 代表移动量误差 e_p	Variation 波动 V_{300}				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SR0812-400R400C7	320	Ct7	350	400	±0.06	0.05	0.120	～0.020	—	2200	4000
SR0812-400R400C10	320	Ct10	350	400	±0.24	0.21	0.240	～0.050			

Note)Please designate end-journal profile with your sketch. 注)轴端的追加加工请结合图纸进行指示。

Standard products in stock SR series
标准库存品 SR系列

SR1002 | Shaft dia.(轴径)φ10 Lead(导程)2mm | Ct7&Ct10

＊Please refer to page A284 for stainless steel type.
※不锈钢型请参照第A284页。



Unit(单位):mm

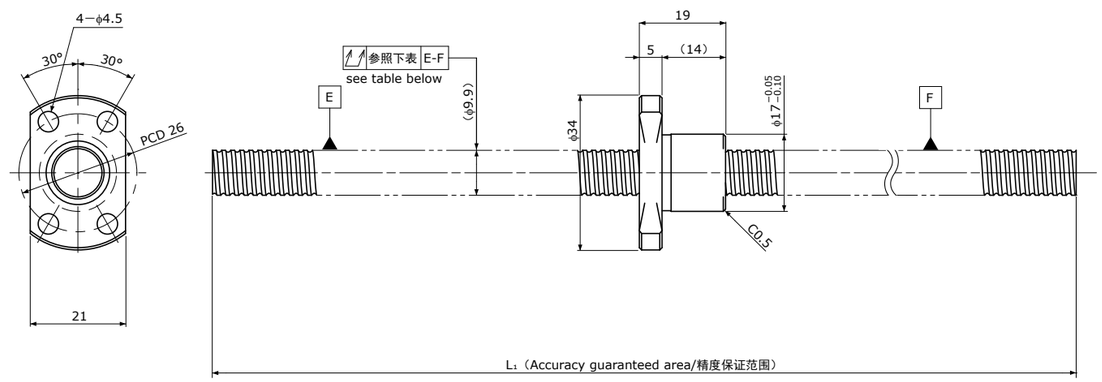
Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ1.5875
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ8.6
Number of circuit 循环数	3.7×1
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度		Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			L_1	L_2	Travel deviation 代表移动量误差 e_p	Variation 波动 V_{300}				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SR1002-400R400C7	325	Ct7	350	400	±0.05	0.05	0.080	～0.020	—	2700	5300
SR1002-400R400C10	325	Ct10	350	400	±0.24	0.21	0.160	～0.050			

Note)Please designate end-journal profile with your sketch. 注)轴端的追加加工请结合图纸进行指示。

SR1002K | Compact Nut / 紧凑型螺母 | Shaft dia.(轴径)φ10 Lead(导程)2mm | Ct7&Ct10



Unit(单位):mm

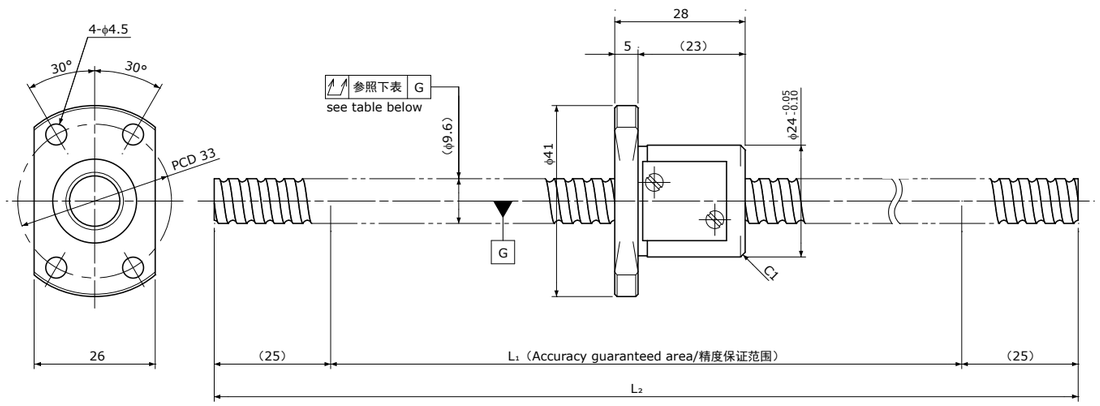
Ball Screw Specifications 主要技术参数		
Ball size 钢珠直径		φ1.2
Number of thread 螺纹条数		1
Thread direction 螺纹旋向		Right 右旋
Shaft root dia. 丝杠轴底径		φ9.0
Number of circuit 循环数		1×3
Material 材质	Shaft 轴	S55C
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度		Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			L_1	L_2	Travel deviation 代表移动量误差 e_p	Variation 波动 V_{300}				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SR1002K-230R230C7	200	Ct7	230	—	±0.03	—	0.080	～0.020	—	1450	3000
SR1002K-230R230C10	200	Ct10	230	—	±0.16	—	0.160	～0.050			

Note)Please designate end-journal profile with your sketch. 注)轴端的追加加工请结合图纸进行指示。

SR1004 | Shaft dia.(轴径)φ10 Lead(导程)4mm | Ct7&Ct10



Unit(单位):mm

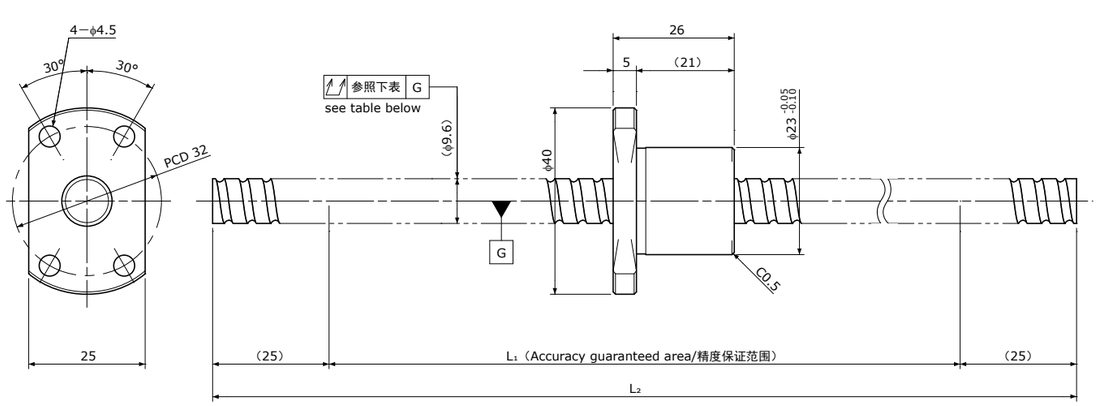
Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ2.0
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ8.2
Number of circuit 循环数	2.7×1
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度		Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			L_1	L_2	Travel deviation 代表移动量误差 e_p	Variation 波动 V_{300}				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SR1004-450R450C7	370	Ct7	400	450	±0.06	0.05	0.120	～0.020	—	3000	5200
SR1004-450R450C10	370	Ct10	400	450	±0.28	0.21	0.240	～0.050			

Note)Please designate end-journal profile with your sketch. 注)轴端的追加加工请结合图纸进行指示。

SR1005 | Shaft dia.(轴径)φ10 Lead(导程)5mm | Ct7&Ct10



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ2.0
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ8.2
Number of circuit 循环数	2.7×1
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

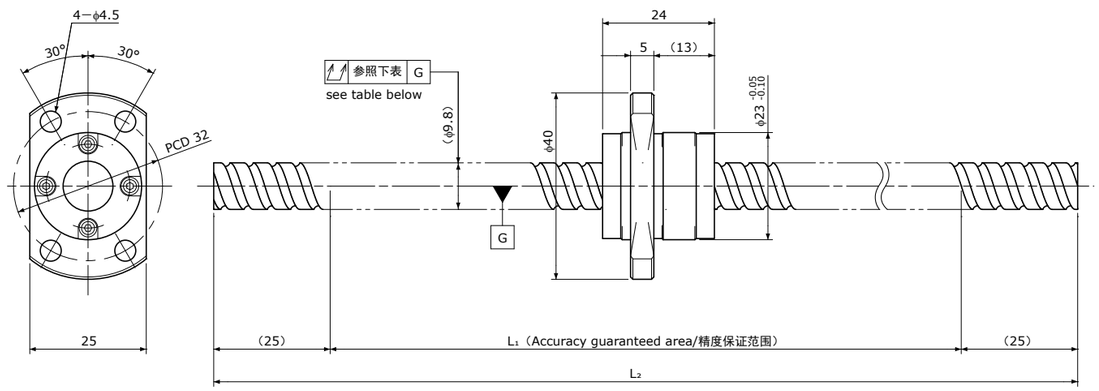
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度		Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			L_1	L_2	Travel deviation 代表移动量误差 e_p	Variation 波动 V_{300}				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SR1005-450R450C7	370	Ct7	400	450	±0.06	0.05	0.120	～0.020	—	3000	5200
SR1005-450R450C10	370	Ct10	400	450	±0.28	0.21	0.240	～0.050			

Note)Please designate end-journal profile with your sketch. 注)轴端的追加加工请结合图纸进行指示。

Standard products in stock SR series 标准库存品 SR系列

SR1010 | Shaft dia.(轴径)φ10 Lead(导程)10mm | Ct7&Ct10



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ2.0
Number of thread 螺纹条数	2
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ8.4
Number of circuit 循环数	1.6×2
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Unit(单位):mm

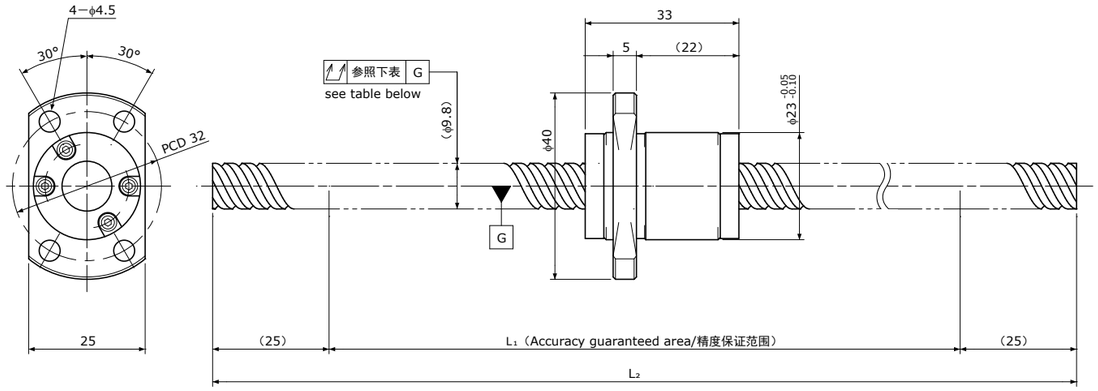
Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度		Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			L_1	L_2	Travel deviation 代表移动量误差 e_p	Variation 波动 V_{300}				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SR1010-450R450C7	375	Ct7	400	450	±0.06	0.05	0.120	～0.020	—	3300	5900
SR1010-450R450C10	375	Ct10	400	450	±0.28	0.21	0.240	～0.050			

Note)Please designate end-journal profile with your sketch. 注)轴端的追加加工请结合图纸进行指示。

Standard products in stock SR series 标准库存品 SR/SSR系列

Standard products in stock SR series 标准库存品 SR系列

SR1015 | Shaft dia.(轴径)φ10 Lead(导程)15mm | Ct7&Ct10



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ2.0
Number of thread 螺纹条数	2
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ8.4
Number of circuit 循环数	1.6×2
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

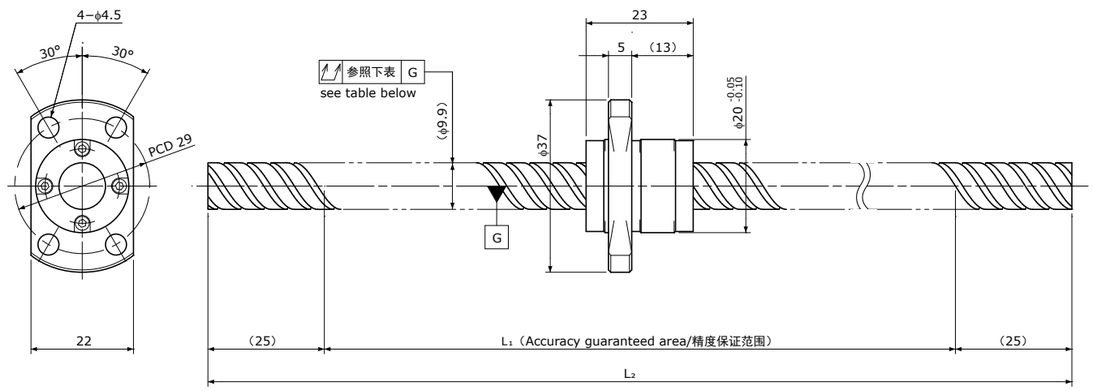
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度		Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			L_1	L_2	Travel deviation 代表移动量误差 e_p	Variation 波动 V_{300}				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SR1015-450R450C7	365	Ct7	400	450	±0.06	0.05	0.120	～0.020	—	3300	6400
SR1015-450R450C10	365	Ct10	400	450	±0.28	0.21	0.240	～0.050			

Note)Please designate end-journal profile with your sketch. 注)轴端的追加加工请结合图纸进行指示。

Standard products in stock SR series 标准库存品 SR系列

SR1020 | Shaft dia.(轴径)φ10 Lead(导程)20mm | Ct7&Ct10



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ1.5875
Number of thread 螺纹条数	4
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ8.7
Number of circuit 循环数	0.7×4
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

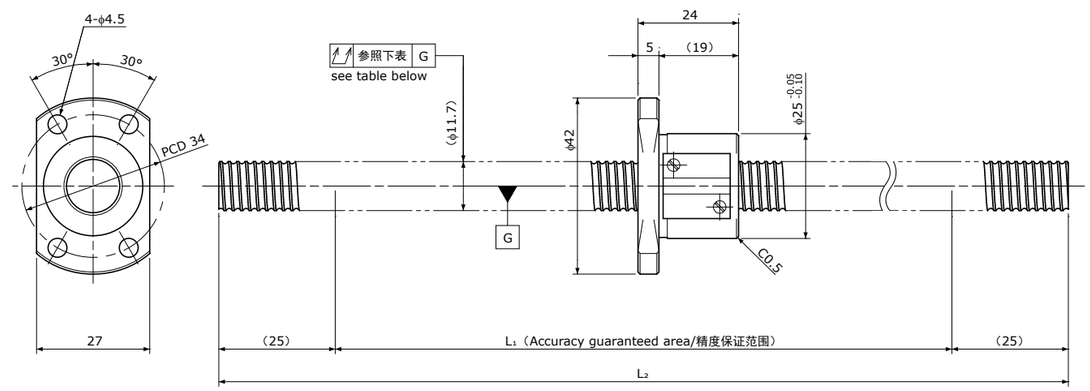
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度		Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			L_1	L_2	Travel deviation 代表移动量误差 e_p	Variation 波动 V_{300}				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SR1020-450R450C7	375	Ct7	400	450	±0.06	0.05	0.120	～0.020	—	2100	4000
SR1020-450R450C10	375	Ct10	400	450	±0.28	0.21	0.240	～0.050			

Note)Please designate end-journal profile with your sketch. 注)轴端的追加加工请结合图纸进行指示。

Standard products in stock SR series 标准库存品 SR系列

SR1202 | Shaft dia.(轴径)φ12 Lead(导程)2mm | Ct7&Ct10



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ1.5875
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ10.6
Number of circuit 循环数	3.7×1
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Unit(单位):mm

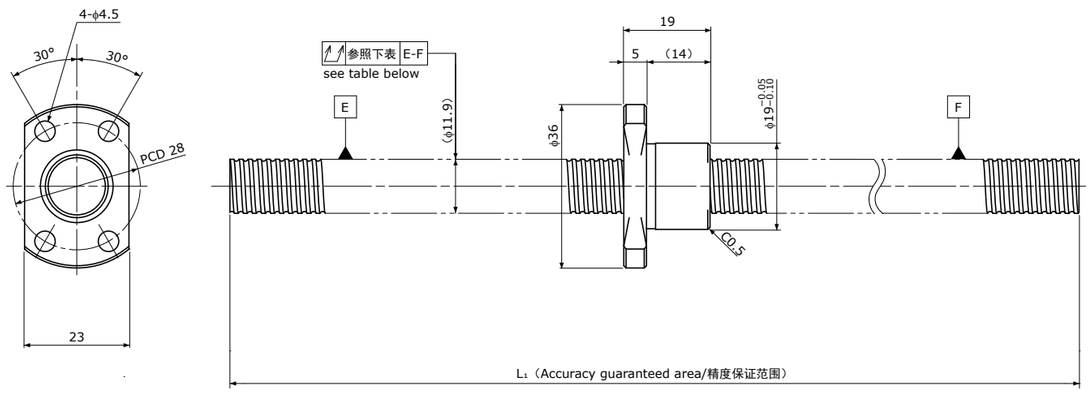
Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度		Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			L_1	L_2	Travel deviation 代表移动量误差 e_p	Variation 波动 V_{300}				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SR1202-450R450C7	375	Ct7	400	450	±0.06	0.05	0.080	～0.020	—	3000	6400
SR1202-450R450C10	375	Ct10	400	450	±0.28	0.21	0.160	～0.050			

Note)Please designate end-journal profile with your sketch. 注)轴端的追加加工请结合图纸进行指示。

SR1202K

Compact Nut / 紧凑型螺母

Shaft dia.(轴径)φ12 Lead(导程)2mm | Ct7&Ct10



Unit(单位):mm

Ball Screw Specifications 主要技术参数		
Ball size 钢珠直径		φ1.2
Number of thread 螺纹条数		1
Thread direction 螺纹旋向		Right 右旋
Shaft root dia. 丝杠轴底径		φ11.0
Number of circuit 循环数		1×3
material 材质	Shaft 轴	S55C
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

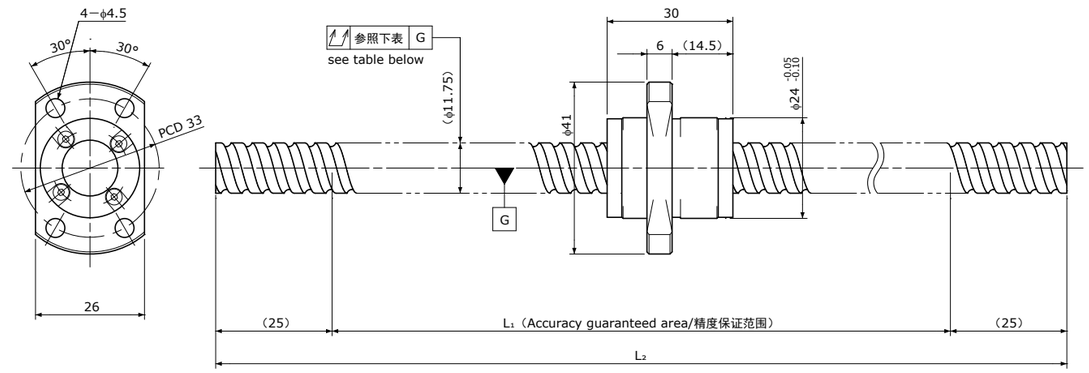
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度		Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			L_1	L_2	Travel deviation 代表移动量误差 e_p	Variation 波动 V_{300}				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SR1202K-280R280C7	250	Ct7	280	—	±0.04	—	0.080	～0.020	—	1600	3700
SR1202K-280R280C10	250	Ct10	280	—	±0.19	—	0.160	～0.050			

Note)Please designate end-journal profile with your sketch. 注)轴端的追加加工请结合图纸进行指示。

SR1210

Shaft dia.(轴径)φ12 Lead(导程)10mm | Ct7&Ct10



Unit(单位):mm

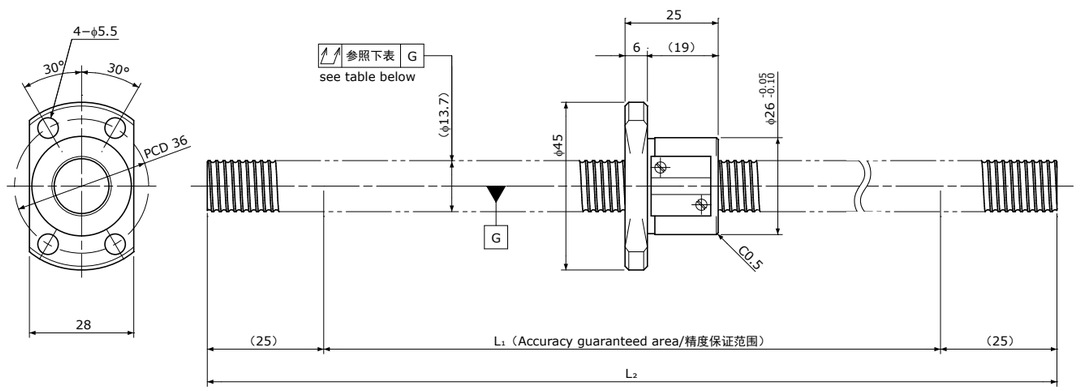
Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ2.381
Number of thread 螺纹条数	2
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ10.2
Number of circuit 循环数	1.7×2
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度		Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			L_1	L_2	Travel deviation 代表移动量误差 e_p	Variation 波动 V_{300}				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SR1210-450R450C7	370	Ct7	400	450	±0.06	0.05	0.080	～0.020	—	5100	9800
SR1210-450R450C10	370	Ct10	400	450	±0.28	0.21	0.160	～0.050			

Note)Please designate end-journal profile with your sketch. 注)轴端的追加加工请结合图纸进行指示。

SR1402 | Shaft dia.(轴径)φ14 Lead(导程)2mm | Ct7&Ct10



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ1.5875
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ12.6
Number of circuit 循环数	3.7×1
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

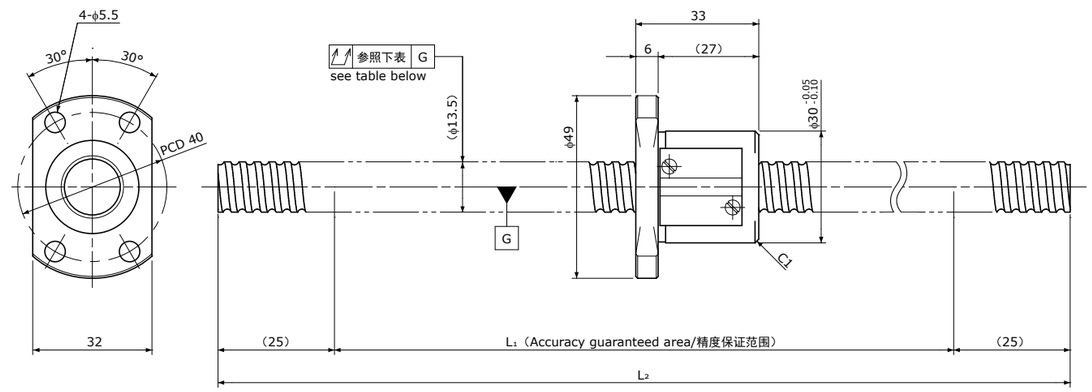
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度		Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			L_1	L_2	Travel deviation 代表移动量误差 e_p	Variation 波动 V_{300}				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SR1402-500R500C7	425	Ct7	450	500	±0.07	0.05	0.080	～0.020	—	3200	7500
SR1402-500R500C10	425	Ct10	450	500	±0.31	0.21	0.160	～0.050			

Note)Please designate end-journal profile with your sketch. 注)轴端的追加加工请结合图纸进行指示。

Standard products in stock SR series 标准库存品 SR系列

SR1404 | Shaft dia.(轴径)φ14 Lead(导程)4mm | Ct7&Ct10



Unit(单位):mm

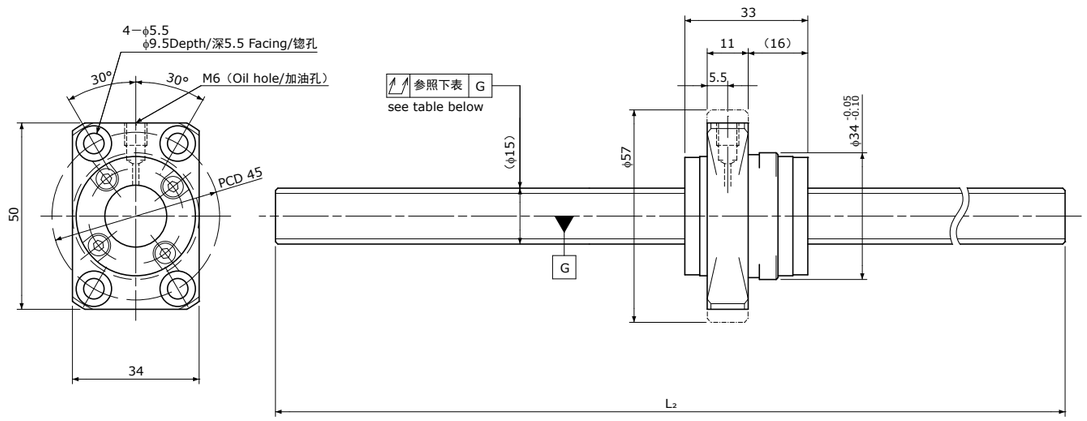
Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ2.381
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ11.8
Number of circuit 循环数	3.7×1
Shaft, Nut material 轴、螺母材质	SCM415H
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度		Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			L_1	L_2	Travel deviation 代表移动量误差 e_p	Variation 波动 V_{300}				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SR1404-500R500C7	415	Ct7	450	500	±0.07	0.05	0.080	～0.020	—	5700	11600
SR1404-500R500C10	415	Ct10	450	500	±0.31	0.21	0.160	～0.050			

Note)Please designate end-journal profile with your sketch. 注)轴端的追加加工请结合图纸进行指示。

SR1505 | Shaft dia.(轴径)φ15 Lead(导程)5mm | Ct10



Unit(单位):mm

Ball Screw Specifications 主要技术参数		
Ball size 钢珠直径		φ3.175
Number of thread 螺纹条数		1
Thread direction 螺纹旋向		Right 右旋
Shaft root dia. 丝杠轴底径		φ12.2
Number of circuit 循环数		3.7×1
Material 材质	Shaft 轴	SUJ2
	Nut 螺母	SCM415
Surface hardness 螺纹部表面硬度		HRC58～62 (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

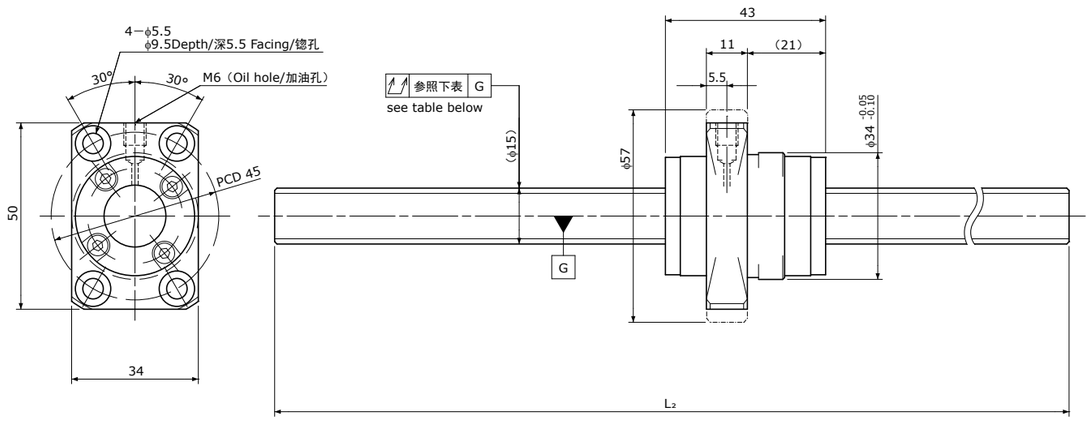
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度		Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			L_1	L_2	Travel deviation 代表移动量误差 e_p	Variation 波动 V_{300}				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SR1505-1000R1000C10	965	Ct10	—	1000	±0.7	0.21	0.400	～0.050	—	8900	17000

Note)Please designate end-journal profile with your sketch. 注)轴端的追加加工请结合图纸进行指示。

Standard products in stock SR series 标准库存品 SR系列

SR1510 | Shaft dia.(轴径)φ15 Lead(导程)10mm | Ct10



Unit(单位):mm

Ball Screw Specifications 主要技术参数		
Ball size 钢珠直径		φ3.175
Number of thread 螺纹条数		2
Thread direction 螺纹旋向		Right 右旋
Shaft root dia. 丝杠轴底径		φ12.2
Number of circuit 循环数		2.7×2
Material 材质	Shaft 轴	SUJ2
	Nut 螺母	SCM415
Surface hardness 螺纹部表面硬度		HRC58～62 (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

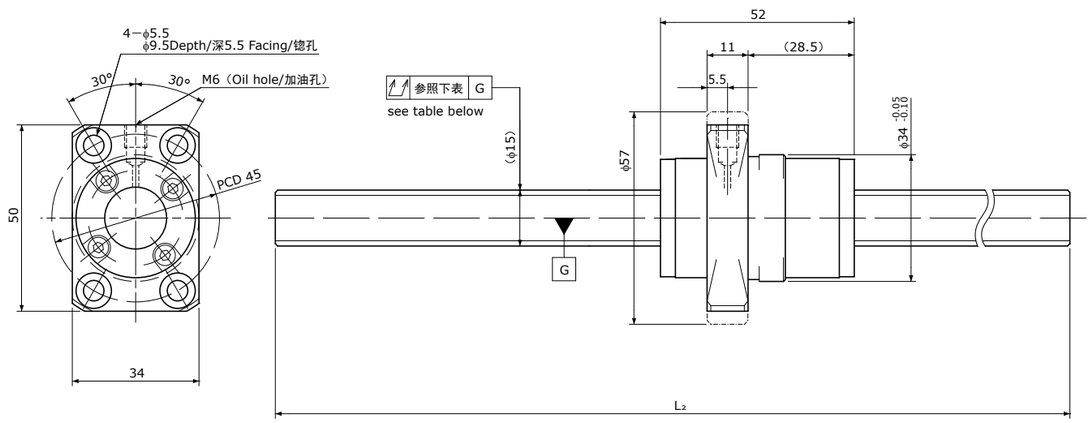
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度		Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			L_1	L_2	Travel deviation 代表移动量误差 e_p	Variation 波动 V_{300}				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SR1510-1000R1000C10	955	Ct10	—	1000	±0.7	0.21	0.400	～0.050	—	12000	25000

Note)Please designate end-journal profile with your sketch. 注)轴端的追加加工请结合图纸进行指示。

Standard products in stock SR series
标准库存品 SR系列

SR1520 | Shaft dia.(轴径)φ15 Lead(导程)20mm | Ct10



Unit(单位):mm

Ball Screw Specifications 主要技术参数		
Ball size 钢珠直径		φ3.175
Number of thread 螺纹条数		2
Thread direction 螺纹旋向		Right 右旋
Shaft root dia. 丝杠轴底径		φ12.7
Number of circuit 循环数		1.7×2
Material 材质	Shaft 轴	SUJ2
	Nut 螺母	SCM415
Surface hardness 螺纹部表面硬度		HRC58～62 (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

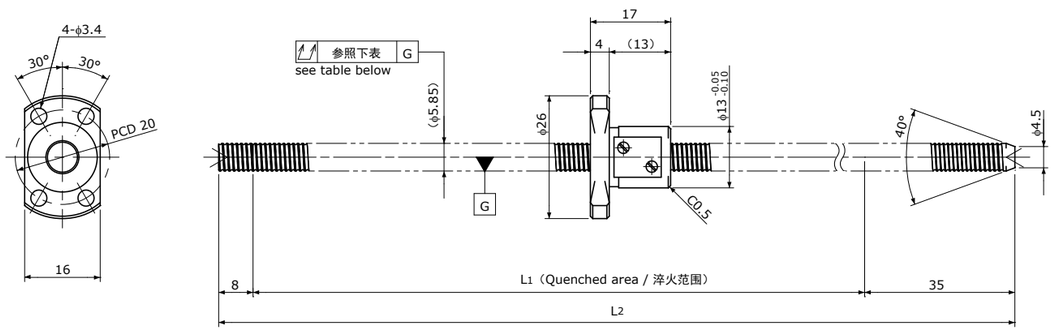
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度		Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			L_1	L_2	Travel deviation 代表移动量误差 e_p	Variation 波动 V_{300}				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SR1520-1000R1000C10	945	Ct10	—	1000	±0.7	0.21	0.400	～0.050	—	8000	16000

Note)Please designate end-journal profile with your sketch. 注)轴端的追加加工请结合图纸进行指示。

Standard products in stock SSR series 标准库存品 SSR系列

SSR0601 | Stainless 不锈钢 Shaft dia.(轴径)φ6 Lead(导程)1mm | Ct7&Ct10



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ0.8
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ5.3
Number of circuit 循环数	3.7×1
Shaft,Nut material 轴、螺母材质	SUS440C
Surface hardness 螺纹部表面硬度	HRC55～ (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

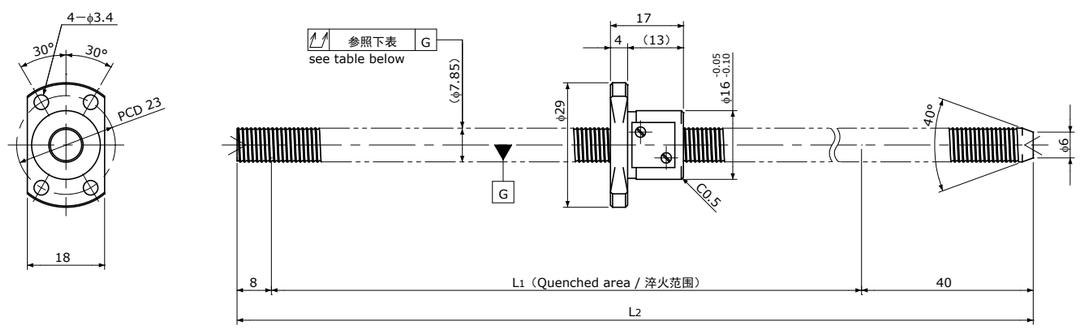
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度		Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			L_1	L_2	Travel deviation 代表移动量误差 e_p	Variation 波动 V_{300}				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SSR0601-300C7	240	Ct7	257	300	±0.04	0.05	0.120	～0.020	—	560	900
SSR0601-300C10	240	Ct10	257	300	±0.17	0.21	0.240	～0.050			

Note)Please designate end-journal profile with your sketch. 注)轴端的追加加工请结合图纸进行指示。

Standard products in stock SSR series 标准库存品 SSR系列

SSR0801 | Stainless 不锈钢 Shaft dia.(轴径)φ8 Lead(导程)1mm | Ct7&Ct10



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ0.8
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ7.3
Number of circuit 循环数	3.7×1
Shaft,Nut material 轴、螺母材质	SUS440C
Surface hardness 螺纹部表面硬度	HRC55～ (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

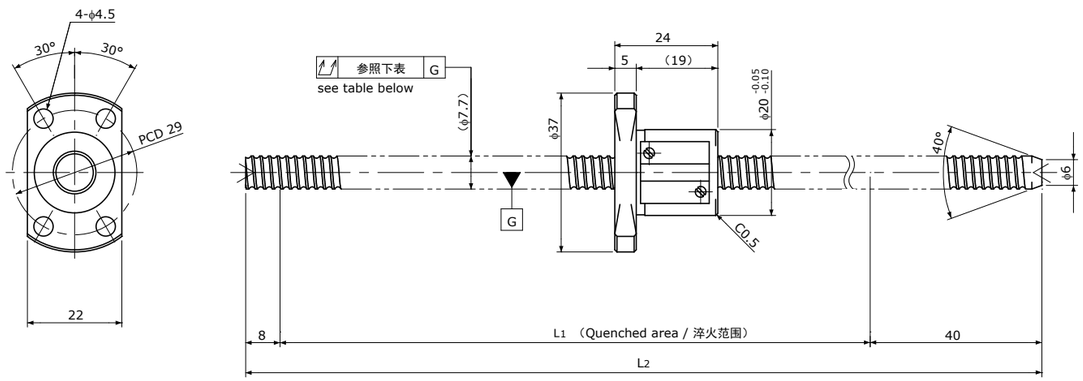
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度		Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			L_1	L_2	Travel deviation 代表移动量误差 e_p	Variation 波动 V_{300}				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SSR0801-400C7	335	Ct7	352	400	±0.06	0.05	0.120	～0.020	—	630	1250
SSR0801-400C10	335	Ct10	352	400	±0.24	0.21	0.240	～0.050			

Note)Please designate end-journal profile with your sketch. 注)轴端的追加加工请结合图纸进行指示。

Standard products in stock SSR series 标准库存品 SSR系列

SSR0802 | Stainless 不锈钢 Shaft dia.(轴径)φ8 Lead(导程)2mm | Ct7&Ct10



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ1.5875
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ6.6
Number of circuit 循环数	3.7×1
Shaft,Nut material 轴、螺母材质	SUS440C
Surface hardness 螺纹部表面硬度	HRC55～ (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

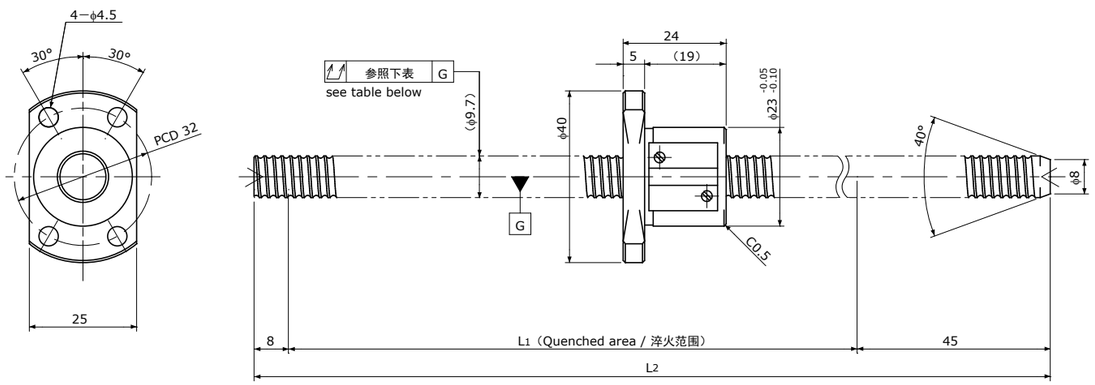
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度		Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			L_1	L_2	Travel deviation 代表移动量误差 e_p	Variation 波动 V_{300}				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SSR0802-400C7	325	Ct7	352	400	±0.06	0.05	0.120	～0.020	—	1950	3100
SSR0802-400C10	325	Ct10	352	400	±0.24	0.21	0.240	～0.050			

Note)Please designate end-journal profile with your sketch. 注)轴端的追加加工请结合图纸进行指示。

Standard products in stock SSR series 标准库存品 SSR系列

SSR1002 | Stainless 不锈钢 Shaft dia.(轴径)φ10 Lead(导程)2mm | Ct7&Ct10



Unit(单位):mm

Ball Screw Specifications 主要技术参数	
Ball size 钢珠直径	φ1.5875
Number of thread 螺纹条数	1
Thread direction 螺纹旋向	Right 右旋
Shaft root dia. 丝杠轴底径	φ8.6
Number of circuit 循环数	3.7×1
Shaft,Nut material 轴、螺母材质	SUS440C
Surface hardness 螺纹部表面硬度	HRC55～ (Thread area)
Anti-rust treatment 防锈处理	Anti-rust oil 防锈油

Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度		Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			L_1	L_2	Travel deviation 代表移动量误差 e_p	Variation 波动 V_{300}				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SSR1002-400C7	320	Ct7	347	400	±0.06	0.05	0.080	～0.020	—	2200	4000
SSR1002-400C10	320	Ct10	347	400	±0.24	0.21	0.160	～0.050			

Note)Please designate end-journal profile with your sketch. 注)轴端的追加加工请结合图纸进行指示。

SRT/SSRT系列 台阶型冷轧滚珠丝杠标准库存品
SRT/SSRT series
Standardized Rolled Ball Screws with Integrated end-journal

由于加工上的关系，传统的冷轧滚珠丝杠在加工时需要缩小轴端直径。但通过采用本公司的特殊技术，可以像切削加工品一样，将单侧（固定侧）设定得比滚珠丝杠部大。

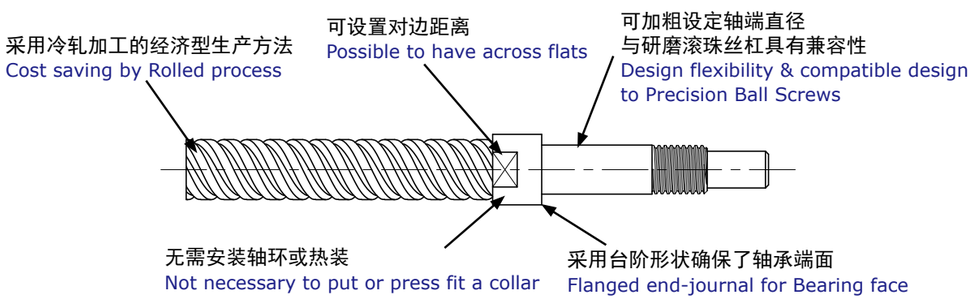
For production reason, Rolled Ball Screws are normally necessary to have smaller end-journal, but as KSS have adopted special technology, it enables fixed end-journal bigger than Shaft diameter alike Ground Ball Screws. This technology enables stable and more flexible on end-journal design.

●特点

- 轴端直径可进行加粗设计，因此可使用台阶形或具有通用性的轴承。
- 与精密滚珠丝杠（切削加工品）的标准轴端形状具有兼容性。
- 与插入轴环及热装相比，稳定性更高。
- 由于不加工轴端而进行库存管理，提高了设计自由度。
- 也可提供具有防锈功能的不锈钢滚珠丝杠。

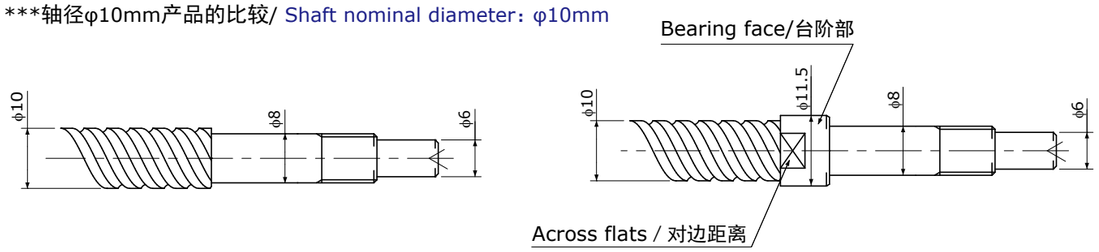
●Features

- Design flexibility and wide use of Bearings on end-journal.
- Compatible end-journal to Precision Ball Screws.
- No need to insert or press fit collar as Bearing shoulder.
- Quick delivery due to unfinished end-journal stock.
- Stainless Rolled Ball Screws are also available.



●与传统产品的比较 Comparison with current model

***轴径φ10mm产品的比较/ Shaft nominal diameter：φ10mm



传统产品的轴端形状/ Current model design

新产品的轴端形状/New model design

●丝杠轴公称外径与导程的组合 Combination of Shaft nominal dia. & Lead

Unit（单位）：mm

Shaft dia. 公称外径 \ Lead 导程	1	2	2.5	4	5	6	8	10	12	15	20
4	A289 A290	A291									
5				A292							
6	A293 A294 A315	A295				A296		A297			
8	A298 A299 A316	A300 A301 A317	A302		A303		A304		A305		
10		A306 A307 A318			A308			A309		A310	A311
12		A312 A313						A314			

注1）用黄色标示的型号可提供不锈钢滚珠丝杠。
注2）表中的数字表示产品刊载页码。

Note 1）Yellow cells are available for Stainless Shaft and Nut.
Note 2）The numbers in a table ：showing a page in this catalogue

●精度等级和轴向间隙

SRT/SSRT系列（台阶型冷轧/台阶型不锈钢冷轧滚珠丝杠标准库存品）的精度等级为Ct7及Ct10（JIS B 1192-3）。轴向间隙根据精度等级不同备有0.020mm以下（Ct7）及0.050mm以下（Ct10）两种。

●Accuracy Grade & Axial play

The grade of SRT/SSRT series （Standardized Rolled & Stainless Rolled Ball Screws with Integrated end-journal） are Ct7 and Ct10（JIS B 1192-3）. According to accuracy grade, Axial play 0.020mm or less （Ct7） and 0.050mm or less（Ct10） are in stock.

●材质和表面硬度

SRT/SSRT系列（台阶型冷轧/台阶型不锈钢冷轧滚珠丝杠标准库存品）的材质和表面硬度如下所示。

●Material & Surface hardness

The material and hardness of SRT/SSRT series （Standardized Rolled & Stainless Rolled Ball Screws with Integrated end-journal） are as follows.

Products 产品类别	Material of thread area 滚珠丝杠部材质	Heat treatment 热处理	Surface hardness 滚珠丝杠部的表面硬度
Rolled Ball Screws （SRT series ） 普通冷轧（SRT系列）	Shaft/丝杠轴： SCM415 S55C	Carburizing and Quenching 渗碳淬火 Induction hardening 高频淬火	HRC58 or more HRC58以上
	Nut/螺母：SCM415		
Stainless Rolled Ball Screws （SSRT series ） 不锈钢冷轧（SSRT系列）	Shaft/丝杠轴：SUS440C	Induction hardening 高频淬火	HRC55 or more HRC55以上
	Nut/螺母：SUS440C	Vacuum hardening 真空淬火	

●润滑

为了防锈，未对轴端进行加工的SRT/SSRT系列（台阶型冷轧/台阶型不锈钢冷轧滚珠丝杠标准库存品）产品均涂抹有防锈油。
由于防锈油不具备润滑性，因此在使用前请另行涂抹润滑剂。如无特殊指定，建议使用KSS原装润滑油脂（MSG No.2）。

●Lubrication

SRT/SSRT series (Standardized Rolled & Stainless Rolled Ball Screws with Integrated end-journal) will be supplied with anti-rust oil.
This oil is not lubricant, when Ball Screw operates, lubricant should be applied.
If there is no specific instruction, KSS would recommend our original Grease (MSG No.2) as standard lubricant. Please feel free to contact us.

●精密冷轧滚珠丝杠

也可生产实现了高精度（JIS C5）的冷轧滚珠丝杠（PSR/PSRT系列）。请参照A319页。

●Precision Rolled Ball Screws

High accuracy (JIS C5) can be produced by Rolled process, what we call Precision Rolled Ball Screws (PSR/PSRT series). Please see page -A319.

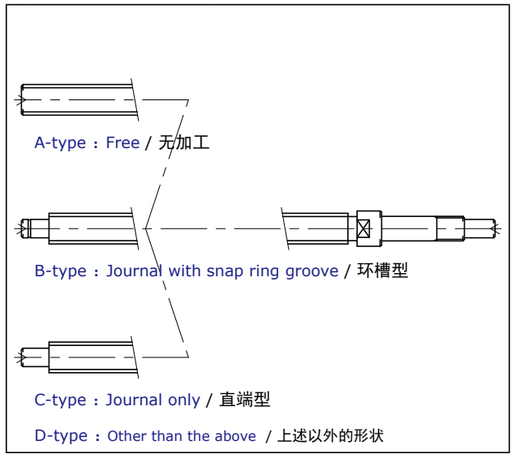
●公称型号的构成 Model number notation

SRT 04 01 K — 086 R 126 C7 B 1 X
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

①系列符号
SRT ：台阶型冷轧滚珠丝杠
SSRT：台阶型不锈钢冷轧滚珠丝杠
②丝杠轴公称外径（mm）
③导程（mm）
④螺母类型
无符号：普通型
K：紧凑型
⑤螺纹部长度（mm）
（追加加工后以1mm为单位指定）
⑥螺纹旋向（R=右旋）
⑦丝杠轴总长（mm）
（以1mm为单位指定）
⑧精度等级（C7或C10）
⑨轴端加工类型
（参照图A-24 ：A-型、B-型、C-型）
D-type（其他）
⑩涂抹的油脂
0：KSS推荐的润滑脂（MSG No.2）
1：防锈油（Non Ruster PZ2）
2：Multemp PS2
3：其他
⑪螺母法兰朝向（参照图A-25）

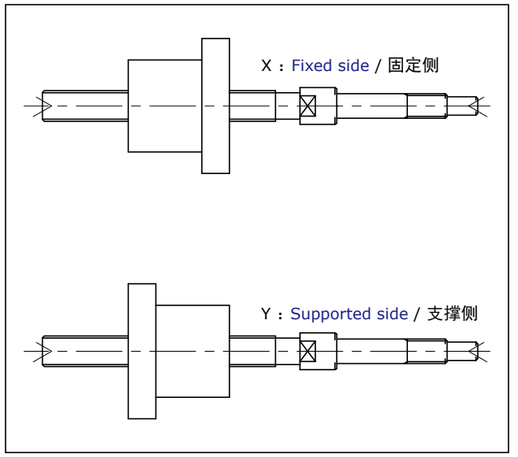
①Rolled Ball Screws Series No.
SRT ：Rolled Ball Screws with Integrated end-journal
SSRT：Stainless Rolled Ball Screws with Integrated end-journal
②Screw Shaft nominal diameter (mm)
③Lead (mm)
④Ball Nut type
None：Standard
K：Compact type
⑤Screw thread length (mm)
(Specify in 1mm unit after end-journal machining)
⑥Thread direction (R=Right-hand)
⑦Screw Shaft total length (mm)
(Specify in 1mm unit)
⑧Accuracy grade (C7 or C10)
⑨Shaft end-journal profile
(Refer to Fig. A-24 below : A-type,B-type,C-type
D-type (oher)
⑩Anti-rust oil or Lubricant
0: KSS grease (MSG No.2)
1: Anti-rust oil (Non Ruster PZ2)
2: Multemp PS2 grease
3: Other
⑪Nut Flange direction (Refer to Fig. A-25 below)

图A-24 ：轴端加工类型
Fig. A-24 : Shaft end-journal profile



注1）关于轴端的详细尺寸，请参照各页。
注2）本公司不进行螺母的追加加工。
注3）产品规格若有变更，恕不另行通告。
注4）若需要非标准的轴端形状（A、B、C），请垂询本公司。

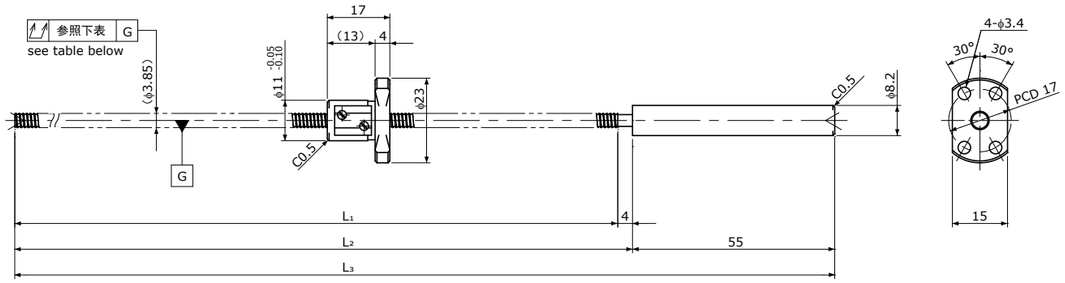
图A-25 ：螺母法兰朝向
Fig. A-25 : Nut Flange direction



Note 1) The detail of end-journal dimension for each size is shown from next page.
Note 2) KSS does not make additional Nut machining.
Note 3) The specification is subject to change without notice.
Note 4) If the other configuration except (A,B,C) is requested, please contact KSS.

Standard products in stock SRT series
标准库存品 SRT系列

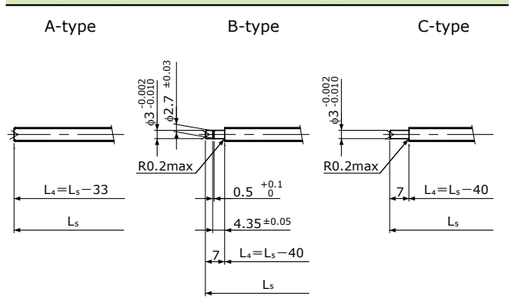
SRT0401 | Shaft dia.(轴径)φ4 Lead(导程)1mm | Ct7&Ct10



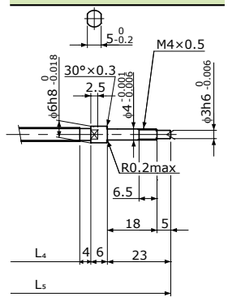
Unit(单位):mm

Ball Screw Specifications 主要技术参数		
Ball size 钢珠直径		φ0.8
Number of thread 螺纹条数		1
Thread direction 螺纹旋向		Right 右旋
Shaft root dia. 丝杠轴底径		φ3.3
Number of circuit 循环数		3.7×1
Material 材质	Shaft 轴	SCM415H+SUS303
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

End-journal profile 轴端加工形状 Supported-side 支撑侧



Fixed-side 固定侧



L₄:Thread length after end-journal machining. 追加加工后的螺纹部长度
Lₛ:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side	支撑侧 :	MSU-4CS/4G
	Fixed-side	固定侧 :	MSU-4C/4G

D-type : Other than the above. 上述以外的形状

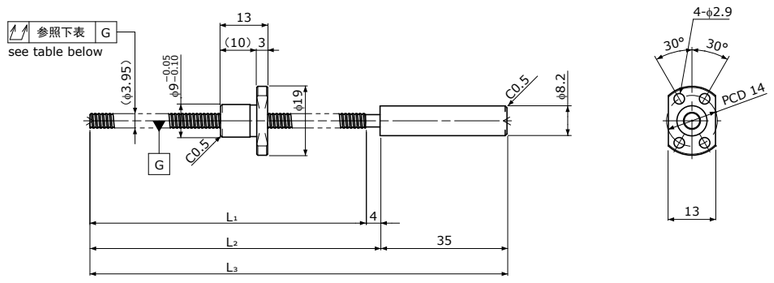
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L₁	L₂	L₃	Lead accuracy 导程精度 Travel deviation 代表移动量误差 eₚ	Variation 波动 V₃₀₀	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SRT0401-096R155C7	75	Ct7	96	100	155	±0.02	—	0.080	～0.020	—	560	790
SRT0401-216R275C7	195	Ct7	216	220	275	±0.03	—	0.120				
SRT0401-096R155C10	75	Ct10	96	100	155	±0.06	—	0.160	～0.050			
SRT0401-216R275C10	195	Ct10	216	220	275	±0.15	—	0.240				

Note)Please refer to page A287 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A287页。

Standard products in stock SRT series
标准库存品 SRT系列

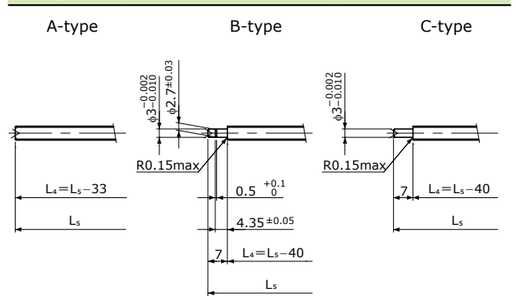
SRT0401K | Compact Nut / 紧凑型螺母 Shaft dia.(轴径)φ4 Lead(导程)1mm | Ct7&Ct10



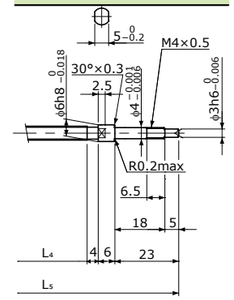
Unit(单位):mm

Ball Screw Specifications 主要技术参数		
Ball size 钢珠直径		φ0.6
Number of thread 螺纹条数		1
Thread direction 螺纹旋向		Right 右旋
Shaft root dia. 丝杠轴底径		φ3.4
Number of circuit 循环数		1×3
Material 材质	Shaft 轴	S55C+SUS303
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

End-journal profile 轴端加工形状 Supported-side 支撑侧



Fixed-side 固定侧



L₄:Thread length after end-journal machining. 追加加工后的螺纹部长度
Lₛ:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side	支撑侧 :	MSU-4CS/4GS
	Fixed-side	固定侧 :	MSU-4C/4G

D-type : Other than the above. 上述以外的形状

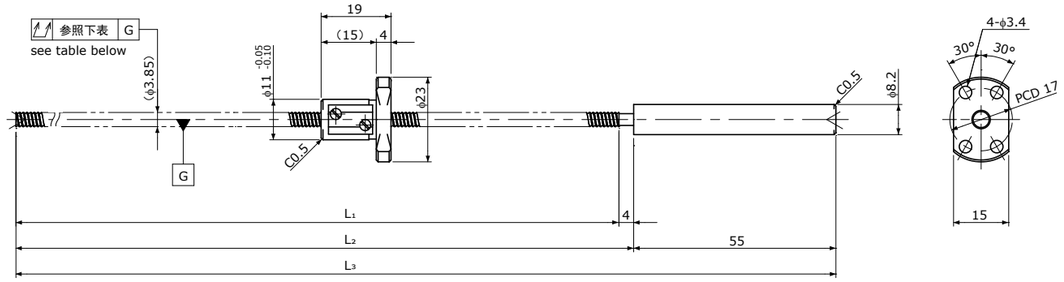
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L₁	L₂	L₃	Lead accuracy 导程精度 Travel deviation 代表移动量误差 eₚ	Variation 波动 V₃₀₀	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SRT0401K-76R115C7	60	Ct7	76	80	115	±0.02	—	0.080	～0.020	—	300	430
SRT0401K-76R115C10	60	Ct10	76	80	115	±0.05	—	0.160	～0.050			

Note)Please refer to page A287 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A287页。

Standard products in stock SRT series 标准库存品 SRT系列

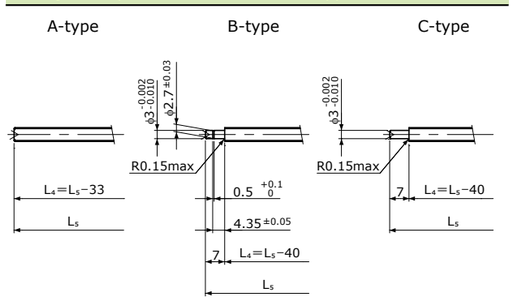
SRT0402 | Shaft dia.(轴径)φ4 Lead(导程)2mm | Ct7&Ct10



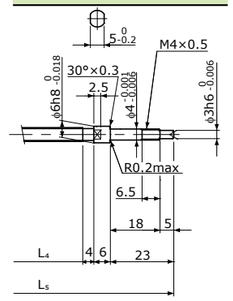
Unit(单位):mm

Ball Screw Specifications 主要技术参数		
Ball size 钢珠直径		φ0.8
Number of thread 螺纹条数		1
Thread direction 螺纹旋向		Right 右旋
Shaft root dia. 丝杠轴底径		φ3.3
Number of circuit 循环数		2.7×1
Material 材质	Shaft 轴	SCM415H+SUS303
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

End-journal profile 轴端加工形状 Supported-side 支撑侧



Fixed-side 固定侧



L4:Thread length after end-journal machining. 追加加工后的螺纹部长度
Ls:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件		
Supported-side 支撑侧 :		MSU-4CS/4GS
Fixed-side 固定侧 :		MSU-4C/4G

D-type : Other than the above. 上述以外的形状

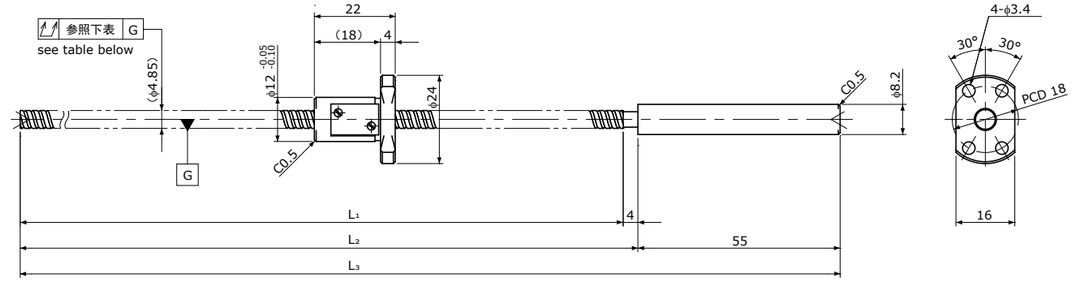
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 V300	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SRT0402-096R155C7	75	Ct7	96	100	155	±0.02	—	0.080	～0.020	—	420	570
SRT0402-216R275C7	195	Ct7	216	220	275	±0.03	—	0.120				
SRT0402-096R155C10	75	Ct10	96	100	155	±0.06	—	0.160	～0.050			
SRT0402-216R275C10	195	Ct10	216	220	275	±0.15	—	0.240				

Note)Please refer to page A287 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A287页。

Standard products in stock SRT series 标准库存品 SRT系列

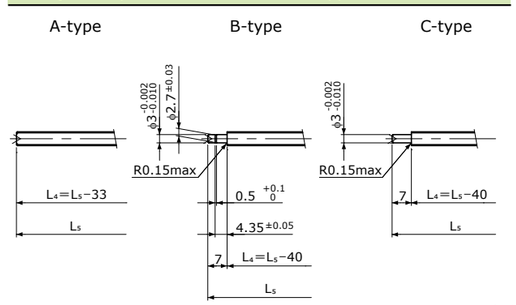
SRT0504 | Shaft dia.(轴径)φ5 Lead(导程)4mm | Ct7&Ct10



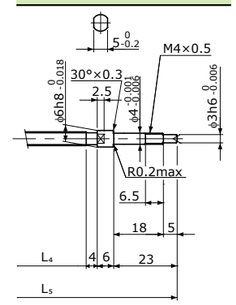
Unit(单位):mm

Ball Screw Specifications 主要技术参数		
Ball size 钢珠直径		φ0.8
Number of thread 螺纹条数		1
Thread direction 螺纹旋向		Right 右旋
Shaft root dia. 丝杠轴底径		φ4.3
Number of circuit 循环数		2.7×1
Material 材质	Shaft 轴	SCM415H+SUS303
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

End-journal profile 轴端加工形状 Supported-side 支撑侧



Fixed-side 固定侧



L4:Thread length after end-journal machining. 追加加工后的螺纹部长度
Ls:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件		
Supported-side 支撑侧 :		MSU-4CS/4GS
Fixed-side 固定侧 :		MSU-4C/4G

D-type : Other than the above. 上述以外的形状

Unit(单位):mm

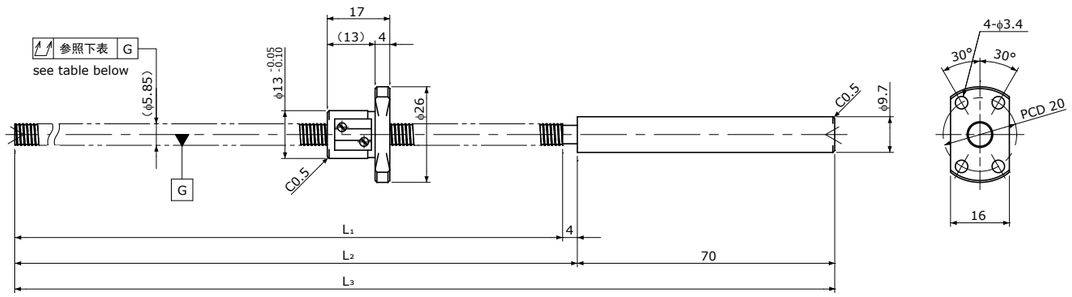
Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 V300	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SRT0504-096R155C7	70	Ct7	96	100	155	±0.02	—	0.080	～0.020	—	470	720
SRT0504-216R275C7	190	Ct7	216	220	275	±0.03	—	0.120				
SRT0504-096R155C10	70	Ct10	96	100	155	±0.06	—	0.160	～0.050			
SRT0504-216R275C10	190	Ct10	216	220	275	±0.15	—	0.240				

Note)Please refer to page A287 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A287页。

Standard products in stock SRT series
标准库存品 SRT系列

SRT0601 | Shaft dia.(轴径)φ6 Lead(导程)1mm | Ct7&Ct10

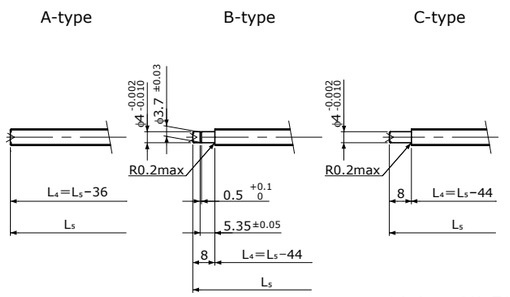
＊Please refer to page A315 for stainless steel type.
※不锈钢型请参照第A315页。



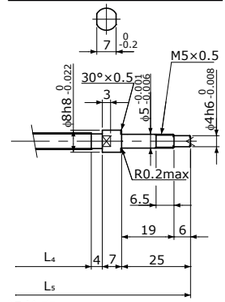
Unit(单位):mm

Ball Screw Specifications 主要技术参数		
Ball size 钢珠直径		φ0.8
Number of thread 螺纹条数		1
Thread direction 螺纹旋向		Right 右旋
Shaft root dia. 丝杠轴底径		φ5.3
Number of circuit 循环数		3.7×1
Material 材质	Shaft 轴	SCM415H+SUS303
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

End-journal profile 轴端加工形状 Supported-side 支撑侧



Fixed-side 固定侧



L₄:Thread length after end-journal machining. 追加加工后的螺纹部长度
Lₛ:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件		
	Supported-side 支撑侧 :	MSU-5CS/5GS
	Fixed-side 固定侧 :	MSU-5C/5G

D-type : Other than the above. 上述以外的形状

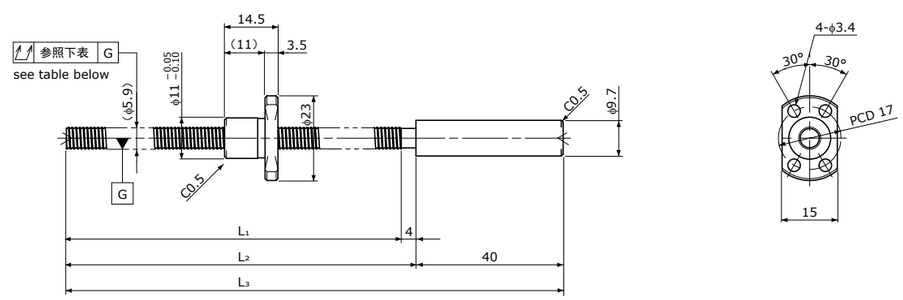
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L₁	L₂	L₃	Lead accuracy 导程精度 Travel deviation 代表移动量误差 eₚ	Variation 波动 V₃₀₀	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SRT0601-146R220C7	125	Ct7	146	150	220	±0.02	—	0.080	～0.020	—	680	1200
SRT0601-261R335C7	240	Ct7	261	265	335	±0.04	—	0.120				
SRT0601-146R220C10	125	Ct10	146	150	220	±0.10	—	0.160	～0.050			
SRT0601-261R335C10	240	Ct10	261	265	335	±0.18	—	0.240				

Note)Please refer to page A287 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A287页。

Standard products in stock SRT series
标准库存品 SRT系列

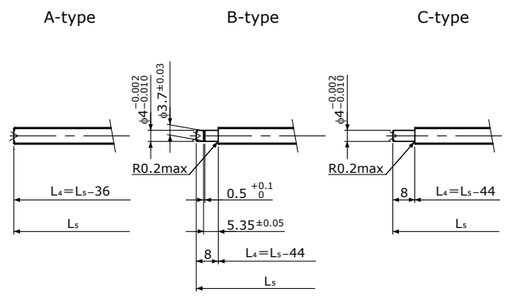
SRT0601K | Compact Nut / 紧凑型螺母 | Shaft dia.(轴径)φ6 Lead(导程)1mm | Ct7&Ct10



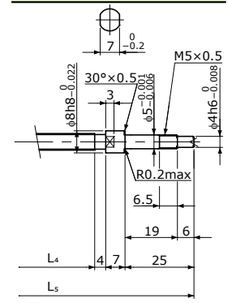
Unit(单位):mm

Ball Screw Specifications 主要技术参数		
Ball size 钢珠直径		φ0.8
Number of thread 螺纹条数		1
Thread direction 螺纹旋向		Right 右旋
Shaft root dia. 丝杠轴底径		φ5.3
Number of circuit 循环数		1×3
Material 材质	Shaft 轴	S55C+SUS303
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

End-journal profile 轴端加工形状 Supported-side 支撑侧



Fixed-side 固定侧



L₄:Thread length after end-journal machining. 追加加工后的螺纹部长度
Lₛ:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件		
	Supported-side 支撑侧 :	MSU-5CS/5GS
	Fixed-side 固定侧 :	MSU-5C/5G

D-type : Other than the above. 上述以外的形状

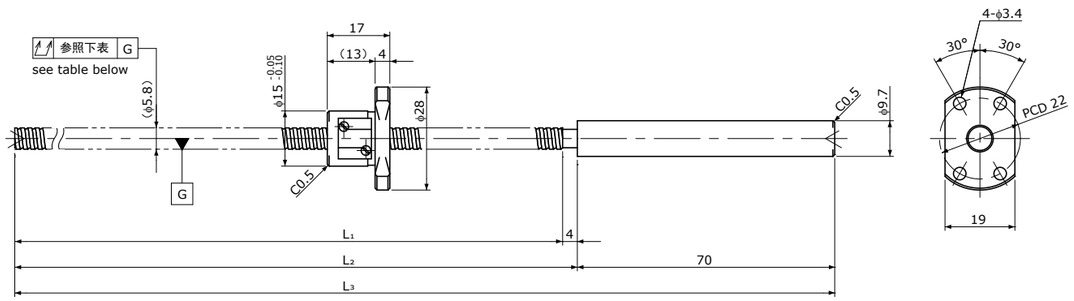
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L₁	L₂	L₃	Lead accuracy 导程精度 Travel deviation 代表移动量误差 eₚ	Variation 波动 V₃₀₀	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SRT0601K-91R135C7	70	Ct7	91	95	135	±0.02	—	0.080	～0.020	—	560	950
SRT0601K-91R135C10	70	Ct10	91	95	135	±0.06	—	0.160	～0.050			

Note)Please refer to page A287 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A287页。

Standard products in stock SRT series
标准库存品 SRT系列

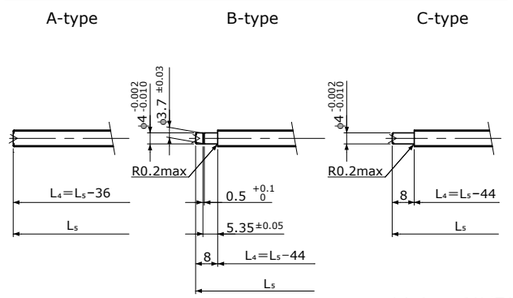
SRT0602 | Shaft dia.(轴径)φ6 Lead(导程)2mm | Ct7&Ct10



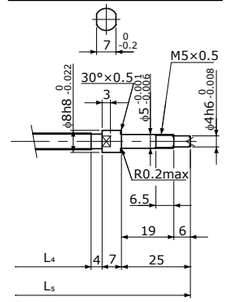
Unit(单位):mm

Ball Screw Specifications 主要技术参数		
Ball size 钢珠直径		φ1.0
Number of thread 螺纹条数		1
Thread direction 螺纹旋向		Right 右旋
Shaft root dia. 丝杠轴底径		φ5.1
Number of circuit 循环数		2.7×1
Material 材质	Shaft 轴	SCM415H+SUS303
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

End-journal profile 轴端加工形状 Supported-side 支撑侧



Fixed-side 固定侧



L4:Thread length after end-journal machining. 追加加工后的螺纹部长度
Ls:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件		
Supported-side 支撑侧 :		MSU-5CS/5GS
Fixed-side 固定侧 :		MSU-5C/5G

D-type : Other than the above. 上述以外的形状

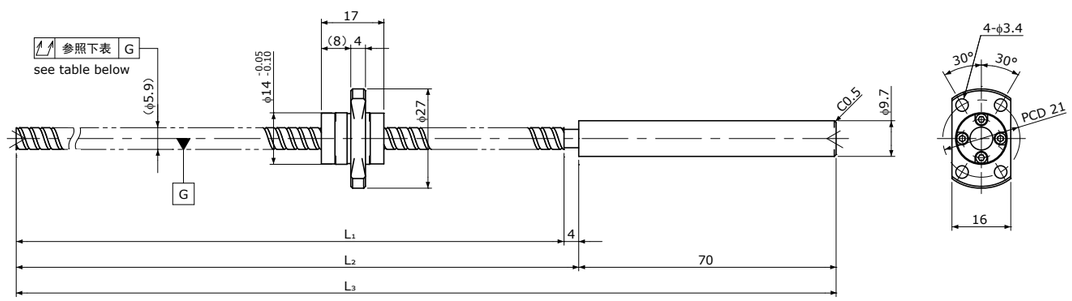
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 V300	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SRT0602-146R220C7	125	Ct7	146	150	220	±0.02	—	0.080	～0.020	—	750	1200
SRT0602-261R335C7	240	Ct7	261	265	335	±0.04	—	0.120				
SRT0602-146R220C10	125	Ct10	146	150	220	±0.10	—	0.160	～0.050			
SRT0602-261R335C10	240	Ct10	261	265	335	±0.18	—	0.240				

Note)Please refer to page A287 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A287页。

Standard products in stock SRT series
标准库存品 SRT系列

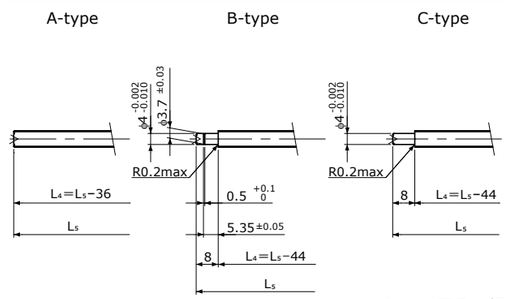
SRT0606 | Shaft dia.(轴径)φ6 Lead(导程)6mm | Ct7&Ct10



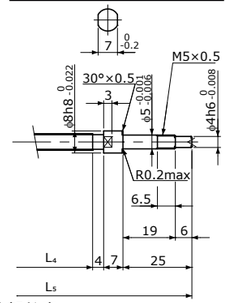
Unit(单位):mm

Ball Screw Specifications 主要技术参数		
Ball size 钢珠直径		φ1.0
Number of thread 螺纹条数		2
Thread direction 螺纹旋向		Right 右旋
Shaft root dia. 丝杠轴底径		φ5.2
Number of circuit 循环数		1.6×2
Material 材质	Shaft 轴	SCM415H+SUS303
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

End-journal profile 轴端加工形状 Supported-side 支撑侧



Fixed-side 固定侧



L4:Thread length after end-journal machining. 追加加工后的螺纹部长度
Ls:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件		
Supported-side 支撑侧 :		MSU-5CS/5GS
Fixed-side 固定侧 :		MSU-5C/5G

D-type : Other than the above. 上述以外的形状

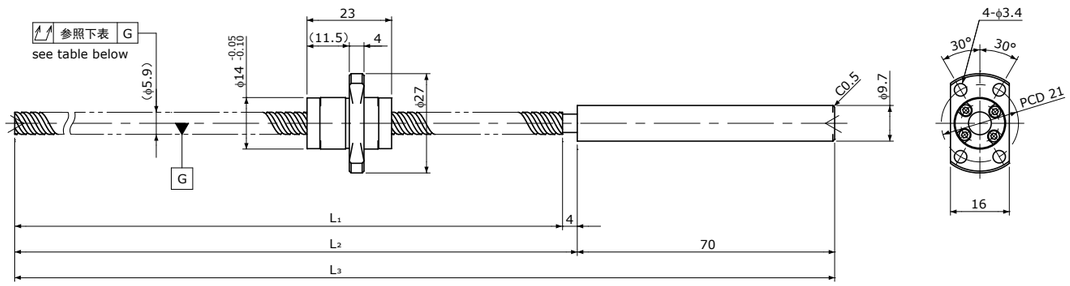
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 V300	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SRT0606-146R220C7	125	Ct7	146	150	220	±0.02	—	0.080	～0.020	—	870	1450
SRT0606-261R335C7	240	Ct7	261	265	335	±0.04	—	0.120				
SRT0606-146R220C10	125	Ct10	146	150	220	±0.10	—	0.160	～0.050			
SRT0606-261R335C10	240	Ct10	261	265	335	±0.18	—	0.240				

Note)Please refer to page A287 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A287页。

Standard products in stock SRT series 标准库存品 SRT系列

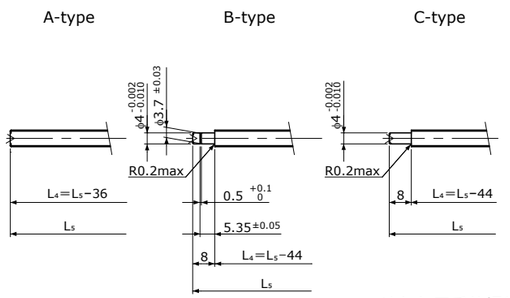
SRT0610 | Shaft dia.(轴径)φ6 Lead(导程)10mm | Ct7&Ct10



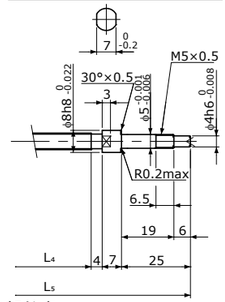
Unit(单位):mm

Ball Screw Specifications 主要技术参数		
Ball size 钢珠直径		φ1.2
Number of thread 螺纹条数		2
Thread direction 螺纹旋向		Right 右旋
Shaft root dia. 丝杠轴底径		φ5.0
Number of circuit 循环数		1.2×2
Material 材质	Shaft 轴	SCM415H+SUS303
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

End-journal profile 轴端加工形状 Supported-side 支撑侧



Fixed-side 固定侧



L₄:Thread length after end-journal machining. 追加加工后的螺纹部长度
Lₛ:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side	支撑侧 :	MSU-5CS/5GS
	Fixed-side	固定侧 :	MSU-5C/5G

D-type : Other than the above. 上述以外的形状

Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L₁	L₂	L₃	Lead accuracy 导程精度 Travel deviation 代表移动量误差 eₚ	Variation 波动 V₃₀₀	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SRT0610-146R220C7	120	Ct7	146	150	220	±0.02	—	0.080	～0.020	—	950	1600
SRT0610-261R335C7	235	Ct7	261	265	335	±0.04	—	0.120				
SRT0610-146R220C10	120	Ct10	146	150	220	±0.10	—	0.160	～0.050			
SRT0610-261R335C10	235	Ct10	261	265	335	±0.18	—	0.240				

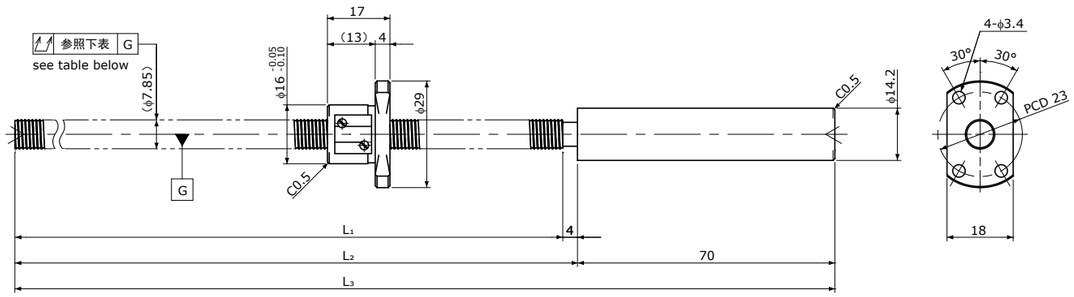
Note)Please refer to page A287 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A287页。

Standard products in stock SRT series 标准库存品 SRT/SSRT系列

Standard products in stock SRT series 标准库存品 SRT系列

SRT0801 | Shaft dia.(轴径)φ8 Lead(导程)1mm | Ct7&Ct10

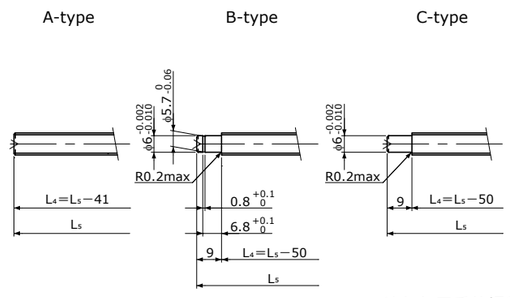
＊Please refer to page A316 for stainless steel type.
※不锈钢型请参照第A316页。



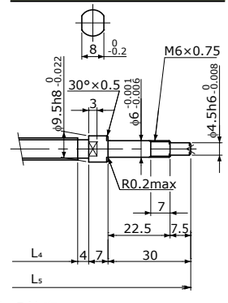
Unit(单位):mm

Ball Screw Specifications 主要技术参数		
Ball size 钢珠直径		φ0.8
Number of thread 螺纹条数		1
Thread direction 螺纹旋向		Right 右旋
Shaft root dia. 丝杠轴底径		φ7.3
Number of circuit 循环数		3.7×1
Material 材质	Shaft 轴	SCM415H+SUS303
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

End-journal profile 轴端加工形状 Supported-side 支撑侧



Fixed-side 固定侧



L₄:Thread length after end-journal machining. 追加加工后的螺纹部长度
Lₛ:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side	支撑侧 :	MSU-6CS/6GS
	Fixed-side	固定侧 :	MSU-6C/6G

D-type : Other than the above. 上述以外的形状

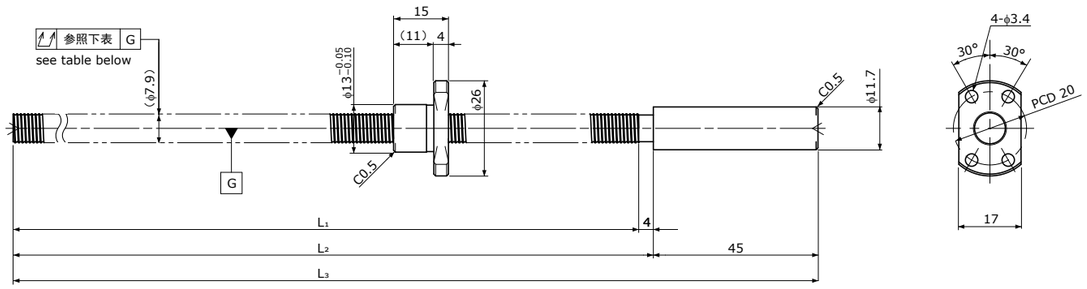
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L₁	L₂	L₃	Lead accuracy 导程精度 Travel deviation 代表移动量误差 eₚ	Variation 波动 V₃₀₀	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SRT0801-196R270C7	175	Ct7	196	200	270	±0.03	—	0.080	～0.020	—	780	1650
SRT0801-356R430C7	335	Ct7	356	360	430	±0.06	0.05	0.120				
SRT0801-196R270C10	175	Ct10	196	200	270	±0.13	—	0.160	～0.050			
SRT0801-356R430C10	335	Ct10	356	360	430	±0.24	0.21	0.240				

Note)Please refer to page A287 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A287页。

Standard products in stock SRT series
标准库存品 SRT系列

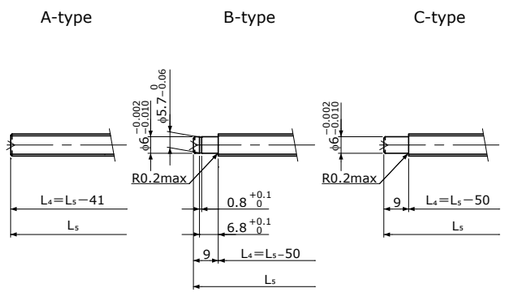
SRT0801K | Compact Nut / 紧凑型螺母 | Shaft dia.(轴径)φ8 Lead(导程)1mm | Ct7&Ct10



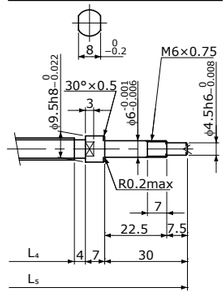
Unit(单位):mm

Ball Screw Specifications 主要技术参数		
Ball size 钢珠直径		φ0.8
Number of thread 螺纹条数		1
Thread direction 螺纹旋向		Right 右旋
Shaft root dia. 丝杠轴底径		φ7.3
Number of circuit 循环数		1×3
Material 材质	Shaft 轴	S55C+SUS303
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

End-journal profile 轴端加工形状 Supported-side 支撑侧



Fixed-side 固定侧



L4:Thread length after end-journal machining. 追加加工后的螺纹部长度
Ls:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side 支撑侧	:	MSU-6CS/6GS
	Fixed-side 固定侧	:	MSU-6C/6G

D-type : Other than the above. 上述以外的形状

Unit(单位):mm

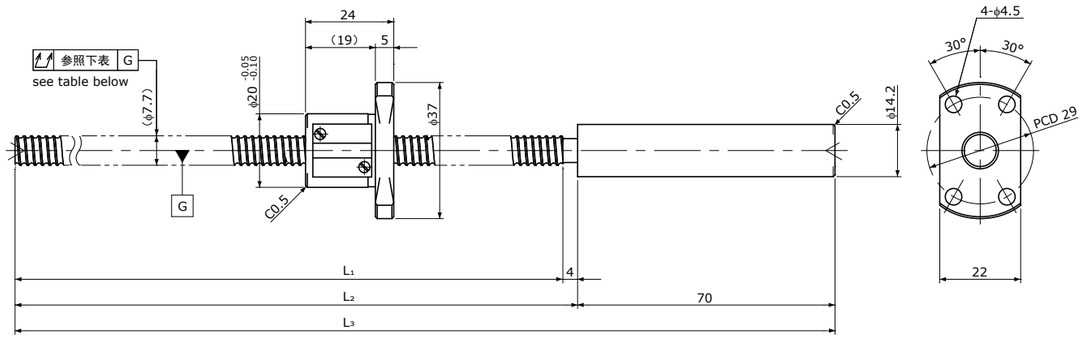
Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 V300	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SRT0801K-171R220C7	150	Ct7	171	175	220	±0.03	—	0.080	～0.020	—	650	1300
SRT0801K-171R220C10	150	Ct10	171	175	220	±0.11	—	0.160	～0.050			

Note)Please refer to page A287 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A287页。

Standard products in stock SRT series
标准库存品 SRT系列

SRT0802 | Shaft dia.(轴径)φ8 Lead(导程)2mm | Ct7&Ct10

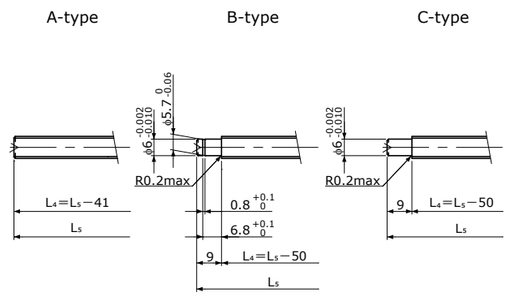
＊Please refer to page A317 for stainless steel type.
※不锈钢型请参照第A317页。



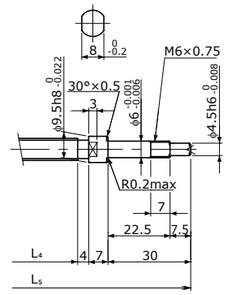
Unit(单位):mm

Ball Screw Specifications 主要技术参数		
Ball size 钢珠直径		φ1.5875
Number of thread 螺纹条数		1
Thread direction 螺纹旋向		Right 右旋
Shaft root dia. 丝杠轴底径		φ6.6
Number of circuit 循环数		3.7×1
Material 材质	Shaft 轴	SCM415H+SUS303
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

End-journal profile 轴端加工形状 Supported-side 支撑侧



Fixed-side 固定侧



L4:Thread length after end-journal machining. 追加加工后的螺纹部长度
Ls:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side 支撑侧	:	MSU-6CS/6GS
	Fixed-side 固定侧	:	MSU-6C/6G

D-type : Other than the above. 上述以外的形状

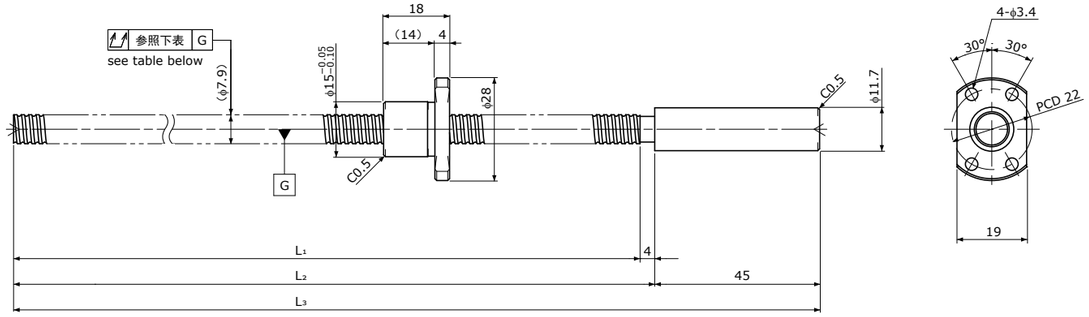
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 V300	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SRT0802-196R270C7	170	Ct7	196	200	270	±0.03	—	0.080	～0.020	—	2400	4100
SRT0802-356R430C7	330	Ct7	356	360	430	±0.06	0.05	0.120				
SRT0802-196R270C10	170	Ct10	196	200	270	±0.13	—	0.160	～0.050			
SRT0802-356R430C10	330	Ct10	356	360	430	±0.24	0.21	0.240				

Note)Please refer to page A287 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A287页。

Standard products in stock SRT series
标准库存品 SRT系列

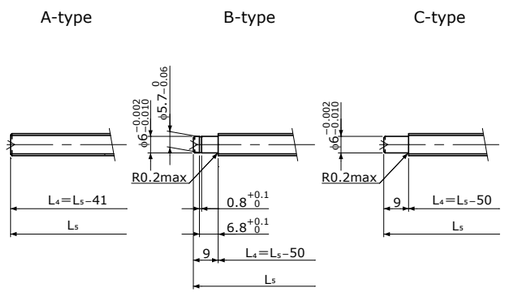
SRT0802K | Compact Nut / 紧凑型螺母 Shaft dia.(轴径)φ8 Lead(导程)2mm | Ct7&Ct10



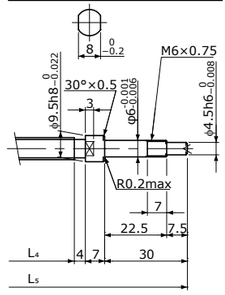
Unit(单位):mm

Ball Screw Specifications 主要技术参数		
Ball size 钢珠直径		φ1.2
Number of thread 螺纹条数		1
Thread direction 螺纹旋向		Right 右旋
Shaft root dia. 丝杠轴底径		φ7.0
Number of circuit 循环数		1×3
Material 材质	Shaft 轴	S55C+SUS303
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

End-journal profile 轴端加工形状 Supported-side 支撑侧



Fixed-side 固定侧



L4:Thread length after end-journal machining. 追加加工后的螺纹部长度
Ls:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side 支撑侧	:	MSU-6CS/6GS
	Fixed-side 固定侧	:	MSU-6C/6G

D-type : Other than the above. 上述以外的形状

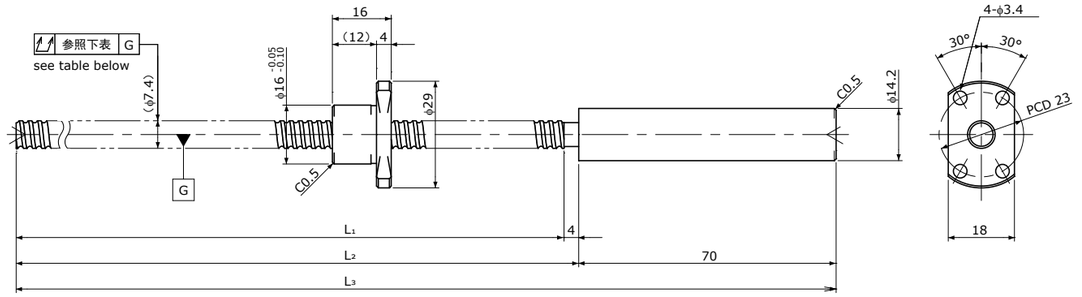
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 V300	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SRT0802K-171R220C7	145	Ct7	171	175	220	±0.03	—	0.080	～0.020	—	1300	2300
SRT0802K-171R220C10	145	Ct10	171	175	220	±0.11	—	0.160	～0.050			

Note)Please refer to page A287 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A287页。

Standard products in stock SRT series
标准库存品 SRT系列

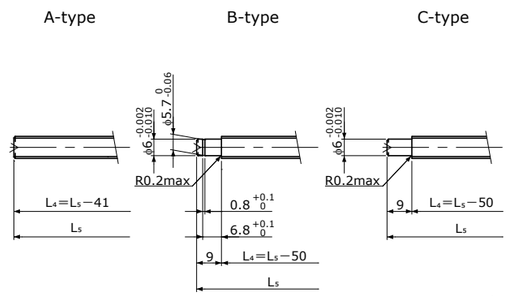
SRT0802.5 | Shaft dia.(轴径)φ8 Lead(导程)2.5mm | Ct7&Ct10



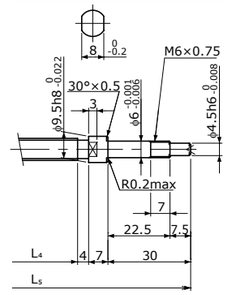
Unit(单位):mm

Ball Screw Specifications 主要技术参数		
Ball size 钢珠直径		φ1.5875
Number of thread 螺纹条数		1
Thread direction 螺纹旋向		Right 右旋
Shaft root dia. 丝杠轴底径		φ6.3
Number of circuit 循环数		2.7×1
Material 材质	Shaft 轴	SCM415H+SUS303
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

End-journal profile 轴端加工形状 Supported-side 支撑侧



Fixed-side 固定侧



L4:Thread length after end-journal machining. 追加加工后的螺纹部长度
Ls:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side 支撑侧	:	MSU-6CS/6GS
	Fixed-side 固定侧	:	MSU-6C/6G

D-type : Other than the above. 上述以外的形状

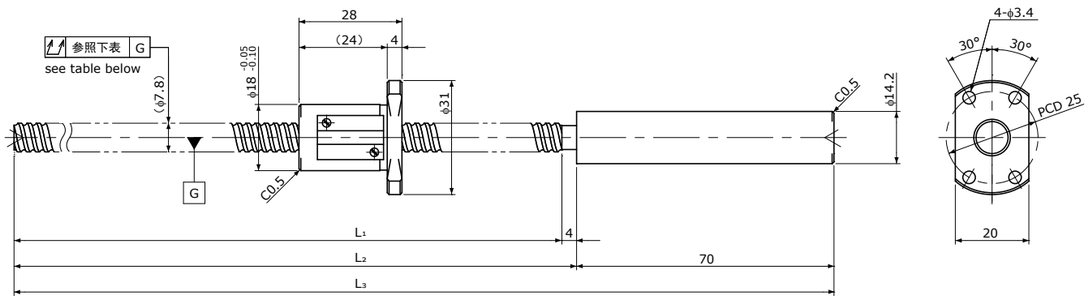
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 V300	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SRT0802.5-196R270C7	180	Ct7	196	200	270	±0.03	—	0.080	～0.020	—	1850	3000
SRT0802.5-356R430C7	340	Ct7	356	360	430	±0.06	0.05	0.120				
SRT0802.5-196R270C10	180	Ct10	196	200	270	±0.13	—	0.160	～0.050			
SRT0802.5-356R430C10	340	Ct10	356	360	430	±0.24	0.21	0.240				

Note)Please refer to page A287 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A287页。

Standard products in stock SRT series 标准库存品 SRT系列

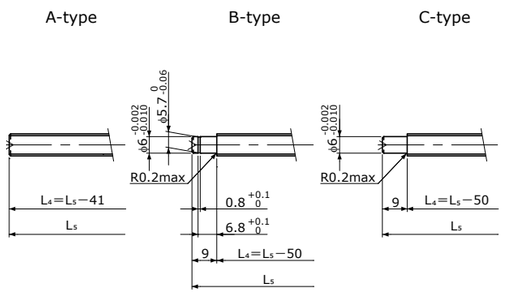
SRT0805 | Shaft dia.(轴径)φ8 Lead(导程)5mm | Ct7&Ct10



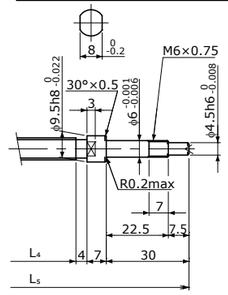
Unit(单位):mm

Ball Screw Specifications 主要技术参数		
Ball size 钢珠直径		φ1.5875
Number of thread 螺纹条数		1
Thread direction 螺纹旋向		Right 右旋
Shaft root dia. 丝杠轴底径		φ6.6
Number of circuit 循环数		2.7×1
Material 材质	Shaft 轴	SCM415H+SUS303
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

End-journal profile 轴端加工形状 Supported-side 支撑侧



Fixed-side 固定侧



L₄:Thread length after end-journal machining. 追加加工后的螺纹部长度
Lₛ:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side	支撑侧 :	MSU-6CS/6GS
	Fixed-side	固定侧 :	MSU-6C/6G

D-type : Other than the above. 上述以外的形状

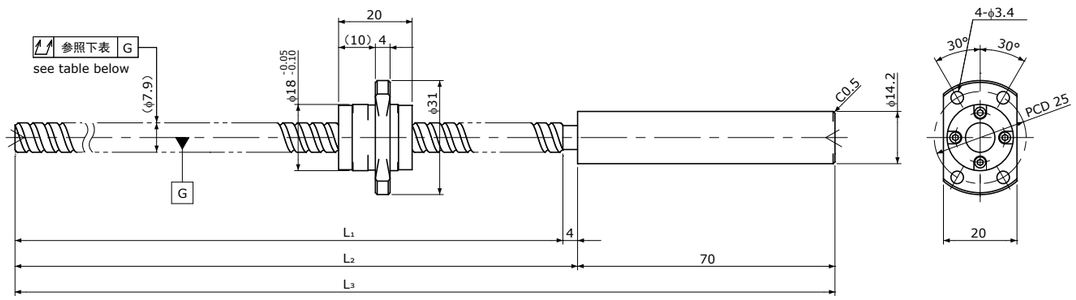
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L₁	L₂	L₃	Lead accuracy 导程精度 Travel deviation 代表移动量误差 eₚ	Variation 波动 V₃₀₀	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SRT0805-196R270C7	165	Ct7	196	200	270	±0.03	—	0.080	～0.020	—	1850	3000
SRT0805-356R430C7	325	Ct7	356	360	430	±0.06	0.05	0.120				
SRT0805-196R270C10	165	Ct10	196	200	270	±0.13	—	0.160	～0.050			
SRT0805-356R430C10	325	Ct10	356	360	430	±0.24	0.21	0.240				

Note)Please refer to page A287 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A287页。

Standard products in stock SRT series 标准库存品 SRT系列

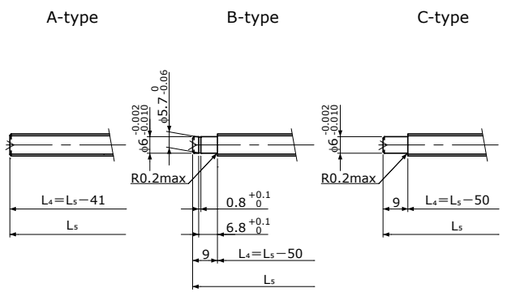
SRT0808 | Shaft dia.(轴径)φ8 Lead(导程)8mm | Ct7&Ct10



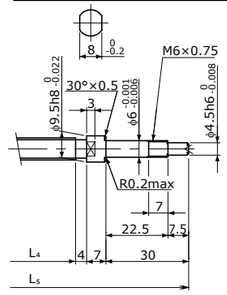
Unit(单位):mm

Ball Screw Specifications 主要技术参数		
Ball size 钢珠直径		φ1.5875
Number of thread 螺纹条数		2
Thread direction 螺纹旋向		Right 右旋
Shaft root dia. 丝杠轴底径		φ6.7
Number of circuit 循环数		1.6×2
Material 材质	Shaft 轴	SCM415H+SUS303
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

End-journal profile 轴端加工形状 Supported-side 支撑侧



Fixed-side 固定侧



L₄:Thread length after end-journal machining. 追加加工后的螺纹部长度
Lₛ:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side	支撑侧 :	MSU-6CS/6GS
	Fixed-side	固定侧 :	MSU-6C/6G

D-type : Other than the above. 上述以外的形状

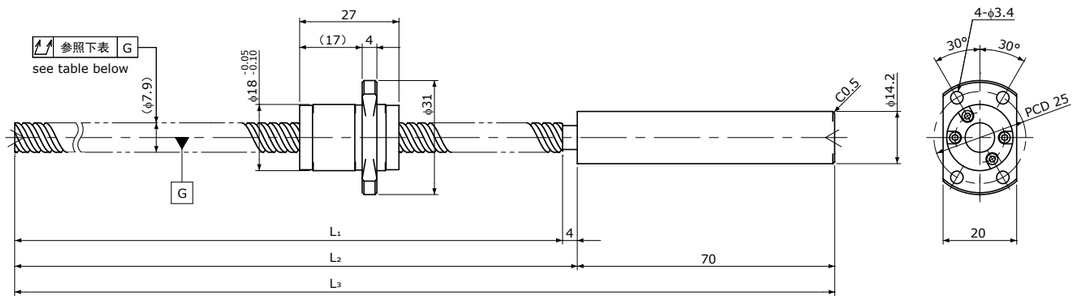
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L₁	L₂	L₃	Lead accuracy 导程精度 Travel deviation 代表移动量误差 eₚ	Variation 波动 V₃₀₀	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SRT0808-196R270C7	175	Ct7	196	200	270	±0.03	—	0.080	～0.020	—	2200	3800
SRT0808-356R430C7	335	Ct7	356	360	430	±0.06	0.05	0.120				
SRT0808-196R270C10	175	Ct10	196	200	270	±0.13	—	0.160	～0.050			
SRT0808-356R430C10	335	Ct10	356	360	430	±0.24	0.21	0.240				

Note)Please refer to page A287 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A287页。

Standard products in stock SRT series
标准库存品 SRT系列

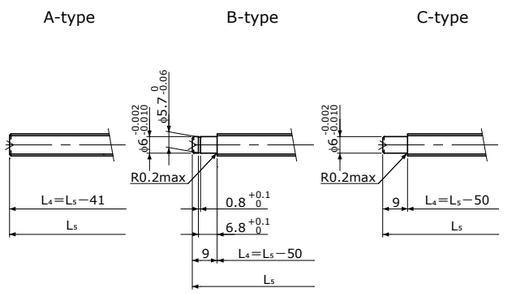
SRT0812 | Shaft dia.(轴径)φ8 Lead(导程)12mm | Ct7&Ct10



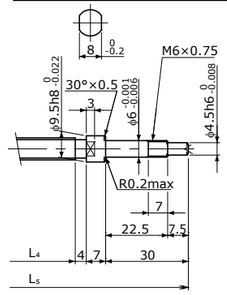
Unit(单位):mm

Ball Screw Specifications 主要技术参数		
Ball size 钢珠直径		φ1.5875
Number of thread 螺纹条数		2
Thread direction 螺纹旋向		Right 右旋
Shaft root dia. 丝杠轴底径		φ6.7
Number of circuit 循环数		1.6×2
Material 材质	Shaft 轴	SCM415H+SUS303
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

End-journal profile 轴端加工形状 Supported-side 支撑侧



Fixed-side 固定侧



L₄:Thread length after end-journal machining. 追加加工后的螺纹部长度
Lₛ:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件		
	Supported-side 支撑侧 :	MSU-6CS/6GS
	Fixed-side 固定侧 :	MSU-6C/6G

D-type : Other than the above. 上述以外的形状

Unit(单位):mm

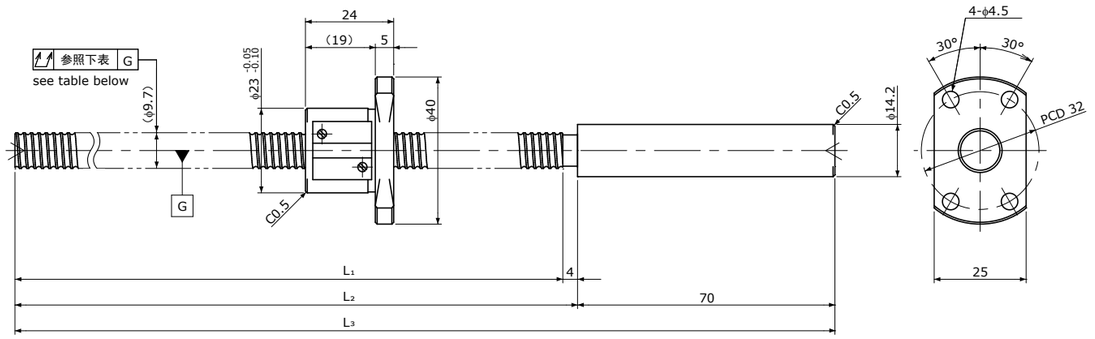
Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L₁	L₂	L₃	Lead accuracy 导程精度 Travel deviation 代表移动量误差 eₚ	Variation 波动 V₃₀₀	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SRT0812-196R270C7	165	Ct7	196	200	270	±0.03	—	0.080	～0.020	—	2200	4000
SRT0812-356R430C7	325	Ct7	356	360	430	±0.06	0.05	0.120				
SRT0812-196R270C10	165	Ct10	196	200	270	±0.13	—	0.160	～0.050			
SRT0812-356R430C10	325	Ct10	356	360	430	±0.24	0.21	0.240				

Note)Please refer to page A287 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A287页。

Standard products in stock SRT series
标准库存品 SRT系列

SRT1002 | Shaft dia.(轴径)φ10 Lead(导程)2mm | Ct7&Ct10

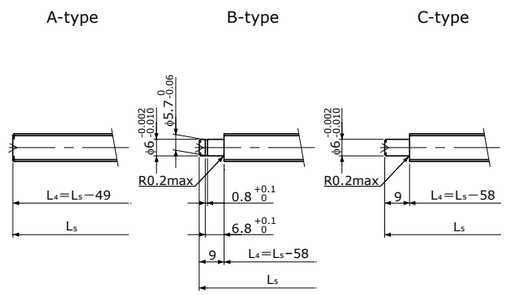
＊Please refer to page A318 for stainless steel type.
※不锈钢型请参照第A318页。



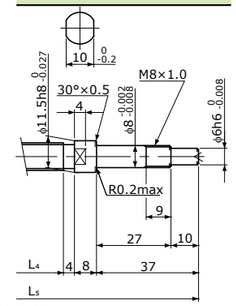
Unit(单位):mm

Ball Screw Specifications 主要技术参数		
Ball size 钢珠直径		φ1.5875
Number of thread 螺纹条数		1
Thread direction 螺纹旋向		Right 右旋
Shaft root dia. 丝杠轴底径		φ8.6
Number of circuit 循环数		3.7×1
Material 材质	Shaft 轴	SCM415H+SUS303
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

End-journal profile 轴端加工形状 Supported-side 支撑侧



Fixed-side 固定侧



L₄:Thread length after end-journal machining. 追加加工后的螺纹部长度
Lₛ:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件		
	Supported-side 支撑侧 :	MSU-8CS/8GS
	Fixed-side 固定侧 :	MSU-8C/8G

D-type : Other than the above. 上述以外的形状

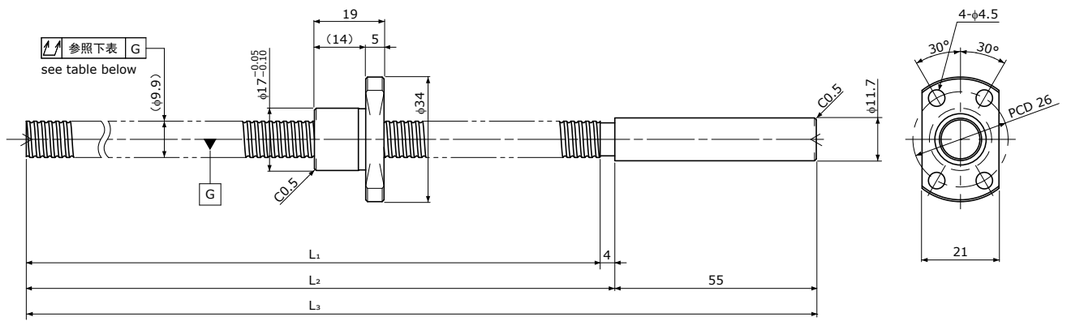
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L₁	L₂	L₃	Lead accuracy 导程精度 Travel deviation 代表移动量误差 eₚ	Variation 波动 V₃₀₀	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SRT1002-196R270C7	170	Ct7	196	200	270	±0.03	—	0.080	～0.020	—	2700	5300
SRT1002-396R470C7	370	Ct7	396	400	470	±0.06	0.05	0.120				
SRT1002-196R270C10	170	Ct10	196	200	270	±0.13	—	0.160	～0.050			
SRT1002-396R470C10	370	Ct10	396	400	470	±0.27	0.21	0.240				

Note)Please refer to page A287 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A287页。

Standard products in stock SRT series
标准库存品 SRT系列

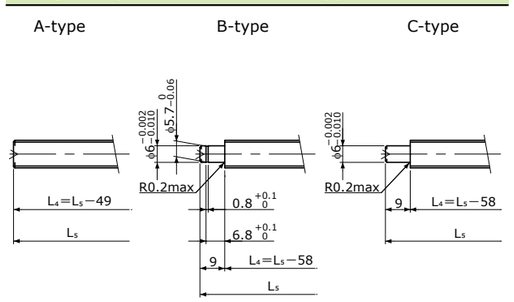
SRT1002K | Compact Nut / 紧凑型螺母 | Shaft dia.(轴径)φ10 Lead(导程)2mm | Ct7&Ct10



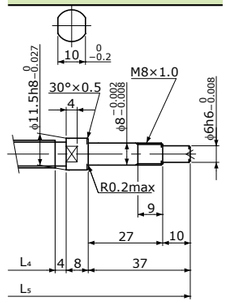
Unit(单位):mm

Ball Screw Specifications 主要技术参数		
Ball size 钢珠直径		φ1.2
Number of thread 螺纹条数		1
Thread direction 螺纹旋向		Right 右旋
Shaft root dia. 丝杠轴底径		φ9.0
Number of circuit 循环数		1×3
Material 材质	Shaft 轴	S55C+SUS303
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

End-journal profile 轴端加工形状 Supported-side 支撑侧



Fixed-side 固定侧



L₄:Thread length after end-journal machining. 追加加工后的螺纹部长度
Ls:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side 支撑侧	:	MSU-8CS/8GS
	Fixed-side 固定侧	:	MSU-8C/8G

D-type : Other than the above. 上述以外的形状

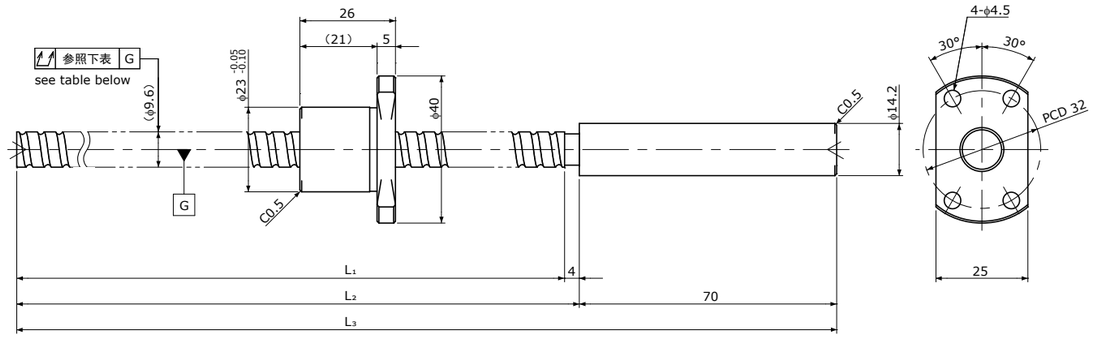
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L₁	L₂	L₃	Lead accuracy 导程精度 Travel deviation 代表移动量误差 eₚ	Variation 波动 V₃₀₀	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SRT1002K-201R260C7	175	Ct7	201	205	260	±0.03	—	0.080	～0.020	—	1450	3000
SRT1002K-201R260C10	175	Ct10	201	205	260	±0.14	—	0.160	～0.050			

Note)Please refer to page A287 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A287页。

Standard products in stock SRT series
标准库存品 SRT系列

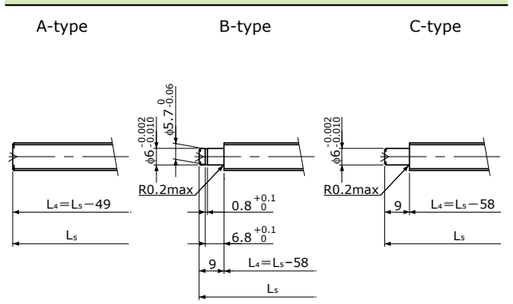
SRT1005 | Shaft dia.(轴径)φ10 Lead(导程)5mm | Ct7&Ct10



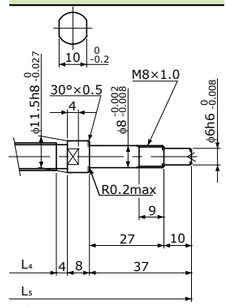
Unit(单位):mm

Ball Screw Specifications 主要技术参数		
Ball size 钢珠直径		φ2.0
Number of thread 螺纹条数		1
Thread direction 螺纹旋向		Right 右旋
Shaft root dia. 丝杠轴底径		φ8.2
Number of circuit 循环数		2.7×1
Material 材质	Shaft 轴	SCM415H+SUS303
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

End-journal profile 轴端加工形状 Supported-side 支撑侧



Fixed-side 固定侧



L₄:Thread length after end-journal machining. 追加加工后的螺纹部长度
Ls:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side 支撑侧	:	MSU-8CS/8GS
	Fixed-side 固定侧	:	MSU-8C/8G

D-type : Other than the above. 上述以外的形状

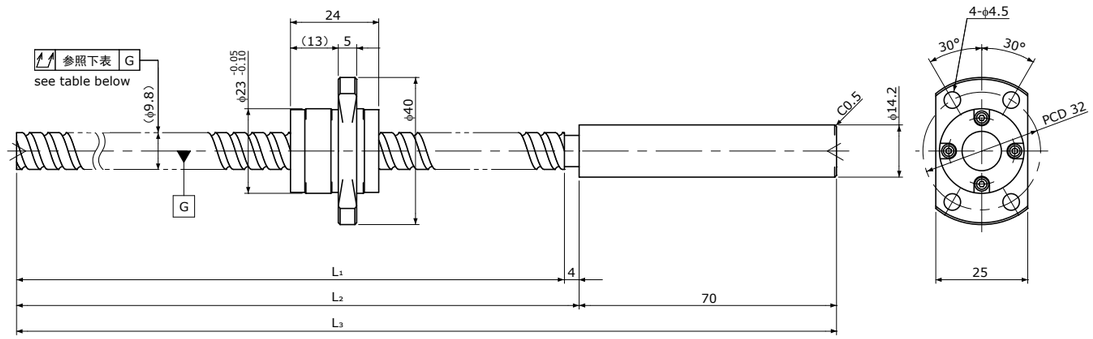
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L₁	L₂	L₃	Lead accuracy 导程精度 Travel deviation 代表移动量误差 eₚ	Variation 波动 V₃₀₀	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SRT1005-196R270C7	170	Ct7	196	200	270	±0.03	—	0.080	～0.020	—	3000	5200
SRT1005-396R470C7	370	Ct7	396	400	470	±0.06	0.05	0.120				
SRT1005-196R270C10	170	Ct10	196	200	270	±0.13	—	0.160	～0.050			
SRT1005-396R470C10	370	Ct10	396	400	470	±0.27	0.21	0.240				

Note)Please refer to page A287 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A287页。

Standard products in stock SRT series
标准库存品 SRT系列

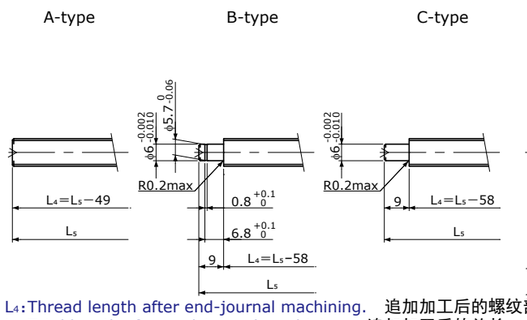
SRT1010 | Shaft dia.(轴径)φ10 Lead(导程)10mm | Ct7&Ct10 |



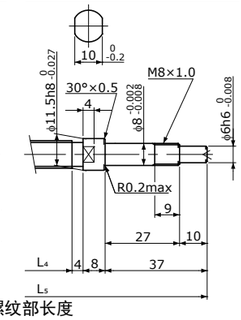
Unit(单位):mm

Ball Screw Specifications 主要技术参数		
Ball size 钢珠直径		φ2.0
Number of thread 螺纹条数		2
Thread direction 螺纹旋向		Right 右旋
Shaft root dia. 丝杠轴底径		φ8.4
Number of circuit 循环数		1.6×2
Material 材质	Shaft 轴	SCM415H+SUS303
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

End-journal profile 轴端加工形状 Supported-side 支撑侧



Fixed-side 固定侧



L₄:Thread length after end-journal machining. 追加加工后的螺纹部长度
Ls:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件	Supported-side 支撑侧 :	MSU-8CS/8GS
	Fixed-side 固定侧 :	MSU-8C/8G

D-type : Other than the above. 上述以外的形状

Unit(单位):mm

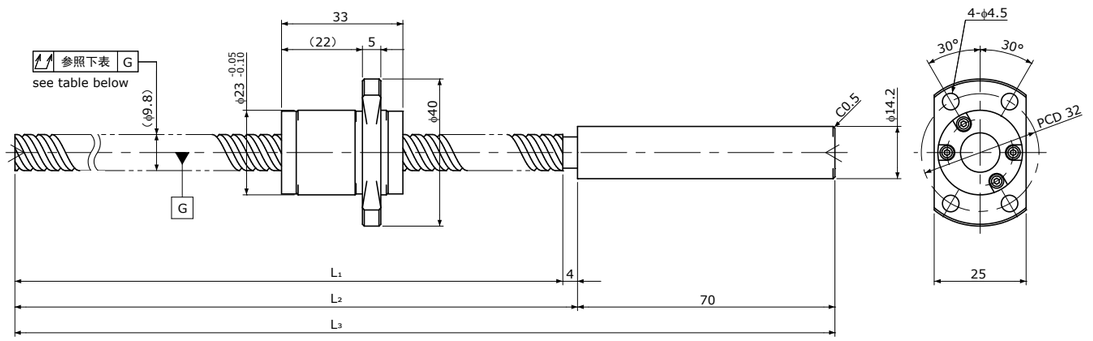
Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度			Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			L₁	L₂	L₃	Travel deviation 代表移动量误差 eₚ	Variation 波动 V₃₀₀				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SRT1010-196R270C7	170	Ct7	196	200	270	±0.03	—	0.080	～0.020	—	3300	5900
SRT1010-396R470C7	370	Ct7	396	400	470	±0.06	0.05	0.120				
SRT1010-196R270C10	170	Ct10	196	200	270	±0.13	—	0.160	～0.050			
SRT1010-396R470C10	370	Ct10	396	400	470	±0.27	0.21	0.240				

Note)Please refer to page A287 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A287页。

Standard products in stock SRT series 标准库存品 SRT系列

Standard products in stock SRT series
标准库存品 SRT系列

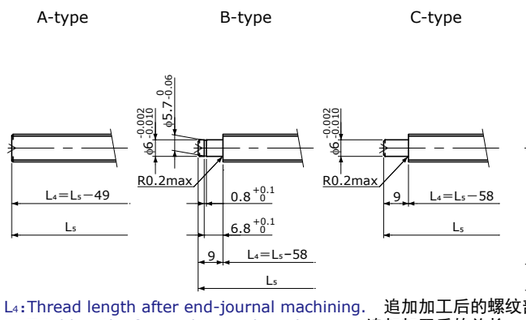
SRT1015 | Shaft dia.(轴径)φ10 Lead(导程)15mm | Ct7&Ct10 |



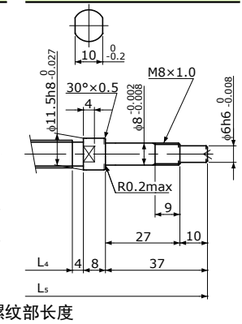
Unit(单位):mm

Ball Screw Specifications 主要技术参数		
Ball size 钢珠直径		φ2.0
Number of thread 螺纹条数		2
Thread direction 螺纹旋向		Right 右旋
Shaft root dia. 丝杠轴底径		φ8.4
Number of circuit 循环数		1.6×2
Material 材质	Shaft 轴	SCM415H+SUS303
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

End-journal profile 轴端加工形状 Supported-side 支撑侧



Fixed-side 固定侧



L₄:Thread length after end-journal machining. 追加加工后的螺纹部长度
Ls:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件	Supported-side 支撑侧 :	MSU-8CS/8GS
	Fixed-side 固定侧 :	MSU-8C/8G

D-type : Other than the above. 上述以外的形状

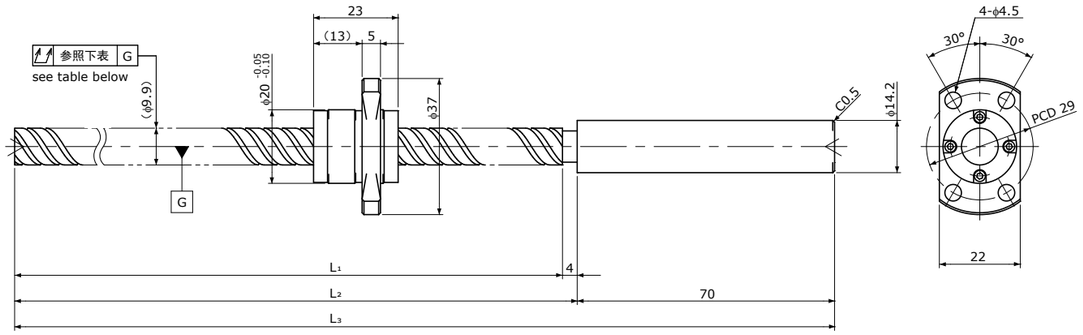
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度			Lead accuracy 导程精度		Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N	
			L₁	L₂	L₃	Travel deviation 代表移动量误差 eₚ	Variation 波动 V₃₀₀				Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SRT1015-196R270C7	160	Ct7	196	200	270	±0.03	—	0.080	～0.020	—	3300	6400
SRT1015-396R470C7	360	Ct7	396	400	470	±0.06	0.05	0.120				
SRT1015-196R270C10	160	Ct10	196	200	270	±0.13	—	0.160	～0.050			
SRT1015-396R470C10	360	Ct10	396	400	470	±0.27	0.21	0.240				

Note)Please refer to page A287 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A287页。

Standard products in stock SRT series
标准库存品 SRT系列

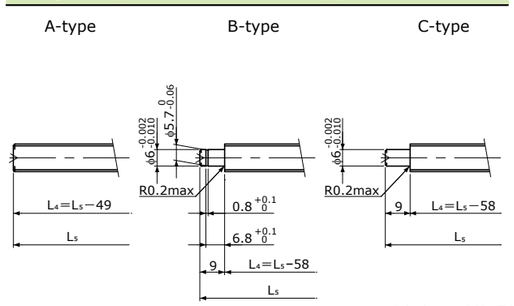
SRT1020 | Shaft dia.(轴径)φ10 Lead(导程)20mm | Ct7&Ct10



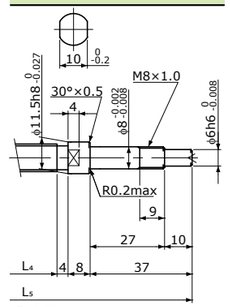
Unit(单位):mm

Ball Screw Specifications 主要技术参数		
Ball size 钢珠直径		φ1.5875
Number of thread 螺纹条数		4
Thread direction 螺纹旋向		Right 右旋
Shaft root dia. 丝杠轴底径		φ8.7
Number of circuit 循环数		0.7×4
Material 材质	Shaft 轴	SCM415H+SUS303
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

End-journal profile 轴端加工形状 Supported-side 支撑侧



Fixed-side 固定侧



L₄:Thread length after end-journal machining. 追加加工后的螺纹部长度
L₅:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side 支撑侧	:	MSU-8CS/8GS
	Fixed-side 固定侧	:	MSU-8C/8G

D-type : Other than the above. 上述以外的形状

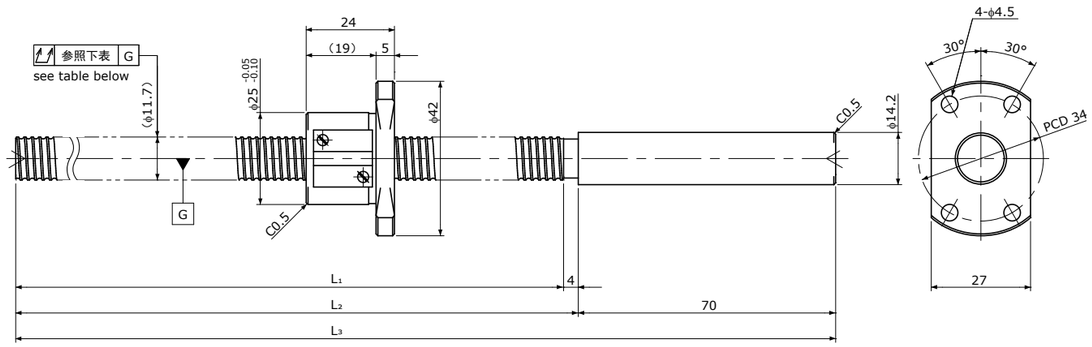
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L₁	L₂	L₃	Lead accuracy 导程精度 Travel deviation 代表移动量误差 eₚ	Variation 波动 V₃₀₀	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SRT1020-196R270C7	170	Ct7	196	200	270	±0.03	—	0.080	～0.020	—	2100	4000
SRT1020-396R470C7	370	Ct7	396	400	470	±0.06	0.05	0.120				
SRT1020-196R270C10	170	Ct10	196	200	270	±0.13	—	0.160	～0.050			
SRT1020-396R470C10	370	Ct10	396	400	470	±0.27	0.21	0.240				

Note)Please refer to page A287 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A287页。

Standard products in stock SRT series
标准库存品 SRT系列

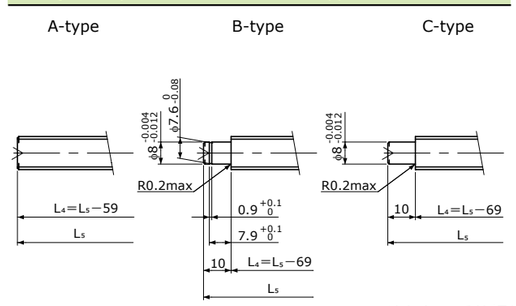
SRT1202 | Shaft dia.(轴径)φ12 Lead(导程)2mm | Ct7&Ct10



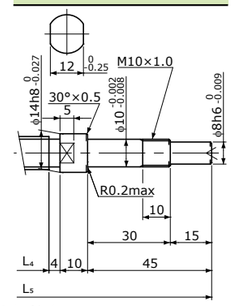
Unit(单位):mm

Ball Screw Specifications 主要技术参数		
Ball size 钢珠直径		φ1.5875
Number of thread 螺纹条数		1
Thread direction 螺纹旋向		Right 右旋
Shaft root dia. 丝杠轴底径		φ10.6
Number of circuit 循环数		3.7×1
Material 材质	Shaft 轴	SCM415H+SUS303
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

End-journal profile 轴端加工形状 Supported-side 支撑侧



Fixed-side 固定侧



L₄:Thread length after end-journal machining. 追加加工后的螺纹部长度
L₅:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side 支撑侧	:	—
	Fixed-side 固定侧	:	—

D-type : Other than the above. 上述以外的形状

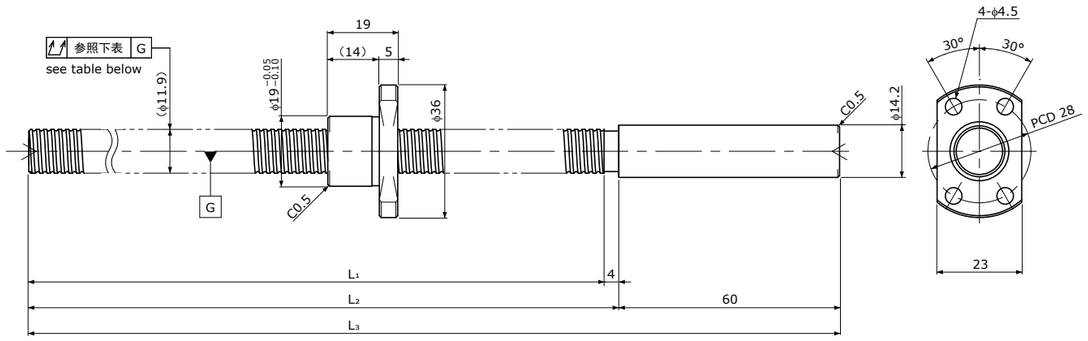
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L₁	L₂	L₃	Lead accuracy 导程精度 Travel deviation 代表移动量误差 eₚ	Variation 波动 V₃₀₀	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SRT1202-196R270C7	170	Ct7	196	200	270	±0.03	—	0.080	～0.020	—	3000	6400
SRT1202-396R470C7	370	Ct7	396	400	470	±0.06	0.05	0.080				
SRT1202-196R270C10	170	Ct10	196	200	270	±0.13	—	0.160	～0.050			
SRT1202-396R470C10	370	Ct10	396	400	470	±0.27	0.21	0.160				

Note)Please refer to page A287 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A287页。

Standard products in stock SRT series
标准库存品 SRT系列

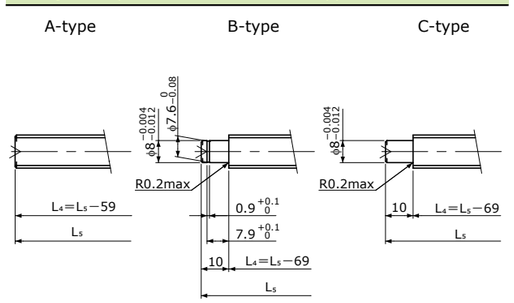
SRT1202K | Compact Nut / 紧凑型螺母 | Shaft dia.(轴径)φ12 Lead(导程)2mm | Ct7&Ct10



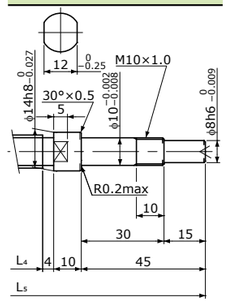
Unit(单位):mm

Ball Screw Specifications 主要技术参数		
Ball size 钢珠直径		φ1.2
Number of thread 螺纹条数		1
Thread direction 螺纹旋向		Right 右旋
Shaft root dia. 丝杠轴底径		φ11.0
Number of circuit 循环数		1×3
Material 材质	Shaft 轴	S55C+SUS303
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

End-journal profile 轴端加工形状 Supported-side 支撑侧



Fixed-side 固定侧



L4:Thread length after end-journal machining. 追加加工后的螺纹部长度
Ls:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件	Supported-side 支撑侧 : —
	Fixed-side 固定侧 : —

D-type : Other than the above. 上述以外的形状

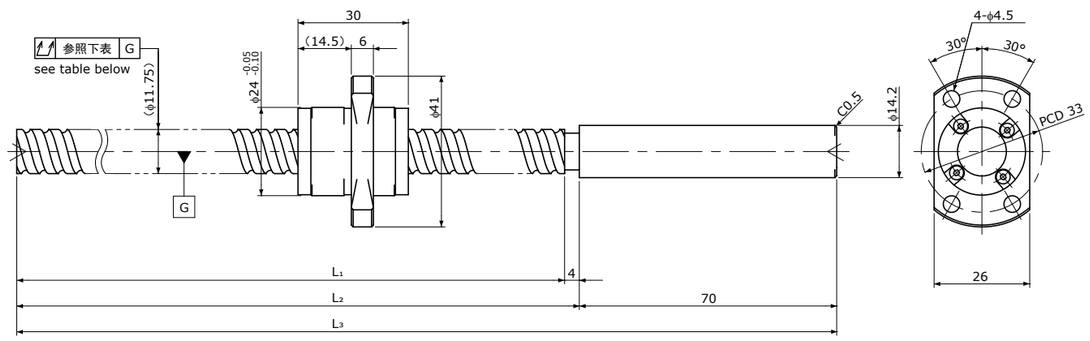
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 V300	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SRT1202K-271R335C7	245	Ct7	271	275	335	±0.04	—	0.080	～0.020	—	1600	3700
SRT1202K-271R335C10	245	Ct10	271	275	335	±0.19	—	0.160	～0.050			

Note)Please refer to page A287 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A287页。

Standard products in stock SRT series
标准库存品 SRT系列

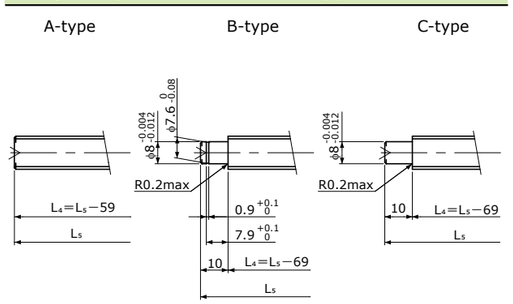
SRT1210 | Shaft dia.(轴径)φ12 Lead(导程)10mm | Ct7&Ct10



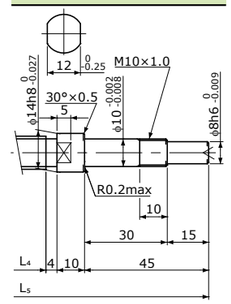
Unit(单位):mm

Ball Screw Specifications 主要技术参数		
Ball size 钢珠直径		φ2.381
Number of thread 螺纹条数		2
Thread direction 螺纹旋向		Right 右旋
Shaft root dia. 丝杠轴底径		φ10.2
Number of circuit 循环数		1.7×2
Material 材质	Shaft 轴	SCM415H+SUS303
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

End-journal profile 轴端加工形状 Supported-side 支撑侧



Fixed-side 固定侧



L4:Thread length after end-journal machining. 追加加工后的螺纹部长度
Ls:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件	Supported-side 支撑侧 : —
	Fixed-side 固定侧 : —

D-type : Other than the above. 上述以外的形状

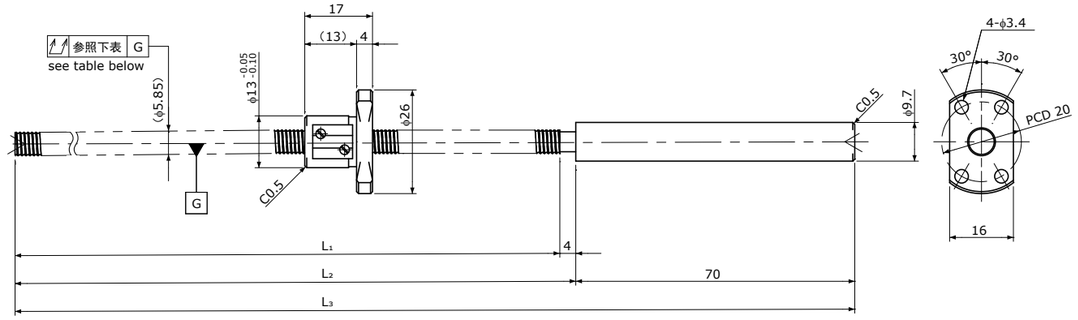
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 V300	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SRT1210-196R270C7	165	Ct7	196	200	270	±0.03	—	0.080	～0.020	—	5100	9800
SRT1210-396R470C7	365	Ct7	396	400	470	±0.06	0.05	0.080				
SRT1210-196R270C10	165	Ct10	196	200	270	±0.13	—	0.160	～0.050			
SRT1210-396R470C10	365	Ct10	396	400	470	±0.27	0.21	0.160				

Note)Please refer to page A287 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A287页。

Standard products in stock SSRT series 标准库存品 SSRT系列

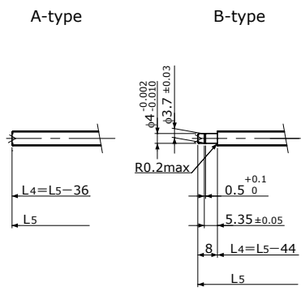
SSRT0601 | Stainless 不锈钢 Shaft dia.(轴径)φ6 Lead(导程)1mm | Ct7&Ct10



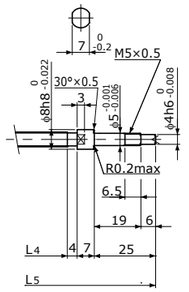
Unit(单位):mm

Ball Screw Specifications 主要技术参数		
Ball size 钢珠直径		φ0.8
Number of thread 螺纹条数		1
Thread direction 螺纹旋向		Right 右旋
Shaft root dia. 丝杠轴底径		φ5.3
Number of circuit 循环数		3.7×1
Material 材质	Shaft 轴	SUS440C+SUS303
	Nut 螺母	SUS440C
Surface hardness 螺纹部表面硬度		HRC55～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

End-journal profile 轴端加工形状 Supported-side 支撑侧



Fixed-side 固定侧



L4:Thread length after end-journal machining. 追加加工后的螺纹部长度
L5:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side	支撑侧 :	MSU-5CS/5GS
	Fixed-side	固定侧 :	MSU-5C/5G

D-type : Other than the above. 上述以外的形状

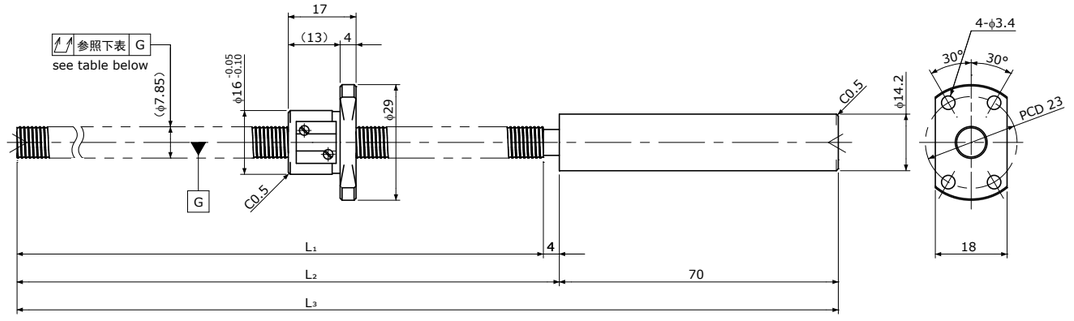
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 V300	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SSRT0601-146R220C7	125	Ct7	146	150	220	±0.02	—	0.080	～0.020	—	560	900
SSRT0601-261R335C7	240	Ct7	261	265	335	±0.04	—	0.120				
SSRT0601-146R220C10	125	Ct10	146	150	220	±0.10	—	0.160	～0.050			
SSRT0601-261R335C10	240	Ct10	261	265	335	±0.18	—	0.240				

Note)Please refer to page A287 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A287页。

Standard products in stock SSRT series 标准库存品 SSRT系列

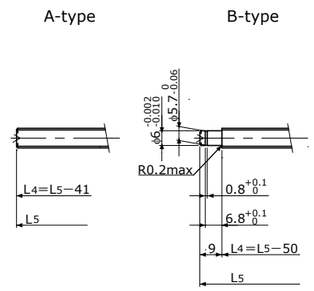
SSRT0801 | Stainless 不锈钢 Shaft dia.(轴径)φ8 Lead(导程)1mm | Ct7&Ct10



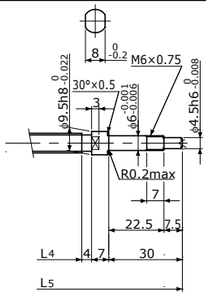
Unit(单位):mm

Ball Screw Specifications 主要技术参数		
Ball size 钢珠直径		φ0.8
Number of thread 螺纹条数		1
Thread direction 螺纹旋向		Right 右旋
Shaft root dia. 丝杠轴底径		φ7.3
Number of circuit 循环数		3.7×1
Material 材质	Shaft 轴	SUS440C+SUS303
	Nut 螺母	SUS440C
Surface hardness 螺纹部表面硬度		HRC55～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

End-journal profile 轴端加工形状 Supported-side 支撑侧



Fixed-side 固定侧



L4:Thread length after end-journal machining. 追加加工后的螺纹部长度
L5:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side	支撑侧 :	MSU-6CS/6GS
	Fixed-side	固定侧 :	MSU-6C/6G

D-type : Other than the above. 上述以外的形状

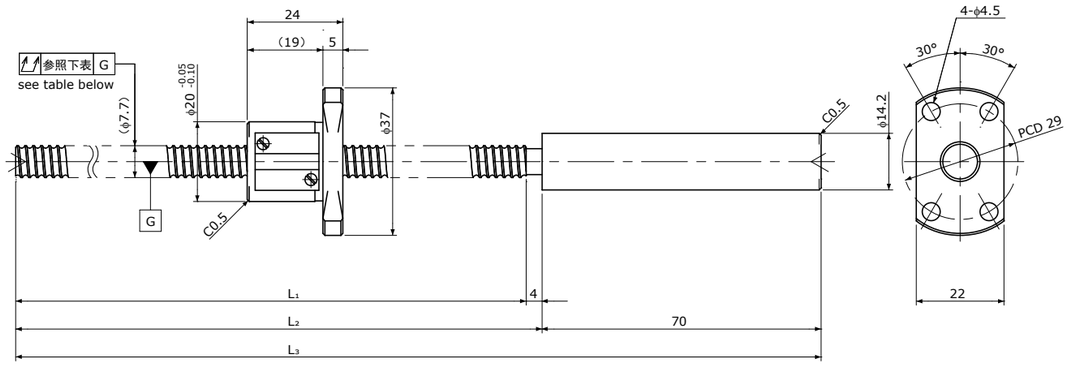
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 V300	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SSRT0801-196R270C7	175	Ct7	196	200	270	±0.03	—	0.080	～0.020	—	630	1250
SSRT0801-356R430C7	335	Ct7	356	360	430	±0.06	0.05	0.120				
SSRT0801-196R270C10	175	Ct10	196	200	270	±0.13	—	0.160	～0.050			
SSRT0801-356R430C10	335	Ct10	356	360	430	±0.24	0.21	0.240				

Note)Please refer to page A287 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A287页。

Standard products in stock SSRT series 标准库存品 SSRT系列

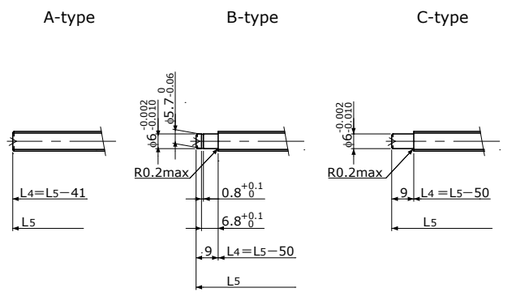
SSRT0802 | Stainless 不锈钢 Shaft dia.(轴径)φ8 Lead(导程)2mm | Ct7&Ct10



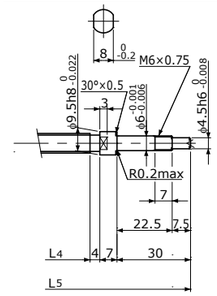
Unit(单位):mm

Ball Screw Specifications 主要技术参数		
Ball size 钢珠直径		φ1.5875
Number of thread 螺纹条数		1
Thread direction 螺纹旋向		Right 右旋
Shaft root dia. 丝杠轴底径		φ6.6
Number of circuit 循环数		3.7×1
Material 材质	Shaft 轴	SUS440C+SUS303
	Nut 螺母	SUS440C
Surface hardness 螺纹部表面硬度		HRC55～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

End-journal profile 轴端加工形状 Supported-side 支撑侧



Fixed-side 固定侧



L4:Thread length after end-journal machining. 追加加工后的螺纹部长度
L5:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side	支撑侧 :	MSU-6CS/6GS
	Fixed-side	固定侧 :	MSU-6C/6G

D-type : Other than the above. 上述以外的形状

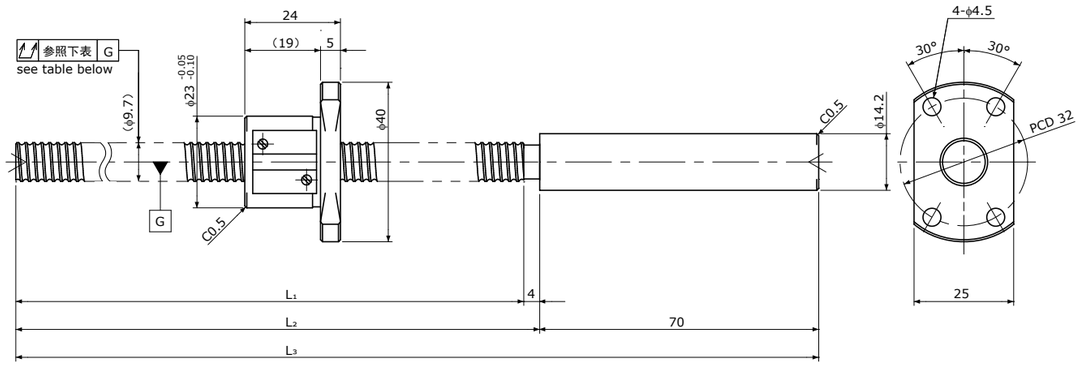
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 V300	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SSRT0802-196R270C7	170	Ct7	196	200	270	±0.03	—	0.080	～0.020	—	1950	3100
SSRT0802-356R430C7	330	Ct7	356	360	430	±0.06	0.05	0.120				
SSRT0802-196R270C10	170	Ct10	196	200	270	±0.13	—	0.160	～0.050			
SSRT0802-356R430C10	330	Ct10	356	360	430	±0.24	0.21	0.240				

Note)Please refer to page A287 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A287页。

Standard products in stock SSRT series 标准库存品 SSRT系列

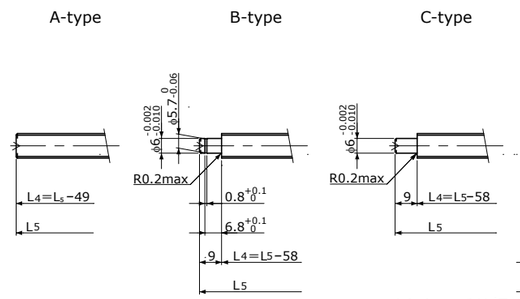
SSRT1002 | Stainless 不锈钢 Shaft dia.(轴径)φ10 Lead(导程)2mm | Ct7&Ct10



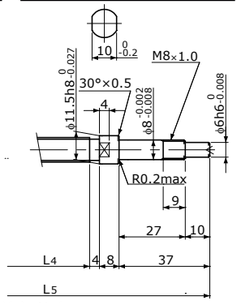
Unit(单位):mm

Ball Screw Specifications 主要技术参数		
Ball size 钢珠直径		φ1.5875
Number of thread 螺纹条数		1
Thread direction 螺纹旋向		Right 右旋
Shaft root dia. 丝杠轴底径		φ8.6
Number of circuit 循环数		3.7×1
Material 材质	Shaft 轴	SUS440C+SUS303
	Nut 螺母	SUS440C
Surface hardness 螺纹部表面硬度		HRC55～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

End-journal profile 轴端加工形状 Supported-side 支撑侧



Fixed-side 固定侧



L4:Thread length after end-journal machining. 追加加工后的螺纹部长度
L5:Total length after end-journal machining. 追加加工后的总长

Support-unit Recommendation 推荐的支架组件			
	Supported-side	支撑侧 :	MSU-8CS/8GS
	Fixed-side	固定侧 :	MSU-8C/8G

D-type : Other than the above. 上述以外的形状

Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Grade 精度	Shaft length 丝杠轴长度 L1	L2	L3	Lead accuracy 导程精度 Travel deviation 代表移动量误差 ep	Variation 波动 V300	Total Run-out 全跳动	Axial play 轴向间隙	Preload Torque 预压扭矩 Nm	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Static 额定静负载 Coa
SSRT1002-196R270C7	170	Ct7	196	200	270	±0.03	—	0.080	～0.020	—	2200	4000
SSRT1002-396R470C7	370	Ct7	396	400	470	±0.06	0.05	0.120				
SSRT1002-196R270C10	170	Ct10	196	200	270	±0.13	—	0.160	～0.050			
SSRT1002-396R470C10	370	Ct10	396	400	470	±0.27	0.21	0.240				

Note)Please refer to page A287 for order code of end-journal machining. 注)追加加工的公称型号指定方式请参照A287页。

PSR/PSRT 系列　精密冷轧滚珠丝杠 标准库存品
PSR/PSRT series　Precision Rolled Ball Screws

PSR/PSRT 系列 精密冷轧滚珠丝杠 标准库存品。
冷轧加工的滚珠丝杠实现了精密级(JIS C5)的精度。
为以往的冷轧滚珠丝杠无法满足精度要求的装置提供性价比优越的产品。

High accuracy(JIS C5) has been achieved by Rolled Ball Screw. We provide Rolled Ball Screws with high precision & better cost performance, which can be replaced with conventional Ground Ball Screw with C5 grade.

●特征

- 以往只能达到Ct7,Ct10 精度的冷轧加工,我司实现了精密级(JIS C5)的精度。
- 备有轴端比丝杠轴粗的台阶型和全螺纹未加工型2种,给客户提供更多的设计自由度。
- 台阶型轴端比丝杠轴粗,无需另配轴环,热套。
- 标准化固定端轴端形状和尺寸,可直接装配KSS支撑单元。
- 支撑端未加工,可按客户规格要求自由调节长度。
- 可按实际要求对应标准以外的轴端形状。
- 全螺纹未加工型具有优越的性价比,可按客户要求追加工轴端。
- 轴向间隙设定为5um以下,也可按客户要求提供无轴向间隙的产品。

●Features

- The conventional type of Rolled Ball Screws can reach the Accuracy grade of Ct10 or Ct7. KSS newly developed the high grade accuracy of Rolled Ball Screw, which can achieve JIS C5 grade.
- We have 2 types of Precision Rolled Ball Screws, which are Integrated type with larger journal and whole threaded type. So it provides wide variety of design choices.
- For Integrated end-journal type, Fixed side end-journal can be set larger than nominal diameter of Screw Shaft, so there is no need to use Collar by press fit.
- Fixed side End-journal profile and dimension are standardized, so KSS Compact Support-Unit can be installed.
- Since supported-side end-journal is unfinished, it is possible to do additional end machining with your requested thread length.
- Special end-journal profile can be available as customized order.
- Whole threaded type is a high cost performance type and end-journal machining is available in accordance with your request.
- The Axial play is set at 5um or less, but Zero backlash is possible based on your request.

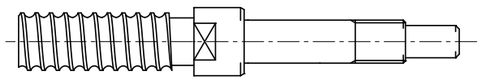
●种类

精密轧制滚珠丝杠有轴端比丝杠轴粗的台阶型(PSRT)和全螺纹未加工型2种(PSR)

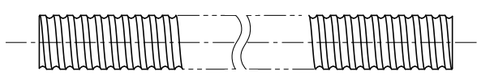
●Variation

We have 2 types of Precision Rolled Ball Screws, which are Integrated type with larger journal (PSRT) and whole threaded length type(PSR).

【台阶型/ Integrated journal type】



【全螺纹未加工型/ whole threaded type】



●丝杠轴公称外径和导程组合　Combination of Shaft nominal dia. & Lead

Unit(单位):mm

Shaft dia. 公称外径 \ Lead 导程	1	2	12
4	A323　A325 A324　A326		
6	A327　A329 A328　A330		
8	A331　A333 A332　A334	A335　A337 A336　A338	A339 A340
10		A341 A342	
12		A343 A344	

注1)表中数字:刊载页码

Note 1)The numbers in a table :showing a page in this catalogue

●精度等级和轴向间隙

PSR/PSRT系列(精密冷轧滚珠丝杠标准库存品)的精度等级为,C5(JIS B 1192-3)。
轴向间隙为0.005mm以下,可按实际要求提供无轴向间隙(预压)的产品。

●Accuracy Grade & Axial play

The grade of PSR/PSRT series(Standardized Precision Rolled Ball Screws) is C5(JIS B 1192-3). Axial play of this series is 0.005mm or less, but zero backlash(pre-load) type is available by your request.

●材质和表面硬度

PSR/PSRT系列(精密冷轧滚珠丝杠标准库存品)的材质和表面硬度如下。

●Material & Surface hardness

The material and hardness of PSR/PSRT series (Standardized Precision Rolled Ball Screws) are as follows.

Products 产品种类	Material of thread area 滚珠丝杠部材质	Heat treatment 热处理	Surface hardness 滚珠丝杠部表面硬度
Precision Rolled Ball Screws (PSR series) 精密冷轧滚珠丝杠 (PSR系列)	Shaft / 丝杠轴 : S55C	Induction hardening 高频热处理	HRC58 or more HRC58以上
	Nut / 螺母 : SCM415	Carburizing and Quenching 浸碳热处理	
Precision Rolled Ball Screws with Integrated end-journal (PSRT series) 台阶性精密冷轧滚珠丝杠 (PSRT系列)	Shaft / 丝杠轴 : S55C	Induction hardening 高频热处理	HRC58 or more HRC58以上
	Nut / 螺母 : SCM415	Carburizing and Quenching 浸碳热处理	

●润滑

精密冷轧滚珠丝杠全螺纹未加工型(PSR系列)库存用防锈油做好了防锈处理。防锈油无润滑作用,使用时请另行涂布润滑脂。无特别指示,将推荐KSS特制润滑脂(MSG No.2)

●Lubrication

Standardized Precision Rolled Ball Screws whole threaded length type(PSR Series) will be supplied with anti-rust oil.
This oil is not lubricant, when Ball Screw operates, lubricant should be applied.
If there is no specific instruction, KSS would recommend our original grease(MSG No.2) as standard lubricant. Please feel free to contact us.

●其他

PSR/PSRT系列(精密冷轧滚珠丝杠标准库存品),除了标准螺母(回路板式以及端盖式)以外,还备有紧凑型螺母(陀螺式)。可按实际用途选用。

●Others

PSR/PSRT series(Standardized Precision Rolled Ball Screws) provide 3 types of Ball Nut profile. Return-plate style and End-cap style are our standard. In addition Internal-Deflector style as Compact Ball Nut is also in stock. So you can pick one of them based on your design.

●公称型号的构成 Model number notation

【台阶型/ Integrated journal type】

如需台阶型追加工，请按以下公称型号指示长度，轴端形状，螺母方向。
In case of PSRT type(Integrated journal type), please designate length, end-journal profile, lubricant and Nut direction according to the Model number notation below.

PSRT	08	01	K	—	155	R	204	C5	B	0	X
①	②	③	④		⑤	⑥	⑦	⑧	⑨	⑩	⑪

①精密冷轧滚珠丝杠记号
PSRT：台阶型
②丝杠轴工程外径(mm)
③导程(mm)
④螺母形式
无记号：一般
K：紧凑型
⑤螺纹部长度(mm)
(追加工后按1mm单位指定)
⑥螺纹方向(R=右旋)
⑦丝杠轴总长(mm)
(按1mm单位指定)
⑧精度等级(JIS C5级)
⑨轴端加工型
参照图 A-26：A-type,B-type,C-type, D-type(其他)
⑩涂布
0：KSS推荐润滑脂(MSG No.2)
1：防锈油(Non Ruster PZ2)
2：Multemp PS2
3：其他
⑪螺母法兰方向(参照图 A-27)

①Precision Rolled Ball Screws Series No.
PSRT：Integrated journal type
②Screw Shaft nominal diameter(mm)
③Lead(mm)
④Ball Nut type
None：Standard
K：Compact type
⑤Screw thread length(mm)
(Specify in 1mm unit after end-journal machining)
⑥Thread direction(R=Right-hand)
⑦Screw Shaft total length(mm)
(Specify in 1mm unit)
⑧Accuracy grade(JIS C5)
⑨Shaft end-journal profile
Refer to Fig. A-26 below：A-type,B-type,C-type, D-type(Othes)
⑩Anti-rust oil or Lubricant
0：KSS grease(MSG No.2)
1：Anti-rust oil(Non Ruster PZ2)
2：Multemp PS2 grease
3：Other
⑪Nut Flange direction(Refer to Fig. A-27 below)

图 A-26：轴端加工型
Fig. A-26：Shaft end-journal profile

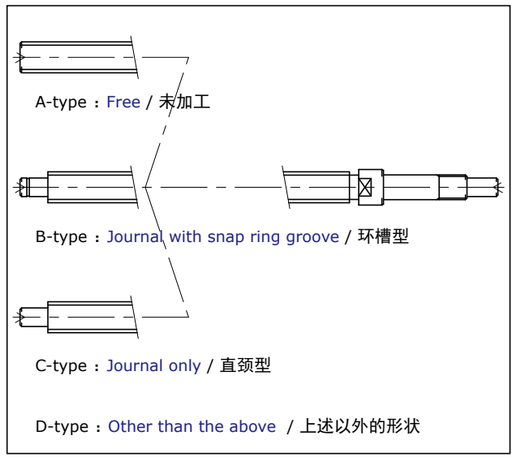
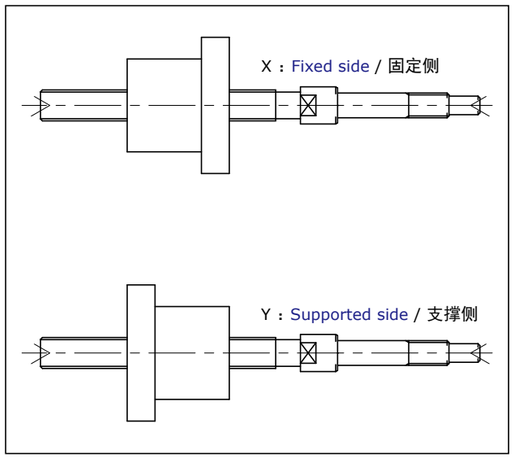


图 A-27：螺母法兰方向
Fig. A-27：Nut Flange direction



●备注
1)轴端详细尺寸请参照各页内容。
2)KSS不受理螺母的追加工。
3)规格如有更改恕不另行通知。
4)如需标准轴端(A,B,C)以外的形状,请垂询KSS。
5)客户自行追加工不予品质保证。

●Note
1)The detail of end-journal dimension for each size is shown from next page.
2)KSS does not make additional Nut machining.
3)The specification is subject to change without notice.
4)If the other configuration except (A,B,C)is requested, please contact KSS.
5)KSS will not be responsible for quality, in case re-work is done by other than KSS.

【全螺纹未加工型/ Whole threaded type】

全螺纹未加工的公称型号的构成如下。
轴端追加工，请提供图纸。
Model number notation of PSR type(whole threaded type) is as follows. Please designate end-journal profile with your simple sketch.

PSR	08	01	K	—	230	R	230	C5
①	②	③	④		⑤	⑥	⑦	⑧

①精密冷轧滚珠丝杠记号
PSR：全螺纹未加工型
②丝杠轴工程外径(mm)
③导程(mm)
④螺母形式
无记号：一般
K：紧凑型
⑤螺纹部长度(mm)
(追加工后按1mm单位指定)
⑥螺纹方向(R=右旋)
⑦丝杠轴总长(mm)
(按1mm单位指定)
⑧精度等级(JIS C5级)

①Precision Rolled Ball Screws Series No.
PSR：Whole threaded type
②Screw Shaft nominal diameter(mm)
③Lead(mm)
④Ball Nut type
None：Standard
K：Compact type
⑤Screw thread length(mm)
(Specify in 1mm unit after end-journal machining)
⑥Thread direction(R=Right-hand)
⑦Screw Shaft total length(mm)
(Specify in 1mm unit)
⑧Accuracy grade(Class JIS C5)

●特殊规格品
可接单生产以下内容的特殊设计,请垂询KSS。
1) 不同于标准的轴端形状,尺寸。
2) 不同于标准的螺母形状,尺寸。
3) 轴向间隙为零(预压规格)的产品。
4) 大于标准长度的产品。

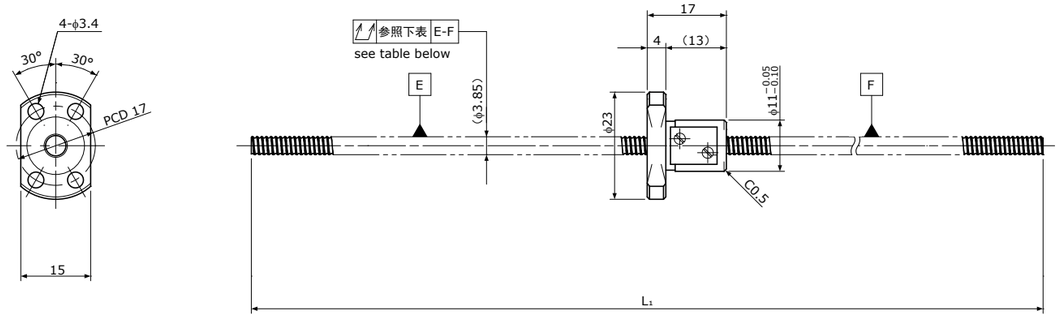
●Customized Design
It will be the customized if you need special specifications like below, please ask KSS representative.
1) Non-standard profile or dimension on Shaft end-journal.
2) Non-standard profile or dimension on Ball Nut or Flange.
3) Zero backlash (Pre - loaded) type Ball Screw.
4) Longer length of Ball Screw Shaft than standard product.

●备注
1)按要求可提供无轴向间隙(预压)的产品,请垂询KSS。
2)推荐KSS进行轴端追加工。
KSS以外进行的追加工,加工后的精度不予保证。
3)追加工时请提供追加工指示图(简易图)。
4)不予受理螺母追加工,请按法兰形状等标准形状进行设计。
5)滚珠丝杠必须涂布润滑脂使用。
请注意防锈油无润滑作用。

●Note
1)Zero backlash is possible by your request, please ask KSS representative.
2)We recommend additional end-journal machining is done by KSS. We do not guarantee accuracy after re-works done by other than KSS.
3)Please send us drawing with end-journal profile when you request end-journal maching.
4)Additional machining is not applied to the Nut. Please design flange configuration according to our standard dimension.
5)In Ball Screws use, lubricant should be applied on them. Please note that anti-rust oil is not lubricant.

Standard products in stock PSR series
标准库存品 PSR系列

PSR0401 | Shaft dia.(轴径)φ4 Lead(导程)1mm | C5



Unit(单位):mm

Ball Screw Specifications 规格		
Ball size 钢珠直径		φ0.8
Number of thread 螺纹条数		1
Thread direction 螺纹方向		Right 右
Shaft root dia. 丝杠轴低径		φ3.3
Number of circuit 循环数		3.7×1
Material 材质	Shaft 轴	S55C
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

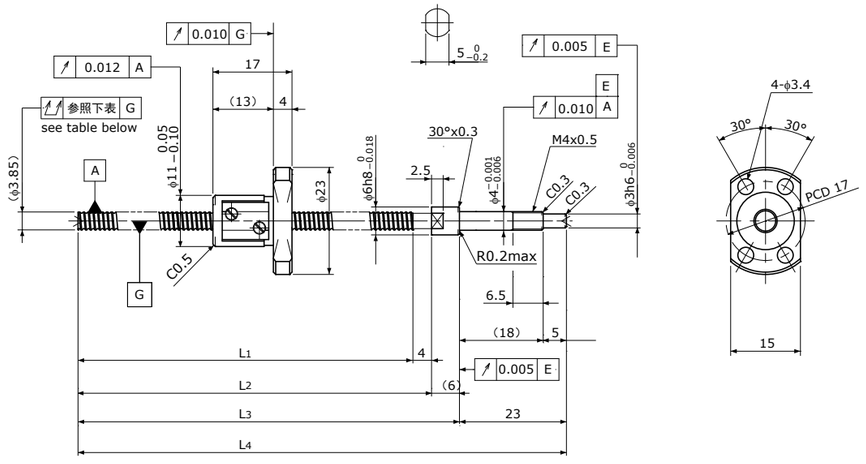
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Shaft length 丝杠轴长度	Travel deviation 代表移动量误差	Total Run-out 全跳动	Axial play 轴向间隙	Basic Load Rating 基本额定负载 N	
		L_1	e_p	↗↗		Dynamic 额定动负载 Ca	Static 额定静负载 Coa
PSR0401-100R100C5	75	100	±0.018	0.035	～0.005	560	790

Note) Please dsignate end-journal profile with your sketch. 注)轴端追加工请提供图纸。

Standard products in stock PSRT series
标准库存品 PSRT系列

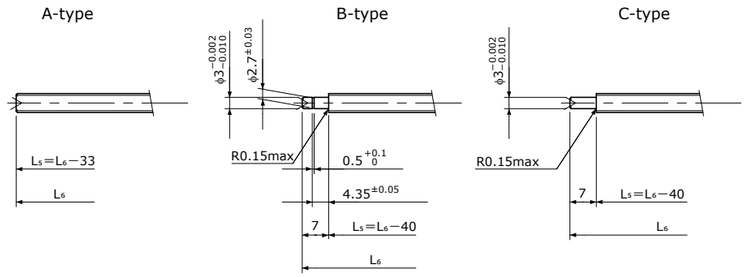
PSRT0401 | Shaft dia.(轴径)φ4 Lead(导程)1mm | C5



Unit(单位):mm

Ball Screw Specifications 规格		
Ball size 钢珠直径		φ0.8
Number of thread 螺纹条数		1
Thread direction 螺纹方向		Right 右
Shaft root dia. 丝杠轴低径		φ3.3
Number of circuit 循环数		3.7×1
Material 材质	Shaft 轴	S55C+SUS303
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Lubrication 润滑剂		KSS Original Grease MSG No.2

Supported-side end-journal profile 支撑侧轴端加工形状



L_5:Thread length after end-journal machining. 追加工后的螺纹部长度
L_6:Total length after end-journal machining. 追加工后的总长

Support-unit Recommendation 推荐的支撑单元			
	Supported-side	支撑侧 :	MSU-4CS/4GS
	Fixed-side	固定侧 :	MSU-4C/4G

D-type : Other than the above. 上述以外的形状

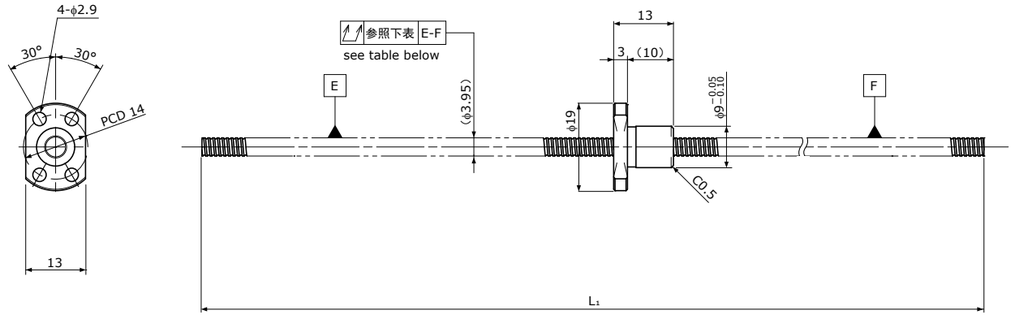
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Shaft length 丝杠轴长度				Travel deviation 代表移动量误差	Total Run-out 全跳动	Axial play 轴向间隙	Basic Load Rating 基本额定负载 N	
		L_1	L_2	L_3	L_4	e_p	↗↗		Dynamic 额定动负载 Ca	Static 额定静负载 Coa
PSRT0401-72R105C5	50	72	76	82	105	±0.018	0.035	～0.005	560	790

Note) Please refer to page A321 for order code of end-journal machining. 注)追加工的公称型号指定方法,请参照A321页

Standard products in stock PSR series
标准库存品 PSR系列

PSR0401K | Compact Nut / 紧凑型螺母 | Shaft dia.(轴径)φ4 Lead(导程)1mm | C5



Unit(单位):mm

Ball Screw Specifications 规格		
Ball size 钢珠直径		φ0.6
Number of thread 螺纹条数		1
Thread direction 螺纹方向		Right 右
Shaft root dia. 丝杠轴低径		φ3.4
Number of circuit 循环数		1×3
Material 材质	Shaft 轴	S55C
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

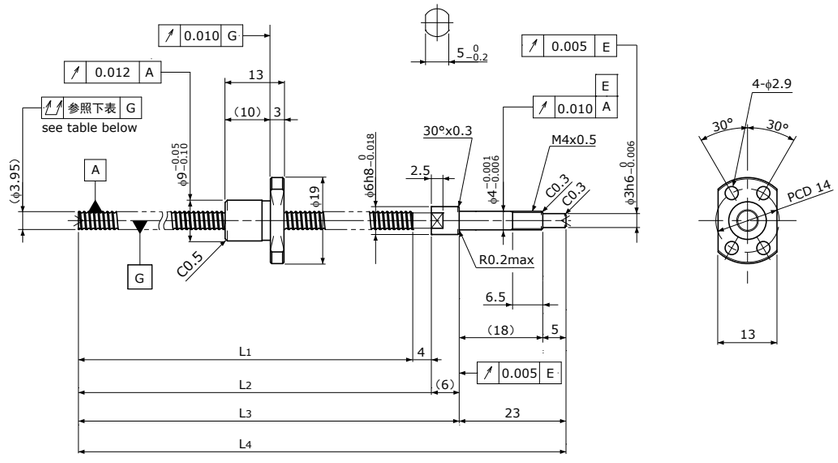
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Shaft length 丝杠轴长度	Travel deviation 代表移动量误差	Total Run-out 全跳动	Axial play 轴向间隙	Basic Load Rating 基本额定负载 N	
		L_1	e_p			Dynamic 额定动负载 Ca	Static 额定静负载 Coa
PSR0401K-100R100C5	80	100	±0.018	0.035	～0.005	300	430

Note) Please dsignate end-journal profile with your sketch. 注)轴端追加工请提供图纸。

Standard products in stock PSRT series
标准库存品 PSRT系列

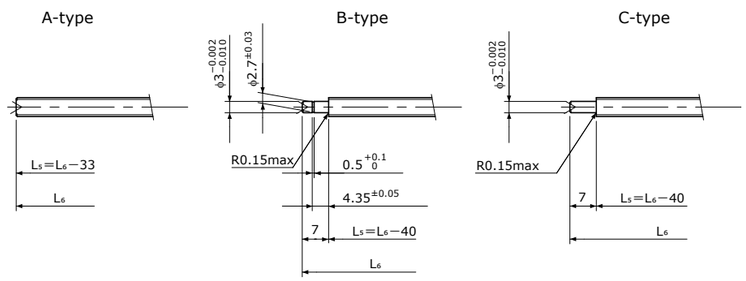
PSRT0401K | Compact Nut / 紧凑型螺母 | Shaft dia.(轴径)φ4 Lead(导程)1mm | C5



Unit(单位):mm

Ball Screw Specifications 规格		
Ball size 钢珠直径		φ0.6
Number of thread 螺纹条数		1
Thread direction 螺纹方向		Right 右
Shaft root dia. 丝杠轴低径		φ3.4
Number of circuit 循环数		1×3
Material 材质	Shaft 轴	S55C+SUS303
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Lubrication 润滑剂		KSS Original Grease MSG No.2

Supported-side end-journal profile 支撑侧轴端加工形状



L_S:Thread length after end-journal machining. 追加工后的螺纹部长度
L_6:Total length after end-journal machining. 追加工后的总长

Support-unit Recommendation 推荐的支撑单元			
	Supported-side	支撑侧 :	MSU-4CS/4GS
	Fixed-side	固定侧 :	MSU-4C/4G

D-type : Other than the above. 上述以外的形状

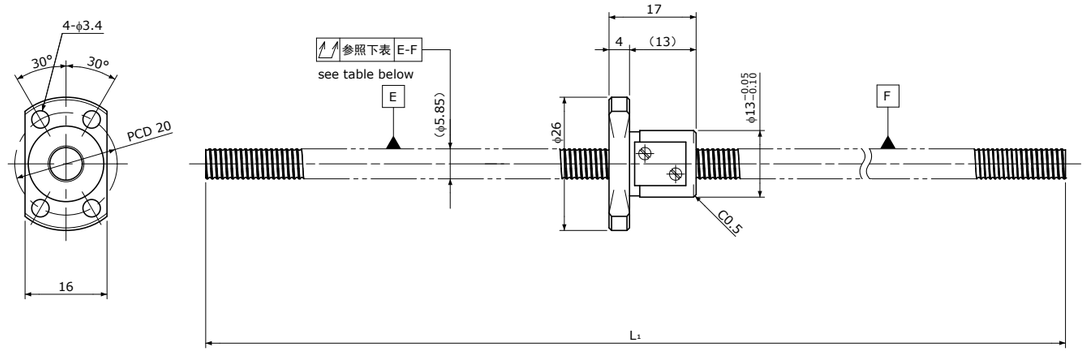
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Shaft length 丝杠轴长度				Travel deviation 代表移动量误差	Total Run-out 全跳动	Axial play 轴向间隙	Basic Load Rating 基本额定负载 N	
		L_1	L_2	L_3	L_4	e_p			Dynamic 额定动负载 Ca	Static 额定静负载 Coa
PSRT0401K-72R105C5	50	72	76	82	105	±0.018	0.035	～0.005	300	430

Note) Please refer to page A321 for order code of end-journal machining. 注)追加工的公称型号指定方法,请参照A321页

Standard products in stock PSR series
标准库存品 PSR系列

PSR0601 | Shaft dia.(轴径)φ6 Lead(导程)1mm | C5



Unit(单位):mm

Ball Screw Specifications 规格		
Ball size 钢珠直径		φ0.8
Number of thread 螺纹条数		1
Thread direction 螺纹方向		Right 右
Shaft root dia. 丝杠轴低径		φ5.3
Number of circuit 循环数		3.7×1
Material 材质	Shaft 轴	S55C
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

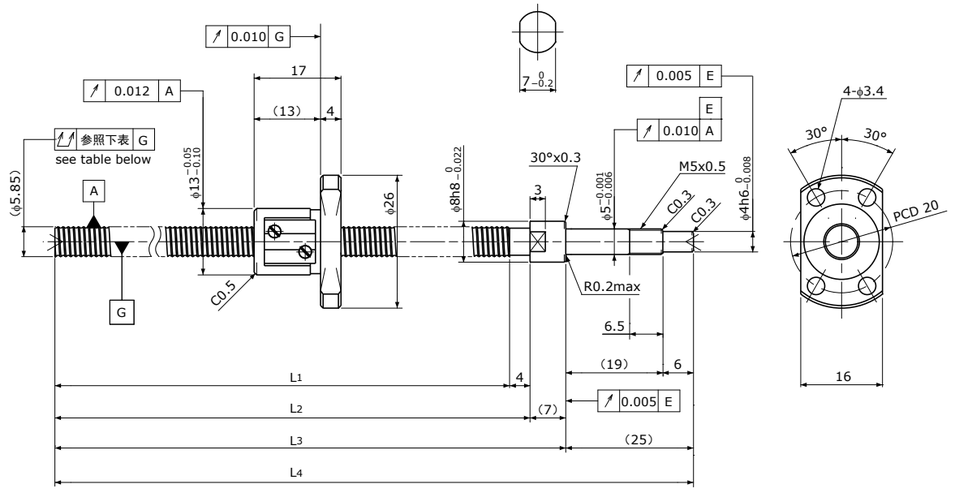
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Shaft length 丝杠轴长度	Travel deviation 代表移动量误差	Total Run-out 全跳动	Axial play 轴向间隙	Basic Load Rating 基本额定负载 N	
		L_1	e_p	↗↗		Dynamic 额定动负载 Ca	Static 额定静负载 Coa
PSR0601-200R200C5	175	200	±0.020	0.050	～0.005	680	1200

Note) Please dsignate end-journal profile with your sketch. 注)轴端追加工请提供图纸。

Standard products in stock PSRT series
标准库存品 PSRT系列

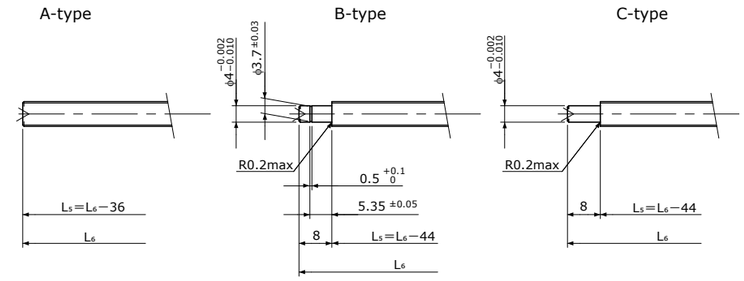
PSRT0601 | Shaft dia.(轴径)φ6 Lead(导程)1mm | C5



Unit(单位):mm

Ball Screw Specifications 规格		
Ball size 钢珠直径		φ0.8
Number of thread 螺纹条数		1
Thread direction 螺纹方向		Right 右
Shaft root dia. 丝杠轴低径		φ5.3
Number of circuit 循环数		3.7×1
Material 材质	Shaft 轴	S55C+SUS303
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Lubrication 润滑剂		KSS Original Grease MSG No.2

Supported-side end-journal profile 支撑侧轴端加工形状



L_S:Thread length after end-journal machining. 追加工后的螺纹部长度
L_6:Total length after end-journal machining. 追加工后的总长

Support-unit Recommendation 推荐的支撑单元			
	Supported-side	支撑侧 :	MSU-5CS/5GS
	Fixed-side	固定侧 :	MSU-5C/5G

D-type : Other than the above. 上述以外的形状

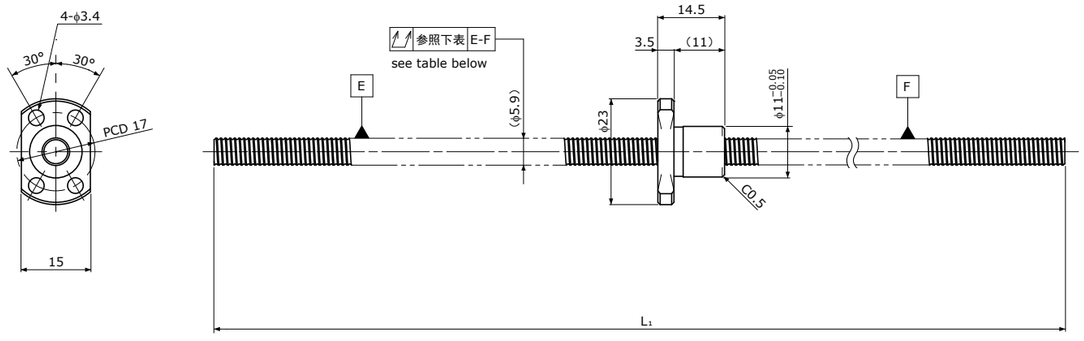
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Shaft length 丝杠轴长度				Travel deviation 代表移动量误差	Total Run-out 全跳动	Axial play 轴向间隙	Basic Load Rating 基本额定负载 N	
		L_1	L_2	L_3	L_4	e_p	↗↗		Dynamic 额定动负载 Ca	Static 额定静负载 Coa
PSRT0601-89R125C5	65	89	93	100	125	±0.018	0.035	～0.005	680	1200

Note) Please refer to page A321 for order code of end-journal machining. 注)追加工的公称型号指定方法,请参照A321页

Standard products in stock PSR series
标准库存品 PSR系列

PSR0601K | Compact Nut / 紧凑型螺母 Shaft dia.(轴径)φ6 Lead(导程)1mm | C5



Unit(单位):mm

Ball Screw Specifications 规格		
Ball size 钢珠直径		φ0.8
Number of thread 螺纹条数		1
Thread direction 螺纹方向		Right 右
Shaft root dia. 丝杠轴低径		φ5.3
Number of circuit 循环数		1×3
Material 材质	Shaft 轴	S55C
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

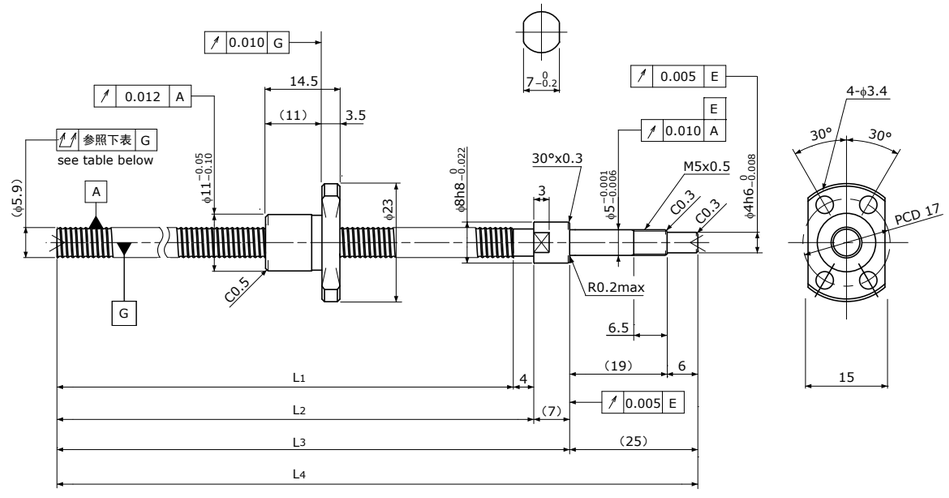
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Shaft length 丝杠轴长度	Travel deviation 代表移动量误差	Total Run-out 全跳动	Axial play 轴向间隙	Basic Load Rating 基本额定负载 N	
		L_1	e_p	↗↗		Dynamic 额定动负载 Ca	Static 额定静负载 Coa
PSR0601K-200R2000C5	180	200	±0.020	0.050	～0.005	560	950

Note) Please dsignate end-journal profile with your sketch. 注)轴端追加工请提供图纸。

Standard products in stock PSRT series
标准库存品 PSRT系列

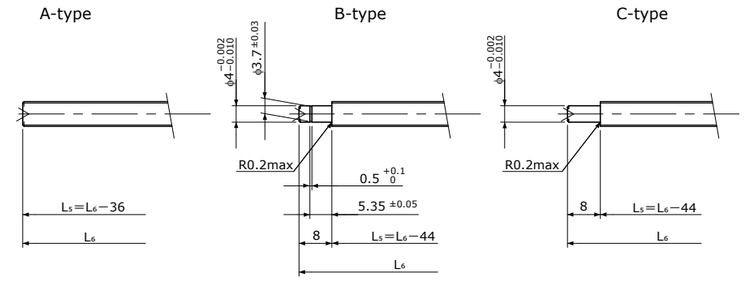
PSRT0601K | Compact Nut / 紧凑型螺母 Shaft dia.(轴径)φ6 Lead(导程)1mm | C5



Unit(单位):mm

Ball Screw Specifications 规格		
Ball size 钢珠直径		φ0.8
Number of thread 螺纹条数		1
Thread direction 螺纹方向		Right 右
Shaft root dia. 丝杠轴低径		φ5.3
Number of circuit 循环数		1×3
Material 材质	Shaft 轴	S55C+SUS303
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Lubrication 润滑剂		KSS Original Grease MSG No.2

Supported-side end-journal profile 支撑侧轴端加工形状



L_5:Thread length after end-journal machining. 追加工后的螺纹部长度
L_6:Total length after end-journal machining. 追加工后的总长

Support-unit Recommendation 推荐的支撑单元			
	Supported-side	支撑侧 :	MSU-5CS/5GS
	Fixed-side	固定侧 :	MSU-5C/5G

D-type : Other than the above. 上述以外的形状

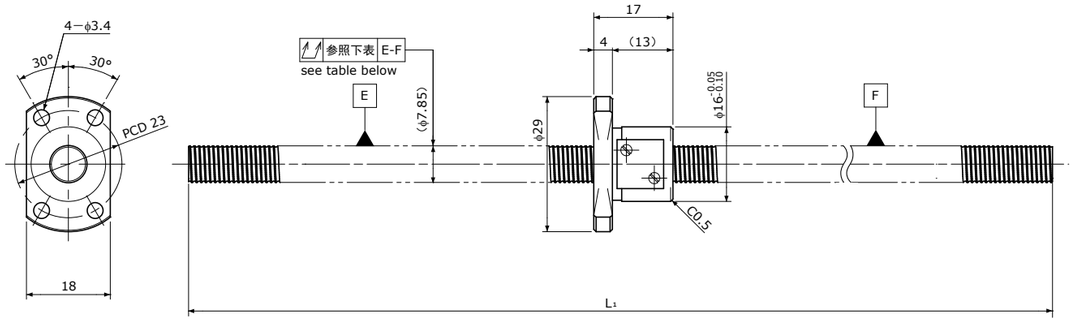
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Shaft length 丝杠轴长度				Travel deviation 代表移动量误差	Total Run-out 全跳动	Axial play 轴向间隙	Basic Load Rating 基本额定负载 N	
		L_1	L_2	L_3	L_4	e_p	↗↗		Dynamic 额定动负载 Ca	Static 额定静负载 Coa
PSRT0601K-89R125C5	65	89	93	100	125	±0.018	0.035	～0.005	560	950

Note) Please refer to page A321 for order code of end-journal machining. 注)追加工的公称型号指定方法,请参照A321页

Standard products in stock PSR series 标准库存品 PSR系列

PSR0801 | Shaft dia.(轴径)φ8 Lead(导程)1mm | C5



Unit(单位):mm

Ball Screw Specifications 规格		
Ball size 钢珠直径		φ0.8
Number of thread 螺纹条数		1
Thread direction 螺纹方向		Right 右
Shaft root dia. 丝杠轴低径		φ7.3
Number of circuit 循环数		3.7×1
Material 材质	Shaft 轴	S55C
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

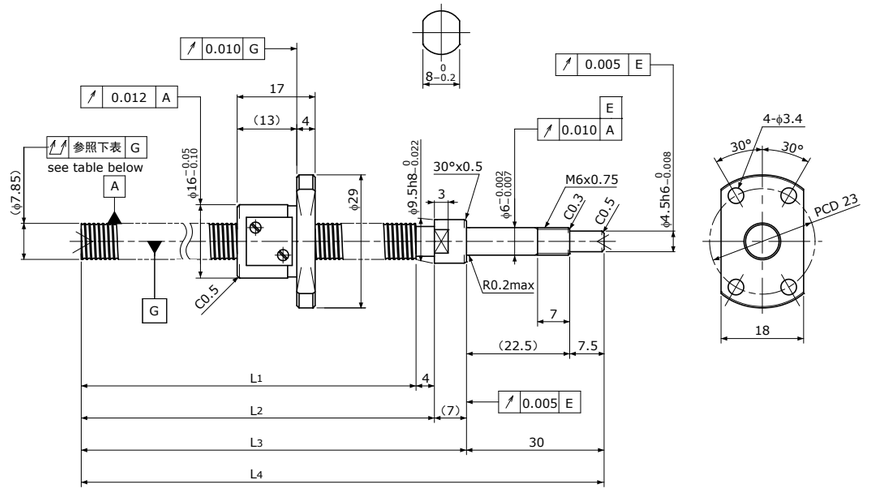
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Shaft length 丝杠轴长度	Travel deviation 代表移动量误差	Total Run-out 全跳动	Axial play 轴向间隙	Basic Load Rating 基本额定负载 N	
		L_1	e_p	↗↗		Dynamic 额定动负载 Ca	Static 额定静负载 Coa
PSR0801-230R230C5	205	230	±0.023	0.065	～0.005	780	1650

Note) Please dsignate end-journal profile with your sketch. 注)轴端追加工请提供图纸。

Standard products in stock PSRT series 标准库存品 PSRT系列

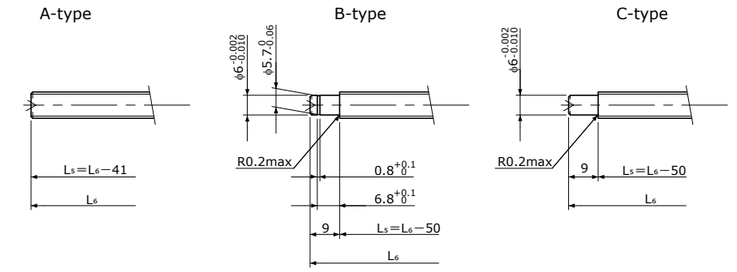
PSRT0801 | Shaft dia.(轴径)φ8 Lead(导程)1mm | C5



Unit(单位):mm

Ball Screw Specifications 规格		
Ball size 钢珠直径		φ0.8
Number of thread 螺纹条数		1
Thread direction 螺纹方向		Right 右
Shaft root dia. 丝杠轴低径		φ7.3
Number of circuit 循环数		3.7×1
Material 材质	Shaft 轴	S55C+SUS303
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Lubrication 润滑剂		KSS Original Grease MSG No.2

Supported-side end-journal profile 支撑侧轴端加工形状



L_S:Thread length after end-journal machining. 追加工后的螺纹部长度
L_6:Total length after end-journal machining. 追加工后的总长

Support-unit Recommendation 推荐的支撑单元			
	Supported-side	支撑侧 :	MSU-6CS/6GS
	Fixed-side	固定侧 :	MSU-6C/6G

D-type : Other than the above. 上述以外的形状

Unit(单位):mm

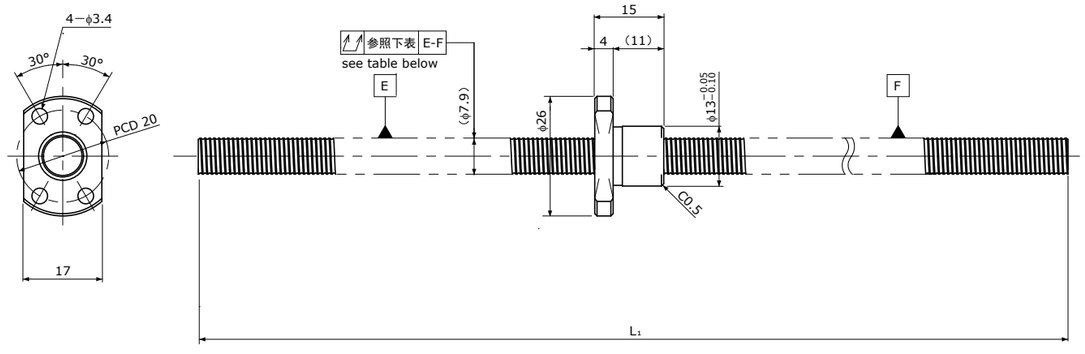
Ball Screw Model 滚珠丝杠型号	Travel 行程	Shaft length 丝杠轴长度				Travel deviation 代表移动量误差	Total Run-out 全跳动	Axial play 轴向间隙	Basic Load Rating 基本额定负载 N	
		L_1	L_2	L_3	L_4	e_p	↗↗		Dynamic 额定动负载 Ca	Static 额定静负载 Coa
PSRT0801-169R210C5	145	169	173	180	210	±0.020	0.065	～0.005	780	1650

Note) Please refer to page A321 for order code of end-journal machining. 注)追加工的公称型号指定方法,请参照A321页

Standard products in stock PSR series 标准库存品 PSR系列

PSR0801K | Compact Nut / 紧凑型螺母 | C5

Shaft dia.(轴径)φ8 Lead(导程)1mm



Unit(单位):mm

Ball Screw Specifications 规格		
Ball size 钢珠直径		φ0.8
Number of thread 螺纹条数		1
Thread direction 螺纹方向		Right 右
Shaft root dia. 丝杠轴低径		φ7.3
Number of circuit 循环数		1×3
Material 材质	Shaft 轴	S55C
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

Unit(单位):mm

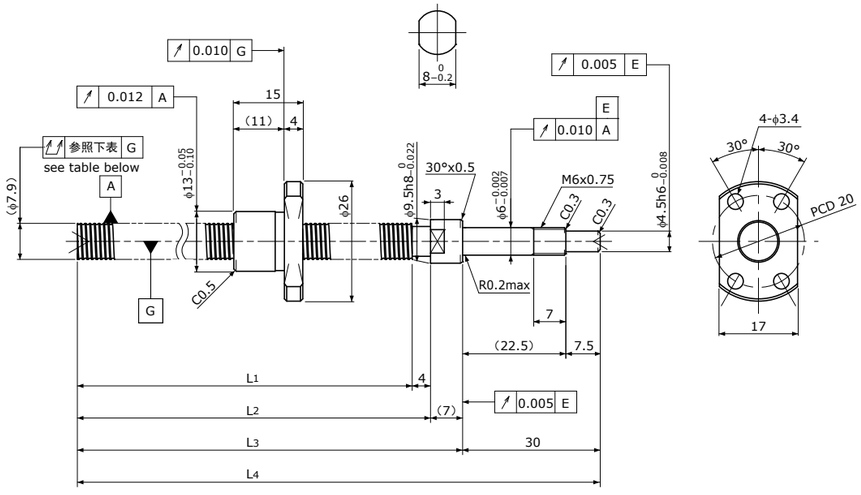
Ball Screw Model 滚珠丝杠型号	Travel 行程	Shaft length 丝杠轴长度	Travel deviation 代表移动量误差	Total Run-out 全跳动	Axial play 轴向间隙	Basic Load Rating 基本额定负载 N	
		L_1	e_p			Dynamic 额定动负载 Ca	Static 额定静负载 Coa
PSR0801K-230R230C5	210	230	±0.023	0.065	～0.005	650	1300

Note) Please dsignate end-journal profile with your sketch. 注)轴端追加工请提供图纸。

Standard products in stock PSRT series 标准库存品 PSRT系列

PSRT0801K | Compact Nut / 紧凑型螺母 | C5

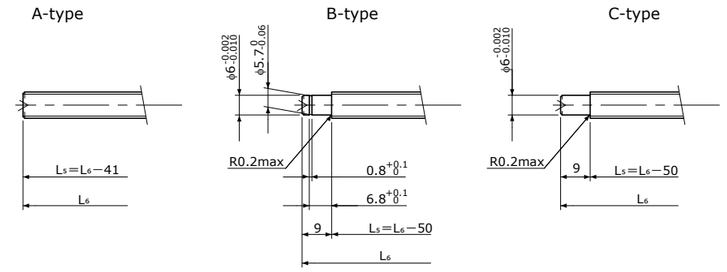
Shaft dia.(轴径)φ8 Lead(导程)1mm



Unit(单位):mm

Ball Screw Specifications 规格		
Ball size 钢珠直径		φ0.8
Number of thread 螺纹条数		1
Thread direction 螺纹方向		Right 右
Shaft root dia. 丝杠轴低径		φ7.3
Number of circuit 循环数		1×3
Material 材质	Shaft 轴	S55C+SUS303
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Lubrication 润滑剂		KSS Original Grease MSG No.2

Supported-side end-journal profile 支撑侧轴端加工形状



L_S:Thread length after end-journal machining. 追加工后的螺纹部长度
L_6:Total length after end-journal machining. 追加工后的总长

Support-unit Recommendation 推荐的支撑单元			
	Supported-side	支撑侧 :	MSU-6CS/6GS
	Fixed-side	固定侧 :	MSU-6C/6G

D-type : Other than the above. 上述以外的形状

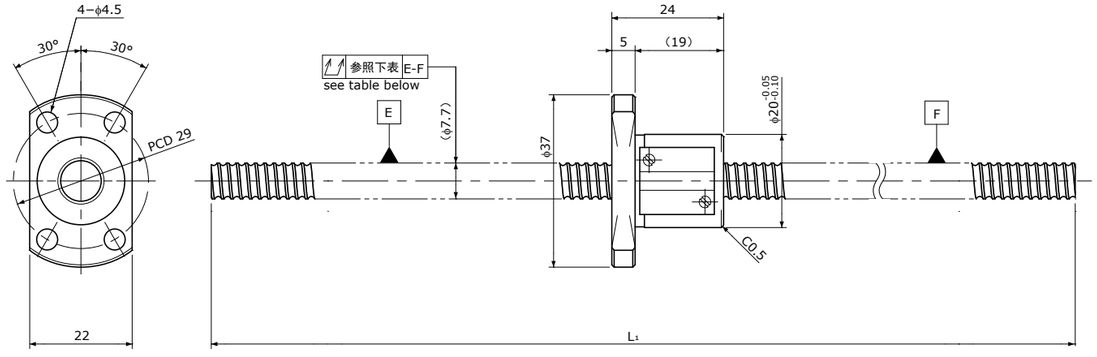
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Shaft length 丝杠轴长度				Travel deviation 代表移动量误差	Total Run-out 全跳动	Axial play 轴向间隙	Basic Load Rating 基本额定负载 N	
		L_1	L_2	L_3	L_4	e_p			Dynamic 额定动负载 Ca	Static 额定静负载 Coa
PSRT0801K-169R210C5	145	169	173	180	210	±0.020	0.065	～0.005	650	1300

Note) Please refer to page A321 for order code of end-journal machining. 注)追加工的公称型号指定方法,请参照A321页

Standard products in stock PSR series 标准库存品 PSR系列

PSR0802 | Shaft dia.(轴径)φ8 Lead(导程)2mm | C5



Unit(单位):mm

Ball Screw Specifications 规格		
Ball size 钢珠直径		φ1.5875
Number of thread 螺纹条数		1
Thread direction 螺纹方向		Right 右
Shaft root dia. 丝杠轴低径		φ6.6
Number of circuit 循环数		3.7×1
Material 材质	Shaft 轴	S55C
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

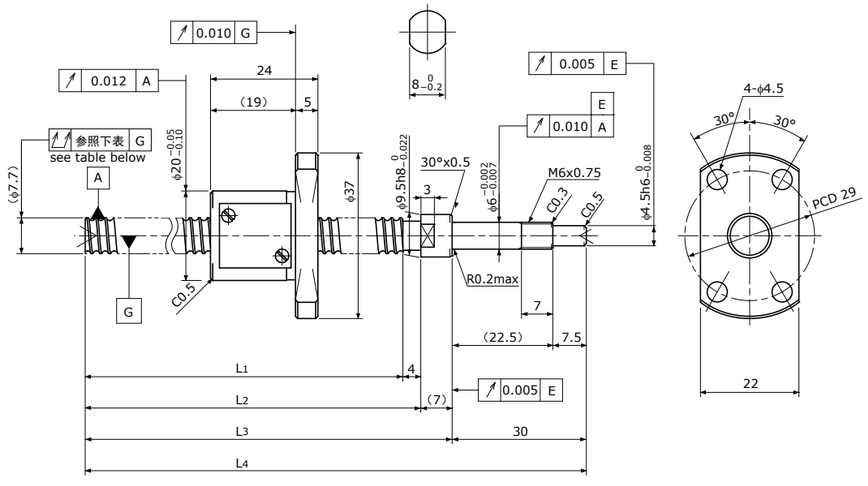
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Shaft length 丝杠轴长度	Travel deviation 代表移动量误差	Total Run-out 全跳动	Axial play 轴向间隙	Basic Load Rating 基本额定负载 N	
		L_1	e_p	↗↗		Dynamic 额定动负载 Ca	Static 额定静负载 Coa
PSR0802-230R230C5	200	230	±0.023	0.065	～0.005	2400	4100

Note) Please dsignate end-journal profile with your sketch. 注)轴端追加工请提供图纸。

Standard products in stock PSRT series 标准库存品 PSRT系列

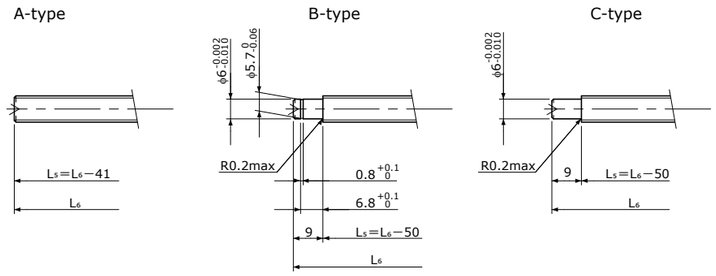
PSRT0802 | Shaft dia.(轴径)φ8 Lead(导程)2mm | C5



Unit(单位):mm

Ball Screw Specifications 规格		
Ball size 钢珠直径		φ1.5875
Number of thread 螺纹条数		1
Thread direction 螺纹方向		Right 右
Shaft root dia. 丝杠轴低径		φ6.6
Number of circuit 循环数		3.7×1
Material 材质	Shaft 轴	S55C+SUS303
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Lubrication 润滑剂		KSS Original Grease MSG No.2

Supported-side end-journal profile 支撑侧轴端加工形状



L_S:Thread length after end-journal machining. 追加工后的螺纹部长度
L_6:Total length after end-journal machining. 追加工后的总长

Support-unit Recommendation 推荐的支撑单元			
	Supported-side	支撑侧 :	MSU-6CS/6GS
	Fixed-side	固定侧 :	MSU-6C/6G

D-type : Other than the above. 上述以外的形状

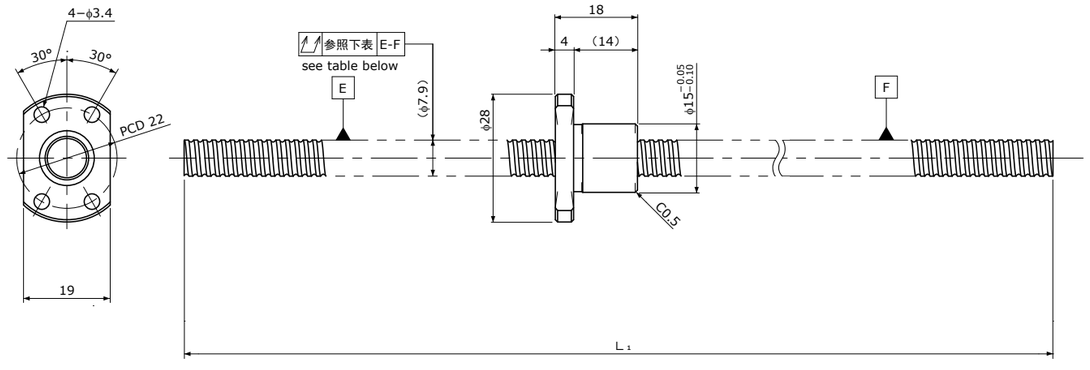
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Shaft length 丝杠轴长度				Travel deviation 代表移动量误差	Total Run-out 全跳动	Axial play 轴向间隙	Basic Load Rating 基本额定负载 N	
		L_1	L_2	L_3	L_4	e_p	↗↗		Dynamic 额定动负载 Ca	Static 额定静负载 Coa
PSRT0802-169R210C5	140	169	173	180	210	±0.020	0.065	～0.005	2400	4100

Note) Please refer to page A321 for order code of end-journal machining. 注)追加工的公称型号指定方法,请参照A321页

Standard products in stock PSR series
标准库存品 PSR系列

PSR0802K | Compact Nut / 紧凑型螺母 | Shaft dia.(轴径)φ8 Lead(导程)2mm | C5



Unit(单位):mm

Ball Screw Specifications 规格		
Ball size 钢珠直径		φ1.2
Number of thread 螺纹条数		1
Thread direction 螺纹方向		Right 右
Shaft root dia. 丝杠轴低径		φ7.0
Number of circuit 循环数		1×3
Material 材质	Shaft 轴	S55C
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

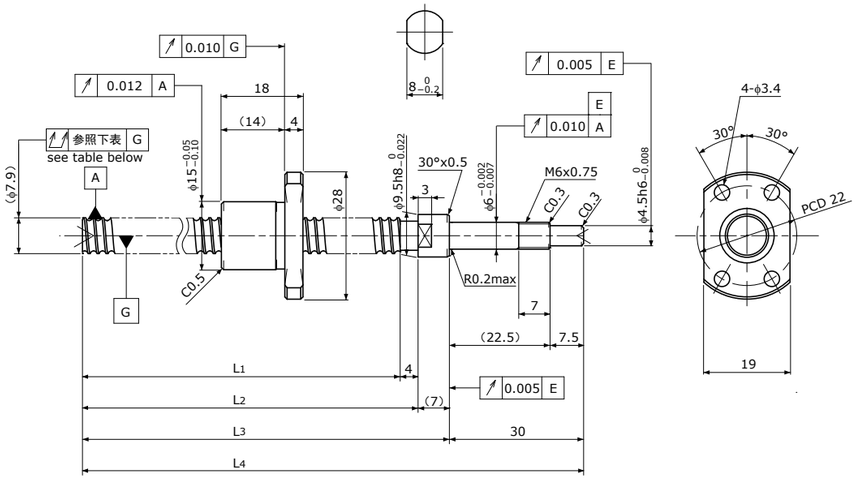
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Shaft length 丝杠轴长度	Travel deviation 代表移动量误差	Total Run-out 全跳动	Axial play 轴向间隙	Basic Load Rating 基本额定负载 N	
		L_1	e_p			Dynamic 额定动负载 Ca	Static 额定静负载 Coa
PSR0802K-230R230C5	205	230	±0.023	0.065	～0.005	1300	2300

Note) Please dsignate end-journal profile with your sketch. 注)轴端追加工请提供图纸。

Standard products in stock PSRT series
标准库存品 PSRT系列

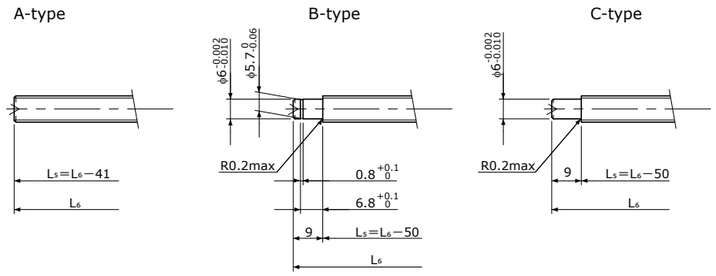
PSRT0802K | Compact Nut / 紧凑型螺母 | Shaft dia.(轴径)φ8 Lead(导程)2mm | C5



Unit(单位):mm

Ball Screw Specifications 规格		
Ball size 钢珠直径		φ1.2
Number of thread 螺纹条数		1
Thread direction 螺纹方向		Right 右
Shaft root dia. 丝杠轴低径		φ7.0
Number of circuit 循环数		1×3
Material 材质	Shaft 轴	S55C+SUS303
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Lubrication 润滑剂		KSS Original Grease MSG No.2

Supported-side end-journal profile 支撑侧轴端加工形状



L_S:Thread length after end-journal machining. 追加工后的螺纹部长度
L_6:Total length after end-journal machining. 追加工后的总长

Support-unit Recommendation 推荐的支撑单元			
	Supported-side	支撑侧 :	MSU-6CS/6GS
	Fixed-side	固定侧 :	MSU-6C/6G

D-type : Other than the above. 上述以外的形状

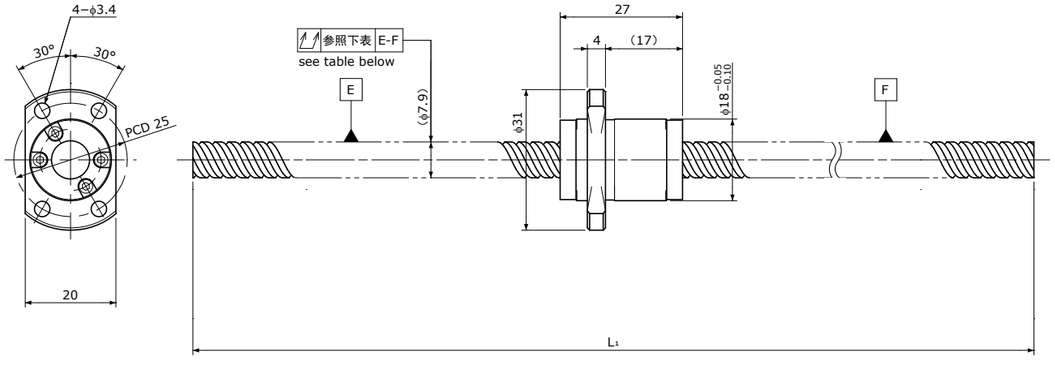
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Shaft length 丝杠轴长度				Travel deviation 代表移动量误差	Total Run-out 全跳动	Axial play 轴向间隙	Basic Load Rating 基本额定负载 N	
		L_1	L_2	L_3	L_4	e_p			Dynamic 额定动负载 Ca	Static 额定静负载 Coa
PSRT0802K-169R210C5	145	169	173	180	210	±0.020	0.065	～0.005	1300	2300

Note) Please refer to page A321 for order code of end-journal machining. 注)追加工的公称型号指定方法,请参照A321页

Standard products in stock PSR series 标准库存品 PSR系列

PSR0812 | Shaft dia.(轴径)φ8 Lead(导程)12mm | C5



Unit(单位):mm

Ball Screw Specifications 规格		
Ball size 钢珠直径		φ1.5875
Number of thread 螺纹条数		2
Thread direction 螺纹方向		Right 右
Shaft root dia. 丝杠轴低径		φ6.7
Number of circuit 循环数		1.6×2
Material 材质	Shaft 轴	S55C
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

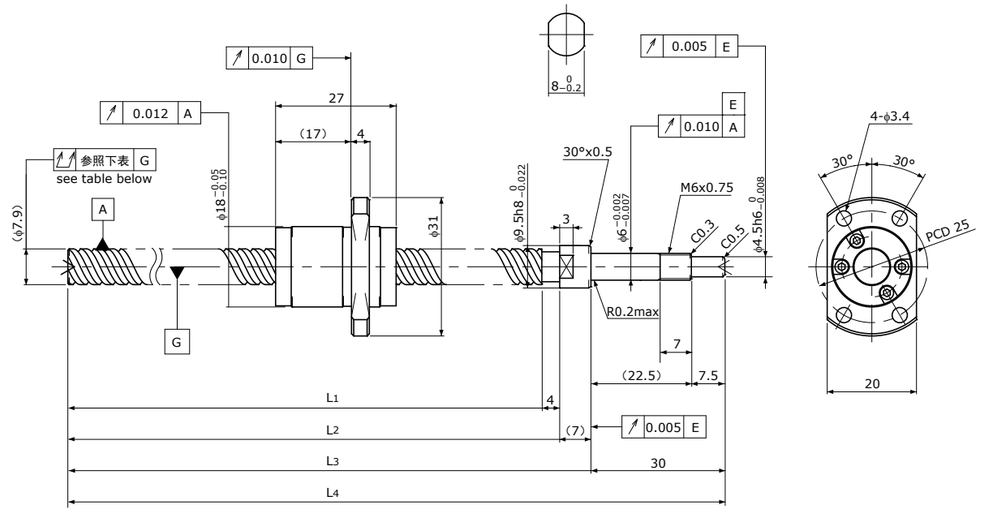
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Shaft length 丝杠轴长度	Travel deviation 代表移动量误差	Total Run-out 全跳动	Axial play 轴向间隙	Basic Load Rating 基本额定负载 N	
		L_1	e_p	↗↗		Dynamic 额定动负载 Ca	Static 额定静负载 Coa
PSR0812-230R230C5	195	230	±0.023	0.065	～0.005	2200	4000

Note) Please dsignate end-journal profile with your sketch. 注)轴端追加工请提供图纸。

Standard products in stock PSRT series 标准库存品 PSRT系列

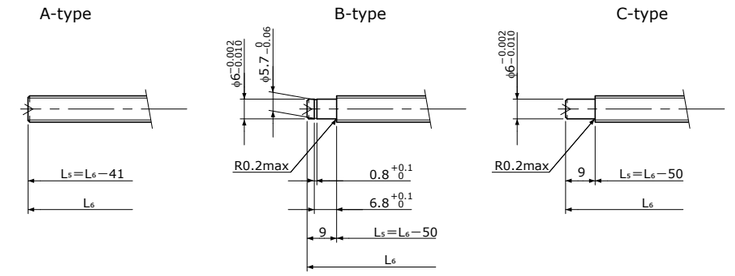
PSRT0812 | Shaft dia.(轴径)φ8 Lead(导程)12mm | C5



Unit(单位):mm

Ball Screw Specifications 规格		
Ball size 钢珠直径		φ1.5875
Number of thread 螺纹条数		2
Thread direction 螺纹方向		Right 右
Shaft root dia. 丝杠轴低径		φ6.7
Number of circuit 循环数		1.6×2
Material 材质	Shaft 轴	S55C+SUS303
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Lubrication 润滑剂		KSS Original Grease MSG No.2

Supported-side end-journal profile 支撑侧轴端加工形状



L_5:Thread length after end-journal machining. 追加工后的螺纹部长度
L_6:Total length after end-journal machining. 追加工后的总长

Support-unit Recommendation 推荐的支撑单元			
	Supported-side	支撑侧 :	MSU-6CS/6GS
	Fixed-side	固定侧 :	MSU-6C/6G

D-type : Other than the above. 上述以外的形状

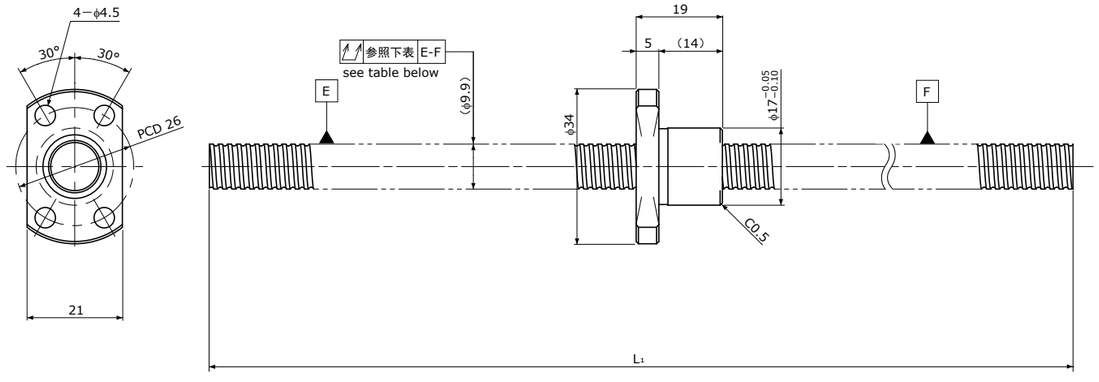
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Shaft length 丝杠轴长度				Travel deviation 代表移动量误差	Total Run-out 全跳动	Axial play 轴向间隙	Basic Load Rating 基本额定负载 N	
		L_1	L_2	L_3	L_4	e_p	↗↗		Dynamic 额定动负载 Ca	Static 额定静负载 Coa
PSRT0812-169R210C5	135	169	173	180	210	±0.020	0.065	～0.005	2200	4000

Note) Please refer to page A321 for order code of end-journal machining. 注)追加工的公称型号指定方法,请参照A321页

Standard products in stock PSR series
标准库存品 PSR系列

PSR1002K | Compact Nut / 紧凑型螺母 | Shaft dia.(轴径)φ10 Lead(导程)2mm | C5



Unit(单位):mm

Ball Screw Specifications 规格		
Ball size 钢珠直径		φ1.2
Number of thread 螺纹条数		1
Thread direction 螺纹方向		Right 右
Shaft root dia. 丝杠轴低径		φ9.0
Number of circuit 循环数		1×3
Material 材质	Shaft 轴	S55C
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

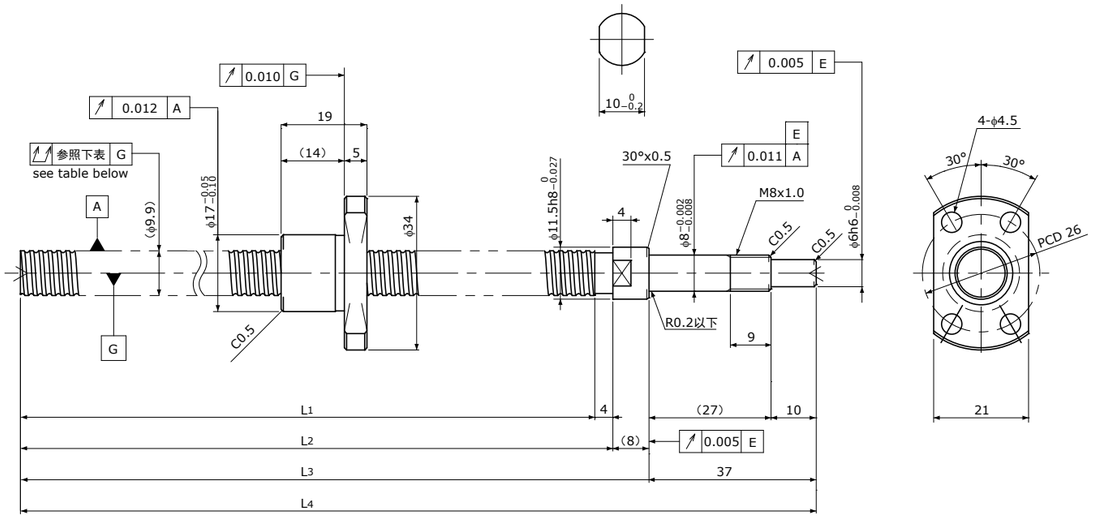
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Shaft length 丝杠轴长度	Travel deviation 代表移动量误差	Total Run-out 全跳动	Axial play 轴向间隙	Basic Load Rating 基本额定负载 N	
		L_1	e_p			Dynamic 额定动负载 Ca	Static 额定静负载 Coa
PSR1002K-230R230C5	205	230	±0.023	0.055	～0.005	1450	3000

Note) Please dsignate end-journal profile with your sketch. 注)轴端追加工请提供图纸。

Standard products in stock PSRT series
标准库存品 PSRT系列

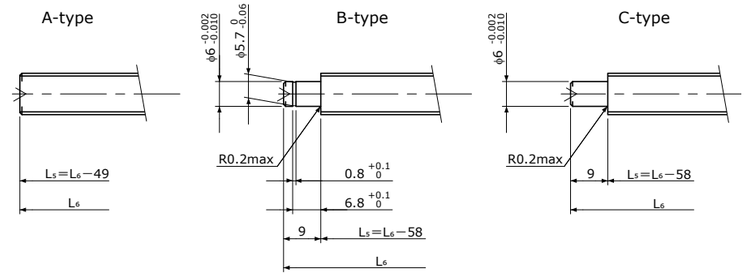
PSRT1002K | Compact Nut / 紧凑型螺母 | Shaft dia.(轴径)φ10 Lead(导程)2mm | C5



Unit(单位):mm

Ball Screw Specifications 规格		
Ball size 钢珠直径		φ1.2
Number of thread 螺纹条数		1
Thread direction 螺纹方向		Right 右
Shaft root dia. 丝杠轴低径		φ9.0
Number of circuit 循环数		1×3
Material 材质	Shaft 轴	S55C+SUS303
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Lubrication 润滑剂		KSS Original Grease MSG No.2

Supported-side end-journal profile 支撑侧轴端加工形状



L_5:Thread length after end-journal machining. 追加工后的螺纹部长度
L_6:Total length after end-journal machining. 追加工后的总长

Support-unit Recommendation 推荐的支撑单元			
	Supported-side	支撑侧 :	MSU-8CS/8GS
	Fixed-side	固定侧 :	MSU-8C/8G

D-type : Other than the above. 上述以外的形状

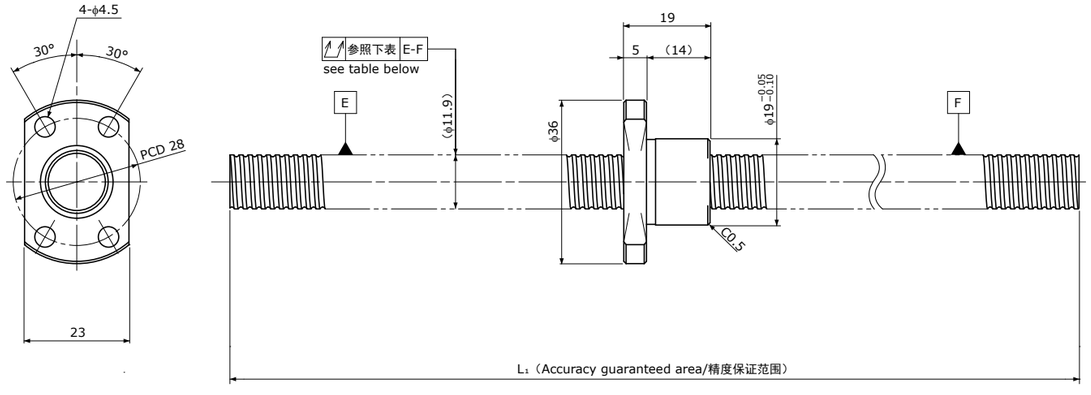
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Shaft length 丝杠轴长度				Travel deviation 代表移动量误差	Total Run-out 全跳动	Axial play 轴向间隙	Basic Load Rating 基本额定负载 N	
		L_1	L_2	L_3	L_4	e_p			Dynamic 额定动负载 Ca	Static 额定静负载 Coa
PSRT1002K-201R250C5	175	201	205	213	250	±0.023	0.055	～0.005	1450	3000

Note) Please refer to page A321 for order code of end-journal machining. 注)追加工的公称型号指定方法,请参照A321页

Standard products in stock PSR series 标准库存品 PSR系列

PSR1202K | Compact Nut / 紧凑型螺母 | Shaft dia.(轴径)φ12 Lead(导程)2mm | C5



Unit(单位):mm

Ball Screw Specifications 规格		
Ball size 钢珠直径		φ1.2
Number of thread 螺纹条数		1
Thread direction 螺纹方向		Right 右
Shaft root dia. 丝杠轴低径		φ11.0
Number of circuit 循环数		1×3
Material 材质	Shaft 轴	S55C
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Anti-rust treatment 防锈处理		Anti-rust oil 防锈油

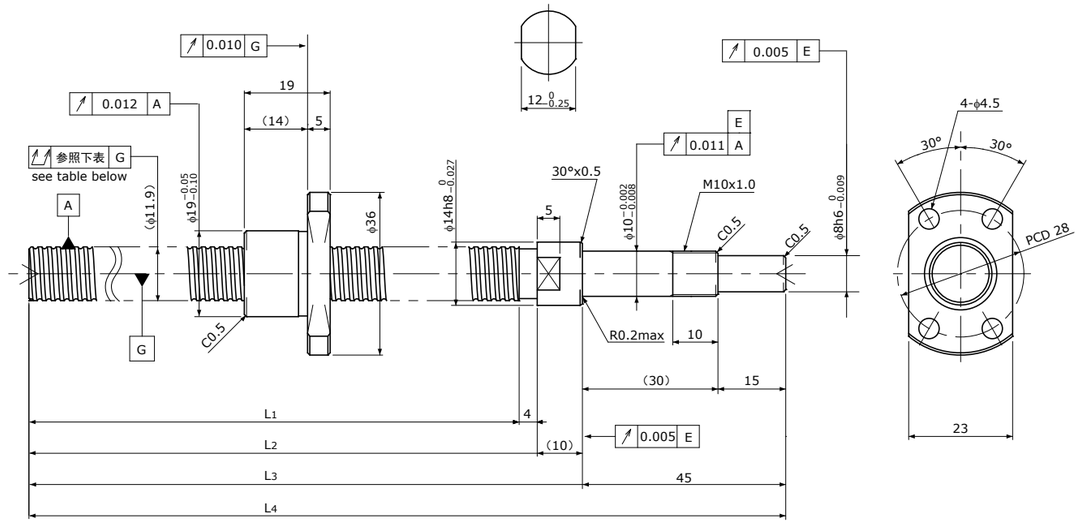
Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Shaft length 丝杠轴长度	Travel deviation 代表移动量误差	Total Run-out 全跳动	Axial play 轴向间隙	Basic Load Rating 基本额定负载 N	
		L_1	e_p			Dynamic 额定动负载 Ca	Static 额定静负载 Coa
PSR1202K-280R280C5	255	280	±0.023	0.055	～0.005	1600	3700

Note) Please dsignate end-journal profile with your sketch. 注)轴端追加工请提供图纸。

Standard products in stock PSRT series 标准库存品 PSRT系列

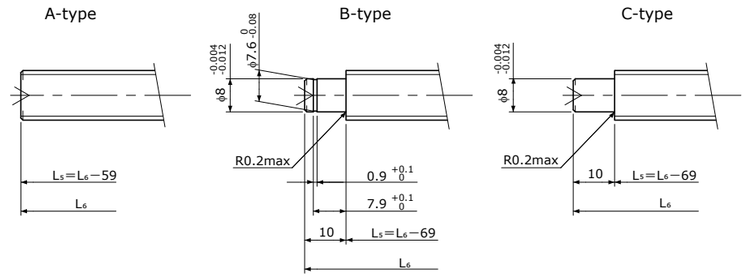
PSRT1202K | Compact Nut / 紧凑型螺母 | Shaft dia.(轴径)φ12 Lead(导程)2mm | C5



Unit(单位):mm

Ball Screw Specifications 规格		
Ball size 钢珠直径		φ1.2
Number of thread 螺纹条数		1
Thread direction 螺纹方向		Right 右
Shaft root dia. 丝杠轴低径		φ11.0
Number of circuit 循环数		1×3
Material 材质	Shaft 轴	S55C+SUS303
	Nut 螺母	SCM415H
Surface hardness 螺纹部表面硬度		HRC58～ (Thread area)
Lubrication 润滑剂		KSS Original Grease MSG No.2

Supported-side end-journal profile 支撑侧轴端加工形状



L_S:Thread length after end-journal machining. 追加工后的螺纹部长度
L_6:Total length after end-journal machining. 追加工后的总长

Support-unit Recommendation 推荐的支撑单元			
	Supported-side	支撑侧 :	—
	Fixed-side	固定侧 :	—

D-type : Other than the above. 上述以外的形状

Unit(单位):mm

Ball Screw Model 滚珠丝杠型号	Travel 行程	Shaft length 丝杠轴长度				Travel deviation 代表移动量误差	Total Run-out 全跳动	Axial play 轴向间隙	Basic Load Rating 基本额定负载 N	
		L_1	L_2	L_3	L_4	e_p			Dynamic 额定动负载 Ca	Static 额定静负载 Coa
PSRT1202K-271R330C5	245	271	275	285	330	±0.023	0.065	～0.005	1600	3700

Note) Please refer to page A321 for order code of end-journal machining. 注)追加工的公称型号指定方法,请参照A321页

接单生产
Customized products

为了满足客户的各种设计需求，除标准库存品以外，本公司还承接接单生产。
为节省客户的设计时间，我们对各种螺母类型进行了标准化。

In order to meet the needs of customer's requested design, we offer customized products.
To reduce design process at customer, each Nut type is standardized.

●接单生产的种类

关于接单生产，无论是精密滚珠丝杠，还是冷轧滚珠丝杠，都根据螺母类型进行了标准化。螺母类型有以下几种。此外，我们还生产其他类型和尺寸的特别定制产品，详情请垂询本公司。

●Variety of Customized products

Customized Precision Ball Screws and Rolled Ball Screws are both standardized in Ball Nut dimension only. Please refer to following description about Standardized Ball Nut type. If you need special Ball Nut other than below, feel free to ask KSS.
KSS will provide with required Ball Nut as a special order.

●按轴径和导程分类的型号一览 Table of Shaft dia. and Lead combination

注)*表示双向螺母。
Note)* means Bi-directional Nut with Flange.

Shaft dia. / 轴径 (mm)	Lead / 导程 (mm) 0.5	1	1.5	2	2.5	3	4	5	6	8	10	12	15	20	25	30
1.8	FBS															
3	FBS	FBS BS														
4	FBS	FKB FBS BS MS FKB* FBS* MRB BSR MSR		FBS BS MRB BSR		FBS BS	FEB									
5	FBS	FKB FBS BS FKB* FBS*					FBS BS MRB BSR									
6	FBS	FKB FBS BS KS FKB* FBS* MRB BSR	FBS BS	FBS BS MS KS MRB BSR	FBS BS				FEB MRB		FEB MRB	FEB				
8	FBS	FKB FBS BS KS FKB* FBS* MRB BSR	FKB FBS BS MS FKB* FBS*	FKB FBS BS MS KS FKB* FBS* MRB BSR MSR	FDB FBS BS MS MRB BSR MSR	FBS BS MS	FBS BS MS	FBS BS MS MRB BSR MSR		FEB MRB	FEB MRB	FEB MRB				
10		FKB FBS BS KS FKB* FBS*	FKB FBS BS FKB* FBS*	FKB FBS BS MS KS FKB* FBS* MRB BSR MSR	FKB FBS BS FKB* FBS*	FBS BS FBS*	FBS BS FBS* MRB BSR	FDB FBS BS FBS* MRB BSR	MRB BSR		FEB MRB	FEB MRB	FEB MRB	FEB MRB	FEB	FEB
12		FKB FBS BS FKB* FBS*		FKB FBS BS MS FKB* FBS* MRB BSR MSR	FKB FBS BS FKB* FBS*	FKB FBS BS FKB* FBS*	FBS BS MS FBS*	FBS BS			FEB MRB					
13												FEB MRB	FEB MRB	FEB MRB		
14		FBS BS FBS*		FKB FBS BS MS FKB* FBS* MRB BSR MSR	FKB FBS BS FKB* FBS*	FKB FBS BS FKB* FBS*	FKB FBS BS MS FKB* FBS* MRB BSR MSR	FBS BS FBS*								
15							FBS	FEB FBS MRB			FEB FBS MRB			FEB FBS MRB		FEB
16		FBS BS FBS*		FKB FBS BS FKB* FBS*	FKB FBS BS FKB* FBS*	FKB FBS BS FKB* FBS*	FKB FBS BS FKB* FBS*	FBS BS FBS*								
20								FBS			FBS					

●按螺母种类分类的型号一览 Nut style list

Nut type 螺母形状	Precision Ball Screws 精密滚珠丝杠	Rolled Ball Screws 冷轧滚珠丝杠
Single Nut with Flange 带法兰单螺母	FKB FBS FDB FEB	MRB
Sleeve type Single Nut 套筒型单螺母	BS	BSR
Single Nut with M-thread 带公制螺纹单螺母	MS	MSR
Square type Single Nut 方型单螺母	KS	—
Bi-directional Nut with Flange 双向螺母	FBS* FKB*	—

注)*表示双向螺母。
Note)* means Bi-directional Nut with Flange.

●滚珠丝杆的生产范围 Maximum limit of overall lengths

Unit(单位):mm

Accuracy grade 精密等级 / Shaft nominal dia. 轴径	C0	C1	C3	C5	C7 & C10 (Rolled Ball Screw / 冷轧)
4	90	120	160	170	240
5	90	120	160	170	300
6	140	180	240	250	350
8	200	250	330	350	450
10	260	320	420	450	650
12	320	390	510	550	700
13	320	390	510	550	700
14	380	460	600	660	700
15	380	460	600	660	1000
16	450	540	700	770	—

●带法兰单螺母（FBS,FKB,FDB,FEB,MRB系列） Single Nut with Flange

用法兰部螺栓孔安装螺母的最简单的单螺母丝杠。
有复式回路板循环方式(FBS,MRB系列),陀螺式循环方式(FKB系列),偏转器式循环方式(FDB系列)以及端盖式循环方式(FEB系列)等的多种产品供您选择。

It is the most simple Single Nut type. Normally Ball Screws are used with small Axial play, but using oversized Balls allows for the application of light preloading and eliminates backlash(only Precision grade). Nut should be mounted using bolt holes in Flange. FBS, MRB(Return-plate), FKB(Internal-deflector), FDB(End-deflector), FEB(End-cap) circulation system can be distinguished. Please refer to dimension table.

●套筒型单螺母（BS,BSR系列）Sleeve type Single Nut

采用圆筒型单螺母实现了径向紧凑化。
可用圆筒面键槽和螺母端面安装螺母。

It is Cylindrical Single Nut which is compact. Alike Single Nut with Flange, Axial play can be eliminated(only Precision grade). The Nut should be mounted by clamping on the key way on the Nut outer and Nut end surface.

●带公制螺纹单螺母（MS,MSR系列）Single Nut with M-thread

圆筒型螺母端面设有公制螺纹用于直接安装螺母。
最适用于气缸,电动杠等用途。

The Cylindrical type with M-thread at the Nut end. The Nut should be mounted using M-thread. It is suitable for mounting with cylinder.

●方型单螺母（KS系列）Square type Single Nut

平行于螺母中心设有较宽安装面的方形螺母丝杠。
螺母与支座一体,可实现紧凑型设计。

The Square Nut is finished with a large mounting face parallel to the Nut center. Nut itself has Housing function. This allows for a more compact design compared to Flange type.

●双向单螺母（FKB,FBS系列）Bi-directional Nut with Flange

单轴同时加工左旋和右旋螺纹,实现双向丝杠,左右相位控制等的功能。

Since there are both Right-handed thread and Left-handed thread on a Shaft, it has Bi-directional function.
Single Nut with Flange type is standardized, but it is also possible to manufacture Sleeve type Nut. In addtion, absolute positon control for both Nut is available.

●其他 Others

作为特殊规格,也生产双螺母产品,需要时请垂询本公司。

KSS can provide Double Nut style as one of choices for pre-loaded Ball Screws as special customized products.
Please ask KSS representative if necessary.

●公称型号的构成 Model number notation

FBS 04 01 B — 100 R 120 C3 — 05
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

①螺母类型符号
精密滚珠丝杠：
FBS ：带法兰单螺母
BS ：套筒型单螺母
MS ：带公制螺纹单螺母
KS ：方型单螺母
冷轧滚珠丝杠
MRB ：带法兰单螺母
BSR ：套筒型单螺母
MSR ：带公制螺纹单螺母
②丝杠轴公称外径(mm)
③导程(mm)
④循环数符号(详情参照尺寸表)
⑤螺纹部长度(mm)
⑥螺纹旋向(R=右旋,L=左旋)
⑦丝杠轴总长(mm)
⑧精度等级(C0、C1、C3、C5、C7、C10)
⑨轴向间隙(μm)

①Ball Nut type No.
Precision Ball Screws
FBS ：Single Nut with Flange
BS ：Sleeve type Single Nut
MS ：Single Nut with M-thread
KS ：Square type Single Nut
Rolled Ball Screws
MRB ：Single Nut with Flange
BSR ：Sleeve type Single Nut
MSR ：Single Nut with M-thread
②Screw Shaft nominal diameter(mm)
③Lead(mm)
④Re-circulation number(In detail refer to dimension table)
⑤Screw thread length(mm)
⑥Thread direction(R=Right-hand, L=Left-hand)
⑦Screw shaft total length(mm)
⑧Accuracy grade(C0,C1,C3,C5,C7,C10)
⑨Axial play(μm)

●注意事项

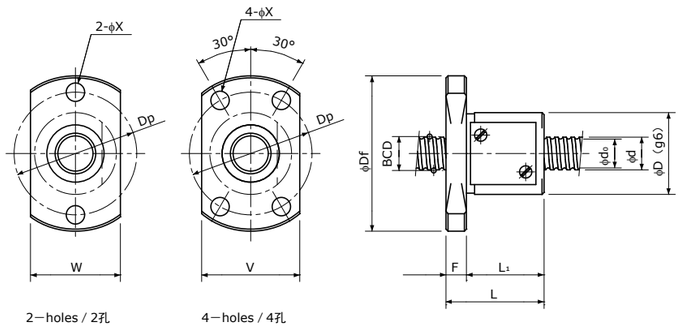
- 有关具体尺寸、额定负载、刚性等,请参照各型号相应的尺寸表。
- 有关精度、轴向间隙、材质、生产范围等详情,请参照技术解说A801页。
- 接单生产时,丝杠轴的形状、尺寸未进行标准化。本公司可根据客户需求,制作KSS规格图。
- 设计丝杠轴时,由于组装螺母的关系,请注意使丝杠轴的其中一端(双向丝杠及冷轧滚珠丝杠时应为两端)不超过底径。
- 有关其它注意事项,请参照“存放、操作及使用注意事项”A901页。

●Precaution

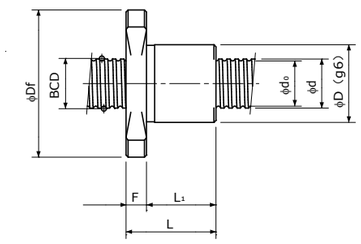
- Please refer to dimension table of each model regarding dimension, Load Rating, Rigidity.
- Please refer to Technical Description in page A801 regarding Accuracy, Axial play, Material, production range and so on.
- Shaft configuration, Shaft dimension of Customized products are not standardized. KSS will create a Drawing based on customer's specifications.
- When designing Shaft configuration, fixed end or supported end (in case of Bi-directional Ball Screws and Rolled Ball Screw, both ends) should be smaller than Shaft Root diameter due to Nut assemble.
- Please refer to「Precaution of storage, handling, and operating」in page A901 in detail other than the above.

Single Nut with Flange
带法兰单螺母

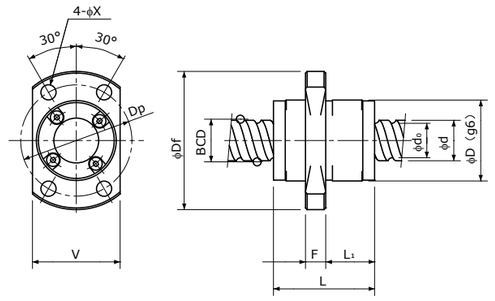
Backlash type/Preload type
齿侧间隙型/预压型



Type-1:Return-plate type
复式回路板循环方式



Type-2:Internal-deflector type or
End-deflector type
陀螺式循环方式或偏转器式循环方式



Type-3:End-cap type or End-deflector type
端盖循环方式或偏转器式循环方式

Unit(单位):mm

Ball Nut Model number 螺母型号	Shaft nominal dia. 丝杠轴公称外径 d	Lead 导程	Ball size 丝杠直径	BCD 钢珠中心直径	Lead angle 导程角	Root dia. 底径 d_0	Number of Circuit 循环数	Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm		Nut dimension 螺母尺寸										Ball Nut Model number 螺母型号
								Dynamic 额定动负载 Ca	Static 额定静负载 Coa			Nut type 螺母类型	D	Df	L	L_1	F	W	V	Dp	Bolt Hole 安装孔 X	
FBS 01800.5 A	1.8	0.5	0.4	1.95	4°40′	1.5	2.7×1	110 / —	130 / —	19 / —		1	6	14	8.5	7	1.5	8	—	10	2.4	FBS 01800.5 A
FBS 0300.5 A	3	0.5	0.4	3.10	2°56′	2.6	2.7×1	150 / —	220 / —	29 / —		1	8	16	11	8	3	8	—	12	2.4	FBS 0300.5 A
FBS 0301 B	3	1	0.6	3.18	5°43′	2.4	3.7×1	330 / —	440 / —	42 / —		1	9	19	14	11	3	11	—	14	2.9	FBS 0301 B
FBS 0400.5 A	4	0.5	0.4	4.10	2°13′	3.6	2.7×1	160 / —	290 / —	36 / —		1	10	20	13	10	3	12	—	15	2.9	FBS 0400.5 A
FKB 0401 A	4	1	0.6	4.15	4°23′	3.4	1×3	300 / 300	430 / 430	38 / 59		2	9	19	13	10	3	11	13	14	2.9	FKB 0401 A
FBS 0401 A	4	1	0.8	4.15	4°23′	3.3	2.7×1	420 / 270	570 / 290	40 / 34		1	10	20	12	9	3	12	14	15	2.9	FBS 0401 A
FBS 0401 B	4	1	0.8	4.15	4°23′	3.3	3.7×1	560 / 350	790 / 400	54 / 45		1	11	23	17	13	4	13	15	17	3.4	FBS 0401 B
FBS 0402 A	4	2	0.8	4.15	8°43′	3.3	2.7×1	420 / 260	570 / 290	39 / 33		1	11	23	19	15	4	13	15	17	3.4	FBS 0402 A
FEB 0404 A	4	4	0.8	4.2	16°51′	3.3	2.6×2	750 / —	1150 / —	73 / —		3	11	23	17.5	11	3	—	15	17	3.4	FEB 0404 A
FEB 0408 A	4	8	0.6	4.15	31°32′	3.4	1.7×4	590 / —	1110 / —	78 / —		3	11	23	20	12	3	—	15	17	3.4	FEB 0408 A

注1)设计时,请注意使滚珠丝杠轴端的其中一端不超过丝杠轴底径。
如果两个轴端设计得大于底径,则将无法组装螺母。
注2)标准螺母不带密封。
需要密封时,螺母的尺寸将发生变化,详情请垂询本公司。
某些型号的螺母不能安装密封,敬请注意。
注3)表中的刚性值为螺母的刚性值,是在以下条件下,根据轴向弹性位移量计算得出的理论值。
齿侧间隙型:相当于基本额定动负载Ca的30%的轴向负载作用时
预压型:施加了相当于基本额定动负载Ca的5%的预压时
轴向负载及预压量与上述条件不同时,可通过第A823页或第A824的公式计算。
注4)标准螺纹旋向为右旋。
需要左旋时,请垂询本公司。
注5)基本额定负载和刚性值(齿侧间隙型和预压型的刚性值可能会有不同)一并标示在上表中。

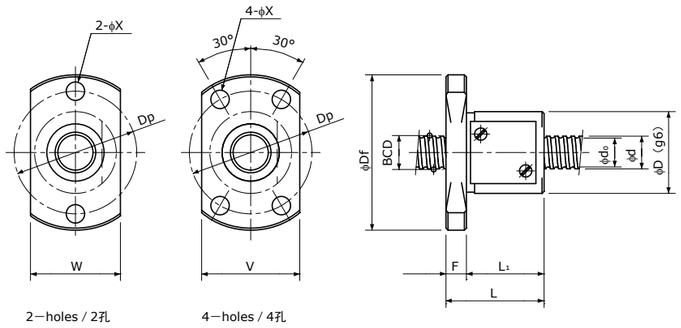
Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm
Dynamic 额定动负载 Ca	Static 额定静负载 Coa	
1000 / 640	3300 / 1650	164 / 138

Preload type 预压型
Backlash type 齿侧间隙型

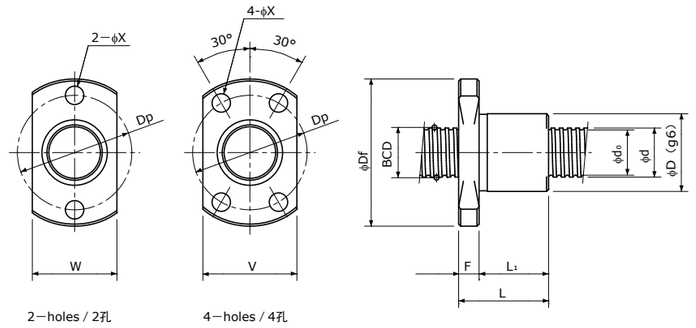
Note 1)The diameter of one of the Screw Shaft ends must be less than the Screw Shaft Root diameter, otherwise Ball Nut cannot be installed.
Note 2)Ball Nut dimension is without seal at the both ends.
If the seals are required, Ball Nut dimension should be changed, in that case, please ask KSS.
Some type of Ball Nuts cannot equip with seals, please ask KSS representative.
Note 3)The Rigidity values shown in the table are theoretical values of Ball Nut Rigidity calculated from the amount of Elastic Displacement under the following conditions.
Backlash type ; Apply the Axial load equivalent to 30% of the Basic Dynamic Load Rating Ca.
Preload type ; Apply the Preload equivalent to 5% of the Basic Dynamic Load Rating Ca.
For Axial load or Preload condition other than the above, see the formula in page A823 or page A824, you can calculate Rigidity using this formula.
Note 4)All models are Right-hand Screw. If Left-hand Screw is required, please ask KSS representative.
Note 5)Basic Load Rating and Rigidity for Backlash type and Preload type are described in the same cell.

Single Nut with Flange
带法兰单螺母

Backlash type/Preload type
齿侧间隙型/预压型



Type-1:Return-plate type
复式回路板循环方式



Type-2:Internal-deflector type or End-deflector type
陀螺式循环方式或偏转器式循环方式

Unit(单位):mm

Ball Nut Model number 螺母型号	Shaft nominal dia. 丝杠轴公称外径 d	Lead 导程	Ball size 丝杠直径	BCD 钢珠中心直径	Lead angle 导程角	Root dia. 底径 d_0	Number of Circuit 循环数	Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm		Nut dimension 螺母尺寸										Ball Nut Model number 螺母型号
								Dynamic 额定动负载 Ca	Static 额定静负载 Coa			Nut type 螺母类型	D	Df	L	L_1	F	W	V	Dp	Bolt Hole 安装孔 X	
FBS 0500.5 A	5	0.5	0.4	5.10	1°47′	4.6	2.7×1	180 / —	370 / —	44 / —		1	11	23	13	10	3	13	—	17	3.4	FBS 0500.5 A
FKB 0501 A	5	1	0.6	5.15	3°32′	4.4	1×3	330 / 330	560 / 560	45 / 70		2	10	20	13	10	3	12	14	15	2.9	FKB 0501 A
FBS 0501 B	5	1	0.8	5.15	3°32′	4.3	3.7×1	630 / 400	1000 / 500	65 / 55		1	12	24	17	13	4	14	15	18	3.4	FBS 0501 B
FBS 0504 A	5	4	0.8	5.15	13°53′	4.3	2.7×1	470 / 300	720 / 360	47 / 39		1	12	24	22	18	4	14	15	18	3.4	FBS 0504 A

注1)设计时,请注意使滚珠丝杠轴端的其中一端不超过丝杠轴底径。
如果两个轴端设计得大于底径,则将无法组装螺母。
注2)标准螺母不带密封。
需要密封时,螺母的尺寸将发生变化,详情请垂询本公司。
某些型号的螺母不能安装密封,敬请注意。
注3)表中的刚性值为螺母的刚性值,是在以下条件下,根据轴向弹性位移量计算得出的理论值。
齿侧间隙型:相当于基本额定动负载Ca的30%的轴向负载作用时
预压型:施加了相当于基本额定动负载Ca的5%的预压时
轴向负载及预压量与上述条件不同时,可通过第A823页或第A824的公式计算。
注4)标准螺纹旋向为右旋。
需要左旋时,请垂询本公司。
注5)基本额定负载和刚性值(齿侧间隙型和预压型的刚性值可能会有不同)一并标示在上表中。

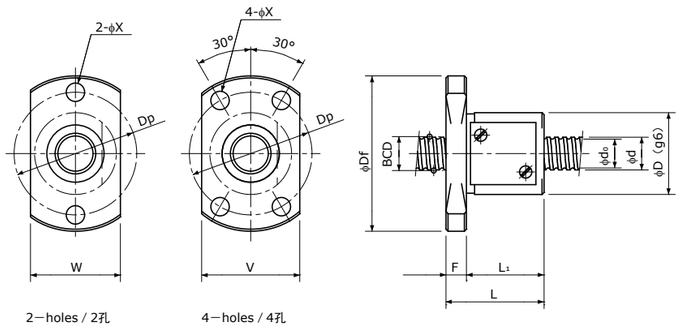
Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm
Dynamic 额定动负载 Ca	Static 额定静负载 Coa	
1000 / 640	3300 / 1650	164 / 138

Preload type 预压型
Backlash type 齿侧间隙型

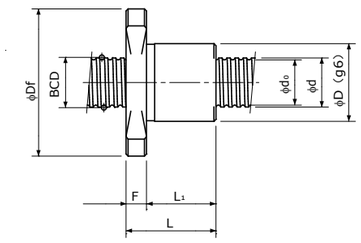
Note 1)The diameter of one of the Screw Shaft ends must be less than the Screw Shaft Root diameter, otherwise Ball Nut cannot be installed.
Note 2)Ball Nut dimension is without seal at the both ends.
If the seals are required, Ball Nut dimension should be changed, in that case, please ask KSS.
Some type of Ball Nuts cannot equip with seals, please ask KSS representative.
Note 3)The Rigidity values shown in the table are theoretical values of Ball Nut Rigidity calculated from the amount of Elastic Displacement under the following conditions.
Backlash type ; Apply the Axial load equivalent to 30% of the Basic Dynamic Load Rating Ca.
Preload type ; Apply the Preload equivalent to 5% of the Basic Dynamic Load Rating Ca.
For Axial load or Preload condition other than the above, see the formula in page A823 or page A824, you can calculate Rigidity using this formula.
Note 4)All models are Right-hand Screw. If Left-hand Screw is required, please ask KSS representative.
Note 5)Basic Load Rating and Rigidity for Backlash type and Preload type are described in the same cell.

Single Nut with Flange
带法兰单螺母

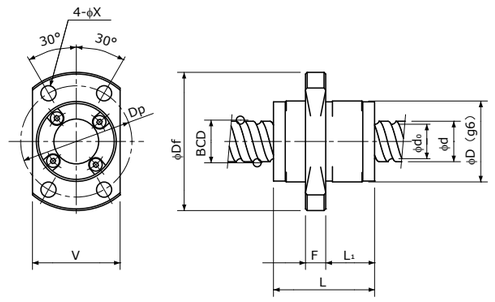
Backlash type/Preload type
齿侧间隙型/预压型



Type-1:Return-plate type
复式回路板循环方式



Type-2:Internal-deflector type or
End-deflector type
陀螺式循环方式或偏转器式循环方式



Type-3:End-cap type or End-deflector type
端盖循环方式或偏转器式循环方式

Unit(单位):mm

Ball Nut Model number 螺母型号	Shaft nominal dia. 丝杠轴公称外径 d	Lead 导程	Ball size 丝杠直径	BCD 钢珠中心直径	Lead angle 导程角	Root dia. 底径 d_0	Number of Circuit 循环数	Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm		Nut dimension 螺母尺寸										Ball Nut Model number 螺母型号
								Dynamic 额定动负载 Ca	Static 额定静负载 Coa			Nut type 螺母类型	D	Df	L	L_1	F	W	V	Dp	Bolt Hole 安装孔 X	
FBS 0600.5 A	6	0.5	0.4	6.10	1°30′	5.6	2.7×1	190 / —	440 / —	50 / —		1	12	25	13	10	3	14	—	19	3.4	FBS 0600.5 A
FKB 0601 A	6	1	0.8	6.20	2°56′	5.3	1×3	560 / 560	950 / 950	55 / 86		2	11	23	14.5	11	3.5	13	15	17	3.4	FKB 0601 A
FBS 0601 B	6	1	0.8	6.15	2°58′	5.3	3.7×1	680 / 430	1200 / 610	75 / 63		1	13	28	17	13	4	15	17	21.5	3.4	FBS 0601 B
FBS 0601.5 B	6	1.5	1.0	6.20	4°24′	5.1	3.7×1	980 / 620	1600 / 800	79 / 67		1	14	28	19	15	4	16	17	22	3.4	FBS 0601.5 B
FBS 0602 A	6	2	1.0	6.20	5°52′	5.1	2.7×1	750 / 470	1200 / 590	58 / 49		1	15	29	17	13	4	17	18	23	3.4	FBS 0602 A
FBS 0602.5 A	6	2.5	1.0	6.20	7°19′	5.1	2.7×1	750 / 470	1200 / 590	59 / 49		1	15	29	18	14	4	17	18	23	3.4	FBS 0602.5 A
FEB 0606 A	6	6	1.0	6.30	16°52′	5.2	1.6×2	870 / —	1450 / —	67 / —		3	14	27	17	8	4	—	16	21	3.4	FEB 0606 A
FEB 0610 A	6	10	1.2	6.30	26°48′	5.0	1.2×2	950 / —	1600 / —	50 / —		3	14	27	23	11.5	4	—	16	21	3.4	FEB 0610 A
FEB 0612 A	6	12	1.2	6.30	31°13′	5.0	0.7×2	600 / —	950 / —	29 / —		3	14	27	16	8.3	4	—	16	21	3.4	FEB 0612 A

注1)设计时,请注意使滚珠丝杠轴端的其中一端不超过丝杠轴底径。
如果两个轴端设计得大于底径,则将无法组装螺母。
注2)标准螺母不带密封。
需要密封时,螺母的尺寸将发生变化,详情请垂询本公司。
某些型号的螺母不能安装密封,敬请注意。
注3)表中的刚性值为螺母的刚性值,是在以下条件下,根据轴向弹性位移量计算得出的理论值。
齿侧间隙型:相当于基本额定动负载Ca的30%的轴向负载作用时
预压型:施加了相当于基本额定动负载Ca的5%的预压时
轴向负载及预压量与上述条件不同时,可通过第A823页或第A824的公式计算。
注4)标准螺纹旋向为右旋。
需要左旋时,请垂询本公司。
注5)基本额定负载和刚性值(齿侧间隙型和预压型的刚性值可能会有不同)一并标示在上表中。

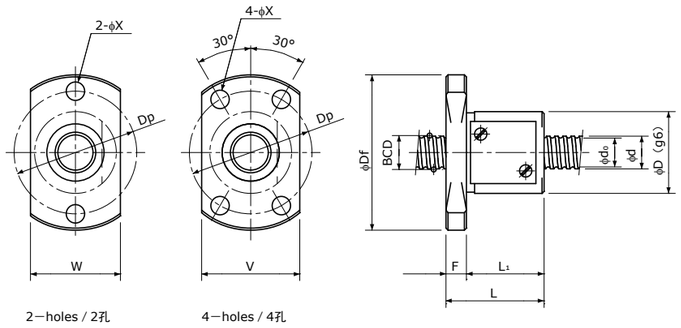
Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm
Dynamic 额定动负载 Ca	Static 额定静负载 Coa	
1000 / 640	3300 / 1650	164 / 138

Preload type 预压型
Backlash type 齿侧间隙型

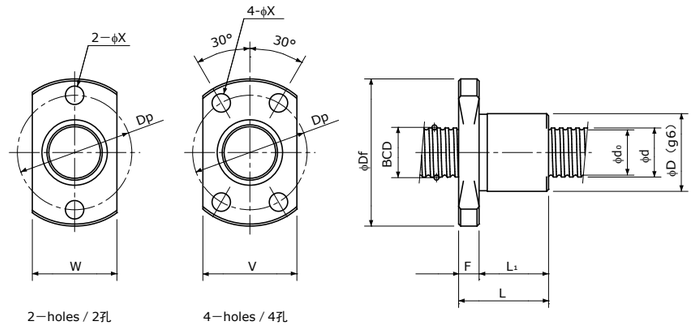
Note 1)The diameter of one of the Screw Shaft ends must be less than the Screw Shaft Root diameter, otherwise Ball Nut cannot be installed.
Note 2)Ball Nut dimension is without seal at the both ends.
If the seals are required, Ball Nut dimension should be changed, in that case, please ask KSS.
Some type of Ball Nuts cannot equip with seals, please ask KSS representative.
Note 3)The Rigidity values shown in the table are theoretical values of Ball Nut Rigidity calculated from the amount of Elastic Displacement under the following conditions.
Backlash type ; Apply the Axial load equivalent to 30% of the Basic Dynamic Load Rating Ca.
Preload type ; Apply the Preload equivalent to 5% of the Basic Dynamic Load Rating Ca.
For Axial load or Preload condition other than the above, see the formula in page A823 or page A824, you can calculate Rigidity using this formula.
Note 4)All models are Right-hand Screw. If Left-hand Screw is required, please ask KSS representative.
Note 5)Basic Load Rating and Rigidity for Backlash type and Preload type are described in the same cell.

Single Nut with Flange
带法兰单螺母

Backlash type/Preload type
齿侧间隙型/预压型



Type-1:Return-plate type
复式回路板循环方式



Type-2:Internal-deflector type or End-deflector type
陀螺式循环方式或偏转器式循环方式

Unit(单位):mm

Ball Nut Model number 螺母型号	Shaft nominal dia. 丝杠轴公称外径 d	Lead 导程	Ball size 丝杠直径	BCD 钢珠中心直径	Lead angle 导程角	Root dia. 底径 d_0	Number of Circuit 循环数	Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm		Nut dimension 螺母尺寸										Ball Nut Model number 螺母型号
								Dynamic 额定动负载 Ca	Static 额定静负载 Coa			Nut type 螺母类型	D	Df	L	L_1	F	W	V	Dp	Bolt Hole 安装孔 X	
FBS 0800.5 A	8	0.5	0.4	8.10	1°08′	7.6	2.7×1	220 / —	590 / —	64 / —		1	14	27	13	10	3	16	—	21	3.4	FBS 0800.5 A
FKB 0801 A	8	1	0.8	8.20	2°13′	7.3	1×3	650 / 650	1300 / 1300	70 / 109		2	13	26	15	11	4	15	17	20	3.4	FKB 0801 A
FBS 0801 B	8	1	0.8	8.15	2°15′	7.3	3.7×1	780 / 490	1650 / 820	95 / 80		1	16	30	17	13	4	18	18	24	3.4	FBS 0801 B
FKB 0801.5 A	8	1.5	1.0	8.30	3°18′	7.2	1×3	890 / 890	1650 / 1650	73 / 113		2	15	28	20	16	4	17	19	22	3.4	FKB 0801.5 A
FBS 0801.5 B	8	1.5	1.0	8.20	3°20′	7.1	3.7×1	1100 / 700	2200 / 1100	99 / 83		1	16	30	19	15	4	18	18	24	3.4	FBS 0801.5 B
FKB 0802 A	8	2	1.2	8.30	4°23′	7.0	1×3	1300 / 1300	2300 / 2300	77 / 121		2	15	28	18	14	4	17	19	22	3.4	FKB 0802 A
FBS 0802 B(1)	8	2	1.0	8.20	4°26′	7.1	3.7×1	1100 / 700	2200 / 1100	99 / 83		1	16	30	21	17	4	18	18	24	3.4	FBS 0802 B(1)
FBS 0802 B(2)	8	2	1.5875	8.30	4°23′	6.6	3.7×1	2400 / 1550	4100 / 2100	111 / 94		1	20	38	24	19	5	22	23	30	4.5	FBS 0802 B(2)

注1)设计时,请注意使滚珠丝杠轴端的其中一端不超过丝杠轴底径。
　　如果两个轴端设计得大于底径,则将无法组装螺母。
注2)标准螺母不带密封。
　　需要密封时,螺母的尺寸将发生变化,详情请垂询本公司。
　　某些型号的螺母不能安装密封,敬请注意。
注3)表中的刚性值为螺母的刚性值,是在以下条件下,根据轴向弹性位移量计算得出的理论值。
　　齿侧间隙型:相当于基本额定动负载Ca的30%的轴向负载作用时
　　预压型:施加了相当于基本额定动负载Ca的5%的预压时
　　轴向负载及预压量与上述条件不同时,可通过第A823页或第A824的公式计算。
注4)标准螺纹旋向为右旋。
　　需要左旋时,请垂询本公司。
注5)基本额定负载和刚性值(齿侧间隙型和预压型的刚性值可能会有不同)一并标示在上表中。

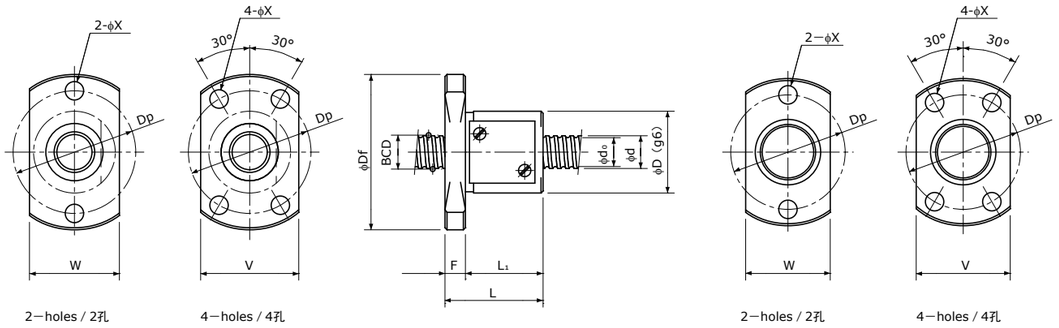
Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm
Dynamic 额定动负载 Ca	Static 额定静负载 Coa	
1000 / 640	3300 / 1650	164 / 138

Preload type 预压型
Backlash type 齿侧间隙型

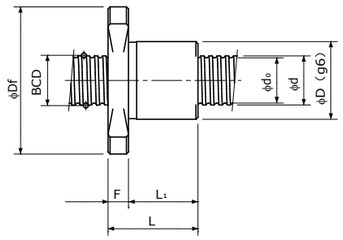
Note 1)The diameter of one of the Screw Shaft ends must be less than the Screw Shaft Root diameter,
　　otherwise Ball Nut cannot be installed.
Note 2)Ball Nut dimension is without seal at the both ends.
　　If the seals are required, Ball Nut dimension should be changed, in that case, please ask KSS.
　　Some type of Ball Nuts cannot equip with seals, please ask KSS representative.
Note 3)The Rigidity values shown in the table are theoretical values of Ball Nut Rigidity
　　calculated from the amount of Elastic Displacement under the following conditions.
　　Backlash type ; Apply the Axial load equivalent to 30% of the Basic Dynamic Load Rating Ca.
　　Preload type ; Apply the Preload equivalent to 5% of the Basic Dynamic Load Rating Ca.
　　For Axial load or Preload condition other than the above, see the formula in page A823 or page A824, you can calculate Rigidity
　　using this formula.
Note 4)All models are Right-hand Screw. If Left-hand Screw is required, please ask KSS representative.
Note 5)Basic Load Rating and Rigidity for Backlash type and Preload type are described in the same cell.

Single Nut with Flange
带法兰单螺母

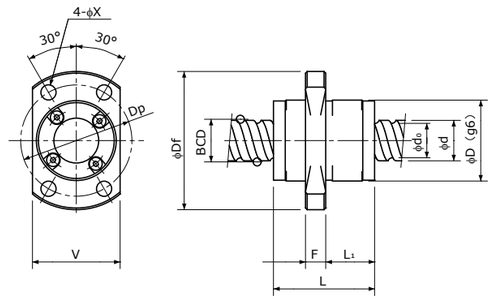
Backlash type/Preload type
齿侧间隙型/预压型



Type-1:Return-plate type
复式回路板循环方式



Type-2:Internal-deflector type or
End-deflector type
陀螺式循环方式或偏转器式循环方式



Type-3:End-cap type or End-deflector type
端盖循环方式或偏转器式循环方式

Unit(单位):mm

Ball Nut Model number 螺母型号	Shaft nominal dia. 丝杠轴公称外径 d	Lead 导程	Ball size 丝杠直径	BCD 钢珠中心直径	Lead angle 导程角	Root dia. 底径 d_0	Number of Circuit 循环数	Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm		Nut dimension 螺母尺寸										Ball Nut Model number 螺母型号
								Dynamic 额定动负载 Ca	Static 额定静负载 Coa			Nut type 螺母类型	D	Df	L	L_1	F	W	V	Dp	Bolt Hole 安装孔 X	
FDB 0802.5 A	8	2.5	1.5875	8.00	5°41′	6.3	2.7×1	1850 / —	3000 / —	80 / —		2	16	29	16	12	4	—	18	23	3.4	FDB 0802.5 A
FBS 0802.5 B	8	2.5	1.5875	8.30	5°29′	6.6	3.7×1	2400 / 1550	4100 / 2100	111 / 93		1	20	38	26	21	5	22	23	30	4.5	FBS 0802.5 B
FBS 0803 A	8	3	2.0	8.30	6°34′	6.2	2.7×1	2600 / 1650	4200 / 2100	85 / 70		1	20	38	25	20	5	22	23	30	4.5	FBS 0803 A
FBS 0804 A	8	4	2.0	8.30	8°43′	6.2	2.7×1	2600 / 1650	4200 / 2100	84 / 70		1	21	39	28	23	5	23	23	31	4.5	FBS 0804 A
FBS 0805 A	8	5	1.5875	8.30	10°51′	6.6	2.7×1	1850 / 1150	3000 / 1500	82 / 67		1	18	31	28	24	4	20	20	25	3.4	FBS 0805 A
FEB 0808 A	8	8	1.5875	8.40	16°52′	6.7	1.6×2	2200 / —	3800 / —	95 / —		3	18	31	20	10	4	—	20	25	3.4	FEB 0808 A
FEB 0810 A	8	10	1.5875	8.40	20°45′	6.7	1.6×2	2200 / —	3900 / —	92 / —		3	18	31	24	13	4	—	20	25	3.4	FEB 0810 A
FEB 0812 A	8	12	1.5875	8.40	24°27′	6.7	1.6×2	2200 / —	4000 / —	90 / —		3	18	31	27	17	4	—	20	25	3.4	FEB 0812 A

注1)设计时,请注意使滚珠丝杠轴端的其中一端不超过丝杠轴底径。
如果两个轴端设计得大于底径,则将无法组装螺母。
注2)标准螺母不带密封。
需要密封时,螺母的尺寸将发生变化,详情请垂询本公司。
某些型号的螺母不能安装密封,敬请注意。
注3)表中的刚性值为螺母的刚性值,是在以下条件下,根据轴向弹性位移量计算得出的理论值。
齿侧间隙型:相当于基本额定动负载Ca的30%的轴向负载作用时
预压型:施加了相当于基本额定动负载Ca的5%的预压时
轴向负载及预压量与上述条件不同时,可通过第A823页或第A824的公式计算。
注4)标准螺纹旋向为右旋。
需要左旋时,请垂询本公司。
注5)基本额定负载和刚性值(齿侧间隙型和预压型的刚性值可能会有不同)一并标示在上表中。

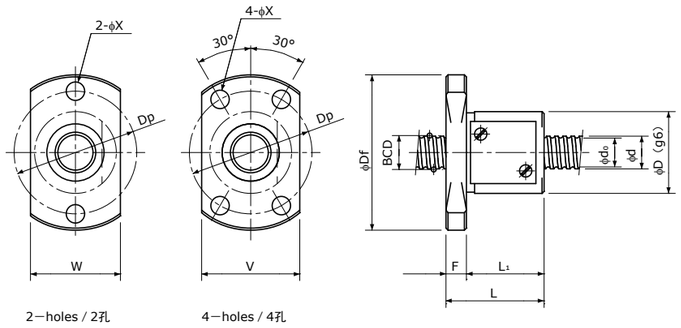
Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm
Dynamic 额定动负载 Ca	Static 额定静负载 Coa	
1000 / 640	3300 / 1650	164 / 138

Preload type 预压型
Backlash type 齿侧间隙型

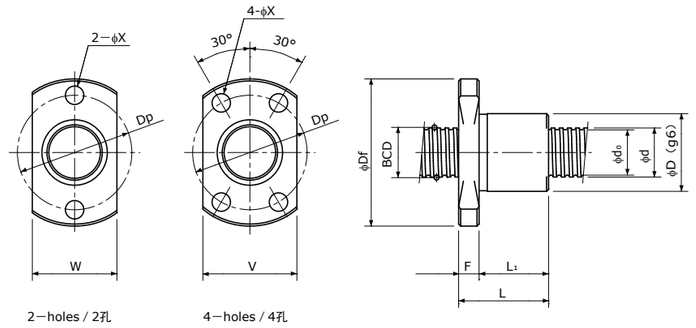
Note 1)The diameter of one of the Screw Shaft ends must be less than the Screw Shaft Root diameter, otherwise Ball Nut cannot be installed.
Note 2)Ball Nut dimension is without seal at the both ends.
If the seals are required, Ball Nut dimension should be changed, in that case, please ask KSS.
Some type of Ball Nuts cannot equip with seals, please ask KSS representative.
Note 3)The Rigidity values shown in the table are theoretical values of Ball Nut Rigidity calculated from the amount of Elastic Displacement under the following conditions.
Backlash type ; Apply the Axial load equivalent to 30% of the Basic Dynamic Load Rating Ca.
Preload type ; Apply the Preload equivalent to 5% of the Basic Dynamic Load Rating Ca.
For Axial load or Preload condition other than the above, see the formula in page A823 or page A824, you can calculate Rigidity using this formula.
Note 4)All models are Right-hand Screw. If Left-hand Screw is required, please ask KSS representative.
Note 5)Basic Load Rating and Rigidity for Backlash type and Preload type are described in the same cell.

Single Nut with Flange
带法兰单螺母

Backlash type/Preload type
齿侧间隙型/预压型



Type-1:Return-plate type
复式回路板循环方式



Type-2:Internal-deflector type or End-deflector type
陀螺式循环方式或偏转器式循环方式

Unit(单位):mm

Ball Nut Model number 螺母型号	Shaft nominal dia. 丝杠轴公称外径 d	Lead 导程	Ball size 丝杠直径	BCD 钢珠中心直径	Lead angle 导程角	Root dia. 底径 d_0	Number of Circuit 循环数	Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm		Nut dimension 螺母尺寸										Ball Nut Model number 螺母型号
								Dynamic 额定动负载 Ca	Static 额定静负载 Coa			Nut type 螺母类型	D	Df	L	L_1	F	W	V	Dp	Bolt Hole 安装孔 X	
FKB 1001 A	10	1	0.8	10.20	1°47′	9.3	1×3	720 / 720	1650 / 1650	84 / 131		2	15	28	15	11	4	17	19	22	3.4	FKB 1001 A
FBS 1001 B	10	1	0.8	10.15	1°48′	9.3	3.7×1	840 / 530	2000 / 1000	113 / 95		1	19	37	18	13	5	21	22	29	4.5	FBS 1001 B
FKB 1001.5 A	10	1.5	1.0	10.30	2°39′	9.2	1×3	990 / 990	2100 / 2100	87 / 136		2	17	34	21	16	5	19	21	26	4.5	FKB 1001.5 A
FBS 1001.5 B	10	1.5	1.0	10.20	2°41′	9.1	3.7×1	1250 / 790	2800 / 1400	120 / 101		1	19	37	20	15	5	21	22	29	4.5	FBS 1001.5 B
FKB 1002 A	10	2	1.2	10.30	3°32′	9.0	1×3	1450 / 1450	3000 / 3000	93 / 144		2	17	34	19	14	5	19	21	26	4.5	FKB 1002 A
FBS 1002 B	10	2	1.5875	10.30	3°32′	8.6	3.7×1	2700 / 1750	5300 / 2700	134 / 112		1	23	41	24	19	5	25	25	33	4.5	FBS 1002 B
FKB 1002.5 A	10	2.5	1.5875	10.40	4°23′	8.7	1×3	2100 / 2100	3800 / 3800	96 / 150		2	18	35	21	16	5	20	22	27	4.5	FKB 1002.5 A
FBS 1002.5 B	10	2.5	1.5875	10.30	4°25′	8.6	3.7×1	2700 / 1750	5300 / 2700	133 / 112		1	24	44	27	21	6	26	27	35	5.5	FBS 1002.5 B

注1)设计时,请注意使滚珠丝杠轴端的其中一端不超过丝杠轴底径。
如果两个轴端设计得大于底径,则将无法组装螺母。
注2)标准螺母不带密封。
需要密封时,螺母的尺寸将发生变化,详情请垂询本公司。
某些型号的螺母不能安装密封,敬请注意。
注3)表中的刚性值为螺母的刚性值,是在以下条件下,根据轴向弹性位移量计算得出的理论值。
齿侧间隙型:相当于基本额定动负载Ca的30%的轴向负载作用时
预压型:施加了相当于基本额定动负载Ca的5%的预压时
轴向负载及预压量与上述条件不同时,可通过第A823页或第A824的公式计算。
注4)标准螺纹旋向为右旋。
需要左旋时,请垂询本公司。
注5)基本额定负载和刚性值(齿侧间隙型和预压型的刚性值可能会有不同)一并标示在上表中。

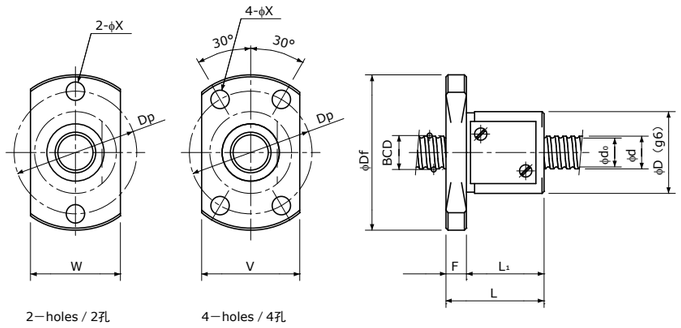
Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm
Dynamic 额定动负载 Ca	Static 额定静负载 Coa	
1000 / 640	3300 / 1650	164 / 138

Preload type 预压型
Backlash type 齿侧间隙型

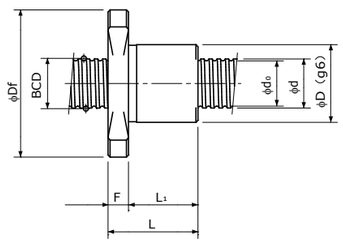
Note 1)The diameter of one of the Screw Shaft ends must be less than the Screw Shaft Root diameter, otherwise Ball Nut cannot be installed.
Note 2)Ball Nut dimension is without seal at the both ends.
If the seals are required, Ball Nut dimension should be changed, in that case, please ask KSS.
Some type of Ball Nuts cannot equip with seals, please ask KSS representative.
Note 3)The Rigidity values shown in the table are theoretical values of Ball Nut Rigidity calculated from the amount of Elastic Displacement under the following conditions.
Backlash type ; Apply the Axial load equivalent to 30% of the Basic Dynamic Load Rating Ca.
Preload type ; Apply the Preload equivalent to 5% of the Basic Dynamic Load Rating Ca.
For Axial load or Preload condition other than the above, see the formula in page A823 or page A824, you can calculate Rigidity using this formula.
Note 4)All models are Right-hand Screw. If Left-hand Screw is required, please ask KSS representative.
Note 5)Basic Load Rating and Rigidity for Backlash type and Preload type are described in the same cell.

Single Nut with Flange
带法兰单螺母

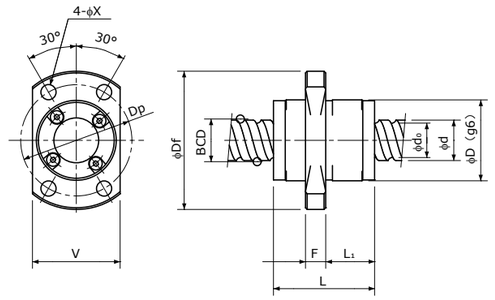
Backlash type/Preload type
齿侧间隙型/预压型



Type-1:Return-plate type
复式回路板循环方式



Type-2:Internal-deflector type or
End-deflector type
陀螺式循环方式或偏转器式循环方式



Type-3:End-cap type or End-deflector type
端盖循环方式或偏转器式循环方式

Unit(单位):mm

Ball Nut Model number 螺母型号	Shaft nominal dia. 丝杠轴公称外径 d	Lead 导程	Ball size 丝杠直径	BCD 钢珠中心直径	Lead angle 导程角	Root dia. 底径 d_0	Number of Circuit 循环数	Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Basic Load Rating 基本额定负载 N Static 额定静负载 Coa	Nut Rigidity 螺母刚性 N/μm		Nut dimension 螺母尺寸 Nut type 螺母类型	D	Df	L	L_1	F	W	V	Dp	Bolt Hole 安装孔 X	Ball Nut Model number 螺母型号
FBS 1003 B	10	3	2.0	10.30	5°18′	8.2	3.7×1	3900 / 2500	7200 / 3600	140 / 118		1	24	44	30	24	6	26	27	35	5.5	FBS 1003 B
FBS 1004 A	10	4	2.0	10.30	7°03′	8.2	2.7×1	3000 / 1800	5200 / 2600	104 / 86		1	24	44	29	23	6	26	27	35	5.5	FBS 1004 A
FDB 1005 A	10	5	2.0	10.30	8°47′	8.2	2.7×1	3000 / —	5200 / —	103 / —		2	23	40	26	21	5	—	25	32	4.5	FDB 1005 A
FBS 1005 A	10	5	2.0	10.30	8°47′	8.2	2.7×1	3000 / 1800	5200 / 2600	103 / 85		1	24	44	34	28	6	26	27	35	5.5	FBS 1005 A
FEB 1010 A	10	10	2.0	10.50	16°52′	8.4	1.6×2	3300 / —	5900 / —	117 / —		3	23	40	24	13	5	—	25	32	4.5	FEB 1010 A
FEB 1015 A	10	15	2.0	10.50	24°27′	8.4	1.6×2	3300 / —	6400 / —	110 / —		3	23	40	33	22	5	—	25	32	4.5	FEB 1015 A
FEB 1020 A	10	20	1.5875	10.40	31°28′	8.7	0.7×4	2100 / —	4000 / —	88 / —		3	20	37	23	13	5	—	22	29	4.5	FEB 1020 A
FEB 1030 A	10	30	1.5875	10.40	42°33′	8.7	0.7×4	2100 / —	4000 / —	76 / —		3	20	37	31.5	21.7	5	—	22	29	4.5	FEB 1030 A

注1)设计时,请注意使滚珠丝杠轴端的其中一端不超过丝杠轴底径。
如果两个轴端设计得大于底径,则将无法组装螺母。
注2)标准螺母不带密封。
需要密封时,螺母的尺寸将发生变化,详情请垂询本公司。
某些型号的螺母不能安装密封,敬请注意。
注3)表中的刚性值为螺母的刚性值,是在以下条件下,根据轴向弹性位移量计算得出的理论值。
齿侧间隙型:相当于基本额定动负载Ca的30%的轴向负载作用时
预压型:施加了相当于基本额定动负载Ca的5%的预压时
轴向负载及预压量与上述条件不同时,可通过第A823页或第A824的公式计算。
注4)标准螺纹旋向为右旋。
需要左旋时,请垂询本公司。
注5)基本额定负载和刚性值(齿侧间隙型和预压型的刚性值可能会有不同)一并标示在上表中。

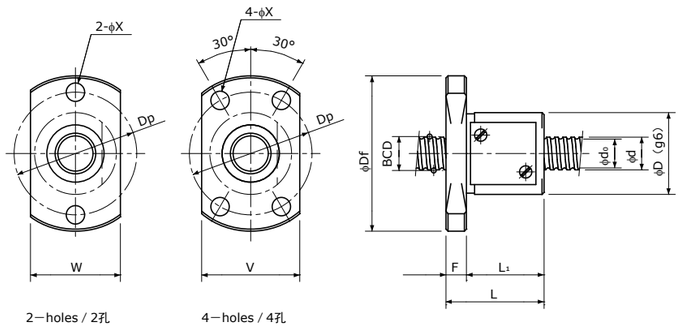
Basic Load Rating 基本额定负载 N Dynamic 额定动负载 Ca	Basic Load Rating 基本额定负载 N Static 额定静负载 Coa	Nut Rigidity 螺母刚性 N/μm
1000 / 640	3300 / 1650	164 / 138

Preload type 预压型
Backlash type 齿侧间隙型

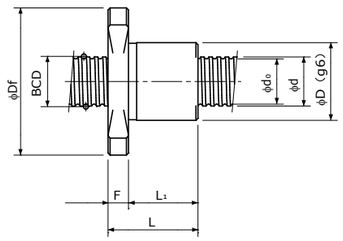
Note 1)The diameter of one of the Screw Shaft ends must be less than the Screw Shaft Root diameter, otherwise Ball Nut cannot be installed.
Note 2)Ball Nut dimension is without seal at the both ends.
If the seals are required, Ball Nut dimension should be changed, in that case, please ask KSS.
Some type of Ball Nuts cannot equip with seals, please ask KSS representative.
Note 3)The Rigidity values shown in the table are theoretical values of Ball Nut Rigidity calculated from the amount of Elastic Displacement under the following conditions.
Backlash type ; Apply the Axial load equivalent to 30% of the Basic Dynamic Load Rating Ca.
Preload type ; Apply the Preload equivalent to 5% of the Basic Dynamic Load Rating Ca.
For Axial load or Preload condition other than the above, see the formula in page A823 or page A824, you can calculate Rigidity using this formula.
Note 4)All models are Right-hand Screw. If Left-hand Screw is required, please ask KSS representative.
Note 5)Basic Load Rating and Rigidity for Backlash type and Preload type are described in the same cell.

Single Nut with Flange
带法兰单螺母

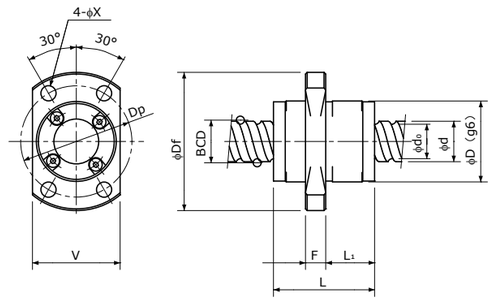
Backlash type/Preload type
齿侧间隙型/预压型



Type-1:Return-plate type
复式回路板循环方式



Type-2:Internal-deflector type or
End-deflector type
陀螺式循环方式或偏转器式循环方式



Type-3:End-cap type or End-deflector type
端盖循环方式或偏转器式循环方式

Unit(单位):mm

Ball Nut Model number 螺母型号	Shaft nominal dia. 丝杠轴公称外径 d	Lead 导程	Ball size 丝杠直径	BCD 钢珠中心直径	Lead angle 导程角	Root dia. 底径 d_0	Number of Circuit 循环数	Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm		Nut dimension 螺母尺寸										Ball Nut Model number 螺母型号
								Dynamic 额定动负载 Ca	Static 额定静负载 Coa			Nut type 螺母类型	D	Df	L	L_1	F	W	V	Dp	Bolt Hole 安装孔 X	
FKB 1201 A	12	1	0.8	12.20	1°30′	11.3	1×3	780 / 780	2000 / 2000	97 / 152		2	17	34	16	11	5	19	21	26	4.5	FKB 1201 A
FBS 1201 B	12	1	0.8	12.15	1°30′	11.3	3.7×1	910 / 570	2400 / 1200	131 / 110		1	22	40	18	13	5	24	24	32	4.5	FBS 1201 B
FKB 1202 A	12	2	1.2	12.30	2°58′	11.0	1×3	1600 / 1600	3700 / 3700	109 / 169		2	19	36	19	14	5	21	23	28	4.5	FKB 1202 A
FBS 1202 B	12	2	1.5875	12.30	2°58′	10.6	3.7×1	3000 / 1900	6400 / 3200	156 / 132		1	25	45	25	19	6	27	27	36	5.5	FBS 1202 B
FKB 1202.5 A	12	2.5	1.5875	12.40	3°41′	10.7	1×3	2300 / 2300	4700 / 4700	112 / 174		2	20	37	21	16	5	22	24	29	4.5	FKB 1202.5 A
FBS 1202.5 B	12	2.5	1.5875	12.30	3°42′	10.6	3.7×1	3000 / 1850	6400 / 3200	156 / 130		1	26	46	27	21	6	28	28	37	5.5	FBS 1202.5 B
FKB 1203 A	12	3	2.0	12.50	4°22′	10.4	1×3	3100 / 3100	5700 / 5700	115 / 179		2	22	41	32	26	6	24	26	32	5.5	FKB 1203 A
FBS 1203 B	12	3	2.0	12.30	4°26′	10.2	3.7×1	4300 / 2800	8700 / 4300	162 / 137		1	28	48	30	24	6	30	30	39	5.5	FBS 1203 B
FBS 1204 B	12	4	2.381	12.30	5°55′	9.8	3.7×1	5400 / 3400	10200 / 5100	165 / 139		1	28	48	33	27	6	30	30	39	5.5	FBS 1204 B
FBS 1205 A	12	5	2.381	12.30	7°22′	9.8	2.7×1	4100 / 2500	7400 / 3700	122 / 101		1	28	48	33	27	6	30	30	39	5.5	FBS 1205 A

注1)设计时,请注意使滚珠丝杠轴端的其中一端不超过丝杠轴底径。
如果两个轴端设计得大于底径,则将无法组装螺母。
注2)标准螺母不带密封。
需要密封时,螺母的尺寸将发生变化,详情请垂询本公司。
某些型号的螺母不能安装密封,敬请注意。
注3)表中的刚性值为螺母的刚性值,是在以下条件下,根据轴向弹性位移量计算得出的理论值。
齿侧间隙型:相当于基本额定动负载Ca的30%的轴向负载作用时
预压型:施加了相当于基本额定动负载Ca的5%的预压时
轴向负载及预压量与上述条件不同时,可通过第A823页或第A824的公式计算。
注4)标准螺纹旋向为右旋。
需要左旋时,请垂询本公司。
注5)基本额定负载和刚性值(齿侧间隙型和预压型的刚性值可能会有不同)一并标示在上表中。

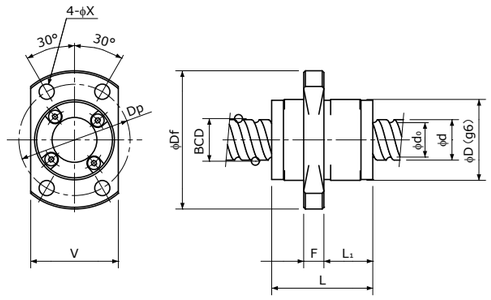
Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm
Dynamic 额定动负载 Ca	Static 额定静负载 Coa	
1000 / 640	3300 / 1650	164 / 138

Preload type 预压型
Backlash type 齿侧间隙型

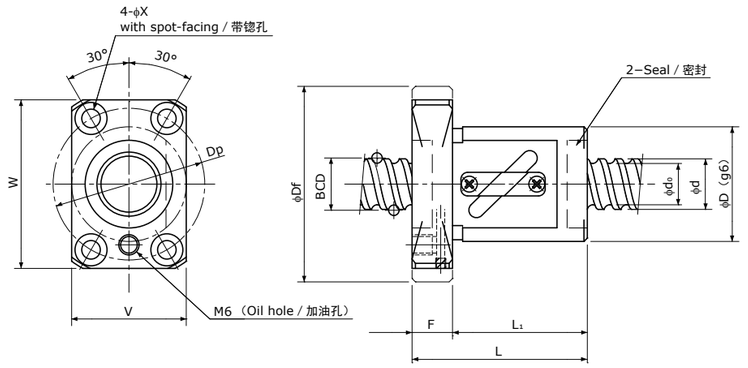
Note 1)The diameter of one of the Screw Shaft ends must be less than the Screw Shaft Root diameter, otherwise Ball Nut cannot be installed.
Note 2)Ball Nut dimension is without seal at the both ends.
If the seals are required, Ball Nut dimension should be changed, in that case, please ask KSS.
Some type of Ball Nuts cannot equip with seals, please ask KSS representative.
Note 3)The Rigidity values shown in the table are theoretical values of Ball Nut Rigidity calculated from the amount of Elastic Displacement under the following conditions.
Backlash type ; Apply the Axial load equivalent to 30% of the Basic Dynamic Load Rating Ca.
Preload type ; Apply the Preload equivalent to 5% of the Basic Dynamic Load Rating Ca.
For Axial load or Preload condition other than the above, see the formula in page A823 or page A824, you can calculate Rigidity using this formula.
Note 4)All models are Right-hand Screw. If Left-hand Screw is required, please ask KSS representative.
Note 5)Basic Load Rating and Rigidity for Backlash type and Preload type are described in the same cell.

Single Nut with Flange
带法兰单螺母

Backlash type/Preload type
齿侧间隙型/预压型



Type-3:End-cap type or End-deflector type
端盖循环方式或偏转器式循环方式



Type-4:Return-tube type
回路管循环方式

Unit(单位):mm

Ball Nut Model number 螺母型号	Shaft nominal dia. 丝杠轴公称外径 d	Lead 导程	Ball size 丝杠直径	BCD 钢珠中心直径	Lead angle 导程角	Root dia. 底径 d_0	Number of Circuit 循环数	Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm		Nut dimension 螺母尺寸										Ball Nut Model number 螺母型号
								Dynamic 额定动负载 Ca	Static 额定静负载 Coa			Nut type 螺母类型	D	Df	L	L_1	F	W	V	Dp	Bolt Hole 安装孔 X	
FEB 1210 A	12	10	2.381	12.65	14°07′	10.2	1.7×2	5100 / —	9800 / —	152 / —		3	24	41	30	14.5	6	—	26	33	4.5	FEB 1210 A
FBS 1210 T	12	10	2.381	12.65	14°07′	10.2	2.5×1	3800 / 2350	7100 / 3350	113 / 93		4	30	50	50	40	10	45	32	40	4.5	FBS 1210 T
FEB 1312 A	13	12	2.381	13.50	15°48′	11.0	1.6×2	5000 / —	9900 / —	151 / —		3	28	45	30	17	5	—	30	37	4.5	FEB 1312 A
FEB 1315 A	13	15	2.381	13.50	19°29′	11.0	1.6×2	5000 / —	10300 / —	147 / —		3	28	45	35	22	5	—	30	37	4.5	FEB 1315 A
FEB 1320 A	13	20	2.381	13.50	25°15′	11.0	1.6×2	5000 / —	10700 / —	142 / —		3	28	45	43	29	5	—	30	37	4.5	FEB 1320 A

注1)设计时,请注意使滚珠丝杠轴端的其中一端不超过丝杠轴底径。
如果两个轴端设计得大于底径,则将无法组装螺母。
注2)标准螺母不带密封。
需要密封时,螺母的尺寸将发生变化,详情请垂询本公司。
某些型号的螺母不能安装密封,敬请注意。
注3)表中的刚性值为螺母的刚性值,是在以下条件下,根据轴向弹性位移量计算得出的理论值。
齿侧间隙型:相当于基本额定动负载Ca的30%的轴向负载作用时
预压型:施加了相当于基本额定动负载Ca的5%的预压时
轴向负载及预压量与上述条件不同时,可通过第A823页或第A824的公式计算。
注4)标准螺纹旋向为右旋。
需要左旋时,请垂询本公司。
注5)基本额定负载和刚性值(齿侧间隙型和预压型的刚性值可能会有不同)一并标示在上表中。

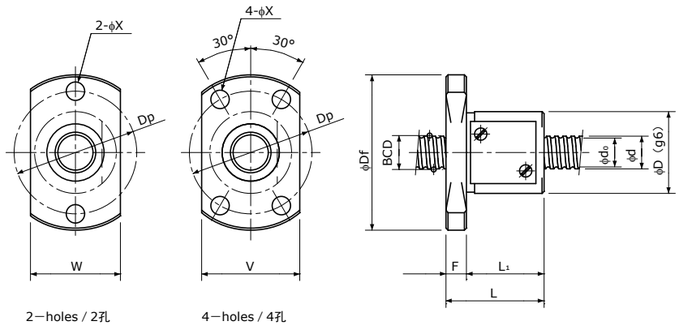
Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm
Dynamic 额定动负载 Ca	Static 额定静负载 Coa	
1000 / 640	3300 / 1650	164 / 138

Preload type 预压型
Backlash type 齿侧间隙型

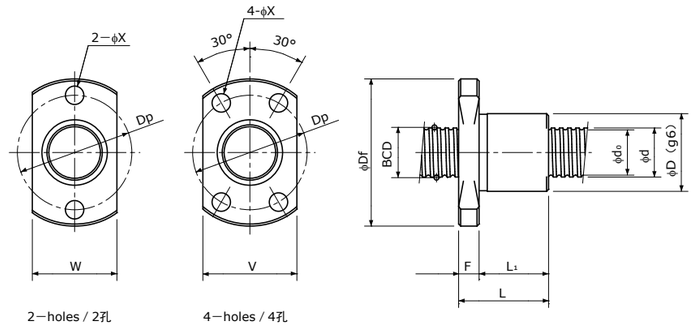
Note 1)The diameter of one of the Screw Shaft ends must be less than the Screw Shaft Root diameter, otherwise Ball Nut cannot be installed.
Note 2)Ball Nut dimension is without seal at the both ends.
If the seals are required, Ball Nut dimension should be changed, in that case, please ask KSS.
Some type of Ball Nuts cannot equip with seals, please ask KSS representative.
Note 3)The Rigidity values shown in the table are theoretical values of Ball Nut Rigidity calculated from the amount of Elastic Displacement under the following conditions.
Backlash type ; Apply the Axial load equivalent to 30% of the Basic Dynamic Load Rating Ca.
Preload type ; Apply the Preload equivalent to 5% of the Basic Dynamic Load Rating Ca.
For Axial load or Preload condition other than the above, see the formula in page A823 or page A824, you can calculate Rigidity using this formula.
Note 4)All models are Right-hand Screw. If Left-hand Screw is required, please ask KSS representative.
Note 5)Basic Load Rating and Rigidity for Backlash type and Preload type are described in the same cell.

Single Nut with Flange
带法兰单螺母

Backlash type/Preload type
齿侧间隙型/预压型



Type-1:Return-plate type
复式回路板循环方式



Type-2:Internal-deflector type or End-deflector type
陀螺式循环方式或偏转器式循环方式

Unit(单位):mm

Ball Nut Model number 螺母型号	Shaft nominal dia. 丝杠轴公称外径 d	Lead 导程	Ball size 丝杠直径	BCD 钢珠中心直径	Lead angle 导程角	Root dia. 底径 d_0	Number of Circuit 循环数	Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm		Nut dimension 螺母尺寸										Ball Nut Model number 螺母型号
								Dynamic 额定动负载 Ca	Static 额定静负载 Coa			Nut type 螺母类型	D	Df	L	L_1	F	W	V	Dp	Bolt Hole 安装孔 X	
FBS 1401 B	14	1	0.8	14.15	1°17′	13.3	3.7×1	960 / 610	2900 / 1450	148 / 124		1	26	46	21	15	6	28	28	37	5.5	FBS 1401 B
FKB 1402 A	14	2	1.2	14.30	2°33′	13.0	1×3	1700 / 1700	4300 / 4300	122 / 190		2	21	40	20	14	6	23	26	31	5.5	FKB 1402 A
FBS 1402 B	14	2	1.5875	14.30	2°33′	12.6	3.7×1	3200 / 2000	7500 / 3800	176 / 148		1	26	46	25	19	6	28	28	37	5.5	FBS 1402 B
FKB 1402.5 A	14	2.5	1.5875	14.40	3°10′	12.7	1×3	2500 / 2500	5600 / 5600	127 / 197		2	22	41	22	16	6	24	26	32	5.5	FKB 1402.5 A
FBS 1402.5 B	14	2.5	1.5875	14.30	3°11′	12.6	3.7×1	3200 / 2000	7500 / 3700	176 / 148		1	28	48	27	21	6	30	30	39	5.5	FBS 1402.5 B
FKB 1403 A	14	3	2.0	14.50	3°46′	12.4	1×3	3400 / 3400	6800 / 6800	131 / 204		2	24	43	32	26	6	26	27	34	5.5	FKB 1403 A
FBS 1403 B	14	3	2.0	14.30	3°49′	12.2	3.7×1	4600 / 2900	10100 / 5000	184 / 154		1	30	51	30	24	6	32	32	42	5.5	FBS 1403 B
FKB 1404 A	14	4	2.381	14.65	4°58′	12.2	1×3	4500 / 4500	8600 / 8600	136 / 212		2	26	45	29	23	6	28	28	36	5.5	FKB 1404 A
FBS 1404 B	14	4	2.381	14.30	5°05′	11.8	3.7×1	5700 / 3600	11600 / 5800	187 / 157		1	30	51	33	27	6	32	32	42	5.5	FBS 1404 B
FBS 1405 B	14	5	2.381	14.30	6°21′	11.8	3.7×1	5700 / 3600	11600 / 5800	186 / 157		1	30	51	39	33	6	32	32	42	5.5	FBS 1405 B

注1)设计时,请注意使滚珠丝杠轴端的其中一端不超过丝杠轴底径。
如果两个轴端设计得大于底径,则将无法组装螺母。
注2)标准螺母不带密封。
需要密封时,螺母的尺寸将发生变化,详情请垂询本公司。
某些型号的螺母不能安装密封,敬请注意。
注3)表中的刚性值为螺母的刚性值,是在以下条件下,根据轴向弹性位移量计算得出的理论值。
齿侧间隙型:相当于基本额定动负载Ca的30%的轴向负载作用时
预压型:施加了相当于基本额定动负载Ca的5%的预压时
轴向负载及预压量与上述条件不同时,可通过第A823页或第A824的公式计算。
注4)标准螺纹旋向为右旋。
需要左旋时,请垂询本公司。
注5)基本额定负载和刚性值(齿侧间隙型和预压型的刚性值可能会有不同)一并标示在上表中。

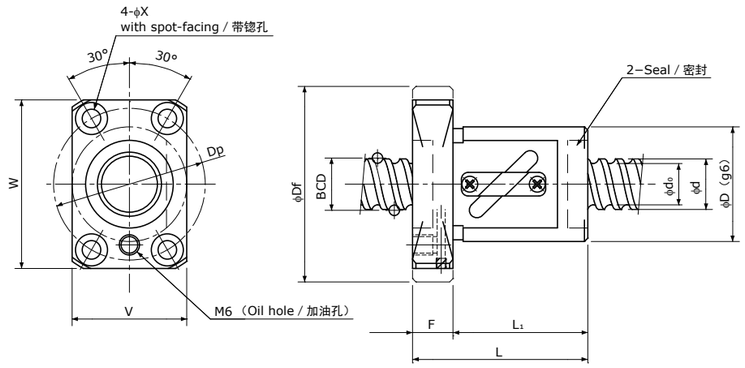
Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm
Dynamic 额定动负载 Ca	Static 额定静负载 Coa	
1000 / 640	3300 / 1650	164 / 138

Preload type 预压型
Backlash type 齿侧间隙型

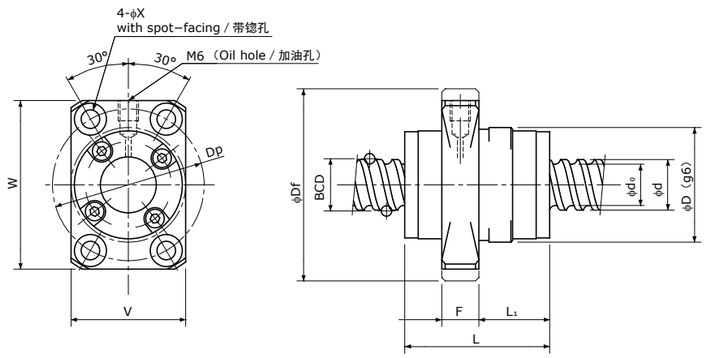
Note 1)The diameter of one of the Screw Shaft ends must be less than the Screw Shaft Root diameter, otherwise Ball Nut cannot be installed.
Note 2)Ball Nut dimension is without seal at the both ends.
If the seals are required, Ball Nut dimension should be changed, in that case, please ask KSS.
Some type of Ball Nuts cannot equip with seals, please ask KSS representative.
Note 3)The Rigidity values shown in the table are theoretical values of Ball Nut Rigidity calculated from the amount of Elastic Displacement under the following conditions.
Backlash type ; Apply the Axial load equivalent to 30% of the Basic Dynamic Load Rating Ca.
Preload type ; Apply the Preload equivalent to 5% of the Basic Dynamic Load Rating Ca.
For Axial load or Preload condition other than the above, see the formula in page A823 or page A824, you can calculate Rigidity using this formula.
Note 4)All models are Right-hand Screw. If Left-hand Screw is required, please ask KSS representative.
Note 5)Basic Load Rating and Rigidity for Backlash type and Preload type are described in the same cell.

Single Nut with Flange
带法兰单螺母

Backlash type/Preload type
齿侧间隙型/预压型



Type-4:Return-tube type
回路管循环方式



Type-5:End-deflector type
偏转器式循环方式

Unit(单位):mm

Ball Nut Model number 螺母型号	Shaft nominal dia. 丝杠轴公称外径 d	Lead 导程	Ball size 丝杠直径	BCD 钢珠中心直径	Lead angle 导程角	Root dia. 底径 d_0	Number of Circuit 循环数	Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm		Nut dimension 螺母尺寸										Ball Nut Model number 螺母型号
								Dynamic 额定动负载 Ca	Static 额定静负载 Coa			Nut type 螺母类型	D	Df	L	L_1	F	W	V	Dp	Bolt Hole 安装孔 X	
FBS 1504 T	15	4	2.381	15.50	4°42′	13.0	2.5×1	4100 / 2580	8550 / 4300	136 / 112		4	32	56	41	31	10	48	32	43	5.5	FBS 1504 T
FEB 1505 A	15	5	3.175	15.50	5°41′	12.2	3.7×1	8900 / —	17000 / —	208 / —		5	34	57	33	16	11	50	34	45	5.5	FEB 1505 A
FBS 1505 T	15	5	3.175	15.80	5°45′	12.4	2.5×1	6900 / 4350	12500 / 6250	148 / 122		4	34	58	44	34	10	50	34	45	5.5	FBS 1505 T
FEB 1510 A	15	10	3.175	15.50	11°36′	12.2	2.7×2	12000 / —	25000 / —	289 / —		5	34	57	43	21	11	50	34	45	5.5	FEB 1510 A
FBS 1510 T	15	10	3.175	15.80	11°23′	12.4	1.5×1	4400 / 2540	7900 / 3450	87 / 69		4	34	58	52	40	12	50	34	45	6.0	FBS 1510 T
FEB 1520 A	15	20	3.175	15.75	22°01′	12.4	1.7×2	8000 / —	16000 / —	178 / —		5	34	57	52	28.5	11	50	34	45	5.5	FEB 1520 A
FBS 1520 T	15	20	3.175	15.80	21°56′	12.4	1.5×1	4400 / 2540	7900 / 3450	84 / 67		4	34	58	62	50	12	50	34	45	6.0	FBS 1520 T
FEB 1530 A	15	30	3.175	15.75	31°14′	12.4	1.7×2	8000 / —	16000 / —	163 / —		5	34	57	71	45.5	11	50	34	45	5.5	FEB 1530 A

注1)设计时,请注意使滚珠丝杠轴端的其中一端不超过丝杠轴底径。
如果两个轴端设计得大于底径,则将无法组装螺母。
注2)标准螺母不带密封。
需要密封时,螺母的尺寸将发生变化,详情请垂询本公司。
某些型号的螺母不能安装密封,敬请注意。
注3)表中的刚性值为螺母的刚性值,是在以下条件下,根据轴向弹性位移量计算得出的理论值。
齿侧间隙型:相当于基本额定动负载Ca的30%的轴向负载作用时
预压型:施加了相当于基本额定动负载Ca的5%的预压时
轴向负载及预压量与上述条件不同时,可通过第A823页或第A824的公式计算。
注4)标准螺纹旋向为右旋。
需要左旋时,请垂询本公司。
注5)基本额定负载和刚性值(齿侧间隙型和预压型的刚性值可能会有不同)一并标示在上表中。

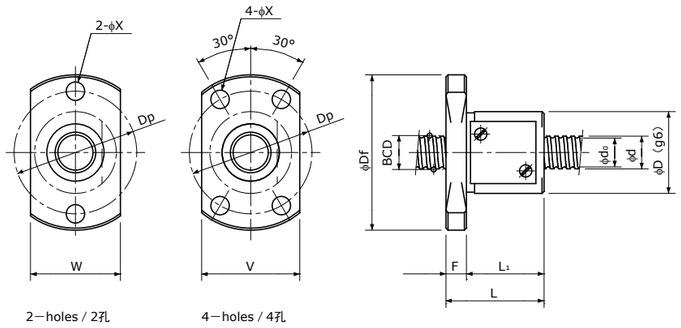
Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm
Dynamic 额定动负载 Ca	Static 额定静负载 Coa	
1000 / 640	3300 / 1650	164 / 138

Preload type 预压型
Backlash type 齿侧间隙型

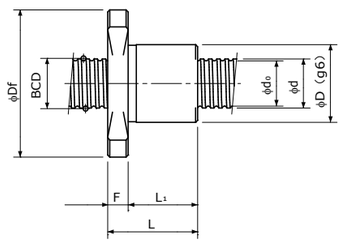
Note 1)The diameter of one of the Screw Shaft ends must be less than the Screw Shaft Root diameter, otherwise Ball Nut cannot be installed.
Note 2)Ball Nut dimension is without seal at the both ends.
If the seals are required, Ball Nut dimension should be changed, in that case, please ask KSS.
Some type of Ball Nuts cannot equip with seals, please ask KSS representative.
Note 3)The Rigidity values shown in the table are theoretical values of Ball Nut Rigidity calculated from the amount of Elastic Displacement under the following conditions.
Backlash type ; Apply the Axial load equivalent to 30% of the Basic Dynamic Load Rating Ca.
Preload type ; Apply the Preload equivalent to 5% of the Basic Dynamic Load Rating Ca.
For Axial load or Preload condition other than the above, see the formula in page A823 or page A824, you can calculate Rigidity using this formula.
Note 4)All models are Right-hand Screw. If Left-hand Screw is required, please ask KSS representative.
Note 5)Basic Load Rating and Rigidity for Backlash type and Preload type are described in the same cell.

Single Nut with Flange
带法兰单螺母

Backlash type/Preload type
齿侧间隙型/预压型



Type-1:Return-plate type
复式回路板循环方式



Type-2:Internal-deflector type or
End-deflector type
陀螺式循环方式或偏转器式循环方式

Unit(单位):mm

Ball Nut Model number 螺母型号	Shaft nominal dia. 丝杠轴公称外径 d	Lead 导程	Ball size 丝杠直径	BCD 钢珠中心直径	Lead angle 导程角	Root dia. 底径 d_0	Number of Circuit 循环数	Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm		Nut dimension 螺母尺寸										Ball Nut Model number 螺母型号
								Dynamic 额定动负载 Ca	Static 额定静负载 Coa			Nut type 螺母类型	D	Df	L	L_1	F	W	V	Dp	Bolt Hole 安装孔 X	
FBS 1601 B	16	1	0.8	16.15	1°08′	15.3	3.7×1	1000 / 640	3300 / 1650	164 / 138		1	28	48	21	15	6	30	30	39	5.5	FBS 1601 B
FKB 1602 A	16	2	1.2	16.30	2°14′	15.0	1×3	1850 / 1850	5000 / 5000	137 / 213		2	24	43	20	14	6	26	27	34	5.5	FKB 1602 A
FBS 1602 B	16	2	1.5875	16.30	2°14′	14.6	3.7×1	3400 / 2100	8600 / 4300	197 / 163		1	28	48	25	19	6	30	30	39	5.5	FBS 1602 B
FKB 1603 A	16	3	2.0	16.50	3°19′	14.4	1×3	3600 / 3600	8000 / 8000	146 / 227		2	26	45	32	26	6	28	28	36	5.5	FKB 1603 A
FBS 1603 B	16	3	2.0	16.30	3°21′	14.2	3.7×1	4900 / 3100	11600 / 5800	205 / 172		1	32	53	30	24	6	34	34	44	5.5	FBS 1603 B
FKB 1604 A	16	4	2.381	16.65	4°22′	13.9	1×3	4800 / 4800	10000 / 10000	152 / 237		2	28	47	29	23	6	30	30	38	5.5	FKB 1604 A
FBS 1604 B	16	4	2.381	16.30	4°28′	13.8	3.7×1	6200 / 3900	13600 / 6800	209 / 174		1	34	54	34	28	6	36	36	45	5.5	FBS 1604 B
FBS 1605 B	16	5	3.175	16.50	5°31′	13.2	3.7×1	9100 / 5700	18200 / 9100	217 / 182		1	38	57	42	36	6	40	40	48	5.5	FBS 1605 B

注1)设计时,请注意使滚珠丝杠轴端的其中一端不超过丝杠轴底径。
如果两个轴端设计得大于底径,则将无法组装螺母。
注2)标准螺母不带密封。
需要密封时,螺母的尺寸将发生变化,详情请垂询本公司。
某些型号的螺母不能安装密封,敬请注意。
注3)表中的刚性值为螺母的刚性值,是在以下条件下,根据轴向弹性位移量计算得出的理论值。
齿侧间隙型:相当于基本额定动负载Ca的30%的轴向负载作用时
预压型:施加了相当于基本额定动负载Ca的5%的预压时
轴向负载及预压量与上述条件不同时,可通过第A823页或第A824的公式计算。
注4)标准螺纹旋向为右旋。
需要左旋时,请垂询本公司。
注5)基本额定负载和刚性值(齿侧间隙型和预压型的刚性值可能会有不同)一并标示在上表中。

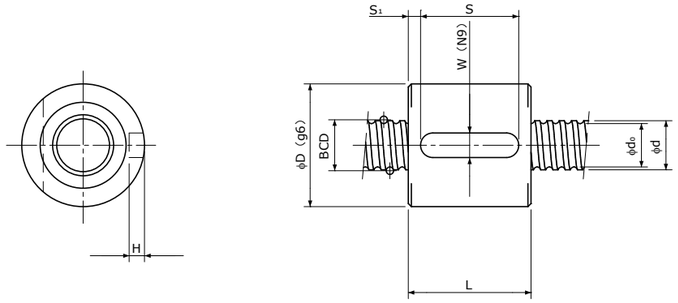
Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm
Dynamic 额定动负载 Ca	Static 额定静负载 Coa	
1000 / 640	3300 / 1650	164 / 138

Preload type 预压型
Backlash type 齿侧间隙型

Note 1)The diameter of one of the Screw Shaft ends must be less than the Screw Shaft Root diameter, otherwise Ball Nut cannot be installed.
Note 2)Ball Nut dimension is without seal at the both ends.
If the seals are required, Ball Nut dimension should be changed, in that case, please ask KSS.
Some type of Ball Nuts cannot equip with seals, please ask KSS representative.
Note 3)The Rigidity values shown in the table are theoretical values of Ball Nut Rigidity calculated from the amount of Elastic Displacement under the following conditions.
Backlash type ; Apply the Axial load equivalent to 30% of the Basic Dynamic Load Rating Ca.
Preload type ; Apply the Preload equivalent to 5% of the Basic Dynamic Load Rating Ca.
For Axial load or Preload condition other than the above, see the formula in page A823 or page A824, you can calculate Rigidity using this formula.
Note 4)All models are Right-hand Screw. If Left-hand Screw is required, please ask KSS representative.
Note 5)Basic Load Rating and Rigidity for Backlash type and Preload type are described in the same cell.

Sleeve type Single Nut
套筒型单螺母

Backlash type/Preload type
齿侧间隙型/预压型



Unit(单位):mm

Ball Nut Model number 螺母型号	Shaft nominal dia. 丝杠轴公称外径 d	Lead 导程	Ball size 丝杠直径	BCD 钢珠中心直径	Lead angle 导程角	Root dia. 底径 d_0	Number of Circuit 循环数	Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm		Nut dimension 螺母尺寸						Ball Nut Model number 螺母型号
								Dynamic 额定动负载 Ca	Static 额定静负载 Coa			D	L	W	H	S	S_1	
BS 0301 B	3	1	0.6	3.18	5°43′	2.4	3.7×1	330 / —	440 / —	42 / —		9	12	2	1.2	8	2	BS 0301 B
BS 0401 A	4	1	0.8	4.15	4°23′	3.3	2.7×1	420 / 270	570 / 290	40 / 34		10	12	2	1.2	8	2	BS 0401 A
BS 0401 B	4	1	0.8	4.15	4°23′	3.3	3.7×1	560 / 350	790 / 400	54 / 45		11	14	3	1.8	8	3	BS 0401 B
BS 0402 A	4	2	0.8	4.15	8°43′	3.3	2.7×1	420 / 260	570 / 290	39 / 33		11	16	3	1.8	8	4	BS 0402 A
BS 0501 B	5	1	0.8	5.15	3°32′	4.3	3.7×1	630 / 400	1000 / 500	65 / 55		12	14	3	1.8	8	3	BS 0501 B
BS 0504 A	5	4	0.8	5.15	13°53′	4.3	2.7×1	470 / 300	720 / 360	47 / 39		12	22	3	1.8	12	5	BS 0504 A
BS 0601 B	6	1	0.8	6.15	2°58′	5.3	3.7×1	680 / 430	1200 / 610	75 / 63		13	14	3	1.8	10	2	BS 0601 B
BS 0601.5 B	6	1.5	1.0	6.20	4°24′	5.1	3.7×1	980 / 620	1600 / 800	79 / 67		14	16	3	1.8	10	3	BS 0601.5 B
BS 0602 A	6	2	1.0	6.20	5°52′	5.1	2.7×1	750 / 470	1200 / 590	58 / 49		15	15	3	1.8	10	2.5	BS 0602 A
BS 0602.5 A	6	2.5	1.0	6.20	7°19′	5.1	2.7×1	750 / 470	1200 / 590	59 / 49		15	16	3	1.8	10	3	BS 0602.5 A

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如果两个轴端设计得大于底径,则将无法组装螺母。
注2)标准螺母不带密封。
需要密封时,螺母的尺寸将发生变化,详情请垂询本公司。
某些型号的螺母不能安装密封,敬请注意。
注3)表中的刚性值为螺母的刚性值,是在以下条件下,根据轴向弹性位移量计算得出的理论值。
齿侧间隙型:相当于基本额定动负载Ca的30%的轴向负载作用时
预压型:施加了相当于基本额定动负载Ca的5%的预压时
轴向负载及预压量与上述条件不同时,可通过第A823页或第A824的公式计算。
注4)标准螺纹旋向为右旋。
需要左旋时,请垂询本公司。
注5)基本额定负载和刚性值(齿侧间隙型和预压型的刚性值可能会有不同)一并标示在上表中。

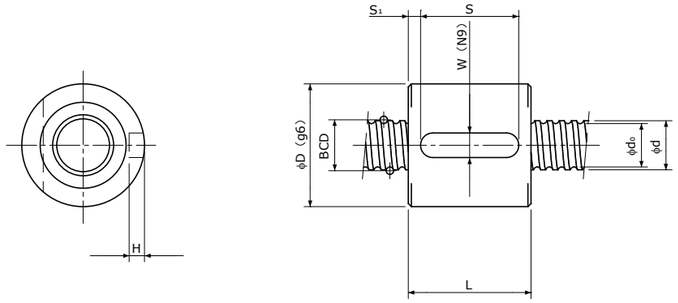
Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm
Dynamic 额定动负载 Ca	Static 额定静负载 Coa	
1000 / 640	3300 / 1650	164 / 138

Preload type 预压型
Backlash type 齿侧间隙型

Note 1)The diameter of one of the Screw Shaft ends must be less than the Screw Shaft Root diameter, otherwise Ball Nut cannot be installed.
Note 2)Ball Nut dimension is without seal at the both ends.
If the seals are required, Ball Nut dimension should be changed, in that case, please ask KSS.
Some type of Ball Nuts cannot equip with seals, please ask KSS representative.
Note 3)The Rigidity values shown in the table are theoretical values of Ball Nut Rigidity calculated from the amount of Elastic Displacement under the following conditions.
Backlash type ; Apply the Axial load equivalent to 30% of the Basic Dynamic Load Rating Ca.
Preload type ; Apply the Preload equivalent to 5% of the Basic Dynamic Load Rating Ca.
For Axial load or Preload condition other than the above, see the formula in page A823 or page A824, you can calculate Rigidity using this formula.
Note 4)All models are Right-hand Screw. If Left-hand Screw is required, please ask KSS representative.
Note 5)Basic Load Rating and Rigidity for Backlash type and Preload type are described in the same cell.

Sleeve type Single Nut
套筒型单螺母

Backlash type/Preload type
齿侧间隙型/预压型



Unit(单位):mm

Ball Nut Model number 螺母型号	Shaft nominal dia. 丝杠轴公称外径 d	Lead 导程	Ball size 丝杠直径	BCD 钢珠中心直径	Lead angle 导程角	Root dia. 底径 d_0	Number of Circuit 循环数	Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm		Nut dimension 螺母尺寸						Ball Nut Model number 螺母型号
								Dynamic 额定动负载 Ca	Static 额定静负载 Coa			D	L	W	H	S	S_1	
BS 0801 B	8	1	0.8	8.15	2°15′	7.3	3.7×1	780 / 490	1650 / 820	95 / 80		16	14	3	1.8	10	2	BS 0801 B
BS 0801.5 B	8	1.5	1.0	8.20	3°20′	7.1	3.7×1	1100 / 700	2200 / 1100	99 / 83		16	16	3	1.8	10	3	BS 0801.5 B
BS 0802 B(1)	8	2	1.0	8.20	4°26′	7.1	3.7×1	1100 / 700	2200 / 1100	99 / 83		16	18	3	1.8	12	3	BS 0802 B(1)
BS 0802 B(2)	8	2	1.5875	8.30	4°23′	6.6	3.7×1	2400 / 1550	4100 / 2100	111 / 94		20	20	4	2.5	16	2	BS 0802 B(2)
BS 0802.5 A	8	2.5	1.5875	8.00	5°41′	6.3	2.7×1	1850 / —	3000 / —	80 / —		16	16	3	1.8	8	4	BS 0802.5 A
BS 0802.5 B	8	2.5	1.5875	8.30	5°29′	6.6	3.7×1	2400 / 1550	4100 / 2100	111 / 93		20	22	4	2.5	16	3	BS 0802.5 B
BS 0803 A	8	3	2.0	8.30	6°34′	6.2	2.7×1	2600 / 1650	4200 / 2100	85 / 70		20	22	4	2.5	16	3	BS 0803 A
BS 0804 A	8	4	2.0	8.30	8°43′	6.2	2.7×1	2600 / 1650	4200 / 2100	84 / 70		21	26	4	2.5	20	3	BS 0804 A
BS 0805 A	8	5	1.5875	8.30	10°51′	6.6	2.7×1	1850 / 1150	3000 / 1500	82 / 67		18	28	4	2.5	20	4	BS 0805 A

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预压型:施加了相当于基本额定动负载Ca的5%的预压时
轴向负载及预压量与上述条件不同时,可通过第A823页或第A824的公式计算。
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Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm
Dynamic 额定动负载 Ca	Static 额定静负载 Coa	
1000 / 640	3300 / 1650	164 / 138

Preload type 预压型
Backlash type 齿侧间隙型

Note 1)The diameter of one of the Screw Shaft ends must be less than the Screw Shaft Root diameter, otherwise Ball Nut cannot be installed.
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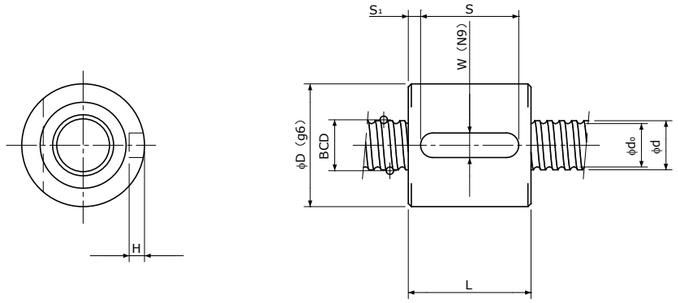
Note 3)The Rigidity values shown in the table are theoretical values of Ball Nut Rigidity calculated from the amount of Elastic Displacement under the following conditions.
Backlash type ; Apply the Axial load equivalent to 30% of the Basic Dynamic Load Rating Ca.
Preload type ; Apply the Preload equivalent to 5% of the Basic Dynamic Load Rating Ca.
For Axial load or Preload condition other than the above, see the formula in page A823 or page A824, you can calculate Rigidity using this formula.
Note 4)All models are Right-hand Screw. If Left-hand Screw is required, please ask KSS representative.
Note 5)Basic Load Rating and Rigidity for Backlash type and Preload type are described in the same cell.

Sleeve type Single Nut
套筒型单螺母

Backlash type/Preload type
齿侧间隙型/预压型



Unit(单位):mm

Ball Nut Model number 螺母型号	Shaft nominal dia. 丝杠轴公称外径 d	Lead 导程	Ball size 丝杠直径	BCD 钢珠中心直径	Lead angle 导程角	Root dia. 底径 d_0	Number of Circuit 循环数	Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm		Nut dimension 螺母尺寸						Ball Nut Model number 螺母型号
								Dynamic 额定动负载 Ca	Static 额定静负载 Coa			D	L	W	H	S	S_1	
BS 1001 B	10	1	0.8	10.15	1°48′	9.3	3.7×1	840 / 530	2000 / 1000	113 / 95		19	14	3	1.8	10	2	BS 1001 B
BS 1001.5 B	10	1.5	1.0	10.20	2°41′	9.1	3.7×1	1250 / 790	2800 / 1400	120 / 101		19	16	3	1.8	10	3	BS 1001.5 B
BS 1002 B	10	2	1.5875	10.30	3°32′	8.6	3.7×1	2700 / 1750	5300 / 2700	134 / 112		23	20	5	3	16	2	BS 1002 B
BS 1002.5 B	10	2.5	1.5875	10.30	4°25′	8.6	3.7×1	2700 / 1750	5300 / 2700	133 / 112		24	22	5	3	16	3	BS 1002.5 B
BS 1003 B	10	3	2.0	10.30	5°18′	8.2	3.7×1	3900 / 2500	7200 / 3600	140 / 118		24	26	5	3	20	3	BS 1003 B
BS 1004 A	10	4	2.0	10.30	7°03′	8.2	2.7×1	3000 / 1800	5200 / 2600	104 / 86		24	26	5	3	20	3	BS 1004 A
BS 1005 A(1)	10	5	2.0	10.30	8°47′	8.2	2.7×1	3000 / —	5200 / —	103 / —		23	26	5	3	16	5	BS 1005 A(1)
BS 1005 A(2)	10	5	2.0	10.30	8°47′	8.2	2.7×1	3000 / 1800	5200 / 2600	103 / 85		24	34	5	3	28	3	BS 1005 A(2)

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预压型:施加了相当于基本额定动负载Ca的5%的预压时
轴向负载及预压量与上述条件不同时,可通过第A823页或第A824的公式计算。
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注5)基本额定负载和刚性值(齿侧间隙型和预压型的刚性值可能会有不同)一并标示在上表中。

Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm
Dynamic 额定动负载 Ca	Static 额定静负载 Coa	
1000 / 640	3300 / 1650	164 / 138

Preload type 预压型
Backlash type 齿侧间隙型

Note 1)The diameter of one of the Screw Shaft ends must be less than the Screw Shaft Root diameter, otherwise Ball Nut cannot be installed.
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Preload type ; Apply the Preload equivalent to 5% of the Basic Dynamic Load Rating Ca.
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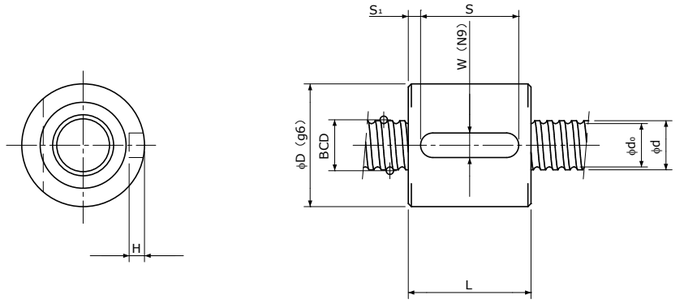
Note 4)All models are Right-hand Screw. If Left-hand Screw is required, please ask KSS representative.
Note 5)Basic Load Rating and Rigidity for Backlash type and Preload type are described in the same cell.

Sleeve type Single Nut
套筒型单螺母

Backlash type/Preload type
齿侧间隙型/预压型



Unit(单位):mm

Ball Nut Model number 螺母型号	Shaft nominal dia. 丝杠轴公称外径 d	Lead 导程	Ball size 丝杠直径	BCD 钢珠中心直径	Lead angle 导程角	Root dia. 底径 d_0	Number of Circuit 循环数	Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm		Nut dimension 螺母尺寸						Ball Nut Model number 螺母型号
								Dynamic 额定动负载 Ca	Static 额定静负载 Coa			D	L	W	H	S	S_1	
BS 1201 B	12	1	0.8	12.15	1°30′	11.3	3.7×1	910 / 570	2400 / 1200	131 / 110		22	14	4	2.5	10	2	BS 1201 B
BS 1202 B	12	2	1.5875	12.30	2°58′	10.6	3.7×1	3000 / 1900	6400 / 3200	156 / 132		25	20	5	3	16	2	BS 1202 B
BS 1202.5 B	12	2.5	1.5875	12.30	3°42′	10.6	3.7×1	3000 / 1850	6400 / 3200	156 / 130		26	22	5	3	16	3	BS 1202.5 B
BS 1203 B	12	3	2.0	12.30	4°26′	10.2	3.7×1	4300 / 2800	8700 / 4300	162 / 137		28	26	5	3	20	3	BS 1203 B
BS 1204 B	12	4	2.381	12.30	5°55′	9.8	3.7×1	5400 / 3400	10200 / 5100	165 / 139		28	31	5	3	25	3	BS 1204 B
BS 1205 A	12	5	2.381	12.30	7°22′	9.8	2.7×1	4100 / 2500	7400 / 3700	122 / 101		28	31	5	3	25	3	BS 1205 A
BS 1401 B	14	1	0.8	14.15	1°17′	13.3	3.7×1	960 / 610	2900 / 1450	148 / 124		26	16	5	3	10	3	BS 1401 B
BS 1402 B	14	2	1.5875	14.30	2°33′	12.6	3.7×1	3200 / 2000	7500 / 3800	176 / 148		26	20	5	3	16	2	BS 1402 B
BS 1402.5 B	14	2.5	1.5875	14.30	3°11′	12.6	3.7×1	3200 / 2000	7500 / 3700	176 / 148		28	22	5	3	16	3	BS 1402.5 B
BS 1403 B	14	3	2.0	14.30	3°49′	12.2	3.7×1	4600 / 2900	10100 / 5000	184 / 154		30	26	5	3	20	3	BS 1403 B
BS 1404 B	14	4	2.381	14.30	5°05′	11.8	3.7×1	5700 / 3600	11600 / 5800	187 / 157		30	31	5	3	25	3	BS 1404 B
BS 1405 B	14	5	2.381	14.30	6°21′	11.8	3.7×1	5700 / 3600	11600 / 5800	186 / 157		30	38	5	3	28	5	BS 1405 B

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齿侧间隙型:相当于基本额定动负载Ca的30%的轴向负载作用时
预压型:施加了相当于基本额定动负载Ca的5%的预压时
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Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm
Dynamic 额定动负载 Ca	Static 额定静负载 Coa	
1000 / 640	3300 / 1650	164 / 138

Preload type 预压型
Backlash type 齿侧间隙型

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Backlash type ; Apply the Axial load equivalent to 30% of the Basic Dynamic Load Rating Ca.
Preload type ; Apply the Preload equivalent to 5% of the Basic Dynamic Load Rating Ca.
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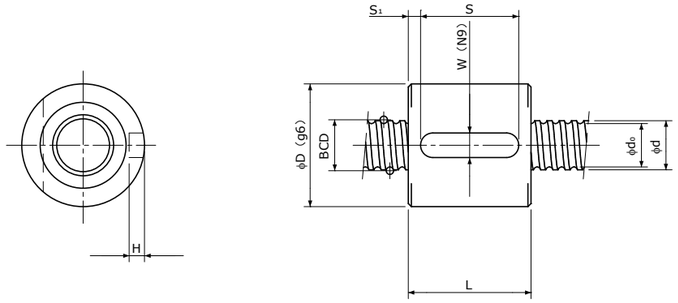
Sleeve type Single Nut
套筒型单螺母

Backlash type/Preload type
齿侧间隙型/预压型



Unit(单位):mm

Ball Nut Model number 螺母型号	Shaft nominal dia. 丝杠轴公称外径 d	Lead 导程	Ball size 丝杠直径	BCD 钢珠中心直径	Lead angle 导程角	Root dia. 底径 d_0	Number of Circuit 循环数	Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm		Nut dimension 螺母尺寸						Ball Nut Model number 螺母型号
								Dynamic 额定动负载 Ca	Static 额定静负载 Coa			D	L	W	H	S	S_1	
BS 1601 B	16	1	0.8	16.15	1°08′	15.3	3.7×1	1000 / 640	3300 / 1650	164 / 138		28	16	5	3	10	3	BS 1601 B
BS 1602 B	16	2	1.5875	16.30	2°14′	14.6	3.7×1	3400 / 2100	8600 / 4300	197 / 163		28	20	5	3	16	2	BS 1602 B
BS 1603 B	16	3	2.0	16.30	3°21′	14.2	3.7×1	4900 / 3100	11600 / 5800	205 / 172		32	26	5	3	20	3	BS 1603 B
BS 1604 B	16	4	2.381	16.30	4°28′	13.8	3.7×1	6200 / 3900	13600 / 6800	209 / 174		34	32	5	3	25	3.5	BS 1604 B
BS 1605 B	16	5	3.175	16.50	5°31′	13.2	3.7×1	9100 / 5700	18200 / 9100	217 / 182		38	38	5	3	28	5	BS 1605 B

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预压型:施加了相当于基本额定动负载Ca的5%的预压时
轴向负载及预压量与上述条件不同时,可通过第A823页或第A824的公式计算。
注4)标准螺纹旋向为右旋。
需要左旋时,请垂询本公司。
注5)基本额定负载和刚性值(齿侧间隙型和预压型的刚性值可能会有不同)一并标示在上表中。

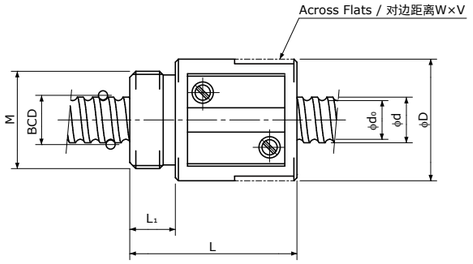
Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm
Dynamic 额定动负载 Ca	Static 额定静负载 Coa	
1000 / 640	3300 / 1650	164 / 138

Preload type 预压型
Backlash type 齿侧间隙型

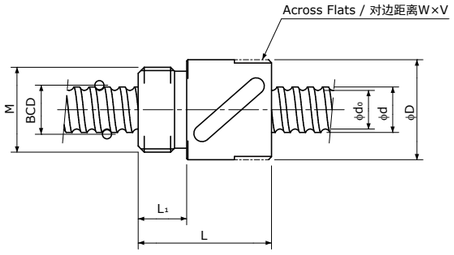
Note 1)The diameter of one of the Screw Shaft ends must be less than the Screw Shaft Root diameter, otherwise Ball Nut cannot be installed.
Note 2)Ball Nut dimension is without seal at the both ends.
If the seals are required, Ball Nut dimension should be changed, in that case, please ask KSS.
Some type of Ball Nuts cannot equip with seals, please ask KSS representative.
Note 3)The Rigidity values shown in the table are theoretical values of Ball Nut Rigidity calculated from the amount of Elastic Displacement under the following conditions.
Backlash type ; Apply the Axial load equivalent to 30% of the Basic Dynamic Load Rating Ca.
Preload type ; Apply the Preload equivalent to 5% of the Basic Dynamic Load Rating Ca.
For Axial load or Preload condition other than the above, see the formula in page A823 or page A824, you can calculate Rigidity using this formula.
Note 4)All models are Right-hand Screw. If Left-hand Screw is required, please ask KSS representative.
Note 5)Basic Load Rating and Rigidity for Backlash type and Preload type are described in the same cell.

Single Nut with M-thread
带公制螺纹单螺母

Backlash type/Preload type
齿侧间隙型/预压型



Type-1:Return-plate type
复式回路板循环方式



Type-2:Return-tube type
回路管循环方式

Unit(单位):mm

Ball Nut Model number 螺母型号	Shaft nominal dia. 丝杠轴公称外径 d	Lead 导程	Ball size 丝杠直径	BCD 钢珠中心直径	Lead angle 导程角	Root dia. 底径 d_0	Number of Circuit 循环数	Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm		Nut dimension 螺母尺寸							Ball Nut Model number 螺母型号
								Dynamic 额定动负载 Ca	Static 额定静负载 Coa			Nut type 螺母类型	D	L	L_1	Across Flats width 对边距离 W	Across Flats length 对边距离长度 V	M	
MS 0401 B	4	1	0.8	4.15	4°23′	3.3	3.7×1	560 / 350	790 / 400	54 / 45		1	11	17	4	10	6	M9×0.75	MS 0401 B
MS 0602 A	6	2	1.0	6.20	5°52′	5.1	2.7×1	750 / 470	1200 / 590	58 / 49		1	16.5	22	8	14	4	M14×1.0	MS 0602 A
MS 0801.5 B	8	1.5	1.0	8.20	3°20′	7.1	3.7×1	1100 / 700	2200 / 1100	99 / 83		1	16.5	24	8	14	5	M14×1.0	MS 0801.5 B
MS 0802 B	8	2	1.5875	8.30	4°23′	6.6	3.7×1	2400 / 1550	4100 / 2100	111 / 94		1	20	27.5	7.5	18	5	M16×1.0	MS 0802 B
MS 0802.5 T(1)	8	2.5	1.5875	8.00	5°41′	6.3	3.5×1	2300 / —	3900 / —	102 / —		2	16.5	22	8	14	4	M14×1.0	MS 0802.5 T(1)
MS 0802.5 T(2)	8	2.5	1.5875	8.00	5°41′	6.3	3.5×1	2300 /—	3900 / —	102 / —		2	17.5	25.5	7.5	15	4	M15×1.0	MS 0802.5 T(2)
MS 0803 A	8	3	2.0	8.30	6°34′	6.2	2.7×1	2600 / 1650	4200 / 2100	85 / 70		1	20	28.5	7.5	18	5	M16×1.0	MS 0803 A
MS 0804 T	8	4	1.5875	8.00	9°03′	5.9	2.5×1	1750 / —	2800 / —	75 / —		2	16.5	24	8	14	4	M14×1.0	MS 0804 T
MS 0805 A	8	5	1.5875	8.30	10°51′	6.6	2.7×1	1850 / 1150	3000 / 1500	82 / 67		1	18	32.5	7.5	16	5	M15×1.0	MS 0805 A

注1)设计时,请注意使滚珠丝杠轴端的其中一端不超过丝杠轴底径。
　　如果两个轴端设计得大于底径,则将无法组装螺母。
注2)标准螺母不带密封。不能安装密封,敬请注意。
注3)表中的刚性值为螺母的刚性值,是在以下条件下,根据轴向弹性位移量计算得出的理论值。
　　齿侧间隙型:相当于基本额定动负载Ca的30%的轴向负载作用时
　　预压型:施加了相当于基本额定动负载Ca的5%的预压时
　　轴向负载及预压量与上述条件不同时,可通过第A823页或第A824的公式计算。
注4)标准螺纹旋向为右旋。
　　需要左旋时,请垂询本公司。
注5)为了便于安装配合零件而需要对螺母外径进行对边距离加工或开孔加工时,
　　请垂询本公司。
注6)基本额定负载和刚性值(齿侧间隙型和预压型的刚性值可能会有不同)一并标示在上表中。

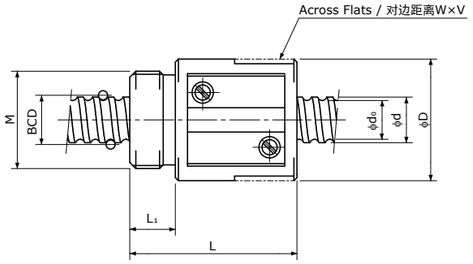
Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm
Dynamic 额定动负载 Ca	Static 额定静负载 Coa	
1000 / 640	3300 / 1650	164 / 138

Preload type 预压型
Backlash type 齿侧间隙型

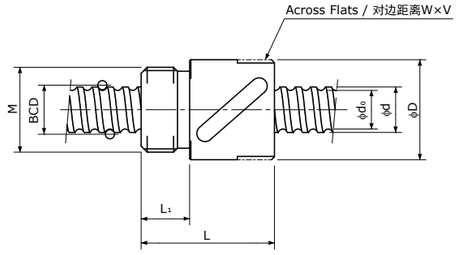
Note 1)The diameter of one of the Screw Shaft ends must be less than the Screw Shaft Root diameter, otherwise Ball Nut cannot be installed.
Note 2)Ball Nut dimension is without seal at the both ends. All type of Ball Nuts cannot equip with seals.
Note 3)The Rigidity values shown in the table are theoretical values of Ball Nut Rigidity calculated from the amount of Elastic Displacement under the following conditions.
　　Backlash type ; Apply the Axial load equivalent to 30% of the Basic Dynamic Load Rating Ca.
　　Preload type ; Apply the Preload equivalent to 5% of the Basic Dynamic Load Rating Ca.
　　For Axial load or Preload condition other than the above, see the formula in page A823 or page A824, you can calculate Rigidity using this formula.
Note 4)All models are Right-hand Screw. If Left-hand Screw is required, please ask KSS representative.
Note 5)Across Flats or drill hole is available on the Ball Nut for the convenience of assembly. Please ask KSS representative.
Note 6)Basic Load Rating and Rigidity for Backlash type and Preload type are described in the same cell.

Single Nut with M-thread
带公制螺纹单螺母

Backlash type/Preload type
齿侧间隙型/预压型



Type-1:Return-plate type
复式回路板循环方式



Type-2:Return-tube type
回路管循环方式

Unit(单位):mm

Ball Nut Model number 螺母型号	Shaft nominal dia. 丝杠轴公称外径 d	Lead 导程	Ball size 丝杠直径	BCD 钢珠中心直径	Lead angle 导程角	Root dia. 底径 d_0	Number of Circuit 循环数	Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm		Nut dimension 螺母尺寸							Ball Nut Model number 螺母型号
								Dynamic 额定动负载 Ca	Static 额定静负载 Coa			Nut type 螺母类型	D	L	L_1	Across Flats width 对边距离 W	Across Flats length 对边距离长度 V	M	
MS 1002 B	10	2	1.5875	10.30	3°32′	8.6	3.7×1	2700 / 1750	5300 / 2700	134 / 112		1	23	27.5	7.5	21	5	M17×1.0	MS 1002 B
MS 1202 B	12	2	1.5875	12.30	2°58′	10.6	3.7×1	3000 / 1900	6400 / 3200	156 / 132		1	25	30	10	23	5	M20×1.0	MS 1202 B
MS 1204 T	12	4	2.381	12.30	5°55′	9.8	2.5×1	3900 / —	7000 / —	113 / —		2	25.5	34	10	23	5	M20×1.0	MS 1204 T
MS 1402 B	14	2	1.5875	14.30	2°33′	12.6	3.7×1	3200 / 2000	7500 / 3800	176 / 148		1	26	30	10	23	5	M22×1.5	MS 1402 B
MS 1404 B	14	4	2.381	14.30	5°05′	11.8	3.7×1	5700 / 3600	11600 / 5800	187 / 157		1	30	38	10	27	8	M25×1.0	MS 1404 B

注1)设计时,请注意使滚珠丝杠轴端的其中一端不超过丝杠轴底径。
如果两个轴端设计得大于底径,则将无法组装螺母。
注2)标准螺母不带密封。不能安装密封,敬请注意。
注3)表中的刚性值为螺母的刚性值,是在以下条件下,根据轴向弹性位移量计算得出的理论值。
齿侧间隙型:相当于基本额定动负载Ca的30%的轴向负载作用时
预压型:施加了相当于基本额定动负载Ca的5%的预压时
轴向负载及预压量与上述条件不同时,可通过第A823页或第A824的公式计算。
注4)标准螺纹旋向为右旋。
需要左旋时,请垂询本公司。
注5)为了便于安装配合零件而需要对螺母外径进行对边距离加工或开孔加工时,
请垂询本公司。
注6)基本额定负载和刚性值(齿侧间隙型和预压型的刚性值可能会有不同)一并标示在上表中。

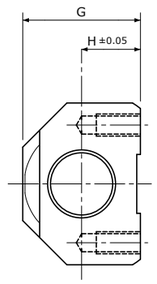
Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm
Dynamic 额定动负载 Ca	Static 额定静负载 Coa	
1000 / 640	3300 / 1650	164 / 138

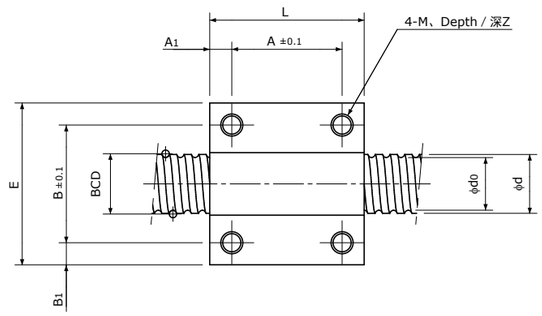
Preload type 预压型
Backlash type 齿侧间隙型

Note 1)The diameter of one of the Screw Shaft ends must be less than the Screw Shaft Root diameter, otherwise Ball Nut cannot be installed.
Note 2)Ball Nut dimension is without seal at the both ends. All type of Ball Nuts cannot equip with seals.
Note 3)The Rigidity values shown in the table are theoretical values of Ball Nut Rigidity calculated from the amount of Elastic Displacement under the following conditions.
Backlash type ; Apply the Axial load equivalent to 30% of the Basic Dynamic Load Rating Ca.
Preload type ; Apply the Preload equivalent to 5% of the Basic Dynamic Load Rating Ca.
For Axial load or Preload condition other than the above, see the formula in page A823 or page A824, you can calculate Rigidity using this formula.
Note 4)All models are Right-hand Screw. If Left-hand Screw is required, please ask KSS representative.
Note 5)Across Flats or drill hole is available on the Ball Nut for the convenience of assembly. Please ask KSS representative.
Note 6)Basic Load Rating and Rigidity for Backlash type and Preload type are described in the same cell.

Square type Single Nut
方型单螺母

Backlash type/Preload type
齿侧间隙型/预压型





Unit(单位):mm

Ball Nut Model number 螺母型号	Shaft nominal dia. 丝杠轴公称外径 d	Lead 导程	Ball size 丝杠直径	BCD 钢珠中心直径	Lead angle 导程角	Root dia. 底径 d_0	Number of Circuit 循环数	Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm		Nut dimension 螺母尺寸										Ball Nut Model number 螺母型号
								Dynamic 额定动负载 Ca	Static 额定静负载 Coa			L	E	G	H	A	A_1	B	B_1	M	Z	
KS 0601 B	6	1	0.8	6.15	2°58′	5.3	3.7×1	680 / 430	1200 / 610	75 / 63		20	20	14	7	14	3	14	3	M3	6	KS 0601 B
KS 0602 A	6	2	1.0	6.20	5°52′	5.1	2.7×1	750 / 470	1200 / 590	58 / 49		20	20	14	7	14	3	14	3	M3	6	KS 0602 A
KS 0801 B	8	1	0.8	8.15	2°15′	7.3	3.7×1	780 / 490	1650 / 820	95 / 80		21	22	16	8	15	3	16	3	M3	6	KS 0801 B
KS 0802 A	8	2	1.0	8.20	4°26′	7.1	2.7×1	850 / 540	1600 / 800	74 / 61		21	22	16	8	15	3	16	3	M3	6	KS 0802 A
KS 1001 B	10	1	0.8	10.15	1°48′	9.3	3.7×1	840 / 530	2000 / 1000	113 / 95		26	28	22	12	18	4	20	4	M4	7	KS 1001 B
KS 1002 B	10	2	1.5875	10.30	3°32′	8.6	3.7×1	2700 / 1750	5300 / 2700	134 / 112		26	28	23.5	12	18	4	20	4	M4	7	KS 1002 B

注1)设计时,请注意使滚珠丝杠轴端的其中一端不超过丝杠轴底径。
　　如果两个轴端设计得大于底径,则将无法组装螺母。
注2)标准螺母不带密封。不能安装密封,敬请注意。
注3)表中的刚性值为螺母的刚性值,是在以下条件下,根据轴向弹性位移量计算得出的理论值。
　　齿侧间隙型:相当于基本额定动负载Ca的30%的轴向负载作用时
　　预压型:施加了相当于基本额定动负载Ca的5%的预压时
　　轴向负载及预压量与上述条件不同时,可通过第A823页或第A824的公式计算。
注4)标准螺纹旋向为右旋。
　　需要左旋时,请垂询本公司。
注5)基本额定负载和刚性值(齿侧间隙型和预压型的刚性值可能会有不同)一并标示在上表中。

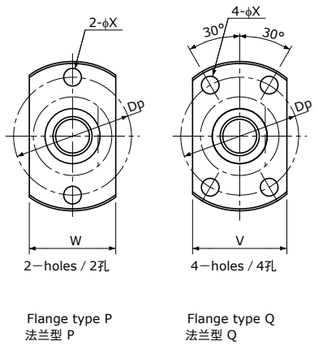
Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm
Dynamic 额定动负载 Ca	Static 额定静负载 Coa	
1000 / 640	3300 / 1650	164 / 138

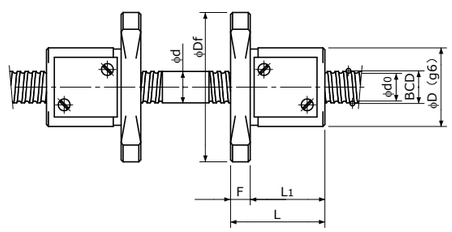
Preload type 预压型
Backlash type 齿侧间隙型

Note 1)The diameter of one of the Screw Shaft ends must be less than the Screw Shaft Root diameter, otherwise Ball Nut cannot be installed.
Note 2)Ball Nut dimension is without seal at the both ends. All type of Ball Nuts cannot equip with seals.
Note 3)The Rigidity values shown in the table are theoretical values of Ball Nut Rigidity calculated from the amount of Elastic Displacement under the following conditions.
　　Backlash type ; Apply the Axial load equivalent to 30% of the Basic Dynamic Load Rating Ca.
　　Preload type ; Apply the Preload equivalent to 5% of the Basic Dynamic Load Rating Ca.
　　For Axial load or Preload condition other than the above, see the formula in page A823 or page A824, you can calculate Rigidity using this formula.
Note 4)All models are Right-hand Screw. If Left-hand Screw is required, please ask KSS representative.
Note 5)Basic Load Rating and Rigidity for Backlash type and Preload type are described in the same cell.

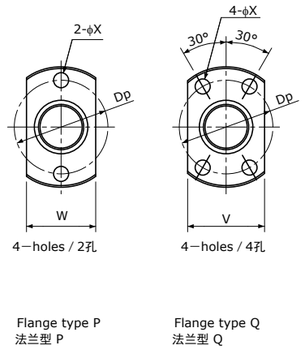
Bi-directional Nut with Flange
双向法兰螺母

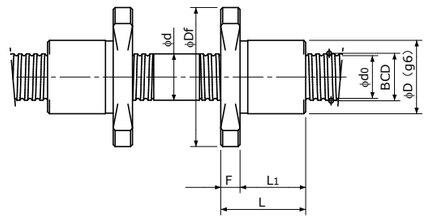
Backlash type/Preload type
齿侧间隙型/预压型





Type-1:Return-plate type
复式回路板循环方式





Type-2:Internal-deflector type
陀螺式循环方式

Unit(单位):mm

Ball Nut Model number 螺母型号	Shaft nominal dia. 丝杠轴公称外径 d	Lead 导程	Ball size 丝杠直径	BCD 钢珠中心直径	Lead angle 导程角	Root dia. 底径 d_0	Number of Circuit 循环数	Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm		Nut dimension 螺母尺寸											Ball Nut Model number 螺母型号
								Dynamic 额定动负载 Ca	Static 额定静负载 Coa			Nut type 螺母类型	D	Df	L	L_1	F	W	V	Dp	Bolt Hole 安装孔 X	Flange Type 法兰类型	
FKB 0401 A	4	1	0.6	4.15	4°23′	3.4	1×3	300 / 300	430 / 430	38 / 59		2	9	19	13	10	3	11	13	14	2.9	P,Q	FKB 0401 A
FKB 0501 A	5	1	0.6	5.15	3°32′	4.4	1×3	330 / 330	560 / 560	45 / 70		2	10	20	13	10	3	12	14	15	2.9	P,Q	FKB 0501 A
FKB 0601 A	6	1	0.8	6.20	2°56′	5.3	1×3	560 / 560	950 / 950	55 / 86		2	11	23	14.5	11	3.5	13	15	17	3.4	P,Q	FKB 0601 A
FKB 0801 A	8	1	0.8	8.20	2°13′	7.3	1×3	650 / 650	1300 / 1300	70 / 109		2	13	26	15	11	4	15	17	20	3.4	P,Q	FKB 0801 A
FKB 0801.5 A	8	1.5	1.0	8.30	3°18′	7.2	1×3	890 / 890	1650 / 1650	73 / 113		2	15	28	20	16	4	17	19	22	3.4	P,Q	FKB 0801.5 A
FKB 0802 A	8	2	1.2	8.30	4°23′	7.0	1×3	1300 / 1300	2300 / 2300	77 / 121		2	15	28	18	14	4	17	19	22	3.4	P,Q	FKB 0802 A
FKB 1001 A	10	1	0.8	10.20	1°47′	9.3	1×3	720 / 720	1650 / 1650	84 / 131		2	15	28	15	11	4	17	19	22	3.4	P,Q	FKB 1001 A
FKB 1001.5 A	10	1.5	1.0	10.30	2°39′	9.2	1×3	990 / 990	2100 / 2100	87 / 136		2	17	34	21	16	5	19	21	26	4.5	P,Q	FKB 1001.5 A
FKB 1002 A	10	2	1.2	10.30	3°32′	9.0	1×3	1450 / 1450	3000 / 3000	93 / 144		2	17	34	19	14	5	19	21	26	4.5	P,Q	FKB 1002 A
FKB 1002.5 A	10	2.5	1.5875	10.40	4°23′	8.7	1×3	2100 / 2100	3800 / 3800	96 / 150		2	18	35	21	16	5	20	22	27	4.5	P,Q	FKB 1002.5 A
FBS 1003 B	10	3	2.0	10.30	5°18′	8.2	3.7×1	3900 / 2500	7200 / 3600	140 / 118		1	24	44	30	24	6	26	27	35	5.5	P,Q	FBS 1003 B
FBS 1004 A	10	4	2.0	10.30	7°03′	8.2	2.7×1	3000 / 1800	5200 / 2600	104 / 86		1	24	44	29	23	6	26	27	35	5.5	P,Q	FBS 1004 A
FBS 1005 A	10	5	2.0	10.30	8°47′	8.2	2.7×1	3000 / 1800	5200 / 2600	103 / 85		1	24	44	34	28	6	26	27	35	5.5	P,Q	FBS 1005 A

注1)设计时,请注意使两个轴端不超过丝杠轴底径。
如果两个轴端设计得大于底径,则将无法组装螺母。
注2)标准螺母不带密封。
需要密封时,螺母的尺寸将发生变化,详情请垂询本公司。
某些型号的螺母不能安装密封,敬请注意。
注3)表中的刚性值为螺母的刚性值,是在以下条件下,根据轴向弹性位移量计算得出的理论值。
齿侧间隙型:相当于基本额定动负载Ca的30%的轴向负载作用时
预压型:施加了相当于基本额定动负载Ca的5%的预压时
轴向负载及预压量与上述条件不同时,可通过第A823页或第A824的公式计算。
注4)基本额定负载和刚性值(齿侧间隙型和预压型的刚性值可能会有不同)一并标示在上表中。

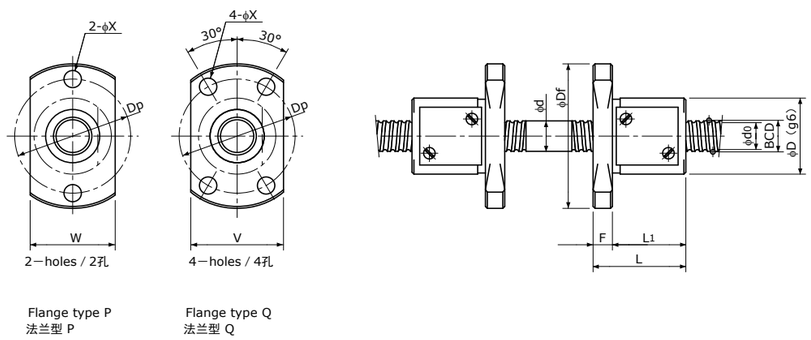
Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm
Dynamic 额定动负载 Ca	Static 额定静负载 Coa	
1000 / 640	3300 / 1650	164 / 138

Preload type 预压型
Backlash type 齿侧间隙型

Note 1)The diameter of the Screw Shaft both ends must be less than the Screw Shaft Root diameter, otherwise Ball Nut cannot be installed.
Note 2)Ball Nut dimension is without seal at the both ends.
If the seals are required, Ball Nut dimension should be changed, in that case, please ask KSS.
Some type of Ball Nuts cannot equip with seals, please ask KSS representative.
Note 3)The Rigidity values shown in the table are theoretical values of Ball Nut Rigidity calculated from the amount of Elastic Displacement under the following conditions.
Backlash type ; Apply the Axial load equivalent to 30% of the Basic Dynamic Load Rating Ca.
Preload type ; Apply the Preload equivalent to 5% of the Basic Dynamic Load Rating Ca.
For Axial load or Preload condition other than the above, see the formula in page A823 or page A824, you can calculate Rigidity using this formula.
Note 4)Basic Load Rating and Rigidity for Backlash type and Preload type are described in the same cell.

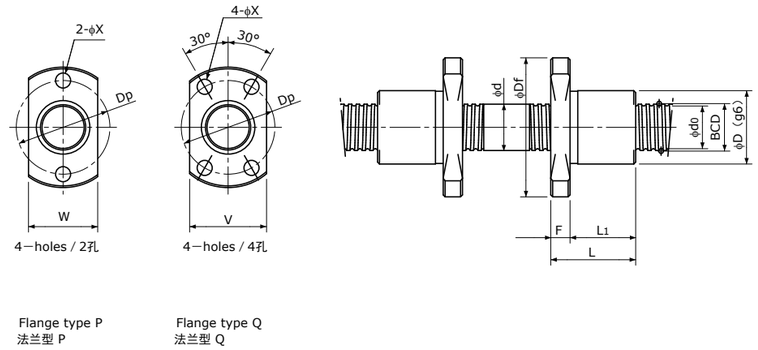
Bi-directional Nut with Flange
双向法兰螺母

Backlash type/Preload type
齿侧间隙型/预压型



Flange type P 法兰型 P　　Flange type Q 法兰型 Q

Type-1:Return-plate type
复式回路板循环方式



Flange type P 法兰型 P　　Flange type Q 法兰型 Q

Type-2:Internal-deflector type
陀螺式循环方式

Unit(单位):mm

Ball Nut Model number 螺母型号	Shaft nominal dia. 丝杠轴公称外径 d	Lead 导程	Ball size 丝杠直径	BCD 钢珠中心直径	Lead angle 导程角	Root dia. 底径 d_0	Number of Circuit 循环数	Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm		Nut dimension 螺母尺寸											Ball Nut Model number 螺母型号
								Dynamic 额定动负载 Ca	Static 额定静负载 Coa			Nut type 螺母类型	D	Df	L	L_1	F	W	V	Dp	Bolt Hole 安装孔 X	Flange Type 法兰类型	
FKB 1201 A	12	1	0.8	12.20	1°30′	11.3	1×3	780 / 780	2000 / 2000	97 / 152		2	17	34	16	11	5	19	21	26	4.5	P,Q	FKB 1201 A
FKB 1202 A	12	2	1.2	12.30	2°58′	11.0	1×3	1600 / 1600	3700 / 3700	109 / 169		2	19	36	19	14	5	21	23	28	4.5	P,Q	FKB 1202 A
FKB 1202.5 A	12	2.5	1.5875	12.40	3°41′	10.7	1×3	2300 / 2300	4700 / 4700	112 / 174		2	20	37	21	16	5	22	24	29	4.5	P,Q	FKB 1202.5 A
FKB 1203 A	12	3	2.0	12.50	4°22′	10.4	1×3	3100 / 3100	5700 / 5700	115 / 179		2	22	41	32	26	6	24	26	32	5.5	P,Q	FKB 1203 A
FBS 1204 B	12	4	2.381	12.30	5°55′	9.8	3.7×1	5400 / 3400	10200 / 5100	165 / 139		1	28	48	33	27	6	30	30	39	5.5	P,Q	FBS 1204 B
FBS 1401 B	14	1	0.8	14.15	1°17′	13.3	3.7×1	960 / 610	2900 / 1450	148 / 124		1	26	46	21	15	6	28	28	37	5.5	P,Q	FBS 1401 B
FKB 1402 A	14	2	1.2	14.30	2°33′	13.0	1×3	1700 / 1700	4300 / 4300	122 / 190		2	21	40	20	14	6	23	26	31	5.5	P,Q	FKB 1402 A
FKB 1402.5 A	14	2.5	1.5875	14.40	3°10′	12.7	1×3	2500 / 2500	5600 / 5600	127 / 197		2	22	41	22	16	6	24	26	32	5.5	P,Q	FKB 1402.5 A
FKB 1403 A	14	3	2.0	14.50	3°46′	12.4	1×3	3400 / 3400	6800 / 6800	131 / 204		2	24	43	32	26	6	26	27	34	5.5	P,Q	FKB 1403 A
FKB 1404 A	14	4	2.381	14.65	4°58′	11.9	1×3	4500 / 4500	8600 / 8600	136 / 212		2	26	45	29	23	6	28	28	36	5.5	P,Q	FKB 1404 A
FBS 1405 B	14	5	2.381	14.30	6°21′	11.8	3.7×1	5700 / 3600	11600 / 5800	186 / 157		1	30	51	39	33	6	32	32	42	5.5	P,Q	FBS 1405 B

注1)设计时,请注意使两个轴端不超过丝杠轴底径。
　　如果两个轴端设计得大于底径,则将无法组装螺母。
注2)标准螺母不带密封。
　　需要密封时,螺母的尺寸将发生变化,详情请垂询本公司。
　　某些型号的螺母不能安装密封,敬请注意。
注3)表中的刚性值为螺母的刚性值,是在以下条件下,根据轴向弹性位移量计算得出的理论值。
　　齿侧间隙型:相当于基本额定动负载Ca的30%的轴向负载作用时
　　预压型:施加了相当于基本额定动负载Ca的5%的预压时
　　轴向负载及预压量与上述条件不同时,可通过第A823页或第A824的公式计算。
注4)基本额定负载和刚性值(齿侧间隙型和预压型的刚性值可能会有不同)一并标示在上表中。

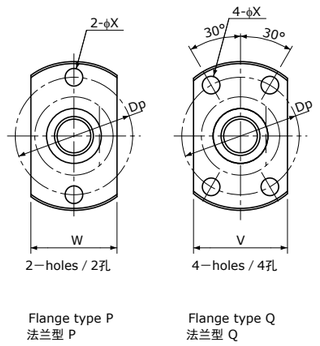
Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm
Dynamic 额定动负载 Ca	Static 额定静负载 Coa	
1000 / 640	3300 / 1650	164 / 138

Preload type 预压型
Backlash type 齿侧间隙型

Note 1)The diameter of the Screw Shaft both ends must be less than the Screw Shaft Root diameter, otherwise Ball Nut cannot be installed.
Note 2)Ball Nut dimension is without seal at the both ends.
If the seals are required, Ball Nut dimension should be changed, in that case, please ask KSS.
Some type of Ball Nuts cannot equip with seals, please ask KSS representative.
Note 3)The Rigidity values shown in the table are theoretical values of Ball Nut Rigidity calculated from the amount of Elastic Displacement under the following conditions.
Backlash type ; Apply the Axial load equivalent to 30% of the Basic Dynamic Load Rating Ca.
Preload type ; Apply the Preload equivalent to 5% of the Basic Dynamic Load Rating Ca.
For Axial load or Preload condition other than the above, see the formula in page A823 or page A824, you can calculate Rigidity using this formula.
Note 4)Basic Load Rating and Rigidity for Backlash type and Preload type are described in the same cell.

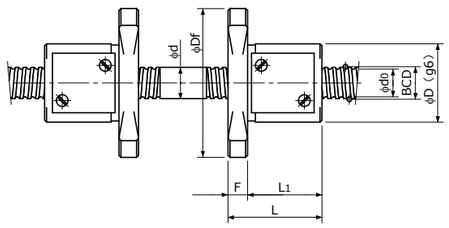
Bi-directional Nut with Flange
双向法兰螺母

Backlash type/Preload type
齿侧间隙型/预压型

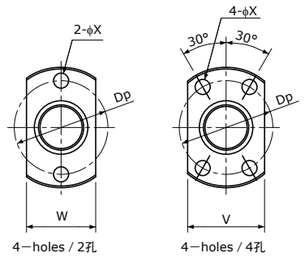


Flange type P
法兰型 P

Flange type Q
法兰型 Q

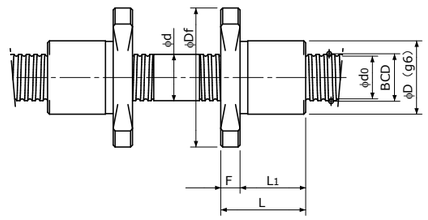


Type-1:Return-plate type
复式回路板循环方式



Flange type P
法兰型 P

Flange type Q
法兰型 Q



Type-2:Internal-deflector type
陀螺式循环方式

Unit(单位):mm

Ball Nut Model number 螺母型号	Shaft nominal dia. 丝杠轴公称外径 d	Lead 导程	Ball size 丝杠直径	BCD 钢珠中心直径	Lead angle 导程角	Root dia. 底径 d_0	Number of Circuit 循环数	Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm		Nut dimension 螺母尺寸											Ball Nut Model number 螺母型号
								Dynamic 额定动负载 Ca	Static 额定静负载 Coa			Nut type 螺母类型	D	Df	L	L_1	F	W	V	Dp	Bolt Hole 安装孔 X	Flange Type 法兰类型	
FBS 1601 B	16	1	0.8	16.15	1°08′	15.3	3.7×1	1000 / 640	3300 / 1650	164 / 138		1	28	48	21	15	6	30	30	39	5.5	P,Q	FBS 1601 B
FKB 1602 A	16	2	1.2	16.30	2°15′	15.0	1×3	1850 / 1850	5000 / 5000	137 / 213		2	24	43	20	14	6	26	27	34	5.5	P,Q	FKB 1602 A
FKB 1603 A	16	3	2.0	16.50	3°19′	14.4	1×3	3600 / 3600	8000 / 8000	146 / 227		2	26	45	32	26	6	28	28	36	5.5	P,Q	FKB 1603 A
FKB 1604 A	16	4	2.381	16.65	4°22′	13.9	1×3	4800 / 4800	10000 / 10000	152 / 237		2	28	47	29	23	6	30	30	38	5.5	P,Q	FKB 1604 A
FBS 1605 B	16	5	3.175	16.50	5°31′	13.2	3.7×1	9100 / 5700	18200 / 9100	217 / 182		1	38	57	42	36	6	40	40	48	5.5	P,Q	FBS 1605 B

注1)设计时,请注意使两个轴端不超过丝杠轴底径。
如果两个轴端设计得大于底径,则将无法组装螺母。
注2)标准螺母不带密封。
需要密封时,螺母的尺寸将发生变化,详情请垂询本公司。
某些型号的螺母不能安装密封,敬请注意。
注3)表中的刚性值为螺母的刚性值,是在以下条件下,根据轴向弹性位移量计算得出的理论值。
齿侧间隙型:相当于基本额定动负载Ca的30%的轴向负载作用时
预压型:施加了相当于基本额定动负载Ca的5%的预压时
轴向负载及预压量与上述条件不同时,可通过第A823页或第A824的公式计算。
注4)基本额定负载和刚性值(齿侧间隙型和预压型的刚性值可能会有不同)一并标示在上表中。

Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm
Dynamic 额定动负载 Ca	Static 额定静负载 Coa	
1000 / 640	3300 / 1650	164 / 138

Preload type 预压型
Backlash type 齿侧间隙型

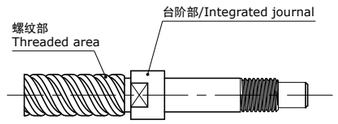
Note 1)The diameter of the Screw Shaft both ends must be less than the Screw Shaft Root diameter, otherwise Ball Nut cannot be installed.
Note 2)Ball Nut dimension is without seal at the both ends.
If the seals are required, Ball Nut dimension should be changed, in that case, please ask KSS.
Some type of Ball Nuts cannot equip with seals, please ask KSS representative.
Note 3)The Rigidity values shown in the table are theoretical values of Ball Nut Rigidity calculated from the amount of Elastic Displacement under the following conditions.
Backlash type ; Apply the Axial load equivalent to 30% of the Basic Dynamic Load Rating Ca.
Preload type ; Apply the Preload equivalent to 5% of the Basic Dynamic Load Rating Ca.
For Axial load or Preload condition other than the above, see the formula in page A823 or page A824, you can calculate Rigidity using this formula.
Note 4)Basic Load Rating and Rigidity for Backlash type and Preload type are described in the same cell.

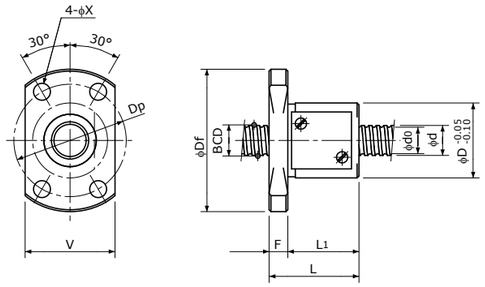
Rolled Ball Screws 冷轧滚珠丝杠

Single Nut with Flange
带法兰单螺母

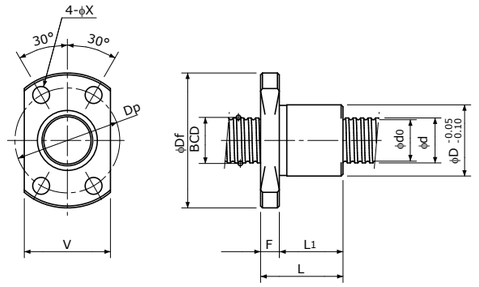
Backlash type
齿侧间隙型

■ 也可生产对轴端直径进行了加粗设计的台阶型冷轧加工（下图），详情请垂询本公司。（轴端直径φ12以下）
■ Rolled Ball Screws with integrated journal are available(φ12 or less only), which have larger diameter than threaded area shown below.

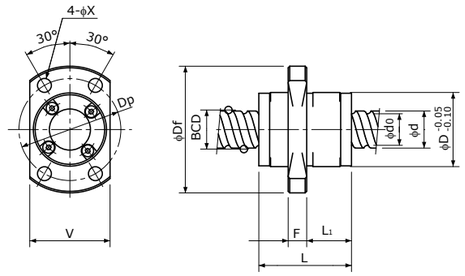




Type-1:Return-plate type
复式回路板循环方式



Type-2:End-deflector type
偏转器式循环方式



Type-3:End-cap type or End-deflector type
端盖循环方式或偏转器式循环方式

Unit(单位):mm

Ball Nut Model number 螺母型号	Shaft nominal dia. 丝杠轴公称外径 d	Lead 导程	Ball size 丝杠直径	BCD 钢珠中心直径	Lead angle 导程角	Root dia. 底径 d_0	Number of Circuit 循环数	Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm		Nut dimension 螺母尺寸										Ball Nut Model number 螺母型号
								Dynamic 额定动负载 Ca	Static 额定静负载 Coa			Nut type 螺母类型	D	Df	L	L_1	F	W	V	Dp	Bolt Hole 安装孔 X	
MRB 0401	4	1	0.8	4.15	4°23′	3.3	3.7×1	560	790	54		1	11	23	17	13	4	—	15	17	3.4	MRB 0401
MRB 0401K	4	1	0.6	4.15	4°23′	3.4	1×3	300	430	38		2	9	19	13	10	3	—	13	14	2.9	MRB 0401K
MRB 0402	4	2	0.8	4.15	8°43′	3.3	2.7×1	420	570	39		1	11	23	19	15	4	—	15	17	3.4	MRB 0402
MRB 0504	5	4	0.8	5.15	13°53′	4.3	2.7×1	470	720	47		1	12	24	22	18	4	—	16	18	3.4	MRB 0504
MRB 0601 **	6	1	0.8	6.15	2°58′	5.3	3.7×1	680	1200	75		1	13	26	17	13	4	—	16	20	3.4	MRB 0601 **
MRB 0601K	6	1	0.8	6.20	2°56′	5.3	1×3	560	950	55		2	11	23	14.5	11	3.5	—	15	17	3.4	MRB 0601K
MRB 0602	6	2	1.0	6.20	5°52′	5.1	2.7×1	750	1200	58		1	15	28	17	13	4	—	19	22	3.4	MRB 0602
MRB 0606	6	6	1.0	6.30	16°52′	5.2	1.6×2	870	1450	67		3	14	27	17	8	4	—	16	21	3.4	MRB 0606
MRB 0610	6	10	1.2	6.30	26°48′	5.0	1.2×2	950	1600	50		3	14	27	23	11.5	4	—	16	21	3.4	MRB 0610

注1)标准螺纹旋向为右旋。
注2)设计时,由于生产及组装螺母的关系,请使滚珠丝杠的两个轴端不超过丝杠轴底径。
需要单侧台阶型时,请垂询本公司。
注3)标准螺母不带密封。
不能安装密封,敬请注意。
注4)刚性
表中的刚性值,是在相当于基本额定动负载Ca的30%的轴向负载作用时,根据轴向弹性位移量计算的理论值。
轴向负载与上述条件不同时,可通过A823页的公式计算。
注5)不锈钢冷轧滚珠丝杠
螺母型号后带**者可提供不锈钢冷轧滚珠丝杠。

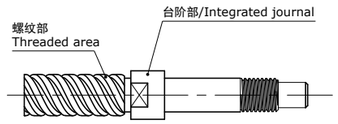
Note 1)All models are Right-hand screw.
Note 2)The diameter of the Screw Shaft both ends must be less than the Screw Shaft Root diameter, because of productlon and Nut assembly reason. If bigger end-journal than Shaft diameter is required, please consult KSS.
Note 3)Ball Nut dimension is without seal at the both ends. All type of Ball Nuts cannot equip with seals.
Note 4)Rigidity
The Rigidity values shown in the table are theoretical values calculated from the amount of Elastic Displacement under the Axial load equivalent to 30% of the Basic Dynamic Load Rating Ca.
For Axial load condition other than the above, see the formula in page A823, you can calculate Rigidity using this formula.
Note 5)Stainless Rolled Ball Screw
Stainless Rolled Ball Screw is available for Ball Nut Model Number marked **.

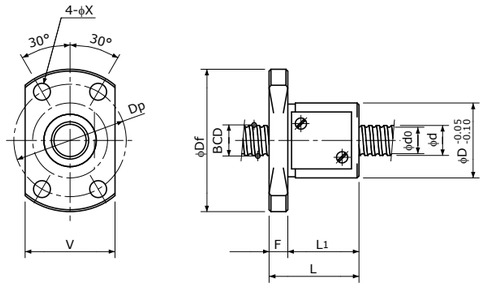
Rolled Ball Screws 冷轧滚珠丝杠

Single Nut with Flange
带法兰单螺母

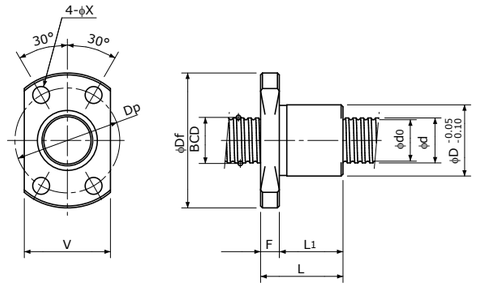
Backlash type
齿侧间隙型

■ 也可生产对轴端直径进行了加粗设计的台阶型冷轧加工（下图），详情请垂询本公司。（轴端直径φ12以下）
■ Rolled Ball Screws with integrated journal are available(φ12 or less only), which have larger diameter than threaded area shown below.

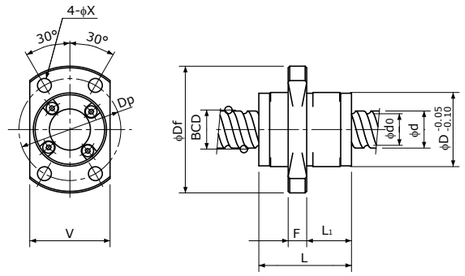




Type-1:Return-plate type
复式回路板循环方式



Type-2:End-deflector type
偏转器式循环方式



Type-3:End-cap type or End-deflector type
端盖循环方式或偏转器式循环方式

Unit(单位):mm

Ball Nut Model number 螺母型号	Shaft nominal dia. 丝杠轴公称外径 d	Lead 导程	Ball size 丝杠直径	BCD 钢珠中心直径	Lead angle 导程角	Root dia. 底径 d_0	Number of Circuit 循环数	Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm		Nut dimension 螺母尺寸										Ball Nut Model number 螺母型号
								Dynamic 额定动负载 Ca	Static 额定静负载 Coa			Nut type 螺母类型	D	Df	L	L_1	F	W	V	Dp	Bolt Hole 安装孔 X	
MRB 0801 **	8	1	0.8	8.15	2°15′	7.3	3.7×1	780	1650	95		1	16	29	17	13	4	—	18	23	3.4	MRB 0801 **
MRB 0801K	8	1	0.8	8.20	2°13′	7.3	1×3	650	1300	70		2	13	26	15	11	4	—	17	20	3.4	MRB 0801K
MRB 0802 **	8	2	1.5875	8.30	4°23′	6.6	3.7×1	2400	4100	111		1	20	37	24	19	5	—	22	29	4.5	MRB 0802 **
MRB 0802K	8	2	1.2	8.30	4°23′	7.0	1×3	1300	2300	77		2	15	28	18	14	4	—	19	22	3.4	MRB 0802K
MRB 0802.5	8	2.5	1.5875	8.00	5°41′	6.3	2.7×1	1850	3000	80		2	16	29	16	12	4	—	18	23	3.4	MRB 0802.5
MRB 0805	8	5	1.5875	8.30	10°51′	6.6	2.7×1	1850	3000	82		1	18	31	28	24	4	—	20	25	3.4	MRB 0805
MRB 0808	8	8	1.5875	8.40	16°52′	6.7	1.6×2	2200	3800	95		3	18	31	20	10	4	—	20	25	3.4	MRB 0808
MRB 0810	8	10	1.5875	8.40	20°45′	6.7	1.6×2	2200	3800	92		3	18	31	24	13	4	—	20	25	3.4	MRB 0810
MRB 0812	8	12	1.5875	8.40	24°27′	6.7	1.6×2	2200	4000	90		3	18	31	27	17	4	—	20	25	3.4	MRB 0812

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注2)设计时,由于生产及组装螺母的关系,请使滚珠丝杠的两个轴端不超过丝杠轴底径。
需要单侧台阶型时,请垂询本公司。
注3)标准螺母不带密封。
不能安装密封,敬请注意。
注4)刚性
表中的刚性值,是在相当于基本额定动负载Ca的30%的轴向负载作用时,根据轴向弹性位移量计算的理论值。
轴向负载与上述条件不同时,可通过A823页的公式计算。
注5)不锈钢冷轧滚珠丝杠
螺母型号后带**者可提供不锈钢冷轧滚珠丝杠。

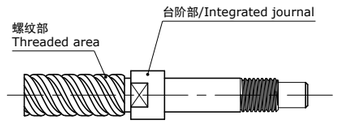
Note 1)All models are Right-hand screw.
Note 2)The diameter of the Screw Shaft both ends must be less than the Screw Shaft Root diameter, because of productlon and Nut assembly reason. If bigger end-journal than Shaft diameter is required, please consult KSS.
Note 3)Ball Nut dimension is without seal at the both ends. All type of Ball Nuts cannot equip with seals.
Note 4)Rigidity
The Rigidity values shown in the table are theoretical values calculated from the amount of Elastic Displacement under the Axial load equivalent to 30% of the Basic Dynamic Load Rating Ca.
For Axial load condition other than the above, see the formula in page A823, you can calculate Rigidity using this formula.
Note 5)Stainless Rolled Ball Screw
Stainless Rolled Ball Screw is available for Ball Nut Model Number marked **.

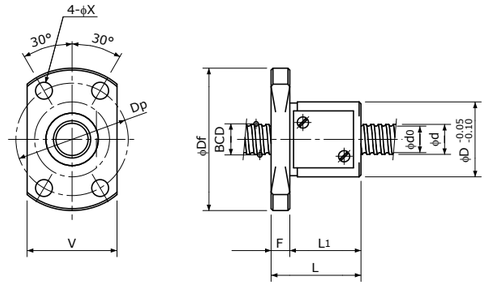
Rolled Ball Screws 冷轧滚珠丝杠

Single Nut with Flange
带法兰单螺母

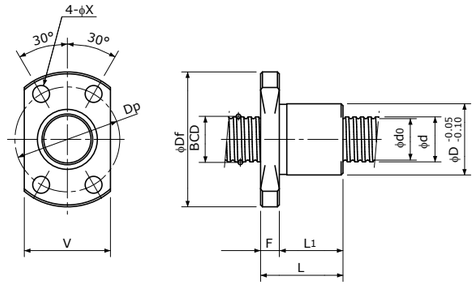
Backlash type
齿侧间隙型

■ 也可生产对轴端直径进行了加粗设计的台阶型冷轧加工（下图），详情请垂询本公司。（轴端直径φ12以下）
■ Rolled Ball Screws with integrated journal are available(φ12 or less only), which have larger diameter than threaded area shown below.

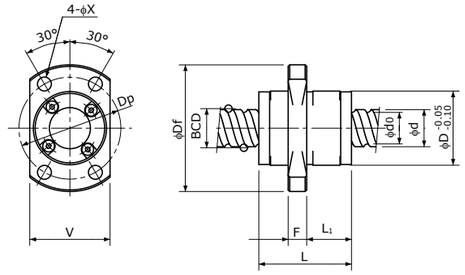




Type-1:Return-plate type
复式回路板循环方式



Type-2:End-deflector type
偏转器式循环方式



Type-3:End-cap type or End-deflector type
端盖循环方式或偏转器式循环方式

Unit(单位):mm

Ball Nut Model number 螺母型号	Shaft nominal dia. 丝杠轴公称外径 d	Lead 导程	Ball size 丝杠直径	BCD 钢珠中心直径	Lead angle 导程角	Root dia. 底径 d_0	Number of Circuit 循环数	Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm		Nut dimension 螺母尺寸										Ball Nut Model number 螺母型号
								Dynamic 额定动负载 Ca	Static 额定静负载 Coa			Nut type 螺母类型	D	Df	L	L_1	F	W	V	Dp	Bolt Hole 安装孔 X	
MRB 1002 **	10	2	1.5875	10.30	3°32′	8.6	3.7×1	2700	5300	134		1	23	40	24	19	5	—	25	32	4.5	MRB 1002 **
MRB 1002K	10	2	1.2	10.30	3°32′	9.0	1×3	1450	3000	93		2	17	34	19	14	5	—	21	26	4.5	MRB 1002K
MRB 1003	10	3	2.0	10.30	5°18′	8.2	3.7×1	3900	7200	140		1	24	41	29	24	5	—	26	33	4.5	MRB 1003
MRB 1004	10	4	2.0	10.30	7°03′	8.2	2.7 ×1	3000	5200	104		1	24	41	28	23	5	—	26	33	4.5	MRB 1004
MRB 1005	10	5	2.0	10.30	8°47′	8.2	2.7 ×1	3000	5200	103		2	23	40	26	21	5	—	25	32	4.5	MRB 1005
MRB 1006	10	6	2.0	10.30	10°30′	8.2	2.7 ×1	3000	5000	102		1	26	42	33	28	5	—	28	34	4.5	MRB 1006
MRB 1010	10	10	2.0	10.50	16°52′	8.4	1.6×2	3300	5900	117		3	23	40	24	13	5	—	25	32	4.5	MRB 1010
MRB 1012	10	12	2.0	10.50	19°59′	8.4	1.6×2	3300	6200	115		3	23	40	28	17	5	—	25	32	4.5	MRB 1012
MRB 1015	10	15	2.0	10.50	24°27′	8.4	1.6×2	3300	6400	110		3	23	40	33	22	5	—	25	32	4.5	MRB 1015
MRB 1020	10	20	1.5875	10.40	31°28′	8.7	0.7×4	2100	4000	88		3	20	37	23	13	5	—	22	29	4.5	MRB 1020
MRB 1202	12	2	1.5875	12.30	2°58′	10.6	3.7×1	3000	6400	156		1	25	42	24	19	5	—	27	34	4.5	MRB 1202
MRB 1202K	12	2	1.2	12.30	2°58′	11.0	1×3	1600	3700	109		2	19	36	19	14	5	—	23	28	4.5	MRB 1202K
MRB 1210	12	10	2.381	12.65	14°07′	10.2	1.7×2	5100	9800	152		3	24	41	30	14.5	6	—	26	33	4.5	MRB 1210

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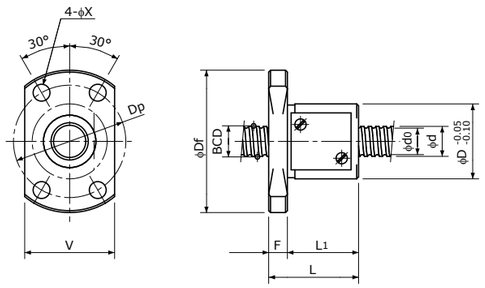
注3)标准螺母不带密封。
不能安装密封,敬请注意。
注4)刚性
表中的刚性值,是在相当于基本额定动负载Ca的30%的轴向负载作用时,根据轴向弹性位移量计算的理论值。
轴向负载与上述条件不同时,可通过A823页的公式计算。
注5)不锈钢冷轧滚珠丝杠
螺母型号后带**者可提供不锈钢冷轧滚珠丝杠。

Note 1)All models are Right-hand screw.
Note 2)The diameter of the Screw Shaft both ends must be less than the Screw Shaft Root diameter, because of productlon and Nut assembly reason. If bigger end-journal than Shaft diameter is required, please consult KSS.
Note 3)Ball Nut dimension is without seal at the both ends. All type of Ball Nuts cannot equip with seals.
Note 4)Rigidity
The Rigidity values shown in the table are theoretical values calculated from the amount of Elastic Displacement under the Axial load equivalent to 30% of the Basic Dynamic Load Rating Ca.
For Axial load condition other than the above, see the formula in page A823, you can calculate Rigidity using this formula.
Note 5)Stainless Rolled Ball Screw
Stainless Rolled Ball Screw is available for Ball Nut Model Number marked **.

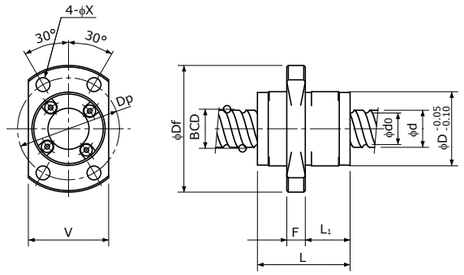
Rolled Ball Screws 冷轧滚珠丝杠

Single Nut with Flange
带法兰单螺母

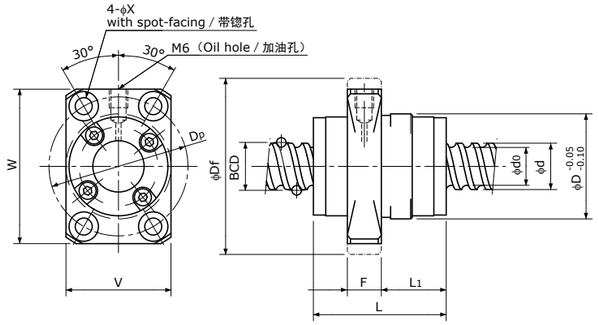
Backlash type
齿侧间隙型



Type-1:Return-plate type
复式回路板循环方式



Type-3:End-cap type or End-deflector type
端盖循环方式或偏转器式循环方式



Type-4:End-deflector type
偏转器式循环方式

Unit(单位):mm

Ball Nut Model number 螺母型号	Shaft nominal dia. 丝杠轴公称外径 d	Lead 导程	Ball size 丝杠直径	BCD 钢珠中心直径	Lead angle 导程角	Root dia. 底径 d_0	Number of Circuit 循环数	Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm		Nut dimension 螺母尺寸										Ball Nut Model number 螺母型号
								Dynamic 额定动负载 Ca	Static 额定静负载 Coa			Nut type 螺母类型	D	Df	L	L_1	F	W	V	Dp	Bolt Hole 安装孔 X	
MRB 1312	13	12	2.381	13.50	15°48′	11.0	1.6×2	5000	9900	151		3	28	45	30	17	5	—	30	37	4.5	MRB 1312
MRB 1315	13	15	2.381	13.50	19°29′	11.0	1.6×2	5000	10300	147		3	28	45	35	22	5	—	30	37	4.5	MRB 1315
MRB 1320	13	20	2.381	13.50	25°15′	11.0	1.6×2	5000	10700	142		3	28	45	43	29	5	—	30	37	4.5	MRB 1320
MRB 1402	14	2	1.5875	14.30	2°33′	12.6	3.7×1	3200	7500	176		1	26	45	25	19	6	—	28	36	5.5	MRB 1402
MRB 1404	14	4	2.381	14.30	5°05′	11.8	3.7×1	5700	11600	187		1	30	49	33	27	6	—	32	40	5.5	MRB 1404
MRB 1505	15	5	3.175	15.50	5°41′	12.2	3.7×1	8900	17000	208		4	34	57	33	16	11	50	34	45	5.5	MRB 1505
MRB 1510	15	10	3.175	15.50	11°36′	12.2	2.7×2	12000	25000	289		4	34	57	43	21	11	50	34	45	5.5	MRB 1510
MRB 1520	15	20	3.175	15.75	22°01′	12.7	1.7×2	8000	16000	178		4	34	57	52	28.5	11	50	34	45	5.5	MRB 1520

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Note 5)Stainless Rolled Ball Screw
Stainless Rolled Ball Screw is available for Ball Nut Model Number marked **.

Sleeve type Single Nut
套筒型单螺母

Backlash type
齿侧间隙型

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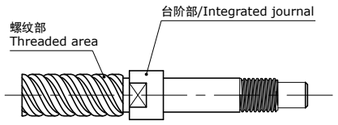
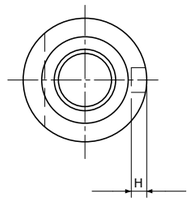
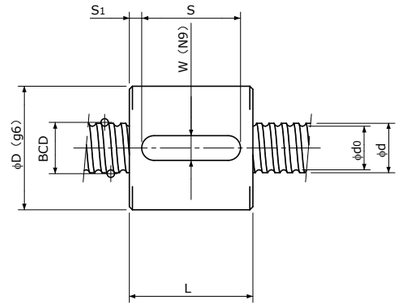
■ Rolled Ball Screws with integrated journal are available(φ12 or less only), which have larger diameter than threaded area shown below.







Unit(单位):mm

Ball Nut Model number 螺母型号	Shaft nominal dia. 丝杠轴公称外径 d	Lead 导程	Ball size 丝杠直径	BCD 钢珠中心直径	Lead angle 导程角	Root dia. 底径 d_0	Number of Circuit 循环数	Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm		Nut dimension 螺母尺寸						Ball Nut Model number 螺母型号
								Dynamic 额定动负载 Ca	Static 额定静负载 Coa			D	L	W	H	S	S_1	
BSR 0401	4	1	0.8	4.15	4°23′	3.3	3.7×1	560	790	54		11	14	3	1.8	8	3	BSR 0401
BSR 0402	4	2	0.8	4.15	8°43′	3.3	2.7×1	420	570	39		11	16	3	1.8	8	4	BSR 0402
BSR 0504	5	4	0.8	5.15	13°53′	4.3	2.7×1	470	720	47		12	22	3	1.8	12	5	BSR 0504
BSR 0601 **	6	1	0.8	6.15	2°58′	5.3	3.7×1	680	1200	75		13	14	3	1.8	10	2	BSR 0601 **
BSR 0602	6	2	1.0	6.20	5°52′	5.1	2.7×1	750	1200	58		15	15	3	1.8	10	2.5	BSR 0602
BSR 0801 **	8	1	0.8	8.15	2°15′	7.3	3.7×1	780	1650	95		16	14	3	1.8	10	2	BSR 0801 **
BSR 0802 **	8	2	1.5875	8.30	4°23′	6.6	3.7×1	2400	4100	111		20	20	4	2.5	16	2	BSR 0802 **
BSR 0802.5	8	2.5	1.5875	8.00	5°41′	6.3	2.7×1	1850	3000	80		16	16	3	1.8	8	4	BSR 0802.5
BSR 0805	8	5	1.5875	8.30	10°51′	6.6	2.7×1	1850	3000	82		18	28	4	2.5	20	4	BSR 0805

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Note 5)Stainless Rolled Ball Screw
　Stainless Rolled Ball Screw is available for Ball Nut Model Number marked **.

Rolled Ball Screws 冷轧滚珠丝杠

Sleeve type Single Nut
套筒型单螺母

Backlash type
齿侧间隙型

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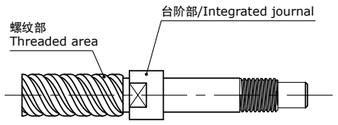
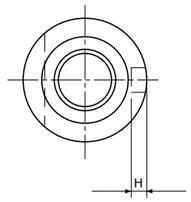
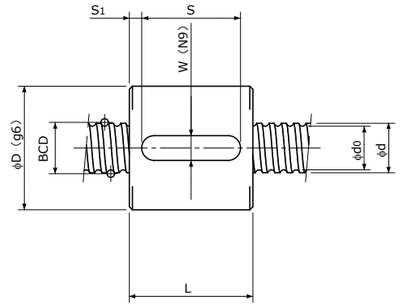






Unit(单位):mm

Ball Nut Model number 螺母型号	Shaft nominal dia. 丝杠轴公称外径 d	Lead 导程	Ball size 丝杠直径	BCD 钢珠中心直径	Lead angle 导程角	Root dia. 底径 d_0	Number of Circuit 循环数	Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm		Nut dimension 螺母尺寸						Ball Nut Model number 螺母型号
								Dynamic 额定动负载 Ca	Static 额定静负载 Coa			D	L	W	H	S	S_1	
BSR 1002 **	10	2	1.5875	10.30	3°32′	8.6	3.7×1	2700	5300	134		23	20	5	3	16	2.0	BSR 1002 **
BSR 1003	10	3	2.0	10.30	5°18′	8.2	3.7×1	3900	7200	140		24	26	5	3	20	3	BSR 1003
BSR 1004	10	4	2.0	10.30	7°03′	8.2	2.7×1	3000	5200	104		24	26	5	3	20	3	BSR 1004
BSR 1005	10	5	2.0	10.30	8°47′	8.2	2.7×1	3000	5200	103		23	26	5	3	16	5	BSR 1005
BSR 1006	10	6	2.0	10.30	10°30′	8.2	2.7×1	3000	5000	102		26	31	5	3	20	5.5	BSR 1006
BSR 1202	12	2	1.5875	12.30	2°58′	10.6	3.7×1	3000	6400	156		25	20	5	3	16	2	BSR 1202
BSR 1402	14	2	1.5875	14.30	2°33′	12.6	3.7×1	3200	7500	176		26	20	5	3	16	2	BSR 1402
BSR 1404	14	4	2.381	14.30	5°05′	11.8	3.7×1	5700	11600	187		30	31	5	3	25	3	BSR 1404

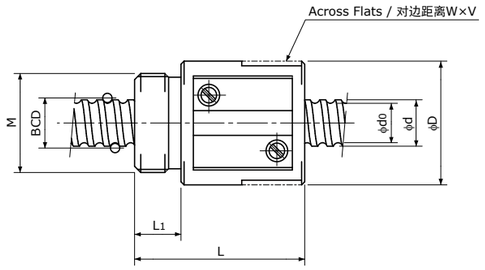
注1)标准螺纹旋向为右旋。
注2)设计时,由于生产及组装螺母的关系,请使滚珠丝杠的两个轴端不超过丝杠轴底径。
需要单侧台阶型时,请垂询本公司。
注3)标准螺母不带密封。
不能安装密封,敬请注意。
注4)刚性
表中的刚性值,是在相当于基本额定动负载Ca的30%的轴向负载作用时,根据轴向弹性位移量计算的理论值。
轴向负载与上述条件不同时,可通过A823页的公式计算。
注5)不锈钢冷轧滚珠丝杠
螺母型号后带**者可提供不锈钢冷轧滚珠丝杠。

Note 1)All models are Right-hand screw.
Note 2)The diameter of the Screw Shaft both ends must be less than the Screw Shaft Root diameter, because of productlon and Nut assembly reason. If bigger end-journal than Shaft diameter is required, please consult KSS.
Note 3)Ball Nut dimension is without seal at the both ends. All type of Ball Nuts cannot equip with seals.
Note 4)Rigidity
The Rigidity values shown in the table are theoretical values calculated from the amount of Elastic Displacement under the Axial load equivalent to 30% of the Basic Dynamic Load Rating Ca.
For Axial load condition other than the above, see the formula in page A823, you can calculate Rigidity using this formula.
Note 5)Stainless Rolled Ball Screw
Stainless Rolled Ball Screw is available for Ball Nut Model Number marked **.

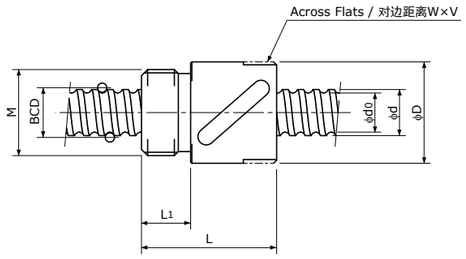
Rolled Ball Screws 冷轧滚珠丝杠

Single Nut with M-thread
带公制螺纹单螺母

Backlash type
齿侧间隙型

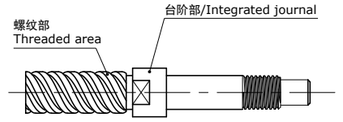


Type-1:Return-plate type
复式回路板循环方式



Type-2:Return-tube type
回路管循环方式

■ 也可生产对轴端直径进行了加粗设计的台阶型冷轧加工（下图），详情请垂询本公司。（轴端直径φ12以下）
■ Rolled Ball Screws with integrated journal are available(φ12 or less only), which have larger diameter than threaded area shown below.



Unit(单位):mm

Ball Nut Model number 螺母型号	Shaft nominal dia. 丝杠轴公称外径 d	Lead 导程	Ball size 丝杠直径	BCD 钢珠中心直径	Lead angle 导程角	Root dia. 底径 d_0	Number of Circuit 循环数	Basic Load Rating 基本额定负载 N		Nut Rigidity 螺母刚性 N/μm		Nut dimension 螺母尺寸							Ball Nut Model number 螺母型号
								Dynamic 额定动负载 Ca	Static 额定静负载 Coa			Nut type 螺母类型	D	L	L_1	Across Flats width 对边距离 W	Across Flats length 对边距离长度 V	M	
MSR 0401 B	4	1	0.8	4.15	4°23′	3.3	3.7×1	560	790	54		1	11	17	4	10	6	M9×0.75	MSR 0401 B
MSR 0802 B **	8	2	1.5875	8.30	4°23′	6.6	3.7×1	2400	4100	111		1	20	27.5	7.5	18	5	M16×1.0	MSR 0802 B **
MSR 0802.5 T(1)	8	2.5	1.5875	8.00	5°41′	6.3	3.5×1	2300	3900	102		2	16.5	22	8	14	4	M14×1.0	MSR 0802.5 T(1)
MSR 0802.5 T(2)	8	2.5	1.5875	8.00	5°41′	6.3	3.5×1	2300	3900	102		2	17.5	25.5	7.5	15	4	M15×1.0	MSR 0802.5 T(2)
MSR 0805 A	8	5	1.5875	8.30	10°51′	6.6	2.7×1	1850	3000	82		1	18	32.5	7.5	16	5	M15×1.0	MSR 0805 A
MSR 1002 B **	10	2	1.5875	10.30	3°32′	8.6	3.7×1	2700	5300	134		1	23	27.5	7.5	21	5	M17×1.0	MSR 1002 B **
MSR 1003 B	10	3	2.0	10.30	5°18′	8.2	3.7×1	3900	7200	140		1	24	32	8	22	5	M18×1.0	MSR 1003 B
MSR 1202 B	12	2	1.5875	12.30	2°58′	10.6	3.7×1	3000	6400	156		1	25	30	10	23	5	M20×1.0	MSR 1202 B
MSR 1402 B	14	2	1.5875	14.30	2°33′	12.6	3.7×1	3200	7500	176		1	26	30	10	23	5	M22×1.5	MSR 1402 B
MSR 1404 B	14	4	2.381	14.30	5°05′	11.8	3.7×1	5700	11600	187		1	30	38	10	27	8	M25×1.0	MSR 1404 B

注1)标准螺纹旋向为右旋。
注2)设计时,由于生产及组装螺母的关系,请使滚珠丝杠的两个轴端不超过丝杠轴底径。
需要单侧台阶型时,请垂询本公司。
注3)标准螺母不带密封。
不能安装密封,敬请注意。
注4)刚性
表中的刚性值,是在相当于基本额定动负载Ca的30%的轴向负载作用时,根据轴向弹性位移量计算的理论值。
轴向负载与上述条件不同时,可通过A823页的公式计算。
注5)不锈钢冷轧滚珠丝杠
螺母型号后带**者可提供不锈钢冷轧滚珠丝杠。

Note 1)All models are Right-hand screw.
Note 2)The diameter of the Screw Shaft both ends must be less than the Screw Shaft Root diameter, because of productlon and Nut assembly reason. If bigger end-journal than Shaft diameter is required, please consult KSS.
Note 3)Ball Nut dimension is without seal at the both ends. All type of Ball Nuts cannot equip with seals.
Note 4)Rigidity
The Rigidity values shown in the table are theoretical values calculated from the amount of Elastic Displacement under the Axial load equivalent to 30% of the Basic Dynamic Load Rating Ca.
For Axial load condition other than the above, see the formula in page A823, you can calculate Rigidity using this formula.
Note 5)Stainless Rolled Ball Screw
Stainless Rolled Ball Screw is available for Ball Nut Model Number marked **.

滚珠丝杠的技术解说　Ball Screw Technical Description

滚珠丝杠的特点
Feature of Ball Screws

●机械效率高

KSS滚珠丝杠在丝杠轴与螺母之间插入钢珠形成滚动接触，使机械效率高达90%以上，而所需扭矩则在传统进给丝杠的1/3以下。此外，还可轻松地将直线运动转换为回转运动（逆动作）（图A-81）。

●轴向间隙

对于传统的三角丝杠及梯形丝杠等，如果缩小其轴向间隙，则会因滑动摩擦而使旋转扭矩增大。KSS滚珠丝杠即使在消除轴向间隙的状态下也能非常轻快地转动。另外，通过采用双螺母，还可进一步提高刚性。

●精度高

KSS滚珠丝杠是在恒温控制下，采用超精密进给丝杠及螺纹量规加工技术加工、组装而成，并进行了严格的检查。其精度高，在准确定位方面具有高度可靠性。

●High mechanical efficiency

KSS Ball Screws are fitted with steel Balls, providing rolling contact between the Nut and Screw Shaft, allowing for mechanical efficiency of about 90% and reducing the required Torque to less than one-third that of conventional Lead Screws. The design of the KSS Ball Screws also allows linear motion to be converted into rotary motion easily (Fig. A-81).

●Axial play

With conventional Triangular and Trapezoidal Screw threads, reducing the Axial play increases the rotational Torque due to the sliding friction.
KSS Ball Screws, on the other hand, are very easily rotated, even with no Axial play. The use of Double Nuts also provides increased Rigidity.

●High precision

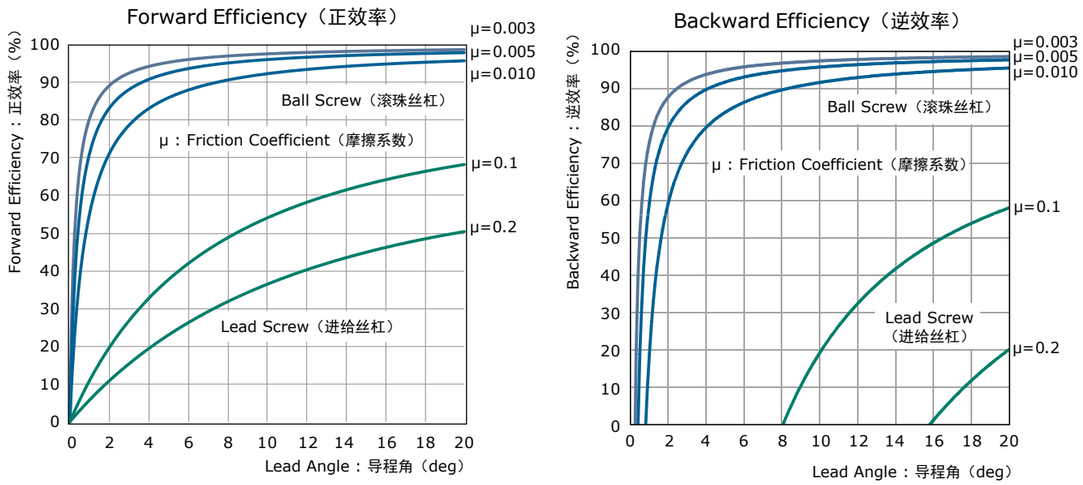
KSS Ball Screws are machined, assembled, and inspected using the technology of ultra-precision Lead Screw and Screw Gauge machining, under the temperature controlled room. High precision and accurate positioning ensure high reliability in use.

●寿命长

KSS滚珠丝杠采用经过热处理的适当材料加工而成，由于进行滚动接触运动，因此摩擦阻力极小，几乎不会发生磨损，可长期保持很高的精度。

●Long service life

The Ball Screw movement results in virtually no wear, as the rolling-contact design, combined with the use of carefully selected heat-treated materials, results in an extremely low friction. This is the reason that high precision can be kept over long period.



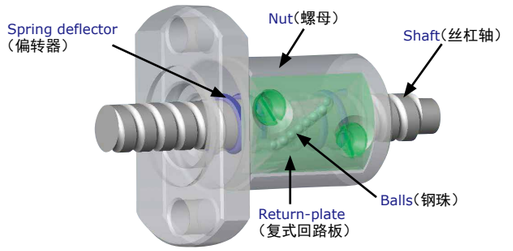
图A-81：机械效率
Fig. A-81：Mechanical Efficiency

滚珠丝杠的构造
Construction of Ball Screws

●复式回路板循环方式　Return-plate system

复式回路板循环方式，是通过安装在螺母内部的螺旋型偏转器将钢球抛出，使其沿着复式回路板的槽进行循环运动的方式。与回路管循环方式相比，具有可以缩小螺母外径的优点。在设备上安装时，如果将复式回路板部分安装在上方，则可使回转动作更加顺畅。

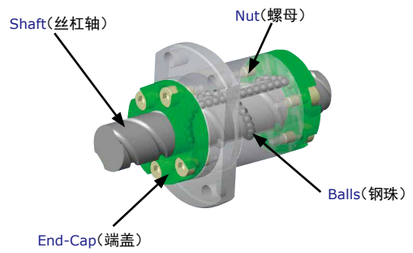
The Return-plate system uses coil-type deflectors incorporated inside the Nut to pick up the steel Balls and circulate them via the Return-plate channel. This system has the advantage of allowing the use of a Nut that is smaller in diameter than those employed in Return-tube systems. In addition, the upward-angle installation of the Return-plate ensures even smoother rotation.



●端盖式循环方式　End-cap system

端盖式循环方式，是指钢珠沿着丝杠轴与螺母之间的槽滚动前行，从安装在螺母两端的循环部件（端盖）上的通路穿过螺母上的通孔，返回原位的循环方式。

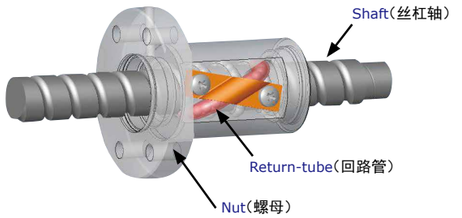
The End-cap system is a recirculating system in which the Balls advance by rolling through the screw groove between the Nut and the Screw Shaft. The Balls are then returned via the holes in the Nut and the channels in the recirculating sections of the End-caps on either end of the Nut.



●回路管循环方式　Return-tube system

回路管循环方式，是指通过插入螺母中的回路管的前端，将正沿着丝杠轴与螺母之间的槽滚动的钢珠取出，使其穿过回路管后，再次返回螺纹槽的循环方式。

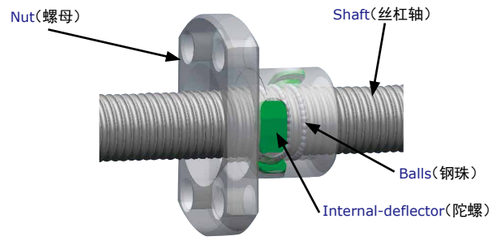
In the Return-tube system, Balls rolling between the Nut and the Shaft are picked up from the screw groove by the end of the Return-tube built into the Nut. Then, they flow back through the Return-tube to the screw groove.



●陀螺式循环方式　Internal-deflector system

陀螺式循环方式最大限度地缩小了螺母的外径及长度，使微型滚珠丝杠的结构更紧凑、更轻量。钢珠在承受轴向负载的同时，在丝杠轴及螺母的钢珠滚动槽中滚动时，沿着螺母内部的陀螺槽进入相邻的滚动槽，然后再次返回负载区，进行无限滚动循环。

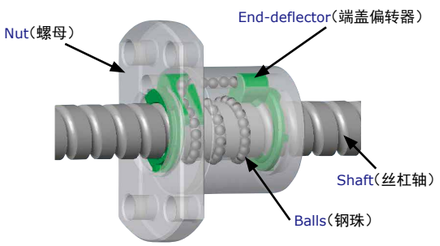
The Internal-deflector system employs a lightweight Miniature Ball Screw, which enables the Nut diameter and length to be reduced to the smallest possible size. The Balls bear the load while rolling along the screw groove between the Shaft and the Nut. The Balls are continuously circulated, transferred to the adjacent groove in the screw via the Internal-deflector channel and then back to the loaded groove area.



●偏转器式循环方式　End-deflector system

偏转器式循环方式，是指钢珠从设置于螺母内部或外部的端盖偏转器，穿过螺母通孔，在原来的滚动槽内循环的方式。与复式回路板循环方式相比，可缩小螺母的外径，是一种最适用于中导程的循环方式。

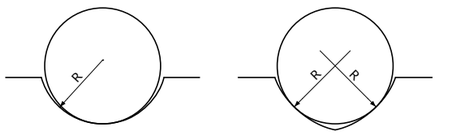
The Balls are circulated from End-deflector incorporated inside the Nut or outside the Nut through the hole in the Nut and the channels in the recirculating sections. Ball Nut diameter can be smaller than Return-plate system. This is suitable for the middle lead Ball Screws.



●螺纹槽形状　Thread Groove profile

滚珠丝杠分为由1个弧形形成的圆弧和由2个弧形形成的拱弧两种类型。KSS滚珠丝杠采用拱弧型。

Ball screws may have either a circular arc profile, formed of a single arc, or a gothic arc profile, formed from two arcs.
KSS Ball Screws feature a gothic arc profile.



滚珠丝杠的生产范围
The range of manufacturing for Ball Screws

按丝杠轴公称外径划分，KSS滚珠丝杠的生产范围为φ1.8～φ16mm。以下介绍了不同精度等级的丝杠轴的参考极限长度。具体长度会因轴端形状、材质及丝杠轴系列而异，详情请垂询本公司。

The range of manufacturing for KSS Ball Screws is from φ1.8 to φ16mm as Shaft nominal diameter. Maximum limit of overall lengths are shown below. Maximum limit of overall lengths will vary depending on the Shaft end configuration, materials and KSS series. Please inquire KSS for details.

●精密滚珠丝杠的生产极限长度(全长) Maximum limit of overall lengths for Precision Ball Screws

Unit(单位):mm

Shaft nominal diameter 丝杠轴公称外径 / Accuracy grade 精度等级	C0	C1	C3	C5
4	90	120	160	170
6	140	180	240	250
8	200	250	330	350
10	260	320	420	450
12	320	390	510	550
14	380	460	600	660
16	450	540	700	770

注1)超出生产极限长度时，请垂询本公司。
Note 1)If required length exceeds the number in table above, please ask KSS representative.

●冷轧滚珠丝杠(Ct7＆Ct10) 的生产极限长度
Maximum limit of overall lengths for Rolled Ball Screws(Ct7 & Ct10)

Unit(单位):mm

Shaft nominal diameter 丝杠轴公称外径	Maximum length 极限长度
4	240
5	300
6	350
8	450
10	650
12	700
13	700
14	700
15	1000

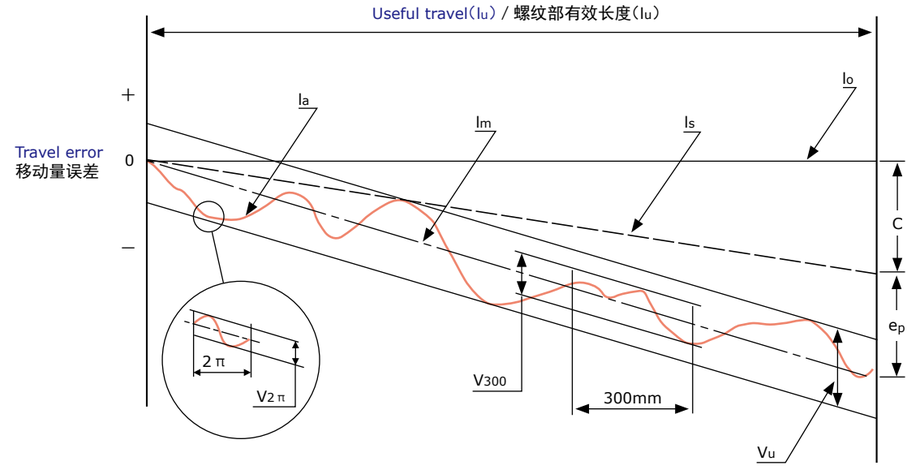
注1)超出生产极限长度时，请垂询本公司。
注2)冷轧滚珠丝杠的极限长度值中包括丝杠两端各25mm的不完全螺纹部分。
Note 1)If required length exceeds the number in table above, please ask KSS representative.
Note 2)Maximum limit of overall length for Rolled Ball Screws includes 25mm of incomplete thread area at both end.

滚珠丝杠的导程精度
Lead accuracy of Ball Screws

JIS B 1192-3中规定，滚珠丝杠的导程精度是指，相对于螺母有效移动量或丝杠轴螺纹部有效长度的代表移动量误差及波动，以及相对于螺纹部有效长度中任意300mm及1圈(2π rad)的波动。
表A-83、84、85中列出了不同精度等级的各种特性的公差。

Ball Screw lead accuracy conforming to JIS B 1192-3 is specified by the tolerance on specified travel over the Nut effective travel amount, or Screw Shaft useful travel, travel variation and travel variation within arbitrary 300mm, and 1 revolution(2π rad) over the Screw Shaft useful travel.
Tolerance of each accuracy grades are shown in the Table A-83, 84, 85.

图A-82：移动量误差线图
Fig. A-82 : Travel deviation diagram



公称移动量(l_0)　：按照公称导程旋转任意圈数时的轴向移动量。
标准导程(Phs)　：预测因温度上升及负载而引起的变形量，对公称导程进行了若干补偿的导程。
代表移动量的目标值(c)：预先将标准移动量设定为正或负时的目标值。
标准移动量(ls)　：按照标准导程旋转任意圈数时的移动量。
实际移动量(la)　：相对于任意丝杠轴旋转角的螺母实际轴向移动量。
代表移动量(lm)　：代表实际移动量倾向的直线。根据表示相对于滚珠丝杠有效移动量或螺纹部有效长度的实际移动量曲线，通过最小二乘法或类似的近似法求出。
代表移动量误差(e_p)　：与螺母的有效移动量或丝杠轴的螺纹部有效长度相应的代表移动量与标准移动量之差。
波动(V_u)　：平行于代表移动量的两条线间的实际移动量最大幅度。
波动(V_{300})　：相对于螺纹部有效长度中任意300mm的实际移动量最大幅度.
波动($V_{2\pi}$)　：相对于螺纹部有效长度中任意1圈(2π rad)的实际移动量最大幅度。

Nominal travel(l_0) : Travel in axial direction when rotated arbitrary number of revolution according to the Nominal lead
Specified Lead(Phs) : Lead given some amount of correction to the Nominal lead in order to compensate the deformation generated due to the temperature rise or the load.
Travel compensation(c) : Difference between the Specified travel and the Nominal travel within the valid travel.
Specified travel(ls) : Travel in axial direction when rotated arbitrary number of revolution according to the Specified lead.
Actual travel(la) : Actual travel of Ball Nut in axial direction in respect to an arbitrary angle of rotation of Ball Screw Shaft.
Actual mean travel(lm) : Straight line which represents the tendency of Actual travel. It is obtained by the least square method or a simple and appropriate approximation method from the curve indicating the Valid travel of Ball Nut.
Tolerance on specified travel(e_p) : Difference between the Actual mean travel and the Specified travel corresponding to the Valid travel of Ball Nut or the Useful travel of Ball Screw Shaft.
Travel variation(V_u) : Maximum width of the Actual travel curve between the two straight lines put in parallel to the Actual mean travel line, that corresponding to Valid travel of Ball Nut or Useful travel of Ball Screw Shaft.
Travel variation(V_{300}) : Maximum width of the Actual travel curve between the two straight lines put in parallel to the Actual mean travel line, that corresponding to arbitrary 300mm taken within Useful travel of Ball Screw Shaft.
Travel variation($V_{2\pi}$) : Maximum width of the Actual travel curve between the two straight lines put in parallel to the Actual mean travel line, that corresponding to arbitrary one revolution(2π rad) within Useful travel of Ball Screw Shaft.

表 A-83 ：精密滚珠丝杠(定位用：C系列)的代表移动量误差(±e_p)和波动(Vu)许用值
Table A-83 ： Tolerance on specified travel(±e_p) and permissible variation of precision Ball Screws(for positioning ： C series)

Unit(单位):μm

Accuracy Grade 精度等级			C0		C1		C3		C5	
Effective screw length(mm) 螺纹部有效长度(mm)	Over 超过	Up to 以下	±e_p	Vu	±e_p	Vu	±e_p	Vu	±e_p	Vu
	—	100	3	3	3.5	5	8	8	18	18
	100	200	3.5	3	4.5	5	10	8	20	18
	200	315	4	3.5	6	5	12	8	23	18
	315	400	5	3.5	7	5	13	10	25	20
	400	500	6	4	8	5	15	10	27	20
	500	630	6	4	9	6	16	12	30	23
	630	800	7	5	10	7	18	13	35	25
	800	1000	8	6	11	8	21	15	40	27

表 A-84 ：精密滚珠丝杠(定位用：C系列)每300mm及1圈的波动(V_{300})、($V_{2\pi}$)许用值
Table A-84 ： Permissible travel variation V_{300}, $V_{2\pi}$(for positioning ： C series)

Unit(单位):μm

Accuracy grade 精度等级	C0		C1		C3		C5	
Item 项目	V_{300}	$V_{2\pi}$	V_{300}	$V_{2\pi}$	V_{300}	$V_{2\pi}$	V_{300}	$V_{2\pi}$
Permissible value 许用值	3.5	3	5	4	8	6	18	8

表 A-85 ：相对于300mm的Ct系列(7、10级)的波动(V_{300})
Table A-85 ： Permissible travel variation V_{300} for Ct series(7,10 grade)

Unit(单位):μm

Accuracy grade 精度等级	Ct7	Ct10
V_{300}	52	210

Ct系列(7级、10级)的代表移动量误差由下式求出。
Tolerance on specified travel(e_p)for Ct series is calculated as follows.

$$e_p = \pm \frac{lu}{300} \times V_{300}$$

lu:螺纹部有效长度(mm)
Useful travel(mm)

为了与ISO保持一致,滚珠丝杠的日本工业标准(JIS B1192)于1997年、2013年及2018年进行了修订。修订后的标准制定了C系列(原JIS标准 C0、1、3、5)和Cp、Ct系列(与ISO统一的标准)的精度等级。本公司根据JIS B 1192-3(2018),对0、1、3、5级采用了C系列,对7、10级采用了Cp、Ct系列。

Japan Industrial Standard of Ball Screw(JIS B1192) was revised in 1997, 2013 and 2018 in order to correspond to ISO.Regarding accuracy grade, C series(current JIS C0, 1, 3, 5) and Cp, Ct series(standard corresponding to ISO) are established. KSS conforms to JIS B 1192-3(2018) and adopts C series for 0,1,3,5 grade, Cp, Ct series for 7,10 grade.

滚珠丝杠的安装部精度
Ball Screw Run-out and location tolerances

为了与ISO保持一致,滚珠丝杠的日本工业标准(JIS B1192)于1997年、2013年及2018年进行了修订。修订后的标准制定了C系列(原JIS标准 C0、1、3、5)和Cp、Ct系列(与ISO统一的标准)的精度等级。C系列和Cp、Ct系列在安装部精度的标示方法和标准值上略有不同,本公司将其统一为下图(图A-86)中的标示方法和标准值(C系列),7级、10级参考了Cp、Ct系列的标准。
而且,2018年的修订将表示垂直度的术语变更为“端面或安装面的圆跳动”,几何公差符号也从 ⊥ 改为了 ↗ 。

Japan Industrial Standard of Ball Screw(JIS B1192)was revised in 1997, 2013 and 2018 in order to correspond to ISO. Regarding accuracy grade, C series(current JIS C0, 1, 3, 5) and Cp, Ct series(standard corresponding to ISO) are established. There are some differences between C series and Cp, Ct series in notation and tolerances for accuracy of Ball Screw mounting section. KSS uses notation in Fig. A-86 below and standard tolerance value, which conforms to C series standard, and KSS refers to Cp, Ct series standard in case of 7 and 10 grade. Moreover, in the revision of 2018, the notation of perpendicularity changed to “run-out of the mounting surface or end face” , and geometric tolerance symbols changed from ⊥ to ↗.

图A-86 ：安装部精度的填写示例
Fig. A-86 ： Description of Run-out and location tolerances for Ball Screws

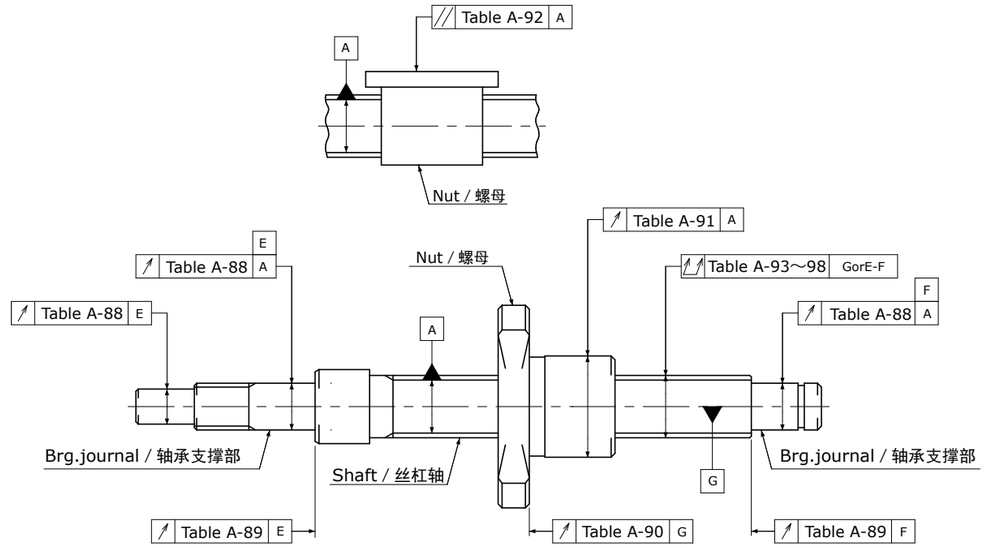


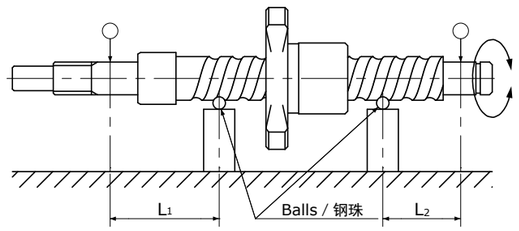
表 A-88 ：相对于丝杠轴螺纹槽面的支撑部外径的半径方向圆跳动
以及相对于丝杠轴支撑部轴线的零件安装部的半径方向圆跳动
Table A-88 ：Radial Run-out of Bearing seat related to the centerline of screw groove and Radial Run-out of journal diameter related to the Bearing seat

Unit(单位):μm

Shaft nominal diameter(mm) 丝杠轴公称外径(mm)		Permissible deviation of Radial Run-out 跳动公差(最大)					
Over 超过	Up to 以下	C0	C1	C3	C5	C7	C10
—	8	3	5	8	10	14	40
8	12	4	5	8	11	14	40
12	20	4	6	9	12	14	40

在测量该项目时，由于受丝杠轴轴线全跳动的影响，因此需要进行补偿。补偿方法为，根据丝杠轴总长与支点到测量点的距离(L_1,L_2)的比值(参照图A-87)，利用第A809～A811页的表A-93～98的丝杠轴轴线的全跳动公差，求出补偿值(参照下式)，然后加上表A-88中的公差。

This measurement item is affected by Total Run-out of the Screw Shaft, and so it must be corrected as follows. Find the corrected value from the Total Run-out tolerances given in Tables A-93～98 on page A809～A811 using the ratio of the total Shaft length to the distance between the supporting point and the measuring point(L_1,L_2)(see Fig. A-87), and add the values obtained to the tolerance given in Table A-88.



图A-87 ：圆跳动的补正
Fig. A-87 ：Compensation of Radial Run-out

$$\text{圆跳动的补正} = \frac{\text{全跳动公差(表 A-93～98)}}{\text{总长}} \times \text{测量间距}(L_1 \text{或} L_2)$$

L_1 ,L_2 ：支点到测量点的距离(mm)

$$\text{Compensation Value of Run-out} = \frac{\text{Tolerance of total Run-out(Table A-93～98)}}{\text{Total shaft length}} \times (L_1 \text{ or } L_2)$$

L_1 ,L_2 ：Distance btw supporting pt & measuring pt(mm)

表 A-89 ：相对于丝杠轴支撑部轴线的支撑部端面的圆跳动
Table A-89 ：Axial Run-out(Perpendicularity) of Shaft(Bearing) face related to the centerline of the Bearing seat

Unit(单位):μm

Shaft nominal diameter(mm) 丝杠轴公称外径(mm)		Permissible deviations of Axial Run-out(Perpendicularity) 圆跳动公差(最大)					
Over 超过	Up to 以下	C0	C1	C3	C5	C7	C10
—	8	2	3	4	5	7	10
8	12	2	3	4	5	7	10
12	20	2	3	4	5	7	10

表 A-90 ：相对于丝杠轴轴线的螺母基准端面或法兰安装面的圆跳动
Table A-90 ：Axial Run-out(Perpendicularity) of Ball Nut location face related to the centerline of Screw Shaft

Unit(单位):μm

Nut outside diameter(mm) 螺母外径		Permissible deviations of Axial Run-out(Perpendicularity) 圆跳动公差(最大)					
Over 超过	Up to 以下	C0	C1	C3	C5	C7	C10
—	20	5	6	8	10	14	20
20	32	5	6	8	10	14	20
32	50	6	7	8	11	18	30

表 A-91 ：相对于丝杠轴轴线的螺母外周面(圆柱形时)的半径方向圆跳动
Table A-91 ：Radial Run-out of Ball Nut location diameter related to the centerline of Screw Shaft

Unit(单位):μm

Nut outside diameter(mm) 螺母外径		Permissible deviations of Radial Run-out 跳动公差(最大)					
Over 超过	Up to 以下	C0	C1	C3	C5	C7	C10
—	20	5	6	9	12	20	40
20	32	6	7	10	12	20	40
32	50	7	8	12	15	30	60

表 A-92 ：相对于丝杠轴轴线的螺母外周面(平面安装时)的平行度
Table A-92 ：Parallelism of rectangular Ball Nut related to the centerline of Screw Shaft

Unit(单位):μm

Mounting length(mm) 标准安装长度(mm)		Permissible deviations of Parallelism 平行度公差(最大)					
Over 超过	Up to 以下	C0	C1	C3	C5	C7	C10
—	50	5	6	8	10	17	30
50	100	7	8	10	13	17	30

表 A-93 ：丝杠轴轴线的半径方向全跳动(C0)

Table A-93 ：Total Run-out in radial direction of Screw Shaft related to the centerline of Screw Shaft(C0) Unit(单位):mm

Shaft total length 丝杠轴总长		Shaft nominal diameter 丝杠轴公称外径		
Over/超过		—	8	12
Up to/以下		8	12	20
Over 超过	Up to 以下	Permissible deviations of total Run-out in radial direction 跳动公差(最大)		
—	125	0.015	0.015	0.015
125	200	0.025	0.020	0.020
200	315	0.035	0.025	0.020
315	400	—	0.035	0.025
400	500	—	0.045	0.035
500	630	—	0.050	0.040
630	800	—	—	0.050
800	1000	—	—	0.065

表 A-94 ：丝杠轴轴线的半径方向全跳动(C1)

Table A-94 ：Total Run-out in radial direction of Screw Shaft related to the centerline of Screw Shaft(C1) Unit(单位):mm

Shaft total length 丝杠轴总长		Shaft nominal diameter 丝杠轴公称外径		
Over/超过		—	8	12
Up to/以下		8	12	20
Over 超过	Up to 以下	Permissible deviations of total Run-out in radial direction 跳动公差(最大)		
—	125	0.020	0.020	0.015
125	200	0.030	0.025	0.020
200	315	0.040	0.030	0.025
315	400	0.045	0.040	0.030
400	500	—	0.050	0.040
500	630	—	0.060	0.045
630	800	—	—	0.060
800	1000	—	—	0.075

表 A-95 ：丝杠轴轴线的半径方向全跳动(C3)

Table A-95 ：Total Run-out in radial direction of Screw Shaft related to the centerline of Screw Shaft(C3) Unit(单位):mm

Shaft total length 丝杠轴总长		Shaft nominal diameter 丝杠轴公称外径		
Over/超过		—	8	12
Up to/以下		8	12	20
Over 超过	Up to 以下	Permissible deviations of total Run-out in radial direction 跳动公差(最大)		
—	125	0.025	0.025	0.020
125	200	0.035	0.035	0.025
200	315	0.050	0.040	0.030
315	400	0.060	0.050	0.040
400	500	—	0.065	0.050
500	630	—	0.070	0.055
630	800	—	—	0.070
800	1000	—	—	0.095

表 A-96 ：丝杠轴轴线的半径方向全跳动(C5)

Table A-96 ：Total Run-out in radial direction of Screw Shaft related to the centerline of Screw Shaft(C5) Unit(单位):mm

Shaft total length 丝杠轴总长		Shaft nominal diameter 丝杠轴公称外径		
Over/超过		—	8	12
Up to/以下		8	12	20
Over 超过	Up to 以下	Permissible deviations of total Run-out in radial direction 跳动公差(最大)		
—	125	0.035	0.035	0.035
125	200	0.050	0.040	0.040
200	315	0.065	0.055	0.045
315	400	0.075	0.065	0.055
400	500	—	0.080	0.060
500	630	—	0.090	0.075
630	800	—	—	0.090
800	1000	—	—	0.120

表 A-97 ：丝杠轴轴线的半径方向全跳动(C7)
Table A-97 ：Total Run-out in radial direction of Screw Shaft related to the centerline of Screw Shaft(C7)

Unit(单位):mm

Shaft total length 丝杠轴总长		Shaft nominal diameter 丝杠轴公称外径		
	Over/超过	—	8	12
	Up to/以下	8	12	20
Over 超过	Up to 以下	Permissible deviations of total Run-out in radial direction 跳动公差(最大)		
—	125	0.060	0.055	0.055
125	200	0.075	0.065	0.060
200	315	0.100	0.080	0.070
315	400	—	0.100	0.080
400	500	—	0.120	0.095
500	630	—	0.150	0.110
630	800	—	—	0.140
800	1000	—	—	0.170

表 A-98 ：丝杠轴轴线的半径方向全跳动(C10)
Table A-98 ：Total Run-out in radial direction of Screw Shaft related to the centerline of Screw Shaft(C10)

Unit(单位):mm

Shaft total length 丝杠轴总长		Shaft nominal diameter 丝杠轴公称外径		
	Over/超过	—	8	12
	Up to/以下	8	12	20
Over 超过	Up to 以下	Permissible deviations of total Run-out in radial direction 跳动公差(最大)		
—	125	0.100	0.095	0.090
125	200	0.140	0.120	0.110
200	315	0.210	0.160	0.130
315	400	—	0.210	0.160
400	500	—	0.270	0.200
500	630	—	0.350	0.250
630	800	—	0.460	0.320
800	1000	—	—	0.420

注)Ct7、Ct10规格时,有时会根据JIS B1192-2013标准,采用基于细长比的全跳动规格(下表)。

Note)In case of Ct7, Ct10 grade, KSS may use the standard of Total Run-out based on slenderness ratio, which conforms to JIS B1192-2013.

Slenderness ratio 细长比		Total Run-out 全跳动	
Over / 超过	Up to / 以下	Ct7	Ct10
—	40	0.080	0.160
40	60	0.120	0.240
60	80	0.200	0.400
80	100	0.320	0.640

细长比 / Slenderness ratio= lu/do

lu：螺纹部有效长度 / Useful travel(mm)
do：丝杠轴公称外径 / Nominal diametor of Ball Screw(mm)

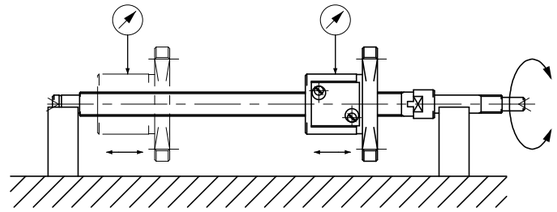
滚珠丝杠安装部精度的测量方法
Measuring method of Ball Screw Run-out and location tolerances

●相对于丝杠轴螺纹槽面的支撑部外径的半径方向圆跳动(表 A-88)

用V形块支撑丝杠轴两端,一边使丝杠轴旋转,一边读取测量头接触螺母外周面的千分表刻度。测量作业在支撑部附近的2处进行。此外,直接用千分表测量支撑部外径时,用两个中心孔支撑丝杠轴进行测量。

●Radial Run-out of Bearing seat related to the centerline of screw groove (Table A-88)

Place the Ball Screw in identical V-blocks at both Bearing seat. Place the dial gauge perpendicular to the Nut cylindrical surface. Rotate Screw Shaft slowly and record the dial gauge readings. Measurement should be done at near both ends of threaded part. Some cases, this measurement will be done by both centerhole support, and directly measured on Bearing seat.

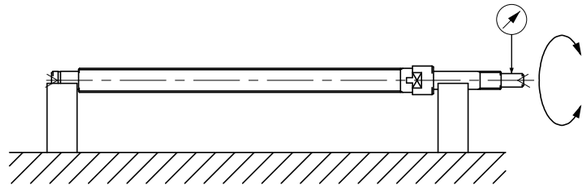


●相对于丝杠轴支撑部轴线的零件安装部的半径方向圆跳动(表A-88)

用V形块支撑丝杠轴两端,一边使丝杠轴旋转,一边读取测量头接触零件安装部的千分表刻度。

●Radial Run-out of journal diameter related to the Bearing seat(Table A-88)

Place the Ball Screw in identical V-blocks at both Bearing seats. Place the dial gauge perpendicular to the journal cylindrical surface. Rotate the Screw Shaft slowly and record the dial gauge readings.



●相对于丝杠轴支撑部轴线的支撑部端面的圆跳动(表 A-89)

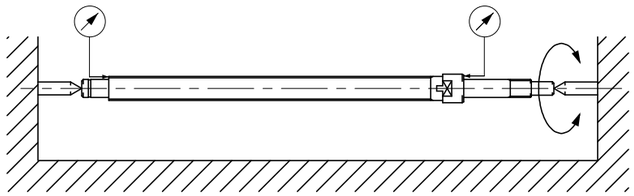
用两个中心孔支撑丝杠轴两端,一边使丝杠轴旋转,一边读取测量头接触支撑部端面的千分表刻度。

**图纸中的标示以支撑部外周面为基准,但由于支撑部外周面以中心孔为基准进行了加工,因此与用V形块支撑支撑部外周面时相同。

●Axial Run-out(Perpendicularity) of shaft (Bearing) face related to the centerline of the Bearing seat(Table A-89)

Support a Screw Shaft at both centers. Place the dial gauge perpendicular to the end face of the journal. Rotate the Screw Shaft slowly and record the dial gauge readings.

**This method is equivalent to the one, which is supported at both Bearing seats, because Bearing seats are ground related to both centers.

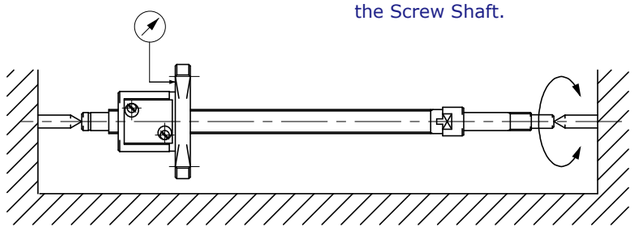


●相对于丝杠轴轴线的螺母基准端面或法兰安装面的圆跳动(表 A-90)

用两个中心孔支撑丝杠轴两端,一边使轴与螺母一起旋转,一边读取测量头接触螺母法兰端面的千分表刻度。

●Axial Run-out(Perpendicularity) of Ball Nut location face related to the centerline of Screw Shaft(Table A-90)

Support the Ball Screw at both centers. Place the dial gauge perpendicular to the flange face. Rotate the Screw Shaft with Ball Nut slowly and record the dial gauge readings. Secure the Ball Nut against rotation on the Screw Shaft.

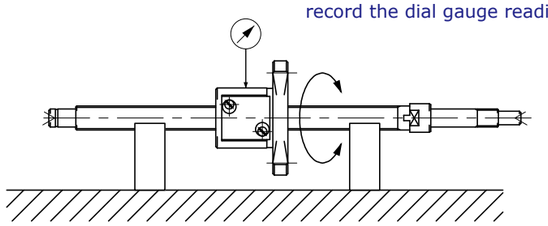


●相对于丝杠轴轴线的螺母外周面的半径方向圆跳动(表 A-91)

用V形块支撑丝杠轴螺母附近的外周面,一边使螺母旋转,一边读取测量头接触螺母外周面的千分表刻度。

●Radial Run-out of Ball Nut location diameter related to the centerline of Screw Shaft(Table A-91)

Place the Ball Screw on V-blocks at adjacent sides of the Ball Nut. Place the dial gauge perpendicular to the cylindrical surface of Ball Nut. Secure the Screw Shaft against rotation of Ball Nut. Rotate Ball Nut slowly and record the dial gauge readings.

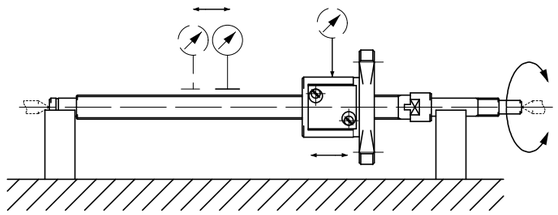


●丝杠轴轴线的半径方向全跳动(表 A-93~98)

用两个中心孔或V形块支撑丝杠轴两端,一边使丝杠轴旋转,一边读取测量头接触丝杠轴外周面或螺母外周面的千分表刻度。测量作业含整个范围,选多处进行。

●Total Run-out in radial direction of Screw Shaft related to the centerline of Screw Shaft(Table A-93~98)

Place the Ball Screw in identical V-blocks at both Bearing seats, or support the Ball Screw at both centers. Place the dial gauge with measuring shoe at the several points over the full thread length.Rotate the Screw Shaft slowly and record the dial gauge readings. Maximum value of measurement should be the Total Run-out.



材质和热处理、硬度
Material and Heat treatment, Surface hardness

KSS滚珠丝杠的标准材质、热处理和硬度如表A-99、100所示。表中数值可能会因系列及型号不同而略有差异,请参照本公司出示的规格图。

Standard material of KSS Ball Screws, Heat treatment and Surface hardness are shown in table A-99, 100. However, they vary depending on series or model number. Please refer to KSS drawings.

表 A-99 : 一般产品的材质和热处理、硬度
Table A-99 : Material, Heat treatment & Surface hardness for regular items

	Material 材质	Heat treatment 热处理	Surface hardness 表面硬度
Screw Shaft 丝杠轴	SCM415 (JIS G 4105)	Carburizing and quenching 渗碳淬火	HRC 58-62
	S55C (JIS G 4051)	Induction hardening 高频淬火	HRC min.58 HRC.58以上
Nut 螺母	SCM415 (JIS G 4105)	Carburizing and quenching 渗碳淬火	HRC 58-62

注1)表中所示硬度为滚珠丝杠部的表面硬度。
注2)S55C材质适用于精密冷轧滚珠丝杠。
Note 1)Hardness on table shows surface hardness of thread part.
Note 2)S55C is applicable for Precision Rolled Ball Screws.

表 A-100 : 不锈钢产品的材质和热处理、硬度
Table A-100 : Material, Heat treatment & Surface hardness for stainless steel items

	Material 材质	Heat treatment 热处理	Surface hardness 表面硬度
Screw Shaft 丝杠轴	SUS440C (JIS G 4303)	Quenching and tempering 淬火、回火	HRC min.55 HRC 55以上
Nut 螺母	SUS440C (JIS G 4303)	Quenching and tempering 淬火、回火	HRC min.55 HRC 55以上

注)表中所示硬度为滚珠丝杠部的表面硬度。
Note)Hardness on table shows surface hardness of thread part.

许用轴向负载
Permissible Axial load

建议尽量在有拉伸负载作用于丝杠轴的条件下使用。但根据使用条件，可能会有压缩负载作用，此时应避免丝杠轴发生压曲。
尤其在安装间距较小时，无论采用何种安装方法，都会受到许用拉伸应力或压缩负载及基本额定静负载Coa的限制。
压曲负载、许用拉伸和许用压缩负载可用下式求出。

It is recommended that Ball Screw Shafts be used almost exclusively under tension load conditions. However, in some applications, compression loads may exist, and under such conditions it must be checked that Shaft buckling will not occur.
Also, when the mounting span distance is short, there is a restriction on the permissible tension or compression load and the Basic Static Load Rating Coa unrelated to mounting.
Buckling load, permissible tension and permissible compression load can be calculated below.

●相对于压曲的许用压缩负载的计算公式
Permissible compression load calculation for buckling

$$P = \alpha \times \frac{n\pi^2 E \cdot I}{L^2} \quad N$$

欧拉公式(Formula for Oiler)

α：安全系数(Safety Factor) 0.5
E：杨氏模量(Young's modulus) 2.08×10^5 N/mm²(MPa)
I：丝杠轴截面的最小惯性矩(Screw Shaft minimum moment of inertia of area)

$$I = \frac{\pi}{64} d^4 \quad mm^4$$

d：丝杠轴底径(Screw Shaft Root diameter) mm
L：安装间距(Mounting span distance) mm
n：取决于滚珠丝杠安装方法的系数(Factor for Ball Screw mounting method)

支撑-支撑(Supported—Supported)	n=1
固定-支撑(Fixed—Supported)	n=2
固定-固定(Fixed—Fixed)	n=4
固定-自由(Fixed—Free)	n=1/4

●相对于丝杠轴屈服应力的许用拉伸、压缩负载的计算公式
Permissible tension, compression load calculation for Screw Shaft yield stress

$$P = \sigma \times A \quad N$$

σ：许用应力(Permissible stress) 98N/mm²(MPa)
A：丝杠轴的最小截面积(Screw Shaft minimum section area)

$$A = \frac{\pi}{4} d^2 \quad mm^2$$

d：丝杠轴底径(Screw Shaft Root diameter) mm

许用转速
Permissible speed

丝杠轴的安装方法决定了旋转丝杠轴的极限转速。转速接近极限值时会引起共振，导致丝杠轴无法运行。
此外，无论采用何种安装方法，滚珠丝杠都存在会导致循环部损坏的极限转速。

For Screw Shaft rotation, the mounting method determines the established rotation limits. When this value is approached, resonance phenomenon will occur, and operation becomes impossible. There is also rotation limit which causes damages to recirculating parts. This limit is unrelated to mounting methods.

●相对于临界速度的许用转速的计算公式
Permissible speed calculation for critical speed

$$N = \beta \times \frac{60 \cdot \lambda^2}{2\pi} \times \sqrt{\frac{E \cdot I \cdot g}{\gamma \cdot A \cdot L^4}} \quad min^{-1}$$

β：安全系数(Safety Factor) 0.8
E：杨氏模量(Young's modulus) 2.08×10^5 N/mm²(MPa)
I：丝杠轴截面的最小惯性矩(Screw Shaft minimum moment of inertia of area)

$$I = \frac{\pi}{64} d^4 \quad mm^4$$

d：丝杠轴底径(Screw Shaft Root diameter) mm
g：重力加速度(Gravity acceleration) 9.8×10^3 mm/sec²
γ：材料的比重(Material specific gravity) 7,850kg/m³(7.7×10^{-5} N/mm³)
L：安装间距(Mounting span distance) mm
A：丝杠轴的最小截面积(Screw Shaft minimum section area)

$$A = \frac{\pi}{4} d^2 \quad mm^2$$

λ:取决于滚珠丝杠安装方法的系数(Factor for Ball Screw mounting method)

支撑-支撑(Supported—Supported)	λ = π
固定-支撑(Fixed—Supported)	λ = 3.927
固定-固定(Fixed—Fixed)	λ = 4.730
固定-自由(Fixed—Free)	λ = 1.875

●相对于循环部损坏的极限转速

关于相对于循环部损坏的极限转速，一般多根据滚珠丝杠的钢珠速度dn值(丝杠轴公称外径×转速)来设定上限值，但对于像KSS滚珠丝杠这样的微型滚珠丝杠，dn值则不适用。KSS滚珠丝杠的循环部损坏极限转速为3,500～4,000min^{-1}左右。该数值会因使用条件及环境而异，详情请垂询本公司。而且，除高速旋转外，以高加减速运行时，循环部损坏的危险性也会增高。高加减速运行下循环部损坏的大致情况因内部规格而异，请垂询本公司。

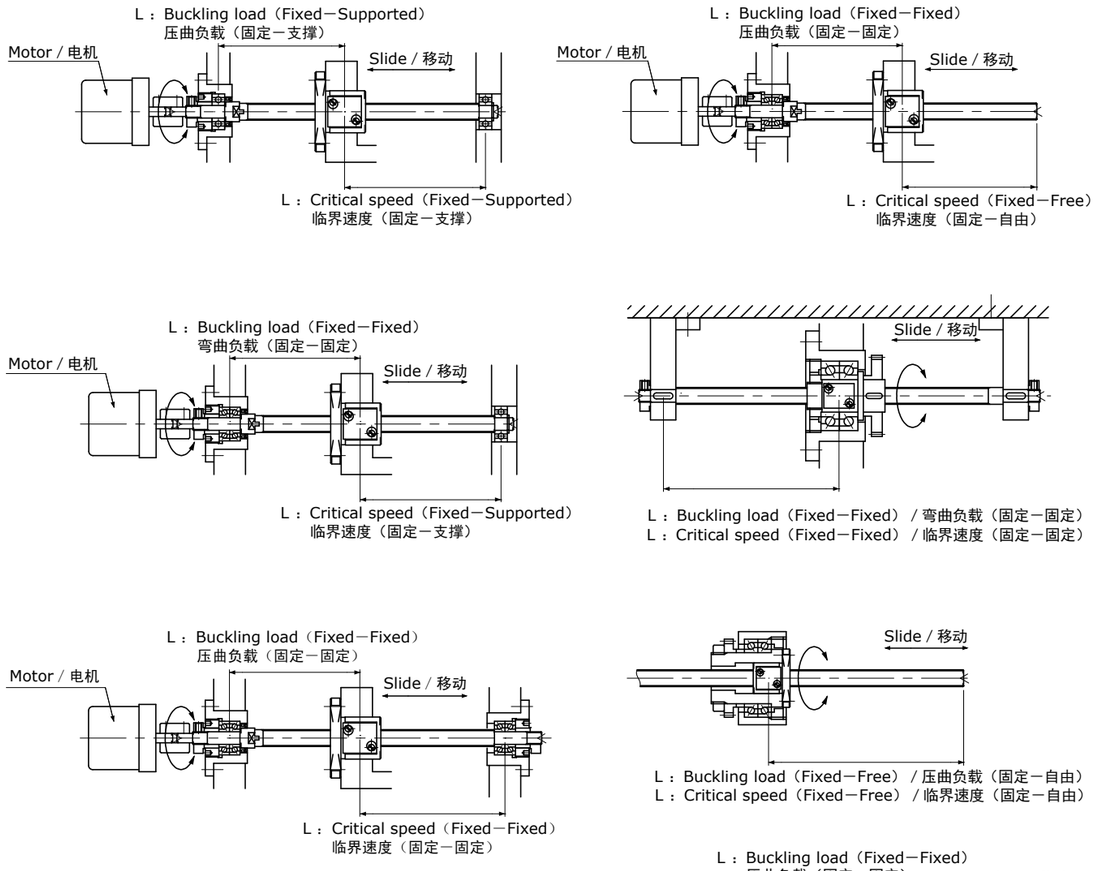
●Rotational speed limit for damage on recirculating parts

Generally, regarding critical speed for damage on recirculating parts, limitation is established by dn value, which is multiplied Shaft nominal diameter of revolution, but dn value cannot be applied to Miniature Ball Screws. For KSS Ball Screws, please consider rotational speed limit by damage on recirculating parts as 3,500 to 4,000 min^{-1}. This value varies depending on operating conditions and environment. Please inquire KSS for details.
Moreover, possibilities of breakage of recirculating parts will be increased when using in high acceleration / deceleration. Estimate criterion of the breakage in the recirculating section is depending on the internal specification of the Ball Screw, please ask KSS for more detail.

滚珠丝杠的安装方法
Ball Screw mounting methods

滚珠丝杠的典型安装方法如图A-101所示。由于安装方法会影响相对于压曲的许用轴向负载、以及相对于临界速度的许用转速，因此请在设计强度和转速时予以考虑。

Typical Ball Screw's mounting methods are shown in Fig. A-101. Mounting configuration affects permissible Axial load in relation to buckling, as well as permissible speed in relation to critical speed. Please refer to below when studying strength and speed.



图A-101：滚珠丝杠的安装方法
Fig. A-101：Ball Screw mounting methods

轴向间隙和预压
Axial play and Preload

通常，普通的单螺母滚珠丝杠的丝杠轴和螺母之间存在微小的轴向间隙。因此，当单螺母滚珠丝杠上有轴向负载作用时，上述轴向间隙和轴向负载所产生的弹性位移量的和就会导致间隙变大，形成齿隙。为消除这样的齿隙，应使滚珠丝杠的轴向间隙为负，即采用预先向丝杠轴和螺母间施加弹性变形，也就是“预压”的方法。

For standard Single Nut Ball Screws under normal conditions, a slight Axial play exists between the Screw Shaft and Nut. Consequently, when Axial loads act on Single Nut Ball Screws, total amount of Axial play and Elastic displacement due to Axial load becomes backlash. In order to prevent this backlash in Ball Screws, the Axial play can be reduced to a negative value. That is what we call “Preload", which is the method of causing Elastic deformation to the Balls between the Screw Shaft and Nut in advance.

●轴向间隙

KSS滚珠丝杠的间隙符号和轴向间隙的许用值如表A-102所示。
滚珠丝杠的精度等级和间隙符号的组合如表A-103所示。

●Axial play

Symbol and permissible value for Axial play are shown in Table A-102.
Combination of accuracy grade and symbol are shown in Table A-103.

表 A-102：间隙符号和轴向间隙的许用值
Table A-102：Symbol and permissible value for Axial play

Unit(单位):mm

Symbol 间隙符号	0	02	05	20	50
Axial play 轴向间隙	0 （Preloading） 0(预压)	0.002 max. 0.002以下	0.005 max. 0.005以下	0.02 max. 0.02以下	0.05 max. 0.05以下

表 A-103：精度等级和间隙符号的组合
Table A-103：Combination of accuracy grade and Axial play

Symbol 间隙符号 / Accuracy grade 精度等级	0	02	05	20	50
C0	C0-0	—	—	—	—
C1	C1-0	C1-02	—	—	—
C3	C3-0	C3-02	C3-05	C3-20	C3-50
C5	—	—	C5-05	C5-20	C5-50
C7	—	—	—	C7-20	C7-50
C10	—	—	—	C10-20	C10-50

注)希望采用上述以外的组合时，请垂询本公司。
Note)When combinations other than the above are requested, please inquire KSS.

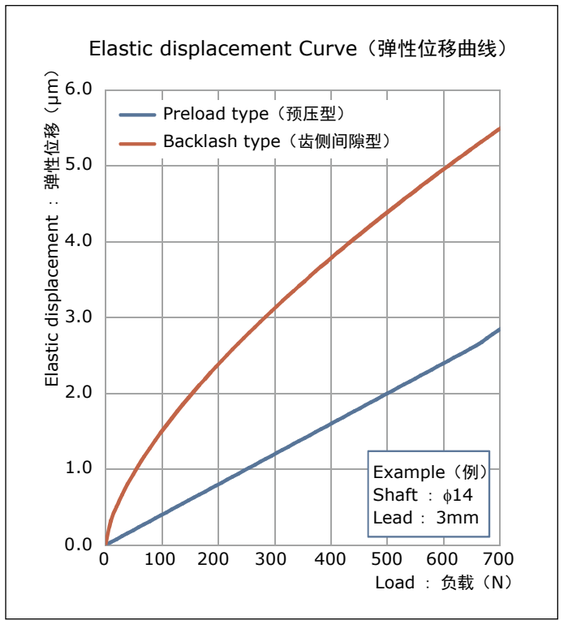
●预压的效果

使用预压，不仅可以消除滚珠丝杠的轴向间隙，还可减少由轴向负载引起的轴向位移量，提高刚性。
图A-104表示间隙规格滚珠丝杠和预压（无间隙）规格滚珠丝杠的轴向负载引起的弹性位移量的不同（理论值）。可以看出，通过预压，可减少（刚性提高）弹性位移量。

●Preload effect

Preload is not only used for removing Axial play, it also has the effect of reducing the amount of Axial displacement due to Axial load, and improving the Rigidity in Ball Screws. Fig. A-104 shows the difference of the amount of Elastic displacement (theoretical value) regarding Ball Screw with Axial play and Ball Screw with Preload under the Axial load.

图A-104 ：间隙规格和预压规格的弹性位移曲线
Fig. A-104 ：Elastic displacement curve comparison between Backlash type and Preload type



●适当的预压量

预压量应该由所需刚性或许用齿侧间隙决定，但施加预压后，可能会产生以下影响：
1）动扭矩增大
2）因发热、温度上升而导致定位精度降低
3）缩短使用寿命
因此，应尽可能设定较低的预压量。

●Proper amount of Preload

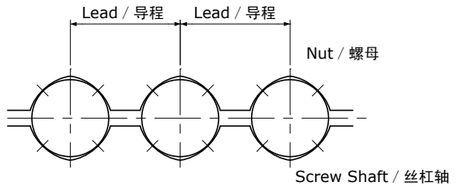
Although the amount of Preload should be determined by the required Rigidity and the permissible amount of backlash, when setting Preload, there are some concerning issues as follows.
1）Increased Dynamic Drag Torque
2）Heat generation,
lowering of positioning accuracy,
due to the temperature rise.
3）Shortened life
Therefore, it is advisable to establish the amount of Preload at the lowest possible limits.

●预压的方法

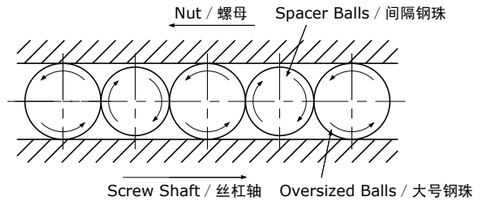
滚珠丝杠一般采用在2个螺母之间插入隔片（填隙片）的预压方法，即双螺母预压法。KSS滚珠丝杠充分发挥微型滚珠丝杠的特点，采用插入略微大于丝杠轴和螺母间隙的钢珠的预压方法、即“大号钢珠预压”法。利用该方法，只需1个螺母即可完全消除间隙，可保持紧凑结构。另外，通过每隔一处使用间隔钢珠（略小于施加预压的大号钢珠），避免了动作性能下降。

●Preload methods

Generally, a method of Double Nut Preload by inserting a spacer between two Nuts is adopted. KSS Ball Screw adopts「Oversized Ball Preload」by inserting Balls slightly bigger than space between Screw Shaft and Nut. As a result, it can eliminate Axial play even with a Single Nut and it is possible to maintain compact. Moreover, operating performance will never be deteriorated by using spacer Balls (Balls with slightly smaller diameter than those of the oversize Balls) alternatively with oversize Balls.



图A-105 ：使用大号钢珠的预压状态
Fig. A-105 ：Preload by oversized Balls



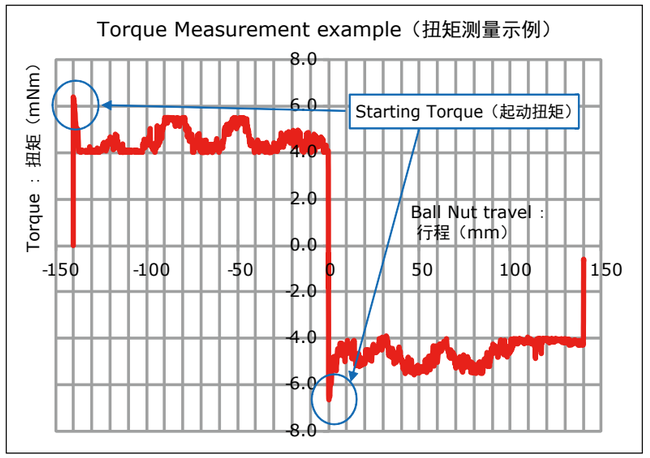
图A-106 ：间隔钢珠
Fig. A-106 ：Spacer Balls

●预压的管理方法

直接测量并管理滚珠丝杠的预压量相当困难。因此，通常将滚珠丝杠的预压换算成预压动扭矩，通过测量该动扭矩来管理预压。预压动扭矩的值标示在规格图中，与客户协商决定。为了管理预压量（轴向间隙必须为0），预压动矩始终在一定的条件下进行测量。因此，润滑条件及使用条件的不同的机械会导致动扭矩产生差异，敬请注意。此外，起动扭矩（驱动滚珠丝杠时的扭矩）会略大于动扭矩，敬请注意。

●Preload control

It is difficult to control Preload amount by measuring. Therefore, Preload of Ball Screw is controlled by measuring Preload Dynamic Drag Torque, which is converted from Preload amount. Amount of Preload Dynamic Drag Torque is decided with customers by specification drawing. Preload Dynamic Drag Torque is measured under specific condition to verify the amount of Axial play is 0. Dynamic Drag Torque installed actual machine will vary depending on lubricating condition, load condition and so on. Starting torque (Torque for starting Ball Screw) is slightly bigger than Dynamic Drag Torque.



*为便于说明，图中所示的扭矩波动比实际有所夸大。
*Torque wave in this diagram is exaggerated for explanation.

图A-107 ：动扭矩测量示例
Fig. A-107 ：Dynamic Drag Torpue measurement

进给丝杠轴系统的刚性
Rigidity in Linear Motion system

在精密机械中,为了提高进给丝杠的定位精度、增强抗负载刚性,必须对进给丝杠轴系统整体的刚性进行探讨。
进给丝杠轴系统的刚性如下所示。

In precision machinery, to improve positioning accuracy of the drive screws or to increase Rigidity for load, the Rigidity of the entire Linear Motion system must be examined. Rigidity of entire Linear Motion system is as follows.

$$\frac{1}{K} = \frac{1}{K_1} + \frac{1}{K_2} + \frac{1}{K_3} + \frac{1}{K_4} \quad \mu m/N$$

K ：进给丝杠轴系统整体的刚性(Total Rigidity of Linear motion system) N/μm
K_1 ：丝杠轴的刚性(Screw Shaft Rigidity) N/μm
K_2 ：螺母的刚性(Nut Rigidity) N/μm
K_3 ：支撑轴承的刚性(Support Bearing Rigidity) N/μm
K_4 ：螺母和轴承安装部的刚性(Nut, Bearing fitting part Rigidity) N/μm

●进给丝杠轴系统整体的刚性 Total Rigidity of Linear Motion system K

$$K = \frac{Fa}{\delta} \quad N/\mu m$$

Fa ：进给丝杠轴系统承受的轴向负载 N
(Axial load applied to Linear Motion system)
δ ：进给丝杠轴系统的弹性位移量 μm
(Elastic displacement of Linear Motion system)

●丝杠轴的刚性 Screw Shaft Rigidity K_1

(1)普通安装时(轴向为固定—自由时)(图A-108)
In case of general mounting(Fixed-Free in axial direction)(Fig. A-108)

$$K_1 = \frac{A \cdot E}{r} \times 10^{-3} \quad N/\mu m$$

(2)两端固定时(图A-109)
In case of Fixed-Fixed mounting in axial direction(Fig. A-109)

$$K_1 = \frac{A \cdot E \cdot L}{r(L-r)} \times 10^{-3} \quad N/\mu m$$

r=L/2时将产生最大轴向位移,刚性如下所示。
The max. axial displacement occurs when r = L/2. The formula is as follows.

$$K_1 = \frac{4 \cdot A \cdot E}{L} \times 10^{-3} \quad N/\mu m$$

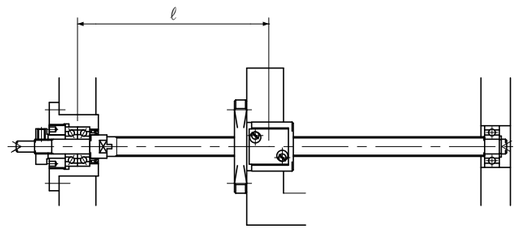
A ：丝杠轴的最小截面积(Screw Shaft minimum section area)

$$A = \frac{\pi}{4} d^2 \quad mm^2$$

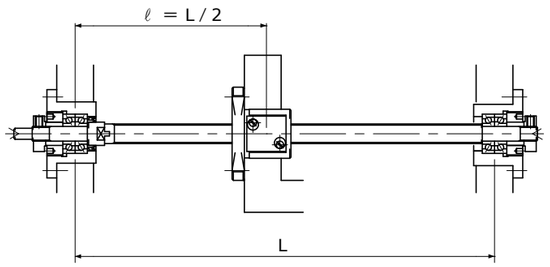
d ：丝杠轴底径(Screw Shaft Root diameter) mm
E ：杨氏模量(Young's modulus) 2.08×10^5 N/mm^2(MPa)
r ：轴向固定点和螺母中央的距离(Axial distance between fixed point & Nut center) mm
L ：安装间距(Mounting span distance) mm

因此,因轴向负载Fa引起的丝杠轴弹性位移量δ可由下式求出。
Accordingly, the amount of Screw Shaft Elastic displacement δ due to Axial load Fa is as follows.

$$\delta = \frac{Fa}{K_1} \quad \mu m$$



图A-108 ：轴向为固定一自由时
Fig. A-108 ：Fixed-Free in axial direction



图A-109 ：两端固定时
Fig. A-109 ：Fixed-Fixed in axial direction

●螺母的刚性　K_2

2018年制定的JIS B1192第4部规定了轴向静刚性的计算公式。KSS依据JIS规定的计算公式计算理论静刚性。

(1)单螺母间隙规格的刚性

单螺母间隙规格的螺母理论静刚性K_2用下式计算。

●Nut Rigidity　K_2

Calculation formula of static Rigidity is defined by JIS B1192-4 established in 2018. KSS will use the formula which is defined by JIS to identify the static Rigidity.

(1)Rigidity of Single Nut with backlash

Theoretical static Rigidity(K_2) of the Single Nut with backlash is calculated by the formula as follows.

$$K_2 = f_{ar} \times (3/2) \times Fa/\delta \quad (N/\mu m)$$

K_2	：螺母的理论静刚性(Theoretical Nut Rigidity)	N/μm
Fa	：轴向负载(Axial Load)	N
δ	：轴向负载Fa时的弹性位移量 (Amount of Elastic displacement at Axial Load Fa)	μm
f_{ar}	：补偿系数(Correction factor) = 0.67	

$$\delta = k \times Fa^{2/3} \quad (\mu m)$$

$$k = \frac{C}{Z^{2/3} \times Dw^{1/3} \times (\sin\alpha \times \cos\beta)^{5/3}}$$

k	：刚性特性系数(Rigidity characterization factor)	
Z	：承受负载的滚珠数量(Quantity of loaded Ball)	个(qty.)
Dw	：钢珠直径(Diameter of Ball)	mm
α	：螺纹槽接触角(Contact angle to the thread groove)	度(deg.)
β	：导程角(Lead angle)	度(deg.)
C	：由材料、形状、尺寸决定的辅助系数 (Coefficient depending on the material, shape and dimension)	0.52～0.58 (0.52～0.58)

基本额定动负载Ca的30%的轴向负载作用时，螺母的理论静刚性值K_2 请见“尺寸表”。轴向负载非基本额定动负载Ca的30%时，可用下式简单计算。

The theoretical static Rigidity K_2 of the Nut under an Axial load equivalent to 30% of the Basic Dynamic Load Rating Ca is described in dimension table. For Axial loads which are not 30% of the Basic Dynamic Load Rating Ca, it can be easily calculated by following formula.

$$K'_2 = K_2 \times \left(\frac{Fa}{0.3Ca}\right)^{1/3} \quad N/\mu m$$

K_2	：尺寸表中标出的螺母刚性值(Nut Rigidity in dimension table)	N/μm
Fa	：轴向负载(Axial load)	N
Ca	：基本额定动负载(Basic Dynamic Load Rating)	N

(2)预压规格(零间隙规格)的刚性

单螺母预压规格的螺母理论静刚性K_2在轴向负载Fa为预压量F_{pr}的 $2\sqrt{2}$ 两倍以下时为固定值，不受轴向负载Fa的影响，用下式计算。

(2)Rigidity of preloaded Ball Nut

Theoretical static Rigidity(K_2) of the preloaded single Ball Nut will become a fixed value if axial load (Fa) is less than $2\sqrt{2}$ times of the preload amount (F_{pr}) regardless of the value of the axial load(Fa), and this will be calculated as follows.

$$K_2 = 2^{3/2} \times \frac{1}{k} \times F_{Pr}^{1/3} \quad N/\mu m$$

k	：刚性特性系数(Rigidity Characterization factor) 参照上述内容(See formula stated above)	
F_{pr}	：预压负载(Preload amount)	N

预压品(轴向间隙为0)的刚性值也会随预压动扭矩值的偏差而发生变化。
因此，详情请垂询本公司。
此外，轴向负载Fa超过预压量Fpr的两倍时，计算公式与单螺母的理论静刚性值相同。

In case of Preload type Ball Screws, Rigidity varies depending on the dispersion of Preload Dynamic Drag Torque. Therefore, please inquire KSS for details.
If the axial load(Fa) will be more than $2\sqrt{2}$ times of the preload amount(F_{pr}), the calculation formula will be the same as the formula for single Nut Theoretical static Rigidity.

施加相当于基本额定动负载Ca的5%的预压负载时的螺母理论静刚性值K2请见“尺寸表”。预压负载与上述不同时，可用下式简单计算。

The theoretical static Rigidity K_2 under a Preload equivalent to 5% of the Basic Dynamic Load Rating Ca is described in dimension table. For Preload amounts other than the above, it can be easily calculated by following formula.

$$K'_2 = K_2 \times \left(\frac{F_{pr}}{0.05Ca}\right)^{1/3} \quad N/\mu m$$

K_2	：尺寸表中标出的螺母刚性值(Nut Rigidity in dimension table)	N/μm
F_{pr}	：预压负载(Preload amount)	N
Ca	：基本额定动负载(Basic Dynamic Load Rating)	N

●支撑轴承的刚性　K_3

支撑轴承的刚性因所用轴承及其预压量而异，详情请洽询轴承制造商。

●Support Bearing Rigidity　K_3

Support Bearing Rigidity varies depending on the type of Bearing and amount of Preload. Please inquire Bearing manufacturers.

●螺母和轴承安装部的刚性　K_4

螺母安装部及轴承安装部等的刚性因装置的结构和设计而异，本公司未作具体规定，请尽量采用高刚性设计。

●Nut, Bearing fitting part Rigidity　K_4

Rigidity of Nut mounting part and Bearing mounting part vary depending on machine structure and design. KSS cannot mention the details but a design of high Rigidity must be considered.

●丝杠轴的扭曲刚性

与轴向位移相比，扭曲造成的定位误差值很小，需要考虑时，可由下式求出。

●Screw Shaft torsion Rigidity

For positioning error due to torsion, this error is a relatively small compared to axial displacement. However, if investigation is required, the following formula may be used for calculation.

$$\theta = \frac{32T\,L}{\pi\,Gd^4} \times \frac{180}{\pi} \times 10 \quad deg$$

θ	：扭力矩引起的扭曲角(Torsion angle due to torsion moment)	deg
T	：扭力矩(Torsion moment)	N·cm
L	：螺母与轴端支撑部的距离(Distance between Nut & Shaft end support)	mm
G	：切变模量(Modulus of Rigidity)	8.3×10^4 N/mm²(MPa)
d	：丝杠轴底径(Screw Shaft Root diameter)	mm

因扭曲角而引起的轴向位移量δa如下所示。

Amount of axial displacement δa due to torsion angle is as follows.

$$\delta a = r \times \frac{\theta}{360} \times 10^3 \quad \mu m$$

r：导程(Lead)　mm

基本额定负载和基本额定寿命
Basic Load Rating and Basic Rating Life

●基本额定动负载Ca与基本额定寿命

滚珠丝杠的额定寿命是指一组相同的滚珠丝杠在相同的条件下运行时，其中90%的滚珠丝杠的滚珠槽及滚珠表面没有因滚动接触而导致疲劳剥落的状态下的总转数。基本额定动负载Ca是指额定寿命为100万转的轴向负载，该值以Ca标记在尺寸表中。滚珠丝杠的额定寿命L10可利用该基本额定动负载Ca的值，通过以下基本公式推算。

$$L_{10} = \left(\frac{Ca}{f \cdot Fa}\right)^3 \times 10^6 \quad rev.$$

不用总转数而用时间L_{10h}或行走距离L_{10d}来表示额定寿命时，可通过以下公式计算。

$$L_{10h} = \left(\frac{1}{60 \cdot N}\right) \times L_{10} \quad 时间(hours)$$

$$L_{10d} = \left(\frac{r}{10^6}\right) \times L_{10} \quad km$$

Ca：基本额定动负载(Basic Dynamic Load Rating) N
Fa：轴向负载(Axial load) N
N ：转速(Revolution) min^{-1}
r：导程(Lead) mm
f ：负载系数(Load factor)
f=1.0～1.2 几乎无振动、无冲击时
(for almost no vibration, no impact load)
f=1.2～1.5 稍有振动、冲击时
(for slight vibration, impact load)
f=1.5～3.0 有强烈振动、冲击时
(for severe vibration, impact load)

一般情况下，作用于设备的轴向负载并不固定，其运行方式可分为几种。此时，可通过下式求出等效轴向负载Fam、等效转速N_m，然后算出额定寿命。

Axial load 轴向负载 N	Revolution 转速 min^{-1}	Frequency of use 使用频率 %
Fa_1	N_1	t_1
Fa_2	N_2	t_2
Fa_3	N_3	t_3

$$Fam = \left(\frac{Fa_1^3 \cdot N_1 \cdot t_1 + Fa_2^3 \cdot N_2 \cdot t_2 + Fa_3^3 \cdot N_3 \cdot t_3}{N_1 \cdot t_1 + N_2 \cdot t_2 + N_3 \cdot t_3}\right)^{1/3} \quad N$$

$$N_m = \frac{N_1 \cdot t_1 + N_2 \cdot t_2 + N_3 \cdot t_3}{t_1 + t_2 + t_3} \quad min^{-1}$$

●Basic Dynamic Load Rating Ca and Basic Rating Life

The Basic Rating Life of Ball Screws means the total number of revolutions which 90% of the Ball Screws can endure. Failure is indicated by flaking caused by rolling fatigue on the surface of grooves or Balls. These figures are valid when a group of the same type Ball Screws are operated individually under the same conditions. The Basic Dynamic Load Rating Ca is the Axial load for which the Basic Rating Life is 1,000,000 revolutions. These values are listed under Ca in the dimension tables. Ball Screw's Basic Rating Life L_{10} can be estimated using Basic Dynamic Load Rating Ca in the following basic formula.

Also, in place of the total number of revolutions, the Basic Rating Life can be expressed in hours:L_{10h} or traveled distance:L_{10d}, and these can be calculated through the following formulas.

Generally, Axial load on the most machine is not constant and it can be divided into several operating pattern. In this case, Basic Rating Life can be calculated to figure up equivalent Axial load Fam, equivalent Revolution N_m in the following formula.

此外，轴向负载呈直线变化时的平均轴向负载Fam也可通过下式近似求出。

Also, for Axial loads which vary linearly, the average Axial load Fam can be calculated approximately using the following formula.

$$Fam = \frac{Fa\ min + 2 \cdot Fa\ max}{3} \quad N$$

Fa min ：最小轴向负载(Minimum Axial load) N
Fa max：最大轴向负载(Maximum Axial load) N

注)滚珠丝杠寿命的计算公式以润滑状态良好、无异物混入为前提，且是在无力矩负载以及径向负载作用的纯轴向负载下的计算公式。

Note)As the Basic Rating Life varies due to lubricating conditions, and contaminations, Moment load or Radial load, etc., this should be considered a rough estimate only.

2018年制定的JIS B1192第5部规定了在计算基本额定寿命时应考虑负载方向和预压负载。因此，小型滚珠丝杠的额定寿命计算也适用以此为基准的计算公式。

Load direction and Preload will be taken into consideration when calculate the Basic Rating Life by JIS B1192-5, which was established in 2018. Therefore, KSS uses a calculation formula of Basic Rating Life for Miniature Ball Screws that is conformed to JIS B1192-5.

●考虑负载方向的寿命计算

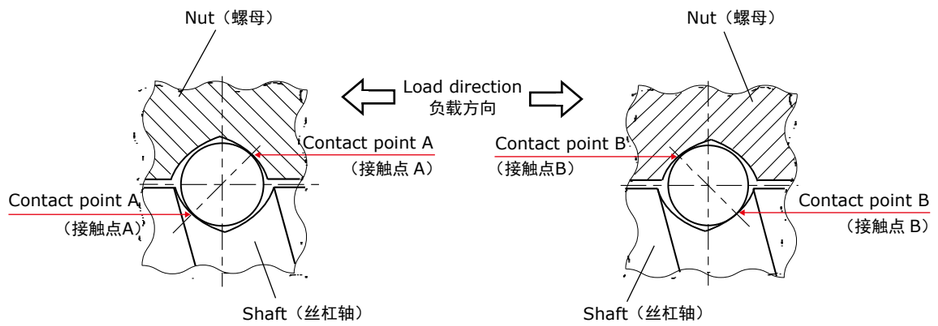
因为负载方向会导致滚珠的接触点位置发生改变(参照图A-110)，所以要计算出各个滚珠接触点的额定寿命，将某一接触点发生剥落(Flaking)的时间点视为寿命。计算公式如下。

●Life calculation considered the Load direction

Contact point of the Steel Balls changes based on Load direction(see Fig. A-110), therefore it is considered the lifetime when flaking occurred at any contact points, with calculating the Rating Life at each contact point of the Steel Balls.
The calculating formula is as follows.

$$L'_{10} = \left(L_{10(A)}^{-10/9} + L_{10(B)}^{-10/9}\right)^{-9/10} \quad rev.$$

L'_{10} ：接触点A侧与B侧的合成寿命(Merged Basic Rating Life of contact point A and B)
$L_{10(A)}$：滚珠接触点A侧的额定寿命(Basic Rating Life on contact point A)
$L_{10(B)}$：滚珠接触点B侧的额定寿命(Basic Rating Life on contact point B)

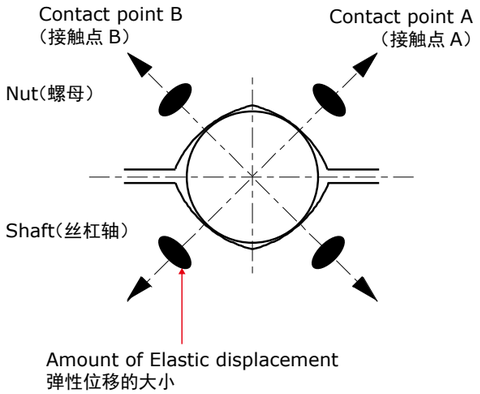


图A-110：各负载方向的钢珠接触状态
Fig. A-110 : Ball contact condition by load direction

●考虑预压负载的寿命计算

负载预压的滚珠丝杠装有大号钢珠，在无负载状态下，钢珠为4点接触。因此要计算出各个滚珠接触点的额定寿命，将某一接触点发生剥落(Flaking)的时间点视为寿命。

大号钢珠施加预压时，钢珠接触状态如图A-111所示。弹性位移的大小大致可用椭圆(接触椭圆)表示。
在没有外部负载的状态下，接触点A、B的接触状态相同。

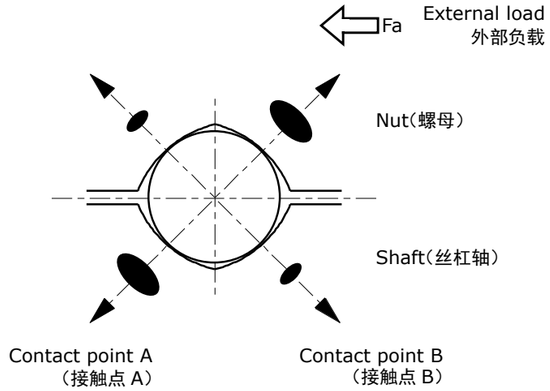


图A-111 ：预压作用状态下的钢珠接触状态
Fig. A-111 ：Ball Contact condition under Preload

●Life calculation considered the Preload

Preloaded Ball Screw is filled with oversized Balls, therefore each Steel Ball is contacted at four(4) points between Screw Shaft and Ball Nut. It is considered the lifetime when flaking occurred at any contact points, with calculating the Rating Life at each contact point.

The contact point of the Steel Balls is described in Fig. A-111, when Preload is effective by oversized Balls. The amount of Elastic displacement is described schematically by oval(contact ellipse).
Both contact point A and B are evenly contacted under no load from outside.



图A-112 ：外部负载作用状态下的钢珠接触状态
Fig. A-112 ：Ball contact condition under preload & external load

外部负载Fa作用于此处后，接触点A侧的弹性位移增大，接触点B侧的弹性位移缩小(图A-112)。
此时，作用于接触点A、B的负载根据赫兹的弹性位移理论，可用下式计算。
将其代入基本额定寿命的基本公式，即可计算出各个接触点的额定寿命。

When external load(Fa) is applied, Elastic displacement increases at contact point A, and decreases at contact point B(see Fig. A-112).
In this case, the load at contact point A and B can be calculated as below based on the Hertz theory of Elastic displacement.
By substituted each values into the formula of Basic Rating Life, Rating Life of each contact point can be calculated.

$Fa \leq 2\sqrt{2}\ F_{pr}$时

In case of $Fa \leqq 2\sqrt{2}\ F_{pr}$

$$Fa_{(A)} = F_{pr} \times \left(1 + \frac{Fa}{2^{3/2} \times F_{pr}}\right)^{3/2} \qquad Fa_{(B)} = Fa_{(A)} - Fa$$

Fa ：外部轴向负载(Amount of external load) N
$Fa_{(A)}$：作用于接触点A侧的轴向负载(Axial load applying on contact point A) N
$Fa_{(B)}$：作用于接触点B侧的轴向负载(Axial load applying on contact point B) N
F_{pr} ：预压负载(Preload) N

$Fa > 2\sqrt{2}\ F_{pr}$时

In case of $Fa > 2\sqrt{2}\ F_{pr}$

$$Fa_{(A)} = Fa \qquad Fa_{(B)} = 0$$

注）A和B的负载方向相反。

Note) Load direction of A and B is opposite.

使用通过上式计算出的轴向负载值，计算接触点A、B的额定寿命($L_{10(A)}$、$L_{10(B)}$)，计算由二者合成的组合寿命。

Using the value calculated by the above formula, calculate the Rating Life at each contact point A and B ($L_{10(A)}$, $L_{10(B)}$), then merge both value to calculate the merged Basic Rating Life.

$$L_{10(A)} = \left(\frac{Ca}{f \cdot Fa_{(A)}}\right)^3 \times 10^6 \quad \text{rev.}$$

$$L_{10(B)} = \left(\frac{Ca}{f \cdot Fa_{(B)}}\right)^3 \times 10^6 \quad \text{rev.}$$

$$L'_{10} = \left(L_{10(A)}^{-10/9} + L_{10(B)}^{-10/9}\right)^{-9/10} \quad \text{rev.}$$

注）粗略计算时，有时也会简单地将外部负载与预压负载F_{pr}之和作为轴向负载计算寿命。

Note) As a rough estimation of Basic Rating Life, we consider the Axis load as external load added by preload amount F_{pr} for some cases.

●基本额定静负载Coa

基本额定静负载Coa是指在承受最大应力的接触部，使钢珠的轨道面和钢珠的永久变形量的和为钢珠直径的1/10000的轴向静止负载。该值以Coa标记于尺寸表中。该基本额定静负载Coa的值用于探讨静止状态或转速非常低(10min^{-1}以下)时的负载条件。上述的永久变形量在多数情况下不影响使用。此时，螺纹槽部的最大许用负载Fa max可由下式求出。

●Basic Static Load Rating Coa

The Basic Static Load Rating Coa is the Axial Static load at which the amount of permanent deformation(Ball + Raceway) occurring at the maximum stress contact point between the Ball and Raceway surfaces is 1/10,000 times the Ball diameter. These values are listed under Coa in the dimension tables. The Basic Static Load Rating Coa values apply to investigation of stationary state or extremely low Revolution load conditions(less than 10 min^{-1}). However, in most cases the amount of permanent deformation causes absolutely no problems under the general conditions. The maximum permissible load Fa max for the screw groove can be found by using the following formula.

$$Fa\ max = \frac{Coa}{fs} \quad N$$

fs ：静态安全系数(Static safety factor)
fs＝1～2　正常运行时(for normal operation)
fs＝2～3　有振动、冲击时(for vibration, impact)

●硬度系数　Hardness coefficient

表面硬度小于HRC58(654 Hv10)时，需要对基本额定动负载Ca和基本额定静负载Coa进行补偿。通过下式进行补偿。

For Surface hardness of less than HRC58(654 Hv10), the Basic Dynamic Load Rating Ca and the Basic Static Load Rating Coa must be adjusted. Adjustment is made by the following formula.

$Ca' = f_h \cdot Ca$ （N）
$Coa' = f_{h0} \cdot Coa$ （N）

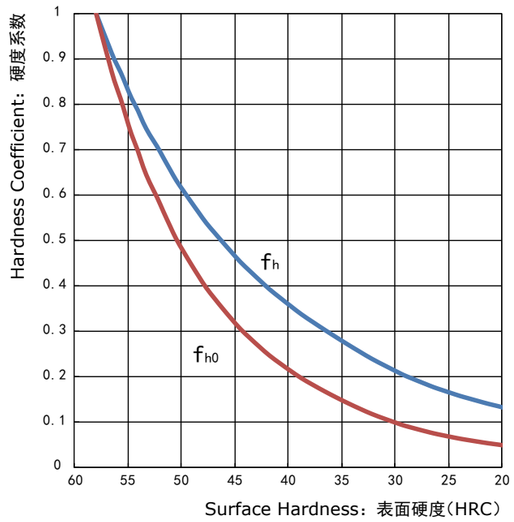
$$f_h = \left(\frac{H_a}{654}\right)^2 \leqq 1$$

$$f_{h0} = \left(\frac{H_a}{654}\right)^3 \leqq 1$$

f_h, f_{h0} ：硬度系数(右图)
Hardness coefficient
(See formula above and graph right)

H_a ：维氏硬度
(Vickers hardness)　Hv10

Hardness Coefficient(硬度系数)



驱动扭矩
Driving Torque

进给丝杠系统的驱动扭矩T由下式求出。

Driving Torque in Linear Motion System T is expressed according to the following formula.

$$T=T_1+T_2+T_3+T_4 \quad N\cdot m$$

T_1	：加速产生的扭矩(Acceleration Torque)	N·m
T_2	：负载扭矩(Load Torque)	N·m
T_3	：预压动扭矩(Preload Dynamic Drag Torque)	N·m
T_4	：其他扭矩(Additional Torque)	N·m

选择电机时需考虑进给丝杠系统产生的扭矩。
T_1～T_3可由下式求出。

When Motor selection, Driving Torque in Linear Motion System is needed.
T_1 ～ T_3 can be calculated by the following formula

●加速产生的扭矩　Acceleration Torque　T_1

$$T_1=\alpha\cdot I \quad N\cdot m$$

$$\alpha = \frac{2\pi N}{60\cdot t} \quad rad/sec^2$$

$$I = Iw\cdot A^2+Is\cdot A^2+I_A\cdot A^2+I_B \quad kg\cdot m^2$$

$$Iw = m_W \times \left(\frac{r}{2\pi}\right)^2 \quad kg\cdot m^2$$

$$Is = m_S \times \left(\frac{d^2}{8}\right) \quad kg\cdot m^2$$

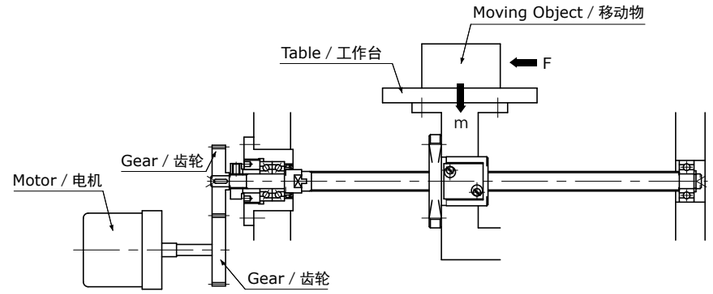
$$m_S = \pi\left(\frac{d}{2}\right)^2 \times L \times \gamma \quad kg$$

α	：角加速度(Angular acceleration)	rad/sec²
I	：惯性矩(Inertia moment)	kg·m²
Iw	：移动物的电机轴换算的惯性矩 (Inertia moment of moving object by Motor axial conversion)	kg·m²
Is	：丝杠轴的惯性矩(Inertia moment of Screw Shaft)	kg·m²
I_A	：丝杠轴侧的齿轮等的惯性矩(Inertia moment of gears on screw side)	kg·m²
I_B	：电机侧的齿轮等的惯性矩(Inertia moment of gears on motor side)	kg·m²
m_W	：移动物质量(Mass of moving object)	kg
m_S	：丝杠轴质量(Mass of Screw Shaft)	kg
r	：导程(Lead)	m
d	：丝杠轴外径(Screw Shaft diameter)	m
L	：丝杠轴长度(Ball Screw length)	m
γ	：比重(Specific gravity)	7,850 kg/m³
A	：减速比(Reduction ratio)	
N	：电机转速(Motor speed)	min⁻¹
t	：加速时间(Acceleration time)	sec

●负载扭矩　Load Torque　T_2

$$T_2=\frac{P\cdot r\cdot A}{2\pi\eta}\times 10^{-3}=\frac{(F+\mu mg)}{2\pi\eta}\cdot r\cdot A\times 10^{-3} \quad N\cdot m$$

P	：轴向负载(Axial load)	N
F	：负载(Load)	N
m	：移动物质量(Mass of moving object)	kg
g	：重力加速度(Gravity acceleraration)＝9.8×10³ mm/sec²	
r	：导程(Lead)	mm
μ	：滑动面摩擦系数(Sliding surface friction coefficient)	
η	：效率(Efficiency)＝0.9	
A	：减速比(Reduction ratio)	



●预压动扭矩　Preload Dynamic Drag Torque　T_3

$$T_3=0.05\times(\tan\beta)^{-0.5}\times\frac{F_{pr}\cdot r}{2\pi}\times 10^{-3} \quad N\cdot m$$

β	：导程角(Lead angle)	deg
F_{pr}	：预压负载(Preload)	N
r	：导程(Lead)	mm

●其他扭矩　Additional Torque　T_4

指上述以外时产生的扭矩。例如支撑轴承的摩擦扭矩及油封滑动阻力产生的扭矩等。

Described as Torque which occurs in addition to those listed above. For example, support Bearing friction Torque, oil seal resistance Torque, etc.

防锈与润滑
Rust prevention and Lubrication

●防锈处理

KSS滚珠丝杠以长期存放为前提，涂抹有防锈油。使用前请用清洁的精制煤油将其洗净，并涂抹润滑油或油脂。根据客户的需求，也可在出厂前涂抹油脂，但长期存放时可能会导致丝杠生锈，敬请注意。

注）KSS涂抹的防锈油侧重于防锈性能，并不具备润滑性能。因此，如果在涂有防锈油的状态下直接使用，可能会缩短丝杠寿命、导致扭矩变大、异常发热等问题。

●Rust prevention

KSS Ball Screws are applied anti-rust oil when shipping in case of no specific instruction. This oil should be removed before use. Wash Ball Screws with cleaned Kerosine and apply lubricant（Grease or Oil） on Ball Screws. As customer's request, specified Grease or Oil can be applied, but it should be noted that they are not suitable for long term storage purpose and rust might occur.

Note）Anti-rust oil is focused on anti-rust performance and it does not have lubricating function. Therefore, when using Ball Screws with anti-rust oil coating, the problems such as shortened Life, increase of Torque and abnormal heat generation occurs.

●润滑

使用滚珠丝杠时，必须涂抹润滑剂。否则会造成扭矩变大或缩短丝杠使用寿命等问题。涂抹润滑剂可以抑制因摩擦而导致的升温、机械效率下降，以及因磨损而导致的精度下降。

滚珠丝杠的润滑方式分为油脂润滑和油润滑。使用油脂润滑时，一般建议使用锂皂基油脂；使用油润滑时，建议使用ISO VG32～68（透平油）。此外，根据用途选择润滑剂也非常重要。特别是微型滚珠丝杠，油脂的搅拌阻力可能会引起扭矩变大等不良情况。本公司备有可在维持滚珠丝杠动作特性的同时，发挥优异润滑性能的KSS原装油脂。用于注重动作特性的低速定位时，备有MSG No.1（稠度 1号）油脂；用于高速、一般用途时，备有MSG No.2（稠度 2号）油脂。详情请参照第B101页的“微型滚珠丝杠专用油脂”。

●Lubrication

In Ball Screw use, lubricant should be required. If lubricant is not applied with, the problem such as increase of Torque and shortened Life occurs. Applying lubricant can minimize temperature increases, decline of mechanical efficiency due to friction, and deterioration of accuracy caused by wear.

Ball Screw lubrication is divided into Greasing and Oiling. A regular lithium-soap-based Grease and ISO VG32-68 Oil（turbine Oil #1 to #3） are recommended. It is highly important to choose lubricant depending on customer's usage. Especially in case of Miniature Ball Screws, malfunction such as increase of Torque are caused by the stir resistance. KSS original Greases which maintains Ball Screw's smooth movement and have high lubricating performance are prepared. MSG No.1 is appropriate for high smooth requirement and high positioning usage（consistency 1）. MSG No.2 is suitable for high speed and general usage（consistency 2）. Please refer to page B101「Original Grease for Miniature Ball Screws」

一般使用条件下的润滑剂示例

Recommended lubricants for normal operating conditions

Lubricant 润滑剂	Type 种类	Product name 产品名称
Grease 油脂	Lithium-based Grease 锂基油脂	KSS original Grease MSG No.2 KSS原装油脂 MSG No.2
Lubricating Oil 润滑油	Sliding surface Oil or turbine Oil 滑动面油或透平油	Super Multi 68 Super Multi68

●检查和补充

使用油脂润滑时，大致检查时间为每2～3个月，使用油润滑时为每隔1周。检查时，请检查油量及有无脏污，并根据需要加油。在追加新油脂时，请尽量擦掉旧的并已变色的油脂。

●Inspection and replenishment

Grease inspection should be performed once every two to three months, and Oil inspection should be performed approximately weekly. Check the Oil or Grease amount and contamination at each inspection and replenish if needed.

When re-greasing, the old or discolored one should be wiped off as much as you can.

润滑剂的检查和补充时间间隔

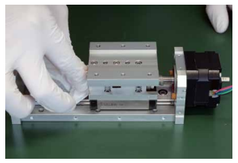
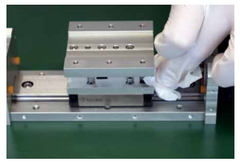
Inspection and replenishment Interval of lubricant

Lubrication 润滑方法	Inspection frequency 检查时间间隔	Inspection Items 检点项目	Replenishment and replacement frequency 补充或更换时间间隔
Automatic intermittent lubrication 自动间歇加油	Weekly 每隔1周	Oil level, contamination 油量、脏污等	Replenish at each inspection, depending on tank capacity 根据油箱容量，在每次检查时适量补充。
Grease 油脂	Every 2 to 3 months initially 运行初期2～3个月	Contamination, swarf contamination 脏物、切屑的混入等	Replenish annually or as necessary, depending on Inspection results The old or discolored grease should be wiped off before re-greasing. 通常每1年补充一次，但应根据检查结果适量补充。擦去变色的旧润滑脂
Oil bath 油浴	Daily before operation 每天开工前	Oil suface check 油面管理	Set a rule for replenishment as necessary, depending on amount of wear. 根据消耗情况适当规定。

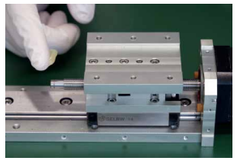
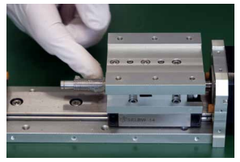
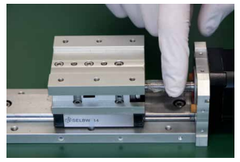
●加注润滑脂的步骤（例）

1）加注润滑脂时，请佩戴橡胶手套，切勿直接用手触摸滚珠丝杠。

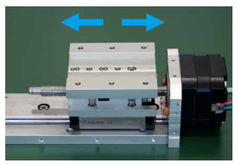
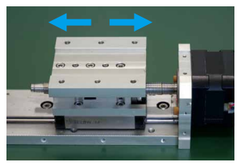
2）使用专用巾（金伯利擦拭纸等）擦去丝杠轴上附着的变色的润滑脂。
请移动螺母，尽可能擦去残留在螺母内的润滑脂。

3）KSS滚珠丝杠未标准设置加油孔。
因此，要将润滑脂涂遍整个丝杠轴。请使用专用刷具或佩戴橡胶手套，直接在丝杠轴上涂抹。螺母上若有加油孔，请使用加油孔封入新润滑脂。

4）在整根丝杠轴上移动螺母，在尚未涂抹到的部分也涂抹润滑脂。尽可能使螺母往复移动多次，进行简单的磨合。
请擦去积存于轴端的多余润滑脂。

详情请垂询本公司。

●Grease-up Procedure（Example）

1）It is desirable to wear rubber gloves, not to handle Ball Screw by bear hand.

2）Wipe off discolored Grease on the Screw Shaft by using cloth or paper exclusive for wiping Grease or oil（e.g.: Kim Wipes by Kimberly-Clark Corp.）.
Move the Ball Nut to wipe off remaining Grease inside the Ball Nut as much as possible.

3）There is no oil hole on the flange for KSS Ball Screws as standard design, apply Grease entirely throughout the Screw Shaft.
Please use the brush exclusive for applying Grease, or apply directly to the Screw Shaft by hand with wearing rubber gloves. If the Ball Nut has an oil hole, utilize it to fill in the new Grease.

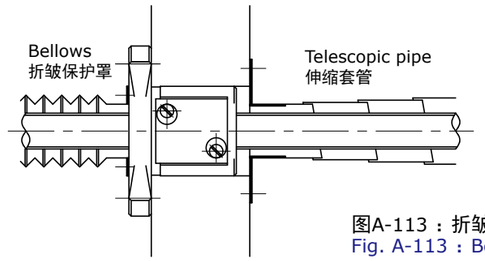
4）In order to apply Grease entirely on the Screw Shaft, move the Ball Nut over full travel manually, or install in the device and do running-in.
Remove any remaining Grease on either end of the Screw Shaft.

Please consult KSS for details.

防尘
Dust prevention

滚珠丝杠的螺母内如果混入脏物或异物，可能会导致过早磨损、螺纹槽损伤、钢珠破裂和循环部损坏等，从而使滚珠丝杠无法工作。如果可能有上述情形发生，建议采取折皱保护罩和伸缩套管等防尘措施，以避免丝杠部外露。

In Ball Screws, if dust or other contaminations intrude into the Ball Nut, wear is accelerated, the screw groove will be damaged, circulation will be obstructed due to Ball fracture, damage of recirculation parts and so on. Eventually, the Ball Screws will cease to function. Where the possibility of dust or other contaminant exists, the screw thread section cannot be left exposed, and dust prevention measure such as a bellows or Telescopic pipe must be taken.



图A-113 ：折皱保护罩和伸缩套管
Fig. A-113 ：Bellows & Telescopic pipe

KSS滚珠丝杠充分发挥微型滚珠丝杠的特点，重视小型化设计。因此，目录中介绍的型号均为不带密封的尺寸。需要密封时，请垂询本公司。螺母尺寸可能会因安装密封而发生变化，敬请注意。此外，某些型号不能安装密封，敬请谅解。

KSS Ball Screws are concentrated on compact design for a feature of Miniature Ball Screw. Therefore, all models in the catalogue are the dimension without seals. Please inquire KSS if seals are required. Please note that Nut dimension may change due to seal installation. Some models cannot install the seals.

表面处理
Surface treatment

出于防锈目的，本公司可对滚珠丝杠实施表面处理。本公司的防锈表面处理以极低温黑铬处理为标准。需要其他表面处理时，请垂询本公司。

Surface treatment can be possible for the purpose of rust prevention. Very Low temp. Black Chrome treatment(BCr) is KSS standard surface treatment for the purpose of rust prevention. Please inquire KSS if other surface treatments are needed.

●KSS极低温黑铬处理滚珠丝杠的特点

- 涂层薄，可安装配合零件。
- 在严格的工序管理下，涂膜的厚度均一，不会影响滚珠丝杠的动作特性。
- 覆膜密接性良好，具有优异的防锈能力。
- 需提高滑动特性时，可一并进行氟树脂涂层。

●Feature of KSS Ball Screws with Very Low temp. Black Chrome(BCr) coating

- Due to thin film thickness, mating part can be applicable with BCr.
- Due to strict production management, film thickness can be treated equally and smoothness is kept.
- High anti-rust ability is possible.
- The surface treatment is officially authorized by MIL standard(MIL-DTL-14538D)
- To improve sliding characteristics, BCr+fluorine resin coating is also available.

照片 A-114 ：极低温黑铬处理品
Photo A-114 ：Very Low temp. Black Chrome coating

●防锈能力试验数据　Examination data of anti-rust ability

根据盐水喷雾试验(JIS Z2371)，使用标准试样进行的防锈能力评估结果如下所示。

Based on the salt spray corrosion test(JIS Z2371), anti-rust ability has been evaluated, as follows.

・标准试样 / Standard test piece ：70mm×150mm×1mm(SPCC材/ material=SPCC)
・数据 / Data ：盐水喷雾试验24小时后的外观和评价数法的评估结果(数值越小，腐蚀越严重)
Evaluated by appearance and rating number method
after 24 hours of salt spray corrosion test.(The less number, the more corrosion)

	Rating number(Average) 评价数(平均值)
Sample A(BCr coating) 试样A(BCr处理)	9.3
Sample B(R coating) 试样B(R处理)	9～8
Sample C(M coating) 试样C(M处理)	3～4

Sample A
试样A

Sample B
试样B

Sample C
试样C

●RoHS指令的符合性　About RoHS compliance

KSS极低温黑铬处理后的滚珠丝杠的六价铬量低于RoHS指令规定的阈值，完全符合RoHS指令。

The amount of hexavalent Chromium in KSS Very Low temp. Black Chrome(BCr) coating is less value than the based on RoHS regulation.

可追溯性
Traceability

KSS滚珠丝杠的生产采用严格精选的材料，使用先进的生产的设备，在严格的温度管理下进行，从各生产工序到产品检查、出厂，采用一条龙的生产管理体。
出厂检查合格的滚珠丝杠可根据需要附加合格证（照片A-115）或检查结果表（照片 A-116）。
本公司生产的滚珠丝杠在螺母上标有生产编号（照片 A-114）。与生产编号相应的出厂检查记录及生产记录由本公司保管，通过查询生产编号，可找出所有出厂检查数据。

KSS Ball Screws are manufactured from rigidly selected materials in our temperature controlled factory. They are manufactured using the latest production equipment, with consistent quality control supervision ranging from the production process to inspection and shipping.
Certificate of inspection, Photo A-115, or Inspection report, Photo A-116 can be provided as your request.
The Ball Screws produced by KSS have a serial number which is marked on the Nut (refer to the Photo A-117).
Record of inspection and production trail which is in correspondence to a production number, are stored in KSS and inspection data can be retrieved by inquiry of a serial number.

此外，也有部分产品未标明生产编号，请垂询本公司。

However,some products may not be applicable for serial number, please ask KSS for more detail.


検査合格証

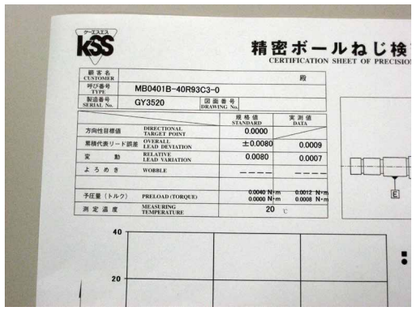
ケーエスエス株式会社
本　　社　東京都大田区矢口 1-22-14
〒146-0093　TEL 03 (3756) 3921 (代)
小千谷工場　新潟県小千谷市大字山谷字新保4-14
〒947-0043　TEL 0258 (82) 5577 (代)


CERTIFICATE OF INSPECTION

This is to Certify that this product has passed the inspection of KSS STANDARD.

KSS CO., LTD.
Head Office: 1-22-14 Yaguchi, Otaku, Tokyo 146-0093
TEL 03(3756)3921
Ojiya Plant: TEL 0258(82)5577

照片 A-115：合格证
Photo A-115：Certificate of Inspection



照片 A-116：检查报告表
Photo A-116：Inspection report

照片 A-117：生产编号
Photo A-117：Serial Number

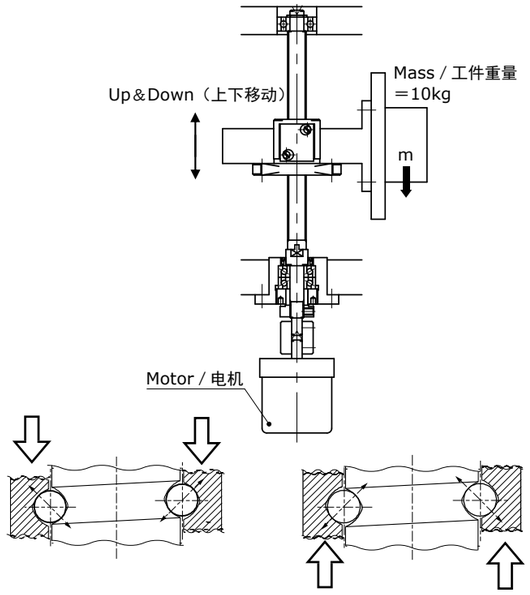
滚珠丝杠各种特性的计算示例
Calculation example of characteristic for Ball Screws.

2018年制定的JIS B1192第5部规定了在计算基本额定寿命时应考虑负载方向和预压负载。因此，小型滚珠丝杠的额定寿命计算也适用以此为基准的计算公式。

Load direction and Preload will be taking into consideration when calculate the Basic Rating Life by JIS B1192-5, which was established in 2018.
Therefore, KSS uses a calculation formula of Basic Rating Life for Miniature Ball Screws that is conformed to JIS B 1192-5.

例1：竖轴规格 Pick＆Place
Example 1：Vertical Pick＆Place

滚珠丝杠的型号和使用条件
Ball Screw model and operating condition

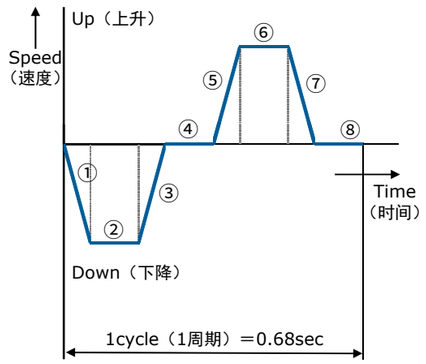


向下负载和钢珠接触状态
Downward load &
Ball contact condition

向上负载和钢珠接触状态
Upward load &
Ball contact condition

图A-118：负载方向和钢珠接触状态
Fig. A-118：Load direction and Ball Contact condition

Operating pattern（运行周期线图）



对于竖轴规格用途，计算寿命时考虑负载方向（滚珠接触点）。本事例以向下为正，向上为负。各负载方向的钢珠接触状态如图A-118所示。

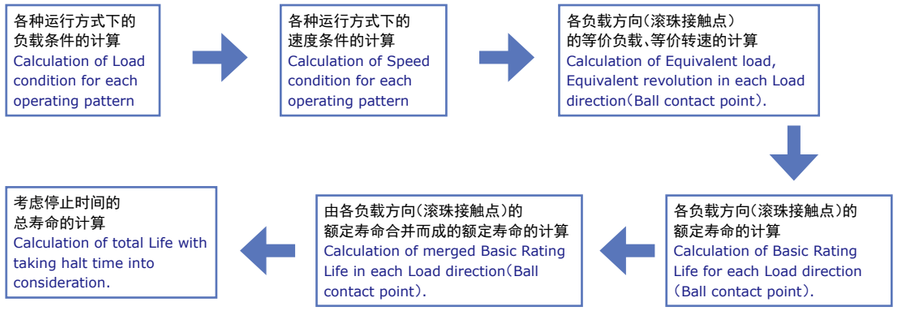
Load direction（Ball contact point）should be considered in calculation of lifetime for Vertical axis application.
Load direction is defined as plus for downward, and as minus for upward. The status of Ball contact point is indicated in Fig. A-118.

主要技术参数	Ball Screw spec.
轴径=φ10mm	Shaft dia. ＝ φ10mm
导程=10mm	Lead ＝ 10mm
基本额定动负载Ca＝3,300N	Dynamic Capacity Ca ＝ 3,300N
滚珠丝杠总长=180mm	Total length ＝ 180mm
轴向间隙=20μm以下	Axial play ＝ 20μm or less

运行条件	Operating Pattern
最高速度=0.4m/sec	Max Speed ＝ 0.4m/sec
**导程10mm时2,400 min^{-1}	** 2,400 min^{-1} because of Lead 10mm
加减速时间=0.02sec	Acceleration ＆ Deceleration time ＝ 0.02 sec
**图中①③⑤⑦	**①③⑤⑦ in diagram above
等速时间=0.2sec	Constant speed time ＝ 0.2 sec
**图中②⑥	**②⑥ in diagram above
停止时间=0.1sec	Halt time ＝ 0.1 sec
**图中④⑧	**④⑧ in diagram above
1周期=0.68sec	Cycle time ＝ 0.68sec

基本额定寿命的计算
Calculation of Basic Rating Life

竖轴规格时，基本额定寿命按以下步骤计算得出。
Basic Rating Life is calculated in the following procedure.



1)根据周期线图(运行方式)计算负载条件

带编号的各种运行方式的负载条件
如下所示。

①下降加速
$Fa_1 = mg - m\alpha = 10 \times 9.807 - 10 \times 20 = -101.9(N)$
②下降等速
$Fa_2 = mg = 10 \times 9.807 = 98.1(N)$
③下降减速
$Fa_3 = mg + m\alpha = 10 \times 9.807 + 10 \times 20 = 298.1(N)$
④停止
$Fa_4 = 0$
⑤上升加速
$Fa_5 = mg + m\alpha = 10 \times 9.807 + 10 \times 20 = 298.1(N)$
⑥上升等速
$Fa_6 = mg = 10 \times 9.807 = 98.1(N)$
⑦上升减速
$Fa_7 = mg - m\alpha = 10 \times 9.807 - 10 \times 20 = -101.9(N)$
⑧停止
$Fa_8 = 0$

式中，
m ：移动物质量 = 10 kg
g ：重力加速度 = 9.807 m/sec²
α ：加速度
达到0.4m/sec前的加速度
$\alpha = 0.4/0.02 = 20$ m/sec²

1)Calculation of Load condition from Operating pattern

Load condition of each operating pattern which is numbered is as follows.

①Down & Acceleration
$Fa_1 = mg - m\alpha = 10 \times 9.807 - 10 \times 20 = -101.9(N)$
②Down & Constant speed area
$Fa_2 = mg = 10 \times 9.807 = 98.1(N)$
③Down & Deceleration
$Fa_3 = mg + m\alpha = 10 \times 9.807 + 10 \times 20 = 298.1(N)$
④Halt
$Fa_4 = 0$
⑤Up & Acceleration
$Fa_5 = mg + m\alpha = 10 \times 9.807 + 10 \times 20 = 298.1(N)$
⑥Up & Constant speed area
$Fa_6 = mg = 10 \times 9.807 = 98.1(N)$
⑦Up & Deceleration
$Fa_7 = mg - m\alpha = 10 \times 9.807 - 10 \times 20 = -101.9(N)$
⑧Halt
$Fa_8 = 0$

Here,
m : Mass = 10 kg
g : Gravity Acceleration = 9.807 m/sec²
α : Acceleration
Acceleration up to 0.4m/sec
$\alpha = 0.4/0.02 = 20$ m/sec²

2)根据周期线图(运行方式)计算速度条件

带编号的各种运行方式的速度条件(转速条件)如下所示。

等速时(②、⑥)：
0.4m/sec = 400 × 60 mm/min = 24,000mm/min
= 2,400 min⁻¹(导程10mm时)
加减速时(①、③、⑤、⑦)：
上述的平均转速为2,400/2 = 1,200 min⁻¹

2)Calculation of Speed condition from Operating pattern

Speed condition(Revolution condition) of each operating pattern which is numbered is as follows.

Constant speed area(②、⑥)；
0.4m/sec = 400 × 60 mm/min = 24,000mm/min
= 2,400 min⁻¹(Lead 10mm)
Acceleration and deceleration area(①、③、⑤、⑦)；
as an average revolution above, 2,400/2 = 1,200 min⁻¹

各种运行方式下的负载条件和速度条件(转速条件)的计算结果如下表所示。

Calculation result of the load condition and speed condition(revolution) for each operating patterns are as below.

Condition 条件	Axial load 轴向负载 Fai(N)	Revolution 转速 Ni(min⁻¹)	Frequency of use 使用频率 ti(sec)
①Down & Acceleration / 下降加速	−101.9	1,200	0.02
②Down & Constant speed / 下降等速	98.1	2,400	0.2
③Down & Deceleration / 下降减速	298.1	1,200	0.02
④Halt / 停止	0	0	0.1
⑤Up & Acceleration / 上升加速	298.1	1,200	0.02
⑥Up & Constant speed / 上升等速	98.1	2,400	0.2
⑦Up & Deceleration / 上升减速	−101.9	1,200	0.02
⑧Halt / 停止	0	0	0.1

负载条件中，+(正)为向下负载，−(负)为向上负载。

plus(+) indicates downward load and minus(−) indicates upward load.

3)分别计算各负载方向(滚珠接触点)的等价负载、等价转速

计算出各运行方式下作用的负载和方向后，下面分别计算各负载方向(滚珠接触点)的等价负载、等价转速。
等价负载、等价转速的计算使用第A825页的计算公式。

3)Calculation of Equivalent load, Equivalent revolution for in each Load direction (Ball contact point)

As we could calculate the applying load and direction in each operating pattern, now we calculate the Equivalent load and Equivalent revolution for each Load direction.
Calculation formula shown in page A825 will be used for calculating Equivalent load and Equivalent revolution.

$$Fam = \left(\frac{Fa_1^3 \cdot N_1 \cdot t_1 + Fa_2^3 \cdot N_2 \cdot t_2 + Fa_3^3 \cdot N_3 \cdot t_3 + \cdots\cdots + Fa_i^3 \cdot N_i \cdot t_i}{N_1 \cdot t_1 + N_2 \cdot t_2 + N_3 \cdot t_3 + \cdots\cdots + N_i \cdot t_i} \right)^{1/3} \quad N$$

$$N_m = \frac{N_1 \cdot t_1 + N_2 \cdot t_2 + N_3 \cdot t_3 + \cdots\cdots + N_i \cdot t_i}{t_1 + t_2 + t_3 + \cdots\cdots + t_i} \quad min^{-1}$$

各负载方向(滚珠接触点)的运行条件及其各自的等价负载、等价转速的计算结果如下表所示。

Now calculation table should be re-arranged as below by load direction, and Equivalent load and Equivalent revolution in each load direction are as follows.

Condition 条件	Downward load / 向下负载		Upward load / 向上负载		Frequency of use 使用频率 ti(sec)
	Axial load 轴向负载 Fai(N)	Revolution 转速 Ni(min⁻¹)	Axial load 轴向负载 Fai(N)	Revolution 转速 Ni(min⁻¹)	
①Down & Acceleration 下降加速	–	–	101.9	1,200	0.02
②Down & Constant speed 下降等速	98.1	2,400	–	–	0.2
③Down & Deceleration 下降减速	298.1	1,200	–	–	0.02
④Halt 停止	–	–	–	–	0.1
⑤Up & Acceleration 上升加速	298.1	1,200	–	–	0.02
⑥Up & Constant speed 上升等速	98.1	2,400	–	–	0.2
⑦Up & Deceleration 上升减速	–	–	101.9	1,200	0.02
⑧Halt 停止	–	–	–	–	0.1
Equivalence 等价	Fam(d) =129.3	Nm(d) =2,290.9	Fam(u) =101.9	Nm(u) =1,200	Working duration(运行) : 0.48 sec Halt time(停止) : 0.2 sec 1 cycle(1周期) : 0.68 sec

4)计算各负载方向(滚珠接触点)的额定寿命

使用各负载方向(滚珠接触点)的等价负载、等价转速,计算向下负载、向上负载的额定寿命。

4)Calculation of Basic Rating Life for each Load direction(Ball contact point)

Then calculate the Basic Rating Life for downward load, upward load by using the value of Equivalent load, Equivalent revolution in each load direction(Ball contact point).

【向下负载】

将等价负载Fam(d)和等价转速Nm(d)代入第A825页的寿命计算公式中,可得出以下结果。

【Downward load】

Substitute the Equivalment Load Fam(d) and Revolution Nm(d) in the following formula in page A825.

$$L_{10h(d)} = \left(\frac{Ca}{f \cdot Fam(d)}\right)^3 \times \left(\frac{10^6}{60 \cdot Nm(d)}\right) = 69{,}991 \text{ 小时(hours)}$$

其中,假设基本额定动负载Ca = 3,300N、负载系数f = 1.2。

Here, Basic Dynamic Load Rating Ca = 3,300N, Load factor f = 1.2.

【向上负载】

向上负载也可用同样的方式计算。

【Upward load】

Calculate the upward load as same method as above.

$$L_{10h(u)} = \left(\frac{Ca}{f \cdot Fam(u)}\right)^3 \times \left(\frac{10^6}{60 \cdot Nm(u)}\right) = 272{,}988 \text{ 小时(hours)}$$

5)计算由各负载方向(滚珠接触点)的额定寿命合并而成的额定寿命

使用第A826页的公式,计算由各负载方向(滚珠接触点)的额定寿命$L_{10h(d)}$、$L_{10h(u)}$合成的组合寿命。

5)Calculation of merged Basic Rating Life in each Load direction(Ball contact point)

Calculate the merged Basic Rating Life by combining the Basic Rating Life of each Load direction($L_{10h(d)}$, $L_{10h(u)}$), with the calculation formula of page A826.

$$L'_{10h} = \left(L_{10h(d)}^{-10/9} + L_{10h(u)}^{-10/9}\right)^{-9/10} = 58{,}504 \text{ 小时(hours)}$$

6)考虑停止时间的总寿命的计算

上述计算只是运行时间的计算结果,计算总寿命还需要考虑1个周期中的停止时间。

5)Calculation of total Life with taking halt time into consideration

Above calculation is only for the working duration, therefore calculate the total Life with taking halt time in each cycle into consideration.

$$L''_{10h} = L'_{10h} \times (\text{周期时间 cycle time}) / (\text{运行时间 working duration}) = 58{,}504 \times (0.68 / 0.48)$$

$$= 82{,}881 \text{ 小时(hours)}$$

进给丝杠系统的驱动扭矩的计算

根据第A829页计算进给丝杠系统的驱动扭矩。这在选择电机时非常重要。
上述示例并非预压规格的滚珠丝杠,所以不产生预压动扭矩。因此只计算加速扭矩T_1、负载扭矩T_2。

Calculation of Driving Torque for Linear Motion system

Calculate Driving Torque for Linear Motion system according to page A829. It is important for motor selection. In the above case, due to backlash type Ball Screw, Preload Dynamic Drag Torque does not occur. Therefore, calculate acceleration Torque T_1 and Load Torque T_2.

$$T = T_1 + T_2 + T_3 + T_4 \quad \text{N·m}$$

T_1 : 加速产生的扭矩(Acceleration Torque) N·m
T_2 : 负载扭矩(Load Torque) N·m
T_3 : 预压动扭矩(Preload Dynamic Drag Torque) N·m
T_4 : 其他扭矩(Additional Torque) N·m

1)加速扭矩T_1的计算(Calculation of acceleration Torque T_1)

$T_1 = \alpha \cdot I = \alpha(Iw + Is)$ N·m

α : 角加速度(Angular acceleration) rad/sec²
I : 惯性矩(Inertia moment) kg·m²
Iw : 移动物的电机轴换算的惯性矩 kg·m²
(Inertia moment of moving object by motor axis conversion)
Is : 丝杠轴的惯性矩(Inertia moment of Screw Shaft) kg·m²

$$Iw = m_W \times (r/2\pi)^2 = 2.53 \times 10^{-5} \quad \text{kg·m}^2$$

m_W: 移动物质量(Mass of moving object)=10kg
r : 滚珠丝杠导程(Ball Screw Lead)=0.01m

$$Is = m_S \times (d^2/8) = (d/2)^2 \pi \gamma \times L \times (d^2/8) = 0.139 \times 10^{-5} \quad \text{kg·m}^2$$

m_S : 丝杠轴质量(Mass of Screw Shaft) kg
γ : 丝杠轴比重(Specific gravity of Screw Shaft)=7,850kg/m³
d : 丝杠轴外径(Shaft dia.)=0.01m
L : 丝杠轴长度(Shaft length)=0.18m

$$\alpha = (2\pi N)/60t = 12{,}566.4 \quad \text{rad/sec}^2$$

N : 最高速度(Max speed)= 2,400min⁻¹
t : 加速时间(Acceleration time)=0.02sec

$$T_1 = 12{,}566.4 \times (2.53 + 0.139) \times 10^{-5} = 0.335 \text{N·m}$$

2)负载扭矩T_2的计算(Calculation of Load Torque T_2)

$$T_2 = mgr/(2\pi\eta) = 0.173 \text{N·m}$$

m : 移动物质量(Mass of moving object)=10kg
g : 重力加速度(Gravity Acceleration)=9.807m/sec²
r : 滚珠丝杠导程(Ball Screw Lead)=0.01m
η : 滚珠丝杠效率(Ball Screw efficiency)=0.9

3)进给丝杠系统的驱动扭矩T的计算

根据以上计算,在不考虑支撑轴承等产生的扭矩时,滚珠丝杠轴系统的驱动扭矩如下所示。

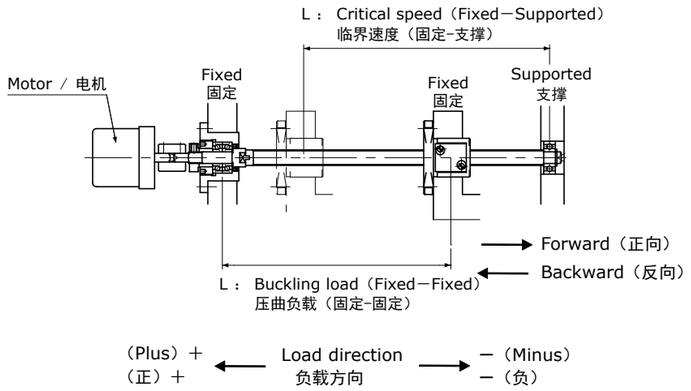
3)Calculation of Driving Torque T

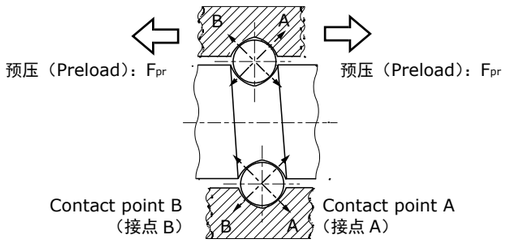
for Linear Motion system
In case without consideration of Torque by support Bearings, Driving Torque of Ball Screw is as follows.

$$T = T_1 + T_2 = 0.335 \text{ N·m} + 0.173 \text{ N·m} = 0.508 \text{N·m}$$

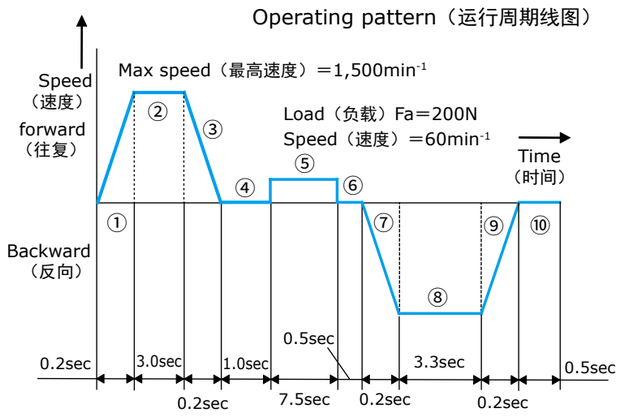
例2 ：横轴规格 台式小型车床
Example 2 ：Horizontal desk top small lathe

滚珠丝杠的型号和使用条件
Ball Screw model and operating condition





图A-119 ：使用条件和钢珠接触状态
Fig A-119 ：Operating condition and Ball Contact point



主要技术参数	Ball Screw spec.
轴径＝φ12mm	Shaft dia. ＝ φ12mm
导程=2mm	Lead ＝ 2mm
丝杠轴底径 d＝φ10.6mm	Shaft Root dia. d ＝ φ10.6mm
基本额定动负载Ca＝1,900N	Dynamic Capacity Ca ＝1,900N
安装间距L=400mm	Mounting span L ＝ 400mm
轴向间隙=0μm以下	Axial play ＝ 0μm or less
移动物质量 m ＝ 10kg	Mass of moving object m ＝ 10kg
滑动面摩擦系数 μ=0.05	Sliding surface friction coefficient μ ＝ 0.05
预压负载 F_{pr} ＝ 95N（Ca×5%）	Preload F_{pr} ＝ 95N（Ca×5%）

运行条件	Operating Pattern
最高速度=50mm/sec	Max Speed ＝ 50mm/sec
**导程2mm时1,500 min^{-1}	** 1,500 min^{-1} because of Lead 2mm
周期线图 ：参照上图	Operating pattern ：see diagram above
①⑦加速 ＝ 0.2sec	①⑦Acceleration ＝ 0.2sec
②正向等速 ＝ 3.0sec	②Constant speed(forward) ＝ 3.0sec
③⑨减速 ＝ 0.2sec	③⑨Deceleration ＝ 0.2sec
④⑥⑩停止 ＝ 2.0sec(合计)	④⑥⑩halt ＝ 2.0sec(total)
⑤切削时间 ＝ 7.5sec	⑤Turning time ＝ 7.5sec
⑧反向等速 ＝ 3.3sec	⑧Constant speed(backward) ＝ 3.3sec
切削阻力Fa ＝ 200N	Load Fa ＝ 200N
切削时速度 ＝ 2mm/sec	Cutting speed ＝ 2mm/sec
**导程2mm时60min^{-1}	**60min^{-1} due to 2 mm lead

许用轴向负载的计算

1）弯曲负载的探讨

根据第A815页的计算公式计算压曲负载。

$$P = \alpha \times \frac{n\pi^2 E \cdot I}{L^2} \quad N$$

$$I = \frac{\pi}{64} d^4 \quad mm^4$$

将安全系数 α＝0.5、
杨氏模量 E＝2.08×10^5N/mm^2(MPa)
底径 d＝10.6mm、固定—固定的安装系数 n＝4、
安装间距 L＝400mm代入上式。

P = 15,900N

该值远大于使用负载，因此没有问题。

2）相对于屈服应力的许用负载的探讨

A815页的计算公式计算。

$$P = \sigma \times A \quad N$$

$$A = \frac{\pi}{4} d^2 \quad mm^2$$

将许用应力σ＝98N/mm^2(MPa)、
底径 d＝10.6mm代入上式。

P ＝ 8,650 N

该值远大于使用负载，因此没有问题。

许用转速的计算

A816页的计算公式计算。

$$N = \beta \times \frac{60 \cdot \lambda^2}{2\pi} \times \sqrt{\frac{E \cdot I \cdot g}{\gamma \cdot A \cdot L^4}} \quad min^{-1}$$

$$I = \frac{\pi}{64} d^4 \quad mm^4 \qquad A = \frac{\pi}{4} d^2 \quad mm^2$$

将安全系数β＝0.8、
杨氏模量 E＝2.08×10^5N/mm^2(MPa)、
重力加速度 g＝ 9.8×10^3mm/sec^2
比重 γ＝7.7×10^{-5}N/mm^3、
底径 d＝10.6mm、
固定—支撑的安装系数 λ＝3.927、
安装间距L＝400mm代入上式。

N＝10,000min^{-1}

该值远大于最高转速，因此没有问题。

Calculation of permissible Axial load

1）Study of Buckling load

Calculate Buckling load according to the following formula in page A815.

$$I = \frac{\pi}{64} d^4 \quad mm^4$$

Substitute safety factor α＝0.5,
Young's modulus E＝2.08×10^5N/mm^2(MPa),
Root diameter d＝10.6mm,
Fixed—Fixed mounting factor n＝4,
mounting span L＝400mm in formula above.

P ＝ 15,900N

It is more than maximum Load so that there is no problem.

2）Study of permissible Load for yield stress

Calculate permissible Load for yield stress based on the formula in page A815.

$$A = \frac{\pi}{4} d^2 \quad mm^2$$

Substitute permissible stress σ＝98N/mm^2(MPa),
Root diameter d＝10.6mm in the formula above.

P ＝ 8,650 N

It is more than maximum Load and there is no problem.

Calculation of permissible Revolution

Calculate permissible Revolution based on the formula in page A816

$$N = \beta \times \frac{60 \cdot \lambda^2}{2\pi} \times \sqrt{\frac{E \cdot I \cdot g}{\gamma \cdot A \cdot L^4}} \quad min^{-1}$$

$$I = \frac{\pi}{64} d^4 \quad mm^4 \qquad A = \frac{\pi}{4} d^2 \quad mm^2$$

Substitute safety factor β＝0.8,
Young's modulus E＝2.08×10^5N/mm^2(MPa),
gravity acceleration g＝9.8×10^3 mm/sec^2,
material specific gravity γ＝7.7×10^{-5}N/mm^3,
Root diameter d＝10.6mm,
Fixed—Support mounting factor λ＝3.927,
mounting span L ＝ 400mm in formula above.

N＝10,000min^{-1}

Therefore, it is more than maximum Revolution and there is no problem.

基本额定寿命的计算

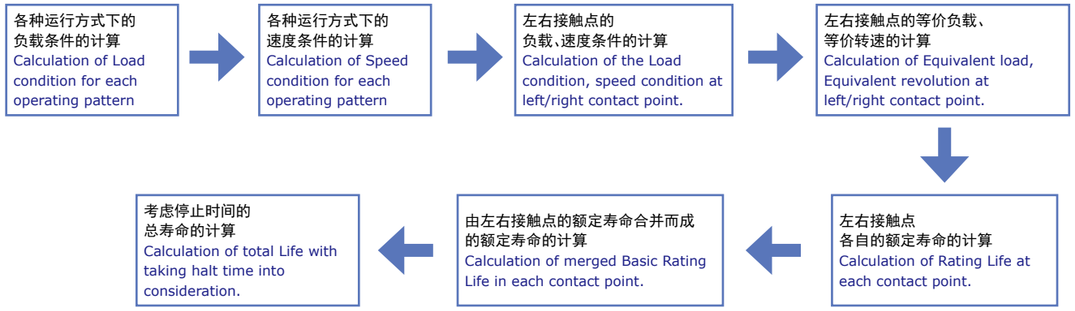
2018年制定的JIS B1192第5部规定了在计算基本额定寿命时应考虑负载方向和预压负载。因此，小型滚珠丝杠的额定寿命计算也适用以此为基准的计算公式。

大号钢珠施加预压时，钢珠接触状态如图A-111所示，为4点接触。正如第A827页的解说，外部负载会使预压下的初期接触状态发生变化，考虑到这些因素，要先分别计算出作用于接触点A、B的负载、额定寿命后，再计算总寿命。

Calculation of Basic Rating Life

Load direction and Preload will be taken into consideration when calculate the Basic Rating Life by JIS B1192-5, which was established in 2018. Therefore, KSS uses a calculation formula of Basic Rating Life for Miniature Ball Screws that is conformed to JIS B 1192-5.

In case when preload is effective by oversized Ball, the contact condition of the Ball is 4 points as per Fig. A-111. As explained in page A827, total Life can be calculated after calculation of Rating Life at contact point A and B due to the change of initial contact condition under the preload casused by external load.



1）根据周期线图（运行方式）计算负载条件

带编号的各种运行方式的负载条件如下所示。

①正向加速
$Fa_1 = \mu mg + ma = 0.05 \times 10 \times 9.807 + 10 \times 0.25 = 7.4(N)$
②正向等速
$Fa_2 = \mu mg = 0.05 \times 10 \times 9.807 = 4.9(N)$
③正向减速
$Fa_3 = \mu mg - ma = 0.05 \times 10 \times 9.807 - 10 \times 0.25 = 2.4(N)$
④停止
$Fa_4 = 0$
⑤切削时
$Fa_5 = \mu mg + Fa = 0.05 \times 10 \times 9.807 + 200 = 204.9(N)$
⑥停止
$Fa_6 = 0$
⑦反向加速
$Fa_7 = -(\mu mg + ma) = -(0.05 \times 10 \times 9.807 + 10 \times 0.25) = -7.4(N)$
⑧反向等速
$Fa_8 = -\mu mg = -0.05 \times 10 \times 9.807 = -4.9(N)$
⑨反向减速
$Fa_9 = -\mu mg + ma = -0.05 \times 10 \times 9.807 + 10 \times 0.25 = -2.4(N)$
⑩停止
$Fa_{10} = 0$

式中，
m：移动物质量＝ 10 kg
g：重力加速度＝ 9.807 m/sec²
α：加速度
达到50mm/sec ＝ 0.05m/sec前的加速度
α ＝0.05/0.2＝0.25 m/sec²

1）Calculation of Load condition from Operating pattern

Load condition of each operating pattern which is numbered is as follows.

①Forward Acceleration
$Fa_1 = \mu mg + ma = 0.05 \times 10 \times 9.807 + 10 \times 0.25 = 7.4(N)$
②Forward at constant speed area
$Fa_2 = \mu mg = 0.05 \times 10 \times 9.807 = 4.9(N)$
③Forward Deceleration
$Fa_3 = \mu mg - ma = 0.05 \times 10 \times 9.807 - 10 \times 0.25 = 2.4(N)$
④Halt
$Fa_4 = 0$
⑤at Turning
$Fa_5 = \mu mg + Fa = 0.05 \times 10 \times 9.807 + 200 = 204.9(N)$
⑥Halt
$Fa_6 = 0$
⑦Backward Acceleration
$Fa_7 = -(\mu mg + ma) = -(0.05 \times 10 \times 9.807 + 10 \times 0.25) = -7.4(N)$
⑧Backward at constant speed area
$Fa_8 = -\mu mg = -0.05 \times 10 \times 9.807 = -4.9(N)$
⑨Backward Deceleration
$Fa_9 = -\mu mg + ma = -0.05 \times 10 \times 9.807 + 10 \times 0.25 = -2.4(N)$
⑩Halt
$Fa_{10} = 0$

Here,
m：Mass ＝ 10 kg
g：Gravity Acceleration ＝ 9.807 m/sec²
α：Acceleration
Acceleration which reaches up to 50mm/sec
α ＝ 0.05 / 0.2 ＝ 0.25 m/sec²

2）根据周期线图（运行方式）计算速度条件

带编号的各种运行方式的速度条件（转速条件）如下所示。

等速时（②、⑧）：
50mm/sec ＝ 50×60 mm/min ＝ 3,000mm/min
＝ 1,500 min^{-1}（导程2mm时）

加减速时（①、③、⑦、⑨）：
上述的平均转速为1,500/2＝ 750 min^{-1}

各种运行方式下的负载条件和速度条件（转速条件）的计算结果如下表所示。

2)Calculation of Speed condition from Operating pattern

Speed condition（Revolution condition）of each operating pattern which is numbered as follows.

Constant speed area（②、⑧）;
50mm/sec＝50×60 mm/min ＝ 3,000mm/min
＝ 1,500 min^{-1}（Lead 2mm）

Acceleration and deceleration area（①、③、⑦、⑨）;
As above average revolution, 1,500/2＝ 750 min^{-1}

Calculation result of the load condition and speed condition（revolution）for each operating patterns are as below.

Condition 条件	Axial load 轴向负载 Fai（N）	Revolution 转速 Ni（min^{-1}）	Frequency of use 使用频率 ti（sec）
①Forward Acceleration / 正向加速	7.4	750	0.2
②Forward at Constant speed / 正向等速	4.9	1,500	3.0
③Forward Deceleration / 正向减速	2.4	750	0.2
④Halt / 停止	0	0	1.0
⑤Turning / 切削	204.9	60	7.5
⑥Halt / 停止	0	0	0.5
⑦Backward Acceleration / 反向加速	−7.4	750	0.2
⑧Backward at constant speed / 反向等速	−4.9	1,500	3.3
⑨Backward Deceleration / 反向减速	−2.4	750	0.2
⑩Halt / 停止	0	0	0.5

3）计算左右接触点各自的负载条件

在预压负载下，滚珠与螺纹槽4点接触，该状态会在外部负载的作用下，变化为第827页（图A-112）的接触状态。根据发生了变化的弹性位移反推，用下式计算作用于接触点（A、B）的负载。

【外部负载方向为＋（正）方向时】

$$Fai_{(A)} = F_{pr} \times \left(1 + \frac{Fai}{2^{3/2} \times F_{pr}}\right)^{3/2}$$

【外部负载方向为－（负）方向时】

$$Fai_{(B)} = F_{pr} \times \left(1 + \frac{|Fai|}{2^{3/2} \times F_{pr}}\right)^{3/2}$$

式中，
F_{pr} ：预压负载 ＝ 95 N
Fai ：各条件下的轴向负载（N）
（A）、（B）：表示滚珠接触点

分别计算接触点（A、B）在上述各运行条件下的负载及转速条件，结果如表A-120所示。

3)Calculation of the Load condition at left/right contact point

Ball contact condition in 4 point between Balls and thread grooves by preload may changes by external load as shown in page 827（Fig. A-112）.
Based on the changed Elastic displacement, load applying on the contact point A and B will be calculated by formula below.

【If the direction of the external load is plus（+）】

$$Fai_{(B)} = Fai_{(A)} - Fai$$

【If the direction of the external load is minus（−）】

$$Fai_{(A)} = Fai_{(B)} - |Fai|$$

Here,
F_{pr} ：Preloaded load ＝ 95 N
Fai ：Axial load in each condition（N）
（A）,（B）：This means contact point

The calculation result of each load condition and revolution condition as per contact point A and B is shown in table A-120.

4）分别计算左右接触点的等价负载、等价转速

计算出各运行条件下作用于接触点A、B的负载后，下面分别计算各接触点的等价负载、等价转速。接触点A、B仅为负载条件不同，速度条件（转速条件）、使用频率相同。
等价负载、等价转速的计算使用第A825页的计算公式。

4) Calculation of Equivalent load, Equivalent revolution at left and right contact point

Load applying on contact point A and B is calculated under each operating condition, then Equivalent load and Equivalent revolution at each contact point will be calculated. However, the speed and frequency of use stay the same, only the load condition will be different.
Calculation formula shown in page A825 will be used for calculating Equivalent load and Equivalent revolution.

$$Fam = \left(\frac{Fa_1^3 \cdot N_1 \cdot t_1 + Fa_2^3 \cdot N_2 \cdot t_2 + Fa_3^3 \cdot N_3 \cdot t_3 + \cdots\cdots + Fa_i^3 \cdot N_i \cdot t_i}{N_1 \cdot t_1 + N_2 \cdot t_2 + N_3 \cdot t_3 + \cdots\cdots + N_i \cdot t_i} \right)^{1/3} \quad N$$

$$N_m = \frac{N_1 \cdot t_1 + N_2 \cdot t_2 + N_3 \cdot t_3 + \cdots\cdots + N_i \cdot t_i}{t_1 + t_2 + t_3 + \cdots\cdots + t_i} \quad min^{-1}$$

各种运行方式下作用于接触点A、B的负载及其各自的等价负载、等价转速的计算结果如下表所示。

The axial load applying on contact point A and B for each condition, Equivalent load and Equivalent revolution are as follows.

表 A-120 ：各接触点的负载、转速条件
Table A-120 ：Load & Revolution condition at each contact point

Condition 条件	Axial load 轴向负载 Fai（N）	Axial load at contact pt. A 接触点A的 轴向负载 $Fai_{(A)}$（N）	Axial load at contact pt. B 接触点B的 轴向负载 $Fai_{(B)}$（N）	Revolution 转速 Ni（min^{-1}）	Frequency of use 使用频率 ti（sec）
① Forward Acceleration 正向加速	7.4	99.0	91.6	750	0.2
② Forward at Constant speed 正向等速	4.9	97.6	92.7	1,500	3.0
③ Forward Deceleration 正向减速	2.4	96.3	93.9	750	0.2
④ Halt 停止	0	—	—	0	1.0
⑤ Turning 切削	204.9	222.3	17.4	60	7.5
⑥ Halt 停止	0	—	—	0	0.5
⑦ Backward Acceleration 反向加速	−7.4	91.6	99.0	750	0.2
⑧ Backward at constant speed 反向等速	−4.9	92.7	97.6	1,500	3.3
⑨ Backward Deceleration 反向减速	−2.4	93.9	96.3	750	0.2
⑩ Halt 停止	0	—	—	0	0.5
Equivalence 等价		$Fam_{(A)}$=109.0	$Fam_{(B)}$=94.0	Nm=719.2	Working duration（运行）：14.6 sec Halt time（停止）：2.0 sec 1 cycle（1周期）：16.6 sec

注）接触点A、B的负载计算结果均用绝对值表示。
Note）Results of applying load at contact point A and B are all absolute number.

5）分别计算左右接触点的额定寿命

使用滚珠接触点A、B各自的等价负载、等价转速，计算接触点A、B的额定寿命。

5) Calculation of Rating Life at each contact point

Calculate the Basic Rating Life at contact point A and B by using the value of Equivalent load, Equivalent revolution in each contact point A, B.

【接触点A】

将等价负载$Fam_{(A)}$和等价转速N_m代入第A825页的寿命计算公式，可得出以下结果。

【Contact point A】

Substitute the Equivalent load $Fam_{(A)}$ and Equivalent revolution N_m in the following formula as shown in page A825.

$$L_{10h(A)} = \left(\frac{Ca}{f \cdot Fam_{(A)}} \right)^3 \times \left(\frac{10^6}{60 \cdot N_m} \right) = 71{,}029 \text{ 小时(hours)}$$

【接触点B】

将等价负载$Fam_{(B)}$和等价转速N_m代入第A825页的寿命计算公式，可得出以下结果。

【Contact point B】

Substitute the Equivalent load $Fam_{(B)}$ and Equivalent revolution N_m
in the following formula as shown in page A825.

$$L_{10h(B)} = \left(\frac{Ca}{f \cdot Fam_{(B)}} \right)^3 \times \left(\frac{10^6}{60 \cdot N_m} \right) = 110{,}747 \text{ 小时(hours)}$$

其中，假设基本额定动负载Ca ＝ 1,900N、
负载系数f ＝ 1.2。

Here, Basic Dynamic Load Rating Ca ＝ 1,900N,
Load factor f ＝ 1.2.

6）计算由左右接触点的额定寿命合并而成的额定寿命

使用第A826页的公式，计算由接触点A、B的额定寿命（$L_{10h(A)}$、$L_{10h(B)}$）合成的组合寿命。

6) Calculation of merged Basic Rating Life in each contact point

Calculate merged Basic Rating Life of contact point A, B（$L_{10h(A)}$, $L_{10h(B)}$）by using formula in page A 826.

$$L'_{10h} = \left(L_{10h(A)}^{-10/9} + L_{10h(B)}^{-10/9} \right)^{-9/10} = 46{,}257 \text{ 小时(hours)}$$

7）考虑停止时间的总寿命的计算

上述计算只是运行时间的计算结果，计算总寿命还需要考虑1个周期中的停止时间。

7) Calculation of total Life with taking halt time into consideration

Above calculation is only for the working duration, therefore calculate the total Life with taking halt time into consideration.

$$L''_{10h} = L'_{10h} \times (\text{周期时间 cycle time}) / (\text{运行时间 working duration}) = 46{,}257 \times (16.6 / 14.6)$$
$$= 52{,}594 \text{ 小时(hours)}$$

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 3months. 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.

微型滚珠丝杠专用油脂
Original Grease for Miniature Ball Screws

滚珠丝杠的动作特性一般会受到油脂特性的影响。
尤其是微型滚珠丝杠会受到很大的油脂稠度引起的搅拌阻力的影响，在涂抹油脂后丝杠扭矩可能会增大。因此，油脂的选择极为重要。
作为微型滚珠丝杠的专业厂商，本公司发挥多年积淀的技术专长，研发出了无损微型滚珠丝杠动作特性、且润滑性能优异的油脂。同时还备有起尘量极少的无尘室专用油脂。
客户可根据用途选择最适用的专用油脂。

In general, it is known that the operation characteristic of the Ball Screws is influenced by properties of Grease. Especially, the stir resistance of Grease influences Ball Screw torque after applying Grease. Selection of Grease is extremely important in the Miniature Ball Screws. KSS has developed Ball Screw excellent Grease, which has high lubrication performance without deteriorating Ball Screw operation.
KSS has also developed its exclusive Grease, which keeps smooth feeling and less contamination under clean room environment.
We think the best special Grease is prepared respectively according to customer's usage.

●特点

摩擦系数小、粘附性良好、润滑性优异，是最适于微型滚珠丝杠的油脂。
根据用户的不同用途，本公司备有常规环境下使用的稠度1号、稠度2号以及在无尘室使用的稠度1号油脂。

●Features

It is the best Grease for the Miniature Ball Screws, which has low coefficient of friction, good adhesion characteristic, excellent lubricity.

●用途

常规环境用	MSG No.1：精密定位用途 最适于特别注重动作特性的用途。 MSG No.2：常规用途 较高转速下粘附性也很优异。
无尘室专用	MCG No.1：用于无尘室内的低速定位， 注重低起尘和动作特性。

●Application

General use	MSG No.1：High positioning usage appropriate for high smoothness requirement. MSG No.2：General usage appropriate for high speed.
Clean room use	MCG No.1：High positioning usage in clean room focused on less contamination, high smoothness.

●基本规格　Specifications

	MSG No.1	MSG No.2	MCG No.1
Application / 用途	General use / 一般规格	General use / 一般规格	Clean room use / 无尘室规格
Thickener / 增稠剂	Lithium / 锂皂	Lithium / 锂皂	Lithium / 锂皂
Base-oil / 基油	Synthetic oil / 合成油	Synthetic oil / 合成油	Synthetic oil / 合成油
Appearance / 外观	Light brown / 浅褐色	Light brown / 浅褐色	Beige / 米色
Consistency / 混合稠度	310～340	265～295	310～340
Temp.range / 使用温度范围	−60～120°C	−60～120°C	−30～120°C
Type & Contents / 型号和封入量	MSG-1-380:380g(400cc) MSG-1-45:45g(50cc)	MSG-2-380:380g(400cc) MSG-2-45:45g(50cc)	MCG-1-45:40g(45cc)

注1)在常温以外的环境下使用KSS原装油脂时，请垂询本公司。　Note 1)In case of the usage of this grease under other than room temperature, please consult KSS.

●油脂摩擦试验机（MSG No.1、MSG No.2）

1）试验装置

· 销盘式摩擦磨损试验机（照片 B-11）
· 销：3/16 英寸钢珠（SUJ2　HRC60～62）
· 负载：50N　250N或350N（10N递增方式）
· 圆盘材料：SCM415（表面粗糙度＝0.8s）渗碳淬火（HRC58～62）

●Grease Friction Test（MSG No.1、MSG No.2）

1）Testing device

· Pin-on Disk test machine（Photo B-11）
· Pin：3/16 inch Steel Ball（SUJ2　HRC60～62）
· Load：50N　250N or 350N（Step up each 10N）
· Disk material：SCM415（surface roughness＝0.8s）Case hardening（HRC58～62）

2）其他油脂与MSG的比较数据

参照图B-12、B-13
试样A、B、D：锂基油脂
试样C：脲基油脂

2）Comparison data to other Grease

See Fig. B-12, B-13
Sample A,B,D：Lithium based Grease,
Sample C：Urea based Grease

照片 B-11：销盘式摩擦磨损试验机
Photo B-11：Pin-on Disk test machine

从图中可以看出，MSG No.1几乎没有摩擦系数增大现象，有利于滚珠丝杠发挥其动作特性。

MSG No.1 hardly increase coefficient of friction.
It has an advantage for smooth operation.

Disk rev.（圆盘转速）＝100min⁻¹

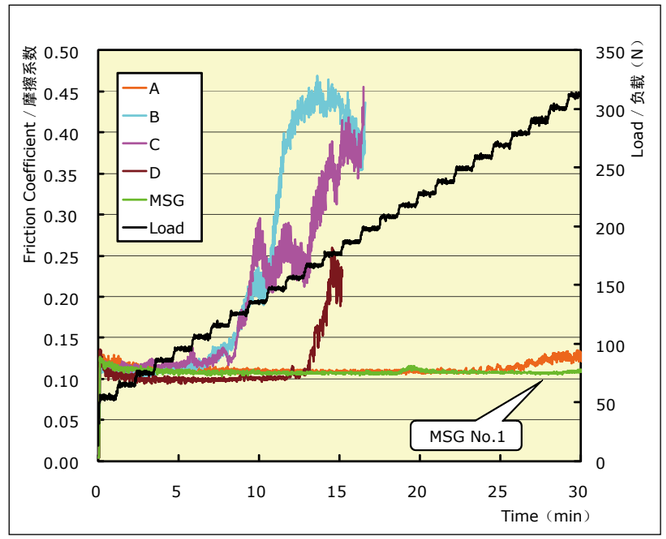


图 B-12：MSG No.1与其他油脂的比较图
Fig. B-12：Comparison btw MSG No.1 & others

Disk rev.（圆盘转速）＝500min⁻¹

MSG No.2即使在较高转速下，摩擦系数的增大也很少，可维持丝杠的动作特性。

MSG No.2 does not increase coefficient of friction under the relatively high speed.

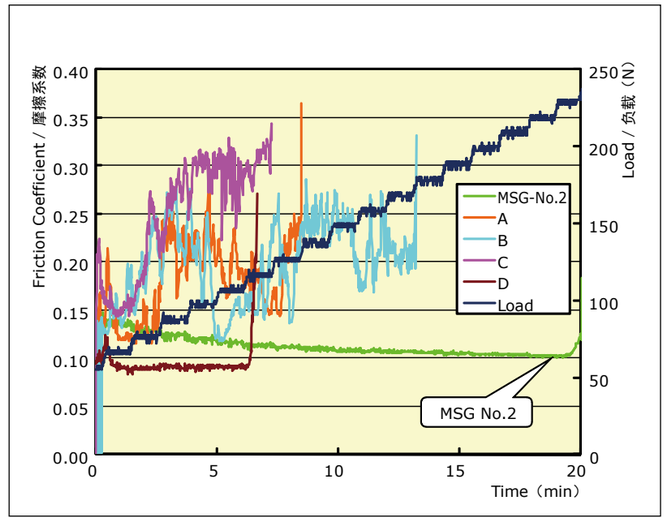


图 B-13：MSG No.2与其他油脂的比较图
Fig. B-13：Comparison btw MSG No.2 & others

●油脂承载能力测量

1)测量装置和测量方法

· 测量装置 ：
曾田式四球磨损试验机(照片 B-14)
· 测量方法 ：
750 min^{-1} 阶跃载荷方式(3/4 inch Ball)***

***注)阶跃载荷方式
将试样设置在试验机上,从0.5kgf/cm^2(0.049MPa)起,每1分中增加0.5kgf/cm^2的压力进行试验,产生烧结时的压力减去0.5kgf/cm^2的值即为承载能力。数值越大,油脂越不易烧结。

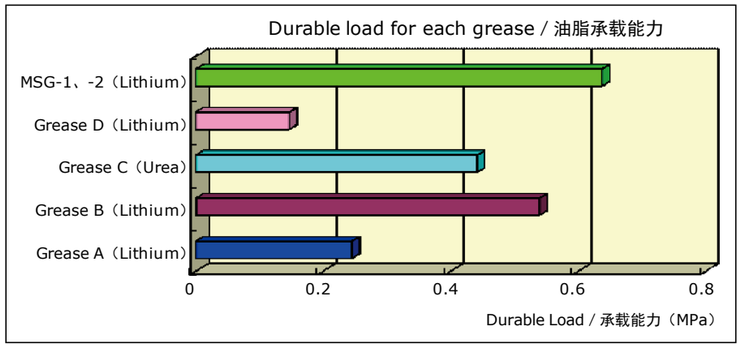
●Grease Load Test (MSG No.1、MSG No.2)

1)Testing device and method

· Testing device and method ：
SOTA-4-Ball test machine(Photo B-14)
· Testing method ：
750 min^{-1} Step load method
(3/4 inch Ball)***

***Note)Step load method
Pressure is added by each 0.5kgf/cm^2(0.049MPa) from the first 0.5kgf/cm^2 in every one minutes.
Durable load are defined when discoloration occur.

2)测量结果 Test results



照片 B-14 ：曾田式四球磨损试验机
Photo B-14 ：SOTA-4-Ball wear test machine

●油脂起尘试验 (MCG No.1)

1)测量装置和测量方法

· 测量装置 ：照片 B-15
· 滚珠丝杠尺寸 ：φ10mm / 导程 15mm
· 测得的转速 ：500min^{-1}

比较本公司生产的常规用途油脂(MSG No.2)与其他公司生产的常规用途油脂后可以发现,本公司生产的KSS无尘室规格油脂MCG No.1即使经过运行时间后起尘量也很少。

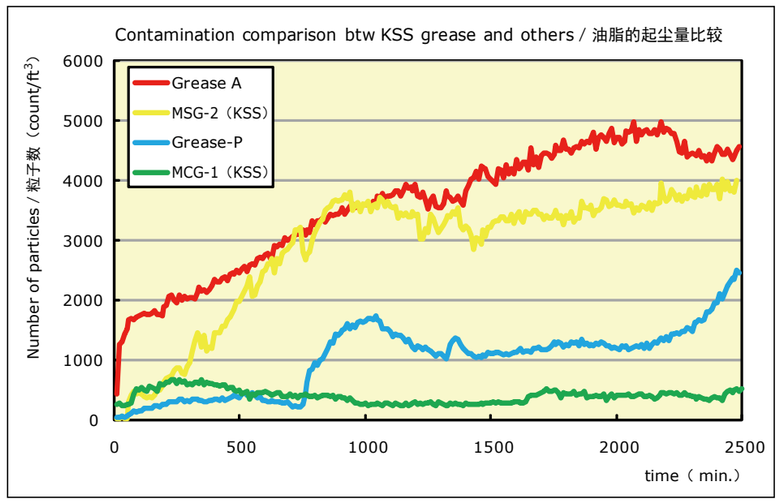
●Grease Contamination Test (MCG No.1)

1)Testing device and method

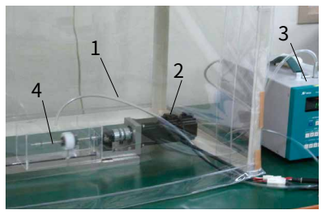
· Measurement device ：see Photo B-15
· Ball Screw size ：φ10mm / Lead 15mm
· Revolution ：500min^{-1}

KSS clean room Grease (MCG No.1) has less contamination compared to other Grease such as KSS general use Grease (MSG No.2) and other competitor's (Grease-A,-P)as the time passed.

2)测量结果(0.5μm粉尘) Test result(0.5μm particle)



1Suction / 吸引泵
2Servo Motor / 伺服电机
3Particle Counter / 计数器
4Sample / 试样



照片 B-15 ：清洁台
Photo B-15 ：Clean bench

●因润滑脂而产生的扭矩特性差异

微型滚珠丝杠的驱动扭矩较小,扭矩特性会受到润滑脂稠度的影响。
涂抹的润滑脂稠度越大,滚珠丝杠的驱动扭矩越大。
而使用KSS微型滚珠丝杠专用油脂不易受到润滑脂稠度的影响,可抑制扭矩增大(参照图 B-16)。

●Difference of Torque characteristics by Grease

Driving torque of Miniature Ball Screw is relatively small, therefore torque characteristics of Miniature Ball Screw is influenced by the Grease consistency.
If high consistency Grease applied, driving torque of the Ball Screw tends to become larger.
By using KSS original Grease for Miniature Ball Screw, influence of the Grease consistency is relatively smaller, and able to prevent the increase in the driving torque.
See graph blow(Fig.B-16).

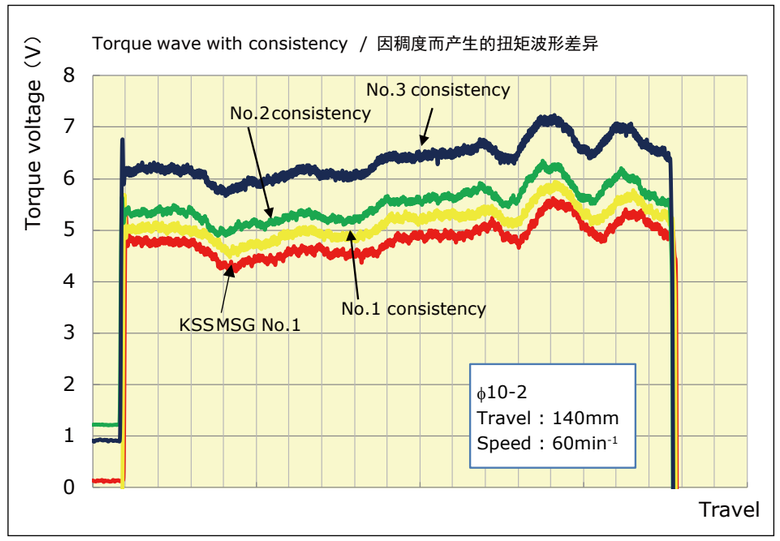


图 B-16 ：因稠度而产生的扭矩特性
Fig. B-16: Torque wave by Grease consistency

⚠ 操作注意事项

操作注意事项

· 如果油脂误入眼中,可能会引发炎症。
操作时请佩戴护目镜等防护用品,以免油脂误入眼中。
· 油脂如果触及皮肤,可能会引发皮肤炎。
操作时请佩戴保护手套等防护用品,以免油脂触及皮肤。
· 请勿饮用或食用。
(如果吞入腹中,可能会引起腹泻或呕吐。)
· 请将油脂放置于儿童用手够不到的场所。

应急处理

· 油脂一旦误入眼中,请用清水冲洗15分钟,并立即接受医生治疗。
· 油脂触及皮肤时,请用肥皂水充分清洗。
· 油脂吞入腹中时,请勿强行催吐,应立即接受医生治疗。

废油和废容器的处理

· 相关法令对油脂的处理方法作了明确规定。请依照法令正确处理。
· 不了解处理方法时,请咨询经销商后再处理。

存放方法

· 请用密封塞对油脂进行密封,以防脏物或水分等混入。
· 请避开直射阳光,存放于阴暗之处。

⚠ Handling instruction

Handling Precaution

· It might be inflammatory when entering eyes.
Wear glasses when you handle it.
· When it touches the skin, it might be inflammatory.
Wear globes when you handle it.
· Do not eat or drink it.
It is likely to have loose bowels, and to vomit when drinking.
· Put the Grease on the place where child's hand does not reach.

First aid

· Wash for 15 minutes by clean water, and receive the doctor's diagnosis when it enters eyes.
· Wash enough with water and soap when it touches your skin.
· Receive the doctor's diagnosis without forcibly vomiting when drinking.

Disposal

· Dispose properly according to the law.
· Consult manufacturer about an uncertain point.

Storage

· Seal up to avoid mixing garbage and moisture.
· Avoid direct sunlight, and keep it in darkness.

精密进给丝杠篇　Precision Lead Screws

接单生产 MG系列
Customized products MG series

本公司除了生产滚珠丝杠外，还生产精密进给丝杠。
精密进给丝杠具有滚珠丝杠所没有的小节距，可用于精度要求不高的场合。

KSS manufactures not only Ball Screws but also Precision Lead Screws.
It can be used as small Pitch which Ball Screws do not have, and it can be achievable when less precise products are needed.

●特点

可选择小节距
可选择难以用滚珠丝杠设定的小节距。

产品种类齐全
本公司以JIS规定的公制细牙螺纹、公制粗牙螺纹为标准，也可以提供梯形螺纹、统一协定螺纹、ACME螺纹、特殊节距、多条螺纹等。

低扭矩
充分发挥螺纹量规生产的技术专长，利用高超的研磨技术和镜面加工技术制造而成的丝杠产品，螺纹加工面表面粗糙度低、导程误差小，实现了低扭矩和低磨损。

螺母形状的自由度
螺母无形状限制，可根据客户设计制成各种形状。

●Features

Possible to select small Pitch
It is possible to select small Pitch which Ball Screws do not have.

Wide variety of size
Metric Fine Thread and Metric Coarse Thread based on JIS（Japanese Industrial Standard）are standardized but we also manufacture Trapezoidal Thread, Unified Screw Thread, ACME Screw Thread, special Pitch, and multiple start Thread.

Low torque
With knowhow of screw gauge, we make use of grinding technique, and lapping technique, so fine surface roughness and low wobble become reality, which lead low torque and less wear.

Flexibility of Nut configuration
Nut configuration is not restricted and it is possible to manufacture in accordance with customer's design.

●公称型号的构成　Model number notation

MG　6　P=0.5（2N）— 120　R　150
①　②　③　④　⑤　⑥　⑦

①进给丝杠符号
　MG：精密进给丝杠
　　M：普通进给丝杠
　**非公制螺纹时符号不同。
②丝杠轴外径(mm)
③节距(mm)
④螺纹条数
　2N＝2条，1条时省略
⑤螺纹部长度(mm)
⑥螺纹旋向　R＝右旋,L＝左旋
⑦丝杠轴总长(mm)

①Lead Screws series No.
　MG：Precision Lead Screws
　　M：General Lead Screws
　**Sign differs other than M-thread Screw.
②Screw Shaft outside diameter(mm)
③Pitch(mm)
④Number of Thread
　2N＝double-start thread、No identified for single-start thread
⑤Screw thread length(mm)
⑥Thread direction　R＝Right-hand, L＝Left-hand
⑦Screw Shaft total length(mm)

注1)型号列于本公司出示的“规格表”中。
注2)精度等级、轴向间隙未列入公称型号。
Note 1)Model number is mentioned in specification document that we hand in.
Note 2)Accuracy, Axial play are not mentioned in Model number notation.

●材质和表面硬度　Material & Surface hardness

Components / 零件	Material / 材质	Surface hardness / 表面硬度
Shaft / 丝杠轴	SKS-31、SCM415、SUS440C	HRC50 or more （HRC50以上）
	SUS303	N/A（无规定）
Nut / 螺母	C5191B、CAC902C（AQ10）	N/A（无规定）

●丝杠轴外径与节距的组合　Combination of Shaft dia. & Pitch

Unit(单位):mm

Shaft dia. 轴径 \ Pitch 节距	0.25	0.35	0.4	0.45	0.5	0.7	0.75	0.8	1.0	1.25	1.5	2.0
2	◎		○									
2.5		◎		○								
3		◎			○							
4					◎	○						
5					◎			○				
6					◎		◎		○			
7					◎		◎		○			
8					◎		◎		◎	○	□	
9					◎		◎		◎		○	□
10					◎		◎		◎		○	□

◎　含公制细牙螺纹在内的推荐型号
○　公制粗牙螺纹
□　公制梯形螺纹
　***空栏部分请垂询本公司。

◎　Recommended model including Metric Fine Pitch Thread.
○　Metric Coarse Pitch Thread.
□　Metric Trapezoidal Thread.
　***Blank：Can be manufactured, but please inquire KSS.

●超小节距（0.1mm）进给丝杠 / Ultra Fine Pitch（0.1mm）Lead Screws

虽然上表中没有列出，但本公司通过多年来累积起来的加工技术，
生产出了超小节距（0.1mm）产品。
如需超小节距产品，请垂询本公司。

0.1mm Pitch is not shown on the table above, but with our machining technique, we have experiences to manufacture 0.1mm Ultra Fine Pitch Lead Screws. If 0.1mm pitch is needed, please inquire KSS.

●轴向间隙推荐值　Recommended Axial play

Unit(单位):mm

Axial play 轴向间隙	max. 0.005 0.005以下	0.005～0.010	0.010～0.020	0.015～0.030	0.020～0.050

●制造极限长度　Maximum Length

Unit(单位):mm

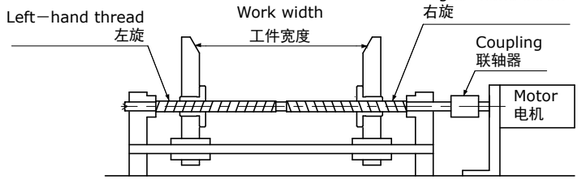
Grade 精度 \ Shaft dia. 丝杠轴外径	2	2.5	3	4	5	6	7	8	9	10
Precision type 精密级	25	30	80	120	160	200	250	300	350	400
Normal type 普通级	25	40	90	140	180	250	300	350	400	450

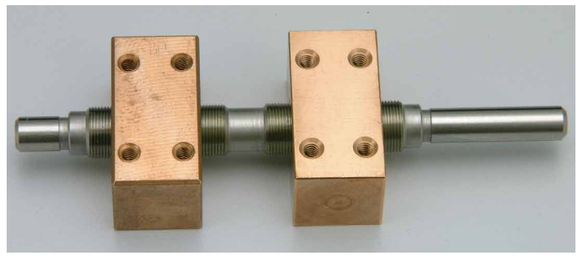
●双向进给丝杠

是在一根轴上同时加工左右旋螺纹，再分别安装螺母的开闭式进给丝杠。
由1台电机控制左右螺母的开闭运动，进行精密定位、确定宽度。
可生产任意形状的螺母。

●Bi-directional Lead Screws

Bi-directional Lead Screws which are machined Left handed and Right handed thread on a Shaft, and Nuts are mounted on each thread. Both Right and Left Nuts move symmetrically, precise positioning, and width adjustment by single motor. Nut configuration is designed freely to suit customer's requirements





●特种进给丝杠

由于本公司的进给丝杠经过了研磨处理，因此将其称为精密进给丝杠。
如果客户需要，也可提供仅经过切削加工的经济型进给丝杠。大批量生产时，也可通过冷轧加工来生产丝杠轴。本公司还可生产采用树脂螺母的特种进给丝杠。该类产品的大批量生产也采用模具注塑成型。

●Special Lead Screws

KSS Lead Screws are defined as precision Lead Screws due to making use of grinding technique. According to customer's request, we manufacture Lead Screws which are done only machining process as a low price version. Moreover, when mass-production, it is possible to manufacture Screw Shaft by Rolling process.
The Lead Screws which have plastic Nuts are also available as special Lead Screws. In mass-production case, plastic Nuts are produced by injection mold.

●进给丝杠设计及使用注意事项

1)建议丝杠轴与螺母采用不同材质。
2)请注意避免螺纹面的表面压力和相对速度变高。
3)对于在螺纹面呈滑动接触的进给丝杠,润滑极其重要。
请注意避免润滑不足现象。

●Precaution for design and use of Lead Screws

1)We recommend Shaft and Nut are made from different materials.
2)Make sure not to raise surface pressure and relative velocity on thread surface.
3)Lubricating is highly important for Lead Screws due to sliding contact by Flank surface.
Make sure not to be lack of lubricant.

树脂进给丝杠
Resin Lead Screws

●特点

- 由于丝杠轴上使用了SUS304（或SUS303），因此耐腐蚀性强。
- 轴径与导程的组合丰富多彩，选择范围广泛。
- MRH（标准材质）含有润滑剂，不加油也可使用。涂抹润滑剂后使用可使运行更顺畅。
- 采用与滚珠丝杠相同的拱弧槽，传动平滑。
- 以MRH型为标准，但可根据用途变更螺母材质。
- 也可通过选择无齿侧间隙型，将轴向齿隙设置为O。

●Features

- The Shaft is manufactured from SUS304(or SUS303), which gives excellent corrosion resistance.
- Wide range of combination of Shaft dia. and Lead are available.
- MRH incorporates a lubricating agent so it can be used without oiling. It is possible to obtain smooth movement with lubricant.
- Uses the same gothic arc grooves as Ball Screws, ensuring smooth transmission.
- MRH is standard in stock, but Nut material can be changed to order, based on the environmental condition.
- Selecting backlash free type, Axial play can be 0.

●种类

接单生产

MRH-A、B系列：KSS产品

MRH标准库存品的螺母采用滑动性能良好的聚酰胺类树脂材质。该材质含有润滑剂，即使不加油也可使用。此外，其他材质也可作为选购件提供。

接单生产

MRH-BP2系列：KSS产品

采用滑动性能良好的聚酰胺类树脂，可通过双螺母＋中间弹簧组成无齿侧间隙构造。

接单生产

R-MSS(Y)系列：NTN产品

具有耐腐蚀性、耐热性等性能，适用于多种环境，同时还备有高导程型（轴径的3倍）。

●Type

Customized products

MRH-A,B series : KSS products

A Polyamide type Resin with good sliding properties is employed in the standard MRH Nut material. And because a lubricating agent is incorporated in the material, it can be used without oiling. Additionally, other Nut materials are available as options.

Customized products

MRH-BP2 series : KSS products

A Polyamide type Resin with good sliding properties is employed.

Backlash free construction made possible with Double Nuts and a Spring in between.

Customized products

R-MSS(Y) series : NTN Corp. products

Corresponding to a wide range of environment and having corrosion resistance, heat resistance. High lead types(3 times as dia.) are available.

●丝杠轴公称外径与导程的组合　Combination of Shaft nominal dia. & Lead

Unit(单位):mm

Shaft dia. 公称外径 \ Lead 导程	1	2	5	6	8	9	10	12	15	18	20	24	30	36
4	D109	D109												
6	D109	D105 D106 D109		D105 D106		D105 D106 D109				D109				
8	D109	D105 D106 D109	D105 D106		D105 D106			D105 D106 D109				D109		
10		D105 D106 D109		D105 D106			D105 D106		D105 D106 D109		D105 D106		D109	
12		D105 D106 D109		D105 D106			D105 D106			D109	D105 D106		D105 D106	D109

注1)表中的数字表示产品刊载页码，D105和D109为齿侧间隙型的刊载页码，D106为无齿侧间隙型的刊载页码。
Note1)The numbers in each cell show pages in the catalogue. D105 and D109 are for back lash type, D106 is for backlash free type.

●规格

精度等级和间隙

KSS树脂导程丝杠的精度等级以滚珠丝杠的JIS Ct10为准，代表移动量误差按下式计算。
此外，轴向间隙为0.05～0.10mm（无齿侧间隙型除外）。

●Specifications

Accuracy grade and Axial play

Accuracy grade of KSS Resin Lead Screws is based on JIS Ct10. Actual mean travel deviation is calculated by following formula.
Axial play is 0.05 to 0.10mm(except Backlash free type).

代表移动量误差 / Actual mean travel deviation　ep：　$ep = \pm \frac{ru}{300} \times 0.21$（mm）

ru：螺纹部有效长度 / Effective Screw thread length(mm)

材　质　Material

Parts / 零　件	Material / 材质
Shaft / 丝杠轴	SUS304 or SUS303
Nut / 螺母	MC nylon（MC703HL）Mitsubishi Chemical Advanced Materials MC尼龙（MC703HL）三菱化学先进材料

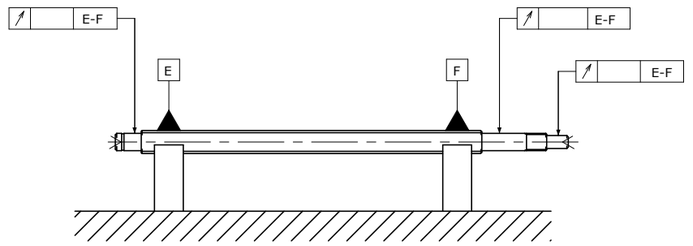
注1)适用于特殊环境的螺母材质请参照D104页。
注2)需要上述以外的材质时，请垂询本公司。
Note 1)Please refer to page D104 for Nut material suitable for special environment.
Note 2)If material other than the table is requested, please inquire KSS

丝杠轴安装精度

KSS树脂导程丝杠的丝杠轴安装部精度按下图进行标示、管理。
各部位的跳动精度标准以滚珠丝杠JIS Ct10为准。

Description of Run-out and location tolerance

Description of Run-out and location tolerance for KSS Resin Lead Screws is as follows.
Each part of Run-out tolerance is based on JIS Ct10 of Ball Screws.



●技术数据

螺纹槽形状

螺纹槽采用拱弧形状。与本公司滚珠丝杠所使用的槽形状基本相同。

机械效率

KSS树脂导程丝杠的机械效率η(%)可按下式计算。根据实测值统计得出的机械效率期待值为20～50%。一般情况下,导程越大,机械效率就越大。请以此为参考标准。

●Technical Data

Thread groove profile

The thread grooves are of a gothic arc design. This is basically the same as those used in our Ball Screws.

Mechanical efficiency

Mechanical efficiency of KSS Resin Lead Screws η (%) can be calculated by the following formula. The expected "Mechanical efficiency" calculated from measurements is 20%-50%.
Generally, as the Lead increases, "Mechanical efficiency" tends to be high. Please use this number as a reference.

$$\eta = \frac{Fa \times r}{T \times 2\pi} \times 100 \quad (\%)$$

Fa ：轴向负载 / Axial load(N)
R ：丝杠导程 / Screw Lead(m)
T ：旋转扭矩 / Rotational torque(Nm)

使用界限FV值和耐久数据

· 使用界限FV值

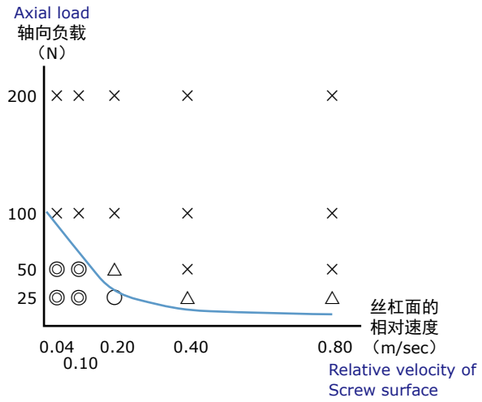
KSS树脂导程丝杠将轴向负载(F)与丝杠面相对速度(V)的乘积定义为FV值,是判断KSS树脂导程丝杠是否可用的大致标准。图D-11表示以MRH(材质:MC703HL)为螺母材料时,可进行无润滑运转的使用界限FV值。使用时,请用作参考。此外,可通过涂抹润滑剂改善运行条件。

FV value limits on use and endurance data

· FV value limits on use

For KSS Resin Lead Screws, the product of Axial Load and relative velocity of Screw surface is defined as FV, and this definition is reference to check if it is usable or not. Fig. D-11 is maximum FV which can be operated without lubricants in case of using Nut material MRH(Material : MC703HL).
Please use it as one of the reference. It is expected to improve operational condition by applying lubricants.

图D-11 ：使用界限FV值
Fig. D-11 ：FV value limits



实验型号 / Model ：MRH0805　　润　　滑 / Lubricant ：无 / None
运行评价 / Evaluation ：
◎可长时间保持稳定的运行状态。
Stable operational conditions were maintained for the long term.
○运行状态良好,但螺母处有磨损。
Operation were good, but some wears were seen on the Nuts.
△较短时间内即出现运行困难。
Operations became difficult in a relatively short time.
×很快出现运行困难。
Operations became difficult in the short time.

结果显示,FV＜5(N·m/s)时运行较为稳定。
FV＞10 (N·m/s)时,难以稳定运行。
轴向负载的上限设定应比相对速度更为严格。

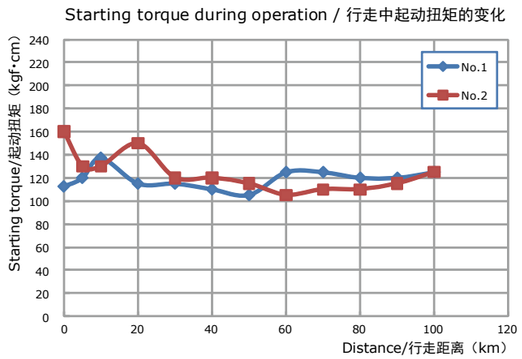
In case of FV＜5(N· m/s), stable operations were maintained.
Operations under FV＞10 (N· m/s), maintaining stability was difficult.
Axial Load should be treated more carefully as to upper limits rather than relative speed.

· 预压品(BP2型)的耐久试验数据

Endurance test data of Preloaded products(BP2 type)

型　　号 / Model　：φ10mm、导程 / Lead ＝ 6mm
负　　载 / Load　：空载 / None
速　　度 / Speed　：1000rpm
行　　程 / Travel　：400mm(往复 / 2-way)
润　　滑 / Lubricant ：无 / None
耐久结果 / Result　：行走100km后无异常
After running 100km, operation were good.
起动扭矩变化 / Starting Torque monitor ：参照右表
see Diagram right

Starting torque during operation / 行走中起动扭矩的变化



●特殊品

KSS树脂导程丝杠除标准材质MC尼龙(MC703HL)外,也可采用下述螺母材质。
螺纹槽也可采用梯形螺纹、ACME螺纹等特殊形状,详情请垂询本公司。
大批量订购时,选择以注塑为前提的材料可降低螺母成本。

●Special products

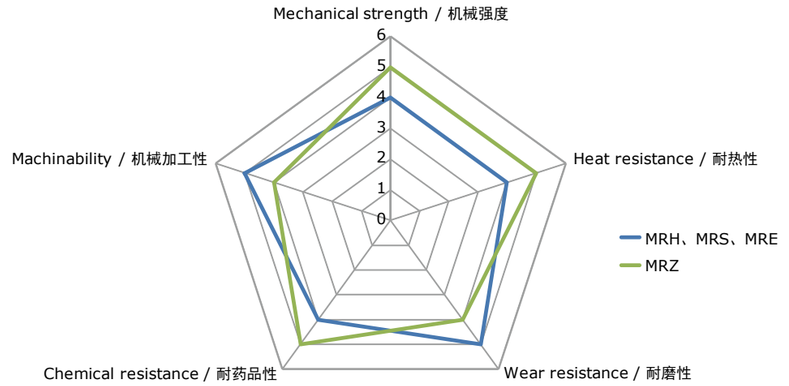
Regarding KSS Resin Lead Screws, the standard material of Nut is MC nylon(MC703HL), but we also provide with the following Nut materials.
Please inquire KSS if Trapezoidal thread and ACME thread are needed.
In case of bulk order, it is possible to save the price to select material which is manufactured by injection molding.

表D-12 ：各种产品性能比较表　Table D-12 ：Product performance comparison

Product 产品名称	MRH	MRS	MRE	MRZ
Classification 产品类别	Standard 标准库存品	Customized 接单生产		
Operating environment 使用环境	Standard environment 常规环境			Special environment 特殊环境
Nut appearnce 螺母外观				
Material 材质	Polyamide type 聚酰胺类			Polyether ether ketone type 聚醚醚酮类
Features 特点	Balanced performance 平衡特性			Flame resistance, heat/water resistance 阻燃性　耐热水性
Other 其他	Good sliding properties 滑动特性良好	—	Good electrical conductivity 导电性良好	Food hygiene, chemical resistance 食品卫生性　耐热性
Mechanical strength 机械强度	○	○	○	◎
Heat resistance 耐热性	○	○	○	◎
Wear resistance 耐磨损性	◎	◎	◎	○
Chemical resistance 耐药品性	○	○	○	◎
Machinability 机械加工性	◎	◎	◎	○

◎ 优异 / superior
○ 可用 / usable
△ 略差 / relatively inferior
▲ 较差 / Inferior

图D-13 ：各种材料评价　Fig. D-13 ：Evaluation each material



MRH-A、B系列(接单生产)
MRH-A,B series(Customized Products)

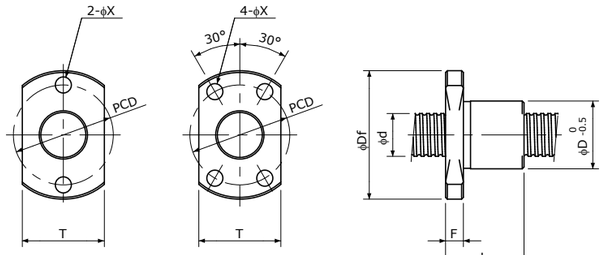
●尺寸表 Dimension table

公称型号的构成 Model number notation

MRH 06 02 A — 300 R 300 N2

①螺母类型符号
②丝杠轴公称外径(mm)
③导程(mm)
④法兰形状
A：2孔 …… 仅φ6mm产品
B：4孔
⑤螺纹部长度(mm)
⑥螺纹旋向(仅右旋)
⑦丝杠轴总长(mm)
⑧螺母个数
(例：N2表示带2个螺母　带1个螺母时无符号)

①Nut model
②Screw Shaft nominal diameter(mm)
③Lead(mm)
④Flange configuration
A：2 holes …… Only products with φ6mm
B：4 holes
⑤Screw thread length(mm)
⑥Thread direction(Right-hand only)
⑦Screw Shaft total length(mm)
⑧Number of Nut
(Example：N2 means 2 Nuts on a Shaft. There is no notation when 1 Nut.)



Unit(单位):mm

Model 型号	Screw Shaft 丝杠轴				Nut 螺母								Standard Shaft length 标准轴长
	Dia. 公称直径 d	Lead 导程	Root dia. 底径	No. of threads 螺纹条数	D	L	Df	F	P.C.D	X	Nut type 螺母类型	T	
MRH0602A	6	2	5.1	1	10	14	20	3	15	3.1	A	10	300
MRH0606A		6	5.2	2									
MRH0609A		9	5.3	4									
MRH0802B	8	2	6.6	1	13	16	26	4	20	3.6	B	17	400
MRH0805B		5	6.6	2									
MRH0808B		8	6.7	2									
MRH0812B		12	6.7	4									
MRH1002B	10	2	8.6	1	15	20	28		22			19	500
MRH1006B		6	8.4	2									
MRH1010B		10	8.4	2									
MRH1015B		15	8.4	4									
MRH1020B		20	8.7	4									
MRH1202B	12	2	10.6	1	18	24	31		25			20	600
MRH1206B		6	10.4	2									
MRH1210B		10	10.4	2									
MRH1220B		20	10.4	6									
MRH1230B		30	10.4	8									

注1)建议由本公司进行丝杠轴的追加加工。
如果由其他公司进行追加加工,本公司将不能保证追加加工后的精度,敬请谅解。
注2)如果由其他公司进行追加加工,加工时请将螺母从丝杠轴上拆下,并在加工后用清洁的精制煤油将附着在丝杠轴上的污垢等清洗干净。
注3)请将丝杠轴的轴端直径指定为不超过丝杠轴底径,并以1mm为单位指定丝杠长度。
注4)螺纹旋向仅为右旋。
注5)丝杠轴、螺母不单售。

Note 1)Additional machining of Screw Shafts should be performed by KSS. Note that accuracy cannot be guaranteed if additional machining is performed by someone other than KSS.
Note 2)When additional end-journal machining is performed by someone other than KSS, always remove the Nut from the Screw Shaft. After machining, wash away any debris on the Screw Shaft with clean refined kerosene or similar material.
Note 3)The Shaft end diameter should be smaller than the Screw Shaft Root diameter, and the Screw thread length should be specified in 1mm unit.
Note 4)Only Right-hand thread is available.
Note 5)Screw Shafts and Nuts are not sold separately.

MRH-BP2系列(接单生产)
MRH-BP2 series (Customized Products)

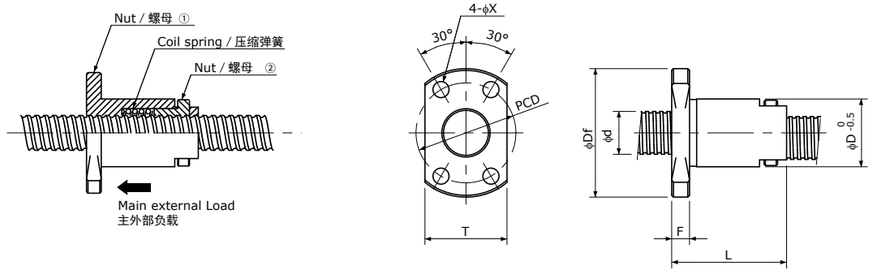
●尺寸表 Dimension table

公称型号的构成 Model number notation

MRH 06 02 B P2 — 300 R 300

①螺母类型符号
②丝杠轴公称外径(mm)
③导程(mm)
④法兰形状
B：双面切割(4孔)
⑤无齿隙符号
P2：标准设定
⑥螺纹部长度(mm)
⑦螺纹旋向(仅右旋)
⑧丝杠轴总长(mm)

①Nut model
②Screw Shaft nominal diameter(mm)
③Lead(mm)
④Flange configuration
B：2 flat faces(4 holes)
⑤Backlash free mark
P2：Standard Preload
⑥Screw thread length(mm)
⑦Thread direction(Right-hand only)
⑧Screw Shaft total length(mm)



Unit(单位):mm

Model 型号	Screw Shaft 丝杠轴				Nut 螺母							Standard Shaft length 标准轴长
	Dia. 公称直径 d	Lead 导程	Root dia. 底径	No. of threads 螺纹条数	D	L	Df	F	P.C.D	X	T	
MRH0602BP2	6	2	5.1	1	13	20	26	4	20	3.6	17	300
MRH0606BP2		6	5.2	2								
MRH0609BP2		9	5.3	4								
MRH0802BP2	8	2	6.6	1	15	23	28		22		19	400
MRH0805BP2		5	6.6	2								
MRH0808BP2		8	6.7	2								
MRH0812BP2		12	6.7	4								
MRH1002BP2	10	2	8.6	1	18	30	31		25		20	500
MRH1006BP2		6	8.4	2								
MRH1010BP2		10	8.4	2								
MRH1015BP2		15	8.4	4								
MRH1020BP2		20	8.7	4								
MRH1202BP2	12	2	10.6	1	23	38	41	5	33	4.8	25	600
MRH1206BP2		6	10.4	2								
MRH1210BP2		10	10.4	2								
MRH1220BP2		20	10.4	6								
MRH1230BP2		30	10.4	8								

注1)建议由本公司进行丝杠轴的追加加工。
如果由其他公司进行追加加工,本公司将不能保证追加加工后的精度,敬请谅解。
注2)请将丝杠轴的轴端直径指定为不超过丝杠轴底径,并以1mm为单位指定丝杠长度。
注3)螺纹旋向仅为右旋。
注4)丝杠轴、螺母不单售。
注5)希望变更弹簧压力(小于或大于标准)时,请另行联系。
注6)建议按上图箭头所示方向使用主外部负载。

Note 1)Additional machining of Screw Shafts should be performed by KSS. Note that accuracy cannot be guaranteed if additional machining is performed by someone other than KSS.
Note 2)The Shaft end diameter should be smaller than the Screw Shaft Root diameter, and the Screw thread length should be specified in 1mm unit.
Note 3)Only Right-hand thread is available.
Note 4)Screw Shafts and Nuts are not sold separately.
Note 5)Please inquire regarding spring tension(lower or higher than standard is available).
Note 6)It is recommended that the main external load is in the direction as indicated by the arrow in the Figure above.

●注意事项

1）润滑

· MRH系列螺母的标准材质MC尼龙虽然含油，但根据不同的使用条件，可能会产生噪音和早期磨损。可能出现这种情况时，建议同时使用可提高滑动性的表面处理（丝杠轴）和油脂。

2）轴端追加加工

· 建议由本公司进行丝杠轴的追加加工。如果由其他公司进行追加加工，本公司将不能保证追加加工后的精度，敬请谅解。

· 如果由其他公司进行追加加工，加工时请将螺母从丝杠轴上拆下，并在加工后用清洁的精制煤油将附着在丝杠轴上的污垢等清洗干净。此外，如果将无齿侧间隙型螺母从丝杠轴上拆下，将会导致难以恢复预压，因此请联系本公司进行追加加工。

3）操作、使用注意事项

· 本产品为精密零件，请勿对其施加冲击。

· 严禁拆分无齿侧间隙型螺母。

· 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。否则会因异物进入而导致产品性能下降。

· 产品掉落时，可能会因零件损伤而导致产品性能下降，因此请务必委托本公司进行检查。请将产品送回本公司，我们将为您提供有偿检查。

· 产品的使用极限温度设计在80˚C以下。超过该温度使用时，请垂询本公司。

· 树脂导程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。如果承受径向负载，可能会导致早期磨损及损伤，因此请勿在树脂导程丝杠与其它直动设备连用时对其施加径向负载。

· 支撑丝杠轴的轴承部、安装螺母的支架的嵌合、偏心、螺母安装面的垂直度等各安装部位的精度如果不良，将对树脂导程丝杠造成不良影响。因此，请充分注意相关零件的尺寸精度、形状精度及组装精度。

●Caution

1）Lubrication

· MC Nylon which is standard Nut material of MRH series includes oil, but depending on operating condition, abnormal noise or wearing at early stage might occur. In that case, surface treatment on shaft or grease applying are recommended.

2）Additional end-journal machining

· Additional machining of Screw Shaft should be performed by KSS. Note that accuracy cannot be guaranteed if additional end-journal machining is performed by someone other than KSS.

· When additional machining is performed by other than KSS, always remove the Nut from the Screw Shaft for additional machining.
After machining, wash away any debris on the Screw Shaft with clean refined kerosene or similar material. For Backlash free type, it is difficult to reproduce Preload if Nut is removed. We will do additional machining when needed.

3）Handling and use precaution.

· Do not subject to sudden impact, as this is a precision part.

· Do not disassemble Backlash free type Nut.

· When storing the products, please store in the original wrapping. Do not open the wrapping or tear the inner wrapping until ready to use. Dust may get inside the wrapper and may cause a decline in functionality.

· If the products falls, loss of functionality due to damage to component parts may result. Please send products back to KSS so that we can check the products. There will be a charge for this service.

· This product has been designed for normal use in temperatures under 80˚C. In case of exceeding 80˚C, please ask KSS.

· Resin Lead Screws are mechanical components that produces thrust toward the axis. It is not constructed to accept Radial Load（Radial direction）. This may result in wear and damage at an early stage.
Therefore, there should be no Radial Load on the Resin Nut parts, take care to set up with other linear equipment for Radial Load.

· Coarse mounting accuracy such as misalignment of Nut bracket and Support Bearing, perpendicularity of Nut mounting face, will affect Resin Lead Screws performance, so be careful with the mounting accuracy.

R-MSS（Y）系列
R-MSS（Y）Series

●BEAREE为NTN的注册商标。
BEAREE product is NTN registered trademark.

●特点

与BEAREE AS5000（PPS树脂：聚苯硫醚）制螺母和不锈钢（SUS304）制丝杠轴组合相比，是适用环境更广的低噪音滑动丝杠。

●Features

BEAREE AS5000（PPS Resign：Poly Phenylene Sulfide）Nuts and Stainless（SUS304）Shafts are employed. This Lead Screw with low operating noise is able to be used as wide use.

· 适用于多种环境。
丝杠面平滑且导程较长，易于反向动作。

· 与滚珠丝杠相比，噪音较小。

· 与低磨损的树脂螺母相比，丝杠效率更高。

· Wide use：Because Screw surfaces are smooth and its lead is high, the reversed operation can be easy.

· Low operation noise compared with Ball Screws.

· Due to the Nuts with low friction, the Screw efficiency is high.

●规格　Specifications

Type / 类型	Single Nut with Flange / 带法兰单螺母
Nut material / 材质	BEAREE　AS5000 / BEAREE AS5000
Shaft material / 丝杠轴	SUS304
Axial play / 轴向间隙	50μm or less（lead 1mm, 2mm）/ 50μm以下（导程1mm、2mm） 100μm or less（more than lead 2mm）/ 100μm以下（导程超过2mm）
Accuracy grade / 精度等级	Ct10（JISB1192-3）
Cumulative lead error / 累积导程误差	±0.21/300mm

●材料特性表　Material characteristics

	AS5000
Specific gravity / 比重	1.53
Hardness / 硬度	80　Durometer / Durometer
Tensile strength / 抗拉强度	51Mpa
Elongation / 延伸率	3%
Bending strength / 弯曲强度	61Mpa
Water absorption rate / 吸水率	0.05%
Linear Expansion coefficient / 线膨胀系数	8.1×10^{-5} / ˚C
Maximum temperature / 使用极限温度	230˚C

●尺寸表　Dimension table

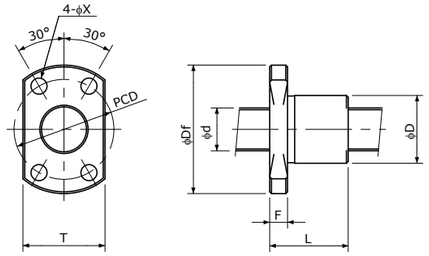
公称型号的构成　Model number notation

R — MSS 04 01 Y — 200 R 200

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

①NTN公司产品
②微型树脂滑动丝杠
③丝杠轴公称外径(mm)
④导程(mm)
⑤螺母材质符号：BEAREE AS5000
⑥螺纹部长度(mm)
⑦螺纹旋向(仅右旋)
⑧丝杠轴总长(mm)

①NTN products
②Miniature Plastic Lead Screws
③Shaft nominal diameter(mm)
④Lead(mm)
⑤Nut symbol ：BEAREE AS5000
⑥Screw thread length(mm)
⑦Thread direction(Right-hand only)
⑧Screw Shaft total length(mm)



Unit(单位)：mm

Model 型号	Shaft 丝杠轴			Nut 螺母							Shaft length 标准轴长
	Dia. 公称直径 d	Lead 导程	Number of thread 螺纹条数	D	L	Df	F	P.C.D	X	T	
R-MSS0401Y	4	1	1	10	11.5	23	3.5	15	2.9	15	200
R-MSS0402Y		2	2								
R-MSS0601Y	6	1	1	12	14.5	26		18	3.4	17	300
R-MSS0602Y		2									
R-MSS0609Y		9	4								
R-MSS0618Y		18									
R-MSS0801Y	8	1	1	14	18	29	4	21		18	300
R-MSS0802Y		2									
R-MSS0812Y		12	4								400
R-MSS0824Y		24	6								
R-MSS1002Y	10	2	1	16	22	33	5	24	4.5	21	300
R-MSS1015Y		15	4								450
R-MSS1030Y		30	6								
R-MSS1202Y	12	2	1	18	25	35		26		22	300
R-MSS1218Y		18	6								500
R-MSS1236Y		36									

注1)标准丝杠轴的轴端未进行加工。本公司可提供轴端加工,如有需要敬请指示。

Note 1)End-journal is not machined. Please inquire, if end-journal machining is required.

●技术数据　Technical data

Model 型号	Shaft 丝杠轴		② Permissible Axial Load 许用轴向负载	② Permissible Revolution 许用转速	③ Tightening Torque(max) 紧固扭矩(最大)	① Efficiency 丝杠效率
	Dia. 公称直径 mm	Lead 导程 mm	N	rpm	N·mm	%
R-MSS0401Y	4	1	50	2000	180	45
R-MSS0402Y		2	60			70
R-MSS0601Y	6	1	120	2000	400	40
R-MSS0602Y		2	60			55
R-MSS0609Y		9	90			85
R-MSS0618Y		18	110			85
R-MSS0801Y	8	1	200	2000		30
R-MSS0802Y		2	290			45
R-MSS0812Y		12	210			80
R-MSS0824Y		24	210			85
R-MSS1002Y	10	2	460	1500	500	40
R-MSS1015Y		15	410			80
R-MSS1030Y		30	440			85
R-MSS1202Y	12	2	660	1000		35
R-MSS1218Y		18	750			75
R-MSS1236Y		36	540			80

许用判断标准：使用R-MSS0824Y在轴向负载100N、转速2000rpm的条件下进行移动距离200km的试验，确认无任何异常磨损。其他均由计算得出。

①丝杠效率是在测得丝杠轴在承受轴向负载且使树脂螺母旋转时的旋转扭矩后，由下式求出。

$$\eta = \frac{R \cdot Q \cdot \tan\beta}{M} \times 100\ (\%) \quad \tan\beta = \frac{Lead}{2\pi R}$$

η：丝杠效率
R：螺纹有效半径
Q：轴向负载
β：导程角
M：旋转扭矩

②许用轴向负载和许用转速是在下列试验条件下测得的值。
1)试验机：NTN滑动丝杠耐久试验机
2)条件：室温、无润滑剂、丝杠轴旋转、100mm行程往复(200mm/周期)
或200mm往复(400mm/周期)
3)许用值判断标准：按照上表的许用轴向负载和许用转速的组合条件运行10^3个周期或6×10^3个周期，确认丝杠面无变形和异常磨损。

③将树脂螺母固定于配合零件上时的安装螺丝紧固扭矩。

Criteria：MSS0824Y, verification of no remarkable wear after 200km running test under 100N of Axial Load and 2,000rpm of Speed. Other than that are obtained by calculation.

① Efficiency η is calculated by following formula based on measurement results of rotational torque(M) under the Axial Load (Q).

$$\eta = \frac{R \cdot Q \cdot \tan\beta}{M} \times 100\ (\%) \quad \tan\beta = \frac{Lead}{2\pi R}$$

η : Efficiency
R : Pitch circle radius
Q : Axial Load
β : Lead angle
M : Rotational torque

③ Permissible Axial Load and Permissible Revolution are based on the test results under the following condition.
1) Test machine : NTN Lead Screw Durability test machine
2) Condition : Room temperature, no lubricant, 100mm travel (200mm/ cycle) or 200mm travel (400mm/cycle)
3) Criteria : No remarkable damage or wear on Screw surface under the Permissible Load and Revolution in the table above.

③ This number means when Plastic Nut is fixed onto the Bracket.

滚珠丝杠支架组件篇　Ball Screw Support Units

序言
Outline

MSU 系列
MSU Series

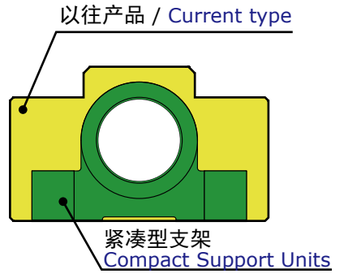
KSS推出了最适合微型滚珠丝杠轴端的支架组件系列产品。MSU系列在以往的支架组件的基础上大幅度减轻了重量，实现了小型化，均设计为可以安装到KSS滚珠丝杠的标准形状轴端上。请务必与滚珠丝杠配合使用。

KSS provides the customer with suitable Support Units for end journal of Miniature Ball Screws.
MSU series have features of light weight & compact compared to existing series.
Our Support Units fit the standard end journal profile of KSS Ball Screws.
Please try and use them as well as Ball Screws.

与以往产品相比，重量减轻50%以上
Light weight (more than 50% down)

紧凑型支架组件
Compact Support Units

与本公司产品相比 / Comparison to our current model



在以往支架组件的基础上最大限度地减小外形尺寸，实现了轻量小型化，最适合于微型滚珠丝杠。
This type of Support Unit has features of light-weight & compact profile compared to our conventional Support Units. KSS believes this type is suitable for Miniature Ball Screws.

●特点
- 去除了以往产品中累赘的部分，最大限度缩小了安装孔距，重量更轻、外形更紧凑。
- 安装有进行了预压管理的微型角接触球轴承，确保了轴向的高刚性。
- 角接触球轴承采用双封闭型，防尘性能佳、零件数量少，大大降低了成本。
- 轴承采用不锈钢材质，封入有低起尘润滑脂，也可在无尘环境中使用。
- 系列中新增加超小尺寸(φ3)产品，推出超小型滚珠丝杠的支架组件。
- 将枕型和法兰型两种(固定侧、支撑侧)产品标准化，扩大了用户的选择范围。

●Features
- By eliminating extra shape of Housing, and minimizing pitch of mounting holes, light-weight & compact design Support Units became reality.
- Pre-load controlled Angular Contact Bearings are installed, so Rigidity can be kept high.
- Reasonable price has been achieved with reducing number of components, because oil seals have been eliminated by using shielded type Angular Contact Bearings.
- Angular Contact Bearings are made from stainless steel and low contamination Grease is applied, so Support Units can be used in clean-environment.
- Ultra-compact size (f3) is standardized, it would be suitable for Ultra Miniature Ball Screws.
- Pillow & Flange type are standardized for both fixed & supported side, so wide variety of choices are available.

●种类 / Variation
紧凑型支架组件(MSU系列)备有枕型和法兰型两种类型，可满足用户不同的安装状态。两种类型的固定侧、支撑侧组件均已实现标准化。枕型产品与以往产品相比，重量大幅度减轻，外形更紧凑。

Compact Support Units(MSU series) provide 2 choices of Housing type, which are Pillow type and Flange type. Fixed side and supported side Units are standardized for each type. In case of Pillow type, it became light-weight & more compact compared to our conventional type.

枕型 / Pillow type

法兰型 / Flange type

●规格 / Specifications
紧凑型支架组件(MSU系列)中安装的角接触球轴承使用不锈钢材质，封入有低起尘润滑脂。其他零件也采用不锈钢材质、或经过了发黑处理，也可应用于无尘环境。还可提供轴承钢(SUJ2)材质+封入了耐微动磨损润滑脂的产品，详情请向KSS咨询。

Angular Contact Bearings built in Compact Support Units(MSU series) are made from stainless steel and low contamination Grease is applied. Other components of Support Units are also made form stainless steel or are coated by black finishing. These series can be used in clean-environment.

[MSU系列使用的轴承 / Ball Bearings for MSU Series]

角接触球轴承 / Angular Contact Ball Bearings

用于紧凑型支架组件(MSU系列)固定侧的角接触球轴承。
根据用户需求，以轴承单体(组装好的状态)的形式销售。(参照E115-E116页)

This series is the Angular Contact Ball Bearings built in fixed side of Compact Support Units(MSU series).
This can be provided as a set of DF or DB configuration only.
(Refer to dimension table in page E115-E116)

深沟球轴承 / Deep Groove Bearings

用于紧凑型支架组件(MSU系列)支撑侧的深沟球轴承。
根据用户需求，以轴承单体的形式销售。
(参照E117-E118页)

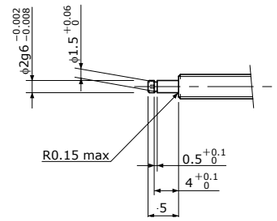
This series is the Deep Groove Ball Bearings built in supported side of Compact Support Units(MSU series).
This type can be provided as a Bearing itself.
(Refer to dimension table in page E117-E118)

●标准库存品 / Standardized end-journal profile

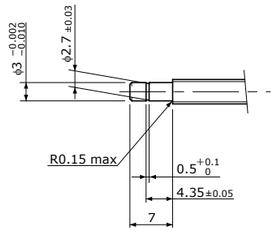
KSS支架组件均设计为可以安装到KSS微型滚珠丝杠的标准形状轴端上。KSS标准轴端形状及其对应的KSS支架组件的一览表如下所示。

KSS Support Units are designed to fit standard end-journal profile of KSS Miniature Ball Screws. Table below shows KSS Support Units list corresponding to standard end-journal profile.

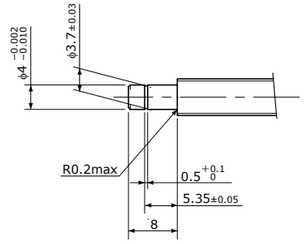
【支撑侧 / Supported side】



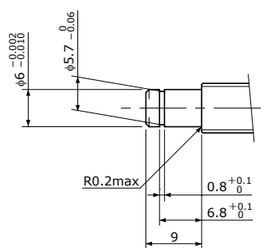
Brg. Inner dia. 轴承内径	Support Unit model 适用的支架组件
f2	MSU-3CS / MSU-3GS



Brg. Inner dia. 轴承内径	Support Unit model 适用的支架组件
f3	MSU-4CS / MSU-4GS



Brg. Inner dia. 轴承内径	Support Unit model 适用的支架组件
f4	MSU-5CS / MSU-5GS

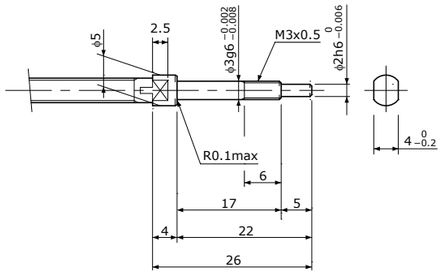


Brg. Inner dia. 轴承内径	Support Unit model 适用的支架组件
f6	MSU-6CS / MSU-6GS MSU-8CS / MSU-8GS

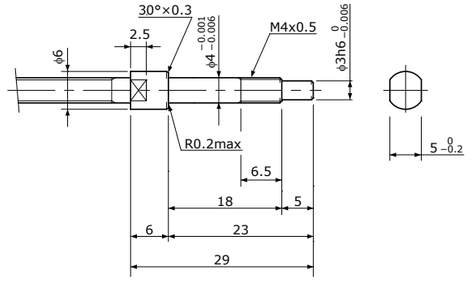
注）如需轴承内径φ8及φ10的标准形状所对应的支架组件，请垂询本公司。

Note）Request for Supported side Support Units with φ8 and φ10 as well as standard design, please ask KSS representative.

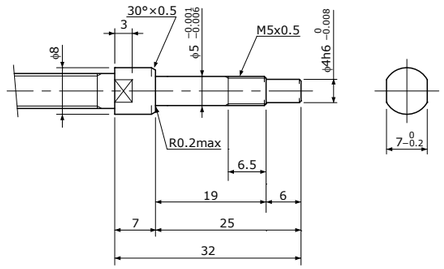
【固定侧 / Fixed side】



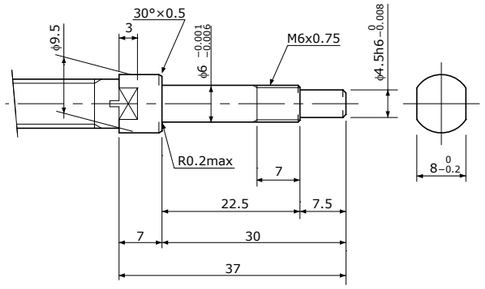
Brg. Inner dia. 轴承内径	Support Unit model 适用的支架组件
f3	MSU-3C / MSU-3G



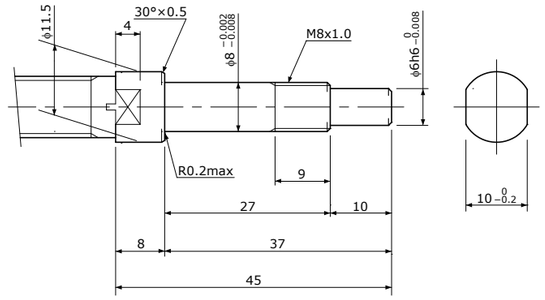
Brg. Inner dia. 轴承内径	Support Unit model 适用的支架组件
f4	MSU-4C / MSU-4G



Brg. Inner dia. 轴承内径	Support Unit model 适用的支架组件
f5	MSU-5C / MSU-5G



Brg. Inner dia. 轴承内径	Support Unit model 适用的支架组件
f6	MSU-6C / MSU-6G



Brg. Inner dia. 轴承内径	Support Unit model 适用的支架组件
f8	MSU-8C / MSU-8G

注）如需轴承内径φ10及φ12的标准形状所对应的支架组件，请垂询本公司。

Note）Request for fixed side Support Units with φ10 and φ12 as well as standard design, please ask KSS representative.

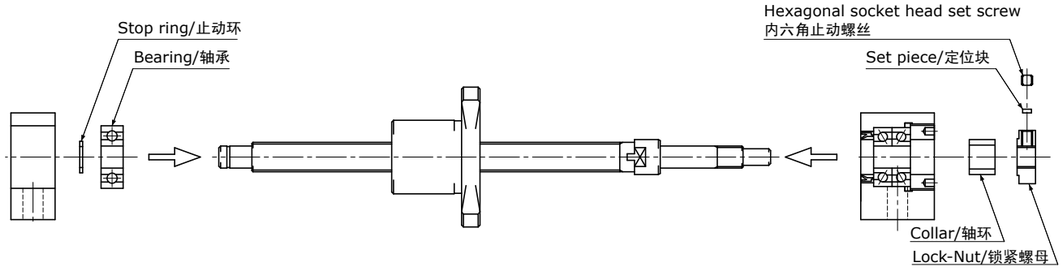
●安装步骤 / Mounting procedure

1.支架组件的组装

1)将固定侧支架组件组装在滚珠丝杠上。
注1)请勿拆分支架组件。
注2)将轴插入支架组件后,请用锁紧螺母进行紧固,避免定位块翘起。
2)插入固定侧支架组件后,用锁紧螺母进行紧固,并通过定位块、内六角止动螺丝进行固定。
3)组装支撑侧轴承,用止动环固定后装入外壳。

1.Assembling Support Unit

1)Mount the fixed end Support Unit onto the Ball Screw.
Note 1)Do not disassemble the Support Unit.
Note 2)Tighten the Lock-Nut after inserting the Shaft into the Support Unit, and make sure that the set piece is not allowed to curl.
2)Tighten the Lock-Nut after inserting into the fixed end Support Unit, and secure using the set piece and hexagonal socket head set screw.
3)Mount the supported end Bearing, secure with the stop ring, and fit into the Housing.

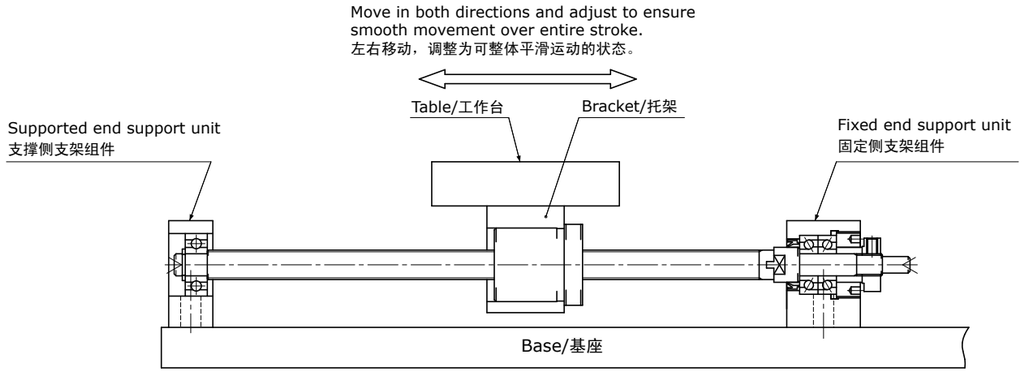


2.工作台和滚珠丝杠螺母的组装以及组件和基座的安装

1)将滚珠丝杠螺母插入工作台(使用托架时插入托架)后临时固定。
2)将固定侧支架组件临时固定到基座上。
注1)此时,请将工作台靠近支架组件侧进行定心,并将工作台调整到可平滑移动的状态。

2.Mounting the table on the Ball Screw Nut and mounting the Support Unit on the base

1)Insert the Ball Screw Nut into the table, or, when using Brackets to attach the table to the Ball Screw Nut, insert into the Bracket, and loosely tighten.
2)Loosely tighten the fixed end Support Unit to the base.
Note 1)Move the table toward the Support Unit and center it. Adjust to ensure that the table moves smoothly.

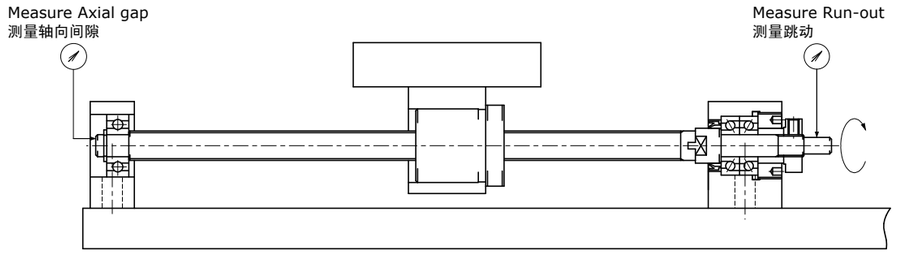


3.支撑侧外壳和基座的安装及精度确认

1)将工作台靠近支撑侧外壳并进行定心,然后使工作台往复运动,将其调整到整体可平滑运动的状态,然后临时固定到基座上。
2)通过千分表确认滚珠丝杠轴端的跳动、轴向间隙,同时切实紧固螺母、固定侧支架组件及支撑侧外壳。

3.Mounting the supported end Housing on the base and checking accuracy

1)Move the table toward the supported end Housing and center it. Move the table in both directions and adjust to ensure smooth movement over entire length. Secure loosely to the base.
2)Check the Run-out and Axial gap at the Ball Screw Shaft end using a dial gauge, and fully tighten the Nut, fixed end Support Unit and supported end Housing.

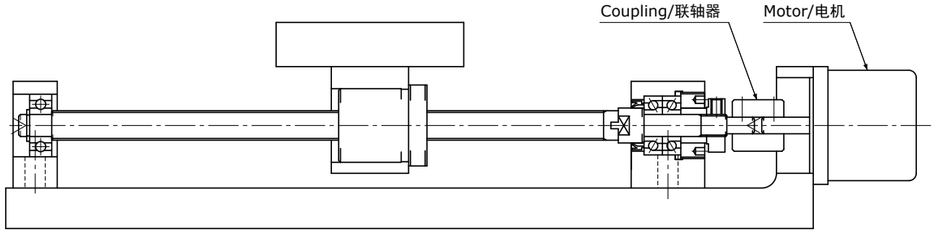


4.与电机的连接

1)将电机固定到主体上。
2)通过联轴器连接电机和滚珠丝杠。
3)请进行充分的磨合运行。

4.Connecting to the Motor

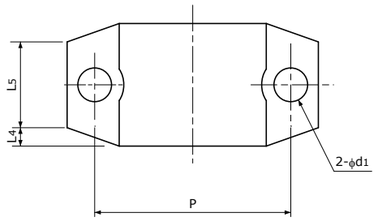
1)Secure the Motor to the main Unit.
2)Connect the Motor to the Ball Screw using the coupling.
3)Run in thoroughly.

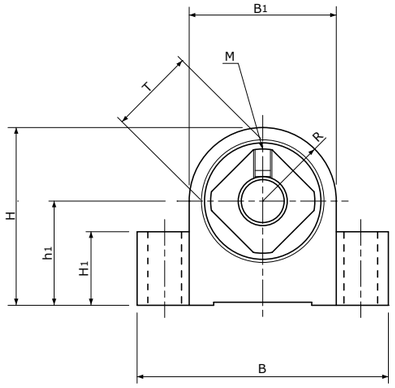


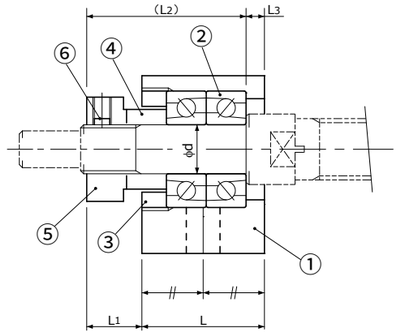
注)上述内容为枕型、块型的安装步骤,法兰型也请按相同要领进行安装。
Note)Instruction above is for Pillow type and Block type Support Units, In case of Flange type Support Units, the same procedure can be applicable.

MSU Series
MSU系列

Pillow type（Fixed side）
枕型（固定侧）







●公称型号的构成 / Model number notation

MSU — 5 C S
① ② ③ ④

①系列符号
　MSU：KSS紧凑型支架组件系列
②公称型号
③形状符号
　C：枕型
　G：法兰型
④轴端符号
　无符号：固定侧
　S：支撑侧

①Series No.
　MSU：KSS Compact Support Unit Series
②Nominal number
③Housing type
　C：Pillow type
　G：Flange type
④End-journal type
　None：fixed side
　S：supported side

注）支撑侧支架组件的公称型号可能与轴承内径不一致，敬请注意。
Note）In some cases, nominal number is not the same as Bearing Inner diameter.

Parts List / 零件表

Part No. 零件号	Part name 零件名称	Qty 数量
1	Housing / 外壳（Black Chrome coating / 黑铬处理）	1
2	Bearings / 轴承（with Shields / 带护板）	1 set
3	Pressure Nut / 压紧螺母	1
4	Collar / 轴环	1
5	Lock Nut / 锁紧螺母	1
6	Hexagonal socket head set screw / 内六角止动螺丝 （with set piece / 带定位块）	1 set

Unit（单位）：mm

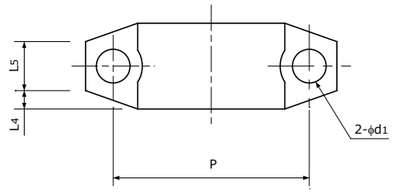
Type 型号	Brg. Inner dia. 轴承内径 d 0 −0.005	L	L_1	L_2	L_3	L_4	L_5	B	H	h_1 0 −0.03	B_1		H_1	R	P	d_1	M	T	Lock Nut 锁紧螺母	Tightening torque of Lock Nut 锁紧螺母的紧固扭矩 N·cm	Bearing 使用的轴承	Mass 重量 g	Type 型号
MSU-3C	3	12.5	5.5	16.5	1.5	2	8.5	24	14.5	9	11		5	5.5	18	3.5	M3	8	M3×0.5	80	MTA03-08HP5DF	16.5	MSU-3C
MSU-4C	4	14	5.5	17.5	2	2.5	9	27	17	10	14		6	7	21	3.5	M3	10	M4×0.5	100	MTA04-11HP5DF	27	MSU-4C
MSU-5C	5	15	5.5	18.5	2	2	11	30.5	19.5	11	17		6	8.5	23	4.5	M3	11	M5×0.5	140	MTA05-13HP5DF	35	MSU-5C
MSU-6C	6	17	7.5	22	2.5	2.5	12	35	22.5	13	19		8	9.5	26	5.5	M3	12	M6×0.75	190	MTA06-15HP5DF	50	MSU-6C
MSU-8C	8	20	9	26	3	3	14	41	29	17	24		12	12	32	5.5	M3	14	M8×1.0	200	MTA08-19HP5DF	96	MSU-8C

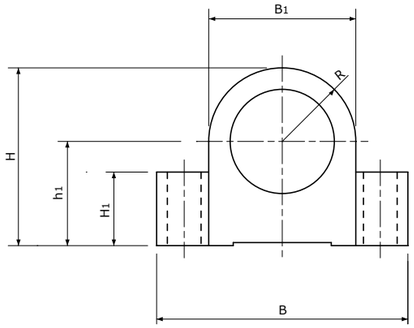
注1）角接触球轴承（ISC制）采用不锈钢材质，并注入有低起尘润滑脂（NSK LG2），是无尘规格的轴承。
注2）压紧螺母、轴环、锁紧螺母均经过了发黑处理。
注3）支架组件已经过预压调整，请勿进行拆分。

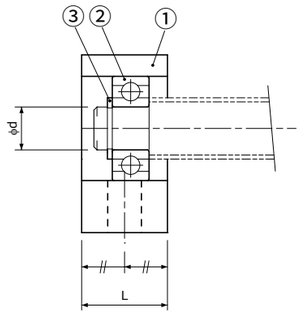
Note 1）Angular Contact Ball Bearings（manufactured by ISC）are designed for clean room use, they are made of Stainless steel with low contamination grease（NSK LG2）packed.
Note 2）Pressure Nut, Collar and Lock Nut are coated with Black finishing.
Note 3）Do not disassemble Support Unit, as they are pre-loaded and pre-adjusted.

MSU Series
MSU系列

Pillow type（Supported side）
枕型（支撑侧）







●公称型号的构成 / Model number notation

MSU — 5 C S
① ② ③ 4

①系列符号
　MSU：KSS紧凑型支架组件系列
②公称型号
③形状符号
　C：枕型
　G：法兰型
④轴端符号
　无符号：固定侧
　S：支撑侧

①Series No.
　MSU：KSS Compact Support Unit Series
②Nominal number
③Housing type
　C：Pillow type
　G：Flange type
④End-journal type
　None：fixed side
　S：supported side

注）支撑侧支架组件的公称型号可能与轴承内径不一致，敬请注意。
Note）In some cases, nominal number is not the same as Bearing Inner diameter.

Parts List / 零件表

Part No. 零件号	Part name 零件名称	Qty 数量
1	Housing / 外壳（Black Chrome coating / 黑铬处理）	1
2	Bearing / 轴承（with Shields / 带护板）	1
3	Stop ring / 止动环	1

Unit（单位）：mm

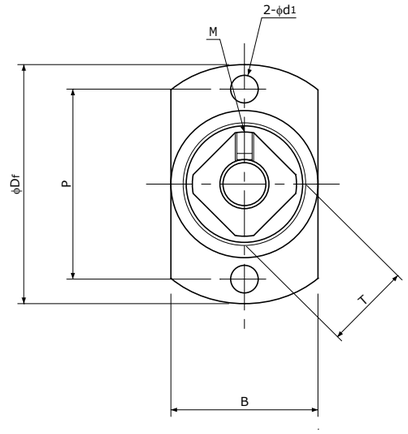
Type 型号	Brg. Inner dia. 轴承内径 d 0 −0.005	L	L_4	L_5	B	H	h_1 0 −0.03	B_1		H_1	R	P	d_1	Bearing 使用的轴承	Stop ring 使用的止动环	Mass 重量 g	Type 型号
MSU-3CS	2	8	2	4	24	14.5	9	11		5	5.5	18	3.5	602HZZ	ETW-1.5（OCHIAI / 落合）	8.5	MSU-3CS
MSU-4CS	3	10	2.5	5	27	17	10	14		6	7	21	3.5	623HZZ	G-3（IWATA / 磐田电工）	16	MSU-4CS
MSU-5CS	4	10	2	6	30.5	19.5	11	17		6	8.5	23	4.5	624HZZ	G-4（IWATA / 磐田电工）	21	MSU-5CS
MSU-6CS	6	12	2.5	7	35	22.5	13	19		8	9.5	26	5.5	B6-113HZZ1	STW-6（OCHIAI / 落合）	32	MSU-6CS
MSU-8CS	6	14	3	8	41	29	17	24		12	12	32	5.5	606HZZ1	STW-6（OCHIAI / 落合）	60	MSU-8CS

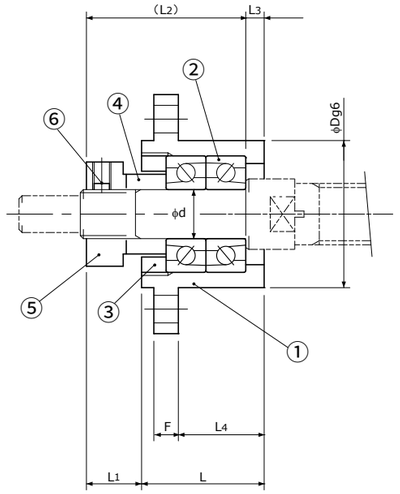
注1）深沟球轴承（ISC制）采用不锈钢材质，并注入有低起尘润滑脂（NSK LG2），是无尘规格的轴承。
注2）交货时使用的止动环可能会是同等规格的其他产品。

Note 1) Deep Groove Ball Bearing (manufactured by ISC) is designed for clean room use, it is made of Stainless steel with low contamination grease (NSK LG2) packed.
Note 2) Stop ring may be the equivalent one described in the table above.

MSU Series
MSU系列

Flange type(Fixed side)
法兰型(固定侧)





●公称型号的构成 / Model number notation

MSU — 5 G S
① ② ③ 4

①系列符号
MSU：KSS紧凑型支架组件系列
②公称型号
③形状符号
C：枕型
G：法兰型
④轴端符号
无符号：固定侧
S：支撑侧

①Series No.
MSU：KSS Compact Support Unit Series
②Nominal number
③Housing type
C：Pillow type
G：Flange type
④End-journal type
None：fixed side
S：supported side

注)支撑侧支架组件的公称型号可能与轴承内径不一致,敬请注意。
Note)In some cases, nominal number is not the same as Bearing Inner diameter.

Parts List / 零件表

Part No. 零件号	Part name 零件名称	Qty 数量
1	Housing / 外壳（Black Chrome coating / 黑铬处理）	1
2	Bearings / 轴承（with Shields / 带护板）	1 set
3	Pressure Nut / 压紧螺母	1
4	Collar / 轴环	1
5	Lock Nut / 锁紧螺母	1
6	Hexagonal socket head set screw / 内六角止动螺丝 （with set piece / 带定位块）	1 set

Unit(单位):mm

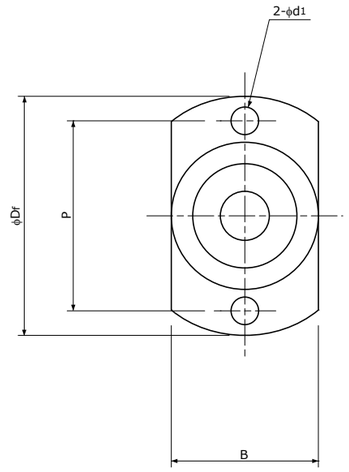
Type 型号	Brg. Inner dia. 轴承内径 d 0 −0.005	L	L_1	L_2	L_3	F	L_4	B	Df		D	P	d_1	M	T	Lock Nut 锁紧螺母	Tightening torque of Lock Nut 锁紧螺母的紧固扭矩 N·cm	Bearing 使用的轴承	Mass 重量 g	Type 型号
MSU-3G	3	12.5	5.5	16.5	1.5	3	7.5	11	23		11	17	3.5	M3	8	M3×0.5	80	MTA03-08HP5DF	12.5	MSU-3G
MSU-4G	4	13.5	5.5	17.5	1.5	3	8.5	14	26		14	20	3.5	M3	10	M4×0.5	100	MTA04-11HP5DF	20	MSU-4G
MSU-5G	5	15	5.5	18.5	2	3	10	17	29		17	23	3.5	M3	11	M5×0.5	140	MTA05-13HP5DF	30	MSU-5G
MSU-6G	6	17	7.5	22	2.5	4	12	19	34		19	26	4.5	M3	12	M6×0.75	190	MTA06-15HP5DF	42	MSU-6G
MSU-8G	8	20	9	26	3	4	16	24	39		24	31	4.5	M3	14	M8×1.0	200	MTA08-19HP5DF	70	MSU-8G

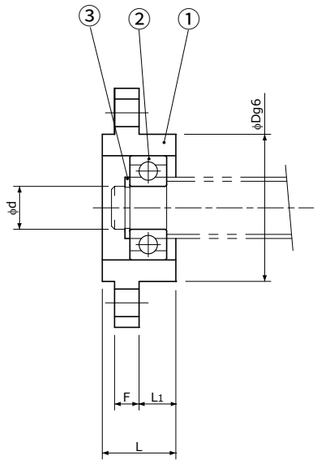
注1)角接触球轴承(ISC制)采用不锈钢材质,并注入有低起尘润滑脂(NSK LG2),是无尘规格的轴承。
注2)压紧螺母、轴环、锁紧螺母均经过了发黑处理。
注3)支架组件已经过预压调整,请勿进行拆分。

Note 1) Angular Contact Ball Bearings (manufactured by ISC) are designed for clean room use, they are made of Stainless steel with low contamination grease (NSK LG2) packed.
Note 2) Pressure Nut, Collar and Lock Nut are coated with Black finishing.
Note 3) Do not disassemble Support Unit, as they are pre-loaded and pre-adjusted.

MSU Series
MSU系列

Flange type（Supported side）
法兰型（支撑侧）





●公称型号的构成 / Model number notation

MSU — 5 G S
① ② ③ ④

①系列符号
　MSU：KSS紧凑型支架组件系列
②公称型号
③形状符号
　C：枕型
　G：法兰型
④轴端符号
　无符号：固定侧
　S：支撑侧

①Series No.
　MSU：KSS Compact Support Unit Series
②Nominal number
③Housing type
　C：Pillow type
　G：Flange type
④End-journal type
　None：fixed side
　S：supported side

注）支撑侧支架组件的公称型号可能与轴承内径不一致，敬请注意。
Note）In some cases, nominal number is not the same as Bearing Inner diameter.

Parts List / 零件表

Part No. 零件号	Part name 零件名称	Qty 数量
1	Housing / 外壳（Black Chrome coating / 黑铬处理）	1
2	Bearing / 轴承（with Shields / 带护板）	1
3	Stop ring / 止动环	1

Unit（单位）：mm

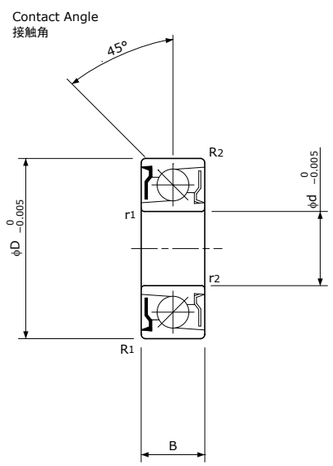
Type 型号	Brg. Inner dia. 轴承内径 d 0 −0.005	L	F	L1	B	Df		D	P	d1	Bearing 使用的轴承	Stop ring 使用的止动环	Mass 重量 g	Type 型号
MSU-3GS	2	8	3	3	11	23		11	17	3.5	602HZZ	ETW-1.5（OCHIAI / 落合）	7.5	MSU-3GS
MSU-4GS	3	10	3	5	14	26		14	20	3.5	623HZZ	G-3（IWATA / 磐田电工）	12	MSU-4GS
MSU-5GS	4	10	3	5	17	29		17	23	3.5	624HZZ	G-4（IWATA / 磐田电工）	16	MSU-5GS
MSU-6GS	6	10	4	5	19	34		19	26	4.5	B6-113HZZ1	STW-6（OCHIAI / 落合）	24	MSU-6GS
MSU-8GS	6	10	4	6	24	39		24	31	4.5	606HZZ1	STW-6（OCHIAI / 落合）	40	MSU-8GS

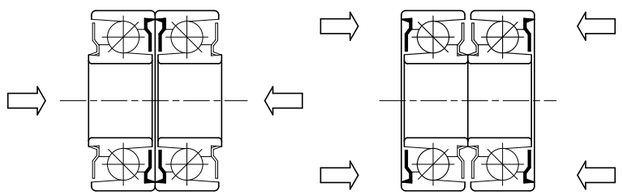
注1）深沟球轴承（ISC制）采用不锈钢材质，并注入有低起尘润滑脂（NSK LG2），是无尘规格的轴承。
注2）交货时使用的止动环可能会是同等规格的其他产品。

Note 1）Deep Groove Ball Bearing（manufactured by ISC）is designed for clean room use, it is made of Stainless steel with low contamination grease（NSK LG2）packed.
Note 2）Stop ring may be the equivalent one described in the table above.

Fixed side Ball Bearings for MSU series
MSU系列/固定侧轴承

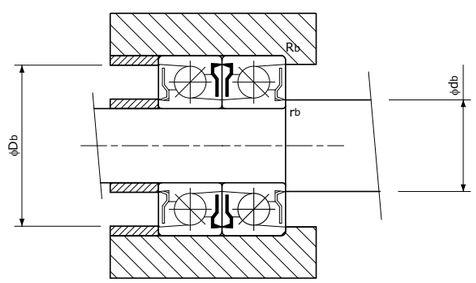
Angular Contact Ball Bearings（Stainless type）
角接触球轴承（不锈钢规格）



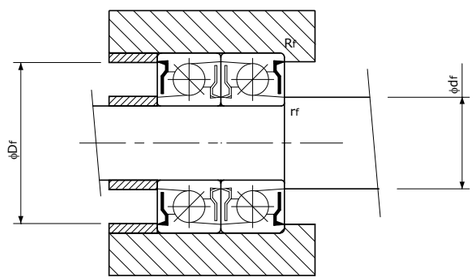


DB type
（Inner ring pre-load type）
**Silver colored shields are outside

DF type
（Outer ring pre-load type）
**Bronze colored shields are outside



DB Configuration
DB组合



DF Configuration
DF组合

●公称型号的构成 / Model number notation

MTA 08 – 19 H P5 DF
① ② ③ ④ ⑤ 6

①系列符号　①Series No.
②轴承内径（mm）　②Inner diameter of Bearing（mm）
③轴承外径（mm）　③Outer diameter of Bearing（mm）
④材料符号　④Material
　H ：不锈钢　H :Stainless Steel
　T ：轴承钢　T :Bearing Steel
⑤精度等级　⑤Accuracy grade
　相当于P5　Equivalent to P5
⑥组合类型　⑥Duplex type
　DF：正面组合　DF:Face to Face duplex
　DB：背面组合　DB:Back to Back duplex

推荐的紧固扭矩 / Recommended tightening torque

Unit（单位）:N·cm（kgf·cm）

Type / 型号	DF type DF型	DB type DB型
MTA02-06HP5DF/DB	19.6(2.0)	9.8(1.0)
MTA03-08HP5DF/DB	19.6(2.0)	14.7(1.5)
MTA04-11HP5DF/DB	49(5.0)	19.6(2.0)
MTA05-13HP5DF/DB	49(5.0)	24.5(2.5)
MTA06-15HP5DF/DB	78.4(8.0)	29.4(3.0)
MTA08-19HP5DF/DB	78.4(8.0)	39.2(4.0)

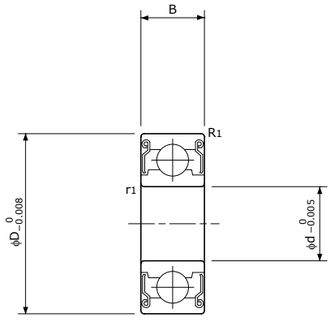
Unit（单位）:mm

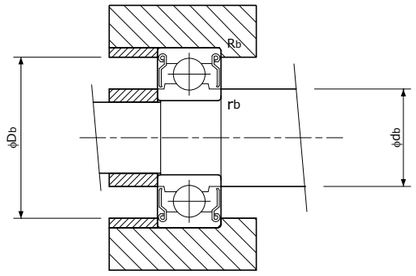
Type 型号	Dimension / 主要尺寸							Basic Load Rating 基本额定负载		Limit Speed 许用转速		Abutment & Fillet / 推荐的安装尺寸								Mass 重量	Type 型号
				Chamfer（min.）/ 倒角尺寸（最小）								DF type / DF型				DB type / DB型					
	I.D. 内径 fd	O.D. 外径 fD	Width 宽度 B	r1	r2	R1	R2	Ca（N）	Coa（N）	min⁻¹		Df max. 最大	df min. 最小	Rf max. 最大	rf max. 最大	Db max. 最大	db min. 最小	Rb max. 最大	rb max. 最大		
MTA02-06HP5DF/DB	2	6	3	0.10	0.10	0.10	0.04	470	360	26,000		5.0	2.8	0.10	0.10	5.3	3.0	0.04	0.10	0.8	MTA02-06HP5DF/DB
MTA03-08HP5DF/DB	3	8	4	0.10	0.10	0.15	0.03	820	670	22,000		6.7	3.9	0.15	0.10	7.2	4.4	0.03	0.10	1.8	MTA03-08HP5DF/DB
MTA04-11HP5DF/DB	4	11	4.5	0.20	0.20	0.20	0.10	1250	1130	17,000		8.9	5.1	0.20	0.20	9.5	6.2	0.10	0.20	3.8	MTA04-11HP5DF/DB
MTA05-13HP5DF/DB	5	13	5	0.20	0.20	0.20	0.10	1780	1740	16,000		10.8	6.1	0.20	0.20	11.3	7.2	0.10	0.20	5.6	MTA05-13HP5DF/DB
MTA06-15HP5DF/DB	6	15	5.5	0.20	0.20	0.20	0.20	2350	2360	14,000		12.5	7.2	0.20	0.20	13.2	8.6	0.20	0.20	7.8	MTA06-15HP5DF/DB
MTA08-19HP5DF/DB	8	19	6.5	0.20	0.20	0.30	0.30	3400	3480	13,000		15.8	9.4	0.30	0.20	16.8	11.4	0.30	0.20	14.5	MTA08-19HP5DF/DB

注1）角接触球轴承（ISC制）采用不锈钢材质，并注入有低起尘润滑脂（NSK LG2），是无尘规格的轴承。如有需要，也可提供普通材质（SUJ2）、加注有耐微动磨损润滑脂的产品。
注2）组合轴承时，请通过护板的颜色区分DF型或DB型（参照上图）。
注3）订货时，请指定组合类型（DF型或DB型）。
注4）仅销售组合轴承，不销售单品，敬请谅解！

Note 1）Angular Contact Ball Bearings（manufactured by ISC）are designed for clean room use, they are made of Stainless steel with low contamination grease（NSK LG2）packed.
If necessary, Bearing steel type Angular Contact Ball Bearings with anti-fretting grease can be also provided.
Note 2）Bearing duplex can be distinguished by the color of shield plate for each duplex, please refer to figure above.
Note 3）Please designate duplex number（DF or DB）, when you place order.
Note 4）This series can be provided as sets of DF or DB configuration only.

Supported side Ball Bearings for MSU series
MSU系列/支撑侧轴承





Unit(单位):mm

Type 型号	Dimension / 主要尺寸					Basic Load Rating 基本额定负载			Limit Speed 许用转速 min^{-1}	Abutment & Fillet / 推荐的安装尺寸				Mass 重量 (g)	Type 型号
	I.D. 内径 fd	O.D. 外径 fD	Width 宽度 B	Chamfer (min.) / 倒角尺寸(最小) r1	Chamfer (min.) / 倒角尺寸(最小) R1	Cr (N)	Cor (N)			Db max. 最大	db min. 最小	Rb max. 最大	rb max. 最大		
602HZZ	2	7	3.5	0.15	0.15	320	102		63,000	6.25	3.85	0.15	0.15	0.6	602HZZ
623HZZ	3	10	4	0.15	0.15	535	175		50,000	7.98	4.35	0.15	0.15	1.7	623HZZ
624HZZ	4	13	5	0.20	0.20	1110	390		40,000	11.35	6.0	0.20	0.20	3.1	624HZZ
B6-113HZZ1	6	15	6	0.20	0.20	1470	535		40,000	13.3	7.9	0.20	0.20	4.3	B6-113HZZ1
606HZZ1	6	17	6	0.30	0.30	1920	670		38,000	14.8	8.2	0.30	0.30	6.1	606HZZ1

注1)深沟球轴承(ISC制)采用不锈钢材质,并注入有低起尘润滑脂(NSK LG2),是无尘规格的轴承。

Note 1) Deep Groove Ball Bearings (manufactured by ISC) are designed for clean room use, they are made of Stainless steel with low contamination grease (NSK LG2) packed.

微型滚珠丝杠花键
Miniature Ball Screw with Ball Spline

由滚珠丝杠制造商和滚珠花键制造商联手打造的混合、紧凑、轻量型产品。
Ball Screw manufacturing company (KSS) and Ball Spline manufacturing company (HEPHAIST) collaborated for developing new product which is focused on Hybrid, Compact and lightweight.

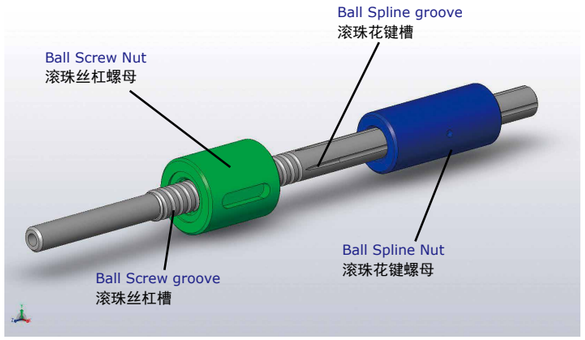
●特点

· 仅使用单件产品,即可实现直动(Z)、旋转(θ)、吸附动作的组合产品。
· 通过微型滚珠丝杠和微型滚珠花键的重叠,最大限度地实现了小型化。

●Features

· This is a combined product which is possible for linear and rotational movement as well as suction at the same time with one unit.
· Achieved developing very compact product as "Overlap type" using Miniature Ball Screws and Miniature Ball Splines.

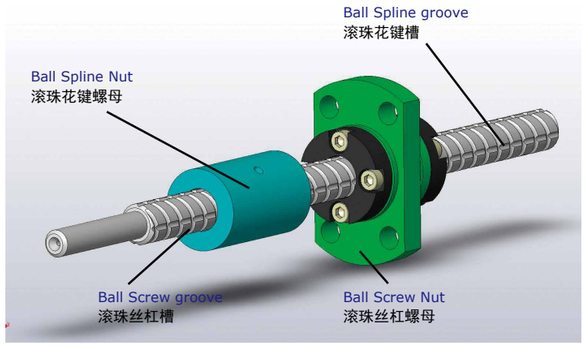
BSSP分离型
BSSP Separated type



将滚珠丝杠和滚珠花键加工在同一根轴上的组合产品。

It's a combined products, which has Ball Screw and Ball Spline processed on the same Shaft.

BSSP重叠型
BSSP Overlap type

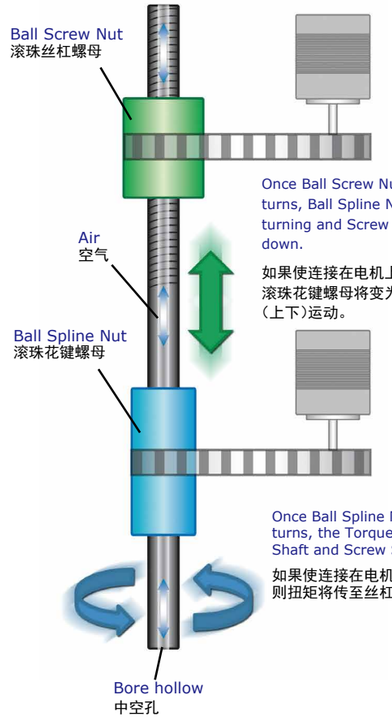


通过将滚珠丝杠和滚珠花键设置在相同的部位,
可实现小型化和长行程。

By processing Ball Screw and Ball Spline on the same place makes product have longer travel and compact.

●使用例 Usage example

传送带驱动 Belt Drive



Once Ball Screw Nut directed to Motor turns, Ball Spline Nut will sustain not turning and Screw Shaft moves up and down.

如果使连接在电机上的滚珠丝杠螺母旋转,则滚珠花键螺母将变为止转结构,丝杠轴作垂直(上下)运动。

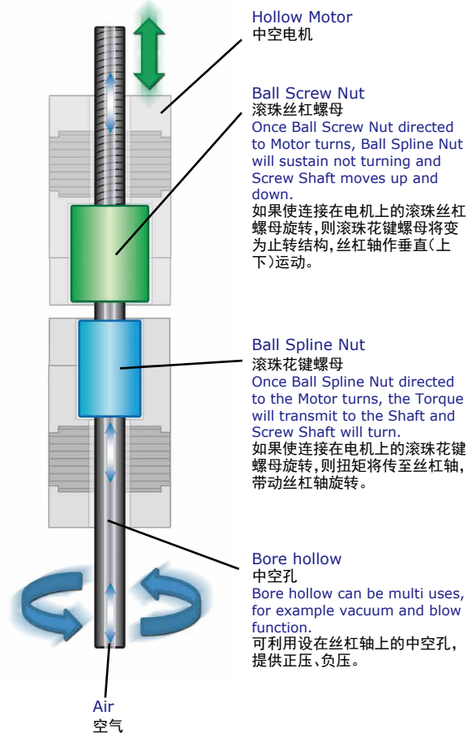
Once Ball Spline Nut directed to the Motor turns, the Torque will transmit to the Shaft and Screw Shaft will turn.

如果使连接在电机上的滚珠花键螺母旋转,则扭矩将传至丝杠轴,带动丝杠轴旋转。

Bore hollow can be multi uses. For example vacuum and blow function.

可利用设在丝杠轴上的中空孔,提供正压、负压。

中空电机驱动 Hollow Motor Drive

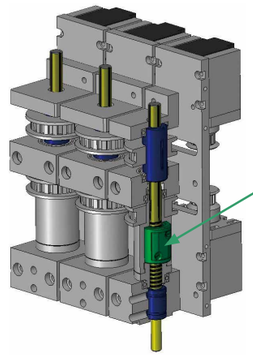


Ball Screw Nut
滚珠丝杠螺母
Once Ball Screw Nut directed to Motor turns, Ball Spline Nut will sustain not turning and Screw Shaft moves up and down.
如果使连接在电机上的滚珠丝杠螺母旋转,则滚珠花键螺母将变为止转结构,丝杠轴作垂直(上下)运动。

Ball Spline Nut
滚珠花键螺母
Once Ball Spline Nut directed to the Motor turns, the Torque will transmit to the Shaft and Screw Shaft will turn.
如果使连接在电机上的滚珠花键螺母旋转,则扭矩将传至丝杠轴,带动丝杠轴旋转。

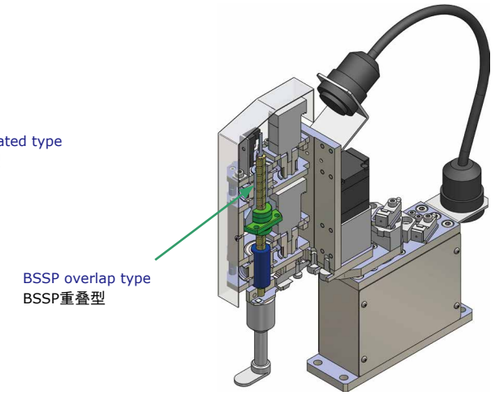
Bore hollow
中空孔
Bore hollow can be multi uses, for example vacuum and blow function.
可利用设在丝杠轴上的中空孔,提供正压、负压。

●适用例 Application Example



使用分离型,可大大节省空间。最适用于贴片机等用途。

Using "Separated type" of Ball Screw Spline is suitable for downsizing devices and equipment. Suitable for Chip-Mounter application etc.



使用重叠型,可确保长行程并实现小型化设计。最适用于小型Scalar机器人的前端部组件等。

Using "Overlap type" can save Shaft length and makes devise as minimized as possible. For example, suitable for Miniature SCARA Robot, especially for the head part.

●规格 Specifications

1）精度等级和间隙

微型滚珠丝杠花键(BSSP)的精度等级和间隙(轴向间隙、径向间隙)如下表所示。

1) Accuracy Grade & Axial/Radial play

Accuracy grade and Axial/Radial play for BSSP are shown in Table below.

Unit(单位):mm

Type 类型	Part 部位	C3 (Maximum / 最大)	C5 (Maximum / 最大)
Separated type 分离型	Ball Screw / 滚珠丝杠 (Axial play / 轴向间隙)	0 or 0.005	0.005
	Ball Spline / 滚珠花键 (Radial play / 径向间隙)	0	
Overlap type 重叠型	Ball Screw / 滚珠丝杠 (Axial play / 轴向间隙)	0.005	
	Ball Spline / 滚珠花键 (Radial play / 径向间隙)	0.002	

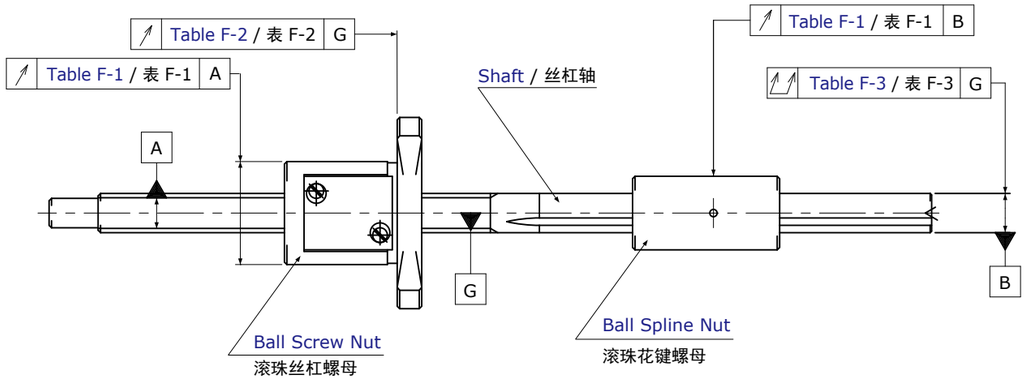
2）滚珠丝杠花键安装部的精度

微型滚珠丝杠花键(BSSP)的安装部精度依据JIS B1192-3(滚珠丝杠)、JIS B1193(滚珠花键),按以下标示方法和规格制造。

2) Run-out and location tolerances for BSSP

Run-out and location tolerances for BSSP are based on JIS B1192-3(Ball Screw), JIS B1193 (Ball Spline).
Tolerance for each part and description are as follows.

【分离型 / Separated type】



【重叠型 / Overlap type】

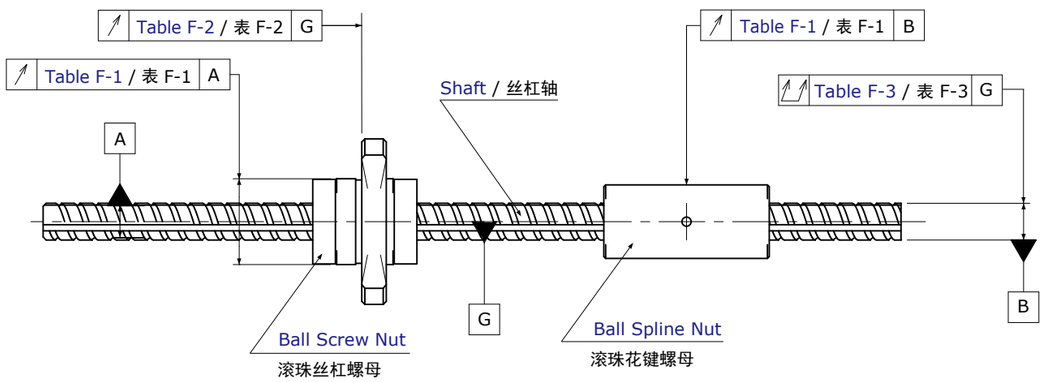


表 F-1：相对于丝杠轴轴线的螺母外周面的半径方向圆跳动
Table F-1 : Radial Run-out of Ball Nut location diameter related to the centerline of Screw Shaft

Unit(单位):μm

Nut outside diameter 螺母外径 (mm)		Permissible deviation of Radial Run-out 跳动公差(最大)		
Over 超过	Up to 以下	Ball Screw Nut / 滚珠丝杠螺母		Ball Spline Nut 滚珠花键螺母
		C3	C5	
–	20	9	12	11
20	32	10	12	–

表 F-2：相对于丝杠轴轴线的滚珠丝杠螺母基准端面或法兰安装面的圆跳动
Table F-2 : Axial Run-out (Perpendicularity) of Ball Nut location face related to the centerline of Screw Shaft

Unit(单位):μm

Nut outside diameter 螺母外径 (mm)		Permissible deviations of Axial Run-out(Perpendicularity) 跳动公差(最大)	
Over 超过	Up to 以下	Ball Screw Nut / 滚珠丝杠螺母	
		C3	C5
–	20	8	10
20	32	8	10

表 F-3：丝杠轴轴线的半径方向全跳动
Table F-3 : Total Run-out in radial direction of Screw Shaft related to the centerline of Screw Shaft

Unit(单位):μm

Shaft total length 丝杠轴总长 (mm)		Permissible deviations of total Run-out in radial direction 跳动公差(最大)	
Over 超过	Up to 以下	C3	C5
–	125	25	35
125	200	35	50
200	315	50	65

3）滚珠丝杠部的导程精度 / Lead accuracy of Ball Screws

滚珠丝杠的导程精度根据相对于螺纹部有效长度的代表移动量误差($\pm e_p$)及波动(V_u)来确定。
不同精度等级的许用值详见表F-4。
Ball Screw lead accuracy is specified by the tolerance of actual mean travel error ($\pm e_p$) and travel variation (V_u) over the Screw Shaft effective length.
Tolerance of each accuracy grades are shown in the Table F-4.

表 F-4：滚珠丝杠的代表移动量误差($\pm e_p$)和波动(V_u)许用值
Table F-4 : Tolerance on Specified travel ($\pm e_p$)and permissible travel variation of Ball Screws.

Unit(单位):μm

Accuracy Grade 精度等级			C3		C5	
Effective screw length 螺纹部有效长度 (mm)	Over 超过	Up to 以下	$\pm e_p$	V_u	$\pm e_p$	V_u
	–	100	8	8	18	18
	100	200	10	8	20	18
	200	315	12	8	23	18

4）材质和热处理、硬度

微型滚珠丝杠花键(BSSP)的标准材质、热处理和硬度如表F-5所示。
表中数值可能会因轴、螺母的形状不同而略有差异，详情请参照本公司出示的规格图。

4) Material & Heat treatment, Surface hardness

Standard material of BSSP, Heat treatment and Surface hardness are shown in Table F-5.
However, they vary depending on profile of Shaft or Nut. Please refer to KSS drawings.

表 F-5：一般产品的材质和热处理、硬度
Table F-5 : Material, Heat treatment & Surface hardness

		Material 材质	Heat treatment 热处理	Surface hardness 表面硬度
Screw Shaft 丝杠轴	Solid Shaft 实心轴	SCM415	Carburizing and quenching 渗碳淬火	HRC 58-62
	Hollow Shaft 空心轴	SUJ2	Induction hardening 高频淬火	
Nut / 螺母		SCM415	Carburizing and quenching 渗碳淬火	HRC 58-62

5）润滑

使用滚珠丝杠花键(BSSP)时，必须涂抹润滑剂。否则会造成扭矩变大或缩短丝杠使用寿命等问题。涂抹润滑剂可以抑制因摩擦而导致的升温、机械效率下降，以及因磨损而导致的精度下降。使用油脂润滑BSSP时，一般建议使用锂皂基油脂；使用油润滑时，建议使用ISO VG32～68(透平油)。
如无特别指定，滚珠丝杠花键(BSSP)在交货时会涂上防锈油。由于防锈油不具备润滑性，因此在使用前请另行涂抹润滑剂。
如无特殊要求，建议使用KSS原装润滑油脂(MSG No.2)。也可在出厂时涂抹客户要求的油脂。

5) Lubrication

In Ball Screw with Ball Spline(BSSP) use, lubricant should be required. If lubricant is not applied with, the problem such as increase of Torque and shortened Life occurs. Applying lubricant can minimize temperature increases, decline of mechanical efficiency due to friction, and deterioration of accuracy caused by wear.
For lubrication of BSSP, regular lithium-soap-based Grease and ISO VG32-68 Oil (turbine Oil #1 to #3) are recommended.
BSSP are applied with anti-rust oil for rust prevention, if there is no designation when shipping. Since anti-rust oil is not lubricant, apply Grease or Lubrication oil before using BSSP.
If there is no specific request, KSS would recommend our original grease (MSG No.2) as standard lubricant. We can apply designated Grease before shipping, please ask KSS representative.

表 F-6：一般使用条件下的润滑剂示例
Table F-6 : Recommended lubricants for normal operating conditions

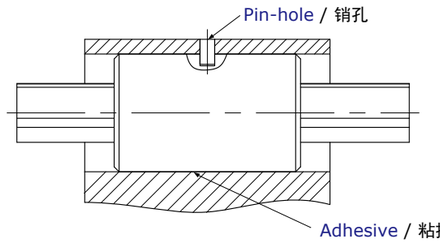
Lubricant 润滑剂	Type 种类	Product name 产品名称
Grease 油脂	Lithium-based Grease 锂基油脂	KSS original Grease MSG No.2 KSS原装油脂 MSG No.2
Lubricating Oil 润滑油	Sliding surface Oil or turbine Oil 滑动面油或透平油	Super Multi 68 Super Multi68

6）花键螺母的安装

利用设在螺母外周的销孔以及粘接剂来安装滚珠花键螺母。
使用销孔安装时，请注意不要使花键螺母承受负载。

6) Mounting of Ball Spline Nut

Ball Spline Nut should be mounted using pin-hole located on Nut outer, and adhesive.
Please make sure that no load would be applied on pin when using pin-hole.



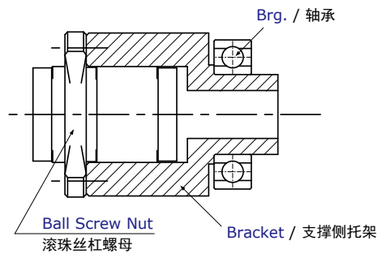
7）滚珠丝杠螺母的安装

通过螺母旋转的方式来使用滚珠丝杠时，
可以通过托架将轴承安装到螺母上、也可以将轴承直接组装到螺母外径上。
可根据客户的安装需求变更滚珠丝杠螺母的设计，详情请垂询本公司。

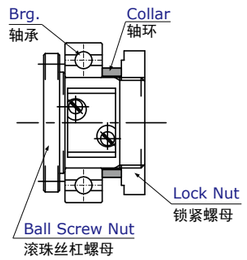
7) Mounting of Ball Screw Nut

There would be a couple of ways to install Bearings onto Ball Screw Nut, such as using Bracket as Bearing shaft, direct mounting on Ball Screw Nut.
KSS designs special profile of Ball Screw Nut in accordance with customer's mounting request.
Please ask KSS representative for further information.

通过托架安装轴承
Brg. install with Bracket



将轴承直接安装到螺母外径上
Direct install of Brg. onto Nut outer



●公称型号的构成 Model number notation

【分离型 / Separated type】

BSSP ① 06 ② 10 ③ / 06 ④ - 080 ⑤ R ⑦ 070 ⑧ S ⑨ 200 ⑩ C5 ⑪ T ⑫

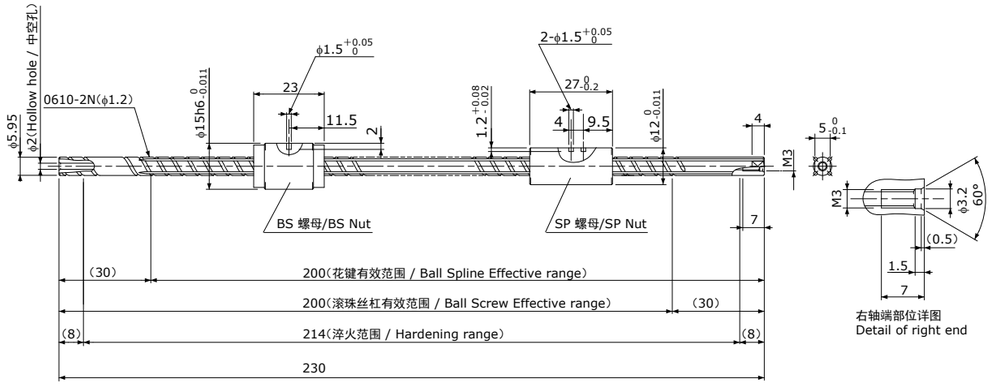
【重叠型 / Overlap type】

BSSP ① 06 ② 10 ③ - 150 ⑥ R ⑦ 180 ⑩ C5 ⑪ T ⑫

① 系列符号　BSSP：滚珠丝杠花键
② 丝杠轴公称外径(mm)
③ 导程(mm)
④ 花键轴径(mm)
⑤ 滚珠丝杠部有效长度(mm)
⑥ 滚珠丝杠 / 滚珠花键有效长度(mm)
⑦ 滚珠丝杠旋向(R=右旋, L=左旋)
⑧ 滚珠花键部有效长度(mm)
⑨ 滚珠花键部的符号
⑩ 丝杠轴总长(mm)
⑪ 精度等级
⑫ 轴形状　无符号：实心轴, T：空心轴

① Ball Screw with Ball Spline series No.
　BSSP : Ball Screw with Ball Spline
② Screw Shaft nominal diameter(mm)
③ Lead(mm)
④ Ball Spline Shaft nominal diameter(mm)
⑤ Screw thread length(mm)
⑥ Screw thread & Spline length(mm)
⑦ Thread direction(R=Right-hand, L=Left-hand)
⑧ Spline length(mm)
⑨ S means Ball Spline part
⑩ Total length(mm)
⑪ Accuracy grade
⑫ Shaft option : No indication=solid shaft, T=Hollow shaft

BSSP0610 | Shaft dia.(轴径)f6　Lead(导程)10mm | C5



Ball Screw Specifications　滚珠丝杠主要技术参数	
Accuracy Grade　精度等级	JIS C5
Ball size　钢珠直径	f1.2mm
Number of thread　螺纹条数	2
Thread direction　螺纹旋向	Right　右
Pitch circle dia.　节圆直径	6.30mm
Number of circuit　循环数	1.2×2
Dynamic Basic Load Rating 基本额定动负载 Ca	(650N)
Static Basic Load Rating 基本额定静负载 Coa	(900N)
Axial Play　轴向间隙	Max 0.005 mm

Ball Spline Specifications　滚珠花键主要技术参数	
Accuracy Grade　精度等级	JIS C5
Dynamic Basic Load Rating 基本额定动负载 Cr	(750N)
Static Basic Load Rating 基本额定静负载 Cor	(1200N)
Dynamic Basic Torque Rating 基本额定动扭矩 Ct	(1.9 Nm)
Static Basic Torque Rating 基本额定静扭矩 Cot	(1.3 Nm)
Radial Play　径向间隙	Max 0.002 mm

Common Specifications　通用技术参数		
Material 材质	Shaft 轴	SUJ2
	Nut 螺母	SCM415
Anti-rust treatment 防锈处理		Anti-rust Oil 防锈油

Note 1) The detail will be provided by drawing.
Note 2) Female thread on left end journal is not available.
注1) 详情记载于规格图中。
注2) 不进行轴端内螺纹的追加加工。

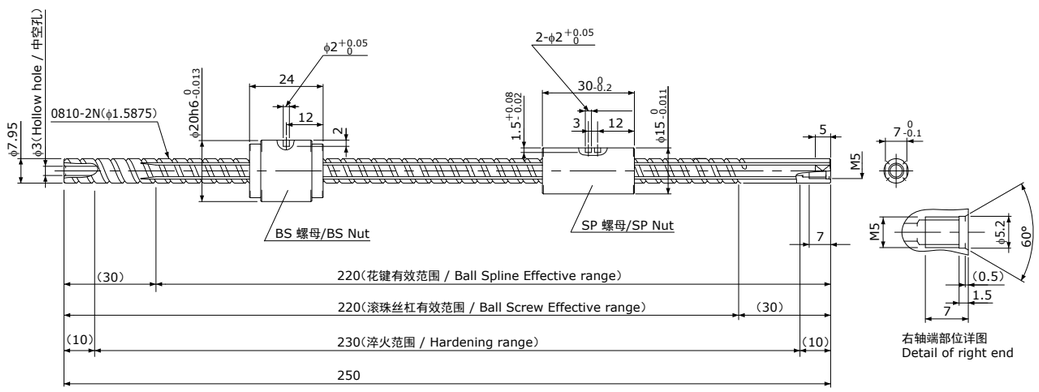
【轴端追加加工／Re-works on Shaft-end】

Other parts can be attached by re-working the end journal, such as turning down, or male thread.

通过对轴端进行切断及追加加工(车削、外螺纹加工)，使得部件得以安装。

轴端追加加工例 / Re-works Example

BSSP0810 | Shaft dia.(轴径)f8　Lead(导程)10mm | C5



Ball Screw Specifications　滚珠丝杠主要技术参数	
Accuracy Grade　精度等级	JIS C5
Ball size　钢珠直径	f1.5875mm
Number of thread　螺纹条数	2
Thread direction　螺纹旋向	Right　右
Pitch circle dia.　节圆直径	8.40mm
Number of circuit　循环数	1.65×2
Dynamic Basic Load Rating 基本额定动负载 Ca	(1400N)
Static Basic Load Rating 基本额定静负载 Coa	(2000N)
Axial Play　轴向间隙	Max 0.005 mm

Ball Spline Specifications　滚珠花键主要技术参数	
Accuracy Grade　精度等级	JIS C5
Dynamic Basic Load Rating 基本额定动负载 Cr	(1000N)
Static Basic Load Rating 基本额定静负载 Cor	(1450N)
Dynamic Basic Torque Rating 基本额定动扭矩 Ct	(3.4Nm)
Static Basic Torque Rating 基本额定静扭矩 Cot	(2.4Nm)
Radial Play　径向间隙	Max 0.002 mm

Common Specifications　通用技术参数		
Material 材质	Shaft 轴	SUJ2
	Nut 螺母	SCM415
Anti-rust treatment 防锈处理		Anti-rust Oil 防锈油

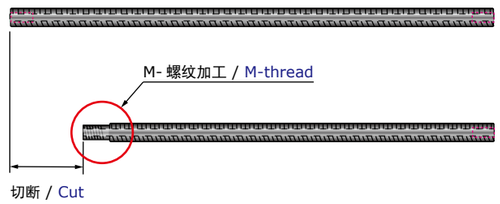
Note 1) The detail will be provided by drawing.
Note 2) Female thread on left end journal is not available.
注1) 详情记载于规格图中。
注2) 不进行轴端内螺纹的追加加工。

【轴端追加加工／Re-works on Shaft-end】

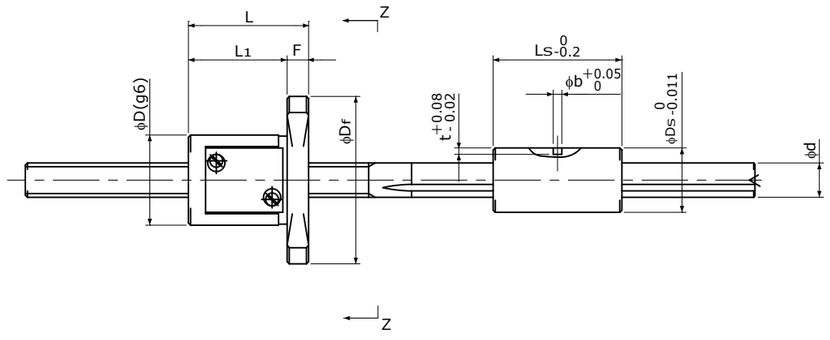
Other parts can be attached by re-working the end journal, such as turning down, or male thread.

通过对轴端进行切断及追加加工(车削、外螺纹加工)，使得部件得以安装。

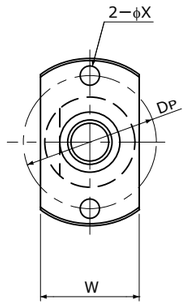
轴端追加加工例 / Re-works Example



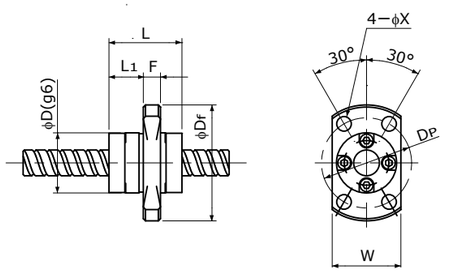
Separated type
分离型



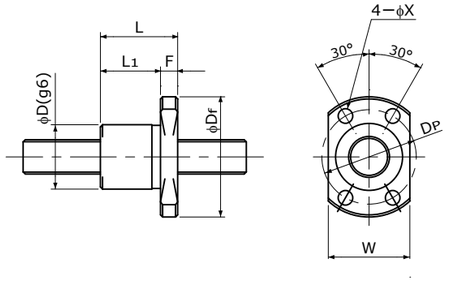
Type-1 : Return-plate type (Ball Screw Nut)
复式回路板循环方式(滚珠丝杠螺母)



View Z-Z
向视图 Z-Z



Type-2 : End-cap type(Ball Screw Nut)
端盖式循环方式(滚珠丝杠螺母)



Type-3 : Internal-deflector type(Ball Screw Nut)
陀螺式循环方式(滚珠丝杠螺母)

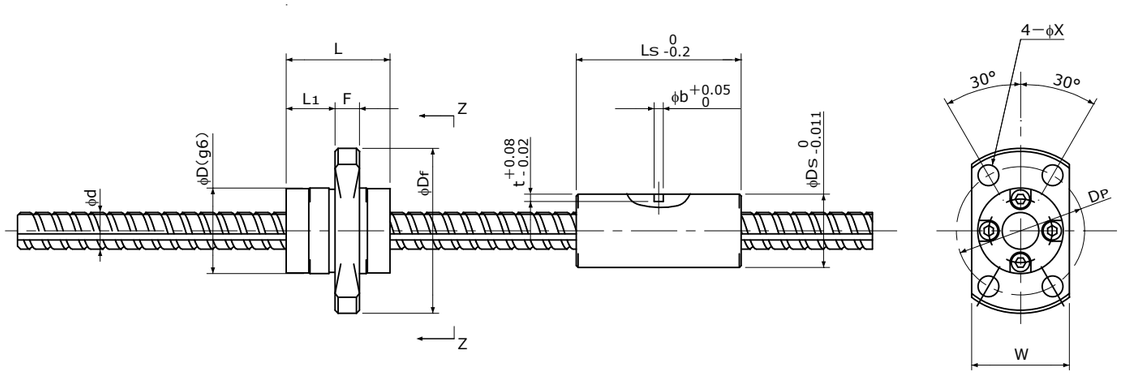
Unit(单位):mm

Ball Nut Model number 螺母型号	Shaft nominal dia. 丝杠轴公称外径 d	Ball Screw part / 滚珠丝杠部													Ball Spline part / 滚珠花键部										Bore hollow 中空孔	Shaft Inertia 丝杠轴惯量	Ball Nut Model number 螺母型号
		Lead 导程	Basic Load Rating 基本额定负载 (Reference) (参考值)		Nut dimension / 螺母尺寸											Basic Load Rating 基本额定负载 (Reference) (参考值)		Basic Torque Rating 基本额定扭矩 (Reference) (参考值)		Permissble Moment 允许力矩 (Ref.) (参考值) Mo	Nut dimension / 螺母尺寸							
			Ca N	Coa N	Nut type 螺母类型	Nut mass 螺母质量 g	D	Df	L	L1	F	W	Dp	Bolt Hole 安装孔 X		Cr N	Cor N	Ct Nm	Cot Nm	Nm	Nut mass 螺母质量 g	OD. 外径 Ds	Length 长度 Ls	Pin hole 销孔 b	Pin hole 销孔 t		Kgm²/mm	
BSSP 0602/06	6	2	(750)	(1200)	1	25	15	29	17	13	4	17	23	3.4		(860)	(1400)	(2.2)	(1.6)	(3.0)	14	12	27	1.5	1.2	2	9.99×10^{-10}	BSSP 0602/06
BSSP 0606/06		6	(870)	(1450)	2	20	14	27	17	8	4	16	21	3.4														BSSP 0606/06
BSSP 0610/06		10	(950)	(1600)	2	20	14	27	23	11.5	4	16	21	3.4														BSSP 0610/06
BSSP 0802/08(1)	8	2	(850)	(1600)	1	25	16	30	17	13	4	18	24	3.4		(1200)	(1900)	(4.1)	(3.1)	(4.1)	22	15	30	2.0	1.5	3	31.6×10^{-10}	BSSP 0802/08(1)
BSSP 0802/08(2)		2	(2400)	(4000)	1	60	20	38	24	19	5	22	30	4.5														BSSP 0802/08(2)
BSSP 0802/08(3)		2	(1300)	(2300)	3	25	15	28	18	14	4	17	22	3.4														BSSP 0802/08(3)
BSSP 0804/08		4	(2600)	(4200)	1	75	21	39	28	23	5	23	31	4.5														BSSP 0804/08
BSSP 0812/08		12	(2200)	(4000)	2	40	18	31	27	17	4	20	25	3.4														BSSP 0812/08

注1) 中空孔为选购件。根据丝杠轴的长度,也可能不适用。
注2) 需要特殊的螺母形状时,请垂询本公司。
注3) 基本额定负载、基本额定扭矩、允许力矩是根据有效负载滚珠数量计算出的理论值。
根据不同的使用条件会发生很大变化,请仅作为参考。
注4) 本产品是承受径向负载的滚珠花键和承受轴向负载的滚珠丝杠的组合产品,
很难预估其理论寿命。
建议使用实机进行评估,或根据本公司的实验数据来判断是否适用。
注5) 可生产的最大长度为max.150mm(f6)、max.200mm(f8)。
需要超过上述长度的产品时,请垂询本公司。

Note 1) Please note that Bore hollow is an option, not a standard.
In some cases Bore hollow is not available due to Shaft length.
Note 2) If special profile of Ball Screw Nut / Ball Spline Nut, please ask KSS representative.
Note 3) Basic Load Rating, Basic Torque Rating and Permissible Moment are theoretical number based on effective number of Balls. They may vary drastically depending on operating condition. Please consider them just reference.
Note 4) It is difficult to estimate theoretical life, because of combined products with Ball Spline which withstands Radial Load and Ball Screw for Axial Load. We would recommend that final decision should be based on your evaluation on actual machine or our experimental data.
Note 5) Maximum limit of Shaft length is 150mm(for f6), 200mm(for f8).
Please ask KSS in case of exceeding limit length.

Overlap type
重叠型



View Z-Z
向视图 Z-Z

Type-2 : End-cap type(Ball Screw Nut)
端盖式循环方式(滚珠丝杠螺母)

Unit(单位):mm

Ball Nut Model number 螺母型号	Shaft nominal dia. 丝杠轴公称外径 d	Ball Screw part / 滚珠丝杠部														Ball Spline part / 滚珠花键部										Bore hollow 中空孔	Shaft Inertia 丝杠轴惯量	Ball Nut Model number 螺母型号
		Lead 导程	Basic Load Rating 基本额定负载 (Reference) (参考值)		Nut dimension / 螺母尺寸											Basic Load Rating 基本额定负载 (Reference) (参考值)		Basic Torque Rating 基本额定扭矩 (Reference) (参考值)		Permissble Moment 允许力矩 (Ref.) (参考值) Mo	Nut dimension / 螺母尺寸										
			Ca	Coa	Nut type 螺母类型	Nut mass 螺母质量	D	Df	L	L1	F	W	Dp	Bolt Hole 安装孔 X		Cr N	Cor N	Ct Nm	Cot Nm	Nm	Nut mass 螺母质量 g	OD. 外径 Ds	Length 长度 Ls	Pin hole 销孔 b	Pin hole 销孔 t			
BSSP 0606	6	6	(600)	(900)	2	20	14	27	17	8	4	16	21	3.4		(650)	(1000)	(1.7)	(1.2)	(2.2)	14	12	27	1.5	1.2	2	9.99×10^{-10}	BSSP 0606
BSSP 0610		10	(650)	(900)	2	20	14	27	23	11.5	4	16	21	3.4		(750)	(1200)	(1.9)	(1.3)	(2.4)								BSSP 0610
BSSP 0812	8	12	(1400)	(2000)	2	40	18	31	27	17	4	20	25	3.4		(1100)	(1700)	(3.8)	(2.8)	(2.7)	22	15	30	2.0	1.5	3	31.6×10^{-10}	BSSP 0812

注1) 中空孔为选购件。根据丝杠轴的长度,也可能不适用。
注2) 需要特殊的螺母形状时,请垂询本公司。
注3) 基本额定负载、基本额定扭矩、允许力矩是根据有效负载滚珠数量计算出的理论值。
根据不同的使用条件会发生很大变化,请仅作为参考。
注4) 本产品是承受径向负载的滚珠花键和承受轴向负载的滚珠丝杠的组合产品,
很难预估其理论寿命。
建议使用实机进行评估,或根据本公司的实验数据来判断是否适用。
注5) 作为参考,本产品的可搬重量最大为10N。
注6) 可生产的最大长度为max.150mm(f6)、max.200mm(f8)。
需要超过上述长度的产品时,请垂询本公司。

Note 1) Please note that Bore hollow is an option, not a standard.
In some cases Bore hollow is not available due to Shaft length.
Note 2) If special profile of Ball Screw Nut / Ball Spline Nut, please ask KSS representative.
Note 3) Basic Load Rating, Basic Torque Rating and Permissible Moment are theoretical number based on effective number of Balls. They may vary drastically depending on operating condition. Please consider them just reference.
Note 4) It is difficult to estimate theoretical life, because of combined products with Ball Spline which withstands Radial Load and Ball Screw for Axial Load. We would recommend that final decision should be based on your evaluation on actual machine or our experimental data.
Note 5) Maximum Load Capacity should be considered 10N.
Note 6) Maximum limit of Shaft length is 150mm(for f6), 200mm(for f8).
Please ask KSS in case of exceeding limit length.

●存放、操作及使用注意事项

· 操作注意事项

BSSP属于精密部件，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 。
请避免将产品保管在80℃以上、－20℃以下、湿度为80%以上的潮湿环境中，
应在不会结露的环境中以水平状态保管。

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. BSSP的轴和螺母可能会因自重而下落，请注意避免受伤。
4. 如果BSSP下落，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。若BSSP下落，必须由本公司进行检查。
   请务必将产品送回本公司。我们将有偿为您检查。

· 使用注意事项

防尘

请在清洁环境下使用BSSP。
请同时使用防尘罩等防止异物、切屑等进入BSSP中。
如果因防尘不当而导致异物、切屑等进入BSSP，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BSSP在短期内丧失功能。
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。

许用转速和许用径向负载

根据尺寸、材质及安装方式等不同，BSSP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。

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。

使用温度

使用温度的极限通常设计在－20℃以上、80℃以下；湿度为80%以下。
超过该温度使用时，可能会产生如下现象：
· BSSP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；
· BSSP各部件的腐蚀。
如需在超过上述条件的环境下使用，请垂询本公司。

偏负载

滚珠丝杠螺母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。
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。
请注意避免对滚珠丝杠螺母部施加径向负载和力矩负载。

●Precaution of storage, handling and operating

· Precaution for handling

BSSP is precision components, and must be handled carefully in accordance with the instruction below.

Storage

BSSP 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.
Please store BSSP under -20℃ ～80 ℃, less than 80%RH humidity without any dew condensation.

Handling

1. Never disassemble BSSP. This will cause contamination, reduce accuracy, and lead to accidents.
2. Customers should not attempt to reassemble BSSP. Incorrect reassembly can easily result in malfunction. BSSP should be returned to KSS, where it will be repaired and reassembled with charge.
3. Take care to avoid injuries due to falling BSSP Shaft or Nut.
4. Dropping BSSP may cause scratching or impact damage to recirculating components, Shaft outside diameters, Balls, or Screw & Spline grooves, which may cause malfunction, such as incorrect rotation. If dropped, BSSP must be inspected by KSS with charge. Please make sure you return dropped Shaft or Nut.

· Precaution 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 BSSP performance, cause damage to recirculating components, which lead to locking.

Lubrication

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

Critical speed and Permissible Axial load

BSSP has the maximum limit of speed and Axial load depending on its size, material, mounting method etc.
When design BSSP, KSS would recommend that you consult with KSS engineering about the operating condition and model selection.

Over-run

Allowing 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 Nut and Ball Spline Nut must therefore never be allowed to overrun. If overrunning occurs, contact KSS for an inspection with charge.

Temperature

BSSP should be used under the temperature of －20℃ ～80 ℃ , and humidity of less than 80%RH.
Avoid use BSSP under lower / higher temperatures and higher humidity.
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.
· Rust on BSSP 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 Screw Nut 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 Ball Screw Nut. If these kinds of loads act on the Ball Screws, Ball load uniformity is lost, and the life of Ball Screws is drastically reduced.

序言
Outline

作为微型滚珠丝杠专业制造商，KSS在执行器产品上同样在不懈地追求轻量、紧凑。运用在微型滚珠丝杠制造中积累的培育出的技术专长，推出了许多紧凑性极高的执行器产品，令其他公司难以企及。

KSS as specialize in the Miniature Ball Screw, is pursuing the light-weight and compactness for our Actuator products. Adopting the know-how of Miniature Ball Screw, we have selections of Actuator products which enables ultimate compactness where no other company can follow.

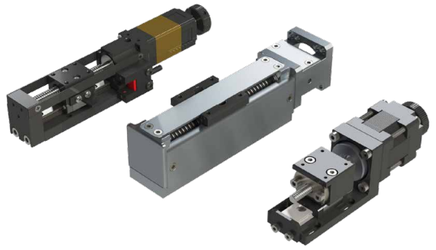
●KSS执行器的分类 / Classification of KSS Actuator

【滚珠丝杠线性执行器 / Ball Screw Linear Actuator】

特点
- 步进电机与滚珠丝杠一体的紧凑型电动线性执行器。
- 推出了External、Captive、Non-Captive三种类型的产品。

Features
- This is a Ball Screw type compact electric Linear Actuator which combined with Stepping Motor.
- 3 types of Linear Actuators, External, Captive and Non-Captive type are available for customer usage.

【单轴执行器 / Single axis Actuator】



特点
- KSS单轴执行器是安装有微型滚珠丝杠、导轨的滑台式紧凑型执行器。
- 具有充实的外装光电传感器及刹车单元等可选功能。

Features
- Single axis Actuator is the stage-type compact Actuator which is made of small sized Ball Screw and Linear Guide.
- Variety of options are available such as External photo-sensor or Brake unit.

【V-Z-θ执行器 / V-Z-θ Actuator】

特点
- 配备微型滚珠丝杠花键(BSSP)，仅使用单件产品，即可实现直线运动(Z)、旋转(θ)、吸附(Vacuum)3项功能的成套产品。
- V-Z-θ执行器有直接驱动型、混合驱动型、传送带驱动型3种类型。

Features
- This is our state of the art product which applied the KSS miniature Ball Screw with Ball Spline(BSSP), and realized three functions, linear (Z), rotary (θ) and vacuum (V) with one product.
- KSS provides 3-types of multi-functional VZθ Actuator, which are Direct Drive type, Hybrid Drive type and Belt Drive type.

滚珠丝杠线性执行器　Ball Screw Linear Actuators

- 步进电机与滚珠丝杠一体的紧凑型电动线性执行器。
- 根据不同的用途，推出了External、Captive、Non-Captive三种类型的产品。
- KSS是唯一以滚珠丝杠的形式推出这三种线性执行器的制造商。
- 配备的滚珠丝杠和电机选择丰富。

- This is a Ball Screw type Compact Electric Linear Actuators with Stepping Motor.
- 3 types of Linear Actuators, Captive, Non-captive, & External, are provided for customer's usage.
- KSS is only one manufacturer who has all 3-types of Linear Actuators.
- Wide variety of selection of Motor & Ball Screw are available.

●特点

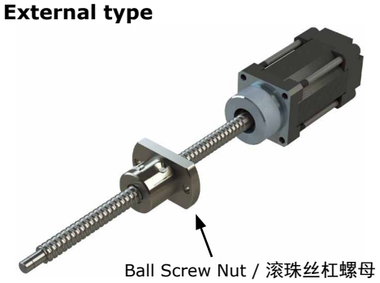
- 采用不需要联轴器的直接驱动，实现了紧凑、高精度。
- 可实现装置的小型化并减少直动结构的部件数量，减少组装工时。
- 与进给丝杠型相比，实现了高效率、长寿命、高精度。
- 电机尺寸、滚珠丝杠的种类、导程的选择多，可根据用途分别使用。

●Features

- High accuracy & compactness are achieved due to direct drive structure.
- Compact design, to reduce the number of components, to save the labor cost are possible.
- High efficiency, long life & high accuracy can be achieved compared to lead screw type.
- Pick one models that fits your application or specifications among variety of combination, Motor size, Ball screw type & screw lead.

●种类与构造 / Variation and Structure

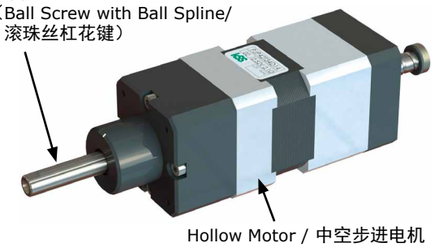
External type



电机轴与滚珠丝杠轴通用，省去了联轴器。

Stepping Motor is directly mounted onto Ball Screw shaft, so that Coupling is not required in this type of Actuator.

Captive type



将滚珠丝杠花键（BSSP）组装到中空电机中，花键起到止转和导向结构的作用。

Ball Screw with Ball Spline（BSSP）is built in the Hollow Motor.
Ball Spline Nut plays a role of anti-rotating device and slide guide.
No need to set up anti-rotating design outside the Actuators.

Non-Captive type

在中空步进电机中组装了滚珠丝杠的简易结构。外部需要止转结构。

This is the simple design Linear Actuator with Ball Screw built in Hollow Motor.
Anti-rotating device should be set up outside Actuators when usage.

线性执行器 External type

Linear Actuator External type

是步进电机与滚珠丝杠一体，不需要联轴器的紧凑型线性执行器。

It's a Compact Linear Actuator series, what we call MoBo.
The MoBo is the combined product that Stepping Motor Shaft is directly mounted onto Ball Screw Shaft, and eliminated Coupling accordingly.

KSS以小型化为微型滚珠丝杠制造商的使命，不懈地追求产品的轻量小型化。
其代表产品线性执行器（External型）是将电机轴与滚珠丝杠轴合二为一的组合产品，
不需要联轴器，从而缩短了长边方向的尺寸。
KSS自2001年推出线性执行器（External 型）以来，
不断增加滚珠丝杠和电机的种类，备有丰富的产品可供客户选择。

In KSS, we always pursue the downsizing of our products that is the mission of the Miniature Ball Screw manufacturer.
Linear Actuator External type is one of our representative product, which combines a Motor Shaft and a Ball Screw.
External type can achieve shortening the longitudinal dimension by eliminating the Coupling.
Since KSS launched the first version of External type in 2001, we continued to add various type of External type on our line-up and provides the variety of choices to our customer.

线性执行器（External 型）是滚珠丝杠和步进电机（2相/5相）一体型产品，备有丰富的组合可供选择（表P-1、表P-2）。也可制作树脂导程丝杠（树脂螺母滑动丝杠）型，请垂询本公司。

Linear Actuator（External type）can offer variety of choices, based on its combination of Stepping Motor type（2-phase or 5-phase）and Ball Screw type（refer to TableP-1, TableP-2）.
In addition, we can provide Resin（plastic Nut）Lead Screw type as customized product, please ask KSS representative if necessary.

表P-1：驱动丝杠和电机的组合 / Table P-1 ： Combination of Ball Screw and Stepping Motor

Type 种 类	Ball Screw type / 滚珠丝杠型		Stepping Motor / 步进电机		Additional Function 附属装置
	Precision type / 精密滚珠丝杠	Rolled type / 冷轧滚珠丝杠	2-phase / 2相	5-phase / 5相	
DMB		○ JIS Ct7 equivalent 相当于JIS Ct7	○		
2TMB		○ JIS Ct7 equivalent 相当于JIS Ct7	○		
TMB		○ JIS Ct7		○	
MB	○ JIS C3			○	
MMB		○ JIS Ct7 equivalent 相当于JIS Ct7	○		Encoder / Driver / Controller 编码器 / 驱动器 / 控制器
SiMB	○ JIS C3		○		Encoder / Memory chip 编码器 存储芯片

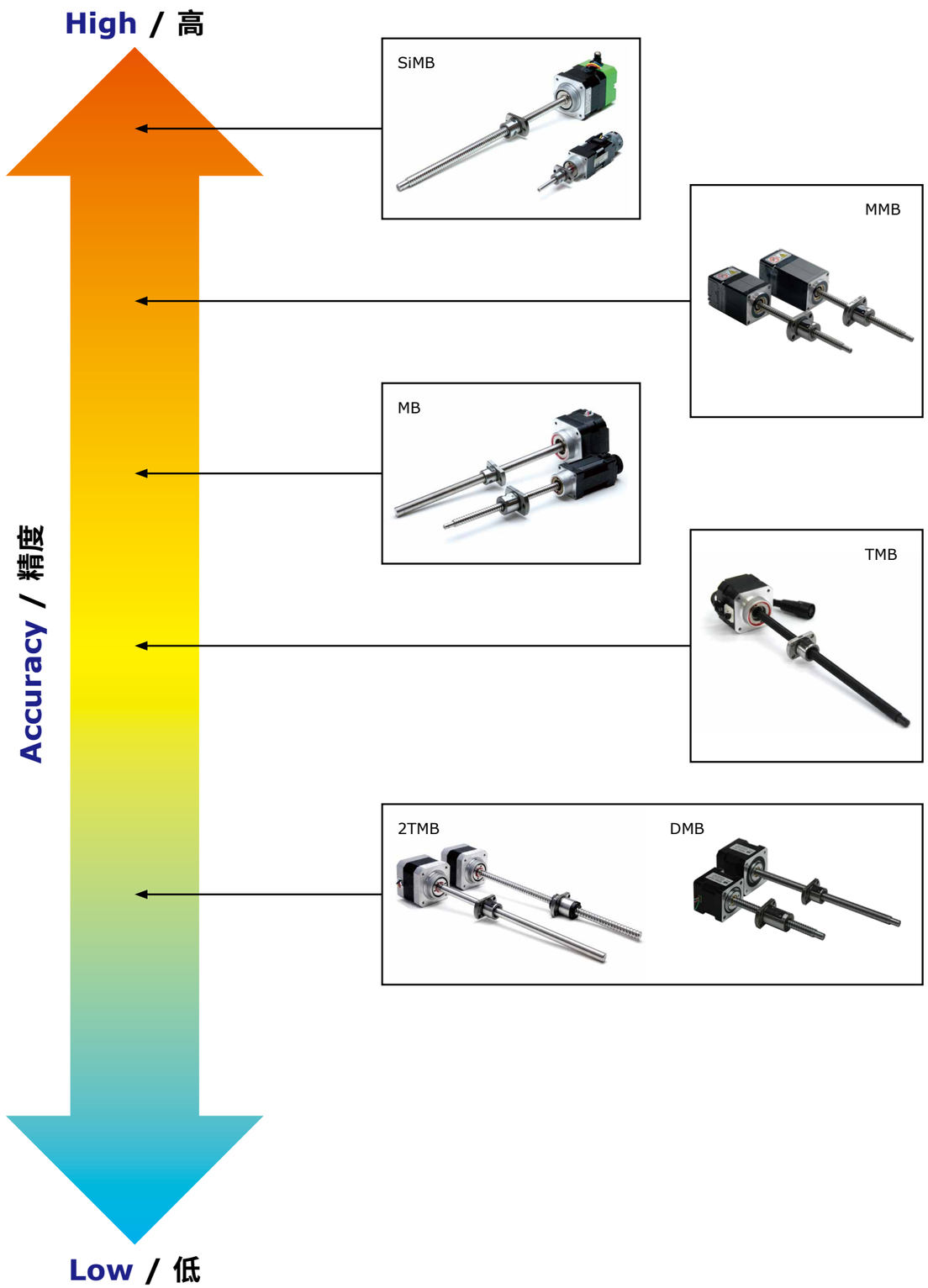
表P-2：驱动丝杠和电机的组合 / Table P-2 ： Combination of Ball Screw and Stepping Motor

Unit（单位）:mm

Shaft Nominal dia. / 轴径 ＼ Lead / 导程	0.5	1	2	4	5	6	10	12
4	MB	DMB TMB MB SiMB	DMB					
5				DMB TMB				
6		DMB TMB MB	DMB TMB MB MMB			TMB	DMB	
8		DMB TMB 2TMB MB SiMB	DMB TMB 2TMB MB SiMB		DMB TMB 2TMB SiMB		DMB	TMB 2TMB

线性执行器(External型)根据客户的精度要求,从高精度到通用品,备有各种类型的产品。

Linear Actuator (External type) provides various types of combination for Ball Screw and Motor ranging from high precision to multi-purpose type depending on the customer requirement.



【DMB系列 / DMB Series】

是将精度等级为Ct7的冷轧滚珠丝杠组装到2相步进电机中的通用型产品。电机尺寸、导程种类丰富。

Ct7 class Rolled Ball Screw is installed into 2-phase Stepping Motor for multi-purpose use.
Variety of Motor size and Ball Screw lead are available.

【2TMB系列 / 2TMB Series】

是将精度等级为Ct7的冷轧滚珠丝杠组装到2相步进电机中的通用型产品。导程种类丰富。

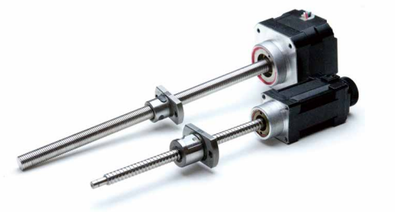
Ct7 class Rolled Ball Screw is installed into 2-phase Stepping Motor for multi-purpose use.
Variety of Ball Screw lead are available.

【TMB系列 / TMB Series】

采用冷轧滚珠丝杠+5相步进电机组合,可实现一般精度的定位运行。使用精度等级为Ct7的冷轧滚珠丝杠。

This series is all-round performance drive unit with Rolled Ball Screw and 5-Phase Stepping Motor.
Ct7 class Rolled Ball Screw is built in this series.

【MB系列 / MB Series】



采用精密滚珠丝杠＋5相步进电机,是可实现高性能和精密定位的驱动组件。
精密滚珠丝杠的标准精度等级为C3。

This series is high performance, high accurate positioning drive unit with Precision Ball Screw and 5-Phase Stepping Motor. C3 class Precision Ball Screws are adopted for this series.

【MMB系列 / MMB Series】

采用冷轧滚珠丝杠+All in One电机(编码器、伺服驱动器、控制器),是可实现高性能、省配线化的驱动组件。可实现“低振动”、“无丢步”的产品。

Rolled Ball Screw with All-in-One Motor (Encoder, Servo driver and Controller) is to realize high performance and significant saving in wiring. Providing smooth drive and closed loop operation.

【SiMB系列 / SiMB Series】

采用精密滚珠丝杠+Si-servo,是可实现“完全等间距定位”、“无振动”、“无丢步”、“扭矩限制运行”的产品。精密滚珠丝杠的标准精度等级为C3。

This series have high accurate positioning, ultra smooth drive, torque control drive and closed loop operation by using Precision Ball Screw with C3 accuracy and Si-Servo Motor.

DMB系列(冷轧滚珠丝杠 + 2相步进电机)

DMB Series (Rolled Ball Screw + 2 Phase Stepping Motor)

●特点

- 电机尺寸有□20、□28、□35、□42,产品种类丰富。
- 将2相步进电机直接组装到滚珠丝杠的轴端,实现了滚珠丝杠轴心即为电机旋转轴心的理想结构。
- 电机轴和滚珠丝杠轴一体化,省去联轴器,实现了长边方向的小型化。
- 以冷轧滚珠丝杠和2相步进电机的组合提供高性价比产品。
- 可定制轴端形状、行程(参照照片)。

●Features

- Wide variety in Motor size, which are NEMA08(□20), NEMA11(□28), NEMA14(□35) and NEMA17(□42).
- 2-phase Stepping Motor is mounted directly onto the Shaft end of the Ball Screw, which is ideally constructed to form the Motor Rotor Shaft.
- Since combining the Motor Shaft and Ball Screw Shaft, Coupling-less, saving the total length can be achieved.
- High cost performance item is provided by combining Rolled Ball Screw and 2-phase Stepping Motor.
- End journal profiles and travel length can be customized(see photo below).

【轴端形状例 / End journal variation】

A—type

仅切断
(Cut only)

B—type

车削&卡槽
(Journal with snap-ring groove)

C—type

车削
(Journal only)

●公称型号 / Model number notation

定制品的公称型号如下所示。
产品目录标准形状品为产品目录记载(P111～P115页)的型号。

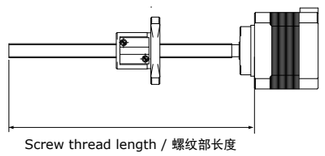
Model number notation for customized DMBR series is as follows.
In case of standard style, model number is described in catalogue from pageP111 to pageP115.

DMB R 06 01 - 80 A - 11E2110 - XXX
① ② ③ ④ ⑤ ⑥ ⑦ ⑧

①系列符号
DMB：电机直连型滚珠丝杠
(2相步进电机)
②滚珠丝杠种类
R：冷轧滚珠丝杠
③丝杠轴公称外径
06表示6mm
④导程(mm)
01表示1mm
⑤丝杠轴长度(mm)
表示突出于电机的轴的长度(下图)
⑥轴端形状
A：无加工
B：车削&卡槽(标准形状)
C：车削
⑦电机型号
参照下表
⑧附加号

①Series No.
DMB：Linear Actuator Ball Screw External type
(2-phase Stepping Motor)
②Ball Screw type
R：Rolled Ball Screw
③Screw Shaft nominal diameter(mm)
06 means 6mm
④Lead(mm)
01 means 1mm
⑤Screw thread length(mm)
Screw length which is exposed from Motor(see below)
⑥End journal profile
A：Cut only
B：Journal with snap ring groove(standard)
C：Journal only
⑦Motor Model
Refer to table below
⑧Extra notation

【⑤丝杠轴长度 / Screw thread length】



【⑥轴端形状 / End journal profile】

A—type

仅切断
(Cut only)

B—type

车削&卡槽
(Journal with snap-ring groove)

C—type

车削
(Journal only)

Motor Model 电机型号	Motor size 电机尺寸 (mm)	Motor length 电机总长 (mm)	Rated current 额定电流 (A/phase)	Holding Torque 保持扭矩 (Nm)	Applicable Shaft dia. 适用轴径 (mm)	Lead 导程 (mm)
08E2004	NEMA08(□20)	(22)	0.4	0.003	f4	1,2
08E2105	NEMA08(□20)	(29)	0.5	0.0035	f4	1,2
11E2110	NEMA11(□28)	(35)	1.0	0.036	f5,f6	1,2,4,10
11E2216	NEMA11(□28)	(47)	1.6	0.052	f5,f6	1,2,4,10
14E2110	NEMA14(□35)	(36)	1.0	0.060	f8	1,2,5,10
14E2215	NEMA14(□35)	(48)	1.5	0.10	f8	1,2,5,10
17E2115	NEMA17(□42)	(36)	1.5	0.18	f8	1,2,5,10

●基本规格 / Specifications

Motor Size 电机尺寸	Model No. 型　号	Motor length 电机总长 （mm）	Screw Shaft nominal dia. 丝杠轴外径 （mm）	Lead 导程 （mm）	Travel 行程 （mm）	Travel per pulse 1脉冲 移动量 （μm）	Mass 质量 （g）
NEMA 08 （□20）	DMBR0401-08E2004	（22）	4	1	23	5	52
	DMBR0402-08E2004	（22）	4	2	21	10	52
	DMBR0401-08E2105	（29）	4	1	23	5	62
	DMBR0402-08E2105	（29）	4	2	21	10	62
NEMA 11 （□28）	DMBR0504-11E2110	（35）	5	4	39	20	140
	DMBR0504-11E2216	（47）	5	4	39	20	194
	DMBR0601-11E2110	（35）	6	1	43	5	140
	DMBR0602-11E2110	（35）	6	2	43	10	148
	DMBR0610-11E2110	（35）	6	10	40	50	146
	DMBR0601-11E2216	（47）	6	1	43	5	194
	DMBR0602-11E2216	（47）	6	2	43	10	202
	DMBR0610-11E2216	（47）	6	10	40	50	198
NEMA 14 （□35）	DMBR0801-14E2110	（36）	8	1	58	5	212
	DMBR0802-14E2110	（36）	8	2	50	10	240
	DMBR0805-14E2110	（36）	8	5	47	25	234
	DMBR0810-14E2110	（36）	8	10	54	50	226
	DMBR0801-14E2215	（48）	8	1	58	5	292
	DMBR0802-14E2215	（48）	8	2	50	10	320
	DMBR0805-14E2215	（48）	8	5	47	25	314
	DMBR0810-14E2215	（48）	8	10	54	50	304
NEMA 17 （□42）	DMBR0801-17E2115	（36）	8	1	118	5	298
	DMBR0802-17E2115	（36）	8	2	110	10	322
	DMBR0805-17E2115	（36）	8	5	107	25	318
	DMBR0810-17E2115	（36）	8	10	114	50	308

Repeatability（reference） 重复定位精度（参考值）	max.±0.01mm （NEMA08/□20:max.±0.02mm）
Lost Motion（reference） 空转（参考值）	max.0.01mm （NEMA08/□20:max.0.02mm）

※重复定位精度及空转值是安装在本公司标准滑台上时测得的值。
实际值请洽询本公司。

※The reference value about Repeatability and Lost Motion represents when the DMB built into KSS original Stage. Please make a contact to KSS for actual value.

注1）关于详细尺寸，请参照P111页以后的规格图。
注2）1脉冲的移动量为整步时的值。
注3）请以50ms/kHz以上的加减速速率使用。
注4）参考推力请参考P109、P110页的推力-速度线图。

Note1）Detail specifications & dimensions are shown in diagram from page P111.
Note2）Travel per pulse represents the value for full step.
Note3）Acceleration & Deceleration Rate should be 50ms/kHz or more.
Note4）For reference thrust, please refer to Force-speed diagram in page109 and page110.

●电机规格 / Motor Specification

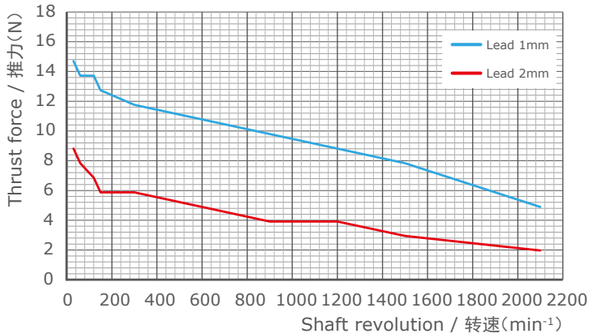
Motor size 电机尺寸	Motor model 电机型号	Rated Voltage 额定电压 （V）	Rated current 额定电流 （A/phase）	Winding resistance 绕组电阻 （Ω）	Holding Torque 保持扭矩 （Nm）	Rotor Inertia 转子惯量 （g·cm²）	Motor length 电机总长 （mm）	Load limit in Vertical Position 许用轴向负载（垂直） （N）
NEMA 08 （□20）	08E2004	DC3.5	0.4	8.8	0.003	2.4	（22）	43
	08E2105	DC2.6	0.5	5.1	0.0035	2.6	（29）	43
NEMA 11 （□28）	11E2110	DC2.1	1.0	2.1	0.036	f5mm：6.7 f6mm：7.2	（35）	150
	11E2216	DC2.4	1.6	1.5	0.052	f5mm：11.5 f6mm：12.0	（47）	150
NEMA 14 （□35）	14E2110	DC3.5	1.0	3.5	0.060	21	（36）	230
	14E2215	DC4.0	1.5	2.7	0.10	32	（48）	230
NEMA 17 （□42）	17E2115	DC2.8	1.5	1.85	0.18	36	（36）	230

注）励磁方式为2相双极，基本步进角为1.8°。

Note）Driving Method is 2-phase Bi-polar, Basic step angle is 1.8 degree.

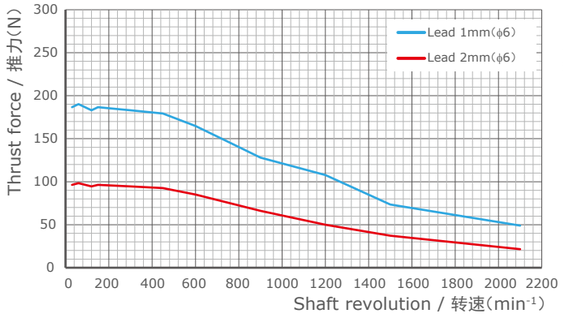
●推力-速度线图 / Force-speed diagram

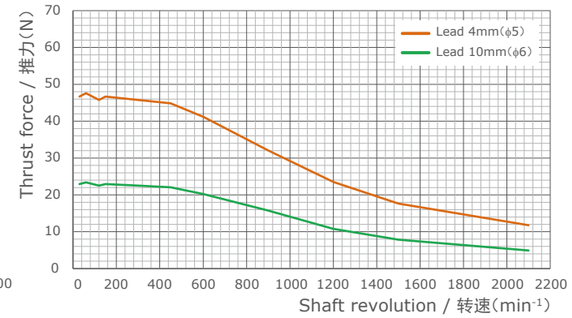
电机型号 / Motor model：08E2004(□20)
适用执行器 / Applicable Actuator：DMBR0401, DMBR0402



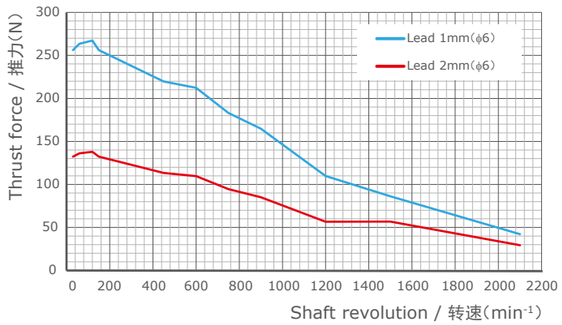
电机型号 / Motor model：08E2105(□20)
适用执行器 / Applicable Actuator：DMBR0401, DMBR0402

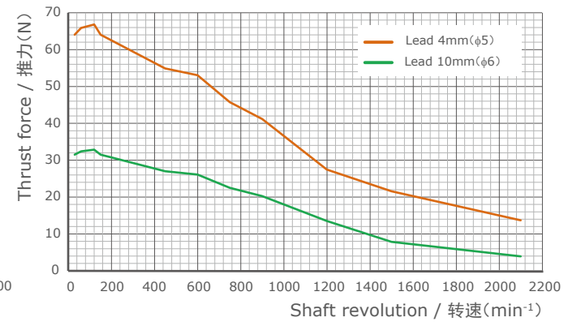
电机型号 / Motor model：11E2110(□28)
适用执行器 / Applicable Actuator：DMBR0504, DMBR0601, DMBR0602, DMBR0610



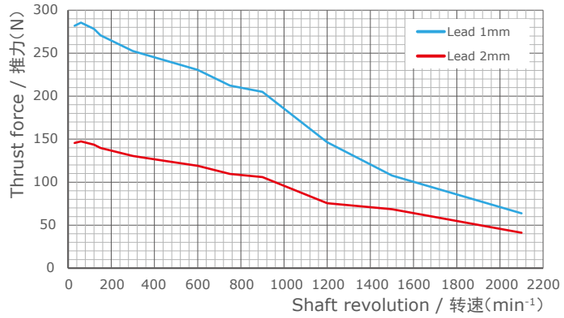


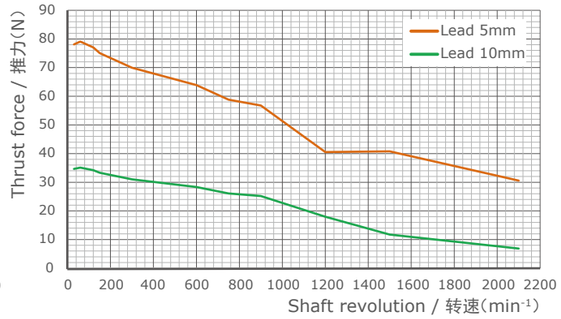
电机型号 / Motor model：11E2216(□28)
适用执行器 / Applicable Actuator：DMBR0504, DMBR0601, DMBR0602, DMBR0610



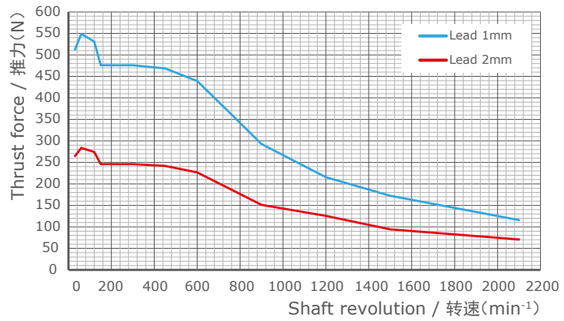


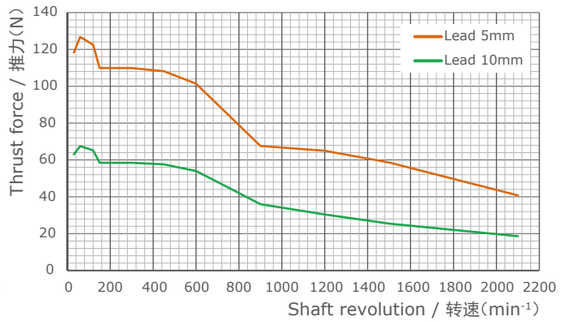
电机型号 / Motor model：14E2110(□35)
适用执行器 / Applicable Actuator：DMBR0801, DMBR0802, DMBR0805, DMBR0810



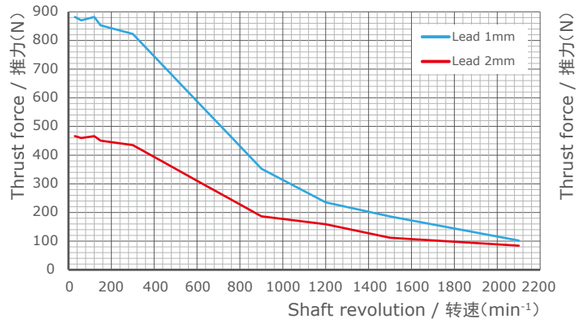


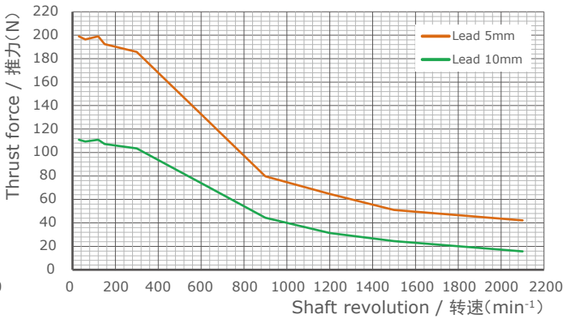
电机型号 / Motor model：14E2215(□35)
适用执行器 / Applicable Actuator：DMBR0801, DMBR0802, DMBR0805, DMBR0810





电机型号 / Motor model：17E2115(□42)
适用执行器 / Applicable Actuator：DMBR0801, DMBR0802, DMBR0805, DMBR0810





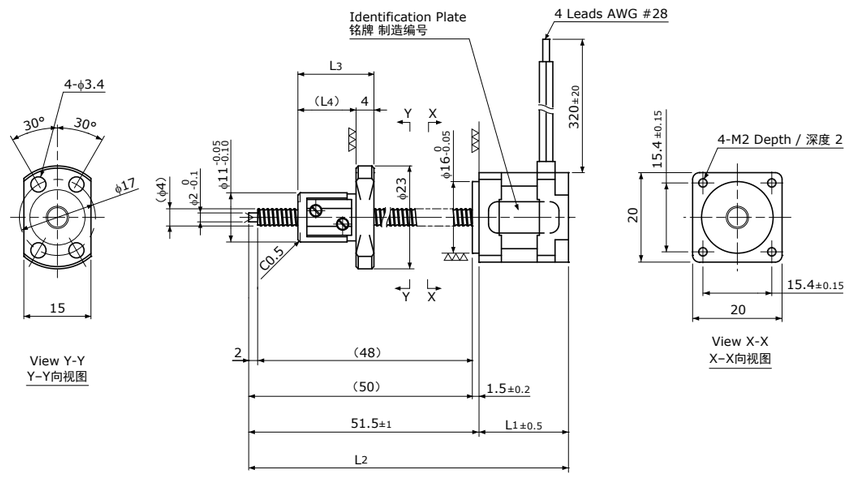
注）推力-速度线图是试样的实测值。
会因电机的个体差异而略有变化,仅供参考。

Note）Force-speed diagrams above are measurement data of samples.
It may vary depending on each motor's characteristic.
Please consider these diagrams as reference data.

冷轧滚珠丝杠+2相步进电机 / Rolled Ball Screw + 2-phase Stepping Motor

DMBR □20 / NEMA 08

Shaft dia.(轴径)f4



Unit(单位):mm

Model 型　号	Lead 导程	Travel 行程	L_1	L_2	L_3	L_4	Mass 质量 (g)
DMBR0401-08E2004	1	23	20	71.5	17	13	52
DMBR0402-08E2004	2	21	20	71.5	19	15	52
DMBR0401-08E2105	1	23	27.2	78.7	17	13	62
DMBR0402-08E2105	2	21	27.2	78.7	19	15	62

Motor Wire / 电机线	
A	Red(红)
$\overline{A}$	Red/White(红白)
B	Green(绿)
$\overline{B}$	Green/White(绿白)

Recommended Drivers 推荐驱动器	SD4015B3

Note) Refer to page P161 for connection diagram of recommended Drivers.
注) 有关与推荐驱动器的接线,请参照P161页。

Ball Screw Specifications　滚珠丝杠主要技术参数	
Accuracy grade 精度等级	JIS Ct7
Thread direction 旋向	Right　右
Axial play 轴向间隙	Max 0.03mm
Ball Screw material 滚珠丝杠材质	Chrome-molybdenum steel 铬钼钢
Surface hardness 螺纹部表面硬度	Min. HRC58
Lubricant 润滑剂	KSS original grease MSG No.2 KSS原装油脂 MSG No.2

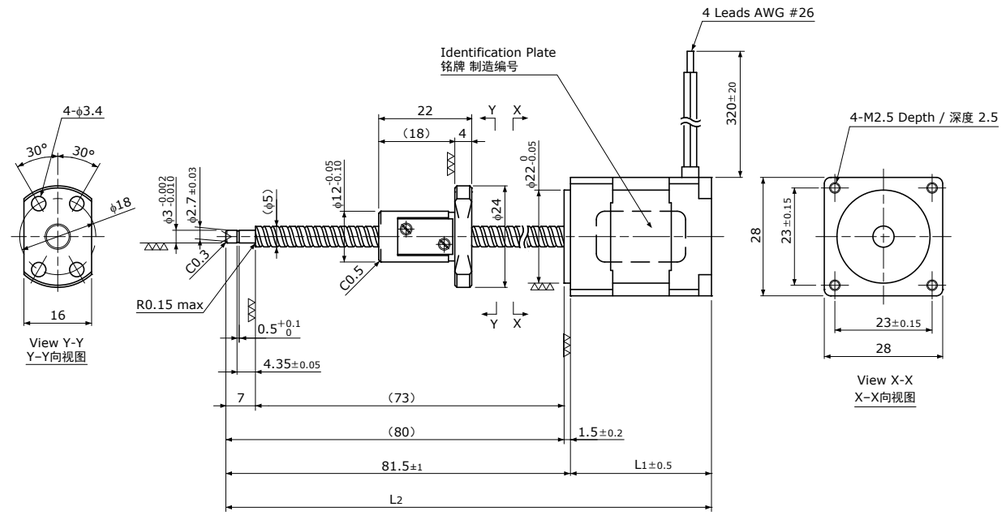
Note) Please contact KSS if different journal profile or length from the above is required.
注) 若轴端形状、长度有所不同,请垂询本公司。

Motor Specifications　电机参数		
Motor Model 电机种类	08E2004	08E2105
Basic step angle 基本步进角	1.8°	
Driving method 励磁方式	2-phase Bi-polar 2相双极方式	
Rated Voltage 额定电压	DC 3.5 V	DC 2.6 V
Rated current 额定电流	DC 0.4A/phase DC 0.4A/相	DC 0.5A/phase DC 0.5A/相
Winding resistance 绕组电阻	8.8Ω	5.1Ω
Holding Torque 保持扭矩	0.003Nm	0.0035Nm
Rotor inertia 转子惯量	2.4g·cm²	2.6g·cm²
Operating temperature 使用温度范围	−10℃～50℃	

冷轧滚珠丝杠+2相步进电机 / Rolled Ball Screw + 2-phase Stepping Motor

DMBR □28 / NEMA 11

Shaft dia.(轴径)f5



Unit(单位):mm

Model 型　号	Lead 导程	Travel 行程	L_1	L_2	Mass 质量 (g)
DMBR0504-11E2110	4	39	33.35	114.85	140
DMBR0504-11E2216	4	39	45	126.5	194

Motor Wire / 电机线	
A	Red(红)
$\overline{A}$	Red/White(红白)
B	Green(绿)
$\overline{B}$	Green/White(绿白)

Recommended Drivers 推荐驱动器	SD4030B3

Note) Refer to page P161 for connection diagram of recommended Drivers.
注) 有关与推荐驱动器的接线,请参照P161页。

Ball Screw Specifications　滚珠丝杠主要技术参数	
Accuracy grade 精度等级	JIS Ct7
Thread direction 旋向	Right　右
Axial play 轴向间隙	Max 0.03mm
Ball Screw material 滚珠丝杠材质	Chrome-molybdenum steel 铬钼钢
Surface hardness 螺纹部表面硬度	Min. HRC58
Lubricant 润滑剂	KSS original grease MSG No.2 KSS原装油脂 MSG No.2

Note) Please contact KSS if different journal profile or length from the above is required.
注) 若轴端形状、长度有所不同,请垂询本公司。

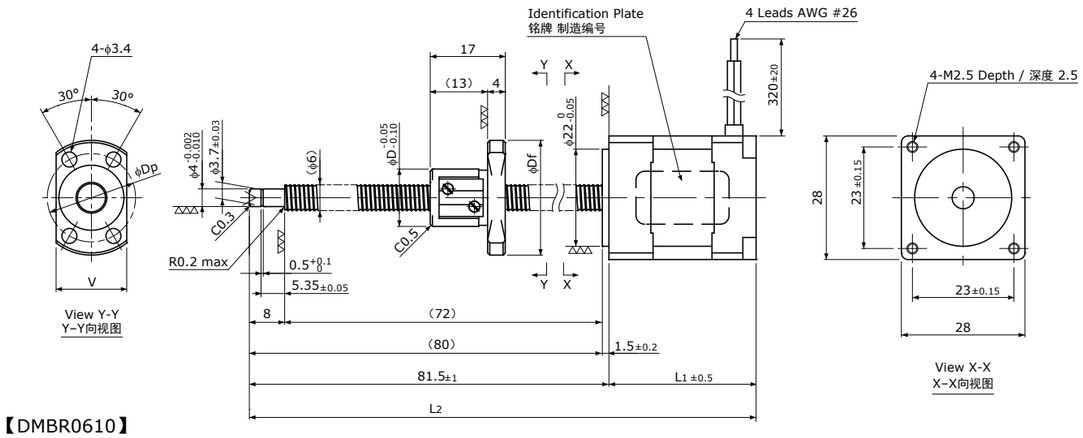
Motor Specifications　电机参数		
Motor Model 电机种类	11E2110	11E2216
Basic step angle 基本步进角	1.8°	
Driving method 励磁方式	2-phase Bi-polar 2相双极方式	
Rated Voltage 额定电压	DC 2.1 V	DC 2.4 V
Rated current 额定电流	DC 1.0A/phase DC 1.0A/相	DC 1.6A/phase DC 1.6A/相
Winding resistance 绕组电阻	2.1Ω	1.5Ω
Holding Torque 保持扭矩	0.036Nm	0.052Nm
Rotor inertia 转子惯量	6.7g·cm²	11.5g·cm²
Operating temperature 使用温度范围	−10℃～50℃	

冷轧滚珠丝杠+2相步进电机 / Rolled Ball Screw + 2-phase Stepping Motor

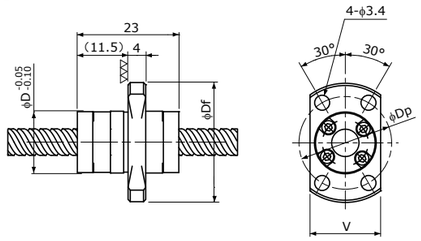
DMBR □28 / NEMA 11

Shaft dia.(轴径)f6

【DMBR0601 / DMBR0602】



【DMBR0610】



Unit(单位):mm

Model 型 号	Lead 导程	Travel 行程	L1	L2	D	Df	V	Dp	Mass 质量 (g)
DMBR0601-11E2110	1	43	33.35	114.85	13	26	16	20	140
DMBR0602-11E2110	2	43	33.35	114.85	15	28	19	22	148
DMBR0610-11E2110	10	40	33.35	114.85	14	27	16	21	146
DMBR0601-11E2216	1	43	45	126.5	13	26	16	20	194
DMBR0602-11E2216	2	43	45	126.5	15	28	19	22	202
DMBR0610-11E2216	10	40	45	126.5	14	27	16	21	198

Motor Wire / 电机线	
A	Red(红)
$\overline{A}$	Red/White(红白)
B	Green(绿)
$\overline{B}$	Green/White(绿白)

Recommended Drivers 推荐驱动器	SD4030B3

Note) Refer to page P161 for connection diagram of recommended Drivers.
注) 有关与推荐驱动器的接线,请参照P161页。

Ball Screw Specifications 滚珠丝杠主要技术参数	
Accuracy grade 精度等级	JIS Ct7
Thread direction 旋向	Right 右
Axial play 轴向间隙	Max 0.03mm
Ball Screw material 滚珠丝杠材质	Chrome-molybdenum steel 铬钼钢
Surface hardness 螺纹部表面硬度	Min. HRC58
Lubricant 润滑剂	KSS original grease MSG No.2 KSS原装油脂 MSG No.2

Note) Please contact KSS if different journal profile or length from the above is required.
注) 若轴端形状、长度有所不同,请垂询本公司。

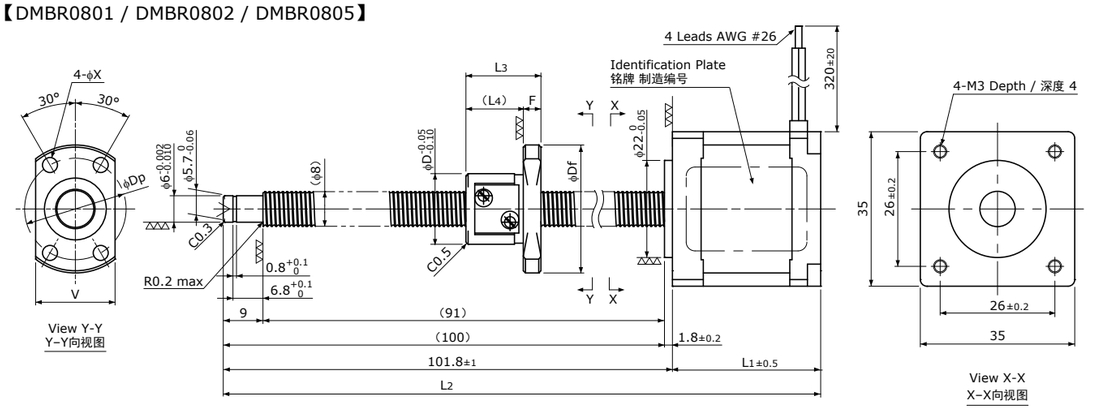
Motor Specifications 电机参数		
Motor Model 电机种类	11E2110	11E2216
Basic step angle 基本步进角	1.8°	
Driving method 励磁方式	2-phase Bi-polar 2相双极方式	
Rated Voltage 额定电压	DC 2.1 V	DC 2.4 V
Rated current 额定电流	DC 1.0A/phase DC 1.0A/相	DC 1.6A/phase DC 1.6A/相
Winding resistance 绕组电阻	2.1Ω	1.5Ω
Holding Torque 保持扭矩	0.036Nm	0.052Nm
Rotor inertia 转子惯量	7.2g·cm²	12.0g·cm²
Operating temperature 使用温度范围	−10℃～50℃	

冷轧滚珠丝杠+2相步进电机 / Rolled Ball Screw + 2-phase Stepping Motor

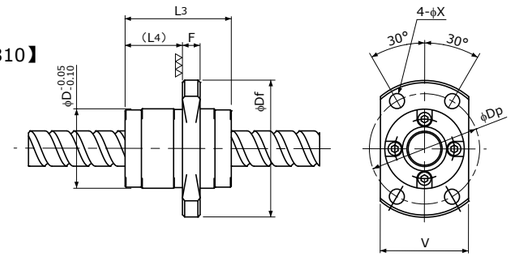
DMBR □35 / NEMA 14

Shaft dia.(轴径)f8

【DMBR0801 / DMBR0802 / DMBR0805】



【DMBR0810】



Motor Wire / 电机线	
A	Red(红)
$\overline{A}$	Red/White(红白)
B	Green(绿)
$\overline{B}$	Green/White(绿白)

Unit(单位):mm

Model 型 号	Lead 导程	Travel 行程	L1	L2	L3	L4	D	Df	F	V	Dp	X	Mass 质量 (g)
DMBR0801-14E2110	1	58	33.6	135.4	17	13	16	29	4	18	23	3.4	212
DMBR0802-14E2110	2	50	33.6	135.4	24	19	20	37	5	22	29	4.5	240
DMBR0805-14E2110	5	47	33.6	135.4	28	24	18	31	4	20	25	3.4	234
DMBR0810-14E2110	10	54	33.6	135.4	24	13	18	31	4	20	25	3.4	226
DMBR0801-14E2215	1	58	45.6	147.4	17	13	16	29	4	18	23	3.4	292
DMBR0802-14E2215	2	50	45.6	147.4	24	19	20	37	5	22	29	4.5	320
DMBR0805-14E2215	5	47	45.6	147.4	28	24	18	31	4	20	25	3.4	314
DMBR0810-14E2215	10	54	45.6	147.4	24	13	18	31	4	20	25	3.4	304

Recommended Drivers 推荐驱动器	SD4030B3

Note) Refer to page P161 for connection diagram of recommended Drivers.
注) 有关与推荐驱动器的接线,请参照P161页。

Ball Screw Specifications 滚珠丝杠主要技术参数	
Accuracy grade 精度等级	JIS Ct7
Thread direction 旋向	Right 右
Axial play 轴向间隙	Max 0.03mm
Ball Screw material 滚珠丝杠材质	Chrome-molybdenum steel 铬钼钢
Surface hardness 螺纹部表面硬度	Min. HRC58
Lubricant 润滑剂	KSS original grease MSG No.2 KSS原装油脂 MSG No.2

Note) Please contact KSS if different journal profile or length from the above is required.
注) 若轴端形状、长度有所不同,请垂询本公司。

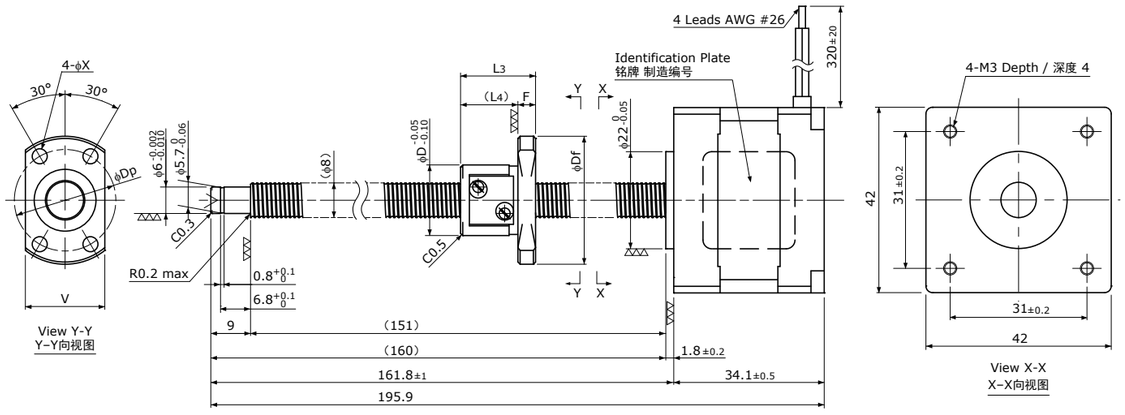
Motor Specifications 电机参数		
Motor Model 电机种类	14E2110	14E2215
Basic step angle 基本步进角	1.8°	
Driving method 励磁方式	2-phase Bi-polar 2相双极方式	
Rated Voltage 额定电压	DC 3.5 V	DC 4.0 V
Rated current 额定电流	DC 1.0A/phase DC 1.0A/相	DC 1.5A/phase DC 1.5A/相
Winding resistance 绕组电阻	3.5Ω	2.7Ω
Holding Torque 保持扭矩	0.060Nm	0.10Nm
Rotor inertia 转子惯量	21.0g·cm²	32.0g·cm²
Operating temperature 使用温度范围	−10℃～50℃	

冷轧滚珠丝杠+2相步进电机 / Rolled Ball Screw ＋ 2-phase Stepping Motor

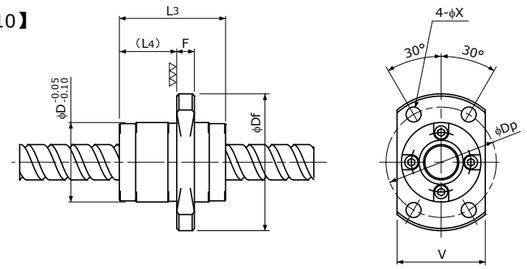
DMBR □42 / NEMA 17

Shaft dia.(轴径)f8

【DMBR0801 / DMBR0802 / DMBR0805】



【DMBR0810】



Unit(单位):mm

Model 型　号	Lead 导程	Travel 行程	L_3	L_4	D	Df	F	V	Dp	X	Mass 质量 (g)
DMBR0801-17E2115	1	118	17	13	16	29	4	18	23	3.4	298
DMBR0802-17E2115	2	110	24	19	20	37	5	22	29	4.5	322
DMBR0805-17E2115	5	107	28	24	18	31	4	20	25	3.4	318
DMBR0810-17E2115	10	114	24	13	18	31	4	20	25	3.4	308

Motor Wire / 电机线	
A	Red(红)
$\overline{A}$	Red/White(红白)
B	Green(绿)
$\overline{B}$	Green/White(绿白)

Recommended Drivers 推荐驱动器	SD4030B3

Note) Refer to page P161 for connection diagram of recommended Drivers.
注) 有关与推荐驱动器的接线,请参照P161页。

Ball Screw Specifications　滚珠丝杠主要技术参数	
Accuracy grade 精度等级	JIS Ct7
Thread direction 旋向	Right　右
Axial play 轴向间隙	Max 0.03mm
Ball Screw material 滚珠丝杠材质	Chrome-molybdenum steel 铬钼钢
Surface hardness 螺纹部表面硬度	Min. HRC58
Lubricant 润滑剂	KSS original grease MSG No.2 KSS原装油脂 MSG No.2

Note) Please contact KSS if different journal profile or length from the above is required.
注) 若轴端形状、长度有所不同,请垂询本公司。

Motor Specifications　电机参数	
Motor Model 电机种类	17E2115
Basic step angle 基本步进角	1.8°
Driving method 励磁方式	2-phase Bi-polar 2相双极方式
Rated Voltage 额定电压	DC 2.8 V
Rated current 额定电流	DC 1.5A/phase DC 1.5A/相
Winding resistance 绕组电阻	1.85Ω
Holding Torque 保持扭矩	0.18Nm
Rotor inertia 转子惯量	36.0g·cm²
Operating temperature 使用温度范围	−10℃～50℃

2TMB系列(冷轧滚珠丝杠 + 2相步进电机)

2TMB Series (Rolled Ball Screw + 2 Phase Stepping Motor)

MoBo

●特点

- 是将2相步进电机直接组装到精密等级为Ct7的冷轧滚珠丝杠轴端上的产品，外形紧凑、通用性强。
- 具有将滚珠丝杠轴心作为电机旋转轴心的理想结构。
- 直连结构省去了联轴器的使用，在缩短长边方向尺寸的同时，还能减少作业工时。
- 还备有推荐的2相步进电机用驱动器。
- 通过轴端的追加加工，可灵活应对多种行程。
- 采用专用支架组件，可实现支撑侧的稳定安装。

●Features

- A 2-phase Stepping Motor is mounted directly onto the shaft end of a Ct7 grade Rolled Ball Screw, which means compact and multipurpose type product.
- Ball Screw Shaft is ideally constructed to form the Motor Rotor Shaft.
- Since combining the Motor Shaft and Ball Screw Shaft, Coupling-less, saving total length, and reducing labor cost can be achieved.
- Recommended Driver for 2-phase Stepping Motor is available.
- Flexible length can be provided by the end journal turning.
- Stable mounting is secured by the exclusive Support Unit.

●基本规格 / Specifications

Model 型 号	Shaft Nominal Dia. 丝杠轴公称外径 (mm)	Lead 导程 (mm)	Travel 行程 (mm)	Travel per pulse 1脉冲移动量 (μm)	Reference Thrust 参考推力 (N)	Mass 质量 (g)
2TMB0801	f8	1	150	5	75	350
2TMB0802	f8	2	150	10	100	400
2TMB0805	f8	5	150	25	50	400
2TMB0812	f8	12	150	60	25	400

Repeatability(reference) 重复定位精度(参考值)	max. ±0.01mm
Lost Motion(reference) 空转(参考值)	max. 0.01mm

※重复定位精度及空转值是安装在本公司标准滑台上时测得的值。
实际值请洽询本公司。

※The reference value about Repeatability and Lost Motion represents when the 2TMB built into KSS original Stage. Please make a contact to KSS for actual value.

注1) 关于详细尺寸，请参照P120页以后的规格图。
注2) 1脉冲的移动量为整步时的值。
注3) 加减速速率的参考值为50ms/kHz以上。
注4) 参考推力根据不同条件会有很大变化，请垂询本公司。

Note1) Detail specifications & dimensions are shown in drawings from page P120.
Note2) Travel per pulse represents the value for full step.
Note3) Acceleration & Deceleration Rate should be 50ms/kHz or more.
Note4) Reference Thrust may vary depending on the operating condition, please ask KSS for more detail.

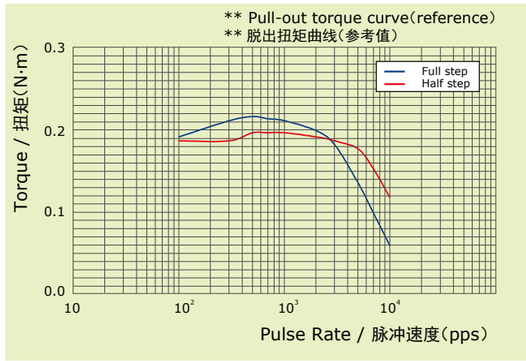
●电机规格 / Motor Specifications

Model 型 号	Motor size 电机尺寸	Rated voltage 额定电压 (V)	Rated current 额定电流 (A/phase) (A/相)	Winding resistance 绕组电阻 (Ω)	Holding torque 保持扭矩 (Nm)	Rotor Inertia 转子惯量 ($g \cdot cm^2$)	Load limit in Vertical Position 许用轴向负载 (垂直) (N)
2TMB0801	NEMA 17 (□42)	DC 2.2	2.0	1.1	0.24	42	300
2TMB0802	NEMA 17 (□42)	DC 2.2	2.0	1.1	0.24	42	300
2TMB0805	NEMA 17 (□42)	DC 2.2	2.0	1.1	0.24	42	300
2TMB0812	NEMA 17 (□42)	DC 2.2	2.0	1.1	0.24	42	300

Driving method 励磁方式	2-phase Bi-polar 2相双极方式
Basic step angle 基本步进角	1.8°

注) 转子惯量为包含滚珠丝杠轴的值。
Note) Rotor Inertia includes Ball Screw Shaft.

●电机特性 / Motor Characteristic

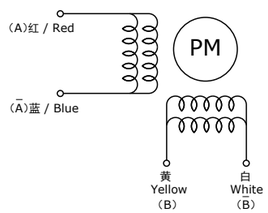


■Test condition / 测试条件

Driver / 驱动器：Maker Standard / 制造商标准机
Input Voltage / 电源电压：DC24V
Phase Currnt / 设定电流：2.0A

注) 电机特性因驱动器、运行条件而异。
Note) Motor characteristic will vary depending on Driver type, opearting conditions.

●接线图 / Schematic



按以下励磁顺序，从输出轴侧看到的CW旋转
Swiching sequence for CW rotation viewed from shaft end.

STEP	红 /Red (A)	黄 /Yellow (B)	蓝 /Blue (Ā)	白 /White (B̄)
0	+	+	-	-
1	-	+	+	-
2	-	-	+	+
3	+	-	-	+
0	+	+	-	-

●公称型号 / Model number notation

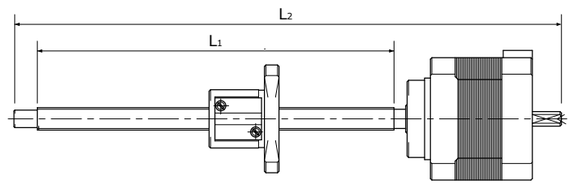
定制品的公称型号如下所示。
产品目录标准形状品为产品目录记载(P120页)的型号。
Model number notation for customized 2TMB series is as follows.
In case of standard style, model number is described in catalogue in page P120.

2TMB 08 01 - 30 R 80 C7 - 30
① ② ③ ④ ⑤ ⑥ ⑦ ⑧

①系列符号
2TMB：冷轧滚珠丝杠+2相步进电机
②丝杠轴公称外径(mm)
③导程(mm)
01表示1mm
④螺纹部长度(mm)
L_1：参照下图
⑤螺纹旋向(R=右旋)
⑥丝杠轴总长(mm)
L_2：参照下图
⑦精度等级
⑧轴向间隙(μm)

①Series No.
2TMB：Rolled Ball Screw+2-phase Stepping Motor
②Screw Shaft nominal diameter(mm)
③Lead(mm)
01 means 1mm
④Screw thread length(mm)
L_1：See below
⑤Thread direction(R=Right-hand)
⑥Screw Shaft total length(mm)
L_2：See below
⑦Accuracy grade
⑧Axial play(μm)

【④⑥丝杠长度定义 / Definition of Screw length】

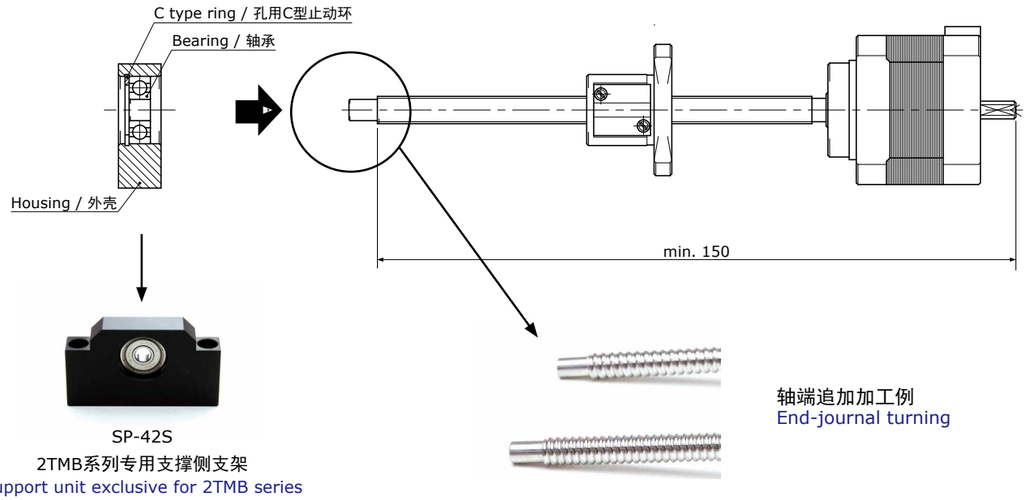


Actuator 执行器
Linear Actuator External type 线性执行器 External type

●轴端的追加加工和专用支架组件 / End-journal turning & Exclusive Support Unit

KSS 2TMB系列备有标准库存品，但为了满足各种行程（总长）的需求，
可对轴端进行追加加工。追加加工包括裁切及轴承支撑形状的加工（照片）。
对轴承支撑形状进行追加加工时，不加工止动环槽。此时请通过孔用止动环进行轴承支撑。
KSS备有使用了孔用止动环的专用支架组件，欢迎选购。

All of 2TMB series are in stock. In order to meet the request of flexible length, Shaft end journal turning is available. Please note that re-work is only for cutting and turning down(see photo below).
KSS does not process Ring groove machining on the end of Shaft. Exclusive Support Unit with Brg. & Retaining ring for hole is provided by KSS.



SP-42S

2TMB系列专用支撑侧支架
Support unit exclusive for 2TMB series

轴端追加加工例
End-journal turning

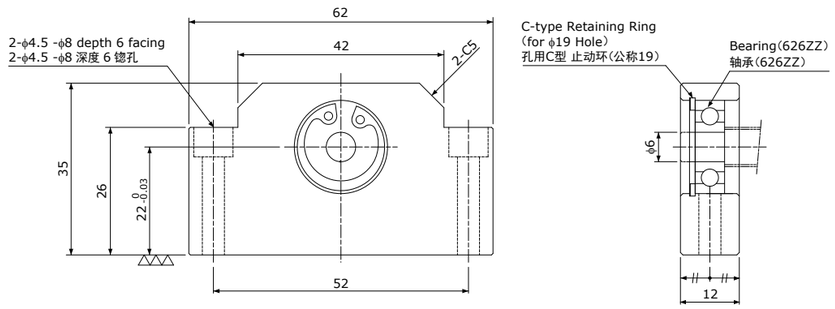
可进行追加加工的长度为自轴端起150mm（追加加工部除外）。
长度短于150mm时，单侧可作为自由端使用。
需要带止动环槽的支撑形状、以及短于150mm（追加加工部除外）的支撑侧形状时，本公司提供定制服务。

Please note that minimum re-work length is 150mm (except re-work portion) as shown in figure above.
Total length shorter than 150mm (except re-work portion) should be used as cantilever.
If supported journal with ring groove or total length of less than 150mm is required, it will be available as a customized order.

关于专用支架组件（SP-42S）的形状及尺寸，请参照下图。
如需特殊的专用支架组件，请垂询本公司。

Regarding the profile and dimension of KSS Exclusive Support Unit (SP-42S) for 2TMB series, please see below.
Special profile of Support Unit is required, please ask KSS representative.

【SP-42S】

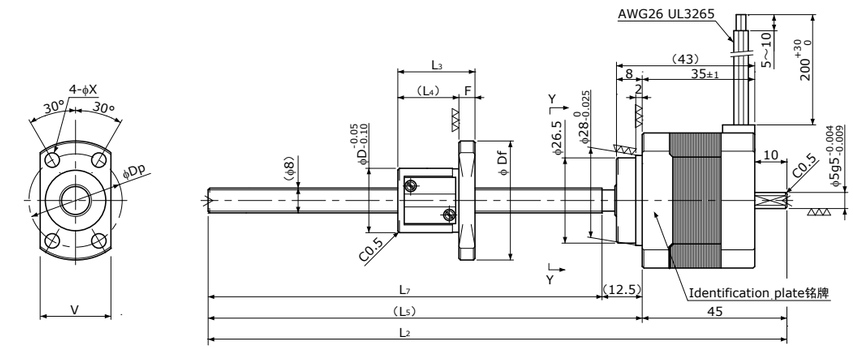


冷轧滚珠丝杠+2相步进电机 / Rolled Ball Screw + 2-Phase Stepping Motor

2TMB □42 / NEMA 17

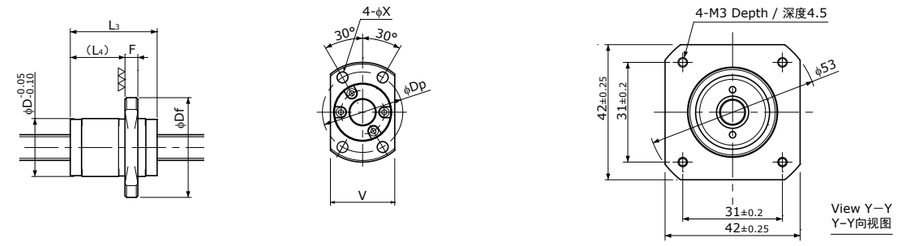
Shaft dia.(轴径)f8

【2TMB0801 / 2TMB0802 / 2TMB0805】



Motor Wire / 电机线	
A	Red(红)
$\overline{A}$	Blue(蓝)
B	Yellow(黄)
$\overline{B}$	White(白)

【2TMB0812】



Unit(单位):mm

Model 型　号	Lead 导程	Travel 行程	Reference Thrust 参考推力 (N)	L_2	L_5	L_7	D	Df	F	L_3	L_4	V	Dp	X	Mass 质量 (g)
2TMB0801	1	150	75	240	195	182.5	16	29	4	17	13	18	23	3.4	350
2TMB0802	2	150	100	250	205	192.5	20	37	5	24	19	22	29	4.5	400
2TMB0805	5	150	50	250	205	192.5	18	31	4	28	24	20	25	3.4	400
2TMB0812	12	150	25	250	205	192.5	18	31	4	27	17	20	25	3.4	400

Recommended Drivers 推荐驱动器	SD4030B3

Note) Refer to page P162 for connection diagram of recommended Drivers.
注）有关与推荐驱动器的接线，请参照P162页。

Ball Screw Specifications　滚珠丝杠主要技术参数	
Accuracy grade 精度等级	Equivalent to JIS Ct7 相当于Ct7
Thread direction 旋向	Right　右
Axial play 轴向间隙	0.03mm or less 0.03mm以下
Shaft material 丝杠轴材质	Stainless steel 不锈钢
Nut material 螺母材质	Chrome-molybdenum steel 铬钼钢
Surface hardness 螺纹部表面硬度	Min. HRC55 (Thread area)
Lubricant 润滑剂	KSS original grease MSG No.2 KSS原装油脂 MSG No.2

Note) Please refer to page P119 for about end-journal turning.
注）关于追加加工，请参照P119页。

Motor Specifications　电机参数	
Basic step angle 基本步进角	1.8°
Driving method 励磁方式	2-phase Bi-polar 2相双极方式
Rated Voltage 额定电压	DC 2.2 V
Rated current 额定电流	DC 2.0 A/phase DC 2.0 A/相
Winding resistance 绕组电阻	1.1 Ω
Holding Torque 保持扭矩	0.24 Nm
Rotor inertia 转子惯量	42 g·cm²
Operating temperature 使用温度范围	−20°C～50°C

TMB系列(冷轧滚珠丝杠 + 5相步进电机)

TMB Series (Rolled Ball Screw + 5 Phase Stepping Motor)

MoBo

●特点

- 是将5相步进电机直接组装到精密等级为Ct7的冷轧滚珠丝杠轴端上的产品，一般定位性能优异。
- 具有将滚珠丝杠轴心作为电机旋转轴心的理想结构。
- 直连结构省去了联轴器的使用，在缩短长边方向尺寸的同时，还能减少作业工时。
- 还备有推荐的5相步进电机用驱动器。

●Features

- A 5-phase Stepping Motor is mounted directly onto the shaft end of a Ct7 grade Rolled Ball Screw, which is all-round performance drive unit.
- Ball Screw Shaft is ideally constructed to form the Motor Rotor Shaft.
- Since combining the Motor Shaft and Ball Screw Shaft, Coupling-less, saving total length, and reducing labor cost can be achieved.
- Recommended Driver for 5-phase Stepping Motor is available.

●基本规格 / Specifications

Model 型 号	Shaft Nominal Dia. 丝杠轴公称外径 (mm)	Lead 导程 (mm)	Travel 行程 (mm)	Travel per pules 1脉冲移动量 (μm)	Reference Thrust 参考推力 (N)	Mass 质量 (g)
TMB0401	f4	1	30	2	50	100
TMB0504	f5	4	75	8	25	180
TMB0601	f6	1	75	2	100	180
TMB0602	f6	2	75	4	50	180
TMB0606	f6	6	75	12	15	180
TMB0801	f8	1	150	2	300	320
TMB0802	f8	2	150	4	150	320
TMB0805	f8	5	150	10	120	450
TMB0812	f8	12	150	24	50	450

Repeatability(reference) 重复定位精度(参考值)	max. ±0.01mm
Lost Motion(reference) 空转(参考值)	max. 0.01mm

※重复定位精度及空转值是安装在本公司标准滑台上时测得的值。
实际值请洽询本公司。

※The reference value about Repeatability and Lost Motion represents when the TMB built into KSS original Stage. Please make a contact to KSS for actual value.

注1）关于详细尺寸，请参照P124页以后的规格图。
注2）1脉冲的移动量为整步时的值。
注3）加减速速率的参考值为20ms/kHz以上。
注4）参考推力根据不同条件会有很大变化，请垂询本公司。

Note 1) Detail specifications & dimensions are shown in drawings from page P124.
Note 2) Travel per pulse represents the value for full step.
Note 3) Acceleration & Deceleration Rate should be 20ms/kHz or more.
Note 4) Reference Thrust may vary depending on the operating condition, please ask KSS for more detail.

●电机规格 / Motor Specifications

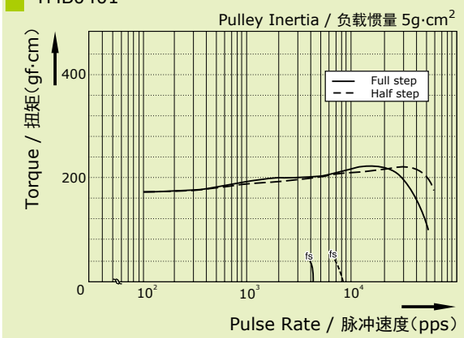
Model 型 号	Motor size 电机尺寸 (mm)	Rated voltage 额定电压 (V)	Rated current 额定电流 (A/phase) (A/相)	Winding resistance 绕组电阻 (Ω)	Holding torque 保持扭矩 (Nm)	Rotor Inertia 转子惯量 (g·cm²)	Load limit in Vertical Position 许用轴向负载（垂直） (N)
TMB0401	NEMA 10 (□24)	DC 0.83	0.75	1.1	0.018	4.2	230
TMB0504	NEMA 10 (□24)	DC 1.28	0.75	1.7	0.028	8.3	230
TMB0601	NEMA 10 (□24)	DC 1.28	0.75	1.7	0.028	8.8	230
TMB0602	NEMA 10 (□24)	DC 1.28	0.75	1.7	0.028	8.7	230
TMB0606	NEMA 10 (□24)	DC 1.28	0.75	1.7	0.028	8.8	230
TMB0801	NEMA 17 (□42)	DC 1.28	0.75	1.7	0.128	40	300
TMB0802	NEMA 17 (□42)	DC 1.28	0.75	1.7	0.128	40	300
TMB0805	NEMA 17 (□42)	DC 1.65	0.75	2.2	0.236	74	300
TMB0812	NEMA 17 (□42)	DC 1.65	0.75	2.2	0.236	74	300

注1）基本步进角为0.72°。
注2）转子惯量为包含滚珠丝杠轴的值。

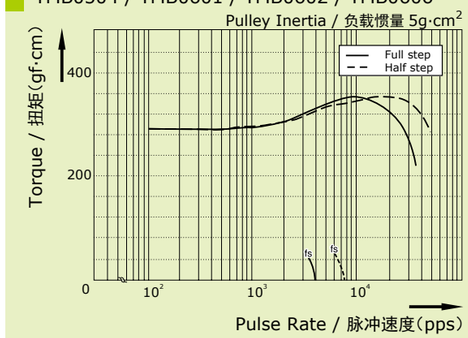
Note 1) Basic step angle is 0.72°
Note 2) Rotor Inertia includes Ball Screw Shaft.

●电机特性 / Motor Characteristic

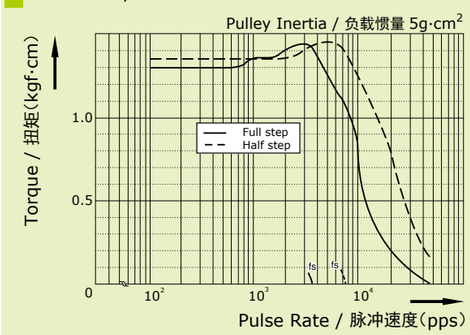
TMB0401



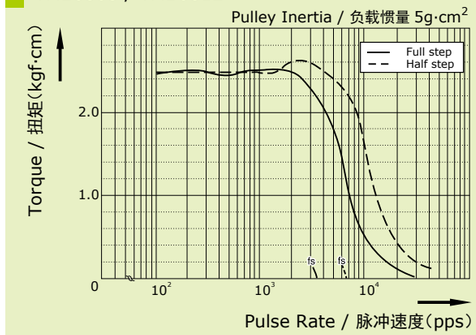
TMB0504 / TMB0601 / TMB0602 / TMB0606



TMB0801 / TMB0802



TMB0805 / TMB0812



■Test condition / 测试条件

Driver / 驱动器：Maker Standard / 制造商标准机
Input Voltage / 电源电压：DC24V
Phase Currnt / 设定电流：0.75A

注）电机特性因驱动器、运行条件而异。
Note) Motor characteristic will vary depending on Driver type, opearting conditions.

●公称型号 / Model number notation

定制品的公称型号如下所示。
产品目录标准形状品为产品目录记载(P124～P128页)的型号。

Model number notation for customized TMB series is as follows.
In case of standard style, model number is described in catalogue from page P124 to page P128.

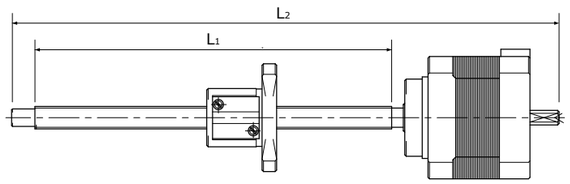
TMB 04 01 - 30 R 80 C7 - 20

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

①系列符号
　TMB：冷轧滚珠丝杠+5相步进电机
②丝杠轴公称外径(mm)
③导程(mm)
　01表示1mm
④螺纹部长度(mm)
　L_1：参照下图
⑤螺纹旋向(R＝右旋)
⑥丝杠轴总长(mm)
　L_2：参照下图
⑦精度等级
⑧轴向间隙(μm)

①Series No.
　TMB：Rolled Ball Screw＋5-phase Stepping Motor
②Screw Shaft nominal diameter(mm)
③Lead(mm)
　01 means 1mm
④Screw thread length(mm)
　L_1：See below
⑤Thread direction(R＝Right-hand)
⑥Screw Shaft total length(mm)
　L_2：See below
⑦Accuracy grade
⑧Axial play(μm)

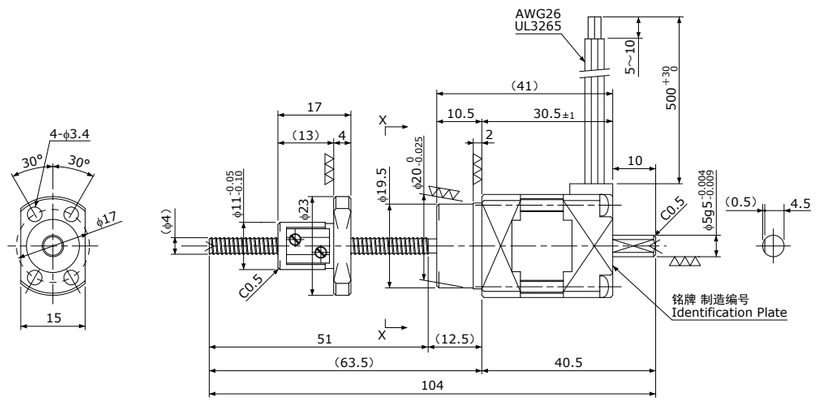
【④⑥丝杠长度定义 / Definition of Screw length】

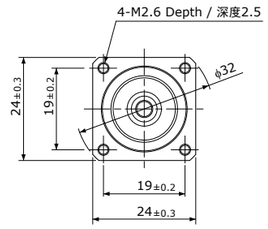


冷轧滚珠丝杠+5相步进电机 / Rolled Ball Screw + 5-Phase Stepping Motor

TMB □24 / NEMA 10

Shaft dia.(轴径)f4





View X-X
X–X 向视图

Unit(单位):mm

Model 型　号	Lead 导程	Travel 行程	Reference Thrust 参考推力 (N)	Mass 质量 (g)
TMB0401	1	30	50	100

Recommended Drivers 推荐驱动器	KR-A5CC KR-A55MC(Micro step) KR-A535M(Micro step / AC-100～220V)

Note) Refer to page P162 or P163 for connection diagram of recommended Drivers.
注) 有关与推荐驱动器的接线,请参照P162或P163页。

Ball Screw Specifications　滚珠丝杠主要技术参数	
Accuracy grade 精度等级	JIS Ct7
Thread direction 旋向	Right　右
Axial play 轴向间隙	0.020mm or less 0.020mm以下
Shaft & Nut material 丝杠轴、螺母材质	Chrome-molybdenum steel 铬钼钢
Surface Coating 表面处理	Black Chrome coating on Shaft 丝杠轴采用黑铬处理
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Lubricant 润滑剂	KSS original grease MSG No.1 KSS原装油脂 MSG No.1

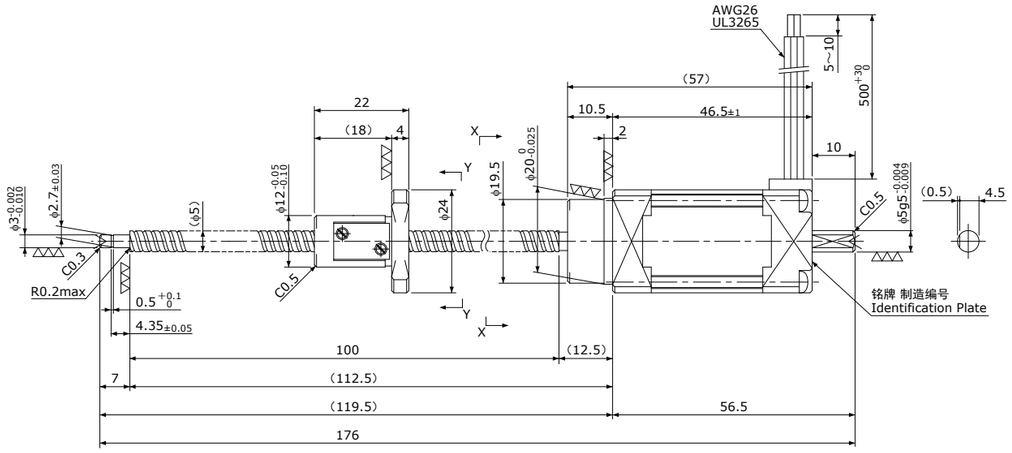
Motor Specifications　电机参数	
Basic step angle 基本步进角	0.72°
Rated Voltage 额定电压	DC 0.83 V
Rated current 额定电流	DC 0.75 A/phase DC 0.75 A/相
Winding resistance 绕组电阻	1.1Ω
Holding Torque 保持扭矩	0.018Nm
Rotor inertia 转子惯量	4.2g·cm²
Operating temperature 使用温度范围	−20℃～50℃

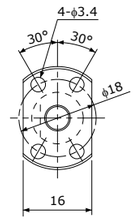
Note) Only shaft end cutting is available.
Other than that, it would be customized order.
注) 只能裁切轴端。
其他轴端形状为定制产品。

冷轧滚珠丝杠+5相步进电机 / Rolled Ball Screw + 5-Phase Stepping Motor

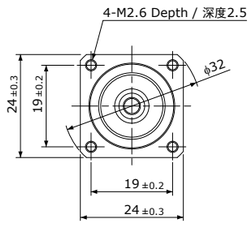
TMB □24 / NEMA 10

Shaft dia.(轴径)f5





View Y-Y
Y–Y 向视图



View X-X
X–X 向视图

Unit(单位):mm

Model 型 号	Lead 导程	Travel 行程	Reference Thrust 参考推力 (N)	Mass 质量 (g)
TMB0504	4	75	25	180

Recommended Drivers 推荐驱动器	KR-A5CC KR-A55MC(Micro step) KR-A535M(Micro step / AC-100~220V)

Note) Refer to page P162 or P163 for connection diagram of recommended Drivers.
注) 有关与推荐驱动器的接线,请参照P162或P163页。

Ball Screw Specifications 滚珠丝杠主要技术参数	
Accuracy grade 精度等级	JIS Ct7
Thread direction 旋向	Right 右
Axial play 轴向间隙	0.020mm or less 0.020mm以下
Shaft & Nut material 丝杠轴、螺母材质	Chrome-molybdenum steel 铬钼钢
Surface Coating 表面处理	Black Chrome coating on Shaft 丝杠轴采用黑铬处理
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Lubricant 润滑剂	KSS original grease MSG No.1 KSS原装油脂 MSG No.1

Motor Specifications 电机参数	
Basic step angle 基本步进角	0.72°
Rated Voltage 额定电压	DC 1.28 V
Rated current 额定电流	DC 0.75 A/phase DC 0.75 A/相
Winding resistance 绕组电阻	1.7Ω
Holding Torque 保持扭矩	0.028Nm
Rotor inertia 转子惯量	8.3g·cm²
Operating temperature 使用温度范围	−20℃～50℃

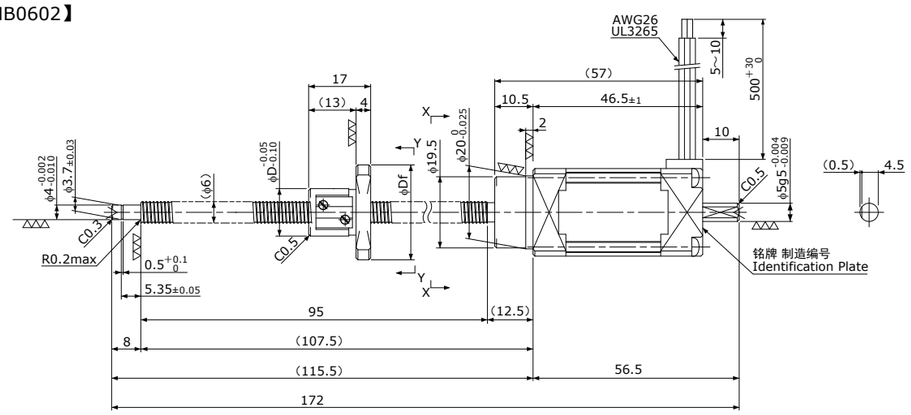
Note) Only shaft end cutting is available.
Other than that, it would be customized order.
注) 只能裁切轴端。
其他轴端形状为定制产品。

冷轧滚珠丝杠+5相步进电机 / Rolled Ball Screw + 5-Phase Stepping Motor

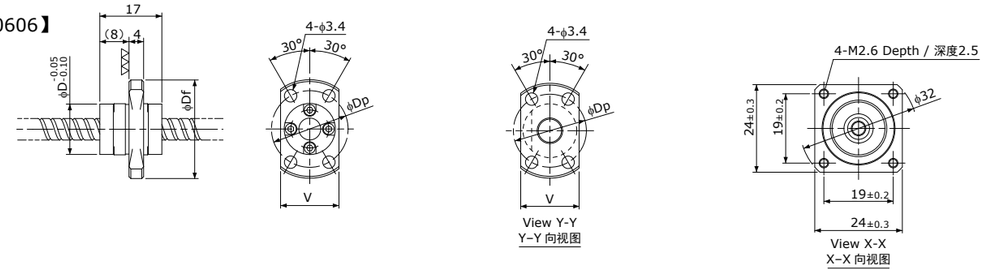
TMB □24 / NEMA 10

Shaft dia.(轴径)f6

【TMB0601 / TMB0602】



【TMB0606】



Unit(单位):mm

Model 型 号	Lead 导程	Travel 行程	Reference Thrust 参考推力 (N)	D	Df	V	Dp	Mass 质量 (g)
TMB0601	1	75	100	13	26	16	20	180
TMB0602	2	75	50	15	28	19	22	180
TMB0606	6	75	15	14	27	16	21	180

Recommended Drivers 推荐驱动器	KR-A5CC KR-A55MC(Micro step) KR-A535M(Micro step / AC-100～220V)

Note) Refer to page P162 or P163 for connection diagram of recommended Drivers.
注) 有关与推荐驱动器的接线,请参照P162或P163页。

Ball Screw Specifications 滚珠丝杠主要技术参数	
Accuracy grade 精度等级	JIS Ct7
Thread direction 旋向	Right 右
Axial play 轴向间隙	0.020mm or less 0.020mm以下
Shaft & Nut material 丝杠轴、螺母材质	Chrome-molybdenum steel 铬钼钢
Surface Coating 表面处理	Black Chrome coating on Shaft 丝杠轴采用黑铬处理
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Lubricant 润滑剂	KSS original grease MSG No.1 KSS原装油脂 MSG No.1

Motor Specifications 电机参数	
Basic step angle 基本步进角	0.72°
Rated Voltage 额定电压	DC 1.28 V
Rated current 额定电流	DC 0.75 A/phase DC 0.75 A/相
Winding resistance 绕组电阻	1.7Ω
Holding Torque 保持扭矩	0.028Nm
Rotor inertia 转子惯量	TMB0601、TMB0606:8.8g·cm² TMB0602:8.7g·cm²
Operating temperature 使用温度范围	−20℃～50℃

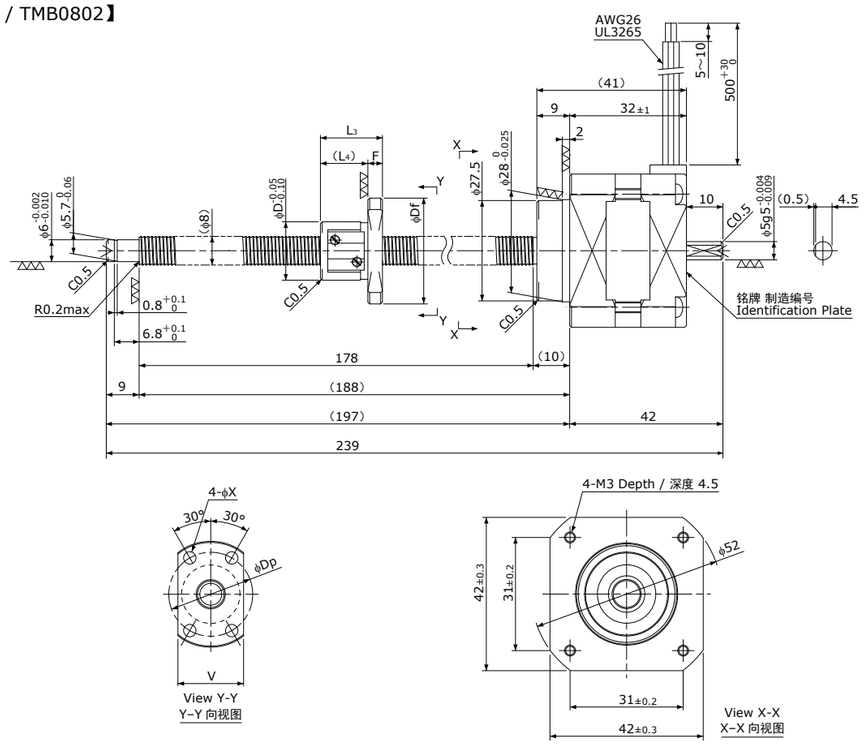
Note) Only shaft end cutting is available.
Other than that, it would be customized order.
注) 只能裁切轴端。
其他轴端形状为定制产品。

冷轧滚珠丝杠+5相步进电机 / Rolled Ball Screw + 5-Phase Stepping Motor

TMB □42 / NEMA 17

Shaft dia.(轴径)f8

【TMB0801 / TMB0802】



Unit(单位):mm

Model 型 号	Lead 导程	Travel 行程	Reference Thrust 参考推力 (N)	D	Df	F	L3	L4	V	Dp	X	Mass 质量 (g)
TMB0801	1	150	300	16	29	4	17	13	18	23	3.4	320
TMB0802	2	150	150	20	37	5	24	19	22	29	4.5	320

Recommended Drivers 推荐驱动器	KR-A5CC KR-A55MC(Micro step) KR-A535M(Micro step / AC-100~220V)

Note) Refer to page P162 or P163 for connection diagram of recommended Drivers.
注) 有关与推荐驱动器的接线,请参照P162或P163页。

Ball Screw Specifications 滚珠丝杠主要技术参数	
Accuracy grade 精度等级	JIS Ct7
Thread direction 旋向	Right 右
Axial play 轴向间隙	0.020mm or less 0.020mm以下
Shaft & Nut material 丝杠轴、螺母材质	Chrome-molybdenum steel 铬钼钢
Surface Coating 表面处理	Black Chrome coating on Shaft 丝杠轴采用黑铬处理
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Lubricant 润滑剂	KSS original grease MSG No.1 KSS原装油脂 MSG No.1

Motor Specifications 电机参数	
Basic step angle 基本步进角	0.72°
Rated Voltage 额定电压	DC 1.28 V
Rated current 额定电流	DC 0.75 A/phase DC 0.75 A/相
Winding resistance 绕组电阻	1.7Ω
Holding Torque 保持扭矩	0.128Nm
Rotor inertia 转子惯量	40g·cm²
Operating temperature 使用温度范围	−20℃～50℃

Note) Only shaft end cutting is available.
Other than that, it would be customized order.
注) 只能裁切轴端。
其他轴端形状为定制产品。

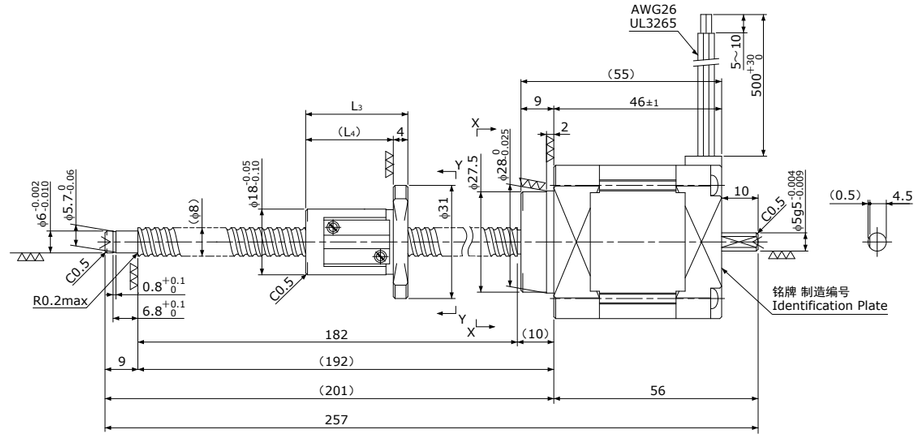
Actuator 执行器
Linear Actuator External type 线性执行器 External type
Standard products in stock TMB series 标准库存品 TMB系列
Dimensions & Specifications 规格参数

冷轧滚珠丝杠+5相步进电机 / Rolled Ball Screw + 5-Phase Stepping Motor

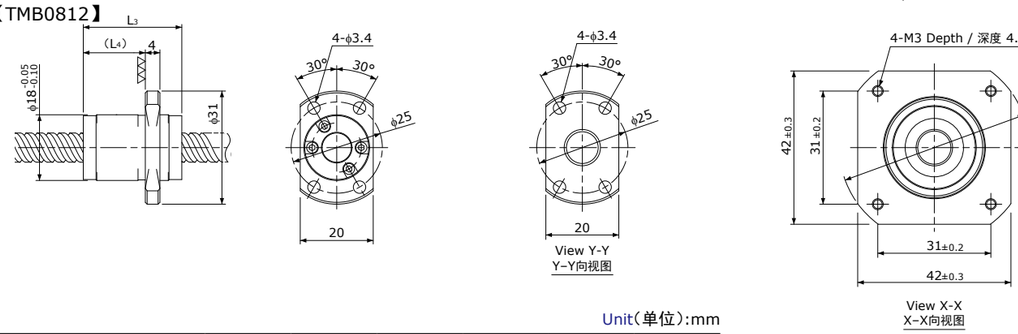
TMB □42 / NEMA 17

Shaft dia.(轴径)f8

【TMB0805】



【TMB0812】



Unit(单位):mm

Model 型 号	Lead 导程	Travel 行程	Reference Thrust 参考推力 (N)	L3	L4	Mass 质量 (g)
TMB0805	5	150	120	28	24	450
TMB0812	12	150	50	27	17	450

Recommended Drivers 推荐驱动器	KR-A5CC KR-A55MC(Micro step) KR-A535M(Micro step / AC-100～220V)

Note) Refer to page P162 or P163 for connection diagram of recommended Drivers.
注) 有关与推荐驱动器的接线,请参照P162或P163页。

Ball Screw Specifications 滚珠丝杠主要技术参数	
Accuracy grade 精度等级	JIS Ct7
Thread direction 旋向	Right 右
Axial play 轴向间隙	0.020mm or less 0.020mm以下
Shaft & Nut material 丝杠轴、螺母材质	Chrome-molybdenum steel 铬钼钢
Surface Coating 表面处理	Black Chrome coating on Shaft 丝杠轴采用黑铬处理
Surface hardness 螺纹部表面硬度	HRC58～62 (Thread area)
Lubricant 润滑剂	KSS original grease MSG No.1 KSS原装油脂 MSG No.1

Motor Specifications 电机参数	
Basic step angle 基本步进角	0.72°
Rated Voltage 额定电压	DC 1.65 V
Rated current 额定电流	DC 0.75 A/phase DC 0.75 A/相
Winding resistance 绕组电阻	2.0Ω
Holding Torque 保持扭矩	0.236Nm
Rotor inertia 转子惯量	74g·cm²
Operating temperature 使用温度范围	−20℃～50℃

Note) Only shaft end cutting is available.
Other than that, it would be customized order.
注) 只能裁切轴端。
其他轴端形状为定制产品。

MB系列(精密滚珠丝杠 + 5相步进电机)

MB Series (Precision Ball Screw + 5 Phase Stepping Motor)

MoBo

●特点

· 是将5相步进电机直接组装到精密滚珠丝杠(C3级)轴端上的产品,
最适合高精度定位。
· 具有将滚珠丝杠轴心作为电机旋转轴心的理想结构。
· 直连结构省去了联轴器的使用,在缩短长边方向尺寸的同时,
还能减少空转。
· 还备有推荐的5相步进电机用驱动器。

●Features

· A 5-pahse Stepping Motor is mounted directly onto the shaft end of a C3 grade precision Ball Screw, which is suitable for high accurate positioning system.
· Ball Screw Shaft is ideally constructed to form the Motor Rotor Shaft.
· Since combining the Motor Shaft and Ball Screw Shaft, Coupling-less, saving total length, low lost-motion can be achieved.
· Recommended Driver for 5-phase Stepping Motor is available.

●基本规格 / Specifications

Model 型 号	Shaft Nominal Dia. 丝杠轴公称外径 (mm)	Lead 导程 (mm)	Travel 行程 (mm)	Travel per pules 1脉冲移动量 (μm)	Reference Thrust 参考推力 (N)	Mass 质量 (g)
MB04005A	f4	0.5	20	1	10	84
MB0401A	f4	1	30	2	20	84
MB0401	f4	1	30	2	50	100
MB0601	f6	1	75	2	100	170
MB0602	f6	2	75	4	50	180
MB0801	f8	1	150	2	300	310
MB0802	f8	2	150	4	150	320

Repeatability(reference) 重复定位精度(参考值)	max. ±0.005mm
Lost Motion(reference) 空转(参考值)	max. 0.005mm

※重复定位精度及空转值是安装在本公司标准滑台上时测得的值。
实际值请洽询本公司。
※The reference value about Repeatability and Lost Motion represents when the MB built into KSS original Stage. Please make a contact to KSS for actual value.

注1) 关于详细尺寸,请参照P132页以后的规格图。
注2) 1脉冲的移动量为整步时的值。
注3) 加减速速率的参考值为20ms/kHz以上。
注4) 参考推力根据不同条件会有很大变化,请垂询本公司。

Note 1) Detail specifications & dimensions are shown in drawings from page P132.
Note 2) Travel per pulse represents the value for full step.
Note 3) Acceleration & Deceleration Rate should be 20ms/kHz or more.
Note 4) Reference Thrust may vary depending on the operating condition, please ask KSS for more detail.

●电机规格 / Motor Specifications

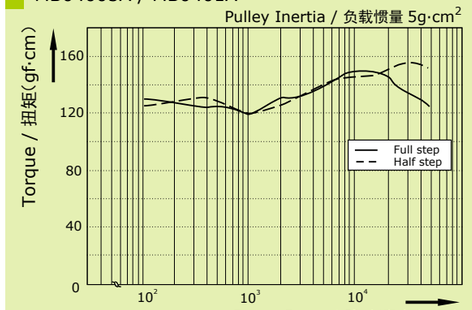
Model 型 号	Motor size 电机尺寸	Rated voltage 额定电压 (V)	Rated current 额定电流 (A/phase) (A/相)	Winding resistance 绕组电阻 (Ω)	Holding torque 保持扭矩 (Nm)	Rotor Inertia 转子惯量 (g·cm²)	Load limit in Vertical Position 许用轴向负载(垂直) (N)
MB04005A	NEMA 08 (□20)	DC 1.05	0.75	1.4	0.010	3.9	230
MB0401A	NEMA 08 (□20)	DC 1.05	0.75	1.4	0.010	3.9	230
MB0401	NEMA 10 (□24)	DC 0.83	0.75	1.1	0.018	4.2	230
MB0601	NEMA 10 (□24)	DC 1.28	0.75	1.7	0.028	8.9	230
MB0602	NEMA 10 (□24)	DC 1.28	0.75	1.7	0.028	8.9	230
MB0801	NEMA 17 (□42)	DC 1.28	0.75	1.7	0.128	41	300
MB0802	NEMA 17 (□42)	DC 1.28	0.75	1.7	0.128	41	300

注1) 基本步进角为0.72° 。
注2) 转子惯量为包含滚珠丝杠轴的值。

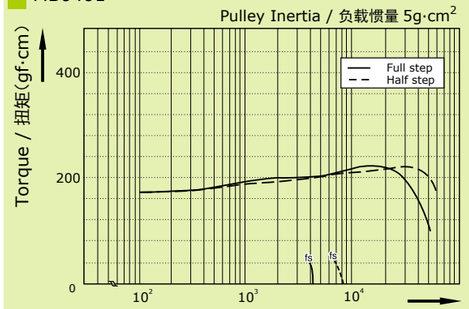
Note 1) Basic step angle is 0.72°
Note 2) Rotor Inertia includes Ball Screw Shaft.

●电机特性 / Motor Characteristic

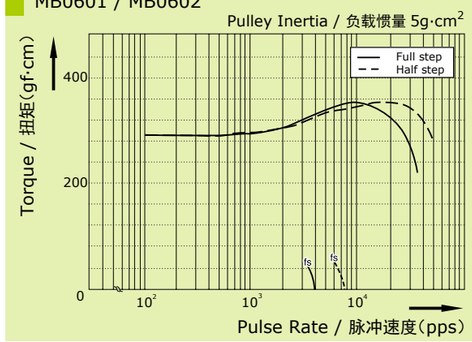
MB04005A / MB0401A



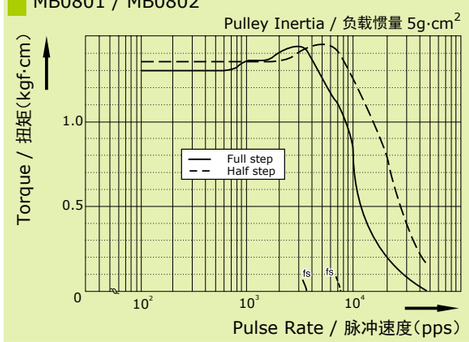
MB0401



MB0601 / MB0602



MB0801 / MB0802



■Test Condition / 测试条件

Driver / 驱动器 : Maker Standard / 制造商标准机
Input Voltage / 电源电压 : DC24V
Phase Current / 设定电流 : 0.75A

注) 电机特性因驱动器、运行条件而异。
Note) Motor characteristic will vary depending on Driver type, opearting conditions.

●公称型号 / Model number notation

定制品的公称型号如下所示。
产品目录标准形状品为产品目录记载(P132～135页)的型号。

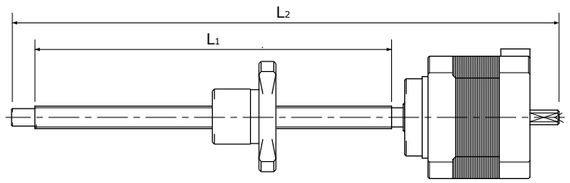
Model number notation for customized MB series is as follows.
In case of standard style, model number is described in catalogue from page P132 to page P135.

MB 04 01 - 30 R 80 C3 - 0
① ② ③ ④ ⑤ ⑥ ⑦ ⑧

①系列符号
MB：精密滚珠丝杠＋5相步进电机
②丝杠轴公称外径(mm)
③导程(mm)
01表示1mm
④螺纹部长度(mm)
L_1：参照下图
⑤螺纹旋向(R＝右旋)
⑥丝杠轴总长(mm)
L_2：参照下图
⑦精度等级
⑧轴向间隙(μm)

①Series No.
MB：Precision Ball Screw＋5-phase Stepping Motor
②Screw Shaft nominal diameter(mm)
③Lead(mm)
01 means 1mm
④Screw thread length(mm)
L_1：See below
⑤Thread direction(R＝Right-hand)
⑥Screw Shaft total length(mm)
L_2：See below
⑦Accuracy grade
⑧Axial play(μm)

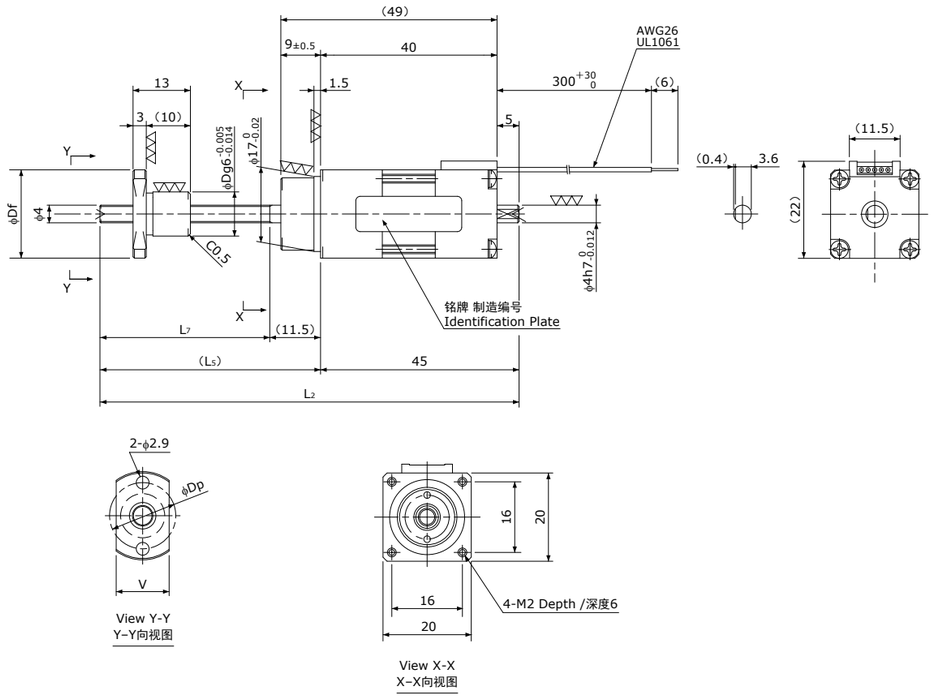
【④⑥丝杠长度定义 / Definition of Screw length】



精密滚珠丝杠+5相步进电机 / Precision Ball Screw + 5-Phase Stepping Motor

MB □20 / NEMA 08

Shaft dia.(轴径)f4



Unit(单位):mm

Model 型　号	Lead 导程	Travel 行程	Reference Thrust 参考推力 (N)	L_2	L_5	L_7	D	Df	V	Dp	Mass 质量 (g)
MB04005A	0.5	20	10	95	50	38.5	10	20	12	15	84
MB0401A	1	30	20	105	60	48.5	9	19	11	14	84

Recommended Drivers 推荐驱动器	KR-A5CC KR-A55MC(Micro step) KR-A535M(Micro step / AC-100~220V)

Note) Refer to page P162 or P163 for connection diagram of recommended Drivers.
注) 有关与推荐驱动器的接线,请参照P162或P163页。

Ball Screw Specifications　滚珠丝杠主要技术参数	
Accuracy grade 精度等级	JIS C3
Thread direction 旋向	Right　右
Axial play 轴向间隙	MB04005A:0.005mm or less MB0401A:0mm
Shaft material 丝杠轴材质	Stainless steel 不锈钢
Nut material 螺母材质	Chrome-molybdenum steel 铬钼钢
Surface hardness 螺纹部表面硬度	Min. HRC55 (Thread area)
Lubricant 润滑剂	KSS original grease MSG No.1 KSS原装油脂 MSG No.1

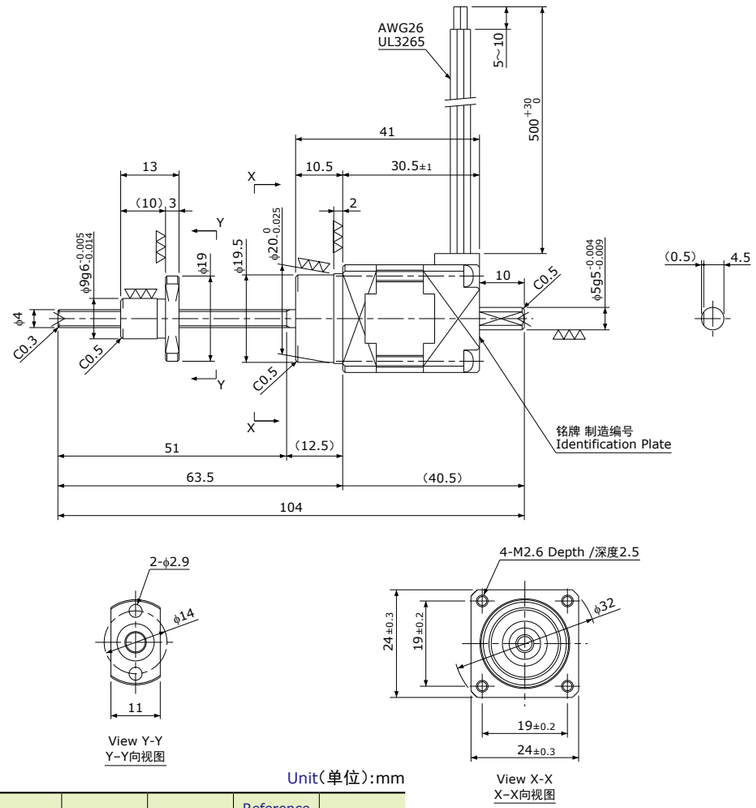
Motor Specifications　电机参数	
Basic step angle 基本步进角	0.72°
Rated Voltage 额定电压	DC 1.05 V
Rated current 额定电流	DC 0.75 A/phase DC 0.75 A/相
Winding resistance 绕组电阻	1.4Ω
Holding Torque 保持扭矩	0.010Nm
Rotor inertia 转子惯量	3.9g·cm²
Operating temperature 使用温度范围	−20°C～50°C

Note) Only shaft end cutting is available.
Other than that, it would be customized order.
注) 只能裁切轴端。
其他轴端形状为定制产品。

精密滚珠丝杠+5相步进电机 / Precision Ball Screw + 5-Phase Stepping Motor

MB □24 / NEMA 10

Shaft dia.(轴径)f4



Unit(单位):mm

Model 型 号	Lead 导程	Travel 行程	Reference Thrust 参考推力 (N)	Mass 质量 (g)
MB0401	1	30	50	100

Recommended Drivers 推荐驱动器	KR-A5CC KR-A55MC(Micro step) KR-A535M(Micro step / AC-100~220V)

Note) Refer to page P162 or P163 for connection diagram of recommended Drivers.
注) 有关与推荐驱动器的接线,请参照P162或P163页。

Ball Screw Specifications 滚珠丝杠主要技术参数	
Accuracy grade 精度等级	JIS C3
Thread direction 旋向	Right 右
Axial play 轴向间隙	0mm
Shaft material 丝杠轴材质	Stainless steel 不锈钢
Nut material 螺母材质	Chrome-molybdenum steel 铬钼钢
Surface hardness 螺纹部表面硬度	Min. HRC55 (Thread area)
Lubricant 润滑剂	KSS original grease MSG No.1 KSS原装油脂 MSG No.1

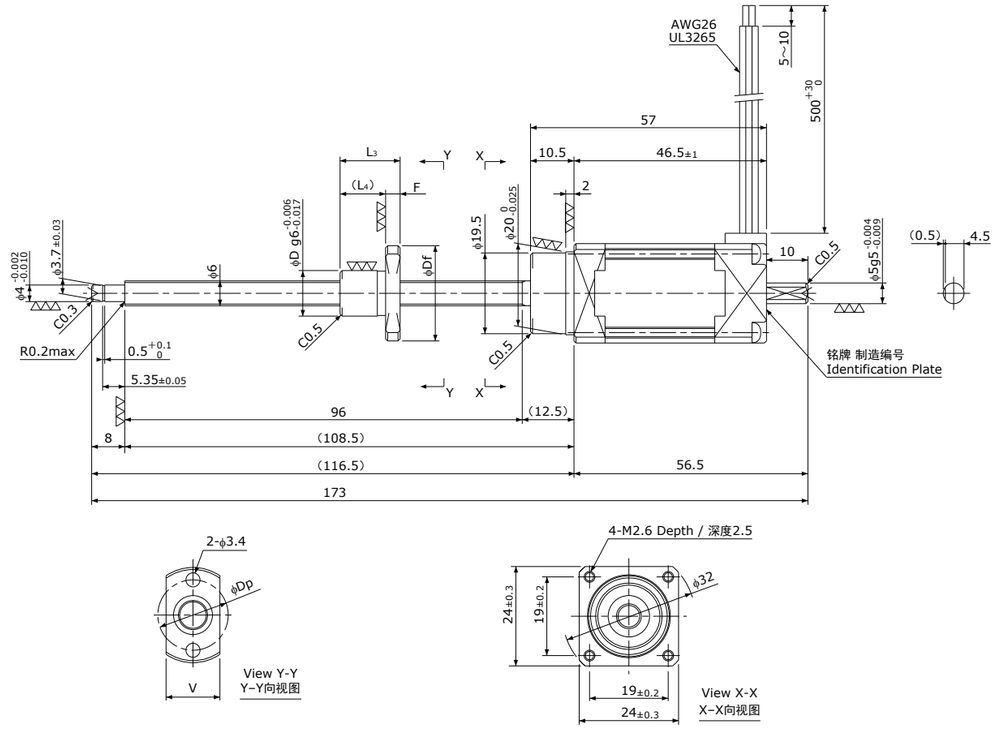
Motor Specifications 电机参数	
Basic step angle 基本步进角	0.72°
Rated Voltage 额定电压	DC 0.83 V
Rated current 额定电流	DC 0.75 A/phase DC 0.75 A/相
Winding resistance 绕组电阻	1.1Ω
Holding Torque 保持扭矩	0.018Nm
Rotor inertia 转子惯量	4.2g·cm²
Operating temperature 使用温度范围	−20℃～50℃

Note) Only shaft end cutting is available.
Other than that, it would be customized order.
注) 只能裁切轴端。
其他轴端形状为定制产品。

精密滚珠丝杠+5相步进电机 / Precision Ball Screw + 5-Phase Stepping Motor

MB □24 / NEMA 10

Shaft dia.(轴径)f6



Unit(单位):mm

Model 型 号	Lead 导程	Travel 行程	Reference Thrust 参考推力 (N)	D	Df	F	L3	L4	V	Dp	Mass 质量 (g)
MB0601	1	75	100	11	23	3.5	14.5	11	13	17	170
MB0602	2	75	50	15	28	4	17	13	17	22	180

Recommended Drivers 推荐驱动器	KR-A5CC KR-A55MC(Micro step) KR-A535M(Micro step / AC-100~220V)

Note) Refer to page P162 or P163 for connection diagram of recommended Drivers.
注) 有关与推荐驱动器的接线,请参照P162或P163页。

Ball Screw Specifications 滚珠丝杠主要技术参数	
Accuracy grade 精度等级	JIS C3
Thread direction 旋向	Right 右
Axial play 轴向间隙	0mm
Shaft material 丝杠轴材质	Stainless steel 不锈钢
Nut material 螺母材质	Chrome-molybdenum steel 铬钼钢
Surface hardness 螺纹部表面硬度	Min. HRC55 (Thread area)
Lubricant 润滑剂	KSS original grease MSG No.1 KSS原装油脂 MSG No.1

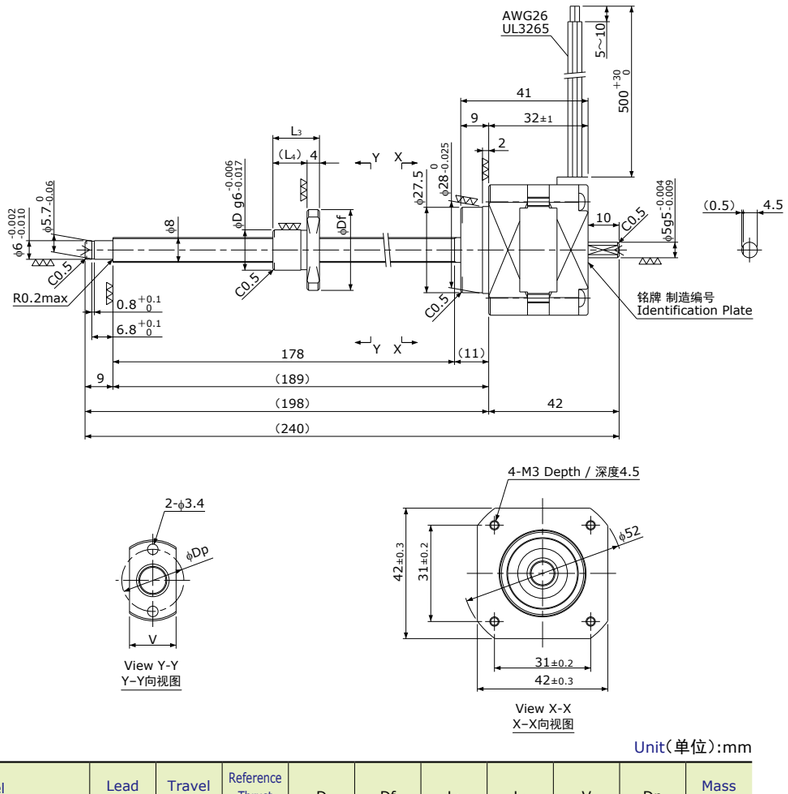
Motor Specifications 电机参数	
Basic step angle 基本步进角	0.72°
Rated Voltage 额定电压	DC 1.28 V
Rated current 额定电流	DC 0.75 A/phase DC 0.75 A/相
Winding resistance 绕组电阻	1.7Ω
Holding Torque 保持扭矩	0.028Nm
Rotor inertia 转子惯量	8.9g·cm²
Operating temperature 使用温度范围	−20℃～50℃

Note) Only shaft end cutting is available.
Other than that, it would be customized order.
注) 只能裁切轴端。
其他轴端形状为定制产品。

精密滚珠丝杠+5相步进电机 / Precision Ball Screw + 5-Phase Stepping Motor

MB □42 / NEMA 17

Shaft dia.(轴径)f8



Unit(单位):mm

Model 型　号	Lead 导程	Travel 行程	Reference Thrust 参考推力 (N)	D	Df	L3	L4	V	Dp	Mass 质量 (g)
MB0801	1	150	300	13	26	15	11	15	20	310
MB0802	2	150	150	15	28	18	14	17	22	320

Recommended Drivers 推荐驱动器	KR-A5CC KR-A55MC(Micro step) KR-A535M(Micro step / AC-100~220V)

Note) Refer to page P162 or P163 for connection diagram of recommended Drivers.
注) 有关与推荐驱动器的接线,请参照P162或P163页。

Ball Screw Specifications　滚珠丝杠主要技术参数	
Accuracy grade 精度等级	JIS C3
Thread direction 旋向	Right　右
Axial play 轴向间隙	0mm
Shaft material 丝杠轴材质	Stainless steel 不锈钢
Nut material 螺母材质	Chrome-molybdenum steel 铬钼钢
Surface hardness 螺纹部表面硬度	Min. HRC55 (Thread area)
Lubricant 润滑剂	KSS original grease MSG No.1 KSS原装油脂 MSG No.1

Motor Specifications　电机参数	
Basic step angle 基本步进角	0.72°
Rated Voltage 额定电压	DC 1.28 V
Rated current 额定电流	DC 0.75 A/phase DC 0.75 A/相
Winding resistance 绕组电阻	1.7Ω
Holding Torque 保持扭矩	0.128Nm
Rotor inertia 转子惯量	41g·cm²
Operating temperature 使用温度范围	−20℃～50℃

Note) Only shaft end cutting is available.
Other than that, it would be customized order.
注) 只能裁切轴端。
其他轴端形状为定制产品。

MMB系列(冷轧滚珠丝杠+ All in One步进伺服电机)

MMB Series (Rolled Ball Screw + All in One Stepping Servo Motor)

●特点

- 是将步进伺服电机直接组装到精度等级为Ct7的冷轧滚珠丝杠上的产品,最适合用于实现无丢步、高速运行、小型化。
- 使用数字信号处理器(DSP)高速处理伺服和控制器的运算,实现外围电路的简化和小型化,是旋转编码器、伺服驱动器、控制器均内置于执行器的产品。
- 可使用专用软件通过PC(RS-422/485通信)设定各种参数、进行伺服调整并创建控制程序。
- 繁琐的配线已基本在执行器内部完成,可大幅节省配线。

●Features

- Stepping Servo Motor is mounted directly onto the shaft end of a Ct7 grade Rolled Ball Screw, which is the best for space saving & high-speed, non-step-out operation.
- Enables to bind Rotary Encoder, Servo Driver and Controller within the Actuator body by simplified circuits due to high-speed operation processing of Servo and Controller using Digital Signal Processor(DSP) .
- Enables to set parameters, servo control or control program through PC(RS-422/485 communication) by using exclusive software.
- The wiring is completed inside the Actuator, enabling significant saving in wiring.

●公称型号 / Model number notation

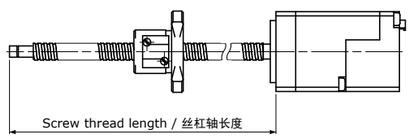
定制品的公称型号如下所示。
产品目录标准形状品为产品目录记载(P138页)的型号。
Model number notation for customized MMB series is as follows.
In case of standard style, model number is described in catalogue in page P138.

MMB R 06 02 - 94 B 1 - XXX
① ② ③ ④ ⑤ ⑥ ⑦ ⑧

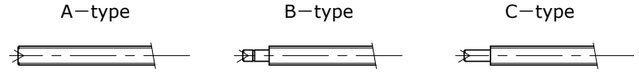
①系列符号
MMB：Moons型线性执行器
②滚珠丝杠种类
R：冷轧滚珠丝杠
③丝杠轴公称外径
06表示6mm
④导程(mm)
02表示2mm
⑤丝杠轴长度(mm)
表示突出于电机的长度(下图)
⑥轴端形状(下图)
A：无加工
B：车削&卡槽(标准形状)
C：车削
⑦电机长度编号
1：短型
2：长型
⑧附加号

①Series No.
MMB：Moons type Linear Actuator
②Ball Screw type
R：Rolled Ball Screw
③Screw Shaft nominal diameter (mm)
06 means 6mm
④Lead (mm)
02 means 2mm
⑤Screw Shaft length (mm)
Screw length which is exposed from Motor (see below)
⑥End journal profile (see below)
A：Cut only
B：Journal with snap ring groove (standard)
C：Journal only
⑦Motor length symbol
1：Short type
2：Long type
⑧Extra notation

【⑤丝杠轴长度 / Screw thread length】



【⑥轴端形状 / End journal profile】



●基本规格 / Specifications

Model 型 号	Shaft Nominal Dia. 丝杠轴公称外径 (mm)	Lead 导程 (mm)	Travel 行程 (mm)	Travel per pulse 1脉冲移动量 (μm)	Reference Thrust 参考推力 (N)	Mass 质量 (g)
MMBR0602-94B1	f6	2	62	0.1	65	162
MMBR0602-94B2	f6	2	62	0.1	104	205

Repeatability(reference) 重复定位精度(参考值)	max. ±0.01mm
Lost Motion(reference) 空转(参考值)	max. 0.01mm

※重复定位精度及空转值是安装在
本公司标准滑台上时测得的值。
实际值请洽询本公司。

※The reference value about Repeatability and Lost Motion represents when the actuator built into KSS original Stage.
Please make a contact to KSS for actual value.

注1) 关于详细尺寸,请参照P138页以后的规格图。
注2) 1脉冲移动量为出厂时(20,000step/rev)的值。
注3) 参考推力根据不同条件会有很大变化,请垂询本公司。

Note1) Detail specifications & dimensions are shown in drawing from page P138.
Note2) Travel per pulse represents the value of default setting.
Note3) Reference Thrust may vary depending on the operating condition, please ask KSS for more detail.

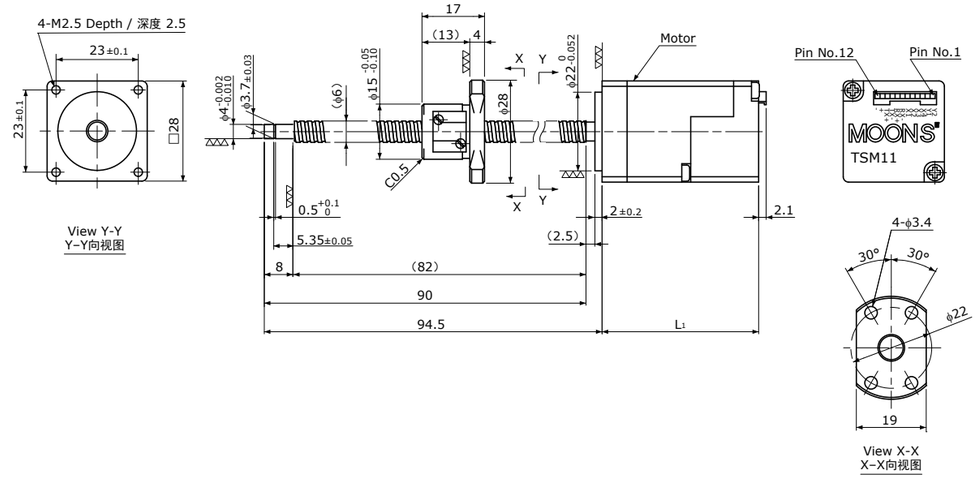
●电机规格 / Motor Specifications

Model 型 号	Motor size 电机尺寸	Rated voltage 额定电压 (V)	Rated current 额定电流 (A/phase) (A/相)	Winding resistance 绕组电阻 (Ω)	Holding torque 保持扭矩 (Nm)	Rotor Inertia 转子惯量 ($g \cdot cm^2$)	Load limit in Vertical Position 许用轴向负载(垂直) (N)
MMBR0602-94B1	NEMA 11 (□28)	DC2.6	1.0	2.6	0.05	9	150
MMBR0602-94B2	NEMA 11 (□28)	DC1.7	1.0	1.7	0.08	12	150

冷轧滚珠丝杠+步进伺服电机 / Rolled Ball Screw + Stepping Servo Motor

MMB □28 / NEMA 11

Shaft dia.(轴径)f6



Note1) Please contact KSS if different journal profile or length from the above is required.
Note2) Recommended journal profile is type B(journal with snap ring groove). Please use Bearing to support the shaft end.
注1) 若轴端形状、长度有所不同,请垂询本公司。
注2) 轴端的推荐形状为带环槽(B型)。使用时请用轴承对其进行支撑。

Unit(单位):mm

Model 型 号	Lead 导程	Travel 行程	Reference Thrust 参考推力 (N)	L1	Mass 质量 (g)
MMBR0602-94B1 (Short type / 短型)	2	62	65	44	162
MMBR0602-94B2 (Long type / 长型)	2	62	104	53	205

Ball Screw Specifications 滚珠丝杠主要技术参数	
Accuracy grade 精度等级	JIS Ct7
Thread direction 旋向	Right 右
Axial play 轴向间隙	Max 0.03mm
Ball Screw material 滚珠丝杠	Chrome-molybdenum steel 铬钼钢
Surface hardness 螺纹部表面硬度	Min. HRC58 (Thread area)
Lubricant 润滑剂	KSS original grease MSG No.2 KSS原装油脂 MSG No.2

Motor Specifications 电机参数		
	Short type 短型	Long type 长型
Basic step angle 基本步进角	1.8°	1.8°
Driving method 励磁方式	2-phase Bi-polar 2相双极方式	
Rated Voltage 额定电压	DC 2.6 V	DC 1.7 V
Rated current 额定电流	DC 1.0 A/phase DC 1.0A/相	
Winding resistance 绕组电阻	2.6Ω	1.7Ω
Holding Torque 保持扭矩	0.05Nm	0.08Nm
Rotor inertia 转子惯量	9g·cm²	12g·cm²
Operating temperature 使用温度范围	0℃～40℃	

●连接器引脚配置 / Connector Pin Diagram

Pin No.	Name	Description / 功能解说
1	Y2	Open drain outputs with freewheeling diode（30VDC 100 mA in max.） 飞轮二极管输出（DC30V 最大100mA）
2	Y1	
3	X4	Digital inputs（input high voltage 5～24VDC, input low voltage below 1VDC, signal frequency 1MHz in max.） 数字输入（High:5～24V、Low:1V以下）信号输入频率:最大1MHz
4	X3	
5	X2	Digital inputs（input high voltage 5～24 VDC, input low voltage below 2VDC, signal frequency 1MHz in max.） 数字输入（High:5～24V、Low:2V以下）信号输入频率:最大1MHz
6	X1	
7	RX-	RS-422 / 485 interface differential signals RS-422 / 485接口差分信号
8	RX+	
9	TX-	
10	TX+	
11	+	V+ Power supply（typ. 24 VDC） V+ 电源（公称值DC24V）
12	-	V- Power ground（GND） V- 电源（GND）

●驱动器规格 / Driver Specification

Power Amplifier / 功率放大器	
Amplifier Type 放大方式	Dual H-Bridge, 4 Quadrant 双H桥、4象限
Current Control 电流控制	4 state PMW at 20 KHz PWM驱动@20KHz
Power Supply 电源电压	External 24VDC power supply required, Current capacity 6.5A 推荐DC24V（15V～30V）、电流容量6.5A
Input Voltage Range 输入电压范围	15-30 VDC min/max（nominal 24VDC） 公称值DC24V（15V～30V）
Protection 保护功能	Over-voltage, under-voltage, over-temperature, internal motor shorts（phase-to-phase, phase-to-ground） 过电压、欠电压、过热、电机内部短路（相间、相与GND间）
Ambient Temperature 使用温度范围	0℃～40℃（32～104°F）when mounted to a suitable heatsink 0℃～40℃（设有适宜的散热器）
Humidity 湿度	90% non-condensing 90%以下（无结露）

●控制器规格 / Controller Specification

Controller / 控制器	
Current Control 电流控制	Advanced digital current control provides excellent high speed torque 数字电流控制
Microstep Resolution 微步分辨率	Software selectable from 200 to 51200 steps/rev. in increments of 2 steps/rev. 软件选择200～51200steps/rev（能以2steps/rev为单位设定）
Speed Range 速度范围	Max.60rps
Distance Range 距离（移动量）设定范围	Over 10,000,000 revolutions（at 200 step/rev.） 10,000,000rev以上（200steps/rev时）
Noise Filtering 噪音滤波器	Programmable hardware digital noise filter. Software noise filter 可编程数字滤波器（硬件）、软件滤波器
Serial Commanding 串行指令	Support Serial Command Language（SCL） SCL（串行指令语言）
Encorder Feedback 编码器反馈	4096 counts/rev. encorder feedback 4096counts/rev
Non-Volatile Storage 非易失性存储器	Configurations are saved in FLASH memory on-board the DSP 闪存（内置DSP）
X1/Step	Input:5～24 vdc, single-ended signals, max. pulse frequency 1MHz Functions:Step, CW Step, A Quadrature, CW Limit, CW Jog, Run/Stop, general purpose input. ＊Adjustable bandwidth digital noise rejection filter ＊Connect with NPN type output ONLY 输入:DC5～24V单端、最大1MHz 功能:Step、CW Step、A相方波、CW限制、CW点动、Run/Stop、通用输入 ＊附加数字噪音滤波器 ＊仅支持NPN型输出
X2/Direction	Input:5～24 VDC, signal-ended signals, max. pulse frequency 1MHz Functions:Dir, CCW Step, B Quadrature, CCW Limit, CCW Jog, general purpose input. ＊Adjustable bandwidth digital noise rejection filter ＊Connect with NPN type output ONLY 输入:DC5～24V单端、最大1MHz 功能:Dir、CCW Step、B相方波、CCW限制、CCW点动、Run/Stop、通用输入 ＊附加数字噪音滤波器 ＊仅支持NPN型输出
X3/Enable	Inputs:5～24 VDC, single-ended signals, max. pulse frequency 1MHz Functions:Enable, general purpose input. ＊Connect with NPN type output ONLY 输入:DC5～24V单端、最大1MHz 功能:有效、通用输入 ＊仅支持NPN型输出
X4/Alarm Reset	Inputs:5～24 VDC, single-ended signals, max. pulse frequency 1MHz Functions:Alarm reset, Change speed, general purpose input. ＊Connect with NPN type output ONLY 输入:DC5～24V单端、最大1MHz 功能:警报复位、速度变更、通用输入 ＊仅支持NPN型输出
Y1/FAULT	Open drain output:maximum current 100mA with maximum voltage of 30 VDC Functions: Fault detection, general purpose 漏极开路输出:最大DC30V时最大100mA 功能:异常检测、通用输出
Y2/BRAKE	Open drain output:maximum current 100mA with maximum voltage of 30 VDC Functions: Brake, In Position, Tach Output, general purpose 漏极开路输出:最大DC30V时最大100mA 功能:制动、就位、转速输出、通用输出
Communication Interface 通信接口	RS-422/485 Modbus/RTU available to use for TSM 11Q RS-422/485 TSM11Q系列也可使用Modbus/RTU

SiMB系列(精密滚珠丝杠 + 步进伺服电机)

SiMB Series (Precision Ball Screw + Stepping Servo Motor)

MoBo

●特点

- 是将步进伺服电机直接组装到精密滚珠丝杠的轴端上的产品，分辨率高、定位精度优越。
- 在电机后部配备有编码器和存储元件，实现了完全等间距定位、无振动、无失调、扭矩控制运行。
- 具有将滚珠丝杠轴心作为电机旋转轴心的理想结构。
- 直连结构省去了联轴器的使用，在缩短长边方向尺寸的同时，还能减少作业工时。
- 还备有专用控制器驱动器、专用电缆。

●Features

- A Stepping Servo Motor, what we call Si-servo Motor, is mounted directly onto the Shaft end of a Precision Ball Screw, which is high resolution and precise positioning unit.
- An Encoder and a Memory chip are installed at the end of Motor, high accurate positioning, ultra smooth drive, torque control drive, and closed loop function have been achieved.
- Ball Screw Shaft is ideally constructed to form the Motor Rotor Shaft.
- Since combining the Motor Shaft and Ball Screw Shaft, Coupling-less, saving total length, and reducing labor cost can be achieved.
- Exclusive Driver, and Cable are provided for Si-servo Motor.

数据库补偿控制

Si伺服的控制方式并非单一的微型步进控制。电机后部配备有编码器和存储元件，以每圈400脉冲分辨率的编码器位置信息和电流反馈为基准。另外，出厂时已将电机固有数据保存在存储器中，电机驱动时通过进行补偿、抑制的精密数据库补偿型控制方式，实现了对目标位置的高速、高精度定位。

Database compensation control

Control mechanism of the Si servo is not simply the micro-step control. Both an Encoder and a Memory chip are installed, and the Encoder position for 400pulse resolution per revolution as well as electrical current feedback are standard. Furthermore, data inherent to the Motor is recorded in the Memory at time of shipping from the factory so that high speed and high precision positioning to designated positions can be realized using a precise database revision control method of compensation and control when the Motor starts.

对电机特性数据采样

因电机的加工、组装精度而引起的齿槽扭矩和扭矩脉动是影响低振动、高精度定位的重要原因。Si伺服可准确测量、掌握这些影响控制的电机固有数据和微型步进控制时的定位精度，并将其作为最佳电流波形进行数据库化。

Sampling motor characteristics

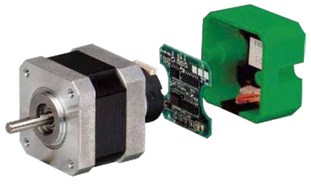
Cogging Torque and Torque ripples originate from Motor processing and assembly precision, big factors that can hinder a low vibration, high accuracy positioning. The Si servo, by accurately measuring and storing individual Motor characteristics data inherit to the Motor, we can create a database of the optimal electrical current wave forms for the highest possible rotary precision.

向存储器保存数据

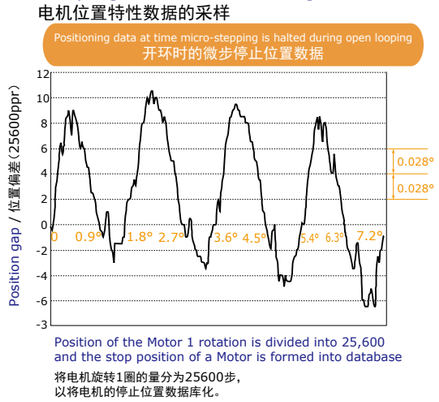
采样数据被保存在电机内的存储器中，接通电源时通过编码器电缆被传送至驱动器。由此可实现驱动器和电机的任意组合。

Storing data in memory

The data gained from sampling is stored in Memory within the Motor, which can be transferred to a Driver by using an Encoder cable at the time power is supplied. This makes it possible for the Driver and the Motor to work as an optimal combination.



Sampling of Motor's Positioning Characteristic
电机位置特性数据的采样



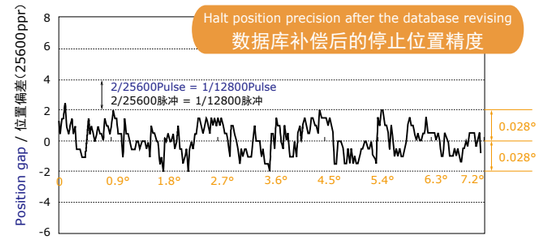
Position of the Motor 1 rotation is divided into 25,600 and the stop position of a Motor is formed into database
将电机旋转1圈的量分为25600步，以将电机的停止位置数据库化。

高精度定位

不仅像微型步进控制那样对指令分辨率进行了细化，还将实际停止精度提高到了相当于10000脉冲编码器的水平。此外，还可实现微型步进控制无法达到的脉冲单位的等间距定位。(*以电机输出扭矩足够高于负载阻力为必要条件。)

High precision positioning

This is not just a simple command analysis as with Micro-step controls. It raises the actual precision of halting to a proper 10000 pulse encoder. Furthermore uniform pitch positioning to the pulse, which can not be achieved by Micro-step, has been realized.
(*As one condition, the output Torque of the Motor needs to sufficiently exceed load resistance.)

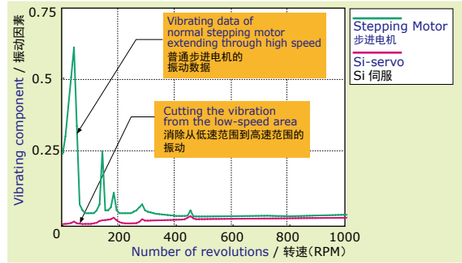


实现了低振动运行

电机动作时，通过高速施加最佳补偿电流指令，可大大消除电机的振动因素。与步进电机相同，在电机停止时不会产生像伺服电机那样的微小振动。

Low vibrations

Vibrating elements in the Motor have been largely removed thanks to the optimal high-speed revision current commands while the Motor is in operation. Also unlike a standard Servo Motor, there is no searching between Encoder counts when the Motor stops.

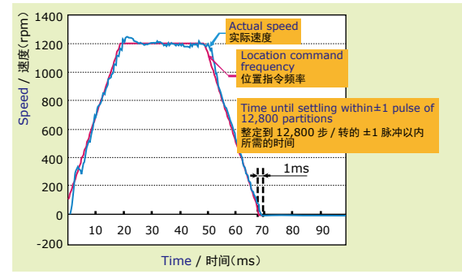


整定时间

Si伺服灵活运用步进电机的优点，对指令脉冲具有极高的模拟性。
整定到12800步/转的±1脉冲以内只需1ms。
在要求高节奏运行的用途中能发挥卓越的性能。

Settling time

The Si Servo makes the most of the stepping motor's advantsges including its ability to closely follow the command pulse train
The amount of time until setting within ±1 pulse of 12,800 partitions is only 1ms. Providing superior performance in high response systems.

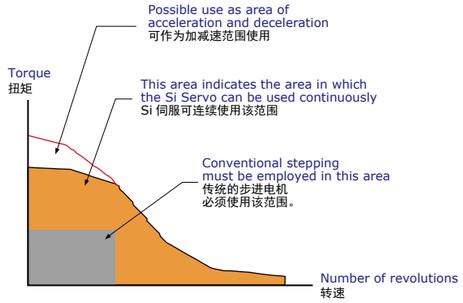


扭矩余量充足

无失调，可以100%负载连续运行，
无需像步进电机那样考虑扭矩余量。

Surplus Torque

Because the Si Servo is never step out, it is possible to operate continuously at 100% capacity. There is no need to consider the Torque margin as with the Stepping Motor.

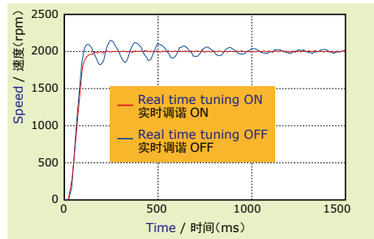


实时自动调谐

即使以传统的调谐方式无法平滑驱动的机械，也可利用实时自动调谐功能自动模拟惯量和刚性的变动，始终保持最佳响应性和稳定性。

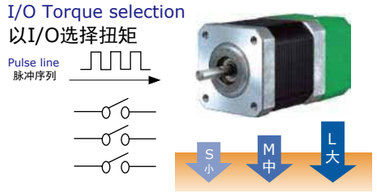
Real-time auto-tuning

Even machinery that could not operate smoothly with conventional tuning methods will automatically imitate Inertia and Rigidity, always able to realize the optimal responsive and stable tuning.



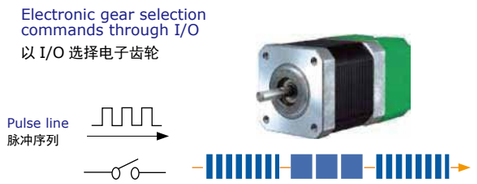
以步进方式控制扭矩
可在位置控制的同时进行5级扭矩控制。
Point Table运行时，可设定任意的扭矩值。可自由切换并使用位置控制和扭矩控制，因此可实现自由度很高的控制。即使在扭矩控制中也会在内部进行偏差管理，因此不会发生位置偏移。

Torque controls through stepping
Five steps of Torque control are performed during position control. Optional Torque value settings are possible during the point table operations. A high degree of freedom in control is possible thanks to being able to switch back and forth between position control and torque control. Even during Torque control, differential controls are still being performed internally, so positions will not deviate.



外部电子齿轮切换
可通过外部I/O信号或通信指令对2级电子齿轮设定进行切换。即使是只能输出低频指令脉冲的控制器，也能以高分辨率进行从低速运行到高速运行的大范围控制。

External electronic gear transfer
Using external I/O signals and/or communication commands, switching the electronicgear setting in two steps possible. Even controller that cannot output except on command pulses with low frequencies can be highly functional in a wide range from low speed to high speed operations.
*Switching can be performed while the motor is halted.



本产品不适于在某些条件下使用，建议就产品规格与本公司充分协商。
Depends on the condition, this product will not be suitable for your specifications.
Please always consult with KSS regarding your requirement.

●基本规格 / Specifications

Model 型 号	Shaft Nominal Dia. 丝杠轴公称外径 (mm)	Lead 导程 (mm)	Travel 行程 (mm)	Travel per pules 1脉冲移动量 (μm)	Reference Thrust 参考推力 (N)	Mass 质量 (g)
SiMB0401	f4	1	30	1/25,600	30	114
SiMB0801	f8	1	100	1/25,600	300	130
SiMB0802	f8	2	160	2/25,600	150	165
SiMB0805	f8	5	150	5/25,600	80	200

Repeatability(reference) 重复定位精度(参考值)	max. ±0.001mm
Lost Motion(reference) 空转(参考值)	max. 0.001mm

※重复定位精度及空转值是安装在本公司标准滑台上时测得的值。实际值请洽询本公司。

※The reference value about Repeatability and Lost Motion represents when the MoBo built into KSS original Stage. Please make a contact to KSS for actual value.

注1）关于详细尺寸，请参照P149页以后的规格图。
注2）加减速速率的参考值为0.5ms/kHz(电机单体性能)以上。
注3）参考推力根据不同条件会有很大变化，请垂询本公司。

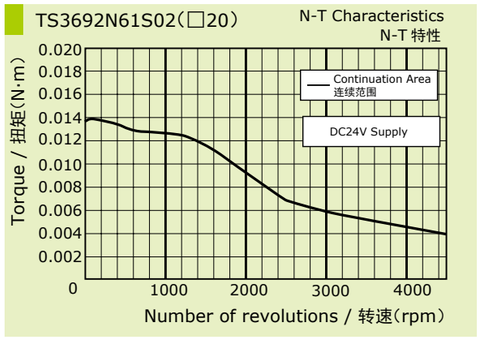
Note1）Detail specifications & dimensions are shown in drawings from page P149.
Note2）Acceleration & Deceleration Rate should be recommended by 0.5ms/kHz or more(Abiliby as a Motor itself).
Note3）Reference Thrust may vary depending on the operating condition, please ask KSS for more detail.

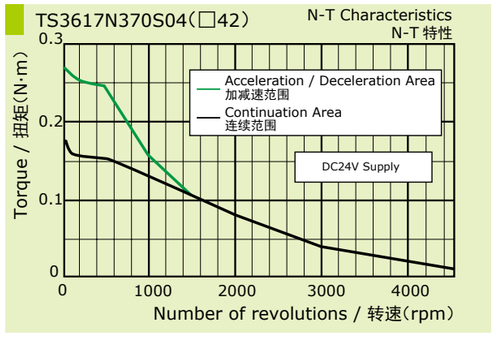
●电机规格 / Motor Specifications

Model 型 号		TS3692N61S02(SiMB0401)	TS3617N370S04(SiMB08xx)
Maximum output torque 最大输出扭矩	N· m	0.017	0.24
Maximum rotating speed 最大转速	rpm	4500	4500
Rated current 额定电流	A0-p	0.35	2.0
Rated voltage 额定电压	V	3.0	2.2
Coil resistance 绕组电阻	Ω	8.5±15%	1.1±15%
Rotor inductance 绕组电感	mH	3.4±20%	1.4±20%
Rotor inertia 转子惯量	10^{-7}kg· m^2	1.9	35
Shaft run out 轴跳动	mm T.I.R	0.05	0.05
Load limit in Vertical Position 许用轴向负载(垂直)	N	230	300
Thrust play 轴向游隙	mm max.	0.01	0.01
Coil Method 绕组方式	—	2-phase hybird stepping motor Bipolar coil 2相混合步进电机 双极绕组	
Insulation class 绝缘等级	—	CLASS B	
Insulation resistance 绝缘电阻	MΩ min.	100(at DC500V)	
Dielectric strength 绝缘耐压	V	500(at AC 1MIN)	
Operating temperature range 使用温度范围	℃	−20～+50	
Operating humidity range 使用相对湿度范围	%RH	5～95	
Storage temperature range 存放温度范围	℃	−40～+70	

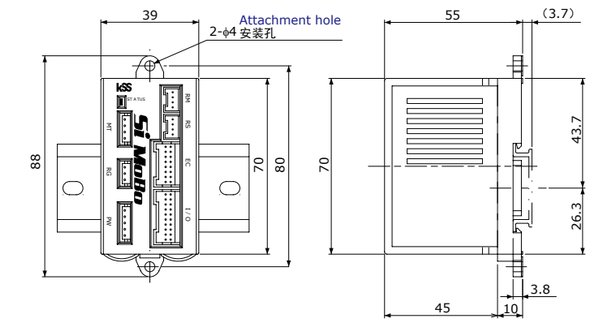
注）转子惯量为包含滚珠丝杠轴的值。
Note ）Rotor Inertia includes Ball Screw Shaft.

●扭矩特性 / Torque Characteristics





●驱动器外形尺寸 / Driver Outer Dimensions



●驱动器规格 / Driver Specifications

Model 型 号			Si-02LDE(SiMB0401)	Si-02DE(SiMB08xx)
Applicable Motor Model 适用的电机型号			TS3692N61S02	TS3617N370S04
Rated Output Current(A0-p) 额定输出电流(A0-p)			0.35	2.0
Maximum Output Current(A0-p) 最大输出电流(A0-p)			1.0	4.5
Controlling Method 控制方式			Transistor PWM(Sine Wave Drive) 晶体管PWM(正弦波驱动)	
Feedback 反馈			Incremental Encoder 200 ppr 增量型编码器200ppr	Increnebtal Encoder 400ppr 增量型编码器400ppr
Power supply 电源	Voltage 电源电压 (V)	Power supply 动力电源	DC24V±10% or DC36V±10%	
		Control power supply 控制电源	DC24V±10%	
	Power Supply Current(A) 电源电流(A)		2	
Position Command Method 位置指令方式			Communication and Control Input through 3 Mode Pules Lines and RS485 通过3模式脉冲序列、RS485进行通信、控制输入、Point Table存储的方式	
Conditions for Use 使用条件	Temperature for Use 使用温度		0～+50℃	
	Storage Temperature 存放温度		−20～+85℃	
	Humidity for Use or Storage 使用、存放湿度		Under 90%RH(no condensation) 90%RH以下(无结露)	
	Resistance Vibrations 抗振性		0.5G	
	Impact Resistance 抗冲击强度		2G	
Standard Functions 内置功能	Dynamic Braking 动态制动器功能		None 无	
	Regenerative Function 再生功能		Able to connect to external regeneration processing circuit 可在外部连接再生处理回路	
	Over Travle Prevention 超程防止功能		Hard OT, Soft OT(Select ON or OFF parameters) 硬件OT、软件OT(通过参数选择有效/无效)	
	Internal Speed Setting 内部速度设定功能		Point Table Transfer Speed, Jog Speed, Reset Speed Point Table移动速度、点动速度、原点复位速度	
	Display 显示功能		1- LED(Alarm Display, Servo ON Conditions) LED指示灯1点(警报显示、伺服ON状态)	
Input / Output 输入/输出	Input 输入	Control Input 控制输入	5 points(Select function parameters) 5点(通过参数选择功能)	
		Command Pulse Input 指令脉冲输入	CW / CCW、PULSE / SIGN、A / B Phase Input(Select parameters) Maximum response waves : 750kpps CW / CCW、PULSE / SIGN、A / B相输入(通过参数选择) 最大响应频率750kpps	
	Output 输出	Control output 控制输出	3 points(Select parameters), Brake Release Signal 3点(通过参数选择功能)、制动解除信号	
Protection Functions 保护功能			EEPROM abnormalities, Encoder abnormalities, System abnormalities, Over Currents, Driver overheating, Excessive location deviation, Motor current abnormalities, Control Current abnormalities EEPROM异常、编码器异常、系统异常、过电流、驱动器过热、位置偏差过大、电机电源异常、控制电源异常	
Zero Return Mode 原点复位方法			Zero LS Signal input or using mechanical stopper(Set parameters of 7 methods) 输入原点LS信号或使用机械挡块(通过参数选择7种方式)	
Multi-axis 多轴连接功能			Multi-drops of up to 15 axis with RS485 通过RS485最多可连接15个轴	
Settigs 设定方式			Parameters are set through use of a computer(RS485 converter required) 使用电脑进行参数设定(需RS485转换器)	
Standard, Environmental, and Protection Grades 标准、环保、保护等级			UL conformance / CE(self-declaration) / Corresponds to RoHS / IP40 符合UL标准 / CE标准(自我宣言) / RoHS指令 / 保护等级为IP40	

●公称型号 / Model number notation

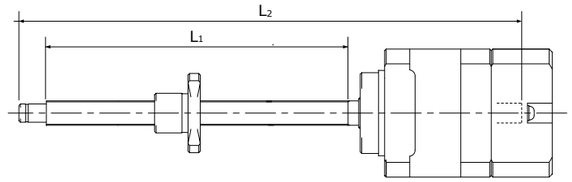
定制品的公称型号如下所示。
产品目录标准形状品为产品目录记载(P149～P150页)的型号。
Model number notation for customized SiMB series is as follows.
In case of standard style, model number is described in catalogue from page P149 to page P150.

SiMB 08 01 - 50 R 100 C3 - 0
① ② ③ ④ ⑤ ⑥ ⑦ ⑧

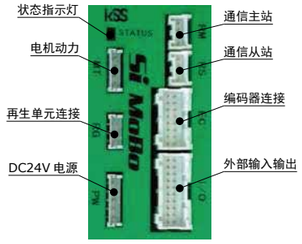
①系列符号
SiMB：精密滚珠丝杠＋步进伺服电机
②丝杠轴公称外径(mm)
③导程(mm)
01表示1mm
④螺纹部长度(mm)
L_1：参照下图
⑤螺纹旋向(R＝右旋)
⑥丝杠轴总长(mm)
L_2：参照下图
⑦精度等级
⑧轴向间隙(μm)

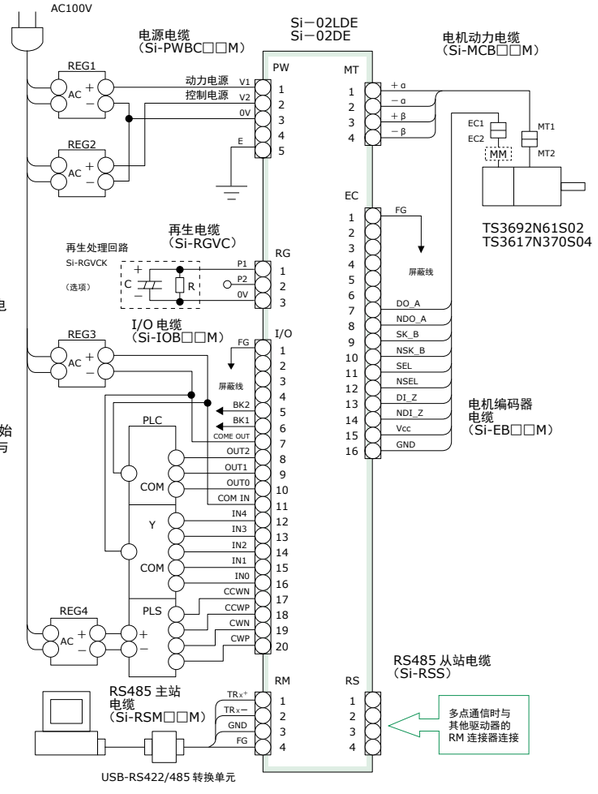
①Series No.
SiMB：Precision Ball Screw＋Stepping Servo Motor
②Screw Shaft nominal diameter(mm)
③Lead(mm)
01 means 1mm
④Screw thread length(mm)
L_1：See below
⑤Thread direction(R＝Right-hand)
⑥Screw Shaft total length(mm)
L_2：See below
⑦Accuracy grade
⑧Axial play(μm)

【④⑥丝杠长度定义 / Definition of Screw length】



●连接



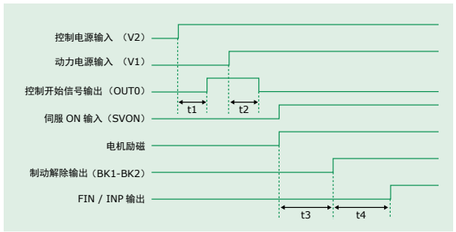


■动力电源接通时间

动力电源(V1)和控制电源(V2)分别使用不同的电源时，请先接通控制电源。接通控制电源后，作为控制开始信号，OUT0信号被置为ON。
请在确认该信号的输出后再接通动力电源。
动力电源和控制电源使用相同的电源(将电源并联在V1、V2端子上)时，可同时接通。

■接通电源时的初始化动作

请以接通动力电源、OUT0信号的时间发出伺服ON指令。注3
定位至电机励磁原点(机械角每7.2°)后，输出FIN/INP信号，完成初始化动作。注2 该初始化动作前输入的脉冲序列指令及其他指令均被忽略。制动解除信号请务必使用计算了与电机励磁动作时间的本装置的无电压继电器触点输出BK1-BK2。



■电源接通时间

(不考虑控制电源、动力电源启动时间的值)

符号	含义	时间	单位
t1	控制电源接通后，在t1后输出OUT0信号	1000	ms
t2	接通动力电源、在t2后电机变为可励磁状态注3	50	
t3	伺服ON指令后电机开始励磁，定位至最近的电机励磁原点(机械角每7.2°)注1 同时输出制动解除信号。	500	
t4	输出制动解除信号后，在t4后输出FIN/INP信号， 完成初始化动作。注2	参数53的值	

注1) 位于机械端、或者机械的摩擦阻力大时，在FIN/INP信号输出时若电机转子无法正确定位至励磁原点，则有可能发生振动或无法输出规定的扭矩。此时，请将参数53“启动时励磁保持时间”适当设定为的较大值，或者将参数56“机械端检测顺序”设定为1。
注2) 将参数58“机械端检测顺序”设定为1时，t4结束后即开始机械端检测动作，检测结束后输出FIN/INP信号。
注3) 自动伺服ON功能有效时，在控制开始信号(OUT0)输出OFF的同时电机开始励磁。

※REG1是主回路电源用稳压电源，使用DC24V或DC36V。
使用DC24V时可与REG2通用。
※REG2是控制回路用稳压电源，使用DC24V。
※REG3是I/O用稳压电源，使用DC24V。
※REG4是指令脉冲串开路集电极输出时的稳压电源，使用DC5V(或以上)。
※BK1、2为无电压继电器触点输出
※MM是电机存储组件，仅TS3692N61S02、TS3617N370S04安装在电缆内。

控制输入选择一览表

选择功能	代码	内容	选择功能	代码	内容
SVON	01	伺服ON	SBK	18	单块
PJOG	02	正转JOG	EXIN	1C	输入分支
NJOG	03	反转JOG	EMCE	20	紧急停止 (控制制动)
ARST	04	警报 复位	EMCF	21	紧急停止 (伺服自由运行)
STR	05	开始	EXIN2	23	输入分支2
ZSTR	06	原点开始	EXIN3	24	输入分支3
DEC	07	原点减速	STRP	25	开始 (单触输入)
HOLD	08	保持	ZSTRP	26	原点开始 (单触输入)
PO_IN	09	定点 编号输入	ERST	27	清除偏差
P1_IN	0A		MFIN	28	M完成
P2_IN	0B		SENS	29	传感器定位
P3_IN	30		STP	2A	停止
P4_IN	31		RSEL	38	分辨率选择
P5_IN	32		TSEL0	39	扭矩选择输入
P6_IN	33		TSEL1	3A	
P7_IN	34		TSEL2	3B	
TDIN	0C	示教	TSEL3	3C	
POT	12	正转OT	TSEL4	3D	
NOT	13	反转OT	VDIR	2E	旋转方向选择输入

向参数60、61指定上述代码。

参数60	IN3	IN2	IN1	IN0
参数61				IN4

控制输出选择一览表

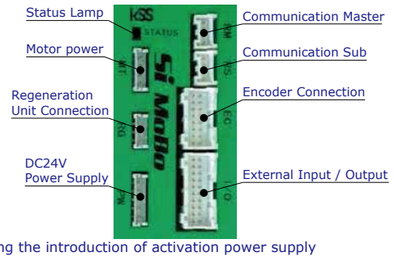
选择功能	代码	内容	选择功能	代码	内容
RDY	01	伺服准备就绪	P0_OUT	04	当前定点输出
INP	02	就位	P1_OUT	05	
ALM	03	警报	P2_OUT	06	
PRG	11	程序执行中	P3_OUT	20	
FIN	12	完成	P4_OUT	21	
VCMP	1A	速度一致	P5_OUT	22	
VZR	1B	零速	P6_OUT	23	
TFIN	1C	扭矩完成	P7_OUT	24	
FIN+TFIN	1D	完成＋扭矩完成	P0_FIN	14	定点完成输出
M0	30	M输出	P1_FIN	15	
M1	31		P2_FIN	16	
M2	32		P3_FIN	28	
TLMT	38	扭矩限制	P4_FIN	29	
SLMT	39	速度限制	P5_FIN	2A	
POTOUT	3A	正转驱动禁止中	P6_FIN	2B	
NOTOUT	3B	反转驱动禁止中	P7_FIN	2C	
ZFIN	3C	原点完成	ZPLS	3E	Z相信号输出
ZERO	3D	原点位置输出	—	—	—

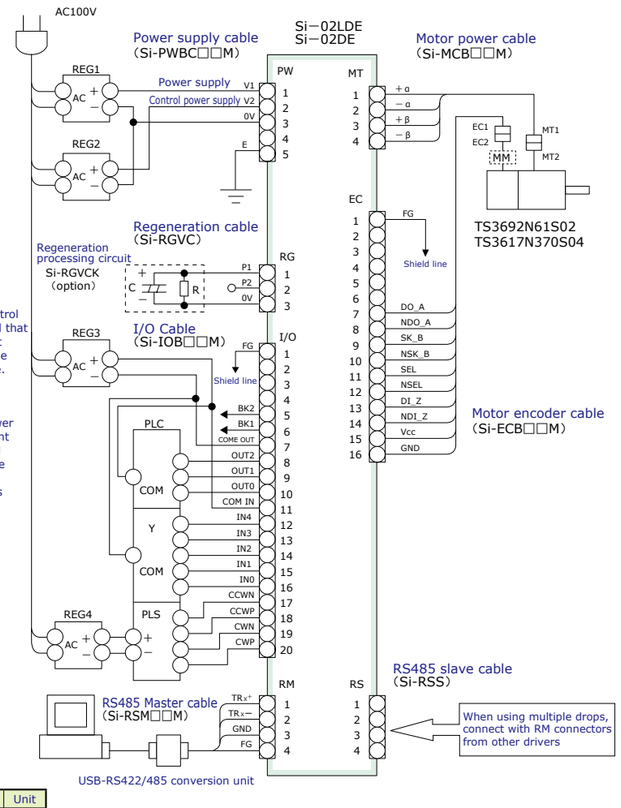
向参数63指定上述代码。

参数63		OUT2	OUT1	OUT0

※参数No.60、61、63作为32位的HEX数据，以8位为间隔设定各输入输出功能。
设定功能后，相应的端子将被分配所设的功能。
※多个输入端子上分配了同一功能时，任意一个有输入的端子将执行该功能。
※多个输出端子上分配了同一功能时，该功能对所设定的所有端子均输出。

●Connections



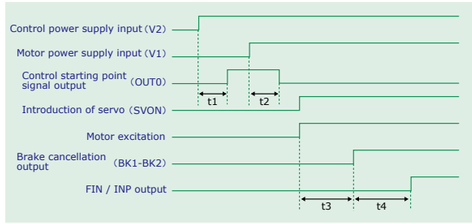


■Timing the introduction of activation power supply

If using separate power supplies from activation(V1)and control (V2), introduce the control power supply first. When the control is supplied, the OUT0 signal is turned on as a signal that control has begun. Introduce the activation power supply only after confiming the output from this signal. If using the same power supply for activation and control(connecting the power supply to parallel V1 and V2 terminals), you can introduce them at the same time.

■Initialization action when introducing power supply

Give the command to turn on the servo timed with the introduction of the activation power supply and the OUT0 signal.*3 When the positioning of the motor excitation starting point (every 7.2° from the machine angle) is complate, the FIN/INP signal will be output and initialization actions are complete.*2All pulse line and other commands input before these initialization actions will be ignored. Furthermore, be sure to use non-voltage relay connection output BK1-BK2 on this device, where the brake cancellation signal measures timing with the motor excitation activation.



■Power Supply Introduction Timing

(These value do not take into consideration times for starting control and activation power supplies)

Symbol	Meaning	Time	Unit
t1	Introduce control power supply, after t1 OUT0 signal is output.	1000	ms
t2	Introduce control power supply, after t2 conditions are set for motor excitation*1	50	
t3	After the command to turn on servo, motor excitation begins and positioning of the motor excitation starting point(every 7.2° from the machine angle) is perfomed.*1 The brake cancellation signal is output at the same time.	500	
t4	After the brake cancellation signal is output and t4, the FIN/INP signal is output and initialization actions are complete *2	Value of Parameter 53	

*1) If the motor rotor cannot accurately position the excitation starting point when the FIN/INP signal is output because it is on the edge of the machine or because the machine has a strong resistance to friction, this is a possibility that vibrations may occur or that the prescribed torque cannot be output. In this case, either set parameter 53, "Time to Hold Excitation at start Time," to an appropriately large value, or set parameter 56, "Machine Edge Detection Sequence," to "1".
*2) If parameter 58, "Machine Edge Detection Sequence", is set to "1", after t4 is completed, machine edge detection activities will begin and the FIN/INP signal will be output upon completion.
*3) If the automatic servo on function is in effect, motor excitation will begin at the same time the control start signal(OUT0)output goes off.

*REG1 uses either DC24V or DC36V for stabilizing power supply to the main circuit power supply. When DC24V is used, REG2 may be shared.
*REG2 uses DC24V for stabilizing power supply to the control circuit.
*REG3 uses DC24V for stabilizing power supply to I/O.
*REG4 uses DC5V(or higher)for stabilizing power supply when the command pulse line outputs an open collector.
*BK1 and 2 have no voltage relay connector output.
*MM refers to motor memory unit, and is packaged only in cables TS3692N61S02 and TS3617N370S04.

Control Input Selection Table

Selection Function	Code	Contents	Selection Function	Code	Contents
SVON	01	Servo ON	SBK	18	Single block
PJOG	02	CW JOG	EXIN	1C	Input branching
NJOG	03	CCW JOG	EMCE	20	Emergency stop (control movement)
ARST	04	Reset alarm	EMCF	21	Emergen stop (servo-free)
STR	05	Start	EXIN2	23	Input branching 2
ZSTR	06	Zero start	EXIN3	24	Input branching 3
DEC	07	Deceleration	STRP	25	Start (One-shot Input)
HOLD	08	Hold	ZSTRP	26	Zero start (one-shot Input)
PO_IN	09	Point number input	ERST	27	Clear deviation
P1_IN	0A		MFIN	28	M Completion
P2_IN	0B		SENS	29	Sensor positioning
P3_IN	30		STP	2A	Stop
P4_IN	31		RSEL	38	Select resolution function
P5_IN	32		TSEL0	39	Torque selection input
P6_IN	33		TSEL1	3A	
P7_IN	34		TSEL2	3B	
TDIN	0C	Teaching	TSEL3	3C	
POT	12	CW OT	TSEL4	3D	
NOT	13	CCW OT	VDIR	2E	Input selection for revolution direction

Parameters 60 and 61 refer to the above codes.

Parameter 60	IN3	IN2	IN1	IN0
Parameter 61				IN4

Control Output Selection Table

Selection Function	Code	Contents	Selection Function	Code	Contents
RDY	01	Servo ready	P0_OUT	04	Current point output
INP	02	In position	P1_OUT	05	
ALM	03	Alarm	P2_OUT	06	
PRG	11	Program in operation	P3_OUT	20	
FIN	12	Completed	P4_OUT	21	
VCMP	1A	Velocity agreement	P5_OUT	22	
VZR	1B	Zero velocity	P6_OUT	23	
TFIN	1C	Torque completed	P7_OUT	24	
FIN+TFIN	1D	Completed and torque completed	P0_FIN	14	Point completion output
M0	30	M output	P1_FIN	15	
M1	31		P2_FIN	16	
M2	32		P3_FIN	28	
TLMT	38	Torque limit	P4_FIN	29	
SLMT	39	Speed limit	P5_FIN	2A	
POTOUT	3A	Positive drive prohibited	P6_FIN	2B	
NOTOUT	3B	Negative drive prohibited	P7_FIN	2C	
ZFIN	3C	Zero complete	ZPLS	3E	Z phase signal output
ZERO	3D	Zero position output	—	—	—

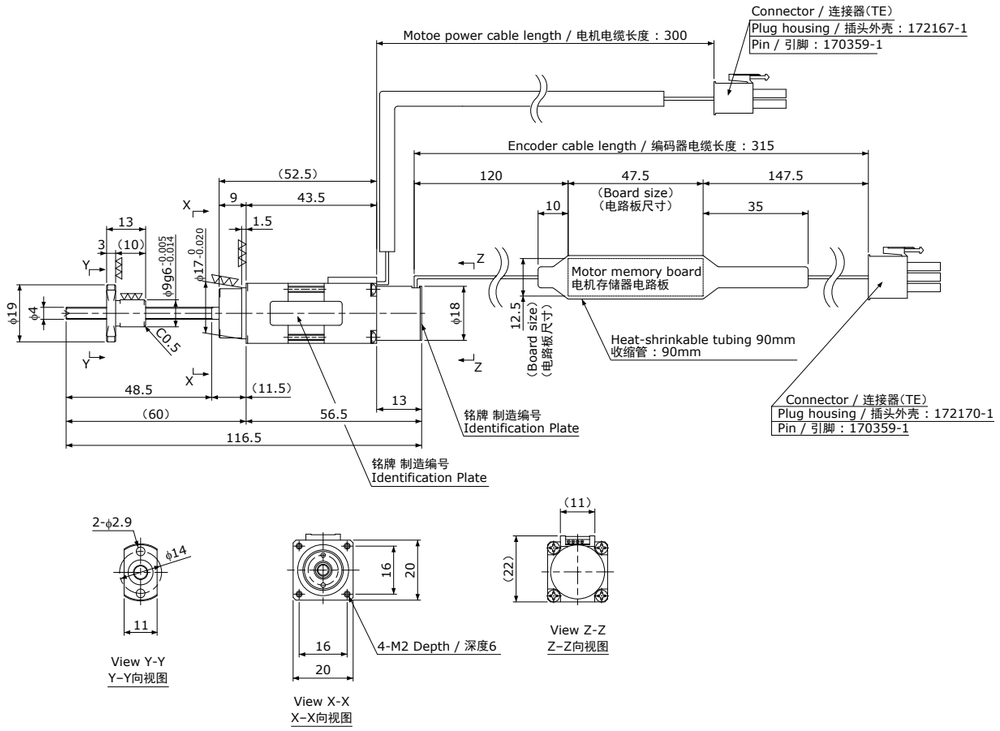
Parameters 63 refer to the above codes.

Parameter 63		OUT2	OUT1	OUT0

*Parameter number 60, 61, and 63 are 32-bit hexadecimal data, and are divided into 8 bits each, set through the input and output functions. When functions are set, the corresponding terminals are assigned to the set functions.
*When multiple input terminals are assigned to the same function,the one with input perfoms that function.
*When multiple output terminals are assigned to the same function,the output from that function will be perfomed at all assigend terminals.

SiMB □20 / NEMA 08

Shaft dia.(轴径)f4



Unit(单位):mm

Model 型 号	Lead 导程	Travel 行程	Reference Thrust 参考推力 (N)	Mass 质量 (g)
SiMB0401	1	30	30	114

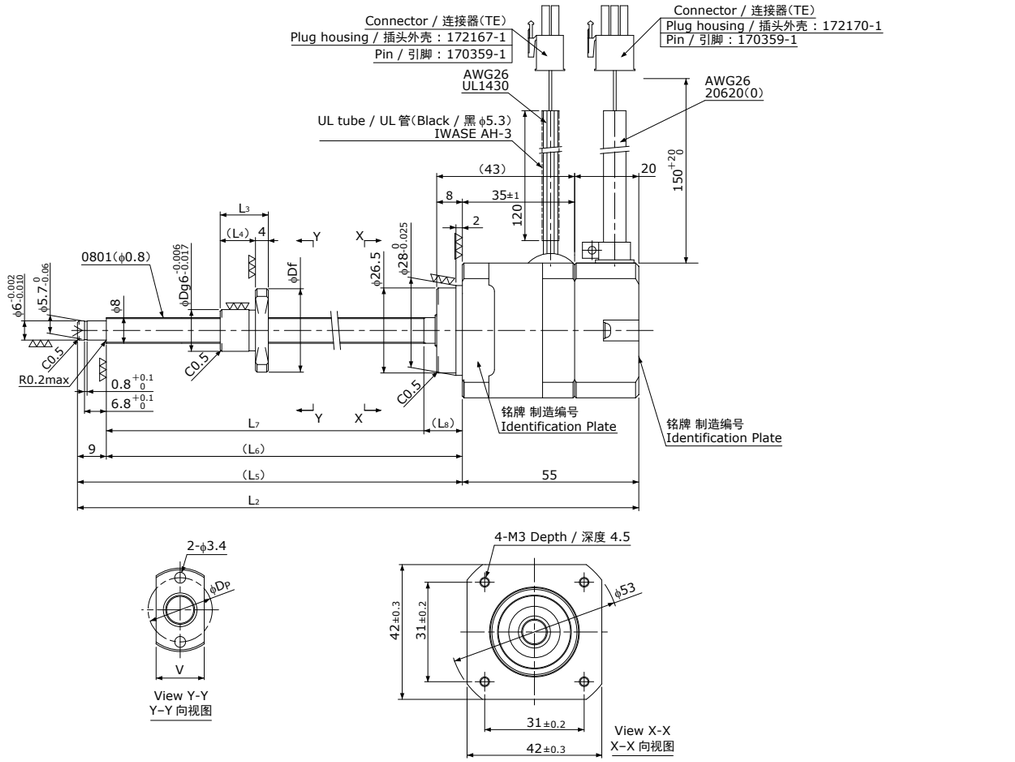
Ball Screw Specifications 滚珠丝杠主要技术参数	
Accuracy grade 精度等级	JIS C3
Thread direction 旋向	Right 右
Axial play 轴向间隙	0
Shaft material 丝杠轴材质	Stainless steel 不锈钢
Nut material 螺母材质	Chrome-molybdenum steel 铬钼钢
Surface hardness 螺纹部表面硬度	Min. HRC55 (Thread area)
Lubricant 润滑剂	KSS original grease MSG No.1 KSS原装油脂 MSG No.1

Motor Specifications 电机参数	
Basic step angle 基本步进角	1.8°
Driving method 励磁方式	2-phase Bi-polar 2相双极方式
Rated Voltage 额定电压	DC 3.0 V
Rated current 额定电流	DC 0.35 A/phase DC 0.35 A/相
Winding resistance 绕组电阻	8.5Ω
Holding Torque 保持扭矩	0.017Nm
Rotor inertia 转子惯量	1.9g·cm²
Operating temperature 使用温度范围	−20°C～50°C
Encoder 编码器	Incremental 200ppr 增量型 200ppr

Note1) Exclusive Driver(Si-02LDE)is required this type.
Note2) Only shaft end cutting is available. Other than that, it would be customized order.
注1) Si-MB需要专用驱动器(Si-02LDE)。
注2) 只能裁切轴端。其他轴端形状为定制产品。

SiMB □42 / NEMA 17

Shaft dia.(轴径)f8



Unit(单位):mm

Model 型 号	Lead 导程	Travel 行程	Reference Thrust 参考推力 (N)	L2	L5	L6	L7	L8	D	Df	L3	L4	V	Dp	Mass 质量 (g)
SiMB0801	1	100	300	215	160	151	139	12	13	26	15	11	15	20	130
SiMB0802	2	160	150	265	210	201	189	12	15	28	18	14	17	22	165
SiMB0805	5	150	80	265	210	201	188	13	18	31	28	24	20	25	200

Ball Screw Specifications 滚珠丝杠主要技术参数	
Accuracy grade 精度等级	JIS C3
Thread direction 旋向	Right 右
Axial play 轴向间隙	0
Shaft material 丝杠轴材质	Stainless steel 不锈钢
Nut material 螺母材质	Chrome-molybdenum steel 铬钼钢
Surface hardness 螺纹部表面硬度	Min. HRC55 (Thread area)
Lubricant 润滑剂	Multemp PS-2 Multemp PS-2

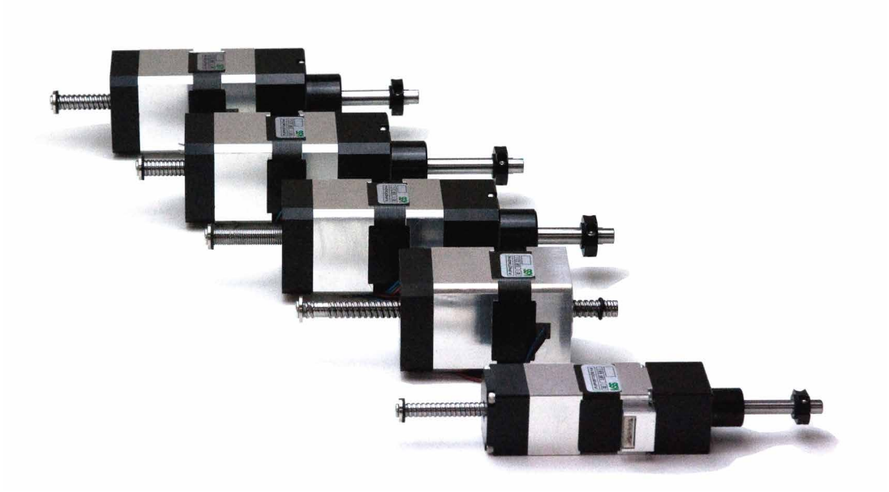
Motor Specifications 电机参数	
Basic step angle 基本步进角	1.8°
Driving method 励磁方式	2-phase Bi-polar 2相双极方式
Rated Voltage 额定电压	DC 2.2 V
Rated current 额定电流	DC 2.0 A/phase DC 2.0 A/相
Winding resistance 绕组电阻	1.1Ω
Holding Torque 保持扭矩	0.24Nm
Rotor inertia 转子惯量	35g·cm²
Operating temperature 使用温度范围	−20°C～50°C
Encoder 编码器	Incremental 400ppr 增量型 400ppr

Note1) Exclusive Driver(Si-02DE)is required this type.
Note2) Only shaft end cutting is available. Other than that, it would be customized order.
注1) Si-MB需要专用驱动器(Si-02DE)。
注2) 只能裁切轴端。其他轴端形状为定制产品。

线性执行器 Captive、Non-Captive型

Linear Actuator Captive, Non-Captive Type

2相中空步进电机和滚珠丝杠一体化的紧凑型电动缸。
Compact type Electric Cylinder with 2-phase Hollow Stepping Motor integrated with Ball Screw or Ball Screw with Ball Spline(BSSP).



●特点

· 电机尺寸有□28、□42两种,且每种电机都有止转结构内置型(Captive)和无止转结构型(Non-Captive)。
· 按配备的驱动丝杠种类和导程,精度和推力选择丰富。

●Features

· The new Cylinder type Actuator comes with 2 Motor sizes, NEMA 11 & NEMA 17. Captive type with anti-rotating device or Non-Captive type without anti-rotating device can be selected in each Motor size as standard.
· Variety of Drive Screw, Shaft diameter & Lead combination allows wider selection of Accuracy and Thrust Force.

●种类

Captive型

配备KSS微型滚珠丝杠花键(BSSP)用作止转结构。

Non-Captive型

滚珠丝杠和中空电机相结合的简易结构,实现了轻量且紧凑型外形。

●Types

Captive Type

KSS miniature Ball Screw with Ball Spline(BSSP) is used for an anti-rotating device.

Non-Captive Type

Simple combination of the Hollow Motor and the Ball Screw contributes to lightweight and compact body.

●种类 / Variation

Unit(单位): mm

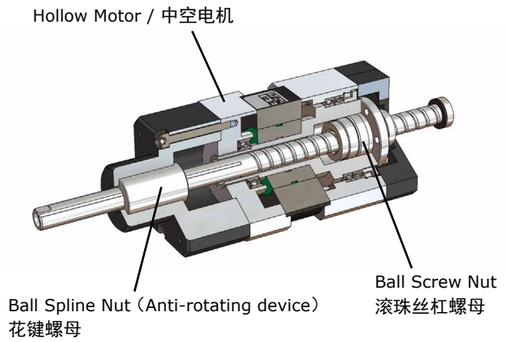
	Drive Screw 驱动丝杠	Notation 符号	NEMA 11 (□28)		NEMA 17 (□42)	
			Lead / 导程	Travel / 行程	Lead / 导程	Travel / 行程
Captive type Captive型	Precision Ball Screw 精密滚珠丝杠	G	1,2	40	2,5	50
Non-Captive type Non-Captive型	Precision Ball Screw 精密滚珠丝杠	G	1,2	40,80	2,5	50,100
	Rolled Ball Screw 冷轧滚珠丝杠	R	1,2	40,80	2,5	50,100

注) 如需上述以外的导程,请垂询本公司。
Note) If the Lead other than the above is required, please ask KSS representative.

取得实用新案 / Utility model resisterd

●构造 / Internal Structure

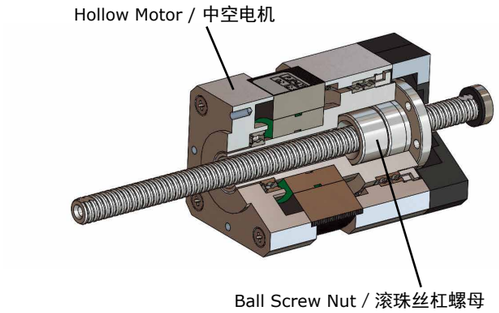
Captive型 / Captive type



配备BSSP,花键螺母用作止转结构。客户无需装配止转结构,实现更加紧凑的外形尺寸。

Ball Spline Nut in BSSP plays a role of anti-rotating device. No need to set up anti-rotating design outside the Actuator.
Our unique BSSP enable a compact and slim body by using Ball Spline Nut as an anti-rotating device.

Non-Captive型 / Non-Captive type



中空电机内置驱动丝杠的简易结构。
客户使用时,
可利用轴端内螺纹装配止转结构。

Simple design of Screw Shaft in Hollow Motor.
External anti-rotating device should be set up when usage.

●公称型号 / Model number notation

DDA AR 42 - G 05 050 N XXX
① ② ③ ④ ⑤ ⑥ ⑦ ⑧

①系列符号
DDA：直接驱动执行器系列
②电动缸型
AR：Captive type
CL：Non-Captive type
③电机尺寸
42：42角步进电机
28：28角步进电机
④进给丝杠种类
G：精密滚珠丝杠
R：冷轧滚珠丝杠
⑤导程 / 节距(mm)：05表示5mm
⑥行程(mm)：050表示50mm
⑦连接器种类
N：散线
E：EI连接器(TE Connectivity制造)
⑧附加号

①Series No.
DDA：Direct Drive Actuator Series
②Clynder type
AR：Captive type
CL：Non-Captive type
③Motor size
42：NEMA 17 Stepping Motor
28：NEMA 11 Stepping Motor
④Lead Screw / Ball Screw type
G：Precision Ball Screw
R：Rolled Ball Screw
⑤Lead / Pitch(mm)：05 means 5mm
⑥Travel(mm)：050 means 50mm
⑦Connector type
N：No connector(Bare)
E：EI connector(TE Connectivity)
⑧Extra notation

●规格 / Specifications

【Captive型 / Captive type】

Model 型 号	DDAAR28-G01 040	DDAAR28-G02 040	DDAAR42-G02 050	DDAAR42-G05 050
Motor size 电机尺寸	NEMA 11 □28		NEMA 17 □42	
Travel 行程	40mm		50mm	
Drive Screw 驱动丝杠	Precision Ball Screw with Ball Spline 精密滚珠丝杠花键			
Screw lead 丝杠导程	1mm	2mm	2mm	5mm
Resolution 分辨率	0.005mm	0.01mm	0.01mm	0.025mm
Repeatability 重复定位精度	±0.005mm			
Lost motion 空转	0.010mm			
Thrust force 推力	50N	25N	80N	30N
Permissible speed 许用速度	20mm/sec	40mm/sec	40mm/sec	100mm/sec
Acceleration & Deceleration time 加减速时间	Min. 0.2 sec 0.2 sec以上			
Operating Temperature 使用环境温度	0～40˚C（No Condensation） 0～40˚C（无结露）			
Lubrication 润滑	KSS original Grease MSG No.2 KSS原装油脂 MSG No.2			
Mass 质量	270g		660g	

【Non-Captive型 / Non-Captive type】

Model 型 号	DDACL28-G01 040 / 080	DDACL28-G02 040 / 080	DDACL28-R01 040 / 080	DDACL28-R02 040 / 080	DDACL42-G02 050 / 100	DDACL42-G05 050 / 100	DDACL42-R02 050 / 100	DDACL42-R05 050 / 100
Motor size 电机尺寸	NEMA 11 □28				NEMA 17 □42			
Travel 行程	40mm / 80mm				50mm / 100mm			
Drive Screw 驱动丝杠	Precision Ball Screw 精密滚珠丝杠		Rolled Ball Screw 冷轧滚珠丝杠		Precision Ball Screw 精密滚珠丝杠		Rolled Ball Screw 冷轧滚珠丝杠	
Screw lead 丝杠导程	1mm	2mm	1mm	2mm	2mm	5mm	2mm	5mm
Resolution 分辨率	0.005mm	0.010mm	0.005mm	0.010mm	0.010mm	0.025mm	0.010mm	0.025mm
Repeatability 重复定位精度	±0.005mm		±0.010mm		±0.005mm		±0.010mm	
Lost motion 空转	0.010mm		0.020mm		0.010mm		0.020mm	
Thrust force 推力	50N	25N	50N	25N	80N	30N	80N	30N
Permissible speed 许用速度	20mm/sec	40mm/sec	20mm/sec	40mm/sec	40mm/sec	100mm/sec	40mm/sec	100mm/sec
Acceleration & Deceleration time 加减速时间	Min. 0.2 sec 0.2 sec以上							
Operating Temperature 使用环境温度	0～40˚C（No Condensation） 0～40˚C（无结露）							
Lubrication 润滑	KSS original Grease MSG No.2 KSS原装油脂 MSG No.2							
Mass 质量	St 40:230g St 80:240g	St 40:230g St 80:240g	St 40:230g St 80:240g	St 40:230g St 80:240g	St 50:530g St 100:550g	St 50:530g St 100:550g	St 50:530g St 100:550g	St 50:530g St 100:550g

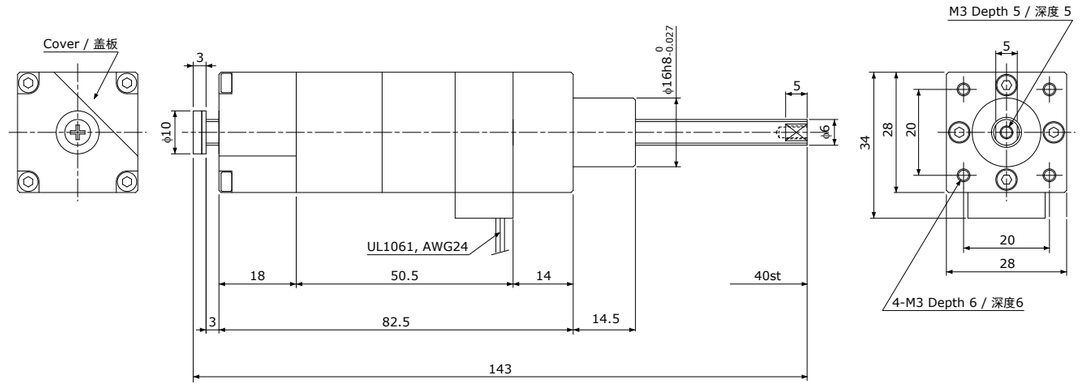
Standard style of Captive type
标准形状 Captive型

Dimensions & Specifications
规格参数

止转功能内置型号 / Anti-rotating device built-in model

DDAAR □28 / NEMA 11

Shaft dia.(轴径)f6



Motor lead wire / 电机线	
A	Black(黑)
$\overline{A}$	Green(绿)
B	Red(红)
$\overline{B}$	Blue(蓝)

UL1061, AWG24(310mm)

Recommended Drivers 推荐驱动器	SD4030B3

Note）Refer to page P164 for connection diagram of recommended Drivers.
注）有关与推荐驱动器的接线,请参照P164页。

Specifications 主要技术参数		
	DDAAR28-G01 040	DDAAR28-G02 040
Drive Screw type 驱动丝杠	Precision Ball Screw 精密滚珠丝杠	
Screw lead 丝杠导程	1mm	2mm
Travel 行程	40mm	
Repeatability 重复定位精度	±0.005mm	
Lost Motion 空转	0.010mm	
Permissible Speed 许用速度	20mm/sec	40mm/sec
Acceleration & deceleration time 加减速时间	Min. 0.2sec 0.2 sec以上	
Thrust Force 推力	50N	25N
Mass 质量	270g	

Motor Specifications 电机参数	
Basic step angle 基本步进角	1.8˚
Driving method 励磁方式	2-phase Bi-polar 2相双极方式
Rated Voltage 额定电压	DC 3.8 V
Rated current 额定电流	0.67 A/phase 0.67 A/相
Winding resistance 绕组电阻	5.6Ω
Winding inductance 绕组电感	5.3mH
Insulation Class 绝缘等级	Class B（130˚C） B级（130˚C）
Operating Temperature 使用环境温度	0～40˚C（No Condensation） 0～40˚C（无结露）

Precautions
- Radial load can not be applied on Captive type. For more detail, please see page S105.
- Specifications above are reference value measured in vertical position at virgin condition.
- Sensor is not built in this standard design. Please ask KSS if necessary.

注意事项
- Captive型不能承受径向负载。请参照技术解说S105页。
- 上述规格为垂直状态且运行初期的参考值。
- 标准规格没有装配传感器。如有需要,请垂询本公司。

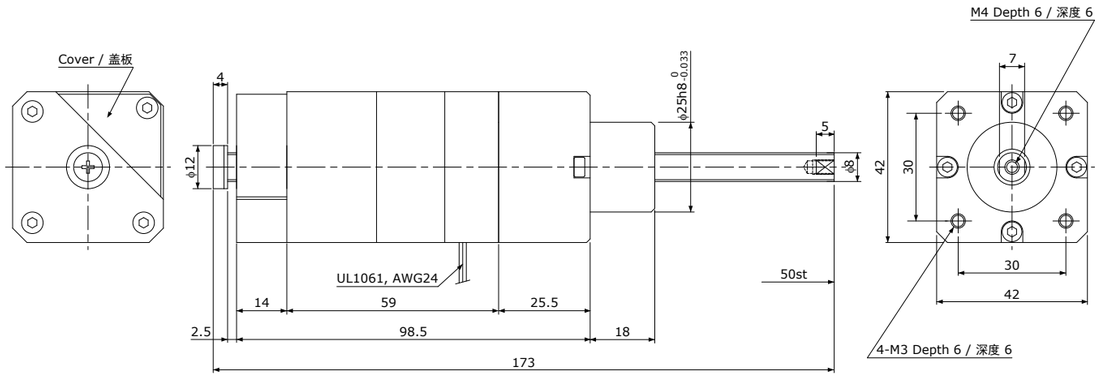
Standard style of Captive type
标准形状　Captive型

Dimensions & Specifications
规格参数

止转功能内置型号 / Anti-rotating device built-in model

DDAAR □42 / NEMA 17

Shaft dia.(轴径)f8



Motor lead wire / 电机线	
A	Black(黑)
$\overline{A}$	Green(绿)
B	Red(红)
$\overline{B}$	Blue(蓝)

UL1061, AWG24(310mm)

Recommended Drivers 推荐驱动器	SD4030B3

Note) Refer to page P164 for connection diagram of recommended Drivers.
注) 有关与推荐驱动器的接线,请参照P164页。

Specifications 主要技术参数		
	DDAAR42-G02 050	DDAAR42-G05 050
Drive Screw type 驱动丝杠	Precision Ball Screw 精密滚珠丝杠	
Screw lead 丝杠导程	2mm	5mm
Travel 行程	50mm	
Repeatability 重复定位精度	±0.005mm	
Lost Motion 空转	0.010mm	
Permissible Speed 许用速度	40mm/sec	100mm/sec
Acceleration & deceleration time 加减速时间	Min. 0.2sec 0.2 sec以上	
Thrust Force 推力	80N	30N
Mass 质量	660g	

Motor Specifications 电机参数	
Basic step angle 基本步进角	1.8°
Driving method 励磁方式	2-phase Bi-polar 2相双极方式
Rated Voltage 额定电压	DC 2.5 V
Rated current 额定电流	1.2 A/phase 1.2A/相
Winding resistance 绕组电阻	2.1Ω
Winding inductance 绕组电感	4.0mH
Insulation Class 绝缘等级	Class B (130℃) B级 (130℃)
Operating Temperature 使用环境温度	0～40℃ (No Condensation) 0～40℃ (无结露)

Precautions
- Radial load can not be applied on Captive type. For more detail, please see page S105.
- Specifications above are reference value measured in vertical position at virgin condition.
- Sensor is not built in this standard design. Please ask KSS if necessary.

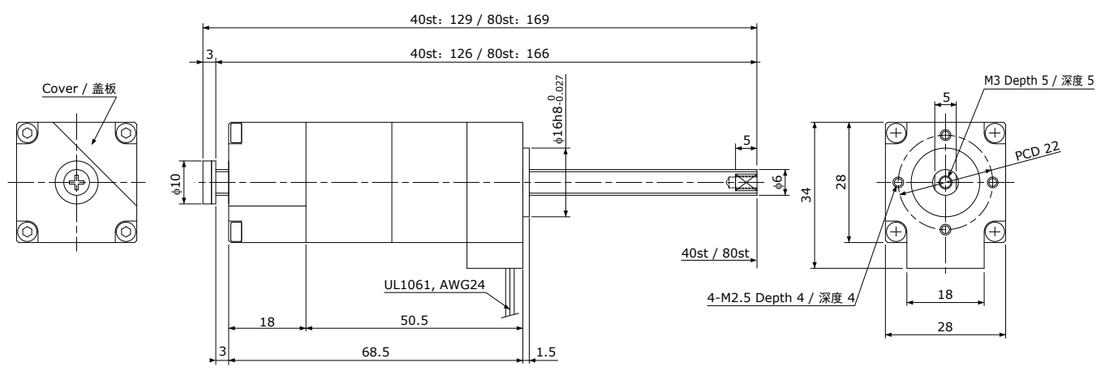
注意事项
- Captive型不能承受径向负载。请参照技术解说S105页。
- 上述规格为垂直状态且运行初期的参考值。
- 标准规格没有装配传感器。如有需要,请垂询本公司。

Standard style of Non-Captive type
标准形状　Non-Captive型

Dimensions & Specifications
规格参数

DDACL □28 / NEMA 11

Shaft dia.(轴径)f6



Motor lead wire / 电机线	
A	Black(黑)
$\overline{A}$	Green(绿)
B	Red(红)
$\overline{B}$	Blue(蓝)

UL1061, AWG24(310mm)

Recommended Drivers 推荐驱动器	SD4030B3

Note) Refer to page P164 for connection diagram of recommended Drivers.
注) 有关与推荐驱动器的接线,请参照P164页。

Specifications 主要技术参数				
	DDACL28-G01 040/080	DDACL28-G02 040/080	DDACL28-R01 040/080	DDACL28-R02 040/080
Drive Screw type 驱动丝杠	Precision Ball Screw 精密滚珠丝杠		Rolled Ball Screw 冷轧滚珠丝杠	
Screw lead 丝杠导程	1mm	2mm	1mm	2mm
Travel 行程	40mm / 80mm		40mm / 80mm	
Repeatability 重复定位精度	±0.005mm		±0.010mm	
Lost Motion 空转	0.010mm		0.020mm	
Permissible Speed 许用速度	20mm/sec	40mm/sec	20mm/sec	40mm/sec
Acceleration & deceleration time 加减速时间	Min. 0.2sec 0.2 sec以上		Min. 0.2sec 0.2 sec以上	
Thrust Force 推力	50N	25N	50N	25N
Mass 质量	Travel 40mm / 行程40mm:230g Travel 40mm / 行程80mm:240g		Travel 40mm / 行程40mm:230g Travel 40mm / 行程80mm:240g	

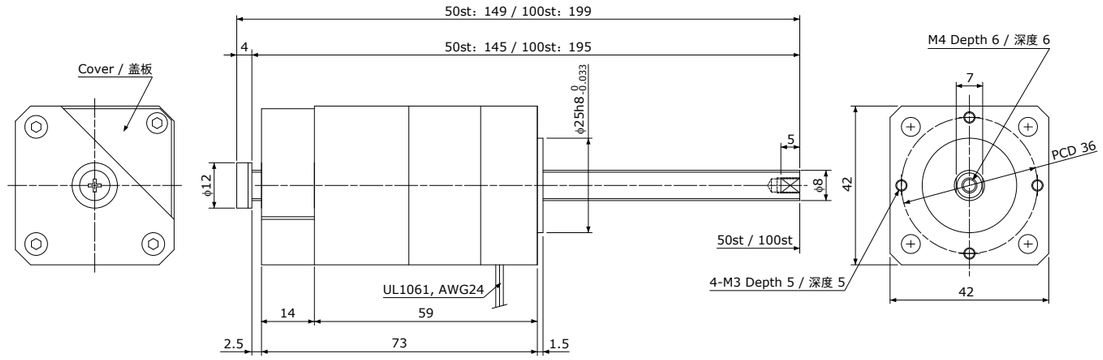
Motor Specifications 电机参数	
Basic step angle 基本步进角	1.8°
Driving method 励磁方式	2-phase Bi-polar 2相双极方式
Rated Voltage 额定电压	DC 3.8 V
Rated current 额定电流	0.67 A/phase 0.67 A/相
Winding resistance 绕组电阻	5.6Ω
Winding inductance 绕组电感	5.3mH
Insulation Class 绝缘等级	Class B (130℃) B级 (130℃)
Operating Temp. 使用环境温度	0～40℃ (No Condensation) 0～40℃ (无结露)

Precautions
- Non-Captive type does not have an anti-rotating device. External anti-rotating devices should be set up when usage. Radial load can not be applied on Captive type. For more detail, please see page S105.
- Specifications above are reference value measured in vertical position at virgin condition.
- Sensor is not built in this standard design. Please ask KSS if necessary.

注意事项
- Non-Captive型无止转结构。客户使用时需在外部构建止转结构。Captive型不能承受径向负载。请参照技术解说S105页。
- 上述规格为垂直状态且运行初期的参考值。
- 标准规格没有装配传感器。如有需要,请垂询本公司。

DDACL □42 / NEMA 17

Shaft dia.(轴径)f8



Motor lead wire / 电机线	
A	Black(黑)
$\overline{A}$	Green(绿)
B	Red(红)
$\overline{B}$	Blue(蓝)

UL1061, AWG24(310mm)

Recommended Drivers 推荐驱动器	SD4030B3

Note) Refer to page P164 for connection diagram of recommended Drivers.
注) 有关与推荐驱动器的接线,请参照P164页。

Specifications 主要技术参数				
	DDACL42-G02 050/100	DDACL42-G05 050/100	DDACL42-R02 050/100	DDACL42-R05 050/100
Drive Screw type 驱动丝杠	Precision Ball Screw 精密滚珠丝杠		Rolled Ball Screw 冷轧滚珠丝杠	
Screw lead 丝杠导程	2mm	5mm	2mm	5mm
Travel 行程	50mm / 100mm		50mm / 100mm	
Repeatability 重复 定位精度	±0.005mm		±0.010mm	
Lost Motion 空转	0.010mm		0.020mm	
Permissible Speed 许用速度	40mm/sec	100mm/sec	40mm/sec	100mm/sec
Acceleration & deceleration time 加减速时间	Min. 0.2sec 0.2 sec以上		Min. 0.2sec 0.2 sec以上	
Thrust Force 推力	80N	30N	80N	30N
Mass 质量	Travel 50mm / 行程50mm:530g Travel 100mm / 行程100mm:550g		Travel 50mm / 行程50mm:530g Travel 100mm / 行程100mm:550g	

Motor Specifications 电机参数	
Basic step angle 基本步进角	1.8°
Driving method 励磁方式	2-phase Bi-polar 2相双极方式
Rated Voltage 额定电压	DC 2.5 V
Rated current 额定电流	1.2 A/phase 1.2 A/相
Winding resistance 绕组电阻	2.1Ω
Winding inductance 绕组电感	4.0mH
Insulation Class 绝缘等级	Class B (130°C) B级 (130°C)
Operating Temp. 使用环境温度	0~40°C (No Condensation) 0~40°C (无结露)

Precautions
- Non-Captive type does not have an anti-rotating device. External anti-rotating devices should be set up when usage. Radial load can not be applied on Captive type. For more detail, please see page S105.
- Specifications above are reference value measured in vertical position at virgin condition.
- Sensor is not built in this standard design. Please ask KSS if necessary.

注意事项
- Non-Captive型无止转结构。客户使用时需在外部构建止转结构。Captive型不能承受径向负载。请参照技术解说S105页。
- 上述规格为垂直状态且运行初期的参考值。
- 标准规格没有装配传感器。如有需要,请垂询本公司。

●推荐驱动器 / Recommended Driver

为使客户更方便地使用执行器,本公司准备了推荐驱动器可供选配。
KSS provides recommended Stepping Motor Driver as an option for Linear Actuator in order to make it easy to use.

KR-A5CC

DC24V 5相步进电机用驱动器。可以进行整步、半步切换。兼具自动电流下降功能。
This Driver is for 5-phase Stepping Motor operated by DC24V power supply. It has automatic current reduction circuits. You can choose full-step or half step function.

KR-A55MC

DC24V 5相步进电机用驱动器。可设定16种步进角,最大分割数为250的微型步进驱动器。
Micro-Step Driver for 5-phase Stepping Motor with DC24V power supply. 16 step angle types can be set up to 250 divisions.

KR-A535M

可使用AC100～220V电源的5相步进电机用微型步进驱动器。
可设定16种步进角,最大分割数为250分割。
Micro-Step Driver for 5-phase Stepping Motor, which can be used with AC100～220V power supply. 16 step angle types can be set up to 250 divisions.

SD4015B3

用于DMB系列、电机型号08E2004的推荐驱动器。具备自动电流下降功能,可设定8种步进角。
This is recommended for Motor model 08E2004 of DMB series. It has automatic current down function and Micro-step function with 8-step angle.

SD4030B3

用于2相步进电机线性执行器的推荐驱动器(电机型号08E2004以外)。
具备自动电流下降功能,可设定8种步进角。
This is recommended for 2 phase stepping Motor Linear Actuator.
(Motor model:Other than 08E2004)
It has automatic current down function and Micro-step function with 8-step angle.

●连接线/ Extension Cable

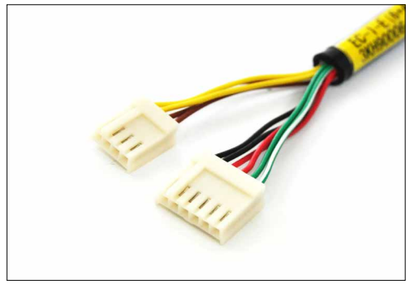
线性执行器Captive型、Non-Captive型和推荐驱动器的专用电缆。
请按照下面的例子指定电缆长度、连接器形状。单侧为散线，敬请注意。

Extension Cable between Linear Actuator Captive type or Non-Captive type, and KSS recommended Stepping Motor Driver.
Please designate Cable length and Connector type in accordance with the example below.
Please note that one side of Extension Cable is cut end only (no connector).

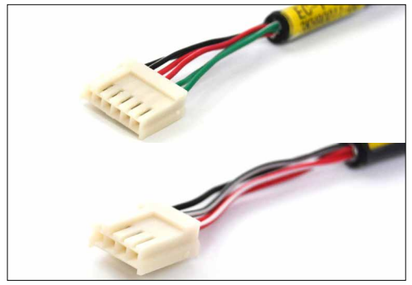
EC R − 2 − E(6)
① ② ③ ④

①连接线符号
②电缆种类
R　　:耐弯曲电缆
③电缆长度(m)
④连接器形状
N　　：散线
E(6)　　：EI 连接器 6芯
E(4)　　：EI 连接器 4芯
E(6+4)　　：EI 连接器 6+4芯

①Extension Cable
②Cable type
R　　:Robot cable type
③Cable length (m)
④Connector type at both end
N　　：No connector (Cut only)
E(6)　　：EI connector 6-pins
E(4)　　：EI connector 4-pins
E(6+4)　　：EI connector 6+4-pins



E(6+4)：EI connector 6+4-pins / EI连接器(6+4芯)
(TE Connectivity)



E(6)：EI connector 6-pins / EI连接器6芯
E(4)：EI connector 4-pins / EI连接器4芯
(TE Connectivity)

●驱动器接线图 / Linear Actuator Connection diagram

KSS线性执行器和推荐驱动器的接线图如下所示。请先确认使用的线性执行器和驱动器的组合，然后按图进行配线。

Describe the connection diagram between the KSS Linear Actuator and the recommended driver.
Please check the combination of the Linear Actuator and the driver, then wire according to diagrams as shown below.

Type 类型	Series 系列	Recommended Driver 推荐驱动器	Output current 输出电流	Connection diagram 接线图
External	DMB (Motor Model:08E2004) (电机型号:08E2004)	SD4015B3	0.25～1.5A/phase	Fig. P-3 图 P-3
	DMB (Motor Model:Other than 08E2004) (电机型号:08E2004 以外)	SD4030B3	0.5～3A/phase	Fig. P-4 图 P-4
	2TMB	SD4030B3	0.5～3A/phase	Fig.P-5 图 P-5
	MB / TMB	KR-A5CC	0.1～0.9A/phase	Fig. P-6 图 P-6
		KR-A55MC	0.4～1.4A/phase	Fig. P-7 图 P-7
		KR-A535M	0.4～1.4A/phase	Fig. P-8 图 P-8
Captive Non-Captive	DDAAR / DDACL	SD4030B3	0.5～3A/phase	Fig. P-9 图 P-9

External type

■适用产品 / Applicable Product series

DMB系列 / DMB series（电机型号:08E2004 / Motor model:08E2004）

■推荐驱动器 / Recommended Driver

SD4015B3：2相微步驱动器 / 2-phase Microstep Driver

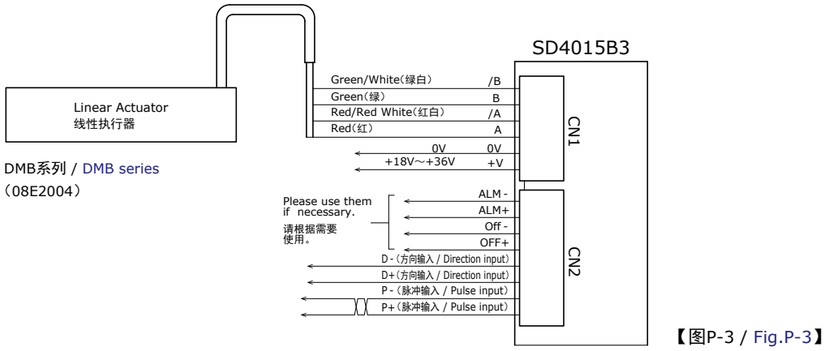
**输出电流 / Output current:0.25～1.5A/Phase

※注意事项

・SD4015B3的出厂设定为1A。
・使用前请务必确认电机额定电流,再设定驱动器电流。
・电流的设定方法请从KSS网站上下载。

※Caution

・The factory setting of SD4015B3 is 1A.
・Please be sure to perform a current set up of Driver based on Motor Rated current before use.
・For the details about current setup, please download the manual from KSS web site.



【图P-3 / Fig.P-3】

■适用产品 / Applicable Product series

DMB系列 / DMB series（电机型号:08E2004以外 / Motor model:Other than 08E2004）

■推荐驱动器 / Recommended Driver

SD4030B3：2相微步驱动器 / 2-phase Microstep Driver

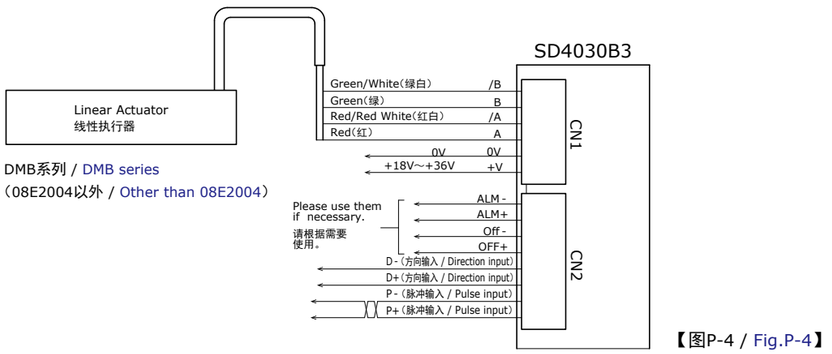
**输出电流 / Output current:0.5～3A/Phase

※注意事项

・SD4030B3的出厂设定为2A。
・使用前请务必确认电机额定电流,再设定驱动器电流。
・电流的设定方法请从KSS网站上下载。

※Caution

・The factory setting of SD4030B3 is 2A.
・Please be sure to perform a current set up of Driver based on Motor Rated current before use.
・For the details about current setup, please download the manual from KSS web site.



【图P-4 / Fig.P-4】

■适用产品 / Applicable Product series

2TMB系列 / 2TMB series

■推荐驱动器 / Recommended Driver

SD4030B3：2相微步驱动器 / 2-phase Microstep Driver

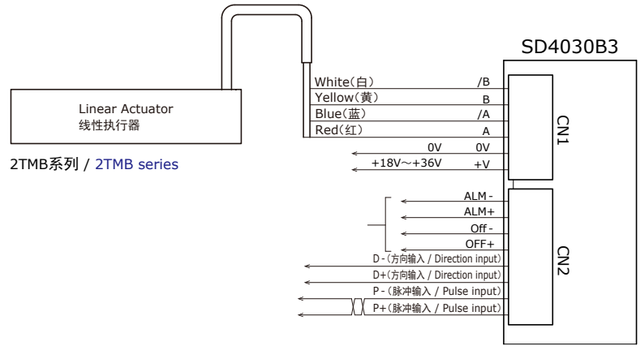
**输出电流 / Output current:0.5～3A/Phase

※注意事项

・SD4030B3的出厂设定为2A。
・使用前请务必确认电机额定电流,再设定驱动器电流。
・电流的设定方法请从KSS网站上下载。

※Caution

・The factory setting of SD4030B3 is 2A.
・Please be sure to perform a current set up of Driver based on Motor Rated current before use.
・For the details about current setup, please download the manual from KSS web site.



【图P-5 / Fig.P-5】

■适用产品 / Applicable Product series

MB系列 / MB series

TMB系列 / TMB series

■推荐驱动器 / Recommended Driver

KR-A5CC：5相步进电机驱动器 / 5-phase Stepping Motor Driver

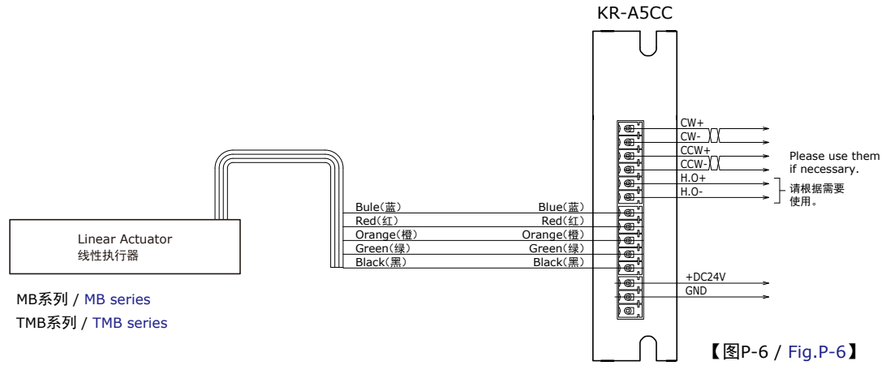
**输出电流 / Output current:0.1～0.9A/Phase

※注意事项

・KR-A5CC的出厂设定为0.35A。
・使用前请务必确认电机额定电流,再设定驱动器电流。

※Caution

・The factory setting of KR-A5CC is 0.35A.
・Please be sure to perform a current set up of Driver based on Motor Rated current before use.



【图P-6 / Fig.P-6】

■适用产品 / Applicable Product series

MB系列 / MB series

TMB系列 / TMB series

■推荐驱动器 / Recommended Driver

KR-A55MC：5相微步驱动器 / 5-phase Microstep Driver

**输出电流 / Output current:0.4～1.4A/Phase

※注意事项

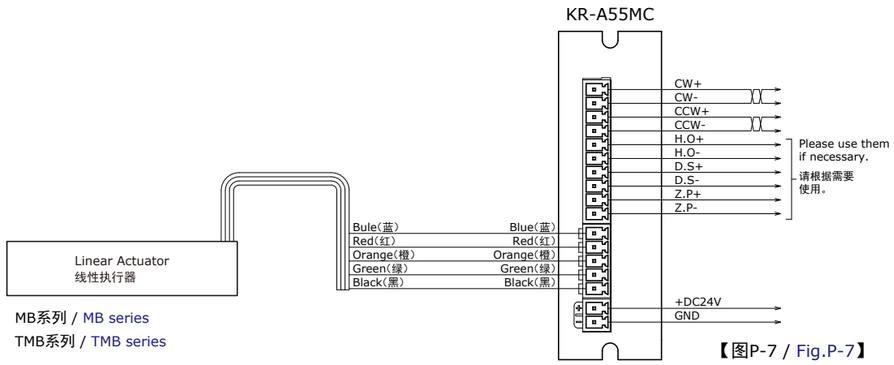
・KR-A55MC的出厂设定为0.75A。

・使用前请务必确认电机额定电流,再设定驱动器电流。

※Caution

・The factory setting of KR-A55MC is 0.75A

・Please be sure to perform a current set up of Driver based on Motor Rated current before use.



MB系列 / MB series

TMB系列 / TMB series

【图P-7 / Fig.P-7】

■适用产品 / Applicable Product series

MB系列 / MB series

TMB系列 / TMB series

■推荐驱动器 / Recommended Driver

KR-A535M：5相微步驱动器 / 5-phase Microstep Driver

**输出电流 / Output current:0.4～1.4A/Phase

※注意事项

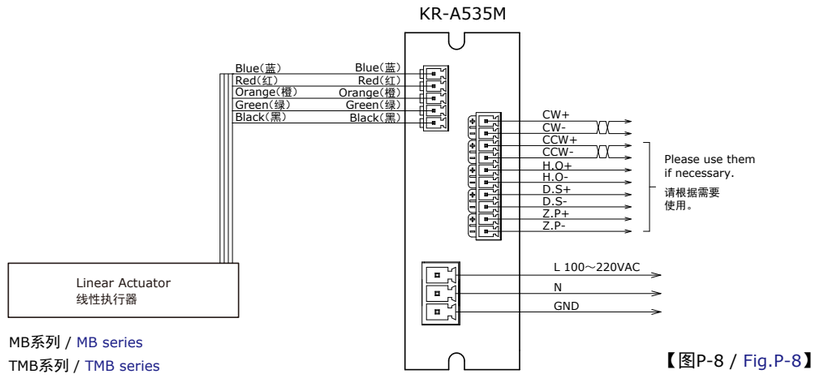
・KR-A535M的出厂设定为0.75A。

・使用前请务必确认电机额定电流,再设定驱动器电流。

※Caution

・The factory setting of KR-A535M is 0.75A

・Please be sure to perform a current set up of Driver based on Motor Rated current before use.



MB系列 / MB series

TMB系列 / TMB series

【图P-8 / Fig.P-8】

Captive, Non-Captive type

■适用产品 / Applicable Product series

Captive型、Non-Captive型 / Captive type, Non-Captive type

■推荐驱动器 / Recommended Driver

SD4030B3：2相微步驱动器 / 2-phase Microstep Driver

**输出电流 / Output current:0.5～3A/Phase

※注意事项

・SD4030B3的出厂设定为2A。

・使用前请务必确认电机额定电流,再设定驱动器电流。

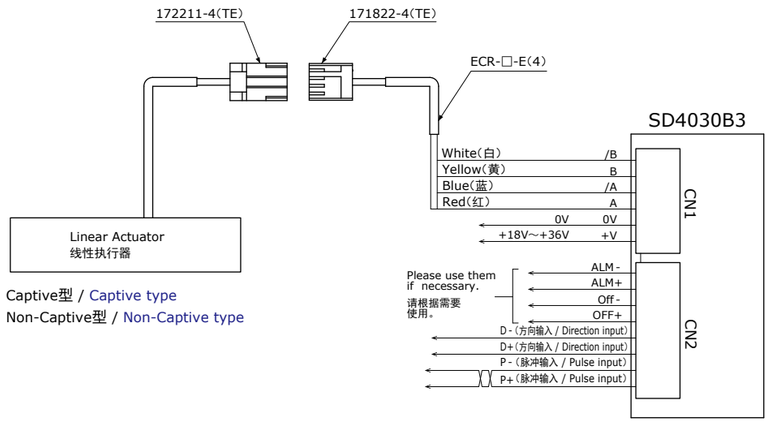
・电流的设定方法请从KSS网站上下载。

※Caution

・The factory setting of SD4030B3 is 2A.

・Please be sure to perform a current set up of Driver based on Motor Rated current before use.

・For the details about current setup, please download the manual from KSS web site.

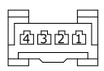


Captive型 / Captive type

Non-Captive型 / Non-Captive type

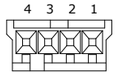
【图P-9 / Fig.P-9】

电机电缆 172211-4（插头)/Motor cable 172211-4（male）



1	Stepping Motor B(Blue/ 蓝)
2	Stepping Motor B(Red/ 红)
3	Stepping Motor /A（Green/ 绿）
4	Stepping Motor A（Black/ 黑）

电机连接线 171822-4（插口)/Motor Extension cable 171822-4（female）

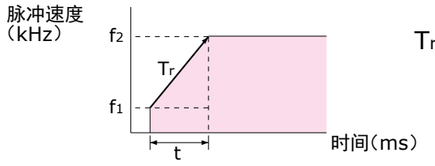


1	Stepping Motor B(Blue/ 蓝)
2	Stepping Motor B(White/ 白)
3	Stepping Motor /A（Yellow/ 黄）
4	Stepping Motor A（Brown/ 褐）

●操作、使用注意事项

★使用注意事项

1. 使用时请仔细阅读使用说明书，充分理解说明书内容，并务必严格遵守安全注意事项
（使用说明书请从KSS网站上下载）。
2. 敲击本产品、使产品下落或对其施加超过规定值的轴向负载、径向负载，可能会导致产品损坏，
请谨慎操作。
3. 开封后请检查产品是否有异常，是否与所订购的产品一致。
4. 若分解各部位，可能会导致异物进入及各部位组装精度降低，因此请勿分解本产品。
5. 若异物进入，将会导致滚珠循环部件损坏、缩短产品寿命或导致功能失效等，
因此请切实防止垃圾、切屑等异物进入。
6. 电机的结构不防水、不防锈。不能在直接接触水、油的场所以及有油雾的环境下使用。
7. 使用滚珠丝杠时，请务必涂抹润滑剂。
在常规用途下使用时，请每2～3个月检查一次油脂，并根据需要补充油脂。
使用过程中油脂变脏时，请擦去旧的油脂后涂抹新的规定油脂。
8. 请勿在超过本公司规定的负载 / 推力、许用转速 / 最高速度规格值的状态下使用。
9. 设计时，请避免径向负载及力矩负载直接作用于滚珠丝杠上。
否则将显著缩短滚珠丝杠的寿命。此外，发生安装偏心时，将会产生偏负载作用，
导致精度降低及寿命缩短。
10. 滚珠丝杠螺母发生超程时，可能会导致钢珠脱落、循环部件受损或钢珠槽产生压痕等，从而引起动作不良。
螺母发生超程时，本公司将提供有偿维修。
11. 加减速速率请参照各系列的推荐值。请勿以产品目录记载数值以下的加减速速率使用。



$$Tr = \frac{t}{f_2 - f_1}$$

Tr：加减速速率（ms/kHz）
t：加减速时间（ms）
f1,f2：脉冲速度（kHz）

12. 请勿拉扯电机导线。另外，电机导线用于固定。请勿将其用于活动用途。
13. 请勿靠近磁性存储媒体。
14. 根据负载条件及使用驱动器的不同，电机扭矩速度特性会有异于规格值。
15. 在规格范围内，步进电机拥有共振点。请避开共振点使用。

★安全注意事项

1. 如果出现异味、噪音、烟雾、过热或振动，请立即停止操作并关闭电源。
2. 禁止使用超过额定电流的电源。
3. 驱动电机前请确认电源的极性。
4. 电机可能因负载条件及使用的驱动器而异常发热。
使用时，请将电机表面温度控制在80℃以下。
5. 请确认接线方式、驱动方式以及相序。错误接线将会导致电机异常动作。
6. 请务必进行接地。
7. 请勿强行弯曲、拉扯、夹住电机导线。
8. 动作中请勿触摸活动部位。
9. 进行电机耐压试验及绝缘电阻测试时，请断开与控制机的连接。
10. 维护、检查前，请切断驱动器的输入电源。

★使用环境

1. 请勿在环境温度超过0～40℃、环境湿度超过20～80%RH、有结露、腐蚀性气体、易燃气体的场所使用。
2. 请勿在产生强电场、强磁场的场所使用。
3. 禁止在金属屑、粉尘、油雾、切削液、水分、盐、有机溶剂出现或飞散的场所使用。
4. 请勿在经常发生振动的场所以及冲击、真空等特殊环境下使用。

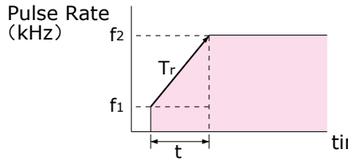
★External type 使用注意事项

※External type是电机轴与丝杠轴一体型结构，因此无论是丝杠轴还是电机轴任意一方损坏，
都不能维修。敬请谅解。

●Precaution of handling and operating

★Precaution for operating

1. Before use, please read instruction manuals and follow the precautions below.
The instruction manuals are availabe on KSS web site.
2. Do not hit or drop the Shaft, do not apply Axial load exceeding specifications or Radial load,
it may cause malfunction.
3. Before use, please check that the product has no defect, and product is the same as your order.
4. Do not disassemble each component, dust may get inside the product. It may deteriorate accuracy.
5. Please prevent contamination from dust or swarf. Dust or swarf may cause damage to Ball Screw,
which lead to deteriorating the function.
6. Motor is not designed to resist water oil. Item cannot be used in direct exposure of water or oil,
or environment such as oil bath.
7. Lubrication is required under the Ball Screw operation. Lubricant condition should be checked
every 2 to 3 months. If Grease is contaminated, remove old Grease and replace with new one.
8. Do not use the Actuator exceeding our specifications in Load or Speed.
9. Care must be taken not to apply Radial load or Moment load directly on Ball Screw.
This will lead to shorten the Ball Screw life remarkably. In addition, misalignment between Ball Screw
and other components will lead to deterioration of function, such as accuracy, life and so on.
10. Allowing Ball Screw Nut to over-run may result in malfunctioning due to Balls escaping,
damage to recirculation parts, and indentation on the raceways. Continued use in this state will lead to rapid wear
and damage to recirculation parts.Therefore Ball Screw Nut must never be allowed to over-run.
If over-running occurs, contact KSS for an inspection with charge.
11. Acceleration & Deceleration rate should be followed by recommended number described in each series.Do not use
Linear Actuator under our recommended Acceleration & Deceleration Rate.



$$Tr = \frac{t}{f_2 - f_1}$$

Tr：Acceleration & Deceleration Rate（ms/kHz）
t：Acceleration & Deceleration time（ms）
f1,f2：Pulse Rate（kHz）

12. Do not hold the Motor lead wire. Motor lead wire is for fixation, do not use the Motor lead wire as movabilities.
13. Keep away from Magnetic memory device.
14. The Motor torque and speed characteristics may vary from the specifications,
depending on the load conditions or Driver used.
15. The Motor has a resonant point within the specifications. Please avoid the resonant point when in use.

★Precaution for safety

1. If abnormal odor, noise, smoke, overheating, or vibration occurs, stop operation immediately
and turn the power off.
2. Do not use the Actuator exceeding rated current.
3. Check and confirm the polarity of the power supply in prior to activate the Motor.
4. The Motor may overheat depending on the load condition or Driver used.
Make sure that the Motor surface temperature does not exceed 80℃ when in use.
5. Check the wire connection type, Drive system, and phase sequence.
Inappropriate connection leads to malfunction.
6. A ground connection must be used.
7. Do not bend, pull or pinch the Motor lead wire.
8. Do not touch moving parts during operation.
9. Disconnect from the Controller before performing dielectric withstanding voltage test of the Motor or
megger test.
10. Please switch off the Driver, when inspection or maintenance.

★Operating environment

1. Operating environment should be 0~40℃ in temperature and 20~80%RH in humidity.
Do not use the Actuator under dew condensation, corrosive gas or inflammable gas environment.
2. Do not use the Actuator under strong electric field, strong magnetic field.
3. Please prevent from swarf, oil mist, cutting fluid, water/moisture, salt spray,
organic solvent and other contamination.
4. The Actuator cannot be used under the vibration, impact, vacuum, and other special environment.

★Precaution for External type

※Since External type is the product which integrated the Motor Shaft and the Screw Shaft,
repair is not possible, if either Motor or Ball Screw is damaged.

单轴执行器　Single axis Actuator

灵活可选执行器系列
Flex Actuator Series

精度(驱动丝杠)、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(Drive 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制造商的特点,设计出了终极紧凑型执行器。

· 根据执行器所使用的驱动丝杠的种类可在广范围内选择定位相关的精度。

· 每种驱动丝杠备有多种导程和行程,进给速度选择范围广。

· 以无电机型为标准,准备了几种电机作为选择方案。可根据使用条件安装相应规格的电机。

· 可与最适合所选电机的标准驱动器配套采购。

· 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 Drive 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

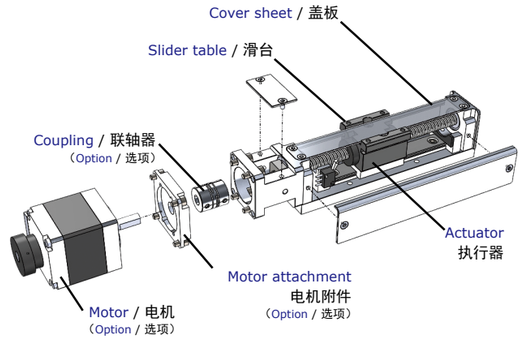
无电机型的标准品
Motor-less is standard

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微型驱动丝杠和导轨的台面型执行器。
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 Drive 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

根据所使用的驱动丝杠,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驱动丝杠的种类。详情请参照规格一览表(表Q-3 第Q106页)。

1)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。
2)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。
3)也可根据需要制作价廉物美的树脂导程丝杠(含油型),请垂询本公司。

●Variation & Features

There are several kinds of KSS Flex Actuators shown below. Each Actuator has a different kinds of Drive Screw inside. Please choose appropriate type Drive Screw depending on your required accuracy. For further information, please refer to Table Q-3 in page Q106.

1)Rolled Ball Screw type
Reasonable price and accuracy have been achieved by using Rolled Ball Screw.
2)Precision Ball Screw type
High accuracy in both Repeatability and Lost motion by using Precision Ball Screw.
3)Resin Lead Screw type is available for less-expensive application based on your request. Please ask KSS representative.

表 Q-1：驱动丝杠的定位精度
Table Q-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)
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Q106页。

There are several choices of Motor as option shown below. Specifications for each combination of Actuator and Motor are shown in page Q106.

Motor type 电机种类	Manufacturer 电机制造商	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
5-phase / 5相 □28	Oriental Motor 东方马达	PK523HPB Double shaft / 双轴	0.75A / Phase 0.75A / 相

●公称型号 / Model number notation

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

①系列符号
FA：KSS灵活可选执行器系列
②构造符号
S：滑块型
③驱动丝杠种类
R：冷轧滚珠丝杠
G：精密滚珠丝杠
④导程 / 节距（mm）：020表示2mm
⑤行程（mm）：080表示80mm
⑥电机类型
无符号：无电机（标准品）
M: 美蓓亚电机制造 2相步进电机
（□25＆0.7A / 相）
E：东方马达制造 5相步进电机
（□28＆0.75A / 相）
S：其他
⑦连接器种类
N：散线
H：广濑RP17
E：EI连接器（TE Connectivity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选项符号
无符号：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

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

●组合与规格

KSS灵活可选执行器能够组合选择驱动丝杠的种类（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2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。
驱动丝杠的种类与电机选择（选项）请参照以下组合一览表（表Q-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Q-2以外组合的执行器时，请垂询本公司。

●Combination & Specifications

KSS Flex Actuator has a lot of combinations with Drive Screws（positioning accuracy）, Screw Lead, and travel length. Motor-less type is our standard, but 2 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 Drive Screw and Motor are shown in Table Q-2.
The detail specifications and dimensions are described in each dimension table.
If other combination in Table Q-2 is required, please ask KSS representative.

标准规格的组合 / Standard Combination

Choice of Drive Screw
驱动丝杠的选择
×
Choice of Travel
选择行程
×
Choice of Screw Lead
选择丝杠导程

定位相关精度因驱动丝杠的种类而有所不同。
每个驱动丝杠都规定了导程、行程的标准组合。

Positioning accuracy will vary depending on the kind of Drive Screw. Lead and travel length are standardized for each Drive Screw.

参照表Q-3
Refer to Table Q-3
×

电机选项 / Motor Option

Option Motor ① / 可选电机 ①
2-phase Stepping Motor（ □25＆0.7A / phase）
2相步进电机（□25＆0.7A / 相）

Option Motor ② / 可选电机 ②
5-phase Stepping Motor（ □28＆0.75A / phase）
5相步进电机（□28＆0.75A / 相）

许用转速或者可搬负载因所选的电机而有所不同。

Permissible speed and Load Capacity are determined by Motor choice.

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

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

Motor / 电机			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 Q107～Q108 参照第Q107～Q108页	See page Q109～Q110 参照第Q109～Q110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 Q111～Q112 参照第Q111～Q112页	See page Q113～Q114 参照第Q113～Q114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 Q115～Q116 参照第Q115～Q116页	See page Q117～Q118 参照第Q117～Q118页

●选定的标准

KSS灵活可选执行器的驱动丝杠的种类、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。

●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.

Drive Screw selection guide 选定驱动丝杠的标准	Positioning related accuracy 定位相关精度	Price 价格
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 分辨率	Load Capacity 可搬负载
1mm	Slow 慢	High 高	High 高
2mm			
6mm			
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
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.

表Q-3：规格一览表
Table Q-3 : Specifications for each combination

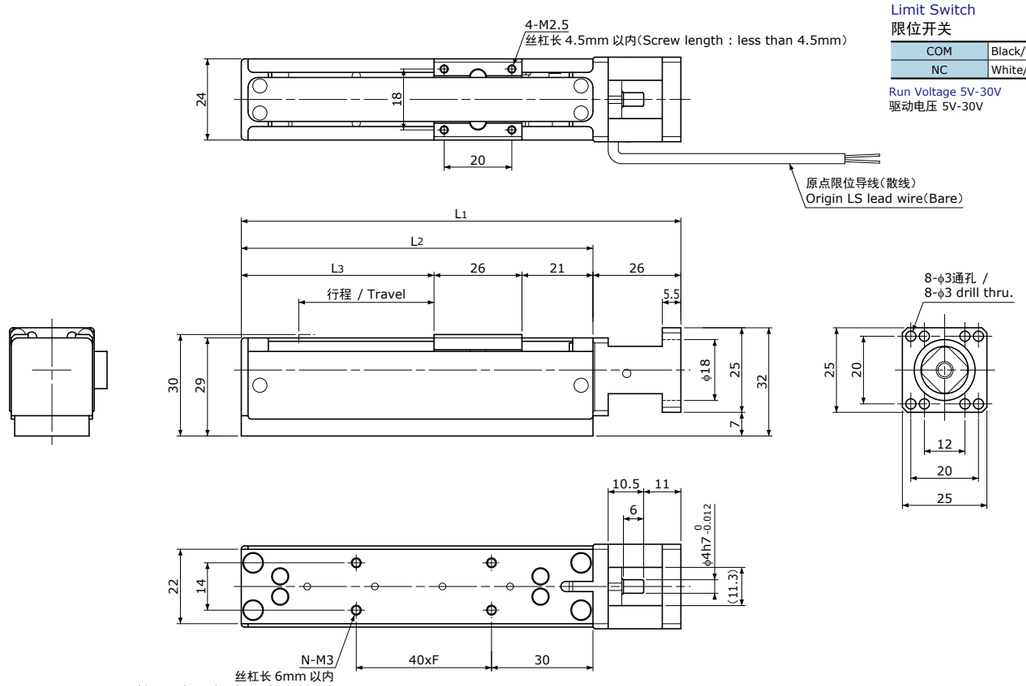
Drive Screw type / 驱动丝杠种类		Rolled Ball Screw 冷轧滚珠丝杠				Precision Ball Screw 精密滚珠丝杠			
Repeatability / 重复定位精度(mm)		±0.01 max.				±0.005 max.			
Lost motion / 空转(mm)		0.01 max.				0.005 max.			
Permissible Moment / 允许负载偏心力矩(Nm) Mp(Pitching / 俯仰)		0.10 ** In case of no load in My & Mr direction **My、Mr方向没有负载时							
Permissible Moment / 允许负载偏心力矩(Nm) My(Yawing / 偏转)		0.09 ** In case of no load in Mp & Mr direction **Mp、Mr方向没有负载时							
Permissible Moment / 允许负载偏心力矩(Nm) Mr(Rolling / 侧滚)		0.23 ** In case of no load in Mp & My direction **Mp、My方向没有负载时							
Spec. for each Motor / 按电机规格一览表		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) H:Horizontal / 水平 V:Vertical / 垂直	1	2	6	10	1	2	6	10
Standard 标准	Max. Load Capacity(N) 最大可搬负载(N) H	29.4	29.4	19.6	19.6	29.4	29.4	19.6	19.6
	V	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) 许用转速(mm / sec)	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	29.4	29.4	19.6	19.6	29.4	29.4	19.6	19.6
	V	19.6	19.6	2.94	2.94	19.6	19.6	2.94	2.94
	Permissible speed(mm / sec) 许用转速(mm / sec)	3～20	6～40	18～120	30～200	3～20	6～40	18～120	30～200
Motor：E 5-phase / 5相 □28 0.75A / phase	Max. Load Capacity(N) 最大可搬负载(N) H	29.4	29.4	19.6	19.6	29.4	29.4	19.6	19.6
	V	19.6	19.6	4.9	4.9	19.6	19.6	4.9	4.9
	Permissible speed(mm / sec) 许用转速(mm / sec)	0～25	0～50	0～150	0～250	0～25	0～50	0～150	0～250
**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；许用转速、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.

Flex Actuator　灵活可选执行器

Motor-less type（Standard）
Rolled Ball Screw type Actuator

无电机型（标准品）
冷轧滚珠丝杠型执行器



Limit Switch
限位开关

COM	Black/黑
NC	White/白

Run Voltage 5V-30V
驱动电压 5V-30V

Model Number 执行器型号	Travel 行程 （mm）	Screw Lead 丝杠导程 （mm）	Motor Required Torque 电机所需扭矩 （Nm）	Length 长度尺寸 （mm） L1	L2	L3	F	N		Max. Load Capacity 最大可搬负载 （N） Hor. 水平	Vert. 垂直	Permissible speed 许用转速 （mm / sec）	Mass 质量 （g）
FAS-R010-020	20	1	0.009	110	84	37	1	4		29.4	19.6	0 ～ 25	160
FAS-R010-040	40	1	0.009	130	104	57	1	4		29.4	19.6	0 ～ 25	180
FAS-R020-040		2	0.011							29.4	19.6	0 ～ 50	
FAS-R060-040		6	0.017							19.6	9.8	0 ～ 150	
FAS-R100-040		10	0.015							19.6	4.9	0 ～ 250	
FAS-R010-080	80	1	0.009	170	144	97	2	6		29.4	19.6	0 ～ 25	225
FAS-R020-080		2	0.011							29.4	19.6	0 ～ 50	
FAS-R060-080		6	0.017							19.6	9.8	0 ～ 150	
FAS-R100-080		10	0.015							19.6	4.9	0 ～ 250	
FAS-R060-120	120	6	0.017	210	184	137	3	8		19.6	9.8	0 ～ 150	265
FAS-R100-120		10	0.015							19.6	4.9	0 ～ 250	
FAS-R060-160	160	6	0.017	250	224	177	4	10		19.6	9.8	0 ～ 150	310
FAS-R100-160		10	0.015							19.6	4.9	0 ～ 250	
FAS-R060-200	200	6	0.017	290	264	217	5	12		19.6	9.8	0 ～ 150	350
FAS-R100-200		10	0.015							19.6	4.9	0 ～ 250	

执行器安装基准面请参照技术解说第S106页。
Please refer to Technical Description page S106 for the Datum clamp face of the Actuator.

注释

1）使用时不得出现结露现象。
2）允许力矩是其他方向没有负载时的值。
3）扭矩值为参考值。
4）无电机时，重复定位精度及空转为参考值。
5）无电机时，许用转速及可搬负载为推荐值。
6）必要扭矩为最大垂直可搬负载作用时的所需扭矩。
7）推荐联轴器
- 酒井制作所：LAS-12C-4×（3 or 4 or 5）
- 锅屋BITECH：MWS-12C-4×（4 or 5）
- 锅屋BITECH：MOS-12C-4×（3 or 4 or 5）
- MISUMI：CPSCN12-4 ×（4 or 5）

Note

1）There should be no condensation when using.
2）Permissible Moment is the number when no load in other direction.
3）Please consider Torque as reference number.
4）In case of Motor-less type, Repeatability & Lost motion are reference number.
5）In case of Motor-less type, Permissible speed & Load Capacity are recommended number.
6）Required Torque is under maximum vertical Load Capacity.
7）Recommended Coupling
- SAKAI SEISAKUSYO：LAS-12C-4×（3 or 4 or 5）
- NBK：MWS-12C-4×（4 or 5）
- NBK：MOS-12C-4×（3 or 4 or 5）
- MISUMI：CPSCN12-4 ×（4 or 5）

Common Specifications 通用规格	
Repeatability 重复定位精度	Max. ±0.01mm
Lost Motion 空转	Max. 0.01mm
Body Material 主体材质	Aluminum 铝
Sliding guide 导向结构	Slide Guide rail 滑动导轨（1列）
Sensor 传感器	Limit switch 限位开关
Accuracy of Zero pt. return 原点复位精度	Max. ±0.01mm

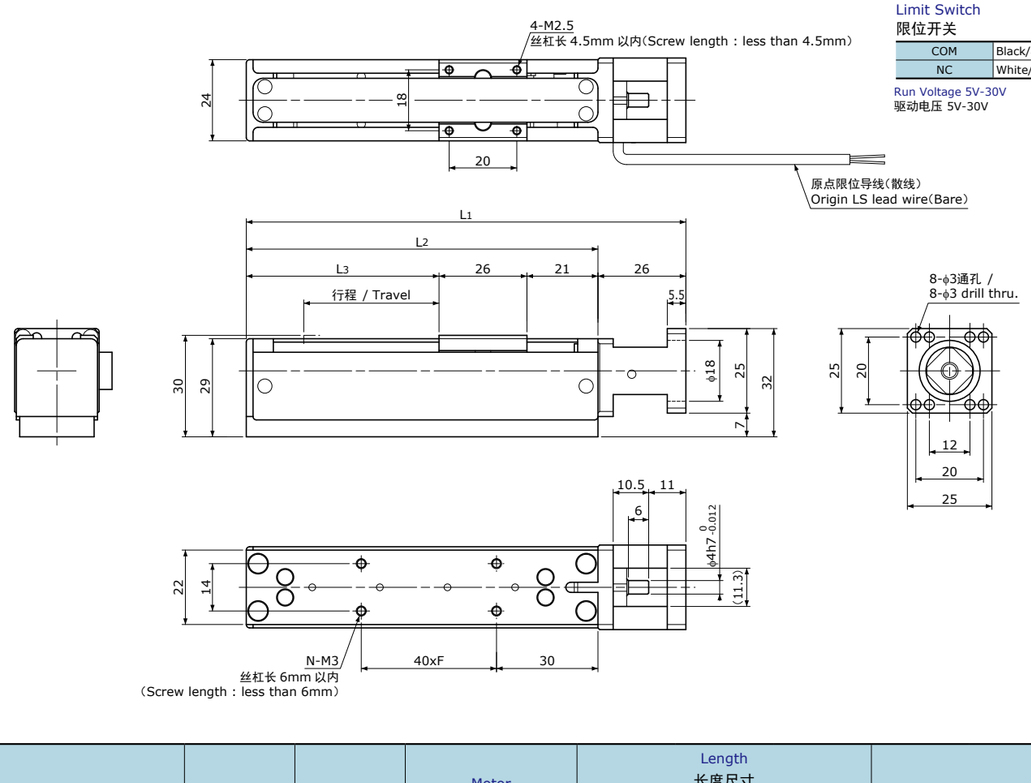
Permissible Moment 允许偏心力矩	
Pitching 俯仰 Mp	0.10Nm
Yawing 偏转 My	0.09Nm
Rolling 侧滚 Mr	0.23Nm

Lubrication 润滑	Grease 油脂 MSG No.2（KSS）
Operating Temp. 使用温度范围	0 ～ 40℃

Flex Actuator　灵活可选执行器

Motor-less type（Standard）
Precision Ball Screw type Actuator

无电机型（标准品）
精密滚珠丝杠型执行器



Limit Switch
限位开关

COM	Black/黑
NC	White/白

Run Voltage 5V-30V
驱动电压 5V-30V

Model Number 执行器型号	Travel 行程 （mm）	Screw Lead 丝杠导程 （mm）	Motor Required Torque 电机所需扭矩 （Nm）	Length 长度尺寸 （mm） L_1	L_2	L_3	F	N		Max. Load Capacity 最大可搬负载 （N） Hor. 水平	Vert. 垂直	Permissible speed 许用转速 （mm / sec）	Mass 质量 （g）
FAS-G010-020	20	1	0.009	110	84	37	1	4		29.4	19.6	0 ～ 25	160
FAS-G010-040	40	1	0.009	130	104	57	1	4		29.4	19.6	0 ～ 25	180
FAS-G020-040		2	0.011							29.4	19.6	0 ～ 50	
FAS-G060-040		6	0.017							19.6	9.8	0 ～ 150	
FAS-G100-040		10	0.015							19.6	4.9	0 ～ 250	
FAS-G010-080	80	1	0.009	170	144	97	2	6		29.4	19.6	0 ～ 25	225
FAS-G020-080		2	0.011							29.4	19.6	0 ～ 50	
FAS-G060-080		6	0.017							19.6	9.8	0 ～ 150	
FAS-G100-080		10	0.015							19.6	4.9	0 ～ 250	
FAS-G060-120	120	6	0.017	210	184	137	3	8		19.6	9.8	0 ～ 150	265
FAS-G100-120		10	0.015							19.6	4.9	0 ～ 250	
FAS-G060-160	160	6	0.017	250	224	177	4	10		19.6	9.8	0 ～ 150	310
FAS-G100-160		10	0.015							19.6	4.9	0 ～ 250	
FAS-G060-200	200	6	0.017	290	264	217	5	12		19.6	9.8	0 ～ 150	350
FAS-G100-200		10	0.015							19.6	4.9	0 ～ 250	

执行器安装基准面请参照技术解说第S106页。
Please refer to Technical Description page S106 for the Datum clamp face of the Actuator.

注释

1）使用时不得出现结露现象。
2）允许力矩是其他方向没有负载时的值。
3）扭矩值为参考值。
4）无电机时，重复定位精度及空转为参考值。
5）无电机时，许用转速及可搬负载为推荐值。
6）必要扭矩为最大垂直可搬负载作用时的所需扭矩。
7）推荐联轴器
- 酒井制作所：LAS-12C-4×（3 or 4 or 5）
- 锅屋BITECH：MWS-12C-4×（4 or 5）
- 锅屋BITECH：MOS-12C-4×（3 or 4 or 5）
- MISUMI：CPSCN12-4 ×（4 or 5）

Note

1）There should be no condensation when using.
2）Permissible Moment is the number when no load in other direction.
3）Please consider Torque as reference number.
4）In case of Motor-less type, Repeatability & Lost motion are reference number.
5）In case of Motor-less type, Permissible speed & Load Capacity are recommended number.
6）Required Torque is under maximum vertical Load Capacity.
7）Recommended Coupling
- SAKAI SEISAKUSYO：LAS-12C-4×（3 or 4 or 5）
- NBK：MWS-12C-4×（4 or 5）
- NBK：MOS-12C-4×（3 or 4 or 5）
- MISUMI：CPSCN12-4 ×（4 or 5）

Common Specifications 通用规格	
Repeatability 重复定位精度	Max. ±0.005mm
Lost Motion 空转	Max. 0.005mm
Body Material 主体材质	Aluminum 铝
Sliding guide 导向结构	Slide Guide rail 滑动导轨（1列）
Sensor 传感器	Limit switch 限位开关
Accuracy of Zero pt. return 原点复位精度	Max. ±0.01mm

Permissible Moment 允许偏心力矩	
Pitching 俯仰 Mp	0.10Nm
Yawing 偏转 My	0.09Nm
Rolling 侧滚 Mr	0.23Nm

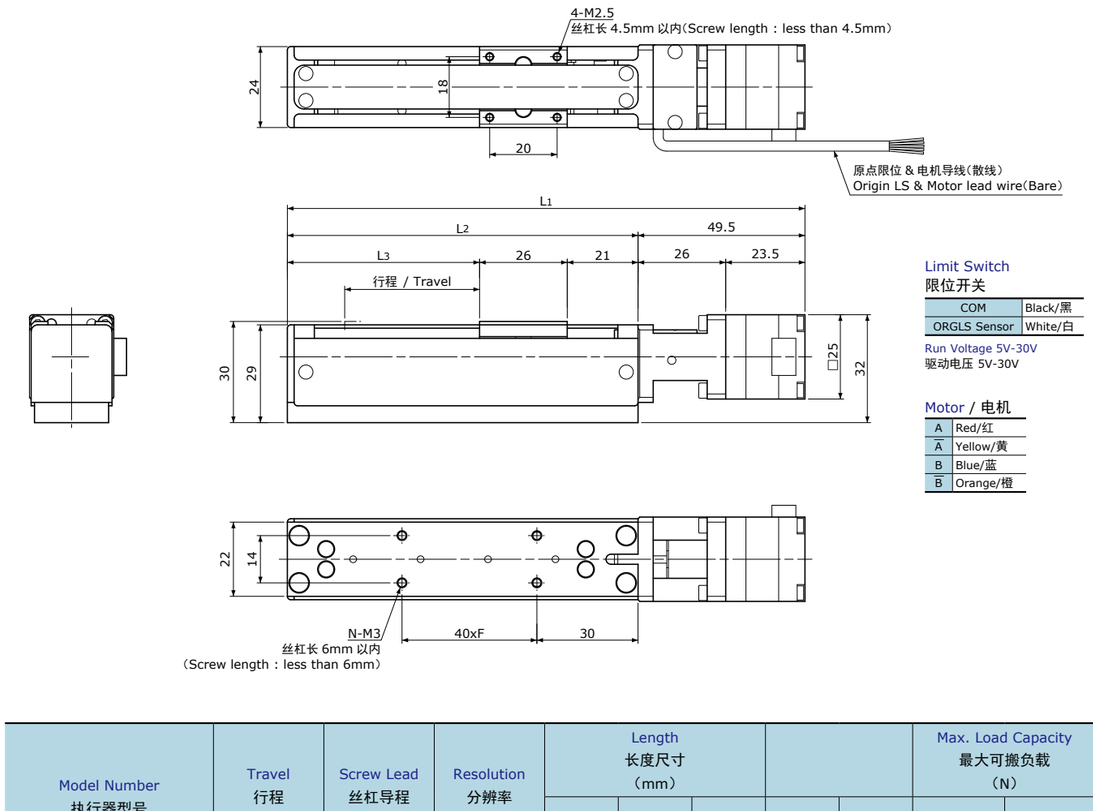
Lubrication 润滑	Grease 油脂 MSG No.2（KSS）
Operating Temp. 使用温度范围	0 ～ 40℃

Flex Actuator 灵活可选执行器

2-phase Stepping Motor(Bi-polar 0.7A / phase & □25) with Rolled Ball Screw type Actuator

带2相步进电机(双极 0.7A / 相 □25) 冷轧滚珠丝杠型执行器

Motor Model / 电机型号：10PM-K202B(Single shaft / 单轴)
Minebea Motor / 美蓓亚电机
推荐驱动器 / Driver recommendation：SD4030B3



Limit Switch
限位开关

COM	Black/黑
ORGLS Sensor	White/白

Run Voltage 5V-30V
驱动电压 5V-30V

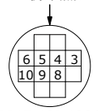
Motor / 电机

A	Red/红
$\bar{A}$	Yellow/黄
B	Blue/蓝
$\bar{B}$	Orange/橙

连接器选择方案
请从下面指定连接器种类。
没有指示的采用散线。
1)散线
2)广濑RP17-13J-12SC
3)EI-连接器(TE connectivity制造)
6芯(172211-6、电机)+4芯(172211-4、传感器)

Connector choice
Please designate connector type below.
No connector if there is no designation.
1)None(Bare)
2)RP17-13J-12SC(HIROSE)
3)EI-Connector(TE connectivity)
172211-6 pins for Motor +172211-4 pins for Sensor

Upper side(white dot)
上侧(白点)



RP17-13J-12SC
(female/插口)

HIROSE RP17 Connector
广濑RP17连接器规格

1	None 无
2	None 无
3	Stepping Motor A(Red/红)
4	Stepping Motor $\bar{A}$(Yellow/黄)
5	Stepping Motor B(Blue/蓝)
6	Stepping Motor $\bar{B}$(Orange/橙)
7	None 无
8	COM(Black/黑)
9	Short circuit with No.8 与8号短路
10	ORGLS Sensor/传感器 NC(White/白)
11	None 无
12	None 无

172211-6(male/ 插头)

172211-4(male/ 插头)

EI Connector
EI连接器规格

1	None 无
2	None 无
3	Stepping Motor A(Red/红)
4	Stepping Motor $\bar{A}$(Yellow/黄)
5	Stepping Motor B(Blue/蓝)
6	Stepping Motor $\bar{B}$(Orange/橙)

1	None 无
2	COM(Black/黑)
3	Short circuit with No.2 与2号短路
4	ORGLS Sensor/传感器 NC(White/白)

注释
1)使用时不得出现结露现象。
2)允许力矩是其他方向没有负载时的值。
3)分辨率为整步时的值。
4)导线为散线及右侧引线时的型号。
5)低速时、原点复位时振动可能略有增大。

Note
1)There should be no condensation when using.
2)Permissible Moment is the number when no load in other direction.
3)Resolution represents the values for full step.
4)Model number is for no-connector and lead wire is set on right side on Motor.
5)Vibration may increase at low speed or zero return.

Model Number 执行器型号	Travel 行程 (mm)	Screw Lead 丝杠导程 (mm)	Resolution 分辨率 (μm)	Length 长度尺寸 (mm) L1	L2	L3	F	N	Max. Load Capacity 最大可搬负载 (N) Hor. 水平	Vert. 垂直		Permissible speed 许用转速 (mm / sec)	Max. Acceleration 最大加速度 (m / sec²)	Mass 质量 (g)
FAS-R010-020MNR	20	1	5	133.5	84	37	1	4	29.4	19.6		3 ～ 20	0.1	210
FAS-R010-040MNR	40	1	5	153.5	104	57	1	4	29.4	19.6		3 ～ 20	0.1	230
FAS-R020-040MNR		2	10						29.4	19.6		6 ～ 40	0.2	
FAS-R060-040MNR		6	30						19.6	2.94		18 ～ 120	0.6	
FAS-R100-040MNR		10	50						19.6	2.94		30 ～ 200	1.0	
FAS-R010-080MNR	80	1	5	193.5	144	97	2	6	29.4	19.6		3 ～ 20	0.1	275
FAS-R020-080MNR		2	10						29.4	19.6		6 ～ 40	0.2	
FAS-R060-080MNR		6	30						19.6	2.94		18 ～ 120	0.6	
FAS-R100-080MNR		10	50						19.6	2.94		30 ～ 200	1.0	
FAS-R060-120MNR	120	6	30	233.5	184	137	3	8	19.6	2.94		18 ～ 120	0.6	315
FAS-R100-120MNR		10	50						19.6	2.94		30 ～ 200	1.0	
FAS-R060-160MNR	160	6	30	273.5	224	177	4	10	19.6	2.94		18 ～ 120	0.6	360
FAS-R100-160MNR		10	50						19.6	2.94		30 ～ 200	1.0	
FAS-R060-200MNR	200	6	30	313.5	264	217	5	12	19.6	2.94		18 ～ 120	0.6	400
FAS-R100-200MNR		10	50						19.6	2.94		30 ～ 200	1.0	

注) 有关与推荐驱动器(SD4030B3)的接线,请参照第Q129页。
Note) Refer to page Q129 for connection diagram of recommended Driver (SD4030B3).

执行器安装基准面请参照技术解说第S106页。
Please refer to Technical Description page S106 for the Datum clamp face of the Actuator.

Common Specifications 通用规格	
Repeatability 重复定位精度	Max. ±0.01mm
Lost Motion 空转	Max. 0.01mm
Body Material 主体材质	Aluminum 铝
Sliding guide 导向结构	Slide Guide rail 滑动导轨(1列)
Sensor 传感器	Limit switch 限位开关
Accuracy of Zero pt. return 原点复位精度	Max. ±0.01mm

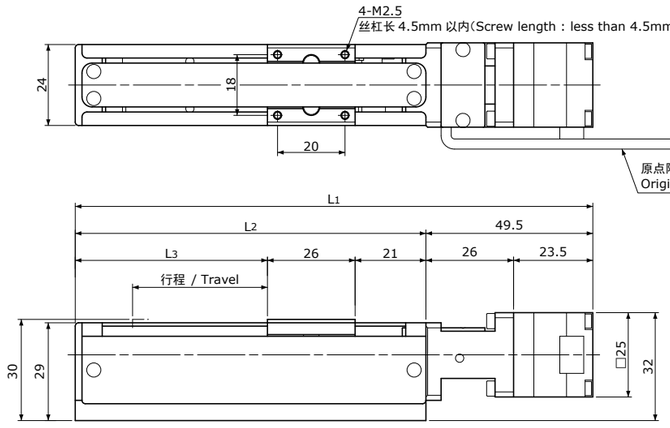
Permissible Moment 允许偏心力矩	
Pitching 俯仰 Mp	0.10Nm
Yawing 偏转 My	0.09Nm
Rolling 侧滚 Mr	0.23Nm

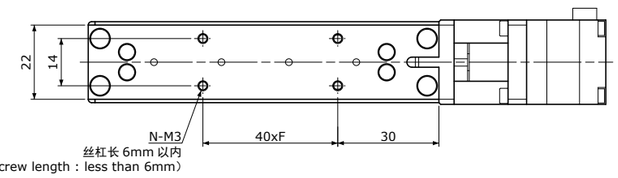
Lubrication 润滑	Grease 油脂 MSG No.2(KSS)
Operating Temp. 使用温度范围	0 ～ 40℃

Flex Actuator　灵活可选执行器

2-phase Stepping Motor（Bi-polar 0.7A / phase & □25）with Precision Ball Screw type Actuator

带2相步进电机（双极 0.7A / 相 □25）精密滚珠丝杠型执行器





Limit Switch
限位开关

COM	Black/黑
ORGLS Sensor	White/白

Run Voltage 5V-30V
驱动电压 5V-30V

Motor / 电机

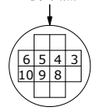
A	Red/红
$\bar{A}$	Yellow/黄
B	Blue/蓝
$\bar{B}$	Orange/橙

Motor Model / 电机型号：10PM-K202B（Single shaft / 单轴）
Minebea Motor / 美蓓亚电机
推荐驱动器 / Driver recommendation：SD4030B3

连接器选择方案
请从下面指定连接器种类。
没有指示的采用散线。
1）散线
2）广濑RP17-13J-12SC
3）EI-连接器（TE connectivity制造）
6芯（172211-6、电机）+4芯（172211-4、传感器）

Connector choice
Please designate connector type below.
No connector if there is no designation.
1）None（Bare）
2）RP17-13J-12SC（HIROSE）
3）EI-Connector（TE connectivity）
172211-6 pins for Motor +172211-4 pins for Sensor

Upper side（white dot）
上侧（白点）



RP17-13J-12SC
（female/插口）

HIROSE RP17 Connector
广濑RP17连接器规格

1	None　无
2	None　无
3	Stepping Motor A（Red/红）
4	Stepping Motor $\bar{A}$（Yellow/黄）
5	Stepping Motor B（Blue/蓝）
6	Stepping Motor $\bar{B}$（Orange/橙）
7	None　无
8	COM（Black/黑）
9	Short circuit with No.8　与8号短路
10	ORGLS Sensor/传感器 NC（White/白）
11	None　无
12	None　无

172211-6（male/ 插头）

172211-4（male/ 插头）

EI Connector
EI连接器规格

1	None　无
2	None　无
3	Stepping Motor A（Red/红）
4	Stepping Motor $\bar{A}$（Yellow/黄）
5	Stepping Motor B（Blue/蓝）
6	Stepping Motor $\bar{B}$（Orange/橙）

1	None　无
2	COM（Black/黑）
3	Short circuit with No.2　与2号短路
4	ORGLS Sensor/传感器 NC（White/白）

注释
1）使用时不得出现结露现象。
2）允许力矩是其他方向没有负载时的值。
3）分辨率为整步时的值。
4）导线为散线及右侧引线时的型号。
5）低速时、原点复位时振动可能略有增大。

Note
1）There should be no condensation when using.
2）Permissible Moment is the number when no load in other direction.
3）Resolution represents the values for full step.
4）Model number is for no-connector and lead wire is set on right side on Motor.
5）Vibration may increase at low speed or zero return.

Model Number 执行器型号	Travel 行程 （mm）	Screw Lead 丝杠导程 （mm）	Resolution 分辨率 （μm）	Length 长度尺寸（mm）					Max. Load Capacity 最大可搬负载（N）			Permissible speed 许用转速 （mm / sec）	Max. Acceleration 最大加速度 （m / sec²）	Mass 质量 （g）
				L_1	L_2	L_3	F	N	Hor. 水平	Vert. 垂直				
FAS-G010-020MNR	20	1	5	133.5	84	37	1	4	29.4	19.6		3 ～ 20	0.1	210
FAS-G010-040MNR	40	1	5	153.5	104	57	1	4	29.4	19.6		3 ～ 20	0.1	230
FAS-G020-040MNR		2	10						29.4	19.6		6 ～ 40	0.2	
FAS-G060-040MNR		6	30						19.6	2.94		18 ～ 120	0.6	
FAS-G100-040MNR		10	50						19.6	2.94		30 ～ 200	1.0	
FAS-G010-080MNR	80	1	5	193.5	144	97	2	6	29.4	19.6		3 ～ 20	0.1	275
FAS-G020-080MNR		2	10						29.4	19.6		6 ～ 40	0.2	
FAS-G060-080MNR		6	30						19.6	2.94		18 ～ 120	0.6	
FAS-G100-080MNR		10	50						19.6	2.94		30 ～ 200	1.0	
FAS-G060-120MNR	120	6	30	233.5	184	137	3	8	19.6	2.94		18 ～ 120	0.6	315
FAS-G100-120MNR		10	50						19.6	2.94		30 ～ 200	1.0	
FAS-G060-160MNR	160	6	30	273.5	224	177	4	10	19.6	2.94		18 ～ 120	0.6	360
FAS-G100-160MNR		10	50						19.6	2.94		30 ～ 200	1.0	
FAS-G060-200MNR	200	6	30	313.5	264	217	5	12	19.6	2.94		18 ～ 120	0.6	400
FAS-G100-200MNR		10	50						19.6	2.94		30 ～ 200	1.0	

Common Specifications 通用规格	
Repeatability　重复定位精度	Max. ±0.005mm
Lost Motion　空转	Max. 0.005 mm
Body Material　主体材质	Aluminum　铝
Sliding guide　导向结构	Slide Guide rail 滑动导轨（1列）
Sensor　传感器	Limit switch 限位开关
Accuracy of Zero pt. return 原点复位精度	Max. ±0.01mm

Permissible Moment 允许偏心力矩	
Pitching　俯仰　Mp	0.10Nm
Yawing　偏转　My	0.09Nm
Rolling　侧滚　Mr	0.23Nm

Lubrication　润滑	Grease 油脂　MSG No.2（KSS）
Operating Temp.　使用温度范围	0 ～ 40℃

注）有关与推荐驱动器（SD4030B3）的接线，请参照第Q129页。
Note）Refer to page Q129 for connection diagram of recommended Driver（SD4030B3）.

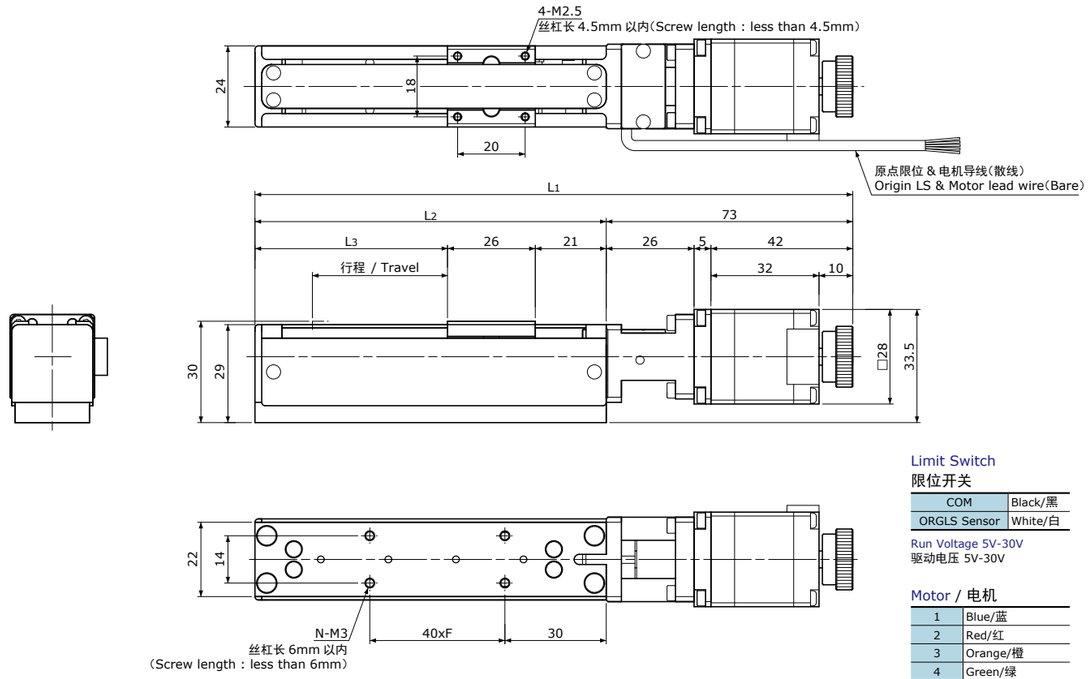
执行器安装基准面请参照技术解说第S106页。
Please refer to Technical Description page S106 for the Datum clamp face of the Actuator.

Flex Actuator　灵活可选执行器

5-phase Stepping Motor（0.75A / phase & □28）with Rolled Ball Screw type Actuator

带5相步进电机（0.75A / 相　□28）冷轧滚珠丝杠型执行器

Motor Model / 电机型号：PK523HPB（Double shaft / 双轴）
Oriental Motor / 东方马达
推荐驱动器 / Driver recommendation：KR-A5CC KR-A55MC



Limit Switch
限位开关

COM	Black/黑
ORGLS Sensor	White/白

Run Voltage 5V-30V
驱动电压 5V-30V

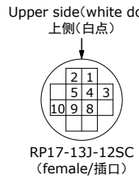
Motor / 电机

1	Blue/蓝
2	Red/红
3	Orange/橙
4	Green/绿
5	Black/黑

注释
1）使用时不得出现结露现象。
2）允许力矩是其他方向没有负载时的值。
3）分辨率为整步时的值。
4）导线为散线及右侧引线时的型号。

连接器选择方案
请从下面指定连接器种类。
没有指示的采用散线。
1）散线
2）广濑RP17-13J-12SC
3）EI-连接器（TE connectivity制造）
6芯（172211-6、电机）+4芯（172211-4、传感器）

Connector choice
Please designate connector type below.
No connector if there is no designation.
1）None（Bare）
2）RP17-13J-12SC（HIROSE）
3）EI-Connector（TE connectivity）
172211-6 pins for Motor +172211-4 pins for Sensor



HIROSE RP17 Connector
广濑RP17连接器规格

1	Stepping Motor（Blue/蓝）
2	Stepping Motor（Red/红）
3	Stepping Motor（Orange/橙）
4	Stepping Motor（Green/绿）
5	Stepping Motor（Black/黑）
6	None　无
7	None　无
8	COM（Black/黑）
9	Short circuit with No.8　与8号短路
10	ORGLS Sensor/传感器 NC（White/白）
11	None　无
12	None　无

172211-6（male/ 插头）

172211-4（male/ 插头）

EI Connector
EI连接器规格

1	Stepping Motor（Blue/蓝）
2	Stepping Motor（Red/红）
3	Stepping Motor（Orange/橙）
4	Stepping Motor（Green/绿）
5	Stepping Motor（Black/黑）
6	None　无

1	None 无
2	COM（Black/黑）
3	Short circuit with No.2　与2号短路
4	ORGLS Sensor/传感器 NC（White/白）

Note
1）There should be no condensation when using.
2）Permissible Moment is the number when no load in other direction.
3）Resolution represents the values for full step.
4）Model number is for no-connector and lead wire is set on right side on Motor

Model Number 执行器型号	Travel 行程 （mm）	Screw Lead 丝杠导程 （mm）	Resolution 分辨率 （μm）	Length 长度尺寸 （mm） L_1	L_2	L_3	F	N	Max. Load Capacity 最大可搬负载 （N） Hor. 水平	Vert. 垂直		Permissible speed 许用转速 （mm / sec）	Max. Acceleration 最大加速度 （m / sec²）	Mass 质量 （g）
FAS-R010-020ENR	20	1	2	157	84	37	1	4	29.4	19.6		0 ～ 25	0.125	265
FAS-R010-040ENR	40	1	2	177	104	57	1	4	29.4	19.6		0 ～ 25	0.125	285
FAS-R020-040ENR		2	4						29.4	19.6		0 ～ 50	0.25	
FAS-R060-040ENR		6	12						19.6	4.9		0 ～ 150	0.75	
FAS-R100-040ENR		10	20						19.6	4.9		0 ～ 250	1.25	
FAS-R010-080ENR	80	1	2	217	144	97	2	6	29.4	19.6		0 ～ 25	0.125	330
FAS-R020-080ENR		2	4						29.4	19.6		0 ～ 50	0.25	
FAS-R060-080ENR		6	12						19.6	4.9		0 ～ 150	0.75	
FAS-R100-080ENR		10	20						19.6	4.9		0 ～ 250	1.25	
FAS-R060-120ENR	120	6	12	257	184	137	3	8	19.6	4.9		0 ～ 150	0.75	370
FAS-R100-120ENR		10	20						19.6	4.9		0 ～ 250	1.25	
FAS-R060-160ENR	160	6	12	297	224	177	4	10	19.6	4.9		0 ～ 150	0.75	415
FAS-R100-160ENR		10	20						19.6	4.9		0 ～ 250	1.25	
FAS-R060-200ENR	200	6	12	337	264	217	5	12	19.6	4.9		0 ～ 150	0.75	455
FAS-R100-200ENR		10	20						19.6	4.9		0 ～ 250	1.25	

Common Specifications 通用规格	
Repeatability　重复定位精度	Max. ±0.01mm
Lost Motion　空转	Max. 0.01mm
Body Material　主体材质	Aluminum　铝
Sliding guide　导向结构	Slide Guide rail 滑动导轨（1列）
Sensor　传感器	Limit switch 限位开关
Accuracy of Zero pt. return 原点复位精度	Max. ±0.01mm

Permissible Moment 允许偏心力矩	
Pitching　俯仰　Mp	0.10Nm
Yawing　偏转　My	0.09Nm
Rolling　侧滚　Mr	0.23Nm

Lubrication　润滑	Grease 油脂　MSG No.2（KSS）
Operating Temp.　使用温度范围	0 ～ 40℃

注）有关与推荐驱动器（KR-A5CC、KR-A55MC）的接线，请参照第Q129、Q130页。
Note）Refer to page Q129 or Q130 for connection diagrams of recommended Driver（KR-A5CC, KR-A55MC）.

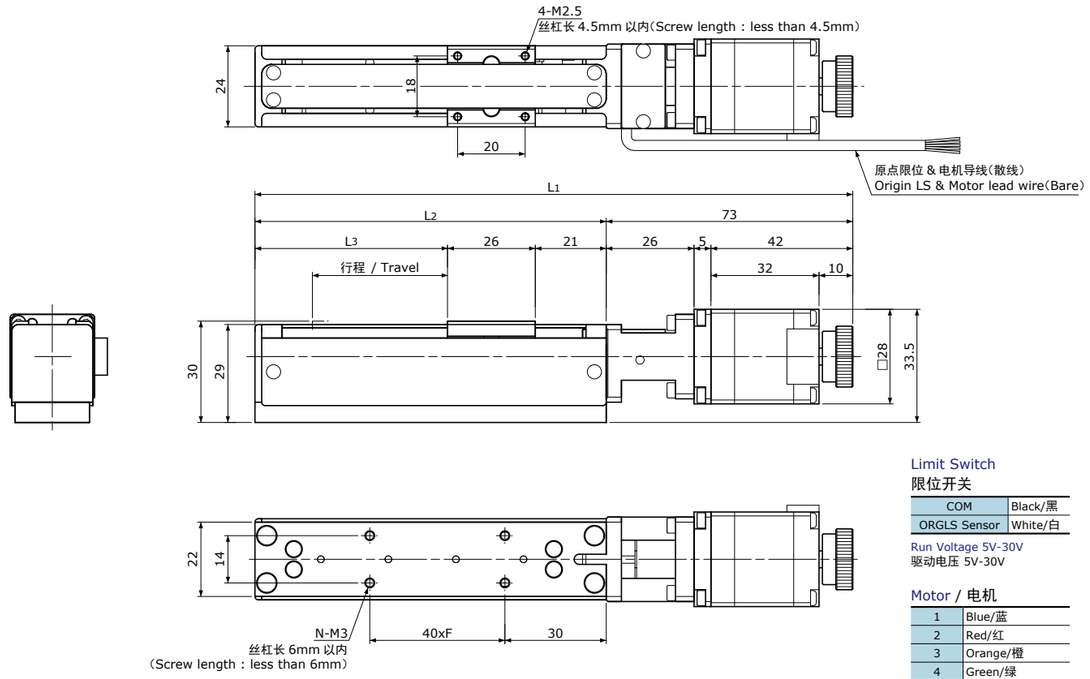
执行器安装基准面请参照技术解说第S106页。
Please refer to Technical Description page S106 for the Datum clamp face of the Actuator.

Flex Actuator　灵活可选执行器

5-phase Stepping Motor(0.75A / phase & □28) with Precision Ball Screw type Actuator

带5相步进电机(0.75A / 相　□28) 精密滚珠丝杠型执行器

Motor Model / 电机型号：PK523HPB(Double shaft / 双轴)
Oriental Motor / 东方马达
推荐驱动器 / Driver recommendation：KR-A5CC KR-A55MC



Limit Switch
限位开关

COM	Black/黑
ORGLS Sensor	White/白

Run Voltage 5V-30V
驱动电压 5V-30V

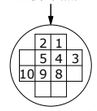
Motor / 电机

1	Blue/蓝
2	Red/红
3	Orange/橙
4	Green/绿
5	Black/黑

连接器选择方案
请从下面指定连接器种类。
没有指示的采用散线。
1)散线
2)广濑RP17-13J-12SC
3)EI-连接器(TE connectivity制造)
6芯(172211-6、电机)+4芯(172211-4、传感器)

Connector choice
Please designate connector type below.
No connector if there is no designation.
1)None(Bare)
2)RP17-13J-12SC(HIROSE)
3)EI-Connector(TE connectivity)
172211-6 pins for Motor +172211-4 pins for Sensor

Upper side(white dot)
上侧(白点)



RP17-13J-12SC
(female/插口)

HIROSE RP17 Connector
广濑RP17连接器规格

1	Stepping Motor(Blue/蓝)
2	Stepping Motor(Red/红)
3	Stepping Motor(Orange/橙)
4	Stepping Motor(Green/绿)
5	Stepping Motor(Black/黑)
6	None　无
7	None　无
8	COM(Black/黑)
9	Short circuit with No.8　与8号短路
10	ORGLS Sensor/传感器 NC(White/白)
11	None　无
12	None　无

172211-6(male/ 插头)

172211-4(male/ 插头)

EI Connector
EI连接器规格

1	Stepping Motor(Blue/蓝)
2	Stepping Motor(Red/红)
3	Stepping Motor(Orange/橙)
4	Stepping Motor(Green/绿)
5	Stepping Motor(Black/黑)
6	None　无

1	None 无
2	COM(Black/黑)
3	Short circuit with No.2　与2号短路
4	ORGLS Sensor/传感器 NC(White/白)

注释
1)使用时不得出现结露现象。
2)允许力矩是其他方向没有负载时的值。
3)分辨率为整步时的值。
4)导线为散线及右侧引线时的型号。

Note
1)There should be no condensation when using.
2)Permissible Moment is the number when no load in other direction.
3)Resolution represents the values for full step.
4)Model number is for no-connector and lead wire is set on right side on Motor

Model Number 执行器型号	Travel 行程 (mm)	Screw Lead 丝杠导程 (mm)	Resolution 分辨率 (μm)	Length 长度尺寸 (mm) L_1	L_2	L_3	F	N	Max. Load Capacity 最大可搬负载 (N) Hor. 水平	Vert. 垂直		Permissible speed 许用转速 (mm / sec)	Max. Acceleration 最大加速度 (m / sec²)	Mass 质量 (g)
FAS-G010-020ENR	20	1	2	157	84	37	1	4	29.4	19.6		0 ～ 25	0.125	265
FAS-G010-040ENR	40	1	2	177	104	57	1	4	29.4	19.6		0 ～ 25	0.125	285
FAS-G020-040ENR		2	4						29.4	19.6		0 ～ 50	0.25	
FAS-G060-040ENR		6	12						19.6	4.9		0 ～ 150	0.75	
FAS-G100-040ENR		10	20						19.6	4.9		0 ～ 250	1.25	
FAS-G010-080ENR	80	1	2	217	144	97	2	6	29.4	19.6		0 ～ 25	0.125	330
FAS-G020-080ENR		2	4						29.4	19.6		0 ～ 50	0.25	
FAS-G060-080ENR		6	12						19.6	4.9		0 ～ 150	0.75	
FAS-G100-080ENR		10	20						19.6	4.9		0 ～ 250	1.25	
FAS-G060-120ENR	120	6	12	257	184	137	3	8	19.6	4.9		0 ～ 150	0.75	370
FAS-G100-120ENR		10	20						19.6	4.9		0 ～ 250	1.25	
FAS-G060-160ENR	160	6	12	297	224	177	4	10	19.6	4.9		0 ～ 150	0.75	415
FAS-G100-160ENR		10	20						19.6	4.9		0 ～ 250	1.25	
FAS-G060-200ENR	200	6	12	337	264	217	5	12	19.6	4.9		0 ～ 150	0.75	455
FAS-G100-200ENR		10	20						19.6	4.9		0 ～ 250	1.25	

Common Specifications 通用规格	
Repeatability　重复定位精度	Max. ±0.005mm
Lost Motion　空转	Max. 0.005mm
Body Material　主体材质	Aluminum　铝
Sliding guide　导向结构	Slide Guide rail 滑动导轨(1列)
Sensor　传感器	Limit switch 限位开关
Accuracy of Zero pt. return 原点复位精度	Max. ±0.01mm

Permissible Moment 允许偏心力矩	
Pitching　俯仰　Mp	0.10Nm
Yawing　偏转　My	0.09Nm
Rolling　侧滚　Mr	0.23Nm

Lubrication　润滑	Grease 油脂　MSG No.2(KSS)
Operating Temp.　使用温度范围	0 ～ 40℃

注) 有关与推荐驱动器(KR-A5CC、KR-A55MC)的接线,请参照第Q129、Q130页。
Note) Refer to page Q129 or Q130 for connection diagrams of recommended Driver (KR-A5CC, KR-A55MC).

执行器安装基准面请参照技术解说第S106页。
Please refer to Technical Description page S106 for the Datum clamp face of the Actuator.

□14紧凑型执行器
Compact Actuator NEMA 6 size

CAS 系列 Series

KSS最小的单轴执行器,配备了尺寸为□14的2相步进电机。

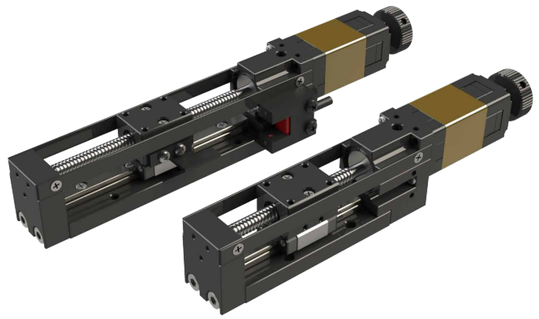
The most compact single axis Actuator in KSS with NEMA 6 size of 2 phase stepping Motor.

●特点

采用KSS独有的不需要联轴器的方式与□14步进电机连接,
不只是外形宽度,执行器总长也实现了小型化。

●Features

Realized compactness not only the body width, but total length of the Actuator by combining NEMA 6 Stepping Motor using our unique coupling-less connection.



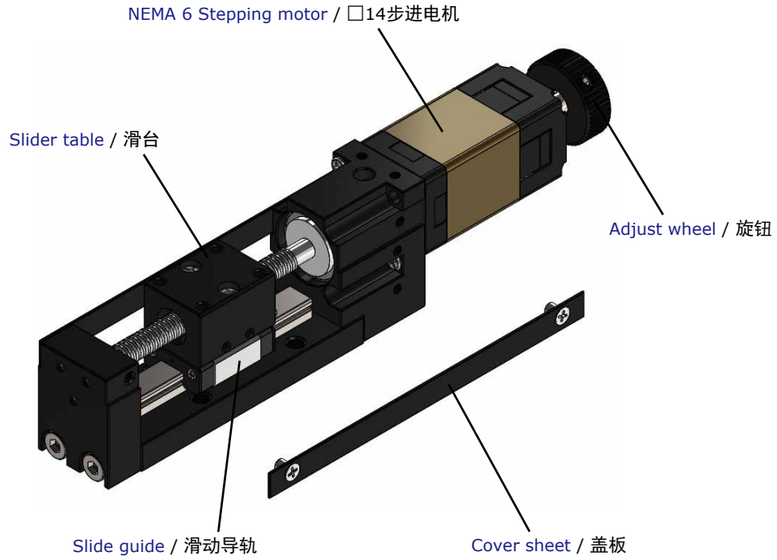
●规格 / Specifications

	Lead / 导程1mm	Lead / 导程2mm
Travel / 行程(mm)	20、40	
Drive Screw / 驱动丝杠	Rolled Ball Screw / 冷轧滚珠丝杠	
Resolution / 分辨率(mm)	0.005	0.01
Repeatability (mm) 重复定位精度(mm)	Max. ±0.010	
Lost motion / 空转(mm)	Max. 0.010	
Horizontal Load Capacity (N) 水平可搬质量(N)	Max. 10	Max. 5
Vertical Load Capacity (N) 垂直可搬质量(N)	Max. 5	Max. 3
Permissible speed (mm / sec) 许用转速(mm / sec)	Max. 20	Max. 40
Maximum acceleration (m / sec^2) 最大加速度(m / sec^2)	0.1	0.2
Permissible Moment Mp (Nm) 允许负载偏心力矩Mp (Nm) (Pitching / 俯仰)	0.14	
Permissible Moment My (Nm) 允许负载偏心力矩My (Nm) (Yawing / 偏转)	0.12	
Permissible Moment Mr (Nm) 允许负载偏心力矩Mr (Nm) (Rolling / 侧滚)	0.22	

Recommended Drivers 推荐驱动器	SD4015B3

Note) Refer to page Q130 for connection diagram of recommended Drivers.
注) 有关与推荐驱动器的接线,请参照第Q130页。

●构造 / Structure



●公称型号 / Model number notation

CAS 14 - R 010 - 020 H R S

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

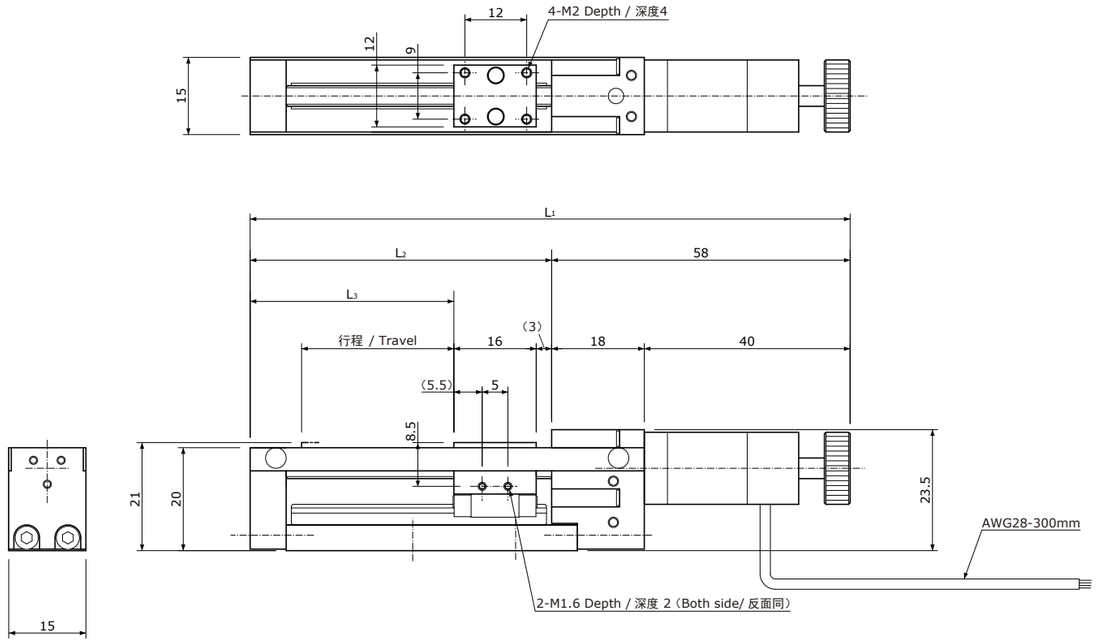
①系列符号
CAS：KSS紧凑型执行器系列
②电机框架尺寸
14：□14尺寸
③驱动丝杠种类
R：冷轧滚珠丝杠
④导程 / 节距(mm)： 010表示1mm
⑤行程(mm)：020表示20mm
⑥连接器种类
N：散线
H：广濑RP17
E：EI连接器（TE Connectivity制造）
S：其他
⑦导线方向
R：右侧引线(从轴侧看)
L：左侧引线
T：上侧引线
B：下侧引线
⑧选项符号
S：传感器外装

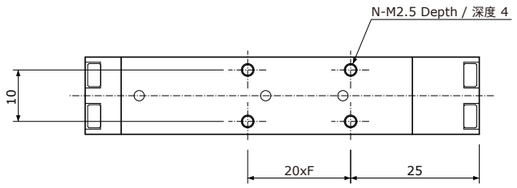
①Series No.
CA：KSS Compact Actuator Series
②Motor Frame Size
14：NEMA 6
③Drive Screw type
R：Rolled Ball Screw
④Lead / Pitch (mm)：010 means 1mm
⑤Travel (mm)020 means 20mm
⑥Connector type
N：No connector (Bare)
H：HIROSE RP17
E：EI connector (TE Connectivity)
S：Others
⑦Direction of Motor leads
R：Right (from shaft end side)
L：Left
T：Top
B：Bottom
⑧Option
S：Sensor outside

冷轧滚珠丝杠+2相步进电机 / Rolled Ball Screw + 2-phase Stepping Motor

CAS□14 / CAS NEMA 6

Shaft dia.(轴径)f4





Motor / 电机

A	Orange/橙
$\overline{A}$	Blue/蓝
B	Red/红
$\overline{B}$	Yellow/黄

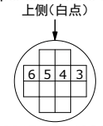
Motor Model / 电机型号 ：SH2141-5511(Double Shaft / 双轴)
Sanyo Denki / 山洋电气
Driver recommendation / 推荐驱动器 ：SD4015B3

连接器选择方案
请从下面指定连接器种类。
没有指示的采用散线。
1)散线
2)广濑RP17-13J-12SC
3)EI-连接器(TE connectivity制造)
6芯(172211-6、电机)+4芯(172211-4、传感器)

Connector choice
Please designate connector type below.
No connector if there is no designation.
1)None(Bare)
2)RP17-13J-12SC(HIROSE)
3)EI-Connector(TE connectivity)
172211-6 pins for Motor +172211-4 pins for Sensor

HIROSE RP17 Connector
广濑RP17连接器规格

Upper side(white dot)
上侧(白点)

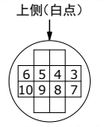


RP17-13J-12SC
(female/插口)

1	None 无
2	None 无
3	Stepping Motor A(Orange/橙)
4	Stepping Motor $\overline{A}$(Blue/蓝)
5	Stepping Motor B(Red/红)
6	Stepping Motor $\overline{B}$(Yellow/黄)
7	None 无
8	None 无
9	None 无
10	None 无
11	None 无
12	None 无

When Sensor option is selected
选择传感器选项时

Upper side (white dot)
上侧(白点)



RP17-13J-12SC
(female/插口)

1	None 无
2	None 无
3	Stepping Motor A(Orange/橙)
4	Stepping Motor $\overline{A}$(Blue/蓝)
5	Stepping Motor B(Red/红)
6	Stepping Motor $\overline{B}$(Yellow/黄)
7	+5～24V(Blown/褐)
8	COM(Blue/蓝)
9	Short circuit with No.8 与8号短路
10	ORGLS Sensor/传感器 NC(Black/黑)
11	None 无
12	None 无

EI Connector
EI连接器规格

172211-6(male/ 插头)

1	None 无
2	None 无
3	Stepping Motor A(Orange/橙)
4	Stepping Motor $\overline{A}$(Blue/蓝)
5	Stepping Motor B(Red/红)
6	Stepping Motor $\overline{B}$(Yellow/黄)

When Sensor option is selected
选择传感器选项时

172211-4（male/插头）

1	+5～24V(Blown/褐)
2	COM(Blue/蓝)
3	Short circuit with No.2 与2号短路
4	ORGLS Sensor/传感器 NC(Black/黑)

注释
1)使用时不得出现结露现象。
2)允许力矩是其他方向没有负载时的值。
3)分辨率为整步时的值。
4)导线为散线及右侧引线时的型号。
5)低速时、原点复位时振动可能略有增大。

Note
1)There should be no condensation when using.
2)Permissible Moment is the number when no load in other direction.
3)Resolution represents the values for full step.
4)Model number is for no-connector and lead wire is set on right side on Motor.
5)Vibration may increase at low speed or zero return.

Model Number 执行器型号	Travel 行程 (mm)	Screw Lead 丝杠导程 (mm)	Resolution 分辨率 (μm)	Length 长度尺寸 (mm) L1	L2	L3	F	N		Max. Load Capacity 最大可搬负载 (N) Hor. 水平	Vert. 垂直	Permissible speed 许用转速 (mm / sec)	Mass 质量 (g)
CAS14-R010-020	20	1	0.005	107	49	30	1	4		10	5	20	88
CAS14-R010-040	40	1	0.005	127	69	50	2	6		10	5	20	96
CAS14-R020-020	20	2	0.01	107	49	30	1	4		5	3	40	88
CAS14-R020-040	40	2	0.01	127	69	50	2	6		5	3	40	96

Permissible Moment 允许偏心力矩	
Pitching 俯仰 Mp	0.14Nm
Yawing 偏转 My	0.12Nm
Rolling 侧滚 Mr	0.22Nm

Lubrication 润滑	Grease 油脂 MSG No.2（KSS）
Operating Temp. 使用温度范围	0～40℃

Common Specifications 通用规格	
Repeatability 重复定位精度	Max. ±0.01mm
Lost Motion 空转	Max. 0.01mm
Body Material 主体材质	Aluminum 铝
Sliding guide 导向结构	Slide Guide rail 滑动导轨(1列)

Motor Specifications 电机参数	
Driving method 励磁方式	2-phase Bi-polar 2相双极方式
Rated Voltage 额定电压	6.3V(DC)
Rated current 额定电流	0.3A/phase(※) 0.3A/相(※)
Winding resistance 绕组电阻	21Ω
Insulation Class 绝缘等级	Class B(130℃) B级(130℃)

※推荐使用组合驱动器SD4015B3(Vanguard Systems公司)。
使用时请将驱动电流设定为0.4A。
※SD4015B3 (Vanguard Systems Co., Ltd.) is recommended for driver.
Please use Run current 0.4A setting.

执行器安装基准面请参照技术解说第S106页。
Please refer to Technical Description page S106 for the Datum clamp face of the Actuator.

MoBo执行器（MA系列）
MoBo Actuator（MA Series）

使用External滚珠丝杠型(MoBo)的执行器。
按客户订单接单生产。

External Ball Screw type(MoBo) is built in this series, what we call MoBo Actuators.
All of MoBo Actuators are produced as customized products, in accordance with customer's order.

●特点

使用电机直连型滚珠丝杠,可实现长边方向尺寸的小型化。

●Features

More compact design of Unit products in longitudinal dimension became reality by using Direct Motor Drive Ball Screws / Resin Lead Screws.

●种类

根据所使用的进给丝杠,MoBo执行器有以下种类。

1）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。

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）树脂螺母滑动丝杠型

采用价廉物美的树脂导程丝杠(含油型),在通常的使用环境下可以免维护使用。

●Variation

There are several kinds of MoBo Actuator shown below. Each Actuator has a different kinds of Ball Screw / Lead Screw inside.

1）Precision Ball Screw type

High accuracy in both Repeatability and Lost motion by using Precision Ball Screw.

2）Rolled Ball Screw type

Reasonable price and accuracy have been achieved by using Rolled Ball Screw.

3）Resin Lead Screw type

It can be used without oiling in normal environment, because lubricating agent is incorporated in Resin Nut.

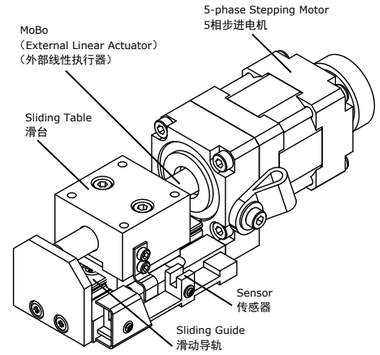
●公称型号的构成 / Model number notation

MA S – G 020 – 015 N R
① ② ③ ④ ⑤ ⑥ ⑦

①系列符号
MA：MoBo执行器系列
②构造符号
S：滑块型
③进给丝杠种类
G：精密滚珠丝杠
R：冷轧滚珠丝杠
Re：树脂螺母滑动丝杠
④导程 / 节距(mm)：020表示2mm
⑤行程(mm)：015表示15mm
⑥连接器种类
N：散线
H：广濑RP17
E：EI连接器（TE Connectivity制造）
⑦导线方向
R：右侧引线(从轴端侧看是右侧)
L：左侧引线

①Series No.
MA：MoBo Actuator Series
②Actuator type
S：Slider type
③Lead Screw / Ball Screw
G：Precision Ball Screw
R：Rolled Ball Screw
Re：Resin Lead Screw
④Lead / Pitch (mm): 020 means 2mm
⑤Travel (mm): 015 means 15mm
⑥Connector type
N：No connector (Bare)
H：HIROSE RP17
E：EI connector (TE Connectivity)
⑦Direction of Motor leads
R：Right (from Shaft end side)
L：Left

●构造 / Structure



●规格 Specifications

MoBo执行器的大致规格一览表如下所示。
详情请参照尺寸表。

Overall specifications for MoBo Actuators are shown in Table below.
For further information, please see dimension Table.

Model / 型号	MAS-G010-015	MAS-G010-030	MAS-R010-015	MAS-R010-030	MAS-Re020-015	MAS-Re020-030
Travel / 行程	15mm	30mm	15mm	30mm	15mm	30mm
Drive Screw 驱动丝杠	Precision Ball Screw 精密滚珠丝杠 Lead / 导程 = 1mm		Rolled Ball Screw 冷轧滚珠丝杠 Lead / 导程 = 1mm		Resin Lead Screw 树脂螺母滑动丝杠 Lead / 导程 = 2mm	
Sliding Guide / 导轨	Slide Guide rail / 滑动导轨					
Body Material 主体材质	Aluminum / 铝					
Mass / 质量	200g	210g	200g	210g	200g	210g
Resolution / 分辨率	0.002mm		0.002mm		0.004mm	
Repeatability 重复定位精度	Max. ±0.005mm		Max. ±0.01mm		Max. ±0.05mm	
Lost motion 空转	Max. 0.005mm		Max. 0.01mm		Max. 0.05mm	
Horizontal Load Capacity 水平可搬负载	Max. 29.4N		Max. 29.4N		Max. 9.8N	
Vertical Load Capacity 垂直可搬负载	Max. 19.6N		Max. 19.6N		Max. 4.9N	
Permissible speed 许用转速	0.4～20mm/sec		0.4～20mm/sec		0.8～15mm/sec	
Maximum acceleration 最大加速度	0.1m/sec²					
Permissble Moment 允许偏心力矩 Mp(Pitching / 俯仰)	0.16Nm	** In case of no load in My & Mr direction **My、Mr方向没有负载时				
Permissible Moment 允许偏心力矩 My(Yawing / 偏转)	0.10Nm	** In case of no load in Mp & Mr direction **Mp、Mr方向没有负载时				
Permissible Moment 允许偏心力矩 Mr(Rolling / 侧滚)	0.20Nm	** In case of no load in Mp & My direction **Mp、My方向没有负载时				
Operating Temp. 使用环境温度	0～40℃(without any due condensation / 无结露)					
Lubrication / 润滑	Ball Screw : KSS MSG No.2 Sliding Guide : KSS MSG No.2 滚珠丝杠：KSS MSG No.2 滑动导轨：KSS MSG No.2				Lead Screw: Sumitec Liquid H20 Sliding Guide: KSS MSG No.2 滑动丝杠: Sumitec Liquid H20 滑动导轨: KSS MSG No.2	

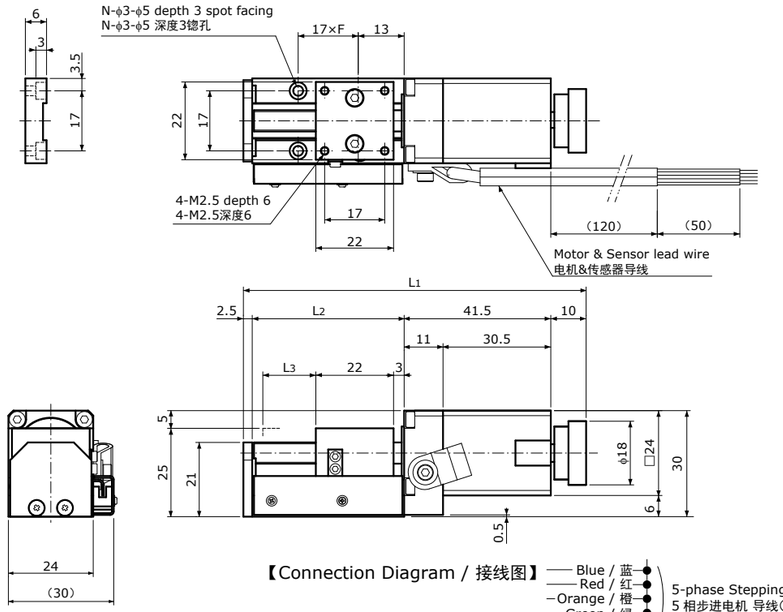
•Motor : 5-phase Stepping Motor □24(NEMA 10) , 0.75A/phase
•Photo Micro sensor : EE-SX1103(Omron) , DC5V 50mA (Motor side and Travel end)

•使用电机：5相步进电机24见方、0.75A/相
•光电微型传感器：欧姆龙EE-SX1103、DC5V 50mA(电机侧、电机对侧2处)

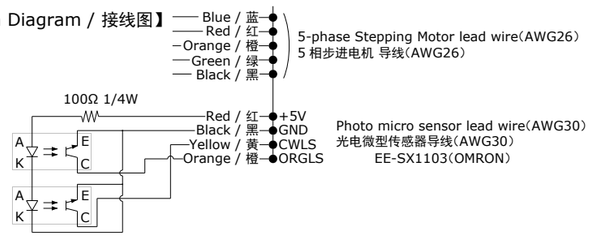
驱动滚珠丝杠+5相步进电机 / Drive Ball Screw + 5-phase Stepping Motor

MAS□24 / MAS NEMA 11

Shaft dia.(轴径)f6



【Connection Diagram / 接线图】

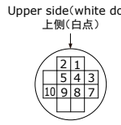


【连接器选择方案 / Connector choice】

请从下面指定连接器种类。
没有指示的采用散线。
Please designate connector type below.
No connector if there is no designation.

1）散线
2）广濑RP17-13J-12SC
3）EI-连接器(TE connectivity制造)
6芯(172211-6、电机)+4芯(172211-4、传感器)
1）None(Bare)
2）RP17-13J-12SC(HIROSE)
3）EI-Connector (TE connectivity：
172211-6 pins for Motor + 172211-4 pins for Sensor)

【HIROSE RP-Connector / 广濑RP17连接器规格】



RP17-13J-12SC(female / 插口)

1	Stepping Motor(Blue / 蓝)
2	Stepping Motor(Red / 红)
3	Stepping Motor(Orange / 橙)
4	Stepping Motor(Green / 绿)
5	Stepping Motor(Black / 黑)
6	None / 无
7	5V(Red / 红)
8	GND(Black / 黑)
9	CWLS Sensor(Yellow / 黄)
10	ORGLS Sensor(orange / 橙)
11	None / 无
12	None / 无

【EI-Connector / EI连接器规格】

172211-6(male / 插头)

1	Stepping Motor(Bule / 蓝)
2	Stepping Motor(Red / 红)
3	Stepping Motor(Orange / 橙)
4	Stepping Motor(Green / 绿)
5	Stepping Motor(Black / 黑)
6	None / 无

172211-4(male / 插头)

1	5V(Red / 红)
2	GND(Black / 黑)
3	CWLS Sensor(Yellow / 黄)
4	ORGLS Sensor(Orange / 橙)

Common Specifications / 通用规格	
Motor 使用电机	5-phase Stepping Motor 5相步进电机 □24, 0.75A / phase
Body Material 主体材质	Aluminum / 铝
Sliding guide 导向结构	Slide Guide rail(Single) 滑动导轨(1列)
Photo Sensor (Motor side & travel end) 光电传感器 (电机侧、电机对侧 2处)	Omron：EE-SX1103 欧姆龙：EE-SX1103 ※Light-on / 受光时ON
Permissible Moment / 允许偏心力矩	
Pitching / 俯仰 Mp	0.16Nm
Yawing / 偏转 My	0.10Nm
Rolling / 侧滚 Mr	0.20Nm
Lubrication / 润　滑	
MSG No.2(KSS original Grease / KSS 原装油脂) **Sumitec Liquid H20 for Resin Lead Screw **仅树脂螺母滑动丝杠为Sumitec Liquid H20	
Operating Temp. / 使用温度范围	
0～40℃	**无结露 **No due condensation

Model Number 执行器型号	Drive Screw type 进给丝杠型	Travel 行程 (mm)	Screw Lead 丝杠导程 (mm)	Resolution 分辨率 (mm)	Length / 长度 (mm) L1	L2	L3	F	N		Repeatability 重复定位精度 max./最大 (mm)	Lost Motion 空转 max./最大 (mm)	Load Capacity 可搬负载 max.(N/kgf) Hor. 水平	Vert. 垂直	Maximum Acceleration 最大加速度 (m/sec²)	Permissible speed 许用转速 (mm/sec)	Mass 质量 (g)	Model Number 执行器型号
MAS-G010-015NR	Precision Ball Screw 精密滚珠丝杠	15	1	0.002	97	43	15	1	4		±0.005	0.005	29.4/3.0	19.6/2.0	0.1	0.4～20	200	MAS-G010-015NR
MAS-R010-015NR	Rolled Ball Screw 冷轧滚珠丝杠		1	0.002	97	43	15	1	4		±0.01	0.01	29.4/3.0	19.6/2.0	0.1	0.4～20	200	MAS-R010-015NR
MAS-Re020-015NR	Resin Lead Screw 树脂螺母滑动丝杠		2	0.004	97	43	15	1	4		±0.05	0.05	9.8/1.0	4.9/0.5	0.1	0.8～15	200	MAS-Re020-015NR
MAS-G010-030NR	Precision Ball Screw 精密滚珠丝杠	30	1	0.002	112	58	30	2	6		±0.005	0.005	29.4/3.0	19.6/2.0	0.1	0.4～20	210	MAS-G010-030NR
MAS-R010-030NR	Rolled Ball Screw 冷轧滚珠丝杠		1	0.002	112	58	30	2	6		±0.01	0.01	29.4/3.0	19.6/2.0	0.1	0.4～20	210	MAS-R010-030NR
MAS-Re020-030NR	Resin Lead Screw 树脂螺母滑动丝杠		2	0.004	112	58	30	2	6		±0.05	0.05	9.8/1.0	4.9/0.5	0.1	0.8～15	210	MAS-Re020-030NR

注1）导线为散线及右侧引线时的型号。
注2）允许偏心力矩是其他方向没有负载时的值。
注3）上述为KSS标准规格品，特殊规格品请垂询本公司。需要特殊规格品时，请垂询本公司。
注4）有关与推荐驱动器(KR-A5CC、KR-A55MC)的接线，请参照第Q131页。
注5）执行器安装基准面请参照技术解说第S106页。

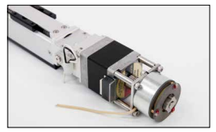
Note 1) Model Number above is for no-connector and lead wire is set on right side on Motor.
Note 2) Permissible moment is based on no load in other direction.
Note 3) Dimension above is our model case, if you need special specifications, please ask KSS representative.
Note 4) Refer to page Q131 for connection diagrams of recommended Driver (KR-A5CC, KR-A55MC).
Note 5) Please refer to Technical Description page S106 for the Datum clamp face of the Actuator.

●单轴执行器 选项 / Options for Single axis Actuator

【电磁刹车单元 / Solenoid Brake Unit】(仅限Flex系列 / Only for Flex series)

在竖轴上使用时，当切断电源后，滚珠丝杠或者滑动丝杠有可能因为自重而下落。与电磁刹车单元并用可保持中间位置。

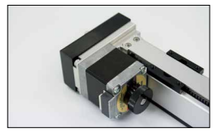
If Flex Actuators are operated in vertical position, Ball Screw / Lead Screw may fall down when its power is off. Solenoid Brake Unit is effective to maintain intermediate position.



【电机周边套件 / Motor side mounting kit】(仅限Flex系列 / Only for Flex series)

想要缩短纵向尺寸时，可使用周边套件。这是由电机座、正时带轮、正时齿带、固定螺丝等组成的套件。在KSS完成组装。

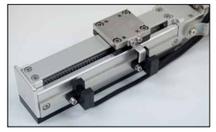
This kit can shorten the Actuator length with side mounting Motor shown in Photo right. Motor mount, timing pulley, timing belt and set screws are included in this kit. KSS can assemble in accordance with your request.



【外装光电微型传感器 / Photo-micro sensor】(仅限Flex系列 / Only for Flex series)

执行器上能够安装外装光电微型传感器。这是由传感设备、传感器导轨、光电传感器、安装盘、固定螺丝等组成的套件。在KSS完成组装。

Sensor accessories for the purpose of putting sensor outside Actuator. Sensor dog, sensor rail, photo sensor, sensor plate and set screws are included in this kit.
KSS can assemble in accordance with your reguest.



【油脂 / Grease】

用于执行器(滑动丝杠型除外)的KSS原装油脂(MSG No.2)。不会损伤微型滚珠丝杠的运作性，且润滑性能出色的油脂。请在油脂维护时使用。

KSS original Grease (MSG No.2) is used for KSS Flex Actuator series, except Lead Screw type. This Grease has high lubrication performance without deteriorating Ball Screw smooth movement. It would be useful for Grease maintenance to keep long term operation.

●推荐驱动器 / Recommended Driver

为使客户更方便地使用单轴执行器，本公司准备了标准驱动器、连接线等可供选配。
KSS provides Standard Stepping Motor Driver and Extension Cable as an option for Single axis Actuators in order to make it easy to use.

【标准驱动器 / Stepping Motor Driver】

KR-A5CC

DC24V 5相步进电机用驱动器。可以实现整步、半步切换。兼具电流自动下降功能(第V102页)。

This Driver is for 5-phase Stepping Motor operated by DC24V power supply. It has automatic current reduction circuits. You can choose full-step or half step function(page V102).

KR-A55MC

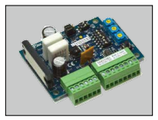
DC24V 5相步进电机用驱动器。可设定16种步进角，最大分割数为250的微型步进驱动器(第V103～V104页)。

Micro-Step Driver for 5-phase Stepping Motor with DC24V power supply. 16 step angle types can be set with up to 250 divisions(page V103～V104).

SD4015B3

适用于0.25～1.5A的2相步进电机的微型步进驱动器。可设定8种步进角(第V107页)。

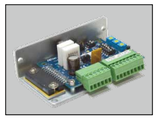
This is recommended 2-phase stepping Motor Driver for 0.25～1.5 A. It has Micro-Step function with 8-step angle(page V107).



SD4030B3

适用于0.5～3.0A的2相步进电机的驱动器。可设定8种步进角(第V108页)。

This is recommended 2-phase stepping Motor Driver for 0.5～3.0A. It has Micro-Step function with 8-step angle(page V108).



●连接线 / Extension Cable

KSS单轴执行器和KSS推荐驱动器的专用电缆。
请按照下面的例子指定电缆种类、电缆长度和连接器形状。单侧为散线，敬请注意。

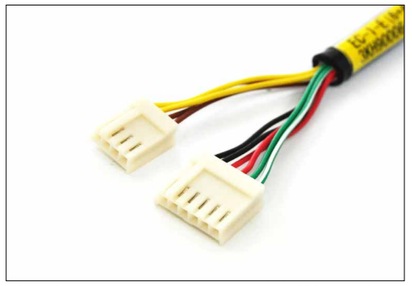
Extension Cable between KSS Single axis Actuators and KSS recommended Stepping Motor Driver.
Please designate Cable type, Cable length and Connector type in accordance with the example below.
Please note that one side of Extension Cable is cut endge only (no connector).

EC R − 2 − E(6)
① ② ③ ④

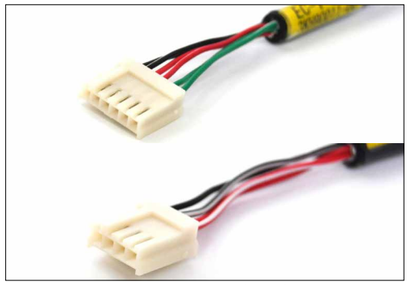
①连接线符号
②电缆种类
R:耐弯曲电缆
③电缆长度(m)
④连接器形状
N ：散线
H ：广濑RP17
E(6) ：EI 连接器 6芯(电机用)
E(4) ：EI 连接器 4芯(传感器用)
E(6+4) ：EI 连接器 6+4芯(电机＋传感器用)

①Extension Cable
②Cable type
R:Robot cable type
③Cable length (m)
④Connector type at both end
N : No connector (Bare)
H : HIROSE RP17
E(6) : EI connector 6-pins (for Motor only)
E(4) : EI connector 4-pins (for Sensor only)
E(6+4) : EI connector 6+4-pins (for Motor & Sensor)

H：HIROSE RP17 / 广濑RP17



E(6＋4)：EI connector 6+4-pins / EI连接器(6＋4芯)
(TE Connectivity)



E(6)：EI connector 6-pins / EI连接器6芯
E(4)：EI connector 4-pins / EI连接器4芯
(TE Connectivity)

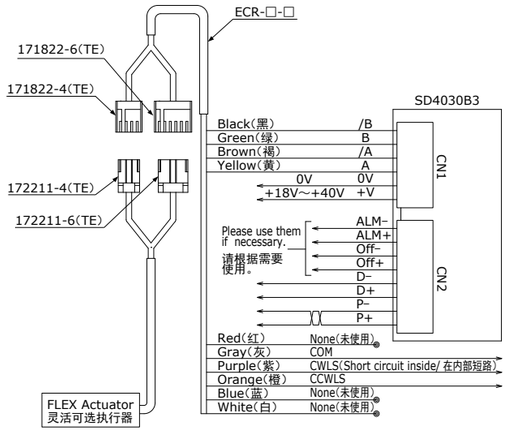
驱动器接线图 / Connection diagrams

●Flex系列 / For Flex series

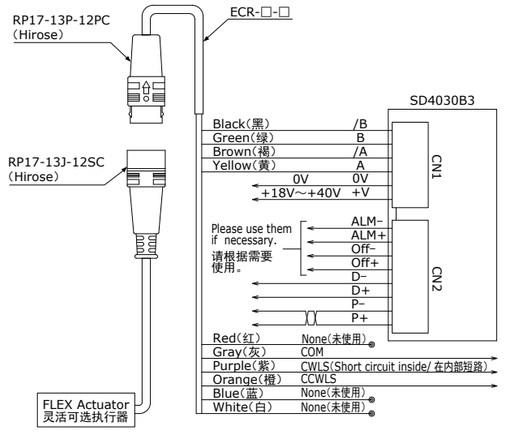
【SD4030B3 接线图 / SD4030B3 Connection diagrams】

适用电机 / Applicable Motor
美蓓亚电机公司　10PM-K202B
Minebea Moter　10PM-K202B

【EI连接器/EI connector】



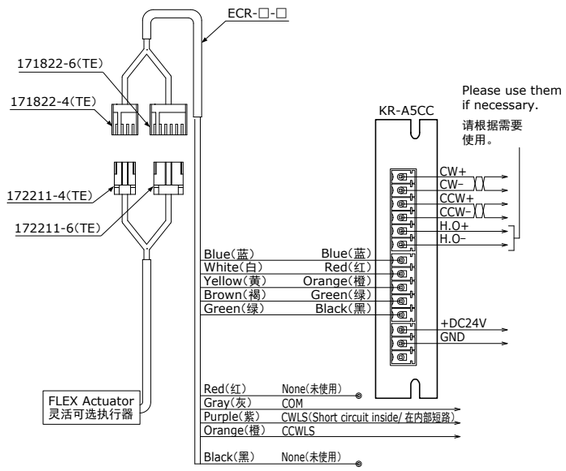
【广濑连接器/HIROSE connector】



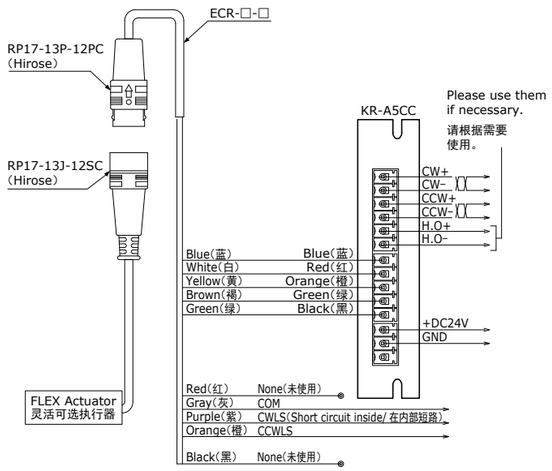
【KR-A5CC 接线图 / KR-A5CC Connection diagrams】

适用电机 / Applicable Motor
东方马达　PK523HPB
Oriental Moter　PK523HPB

【EI连接器/EI connector】



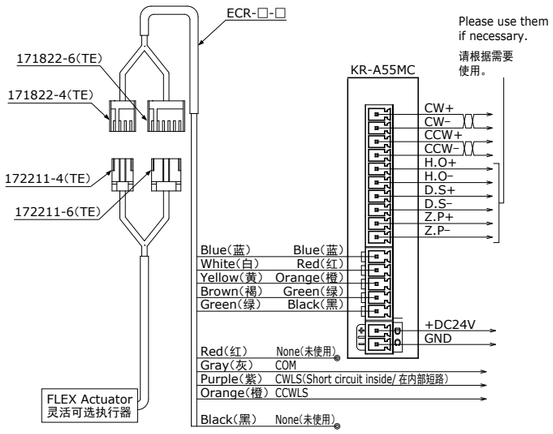
【广濑连接器/HIROSE connector】



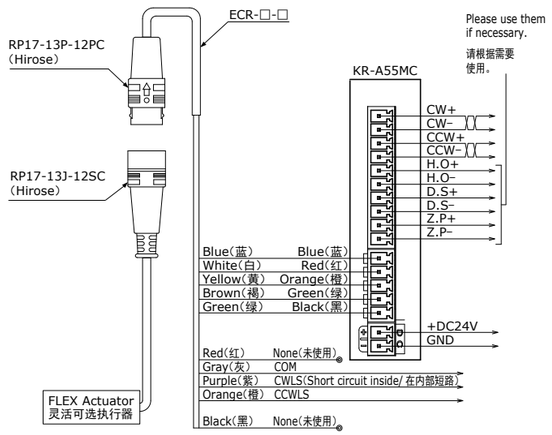
【KR-A55MC 接线图 / KR-A55MC Connection diagrams】

适用电机 / Applicable Motor
东方马达　PK523HPB
Oriental Moter　PK523HPB

【EI连接器/EI connector】



【广濑连接器/HIROSE connector】

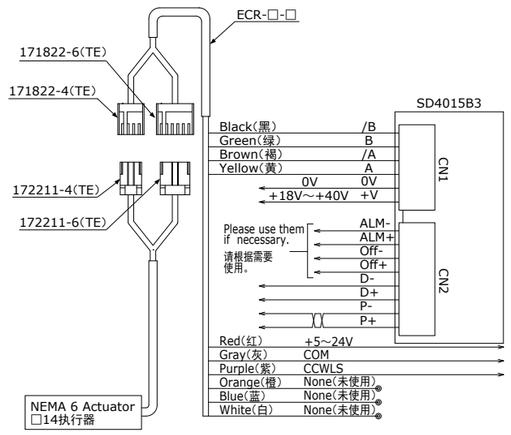


●CAS系列 / For CAS series

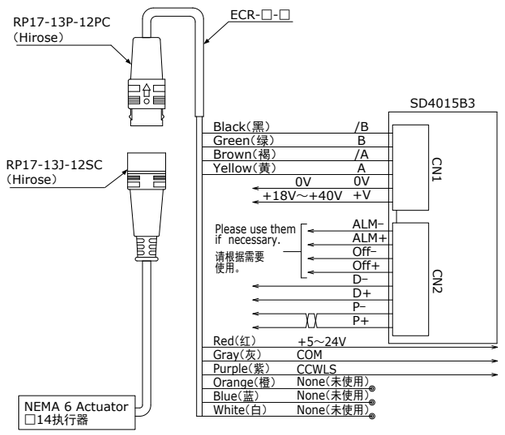
【 SD4015B3接线图 / SD4015B3 Connection diagrams】

适用电机 / Applicable Motor
山洋电气　SH2141-551
Sanyo　SH2141-551

【EI连接器/EI connector】



【广濑连接器/HIROSE connector】

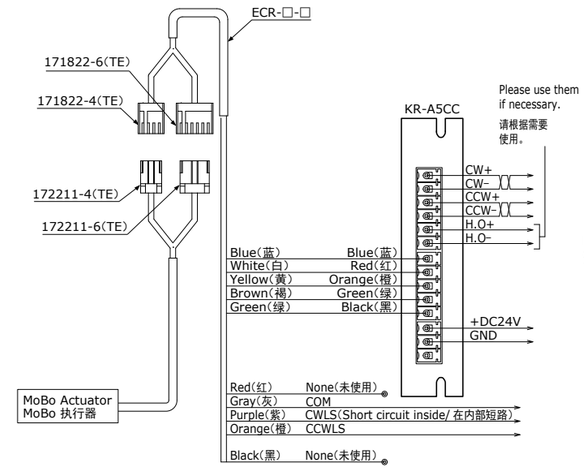


●MA系列 / For MA series

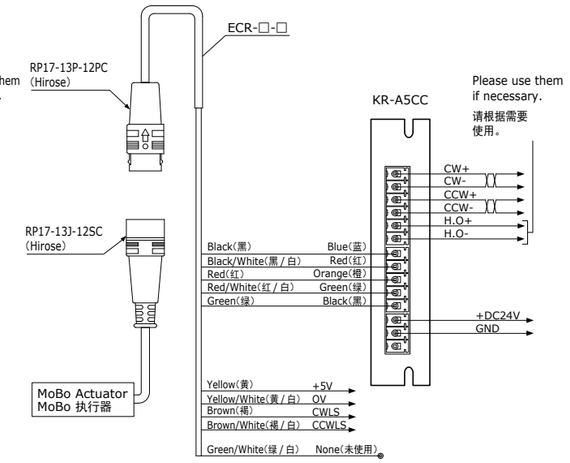
【KR-A5CC 接线图 / KR-A5CC Connection diagrams】

适用电机 / Applicable Motor
多摩川精机　线性执行器专用电机
TAMAGAWA SEIKI　Dedicated Motor for Linear Actuator

【EI连接器/EI connector】



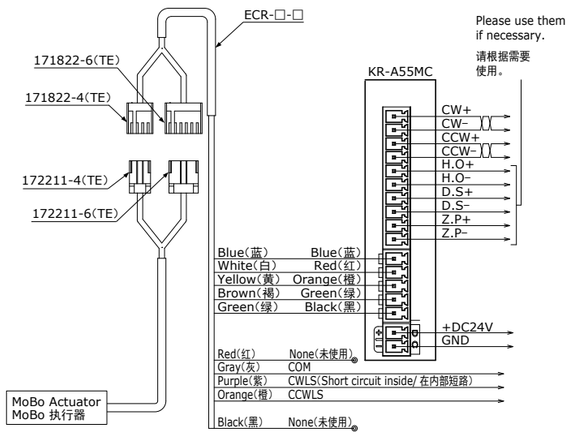
【广濑连接器/HIROSE connector】



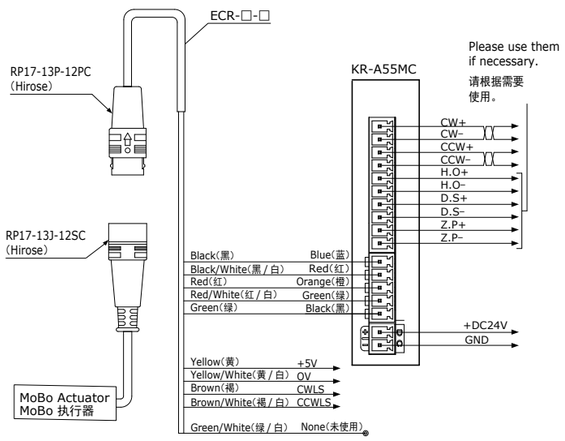
【KR-A55MC 接线图 / KR-A55MC Connection diagrams】

适用电机 / Applicable Motor
多摩川精机　线性执行器专用电机
TAMAGAWA SEIKI　Dedicated Motor for Linear Actuator

【EI连接器/EI connector】



【广濑连接器/HIROSE connector】



●操作、使用注意事项

【使用注意事项】

1）使用时请仔细阅读使用说明书，充分理解说明书内容，并务必严格遵守安全事项。
2）敲击本产品、使产品下落或对其施加超过规定值的轴向负载、径向负载，可能会导致产品损坏，请谨慎操作。
3）确认开包的产品有无异常或者是否为订购产品。
4）禁止分解各部配件，否则会引起污渍侵入或者各部装配精度下降。
5）防止污渍及碎粉侵入，否则异物侵入后会引起滚珠循环配件破损或缩短寿命、功能损失。
6）在使用滚珠丝杠 / 滑动丝杠的过程中，遵照油脂维护周期每2～3个月注入1次润滑剂。
使用过程中油脂变脏时，请擦去旧的油脂后涂抹新的规定油脂。
7）负载或许用转数等，不得超过本公司规格使用。
8）使用时请勿超过产品目录记载的最大加速度。
9）禁止手持电机线和传感器线。切实固定后运行。
10）远离磁性存储设备。

【安全注意事项】

1）如果出现异味、噪音、烟雾、过热或振动，请立即停止操作并关闭电源。
2）禁止使用超过额定电流的电源。
3）电机可能因负载条件及使用的驱动器而异常发热。应确保电机表面温度不超过80˚C。
4）请勿强行弯曲、拉扯、夹住导线。
5）动作中请勿触摸活动部位。
6）维护、检查前，请切断驱动器的输入电源。

【使用环境】

1）请勿在环境温度超过0～40˚C、环境湿度超过20～80%RH、有结露、腐蚀性气体、易燃气体的场所使用。
2）请勿在产生强电场、强磁场的场所使用。
3）禁止在金属屑、粉尘、油雾、切削液、水分、盐、有机溶剂出现或飞散的场所使用。
4）请勿在经常发生振动的场所以及冲击、真空等特殊环境下使用。

●Precaution of handling and operating

【Precaution for safety】

1）Before using these products, please read instruction manuals and follow the precautions below.
2）Do not hit or drop the Shaft, do not apply Axial or Radial load exceeding specifications, it may cause malfunction.
3）Before using, please check that the product has no defect, and product is the same as your order.
4）Do not disassemble each component, dust may get inside the product. It may deteriorate accuracy.
5）Please prevent contamination from dust or swarf. Dust or swarf may cause damage to Ball Screw/Lead Screw, which lead to deteriorating the function.
6）Single axis Actuator should be checked the lubricant condition every 2 to 3 months. If Grease is contaminated, remove old Grease and replace with new one. Grease should be the same as the original Grease, which is described in dimension table.
7）Do not use Single axis Actuator exceeding our specifications in Load or Speed.
8）Do not use Single axis Actuator beyond the Maximum Acceleration.
9）Do not hold the Motor leads and Sensor leads, this may result in damage to the device or injury. The Motor lead wire should be fixed securely.
10）Keep away from Magnetic memory device.

【Precaution for safety】

1）If abnormal odor, noise, smoke overheating, or vibration occurs, stop operation immediately and turn the power off.
2）Do not use exceeding rated current.
3）The Motor may overheat depending on the load conditions or driver used. Make sure that the Motor surface temperature does not exceed 80˚C when in use.
4）Do not bend, pull or pinch the Motor lead wire.
5）Do not touch moving parts during operation.
6）Please switch off the Driver, when inspection or maintenance.

【Operating environment】

1）Operating environment should be 0～40˚C in temperature and 20～80%RH in humidity. Do not use these products under dew condensation, corrosive gas or inflammable gas environment.
2）Do not use these products under strong electric field, strong magnetic field.
3）Please prevent from swarf, oil mist, cutting fluid, Water/moisture, salt spray, organic solvent and other contamination.
4）Single axis Actuator cannot be used under the vibration, impact, vacuum, and other special environment.

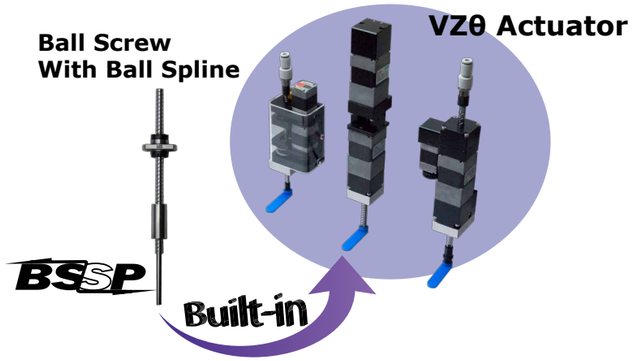
VZθ执行器篇
VZθActuator

VZθ 系列
VZθ Series

应用KSS微型滚珠丝杆花键(BSSP),在同一产品里实现直线运动(z),旋转(θ),吸附(Vacuum)功能的模组化产品。

The brand new products which applied the KSS miniature Ball Screw with Ball Spline (BSSP), and realized three functions, linear motion (Z), rotary motion (θ), and vacuum (V), with one product.

微型滚珠丝杠花键(BSSP)
Ball Screw with Ball Spline(BSSP)



●种类与特征 / Types and Features

KSS VZθ执行器有直接驱动型、混合驱动型、传送带驱动型(包括高速式)3种类型。
可根据用途和规格分别使用。

KSS provides 3-types of VZθ Actuator, which are Direct Drive type, Hybrid Drive type, and Belt-Drive type including high speed type. It is possible to select one of them according to your specifications or application.

直接驱动型
Direct Drive type

混合驱动型
Hybrid Drive type

传送带驱动型
Belt Drive type

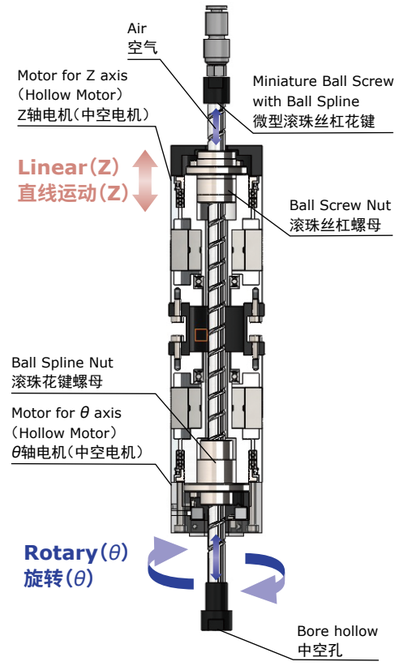
●规格 / Specifications

Model / 种类	Shaft dia. 直径 (mm)	Lead 导程 (mm)	Travel 行程 (mm)	Max. Speed(Z) 最高速度(Z) (mm/sec)	Max. speed(θ) 最高速度(θ) (rev/sec)	Thrust Force 推力 (N)	Max. Permissible Moment 最大允许负载力矩 (kg·m²)
Direct Drive type 直接驱动型	φ6	10	50	120	3	5	0.15×10^{-4}
	φ8	10	50	200	3	25	0.15×10^{-3}
Hybrid Drive type 混合驱动型	φ6	10	60	200	3	5	0.15×10^{-4}
Belt-Drive type 传送带驱动型	φ4	4	60	80	3	5	0.8×10^{-5}
	φ6	10	60,120	200	3	10	0.4×10^{-4}
	φ8	10	120	200	3	15	0.1×10^{-3}
Belt-Drive High speed type 传送带驱动型	φ6	10	80	500	25	3	0.15×10^{-4}

●构造 / Structures

【直接驱动型 / Direct Drive type】

中空电机直接驱动滚珠丝杠,滚珠花键螺母,从而实现紧凑型外观形状。
Slim form is realized by driving a Ball Screw and a Ball Spline Nut directly bult in a Hollow Motor.



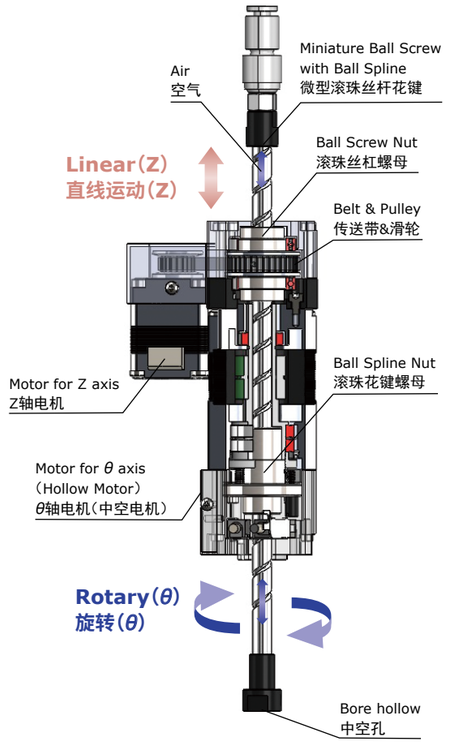
-动作原理-
直线运动(Z)
驱动Z轴电机旋转滚珠丝杠螺母,实现直线运动。
此时滚珠花键螺母起到丝杠轴的止转和导向结构的作用。
旋转(θ)
滚珠丝杠螺母和滚珠花键螺母同速同方向旋转,实现驱动轴原地旋转无上下直线运动。
吸附(V)

利用丝杠轴的中空孔提供正压和负压

-Principle of operation-
Linear motion(Z)
Linear motion by driving a Z-axis Motor and rotating the Ball Screw Nut. At this time, the Ball Spline Nut plays a role of anti-rotating device and slide guide of a Screw Shaft.
Rotation(θ)
Turn the Ball Screw Nut and Ball Spline Nut at the same time, same speed and direction, the Shaft rotates without moving up & down.
Vacuum(V)
Bore Hollow can be multi uses.
For example vacuum and blow function.

【混合驱动型/ Hybrid Drive type】

除了利用中空电机的直接驱动型以外,利用一般电机和传送带驱动相结合实现了轴向紧凑型设计。
Combination of the Hollow Motor and Normal Motor gives dramatically short length of Actuator Body.

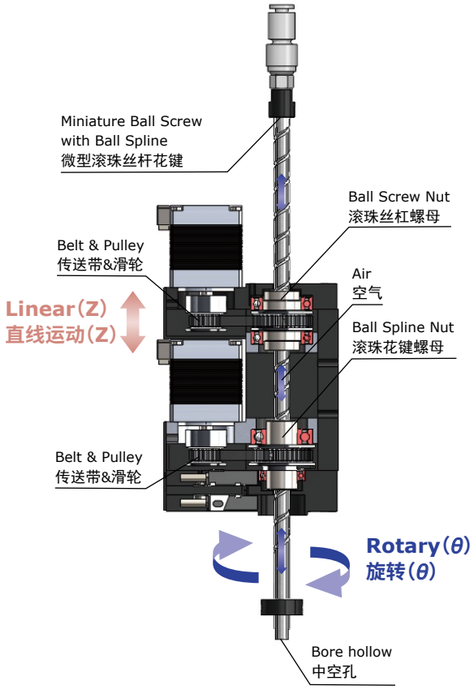


-动作原理-
直线运动(Z)
除了利用中空电机的直接驱动型以外,利用一般电机和传送带驱动相结合实现了轴向紧凑型设计。此时滚珠花键螺母起到丝杠轴的止转和导向结构作用。
旋转(θ)
滚珠丝杠螺母和滚珠花键螺母同速同方向旋转,实现驱动轴原地旋转无上下直线运动。
吸附(V)
利用丝杠轴的中空孔提供正压和负压

-Principle of operation-
Linear motion(Z)
For linear motion, drive the Ball Screw Nut by Z-axis Motor through the Belt & Pulley. In this case, Ball Spline Nut plays a role of slide guide & anti-rotating device.
Rotary Motion(θ)
Turn the Ball Screw Nut and Ball Spline Nut at the same time, same speed and direction, the Shaft rotates without moving up & down.
Vacuum(V)
Bore Hollow can be multi uses.
For example vacuum and blow function.

【传送带驱动型 / Belt Drive type】

传送带驱动实现电机泛用性，对应各种选项。
Wide variety of Motor can be set on this Actuator.
This means various options are available based on Motor Specifications.



-动作原理-

直线运动(Z)

驱动Z轴电机旋转滚珠丝杠螺母，实现直线运动。此时滚珠花键螺母起到丝杠轴的止转和导向结构的作用。

旋转(θ)

滚珠丝杠螺母和滚珠花键螺母同速同方向旋转，实现驱动轴原地旋转无上下直线运动。

吸附(V)

利用丝杠轴的中空孔提供正压和负压

-Principle of operation-

Linear motion(Z)

For linear motion, drive the Ball Screw Nut by Z-axis Motor through the Belt & Pulley. In this case, Ball Spline Nut plays a role of slide guide & anti-rotating device.

Rotation(θ)

Turn the Ball Screw Nut and Ball Spline Nut at the same time, same speed and direction, the Shaft rotates without moving up & down.

Vacuum(V)

Bore Hollow can be multi uses.
For example vacuum and blow function.

●公称型号 / Model number notation

【直接驱动型 / Direct Drive type　混合驱动型 / Hybird Drive type】

DD VZ 42 - G 05 - 050 N XXX
① ② ③ ④ ⑤ ⑥ ⑦ ⑧

①系列号
　DD：直接驱动型
　HD：混合驱动型
②执行器种类记号
　VZ：VZθ执行器
③电机尺寸
　42：□42角步进电机
　28：□28角步进电机
④驱动丝杠种类
　G：精密级滚珠丝杠＋滚珠花键
⑤导程 / 节距(mm)：05表示5mm
⑥行程(mm)： 050表示50mm
⑦连接器种类
　N：散线
　E：EI连接器(TE Connectivity制)
⑧特记

①Series No.
　DD：Direct Drive type
　HD：Hybrid Drive type
②Actuator type
　VZ：VZθ(VZ-theta) Actuator
③Motor size
　42：NEMA 17 Stepping Motor
　28：NEMA 11 Stepping Motor
④Lead Screw / Ball Screw type
　G：Precision Ball Screw+Ball Spline
⑤Lead / Pitch(mm)：05 means 5mm
⑥Travel(mm)：050 means 50mm
⑦Connector type
　N：No connector(Bare)
　E：EI connector(TE Connectivity)
⑧Extra notation

【传送带驱动型 / Belt Drive type】

BD VZ 06 — G 10 050 N 01 XXX
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

①系列号
　BD：传送带驱动执行器系列
②执行器种类记号
　VZ：VZθ执行器
③驱动丝杠直径：06表示6mm
④驱动丝杠种类
　G：精密级滚珠丝杠+滚珠花键
⑤导程 / 节距(mm) 10表示10mm
⑥行程(mm) 050表示50mm
⑦连接器种类
　N：散线
　E：EI连接器(TE Connectivity制)
⑧电机识别
　01：20角步进电机
　02：28角步进电机
　03：35角步进电机
⑨特记

①Series No.
　BD：Belt Drive Actuator Series
②Actuator type
　VZ：VZθ(VZ-theta) Actuator
③Shaft Nominal diameter：06 means 6mm
④Lead Screw / Ball Screw type
　G：Precision Ball Screw+Ball Spline
⑤Lead / Pitch(mm)：10 means 10mm
⑥Travel(mm)：050 means 50mm
⑦Connector type
　N：No connector(Bare)
　E：EI connector(TE Connectivity)
⑧Motor type
　01：NEMA 10 Stepping Motor
　02：NEMA 11 Stepping Motor
　03：NEMA 14 Stepping Motor
⑨Extra notation

【高速式传送带驱动型 / High Speed Belt Drive type】

对于高速式传送带驱动，以及在产品目录规格、形状的基础上进行了大幅变更的接单生产，公称型号的构成如下。
The model number nomination is as follows for High Speed Belt Drive type or custom design products which specifications and dimension significantly change from Catalogue.

DD 28 - G 100 100 N2 K 2 E - B
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

①执行器种类记号
　DD：直接驱动型
　HD：混合驱动型
　BD：传送带驱动型
②电机规格
　25：□25　　28：□28
　35：□35　　42：□42
③驱动丝杠种类
　G：精密级滚珠丝杠
④导程 / 节距(mm)：100表示10mm
⑤行程 (mm)：100表示100mm
⑥电机识别
　N2：2相步进电机
　N5：5相步进电机
　NE：带编码器步进电机
　NS：伺服电机
⑦传感器种类
　F：光电微型　　L：限位开关
　K：近距离　　Z：磁
⑧传感器数
　1：1个　　2：2个
⑨连接器种类
　H：广濑
　E：EI（TE Connectivity制）
　N：散线
⑩其他
　B：电磁刹车　　C：无尘规格　　V：吸附
　( )：电机相位角度

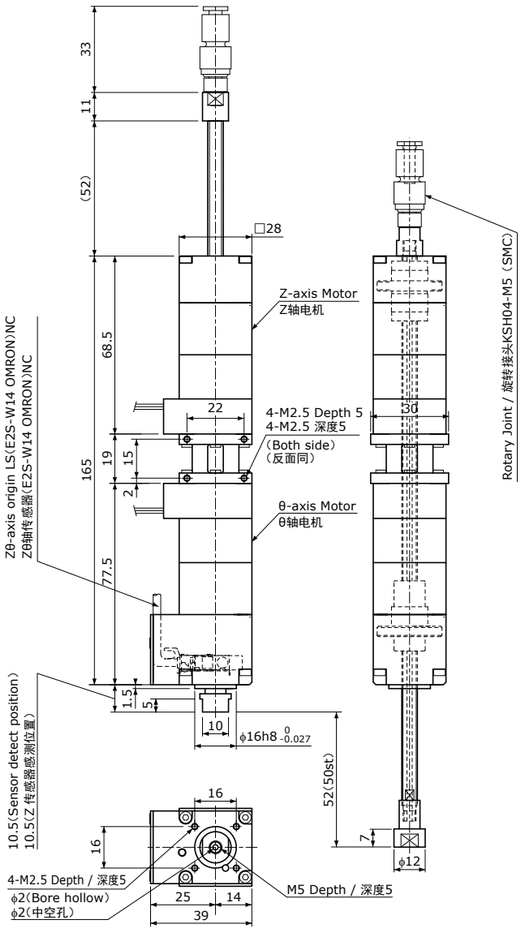
①Actuator type
　DD：Direct Drive Actuator Series
　HD：Hybrid Drive Actuator Series
　BD：Belt Drive Actuator Series
②Motor Frame size
　25：NEMA 10　　28：NEMA 11
　35：NEMA 14　　42：NEMA 17
③Lead Screw / Ball Screw type
　G：Precision Ball Screw
④Lead / Pitch(mm)：100 means 10mm
⑤Travel(mm)： 100 means 100mm
⑥Motor type
　N2：2-phase stepping motor
　N5：5-phase stepping motor
　NE：Stepping motor with Encoder
　NS：Servo motor
⑦Sensor type
　F：Photo-Micro　　L：Limit Switch
　K：Proximity　　Z：Magnetic
⑧Number of Sensor
　1：1 sensor　　2：2 sensors
⑨Connector type
　H：HIROSE
　E：EI（TE Connectivity）
　N：No connector（Bare）
⑩Option
　B：Electro Magnetic Brake
　C：for Clean room　　V：Vacuum
　( )：Motor position represented by degree

Standard style of VZθ DD series 标准形状 VZθ DD系列

Direct Drive type 直接驱动型

DDVZ28 - G10 - 050 N

□28 / NEMA 11 2-phase Stepping Motor(2相步进电机)
Lead(导程) 10mm Travel(行程) 50mm



Parts List 主要部件	
Motor 电机	NEMA 11 Hollow Stepping Motor 0.67A/phase □28 中空步进电机 0.67A/相
Drive Screw 驱动丝杠	Ball Screw f6 (Lead 10mm) 滚珠丝杠 f6 (导程 10mm)
Sliding Guide 导向结构	Ball Spline f6mm 滚珠花键 f6mm
Sensor (Linear,Rotary) 传感器 (直动、旋转)	Proximity Sensor E2S-W14-1M(OMRON) 近距离传感器 E2S-W14-1M(欧姆龙)

Motor(Z,θ-axis) / 电机(Z,θ轴)

A	Black(黑)
Ā	Green(绿)
B	Red(红)
B̄	Blue(蓝)

UL1061,AWG24(300mm)

Sensor(Z,θ-axis) / 传感器(Z,θ轴)

+12~24V	Brown(褐)
LS	Black(黑)
GND	Blue(蓝)

1000mm

●规格 / Specifications

※The numbers in table below are reference. Detail dimmensions will be provided by drawing.
※以下为参考值。详情记载于规格图中。

Items 项目	Z Axis Z轴	θ Axis θ轴
Movable Range 动作范围	50mm	± 360°
Repeatability 重复定位精度	±0.010mm	±0.03°
Resolution 分辨率	50μm (Full Step / 整步)	1.8° (Full Step / 整步)
Maximum Speed 最高速度	120mm / sec	3 rev / sec
Maximum acceleration 最大加速度	0.6 m/sec²	150π rad/sec²
Reference Thrust Force 参考推力	5N	—
Maximun Permissible Moment 最大允许惯性力矩	—	0.15×10⁻⁴kg·m²(※1)
Mass 重量	540g	
Operating Temperature 使用温度范围	0~40℃(No Condensation) 0~40℃(无结露)	

Reference of Moment of Inertia 负载偏心力矩标准		
Dia. / 直径	Height / 高度	
	Aluminum 铝材	Steel 铁材
f20mm	340mm(300g)	120mm(300g)
f30mm	65mm(130g)	25mm(130g)
f40mm	20mm(75g)	7.5mm(75g)

※1 For the Maximum Permissible Moment, see "Reference of Moment of Inertia" table above.
※2 For the technical information, see " Actuator Technical Description".

※1 θ轴最大允许负载力矩请参照"负载力矩标准"。
※2 技术数据请参照执行器技术解说。

Precautions
1) The Z-axis does not have brake device. Please be careful when the power supply is switched off in case Z-axis may free-fall.
2) Reference of Moment of Inertia table shows the theoretical values. KSS recommends that you should apply actual moment to the machine and confirm the safety operation before use.

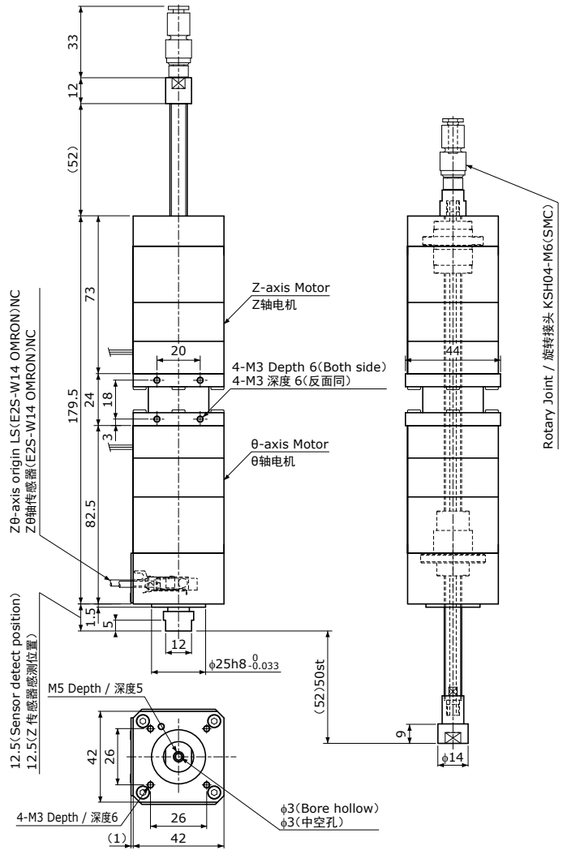
注意事项
1) Z轴不附带制动结构。关闭电源时Z轴可能会下落，敬请注意。
2) "负载力矩标准"为理论值。建议在使用前以实际负载的力矩进行动作确认。

Standard style of VZθ DD series 标准形状 VZθ DD系列

Direct Drive type 直接驱动型

DDVZ42 - G10 - 050 N

□42 / NEMA 17 2-phase Stepping Motor(2相步进电机)
Lead(导程) 10mm Travel(行程) 50mm



Parts List 主要部件	
Motor 电机	NEMA 17 Hollow Stepping Motor 1.2A/phase □42 中空步进电机 1.2A/相
Drive Screw 驱动丝杠	Ball Screw f8 (Lead 10mm) 滚珠丝杠 f8 (导程 10mm)
Sliding Guide 导向结构	Ball Spline f8mm 滚珠花键 f8mm
Sensor (Linear, Rotary) 传感器 (直动、旋转)	Proximity Sensor E2S-W14-1M(OMRON) 近距离传感器 E2S-W14-1M(欧姆龙)

Motor(Z,θ-axis) / 电机(Z,θ轴)

A	Black(黑)
Ā	Green(绿)
B	Red(红)
B̄	Blue(蓝)

UL1061,AWG24(300mm)

Sensor(Z,θ-axis) / 传感器(Z,θ轴)

+12~24V	Brown(褐)
LS	Black(黑)
GND	Blue(蓝)

1000mm

●规格 / Specifications

※The numbers in table below are reference. Detail dimmensions will be provided by drawing.
※以下为参考值。详情记载于规格图中。

Items 项目	Z Axis Z轴	θ Axis θ轴
Movable Range 动作范围	50mm	± 360°
Repeatability 重复定位精度	±0.010mm	±0.03°
Resolution 分辨率	50μm (Full Step / 整步)	1.8° (Full Step / 整步)
Maximum Speed 最高速度	200mm / sec	3 rev / sec
Maximum acceleration 最大加速度	1 m/sec²	150π rad/sec²
Reference Thrust Force 参考推力	25N	—
Maximun Permissible Moment 最大允许惯性力矩	—	0.15×10⁻³kg·m²(※1)
Mass 重量	1150g	
Operating Temperature 使用温度范围	0~40℃(No Condensation) 0~40℃(无结露)	

Reference of Moment of Inertia 负载偏心力矩标准		
Dia. / 直径	Height / 高度	
	Aluminum 铝材	Steel 铁材
f30mm	670mm(1300g)	240mm(1300g)
f50mm	85mm(460g)	30mm(460g)
f100mm	5mm(110g)	1.5mm(90g)

※1 For the Maximum Permissible Moment, see "Reference of Moment of Inertia" table above.
※2 For the technical information, see " Actuator Technical Description".

※1 θ轴最大允许负载力矩请参照"负载力矩标准"。
※2 技术数据请参照执行器技术解说。

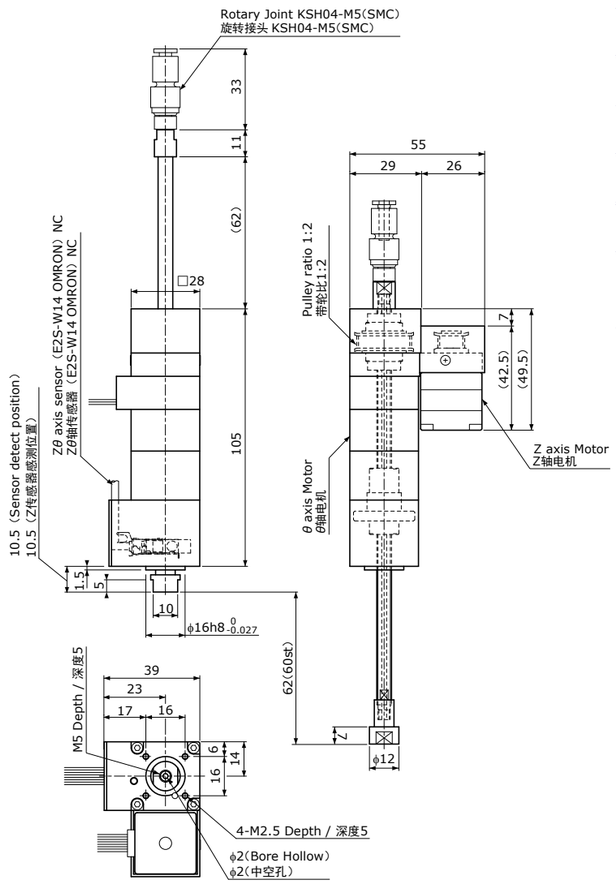
Precautions
1) The Z-axis does not have brake device. Please be careful when the power supply is switched off in case Z-axis may free-fall.
2) Reference of Moment of Inertia table shows the theoretical values. KSS recommends that you should apply actual moment to the machine and confirm the safety operation before use.

注意事项
1) Z轴不附带制动结构。关闭电源时Z轴可能会下落，敬请注意。
2) "负载力矩标准"为理论值。建议在使用前以实际负载的力矩进行动作确认。

Standard style of VZθ HD series 标准形状 VZθ HD系列 — Hybrid type 混合驱动型

HDVZ28 - G10 - 060 N

□25/28 (NEMA10/11) 2-phase Stepping Motor(2相步进电机)
Lead(导程)10mm Travel(行程) 60mm



Parts List 主要部件		
Motor 电机	Z	NEMA 10 Stepping Motor 0.7A/phase □25 步进电机 0.7A/相
	θ	NEMA 11 Hollow Stepping Motor 0.67A/phase □28 中空步进电机 0.67A/相
Drive Screw 驱动丝杠		Ball Screw f6 (Lead 10mm) 滚珠丝杠 f6 (导程 10mm)
Sliding Guide 导向结构		Ball Spline f6mm 滚珠花键 f6mm
Sensor (Linear, Rotary) 传感器 (直动、旋转)		Proximity Sensor E2S-W14-1M(OMRON) 近距离传感器 E2S-W14-1M(欧姆龙)

Z-axis Motor / Z 轴电机

A	Red(红)
Ā	Yellow(黄)
B	Blue(蓝)
B̄	Orange(橙)

UL1061,AWG26(300mm)

θ-axis Motor / θ轴电机

A	Black(黑)
Ā	Green(绿)
B	Red(红)
B̄	Blue(蓝)

UL1061,AWG24(300mm)

Sensor(Z,θ-axis) / 传感器(Z,θ轴)

+12~24V	Brown(褐)
LS	Black(黑)
GND	Blue(蓝)

1000mm

●规格 / Specifications

※The numbers in table below are reference. Detail dimmensions will be provided by drawing.
※以下为参考值。详情记载于规格图中。

Items 项目	Z Axis Z轴	θ Axis θ轴
Movable Range 动作范围	60mm	± 360°
Repeatability 重复定位精度	±0.020mm	±0.03°
Resolution 分辨率	25μm (Full Step / 整步)	1.8° (Full Step / 整步)
Maximum Speed 最高速度	200mm / sec	3 rev / sec
Maximum acceleration 最大加速度	1 m/sec²	150π rad/sec²
Reference Thrust Force 参考推力	5N	—
Maximun Permissible Moment 最大允许惯性力矩	—	0.15×10⁻⁴kg·m²(※1)
Reduction ratio 减速比	1/2	—
Mass 重量	440g	
Operating Temperature 使用温度范围	0~40℃(No Condensation) 0~40℃(无结露)	

※1 For the Maximum Permissible Moment, see "Reference of Moment of Inertia" table above.
※2 For the technical information, see " Actuator Technical Description".

※1 θ轴最大允许负载力矩请参照"负载力矩标准"。
※2 技术数据请参照执行器技术解说。

Reference of Moment of Inertia 负载偏心力矩标准		
Dia. / 直径	Height / 高度	
	Aluminum 铝材	Steel 铁材
f20mm	340mm(300g)	120mm(300g)
f30mm	65mm(130g)	25mm(130g)
f40mm	20mm(75g)	7.5mm(75g)

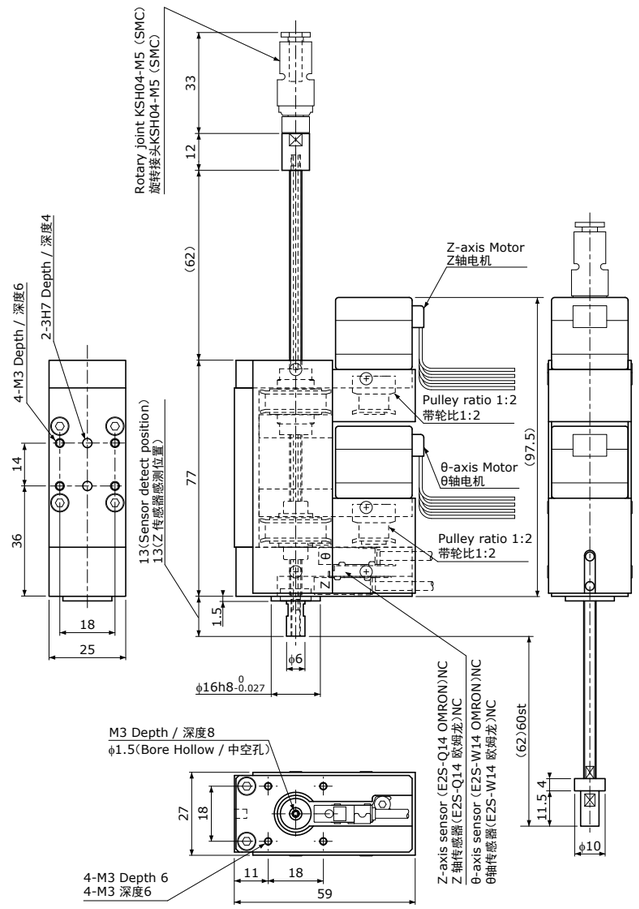
Precautions
1) The Z-axis does not have brake device. Please be careful when the power supply is switched off in case of Z-axis may free-fall.
2) Reference of Moment of Inertia table shows the theoretical values. KSS recommends that you should apply actual moment to the machine and confirm the safety operation before use.

注意事项
1) Z轴不附带制动结构。关闭电源时Z轴可能会下落,敬请注意。
2) "负载力矩标准"为理论值。建议在使用前以实际负载的力矩进行动作确认。

Standard style of VZθ BD series 标准形状 VZθBD系列 — Belt Drive type 传送带驱动型

BDVZ04 - G04 - 060 N 01

□25/NEMA 10 2-phase Stepping Motor(2相步进电机)
Lead(导程) 4mm Travel(行程) 60mm



Parts List 主要部件	
Motor 电机	NEMA 10 Stepping Motor 0.7A/phase □25 步进电机 0.7A/相
Drive Screw 驱动丝杠	Ball Screw f4 (Lead 4mm) 滚珠丝杠 f4(导程 4mm)
Sliding Guide 导向结构	Ball Spline f4mm 滚珠花键 f4mm
Sensor 传感器	Z axis:Proximity Sensor E2S-Q14-1M (OMRON) NC Z轴:近距离传感器E2S-Q14-1M (欧姆龙) NC θ axis:Proximity Sensor E2S-W14-1M (OMRON) NC θ轴:近距离传感器E2S-W14-1M (欧姆龙) NC

Motor(Z,θ-axis) / 电机(Z,θ轴)

A	Red(红)
Ā	Yellow(黄)
B	Blue(蓝)
B̄	Orange(橙)

UL1061,AWG26(300mm)

Sensor(Z,θ-axis) / 传感器(Z,θ轴)

+12~24V	Brown(褐)
LS	Black(黑)
GND	Blue(蓝)

1000mm

●规格 / Specifications

※The numbers in table below are reference. Detail dimmensions will be provided by drawing.
※以下为参考值。详情记载于规格图中。

Items 项目	Z Axis Z轴	θ Axis θ轴
Movable Range 动作范围	60mm	± 360°
Repeatability 重复定位精度	±0.020mm	±0.03°
Resolution 分辨率	10μm (Full Step / 整步)	0.9° (Full Step / 整步)
Maximum Speed 最高速度	80mm / sec	3 rev / sec
Maximum acceleration 最大加速度	0.4 m/sec²	150π rad/sec²
Reference Thrust Force 参考推力	5N	—
Maximun Permissible Moment 最大允许惯性力矩	—	0.8×10⁻⁵kg·m²(※1)
Reduction ratio 减速比	1/2	1/2
Mass 重量	370g	
Operating Temperature 使用温度范围	0~40℃(No Condensation) 0~40℃(无结露)	

※1 For the Maximum Permissible Moment, see "Reference of Moment of Inertia" table above.
※2 For the technical information, see " Actuator Technical Description".

※1 θ轴最大允许负载力矩请参照"负载力矩标准"。
※2 技术数据请参照执行器技术解说。

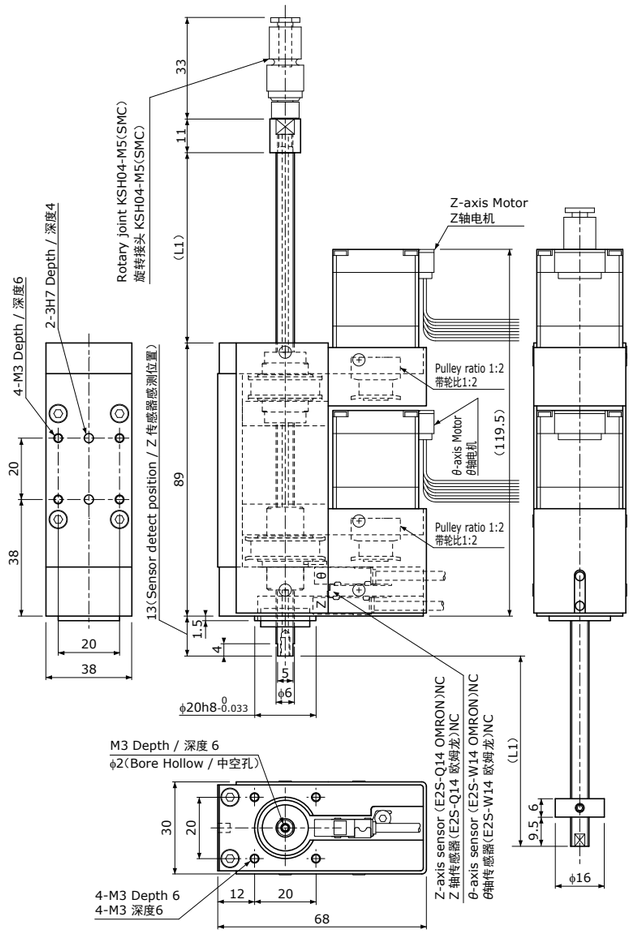
Reference of Moment of Inertia 负载偏心力矩标准		
Dia. / 直径	Height / 高度	
	Aluminum 铝材	Steel 铁材
f20mm	180mm(160g)	64mm(160g)
f30mm	36mm(70g)	12.5mm(70g)
f40mm	11mm(40g)	4mm(40g)

Precautions
1) The Z-axis does not have brake device. Please be careful when the power supply is switched off in case of Z-axis may free-fall.
2) Reference of Moment of Inertia table shows the theoretical values. KSS recommends that you should apply actual moment to the machine and confirm the safety operation before use.

注意事项
1) Z轴不附带制动结构。关闭电源时Z轴可能会下落,敬请注意。
2) "负载力矩标准"为理论值。建议在使用前以实际负载的力矩进行动作确认。

BDVZ06 - G10 - 060/120 N 02

□28/NEMA 11 2-phase Stepping Motor(2相步进电机)
Lead(导程) 10mm Travel(行程) 60/120mm



Parts List 主要部件	
Motor 电机	NEMA 11 Stepping Motor 1.5A/phase □28 步进电机 1.5A/相
Drive Screw 驱动丝杠	Ball Screw f6 (Lead 10mm) 滚珠丝杠 f6(导程 10mm)
Sliding Guide 导向结构	Ball Spline f6mm 滚珠花键 f6mm
Sensor 传感器	Z axis:Proximity Sensor E2S-Q14-1M (OMRON) NC Z轴:近距离传感器E2S-Q14-1M (欧姆龙) NC θ axis:Proximity Sensor E2S-W14-1M (OMRON) NC θ轴:近距离传感器E2S-W14-1M (欧姆龙) NC

Motor(Z,θ-axis) / 电机(Z,θ轴)

A	Black(黑)
Ā	Green(绿)
B	Red(红)
B̄	Blue(蓝)

UL3265,AWG24(600mm)

Sensor(Z,θ-axis) / 传感器(Z,θ轴)

+12~24V	Brown(褐)
LS	Black(黑)
GND	Blue(蓝)

1000mm

	L1
Travel / 行程 60mm	62
Travel / 行程 120mm	122

●规格 / Specifications

※The numbers in table below are reference. Detail dimmensions will be provided by drawing.
※以下为参考值。详情记载于规格图中。

Items 项目	Z Axis Z轴	θ Axis θ轴
Movable Range 动作范围	60mm / 120mm	± 360°
Repeatability 重复定位精度	±0.020mm	±0.03°
Resolution 分辨率	25μm (Full Step / 整步)	0.9° (Full Step / 整步)
Maximum Speed 最高速度	200mm / sec	3 rev / sec
Maximum acceleration 最大加速度	1 m/sec²	150π rad/sec²
Reference Thrust Force 参考推力	10N	—
Maximun Permissible Moment 最大允许惯性力矩	—	0.4×10⁻⁴kg·m²(※1)
Reduction ratio 减速比	1/2	1/2
Mass 重量	590g(60 travel), 600g(120 travel) 590g(60行程), 600g(120行程)	
Operating Temperature 使用温度范围	0~40℃(No Condensation) 0~40℃(无结露)	

※1 For the Maximum Permissible Moment, see "Reference of Moment of Inertia" table above.
※2 For the technical information, see " Actuator Technical Description".

※1 θ轴最大允许负载力矩请参照"负载力矩标准"。
※2 技术数据请参照执行器技术解说。

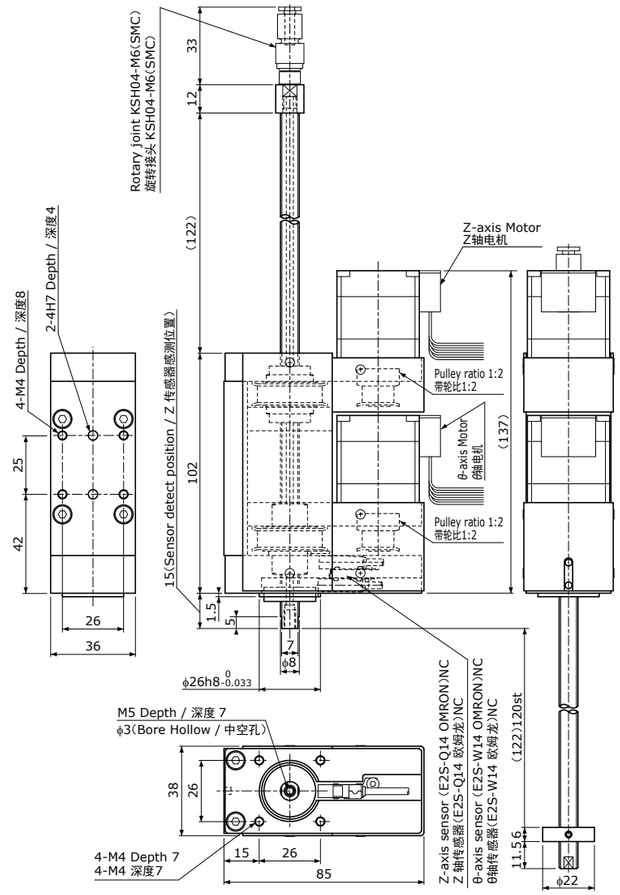
Reference of Moment of Inertia 负载偏心力矩标准		
Dia. / 直径	Height / 高度	
	Aluminum 铝材	Steel 铁材
f30mm	180mm(360g)	65mm(360g)
f40mm	57mm(200g)	20mm(200g)
f50mm	23mm(130g)	8.5mm(130g)

Precautions
1) The Z-axis does not have brake device. Please be careful when the power supply is switched off in case of Z-axis may free-fall.
2) Reference of Moment of Inertia table shows the theoretical values. KSS recommends that you should apply actual moment to the machine and confirm the safety operation before use.

注意事项
1) Z轴不附带制动结构。关闭电源时Z轴可能会下落,敬请注意。
2) "负载力矩标准"为理论值。建议在使用前以实际负载的力矩进行动作确认。

BDVZ08 - G10 - 120 N 03

□35 / NEMA 14 2-phase Stepping Motor(2相步进电机)
Lead(导程) 10mm Travel(行程) 120mm



Parts List 主要部件	
Motor 电机	NEMA 14 Stepping Motor 1.5A/phase □35 步进电机 1.5A/相
Drive Screw 驱动丝杠	Ball Screw f8 (Lead 10mm) 滚珠丝杠 f8(导程 10mm)
Sliding Guide 导向结构	Ball Spline f8mm 滚珠花键 f8mm
Sensor 传感器	Z axis:Proximity Sensor E2S-Q14-1M (OMRON) NC Z轴:近距离传感器E2S-Q14-1M (欧姆龙) NC θ axis:Proximity Sensor E2S-W14-1M (OMRON) NC θ轴:近距离传感器E2S-W14-1M (欧姆龙) NC

Motor(Z,θ-axis) / 电机(Z,θ轴)

A	Black(黑)
Ā	Green(绿)
B	Red(红)
B̄	Blue(蓝)

UL3265,AWG24(600mm)

Sensor(Z,θ-axis) / 传感器(Z,θ轴)

+12~24V	Brown(褐)
LS	Black(黑)
GND	Blue(蓝)

1000mm

●规格 / Specifications

※The numbers in table below are reference. Detail dimmensions will be provided by drawing.
※以下为参考值。详情记载于规格图中。

Items 项目	Z Axis Z轴	θ Axis θ轴
Movable Range 动作范围	120mm	± 360°
Repeatability 重复定位精度	±0.020mm	±0.03°
Resolution 分辨率	25μm (Full Step / 整步)	0.9° (Full Step / 整步)
Maximum Speed 最高速度	200mm / sec	3 rev / sec
Maximum acceleration 最大加速度	1 m/sec²	150π rad/sec²
Reference Thrust Force 参考推力	15N	—
Maximun Permissible Moment 最大允许惯性力矩	—	0.1×10⁻³kg·m²(※1)
Reduction ratio 减速比	1/2	1/2
Mass 重量	1000g	
Operating Temperature 使用温度范围	0~40℃(No Condensation) 0~40℃(无结露)	

※1 For the Maximum Permissible Moment, see "Reference of Moment of Inertia" table above.
※2 For the technical information, see " Actuator Technical Description".

※1 θ轴最大允许负载力矩请参照"负载力矩标准"。
※2 技术数据请参照执行器技术解说。

Reference of Moment of Inertia 负载偏心力矩标准		
Dia. / 直径	Height / 高度	
	Aluminum 铝材	Steel 铁材
f40mm	142mm(500g)	50mm(500g)
f50mm	58mm(320g)	20.5mm(320g)
f60mm	28mm(220g)	10mm(220g)

Precautions
1) The Z-axis does not have brake device. Please be careful when the power supply is switched off in case of Z-axis may free-fall.
2) Reference of Moment of Inertia table shows the theoretical values. KSS recommends that you should apply actual moment to the machine and confirm the safety operation before use.

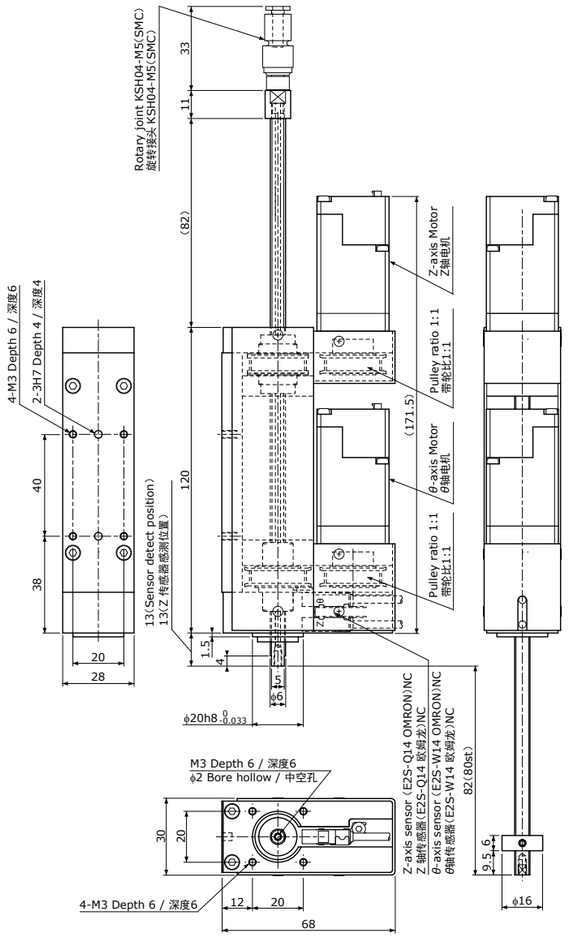
注意事项
1) Z轴不附带制动结构。关闭电源时Z轴可能会下落,敬请注意。
2) "负载力矩标准"为理论值。建议在使用前以实际负载的力矩进行动作确认。

Standard style of VZθ BD series 标准形状 VZθ BD系列

Belt Drive High Speed type 高速式传送带驱动型

BD28-G100 080 NEK2N-V

□28 / NEMA 11 2-phase Stepping-Servo Motor type(2相步进伺服电机型)
Lead(导程) 10mm Travel(行程) 80mm



Parts List 主要部件	
Motor 电机	NEMA 11 Stepping-Servo Motor TSM11Q-2RM □28步进伺服电机 TSM11Q-2RM
Drive Screw 驱动丝杠	Ball Screw f6(Lead 10mm) 滚珠丝杠 f6(导程 10mm)
Sliding Guide 导向结构	Ball Spline f6mm 滚珠花键 f6mm
Sensor 传感器	Z axis:Proximity Sensor E2S-Q14-1M (OMRON) NC Z轴:近距离传感器E2S-Q14-1M (欧姆龙) NC θ axis:Proximity Sensor E2S-W14-1M (OMRON) NC θ轴:近距离传感器E2S-W14-1M (欧姆龙) NC

Sensor(Z,θ-axis) / 传感器(Z,θ轴)

+12~24V	Brown(褐)
LS	Black(黑)
GND	Blue(蓝)

1000mm

●规格 / Specifications

※The numbers in table below are reference. Detail dimmensions will be provided by drawing.
※以下为参考值。详情记载于规格图中。

Items 项目	Z Axis Z轴	θ Axis θ轴
Movable Range 动作范围	80mm(※1)	± 360°
Repeatability 重复定位精度	±0.020mm	±0.03°
Resolution 分辨率	0.5μm(※2)	0.018°(※2)
Maximum Speed 最高速度	500mm / sec	25 rev/sec
Maximum acceleration 最大加速度	10 m/sec²	1000π rad/sec²
Reference Thrust Force 参考推力	3N	—
Maximun Permissible Moment / 最大允许惯性力矩	—	0.15×10⁻⁴kg·m²(※3)
Reduction ratio / 减速比	1/1	
Mass 重量	740g	
Operating Temperature / 使用温度范围	0~40℃(No Condensation) / 0~40℃(无结露)	

※1) Travel length(Movable Range) can be changed according to your request.
※2) Default setting : 20,000 steps / rev
※3) For the Maximum Permissible Moment, see "Reference of Moment of Inertia" table above.
※4) For the technical information, see " Actuator Technical Description".

※1) 行程可根据需要变更。
※2) 出厂设定:20,000 steps / rev
※3) θ轴最大允许力矩请参照"负载力矩标准"。
※4) 技术数据请参照执行器技术解说。

Reference of Moment of Inertia 负载偏心力矩标准		
Dia. / 直径	Height / 高度	
	Aluminum 铝材	Steel 铁材
f30mm	65mm(128g)	23mm(128g)
f40mm	21mm(74g)	7.5mm(74g)
f50mm	8.5mm(46g)	3mm(46g)

Precautions
1) The Z-axis does not have brake device. Please be careful when the power supply is switched off in case Z-axis may free-fall.
2) Reference of Moment of Inertia table shows the theoretical values. KSS recommends that you should apply actual moment to the machine and confirm the safety operation before use.

注意事项
1) Z轴不附带制动结构。关闭电源时Z轴可能会下落，敬请注意。
2) "负载力矩标准"为理论值。建议在使用前以实际负载的力矩进行动作确认。

●电机侧引脚配线 / Connector Pin diagram

Pin No.	Name	Color / 颜色	Description / 说明
1	Y2	Purple / 紫	Open drain outputs with freewheeling diode (30 VDC, 100 mA in max.) 带飞轮二极管漏极开路输出 (DC30V 最大100 mA)
2	Y1	Orange / 橙	
3	X4	White / 白	Digital inputs (input high voltage 5~24 VDC, input low voltage below 1 VDC, signal frequency 1 MHz in max.) 数字输入(High : 5~24V、Low : 1V以下) 信号输入频率 : 最大1MHz
4	X3	Brown / 褐	
5	X2	Yellow / 黄	Digital inputs (input high voltage 5~24 VDC, input low voltage below 2 VDC, signal frequency 1 MHz in max.) 数字输入(High : 5~24V、Low : 2V以下) 信号输入频率 : 最大1MHz
6	X1	Gray / 灰	
7	RX-	Green and White / 绿白	RS-422/485 interface differential signals RS-422/485接口差分信号
8	RX+	Green / 绿	
9	TX-	Blue and White /蓝白	
10	TX+	Blue / 蓝	
11	+	Red / 红	V+ power supply(typ. 24 VDC) V+ 电源(公称值 DC24V)
12	—	Black / 黑	V- power ground(GND) V- 电源(GND)

Note 1) All digital inputs & outputs are referenced to the power ground-(V-).
Note 2) Please use Mating Cable.

注1) 所有数字输入输出均以电源GND(-V)为基准。
注2) 请使用附带电缆。

●选项 / Attachment

为使用户更方便地使用VZθ执行器，本公司准备了标准驱动、连接线等可供选配。

KSS provides Standard Stepping Motor Driver and Extension Cable as an option for VZθ Actuators in order to make it easy to use.

[标准驱动器/ Stepping Motor Driver]

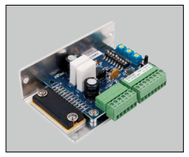
SD4030B3

2相步进电机用推荐驱动器

可设定8种步进角（V108页）

This is recommended Driver for 2-phase stepping Motor.

It has Micro-Step function with 8-step angle.（page V108）



※注意事项

- SD4030B3的出货时电流设定为2A
- 使用前请确认电机额定电流之后，再设定驱动器电流。
- 请按驱动器附属使用说明书内容设定电流。

※Caution

- The factory setting of SD4030B3 is 2A.
- Please be sure to perform a current setup of Driver based on Motor Rated current before use.
- Please confirm the operation manual attached to a Driver about current setup.

[连接线]

KSS VZθ执行器和KSS推荐驱动器专用连接线。
以下实例以外，可指定长度，连接器形状。一端为散线，敬请注意。

[Extension Cable]

Extension Cable between VZθ Actuators and KSS recommended Stepping Motor Driver.
Please designate Cable length and Connector type in accordance with the example below.
Please note that one side of Extension Cable is cut endge only（Bare）.

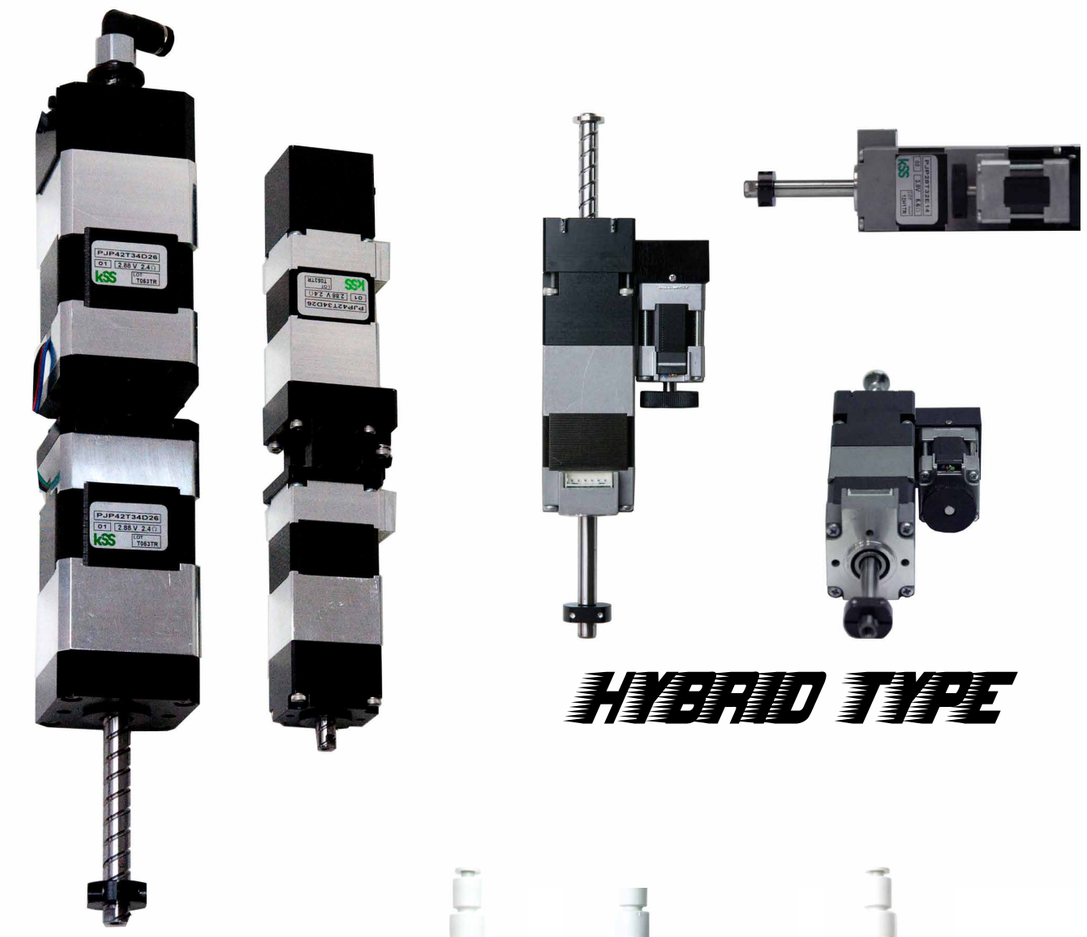
EC R — 2 — E(4)

①　②　③　④

①连接线记号
②种类
　R：耐屈曲线
③长度（m）
④连接器形状
　N：散线
　E（4）：EI连接器4芯（ TE Connectivity制）

①Extension Cable
②Cable type
　R：Robot Cable
③Cable length（m）
④Connector type
　N：No commector
　E（4）：EI connector 4-pins（TE Connectivity）

DIRECT DRIVE TYPE

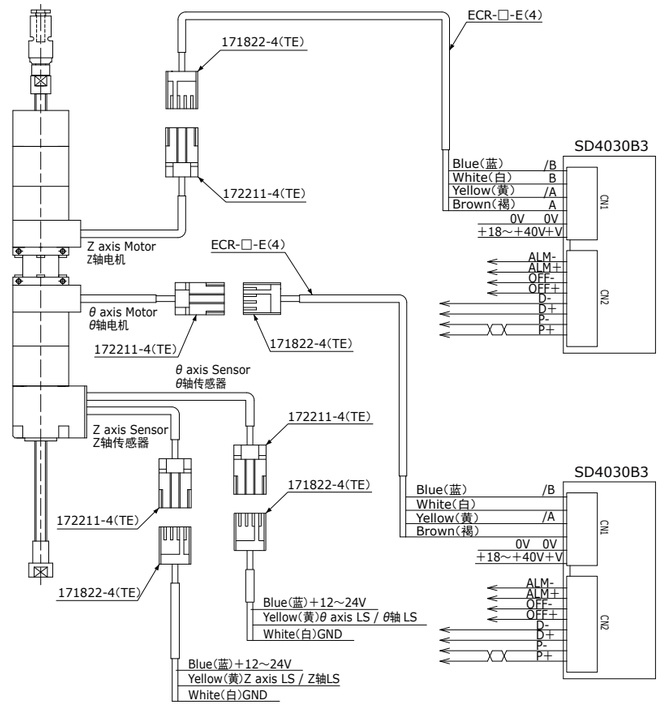


HYBRID TYPE

Belt Drive type

●驱动器接线图 / Connection Diagram

【□28直接驱动型 / □28 / NEMA11 Direct Drive type】



Motor cable 172211-4（male）
电机线172211-4（公头）

1	Stepping Motor /B（Blue/蓝）
2	Stepping Motor B（Red/红）
3	Stepping Motor /A（Green/绿）
4	Stepping Motor A（Black/黑）

Motor Extension cable171822-4（female）
电机连接线171822-4（母头）

4 3 2 1

1	Stepping Motor /B（Blue/蓝）
2	Stepping Motor B（White/白）
3	Stepping Motor /A（Yellow/黄）
4	Stepping Motor A（Brown/茶）

Sensor cable 172211-4（male）
传感器线172211-4（公头）

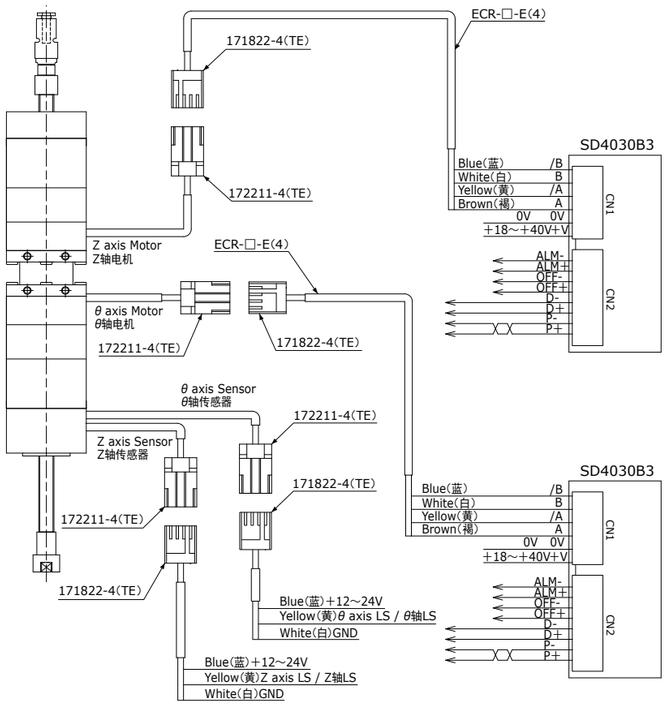
1	+12V~24（Brown/茶）
2	GND（Blue/蓝）
3	LS（Black/黑）
4	None 备用

Sensor Extension cable171822-4（female）
传感器连接线171822-4（母头）

3 2 1

1	+12V~24（Blue/蓝）
2	GND（White/白）
3	LS（Yellow/黄）
4	None 备用

【□42直接驱动型 / □42 / NEMA17 Direct Drive type】



Motor cable 172211-4（male）
电机线172211-4（公头）

1	Stepping Motor/B（Blue/蓝）
2	Stepping Motor B（Red/红）
3	Stepping Motor/A（Green/绿）
4	Stepping Motor A（Black/黑）

Motor Extension cable171822-4（female）
电机连接线171822-4（母头）

4 3 2 1

1	Stepping Motor/B（Blue/蓝）
2	Stepping Motor B（White/白）
3	Stepping Motor/A（Yellow/黄）
4	Stepping Motor A（Brown/褐）

Sensor cable 172211-4（male）
传感器线172211-4（公头）

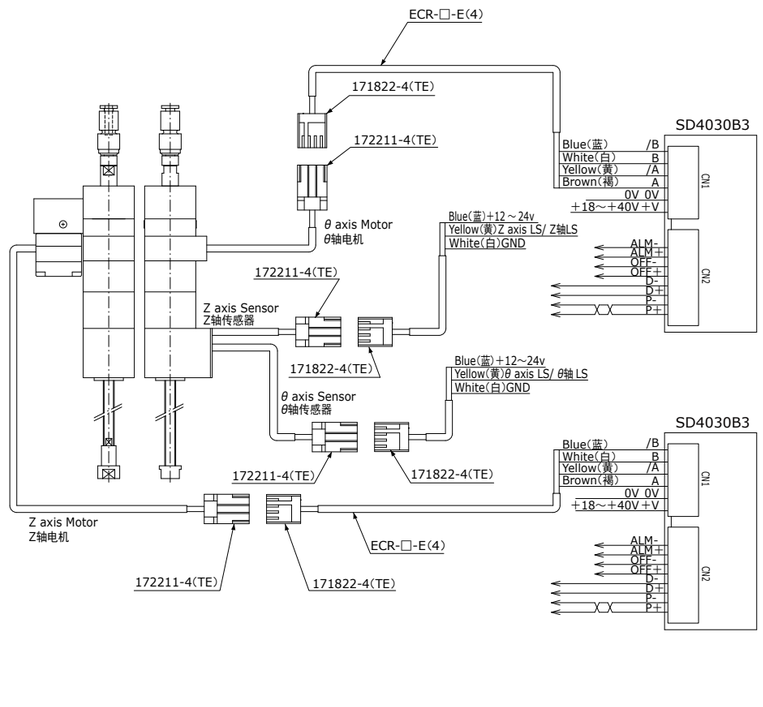
1	+12V~24（Brown/褐）
2	GND（Blue/蓝）
3	LS（Black/黑）
4	None 备用

Sensor Extension cable171822-4（female）
传感器连接线171822-4（母头）

3 2 1

1	+12V~24（Blue/蓝）
2	GND（White/白）
3	LS（Yellow/黄）
4	None 备用

【混合驱动型 / Hybrid Drive type】



Z axis Motor cable 172211-4（male）
Z轴电机线172211-4（公头）

1	Stepping Motor/B（Orange/橙）
2	Stepping Motor B（Blue/蓝）
3	Stepping Motor/A（Yellow/黄）
4	Stepping Motor A（Red/红）

Z axis Motor Extension cable171822-4（female）
Z轴电机连接线171822-4（母头）

4 3 2 1

1	Stepping Motor/B（Blue/蓝）
2	Stepping Motor B（White/白）
3	Stepping Motor/A（Yellow/黄）
4	Stepping Motor A（Brown/褐）

θ axis Motor cable 172211-4（male）
θ轴电机线172211-4（公头）

1	Stepping Motor/B（Blue/蓝）
2	Stepping Motor B（Red/红）
3	Stepping Motor/A（Green/绿）
4	Stepping Motor A（Black/黑）

θ axis Motor Extension cable 171822-4（female）
θ轴电机连接线171822-4（母头）

4 3 2 1

1	Stepping Motor/B（Blue/蓝）
2	Stepping Motor B（White/白）
3	Stepping Motor/A（Yellow/黄）
4	Stepping Motor A（Brown/褐）

Sensor cable 172211-4（male）
传感器线172211-4（公头）

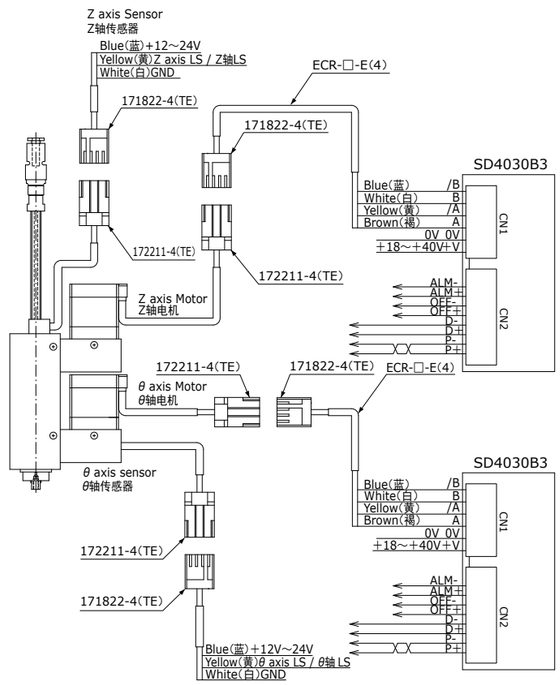
1	+12V~24（Brown/褐）
2	GND（Blue/蓝）
3	LS（Black/黑）
4	None 备用

Sensor Extension cable 171822-4（female）
传感器连接线171822-4（母头）

3 2 1

1	+12V~24（Blue/蓝）
2	GND（White/白）
3	LS（Yellow/黄）
4	None 备用

【传送带驱动型 / Belt Drive type】



Motor cable 172211-4（male）
电机线172211-4（公头）

		BDVZ04	BDVZ06/BDVZ08
1	Stepping Motor /B	Orange/橙	Blue/蓝
2	Stepping Motor B	Blue/蓝	Red/红
3	Stepping Motor /A	Yellow/黄	Green/绿
4	Stepping Motor A	Red/红	Black/黑

Motor Extension cable171822-4（female）
电机连接线171822-4（母头）

4 3 2 1

1	Stepping Motor /B（Blue/蓝）
2	Stepping Motor B（White/白）
3	Stepping Motor /A（Yellow/黄）
4	Stepping Motor A（Brown/褐）

Sensor cable 172211-4（male）
传感器线172211-4（公头）

1	+12V~24（Brown/褐）
2	GND（Blue/蓝）
3	LS（Black/黑）
4	None 备用

Sensor Extension cable 171822-4（female）
传感器连接线171822-4（母头）

3 2 1

1	+12V~24（Blue/蓝）
2	GND（White/白）
3	LS（Yellow/黄）
4	None 备用

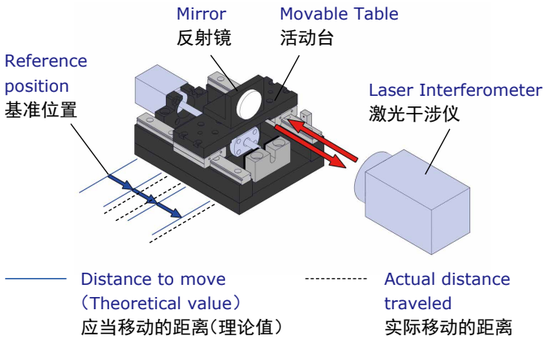
执行器技术解说 Technical Description of the Actuator products

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"。

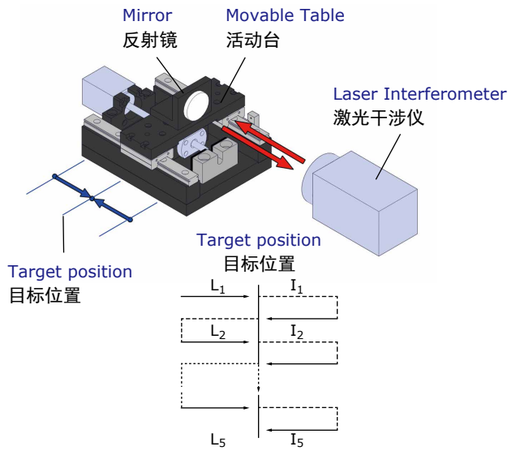
Absolute positioning accuracy is the difference between actual and ideal position in one direction. Measurement is done at several arbitrary points within effective travel range, it should be repeated 5 times under the same points. Maximum difference for each measurement is defined as Absolute Positioning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

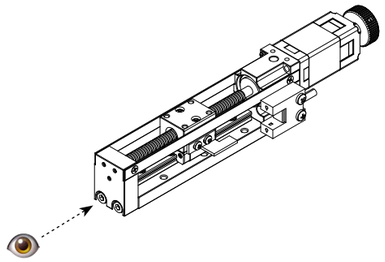
Lost motion is frankly the back and forth positioning error at the arbitrary one point from the different direction. Averaged number of the difference between forward and backward should be obtained for 5 times measurements at the center and both end points. Maximum number from the measurement above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

【移动平行度 / Parallelism】

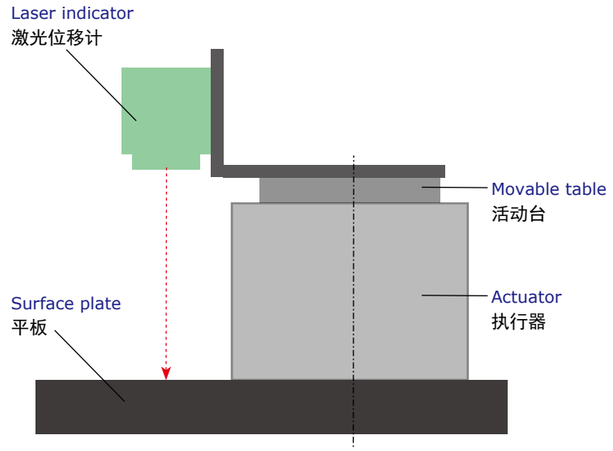
适用于滑块型执行器 / Applicable for Slider type Actuator

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.



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

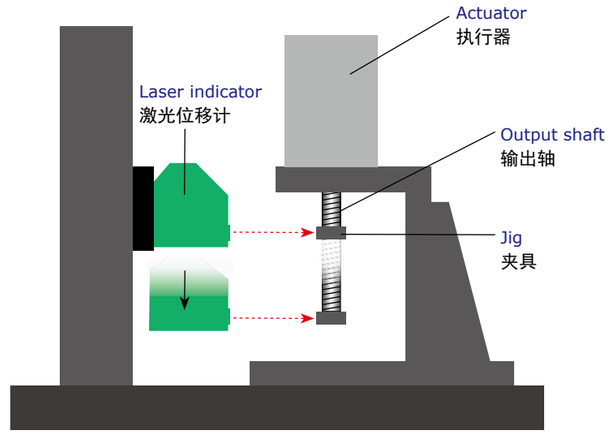


【平直度 / Straightness】

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,使输出轴移动全行程(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.

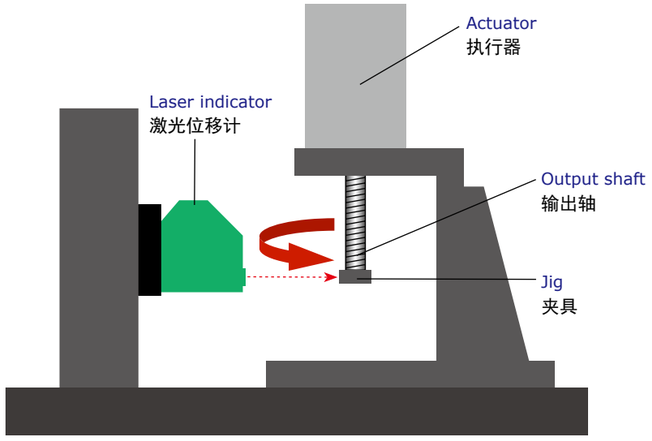


【轴前端跳动 / Runout of shaft travel end】

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.


検査合格証

ケーエスエス株式会社
本　　社　東京都大田区矢口 1-22-14
〒146-0093　TEL 03 (3756) 3921 (代)
小千谷工場　新潟県小千谷市大字山谷字新保4-14
〒947-0043　TEL 0258 (82) 5577 (代)


CERTIFICATE OF INSPECTION

This is to Certify that this product has passed the inspection of KSS STANDARD.

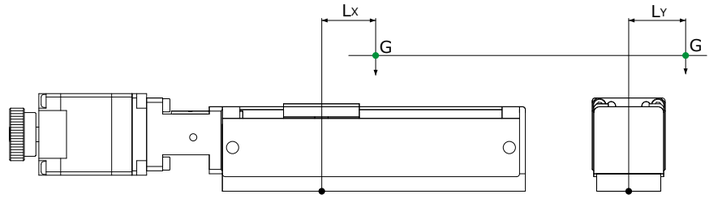
KSS CO., LTD.
Head Office: 1-22-14 Yaguchi, Otaku, Tokyo 146-0093
TEL 03(3756)3921
Ojiya Plant: TEL 0258(82)5577

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

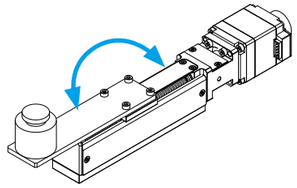
【关于滑块型执行器的允许偏心力矩 / Permissible Moment of Slider type Actuator】

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。

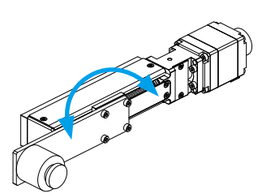
Momentum Load which is applicable for Slider type Actuator is defined in three (3) directions; Mp (pitching) My (yawing) and Mr (Rolling). KSS is setting the Permissible Moment for each series of the Slider type Actuator. Please apply calculation formula below to calculate the value of Moment of Load 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.



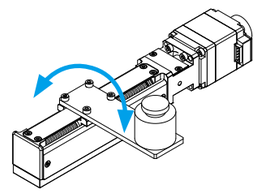
m：工件的质量（kg）
Work mass (kg)
g：重力加速度9.807（m/sec²）
Gravity acceleration 9.807(m/sec²)
Lx：X轴方向伸出距离（m）
Amount of overhang in X-axis direction(m)
Ly：Y轴方向伸出距离（m）
Amount of overhang in Y-axis direction(m)
G：工件重心位置
Work center of gravity position



Formula for Mp(Pitchng)
Mp（俯仰）计算公式
Mp=m·g·Lx



Formula for My(Yawing)
My（偏转）计算公式
My=m·g·Lx



Formula for Mr(Rolling)
Mr（侧滚）计算公式
Mr=m·g·Ly

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

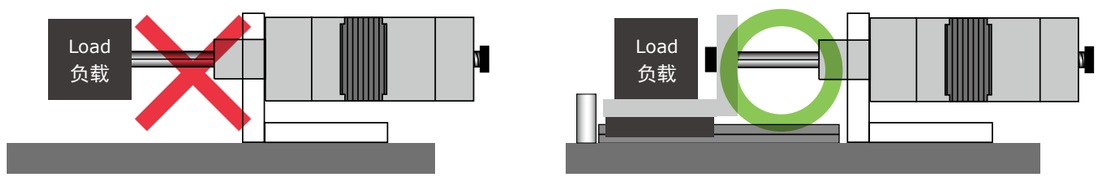
关于作用至滚珠丝杠花键(BSSP)的偏心力矩负载
Moment Load to the Ball Screw with Ball Spline(BSSP)

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

【推荐例 / Recommended example】

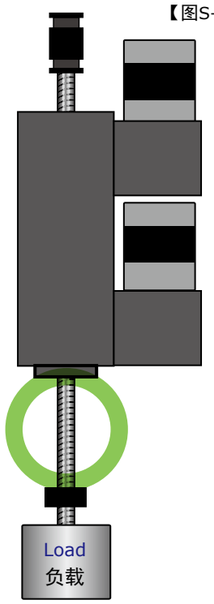


· 在水平状态下使用时,请切勿按照左图安装负载。
· 在水平状态下使用时,请按【推荐例】所示,由外部导向结构承受径向负载。

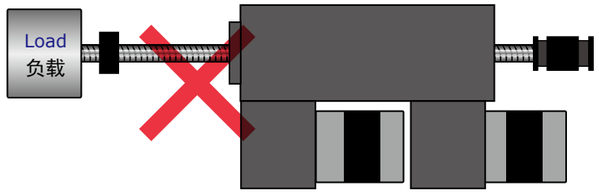
· Do not apply load as illustration shown above left.
· In horizontal position, configure as illustration shown above right as recommended example to apply radial load by Guide rail.

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

【图S-2 / Fig.S-2】



【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.

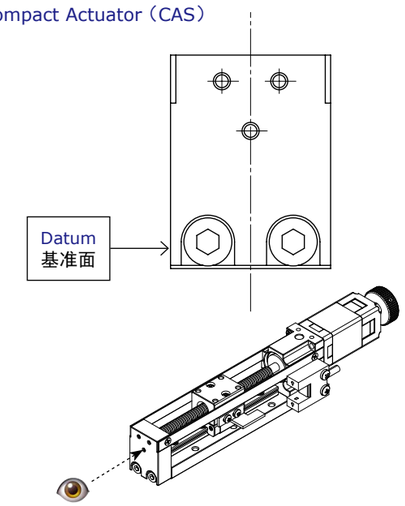
执行器的组装方法和注意事项
Assembling method and precautions for the Actuator

【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。

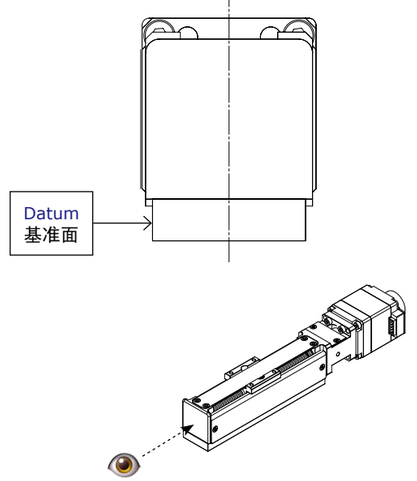
Use the Datum clamp face when assembling the Slider type Actuator to the device.
Note that Datum clamp face does not guarantee parallelism with the movable table.

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



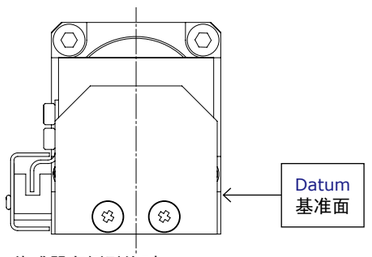
※执行器支撑侧视图。
Illustration is seen from the supporting side of the Actuator.

· Flex执行器(FAS)
· Flex Actuator (FAS)

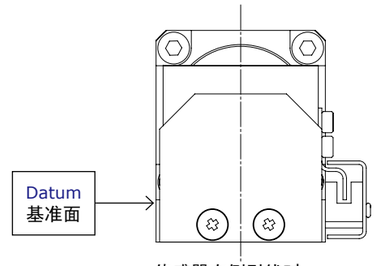


※执行器支撑侧视图。
Illustration is seen from the supporting side of the Actuator.

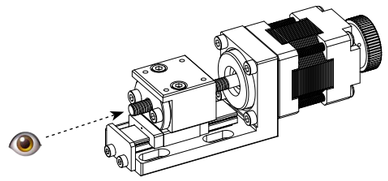
· MoBo 执行器(MAS)
· MoBo Actuator (MAS)



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.



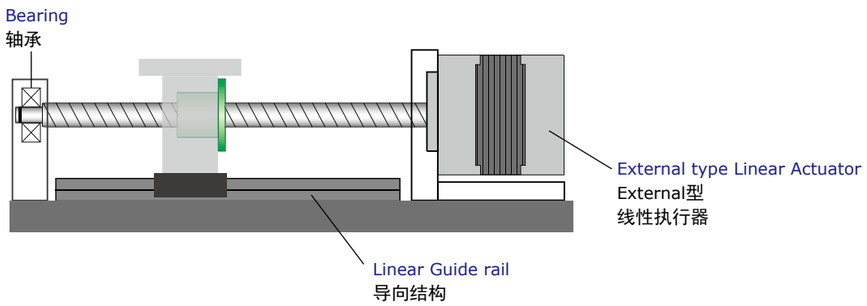
※执行器轴端侧视图。
Illustration is seen from the shaft end of the Actuator.

【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。

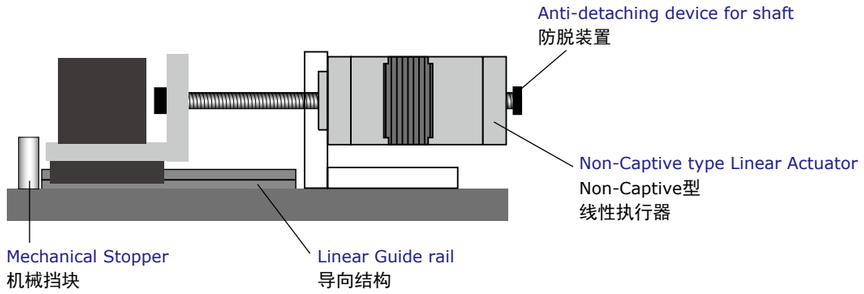
Customer should be careful with assembling and using KSS Actuator due to its compactness and light-weighted design. There are differences of assembling method and precautions depending on each type of Actuator, so please refer to instruction below to assemble and use them properly.

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.

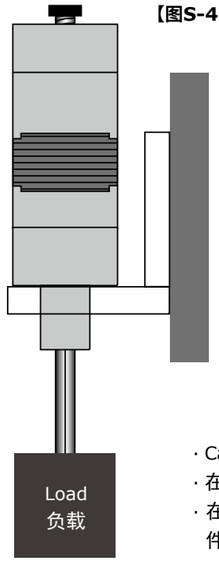
Non-Captive type安装例 / Non-Captive type Assembling example



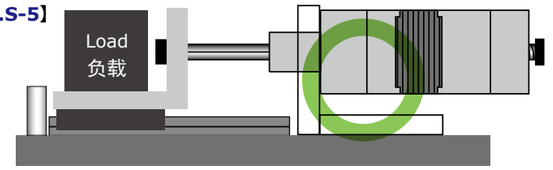
· Non-Captive type未内置止转结构。客户使用时需在外部设置止转结构。而且要使外部止转结构承受径向负载。
· 请勿将执行器的防脱装置用作机械挡块。
防脱装置仅用于防止丝杠轴脱落，若向其施加过大的力，执行器可能会损坏。客户使用时需在外部设置机械挡块结构。
· Non-Captive type does not have anti-rotating device. External anti-rotating device, such as Linear Guide rail should be set up when usage. In addition, Radial load should 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

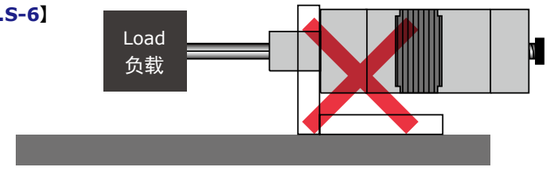
【图S-4 / Fig.S-4】



【图S-5 / Fig.S-5】



【图S-6 / Fig.S-6】



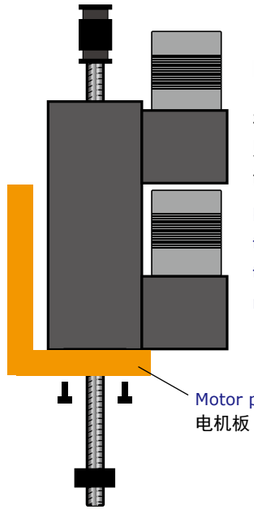
· Captive type不能承受径向负载。请按图S-4所示，在垂直状态下使用。
· 在水平状态下使用时，请按图S-5所示，由外部导向结构承受径向负载。
· 在水平状态下使用时，请切勿按照图S-6安装负载。否则径向负载会直接作用于滚珠丝杠，导致循环部件受损。
· Radial load cannot be applied on Captive type Linear Actuator. Please use Captive type Actuator in vertical position, as illustrated in Fig.S-4 above.
· In horizontal position,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

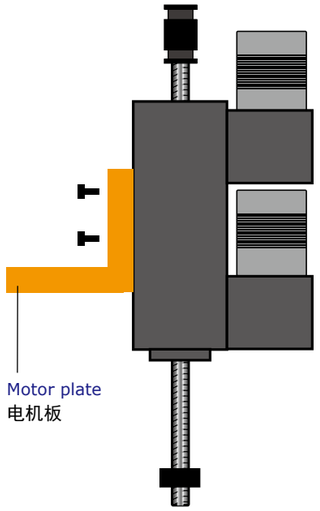
Z-θ执行器安装例 / Z-θ Actuator Assembling example



【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 relys 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-Attatchment

【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.

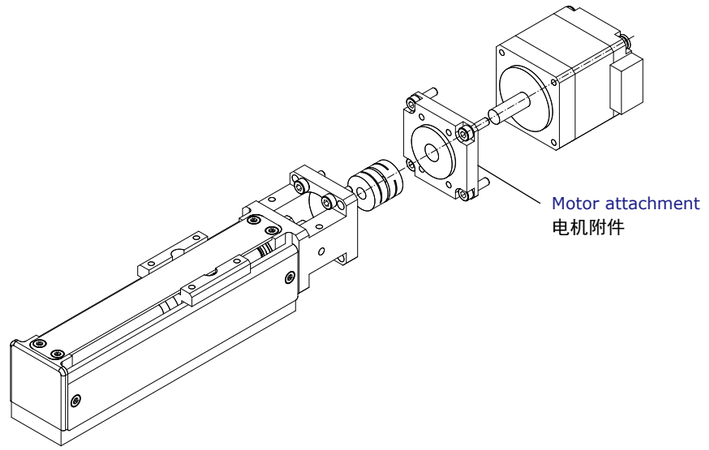
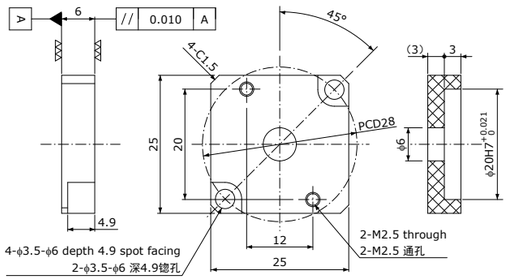


表 S-8：电机附件一览表
Table S-8：Motor-Attachment list

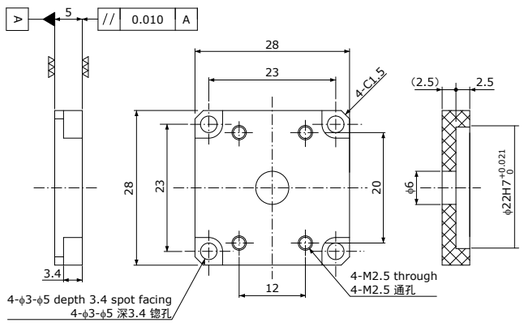
Motor manufacturer 电机制造商	Motor Type 电机种类	Motor Size 电机尺寸	Acceptable Motor 适用电机型号
Mitsubishi 三菱电机	AC Servo Motor AC伺服电机	NEMA 10 □25	HG-AK0＊＊＊
Yasukawa 安川电机		NEMA 10 □25	SGMMV-A＊＊
Oriental Motor 东方马达	2 Phase Stepping Motor 2相步进电机	NEMA 11 □28	PKP2＊＊
	5 Phase Stepping Motor 5相步进电机	NEMA 11 □28	PKP5＊＊
	α Step Motor α 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＊＊

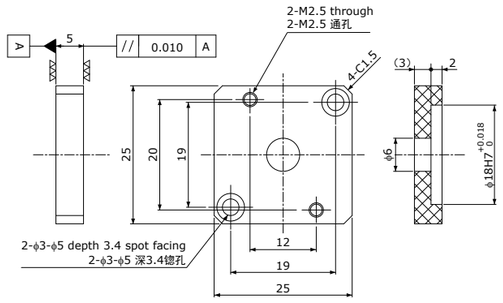


Moons TSM11＊＊ / Moons TSM11＊＊

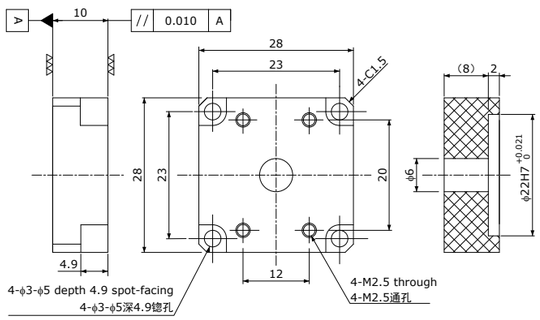
东方马达
PKP2＊＊、PKP5＊＊、ARM2＊＊、AZM2＊＊ /
Oriental Motor
PKP2＊＊、PKP5＊＊、ARM2＊＊、AZM2＊＊



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



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

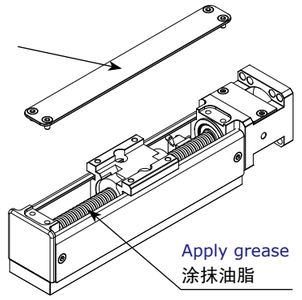


关于润滑剂的补充和加注方法
Lubricant and Greasing method

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。

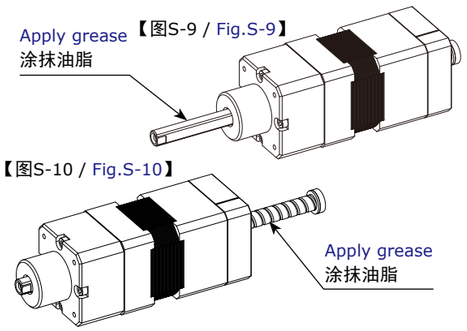
Greasing is required for any KSS Actuators. Maintenance cycle will be depending on your usage and working condition, however in general we recommend that you check the Grease condition in every 3 months, and if required please apply re-Greasing. Please refer to diagram below for how to re-Grease for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

●滑块型 / Slider type(FAS, CAS, MAS)

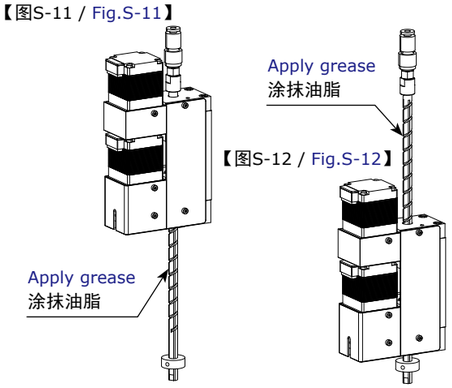


※1）仅限FAS/ For only FAS
先拆下盖板，露出轴后再进行加注。
Remove the cover first and expose the shaft before applying the Grease.

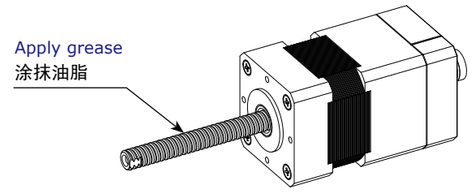
●Captive型 / Captive type



●Z-θ执行器/ Z-θ Actuator



●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.

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）.

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。

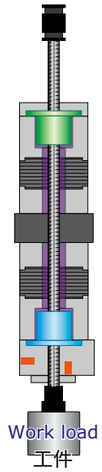
※Caution

Values are not guaranteed number.

Please take them as reference value.

【自重下落例 / Example of free falling】

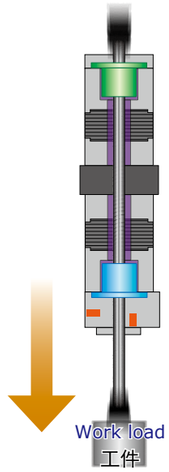
电源on / Power on



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 / Power off



电源off后电机保持力消失,输出轴下落。

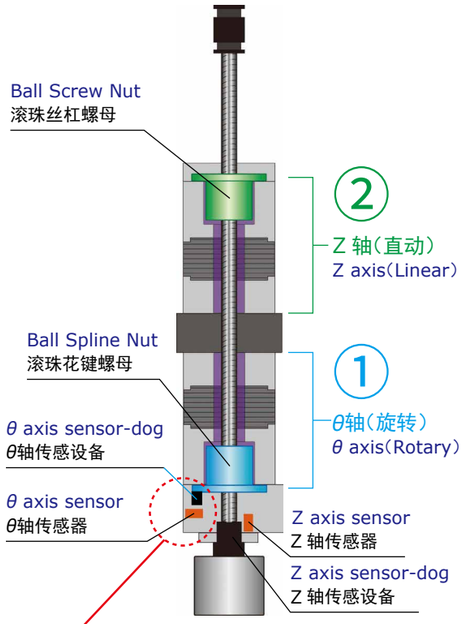
The Shaft will free fall once the Actuator turned off, by the loss of retention force from the Motor.

【原点复位 / Home positioning】

使用V-Z-θ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θ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 θ-axis should be the first, then followed by Z axis. If Z-axis home positioning is first, then zero position may move after θ-axis home positioning.
The reason is shown below diagram.

推荐原点复位顺序
Recommended procedure of home positioning

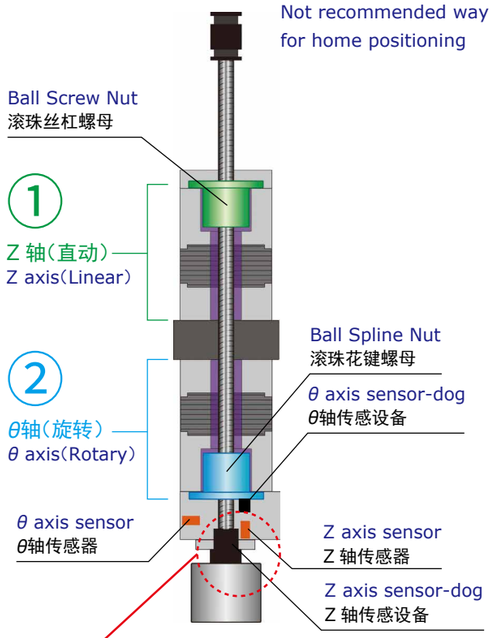


执行θ轴原点复位，已完成θ轴原点定位。
在该状态下执行 Z 轴原点，
θ轴(滚珠花键)只起到直动导向的作用，不会出现旋转方向的位置偏移。

θ-axis home positioning has been done in zero position. In this situation, Z-axis home positioning should be applied. θ-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➡θ轴时
In case of home positioning for Z axis ➡θaxis

＊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θ轴原点复位。输出轴在旋转的同时上下移动。
（θ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 θ-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】

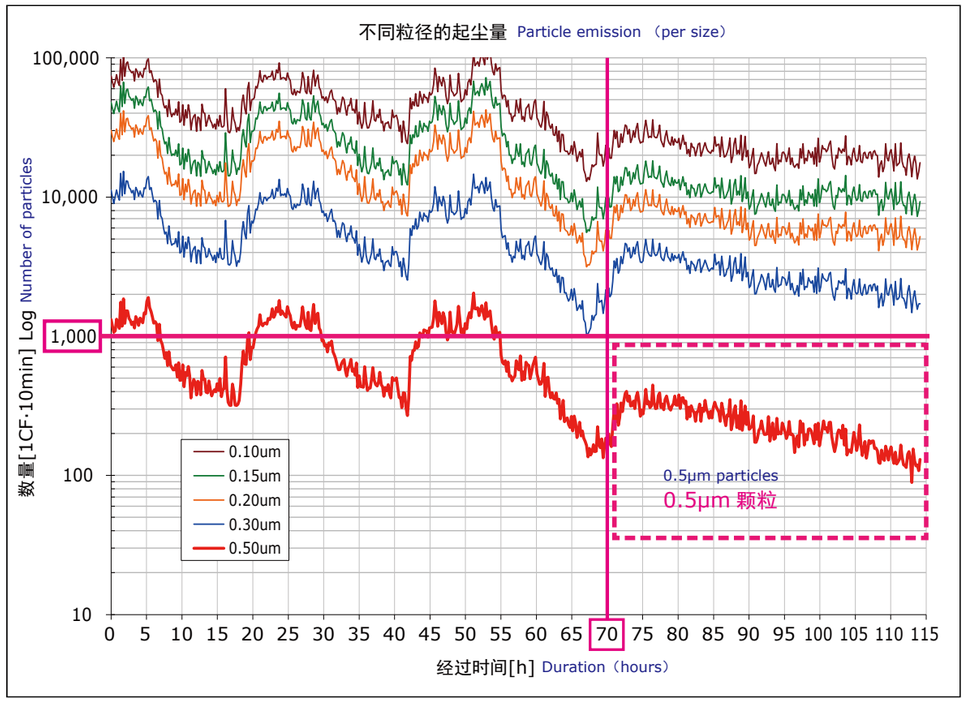
Z-θ执行器没有采用适用于无尘室的设计。
本公司实施的起尘量测量结果如下所示，仅供参考。
请客户参考以下测量结果，自行判断可否在无尘室中使用。

Z-θ 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-θ Actuator in such facility.

测量条件 / Measurement Condition

- 工件 :BDVZ06-G10050N02（传送带驱动型）
- 移动时间 :115小时
- 速度 :Z轴 200mm/sec（产品目录最高规格）
  θ轴 1080°/sec（产品目录最高规格）
- 动作方式 :螺旋驱动
- 可搬重量 :无负载

- Sample :BDVZ06-G10050N02（Belt-Drive type）
- Running period :115 hours
- Speed :Z axis 200mm/sec（Highest spec in Catalogue）
  θ axis 1080°/sec（Highest spec in Catalogue）
- Operating pattern :Spiral moving（Z & θ）
- 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.

推荐的步进电机驱动器
Stepping Motor Driver recommendation

为使用户更方便地使用KSS执行器产品,本公司准备了推荐的驱动器可供选配。
KSS provides recommended Stepping Motor Driver as an option in order to make it easy to use.

●驱动器使用注意事项/ Precaution of Driver usage

请在使用前根据电机的额定电流调整驱动电流。
驱动电流的设定方法因驱动器而异。关于不同驱动器的驱动电流设定方法,请从本公司网站下载使用说明书,按照步骤正确地进行调整。

Please adjust the run current according to the rated current of the Motor before use.
The adjustment method of the Run current is different for each driver. To adjust the Run current, it is available to down load each instruction manuals from KSS website and follow the steps to make the correct adjustment.

●标准驱动器/ Standard Stepping Motor Driver

KR-A5CC
DC24V 5相步进电机用驱动器。可以进行整步、半步切换。兼具电流自动下降功能。
This Driver is for 5-phase Stepping Motor operated by DC24V power supply. It has automatic current reduction circuits. You can choose full-step or half step function.

KR-A55MC
DC24V 5相步进电机用驱动器。可设定16种步进角,最大分割数为250的微型步进驱动器。
Micro-Step Driver for 5-phase Stepping Motor with DC24V power supply. 16 step angle types can be set with up to 250 divisions.

KR-A535M
可使用AC100～220V电源的5相步进电机用微型步进驱动器。
最大分割数可达250。
Micro-Step Driver for 5-phase Stepping Motor, which can be used with AC100～220V power supply. 16 step angle types can be set with up to 250 divisions.

SD4015B3
额定电流为0.25A/相～1.5A/相的2相步进电机双极驱动用推荐驱动器。
可设定8种步进角。
This is recommended Bipolar 2-phase stepping Motor Driver for rated current 0.25A/phase～1.5A/phase. It has Micro-Step function with 8-step angle.

SD4030B3
额定电流为0.5A/相～3.0A/相的2相步进电机双极驱动用推荐驱动器。
可设定8种步进角。
This is recommended Bipolar 2-phase stepping Motor Driver for rated current 0.5A/phase～3.0A/phase. It has Micro-Step function with 8-step angle.

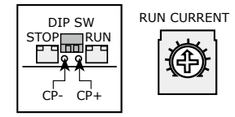
各推荐驱动器的规格和外形图请见下页以后。
Outer dimensions and specifications of KSS recommended Driver are shown from next page.

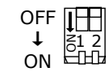
KR-A5CC
DC24V输入 5相步进电机驱动器
DC24V Input 5-phase Stepping Motor Driver

DC24V | 适用于0.1～0.9A / 相 0.1～0.9A / phase | 整步、半步 Full / Half-Step | 箱型 Case type

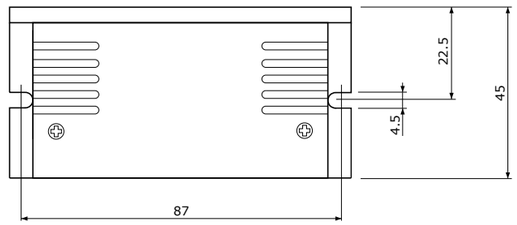
■规　格　Specifications

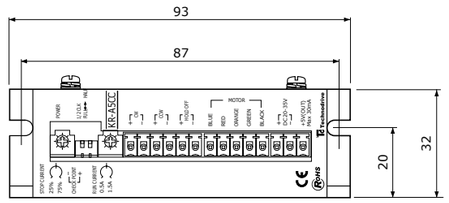
项目　Items		规格值　Specifications		
电源　Power supply		DC20-35V（-10%,+20%）max.3A		
驱动电流　Output current（出厂时 0.35A/相）（0.35A/phase at shipping）		额定电流0.1～0.9A / 相 Rated current：0.1～0.9A/phase		
驱动方式　Driving Type		双极恒流五角驱动方式　Bipolar pentagon constant current drive		
输入信号回路 Input signal circuit	信号名 Signal name	功能说明　Functional description		输入电阻　Input resistance
	CW+	1时钟模式时的脉冲信号输入 2时钟模式时的正转信号输入	Pulse signal input for 1 clock mode CW rotation input for 2 clock mode	390Ω
	CW-			
	CCW+	1时钟模式时的转向指示输入 2时钟模式时的反转信号输入	Rotational direction input for 1 clock CCW rotation input for 2 clock	390Ω
	CCW-			
	H.O.+	电机励磁OFF控制信号 “H”时电机励磁OFF	Motor exciting OFF control signal "H" for motor exciting OFF	390Ω
	H.O.-			
		脉冲宽度 0.5μsec以上、上升下降时间 10μsec以下 脉冲间隔 0.5μsec以上、脉冲频率 50kpps以下 脉冲电压“H”：4～8V “L”：0～0.5V 光电耦合器的电流从OFF（逻辑L）到ON（逻辑H）时动作 在1时钟模式下，CCW输入为“L”时进行CCW旋转	Pulse width：0.5μs min., Rising-up time：10μs max. Pulse interval：0.5μs min., Pulse frequency：50kpps max. Pulse voltage："H" for 4～8V & "L" for 0～0.5V Triggered at the edge of OFF（Logic"L"）to ON（Logic"H"）of photo-coupler current CCW rotation with CCW input of "L" in 1-clock system	
驱动电流值设定 Setting of driving current		设定驱动电流时，将电压表连接至CP+ CP-，并旋转RUN旋钮，将电压设定为下式得出的电压值。 To change the RUN current, connect the CP+ to the（+） terminal of the voltmeter and the CP- to the （-） terminal of the voltmeter then adjust RUN CURRENT volume. 驱动电流（A）＝ CP电压（V） / 4　　Setting current（A）＝ CP voltage（V） / 4 设定例）驱动电流设定为0.35A/相时，将CP电压调整至1.4V Setting example）When drive current is set to 0.35A/phase, the CP voltage is adjusted to 1.4V. 注）须在电机旋转的状态下设定驱动电流。 Note） Run current should be changed during the operating of motor.		
电流下降值设定 Setting of Stop current		设定电机停止时的电流值。通过STOP旋钮设定 电流下降值以相对于驱动电流值的百分比（%）来设定 In order to reduce the heat adjusting the current, change it using STOP CURRENT volume. The setting value of STOP CURRENT volume is a percentage of the setting volume of RUN CURRENT. 设定例）驱动电流值设定为1.4A、STOP旋钮设定为50%时，电机停止时的电流为0.7A/相。 Ex） After setting 1.4A for Run current then put STOP CURRENT volume at 50%, the stop current will be 0.7A.		
拨动开关设定（出厂时的设定均为OFF） Setting of Dip-switches（All off at shipping）	No.	显示 Symbol	功能　Function	ON	OFF
	1	1/2 CLK	时钟模式切换 Switching of clock	1时钟模式 1 clock mode	2时钟模式 2 clock mode
	2	Full / Half	插值数设定 Setting of Interpolation	整步（0.72°） Full-step（0.72°）	半步（0.36°） Half-step（0.36°）
工作环境温度、湿度 Operating temperature & humidity		0～40℃　85%RH以下（无结露） 0～40°C　85%RH max. without any dew condensation.		
存放环境温度、湿度 Storage temperature & humidity		-10～70℃　85%RH以下（无结露） -10～70°C　85%RH max. without any dew condensation.		
重量 Mass		约130g Approximately 130g		

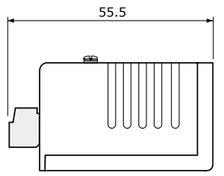




●驱动器外形尺寸 / Driver Outer Dimensions







KR-A55MC

DC24V输入　微型步进驱动器
DC24V Input Microstep Driver

DC24V | 适用于0.4～1.4A / 相 0.4～1.4A / phase | 微型步进 Micro-step | 箱型 Case type

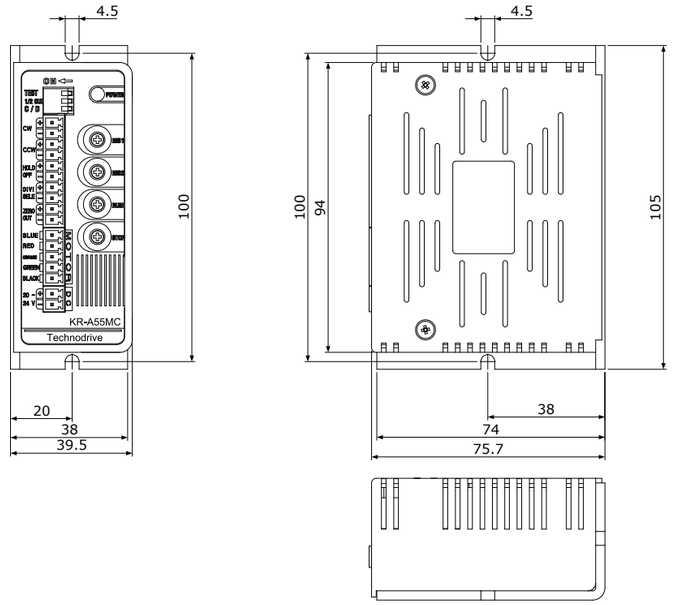
■规　格　Specifications

项目　Items		规格值　Specifications										
电源　Power supply		DC20-35V（-10%,+20%）max.3A										
驱动电流　Output current （出厂时 0.75A/相） （0.75A/phase at shipping）		额定电流0.4～1.4A/相　Rated current：0.4～1.4A/phase 可利用数字开关[RUN]在0.4～1.4A/相的范围内设定。 Capable of setting the current to 0.4～1.4A/phase by the digital switch "RUN"										
驱动方式　Driving Type		双极恒流五角驱动方式　Bipolar pentagon constant current drive										
输入信号回路 Input signal circuit	信号名 Signal name	功能说明	Functional description	输入电阻　Input resistance								
	CW+	1时钟模式时的脉冲信号输入	Pulse signal input for 1 clock mode	270Ω								
	CW-	2时钟模式时的正转信号输入	CW rotation input for 2 clock mode									
	CCW+	1时钟模式时的转向指示输入	Rotational direction input for 1 clock	270Ω								
	CCW-	2时钟模式时的反转信号输入	CCW rotation input for 2 clock									
	H.O.+	电机励磁OFF控制信号	Motor excitation OFF control signal	390Ω								
	H.O.-	“H”时电机励磁OFF	"H" for motor exciting OFF									
	D.S.+	微步插值选择信号	Micro-step interpolation selection	390Ω								
	D.S.-	“L”时选择MS1、“H”时选择MS2	"L" for MS1 & "H" for MS2									
		脉冲宽度 0.25μsec以上、上升下降时间 10μsec以下	Pulse width：0.25μs min., Rising-up time：10μs max.									
		脉冲间隔 0.25μsec以上、脉冲频率 500kpps以下	Pulse interval：0.25μs min., Pulse frequency：500kpps max.									
		脉冲电压“H”：4～8V “L”：0～0.5V	Pulse voltage："H" for 4～8V & "L" for 0～0.5V									
		光电耦合器的电流从OFF（逻辑L）到ON（逻辑H）时动作	Triggered at the edge of OFF（Logic"L"）to ON（Logic"H"）of photo-coupler current									
		在1时钟模式下，CCW输入为“L”时进行CCW旋转	CCW rotation with CCW input of "L" in 1-clock system									
输出信号回路 Output signal Circuit	信号名 Signal name	功能说明	Functional description	输出容量 Output capacity								
	Z.P.+	原点励磁信号输出	Origin exciting output signal	DC30V max.								
	Z.P.-	原点励磁时ON	Switched ON while origin is being excited	50mA max.								
		励磁顺序为[0]时ON，使用0.72°电机时每7.2度输出。接通电源时，若切换步进角则可能无法输出。 This signal is ON at the exciting sequence of [0] and is transmitted at each 7.2 degrees for the Step Motor with 0.72°steps. When micro-step angle is changed after the power supply is turned on, it may not be transmitted.										
微步插值设定 （出厂时MS1：5、MS2：0） Setting of micro-step Interpolation （MS1：5, MS2：0 at shipping）		仅采用1种微步驱动时，通过数字开关MS1设定插值数。 采用2种微步驱动时（在往复运动的前进、返回过程中改变速度时），通过数字开关MS1、MS2设定各插值数。 For micro-step driving of one type only, set the number interpolation using the digital SW MS1. For micro-step driving of two types.（i.e. when changing speed for going and returning in reciprocating motion） set respective numbers of interpolation using the digital SW MS1 and MS2.										
		设定编号　Set No.	0	1	2	3	4	5	6	7	8	9
		插值数　Interpolation	1	2	4	5	8	10	16	20	25	40
			A	B	C	D	E	F				
			50	80	100	125	200	250				
		注1）Note 1）　MS1　MS2										
		微步插值的设定编号选择0.1时，内部将发生1/4插值的低振动驱动。 When the setting of micro-step interpolating No. is "0.1", 1/4-interpolate low-frequency driving takes place inside.										
驱动电流的设定 （出厂设定：5） Setting of driving current （Setting "5" at shipping）		根据下表选择电机旋转时的电流，并通过数字开关RUN进行设定。 The output current to the motor in rotation is set by the digital switch "RUN" to select from the table below.										
		设定编号　Set No.	0	1	2	3	4	5	6	7	8	9
		电流（A）　Current（A）	0.4	0.5	0.57	0.63	0.71	0.77	0.84	0.9	0.96	1.02
			A	B	C	D	E	F				
			1.09	1.15	1.22	1.27	1.33	1.4				
		RUN										
电流自动下降的设定 （出厂设定：5） Automatic current-down （Setting "5" at shipping）		根据下表选择电机停止时的电流，并通过数字开关STOP进行设定。 该数值为相对于RUN电流的百分比。最终脉冲输入约后500ms，电流开始减少。 The output current to the motor at stationary is set by the digital switch "STOP" to select from the table below. The value is set by the percent to "RUN" current. The current decreases at approx. 500ms after the last pulse.										
		设定编号　Set No.	0	1	2	3	4	5	6	7	8	9
		百分比（%）	27	31	36	40	45	50	54	58	62	66
			A	B	C	D	E	F				
			70	74	78	82	86	90				
		STOP										

项目　Items	规格值　Specifications					
拨动开关设定 （出厂时的设定均为OFF） Setting of dip-switches （All off at shipping）	No.	显示 symbol	功能 Function	ON	OFF	ON ← OFF 注2（Note2）
	1	TEST	自测功能 Self test function	约250pps时旋转 Rotating at 250pps	常规动作 Normal operation	
	2	1 / 2 CLK	时钟模式切换 Switching of clock	1时钟模式 1 clock mode	2时钟模式 2 clock mode	
	3	C / D	电流自动下降 Automatic current-down	不使用 Invalid	使用 Valid	
工作环境温度、湿度 Operating temperature & humidity	0～40℃　85%RH以下（无结露） 0 ～ 40℃　85%RH Max. without any condensation.					
存放环境温度、湿度 Storage temperature & humidity	-10～70℃　85%RH以下（无结露） -10 ～ 70℃　85%RH Max. without any dew condensation.					
重量 Mass	约220g Approximately 220g					

注1）1脉冲的微步角度＝基本步进角 / 插值数
注2）无论插值数的设定如何，在内部发生约250pps，拨动开关No.2 ON时进行CCW旋转，OFF时进行CW旋转。
Note 1）Micro-step angle for 1 pulse=Basic step angle / Number of interpolation
Note 2）Approx. 250pps is generated inside, regardless of splits setting ; CCW rotation when the dip switch NO.2 is ON, and CW rotation when the dip switch NO.2 is OFF.

●驱动器外形尺寸 / Driver Outer Dimensions



Stepping Motor Driver
步进电机驱动器

KR-A535M

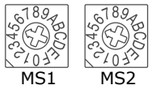
AC100-220V输入　微型步进驱动器

AC100-220V Input Microstep Driver

AC100-220V | 适用于0.4～1.4A / 相 0.4～1.4A / phase | 微型步进 Micro-step | 全连接型 Full connector

■规　格　Specifications

项目　Items	规格值　Specifications			
电源　Power supply	AC100-220V（±10%）max.3A 50/60Hz			
驱动电流　Output current （出厂时 0.75A/相） （0.75A/phase at shipping）	额定电流0.4～1.4A/相　Rated current：0.4～1.4A/phase 可利用数字开关[RUN]在0.4～1.4A/相的范围内设定。 Capable of setting the current to 0.4～1.4A/phase by the digital switch "RUN"			
驱动方式　Driving Type	双极恒流五角驱动方式　Bipolar pentagon constant current drive			
输入信号回路 Input signal circuit	信号名 Signal name	功能说明　Functional description		输入电阻　Input resistance
	CW+	1时钟模式时的脉冲信号输入 2时钟模式时的正转信号输入	Pulse signal input for 1 clock mode CW rotation input for 2 clock mode	270Ω
	CW-			
	CCW+	1时钟模式时的转向指示输入 2时钟模式时的反转信号输入	Rotational direction input for 1 clock CCW rotation input for 2 clock	270Ω
	CCW-			
	H.O.+	电机励磁OFF控制信号 “H”时电机励磁OFF	Motor exciting OFF control signal "H" for motor exciting OFF	390Ω
	H.O.-			
	D.S.+	微步插值选择信号 “L”时选择MS1、“H”时选择MS2	Micro-step interpolation selection "L" for MS1 & "H" for MS2	390Ω
	D.S.-			
	脉冲宽度 0.25μsec以上、上升下降时间 10μsec以下 脉冲间隔 0.25μsec以上、脉冲频率 500kpps以下 脉冲电压“H”：4～8V “L”：0～0.5V 光电耦合器的电流从OFF（逻辑L）到ON（逻辑H）时动作 在1时钟模式下，CCW输入为“L”时进行CCW旋转		Pulse width：0.25μs min., Rising-up time：10μs max. Pulse interval：0.25μs min., Pulse frequency：500kpps max. Pulse voltage："H" for 4～8V & "L" for 0～0.5V Triggered at the edge of OFF（Logic"L"）to ON（Logic"H"）of photo-coupler current CCW rotation with CCW input of "L" in 1-clock system	
输出信号回路 Output signal Circuit	信号名 Signal name	功能说明　Functional description		输出容量　Output capacity
	Z.P.+	原点励磁信号输出	Origin exciting output signal	DC30V max.
	Z.P.-	原点励磁时ON	Switched ON while origin is being excited	50mA max.
	励磁顺序为[0]时ON，使用0.72°电机时每7.2度输出。接通电源时，若切换步进角则可能无法输出。 This signal is ON at the exciting sequence of [0] and is transmitted at each 7.2 degrees for the Step Motor with 0.72°steps. When micro-step angle is changed after the power supply is turned on, it may not be transmitted.			
微步插值设定 （出厂时MS1：5、MS2：0） Setting of micro-step interpolation （MS1：5, MS2：0 at shipping）	仅采用1种微步驱动时，通过数字开关MS1设定插值数。 采用2种微步驱动时（在往复运动的前进、返回过程中改变速度时），通过数字开关MS1、MS2设定各插值数。 For micro-step driving of one type only, set the number interpolation using the digital SW MS1. For micro-step driving of two types.（i.e. when changing speed for going and returning in reciprocating motion） set respective numbers of interpolation using the digital SW MS1 and MS2.			
	设定编号　Set No.	0	1	2	3	4	5	6	7	8	9
	插值数　Interpolation	1	2	4	5	8	10	16	20	25	40
		A	B	C	D	E	F				
		50	80	100	125	200	250				
	注）微步插值的设定编号选择0.1时，内部将发生4插值的低振动驱动。 Note）When the setting of micro-step interpolating No. is "0.1", 1/4-interpolate low-frequency driving takes place inside.										
驱动电流的设定 （出厂设定：5） Setting of driving current （Setting "5" at shipping）	根据下表选择电机旋转时的电流，并通过数字开关RUN进行设定。 The output current to the motor in rotation is set by the digital switch "RUN" to select from the table below.										
	设定编号　Set No.	0	1	2	3	4	5	6	7	8	9
	电流（A）　Current（A）	0.4	0.5	0.57	0.63	0.71	0.77	0.84	0.9	0.96	1.02
		A	B	C	D	E	F				
		1.09	1.15	1.22	1.27	1.33	1.4				
电流自动下降的设定 （出厂设定：5） Automatic current-down （Setting "5" at shipping）	根据下表选择电机停止时的电流，并通过数字开关STOP进行设定。 该数值为相对于RUN电流的百分比。最终脉冲输入约后500ms，电流开始减少。 The output current to the motor at stationary is set by the digital switch "STOP" to select from the table below. The value is set by the percent to "RUN" current. The current decreases at approx. 500ms after the last pulse.										
	设定编号　Set No.	0	1	2	3	4	5	6	7	8	9
	百分比（%）	27	31	36	40	45	50	54	58	62	66
		A	B	C	D	E	F				
		70	74	78	82	86	90				



项目　Items	规格值　Specifications					
拨动开关设定 （出厂时的设定均为OFF） Setting of dip-switches （All off at shipping）	No.	显示 symbol	功能 Function	ON	OFF	 OFF → ON 注2（Note2）
	1	TEST	自测功能 Self test function	约250pps时旋转 Rotating at 250pps	常规动作 Normal operation	
	2	1 / 2 CLK	时钟模式切换 Switching of clock	1时钟模式 1 clock mode	2时钟模式 2 clock mode	
	3	C / D	电流自动下降 Automatic current-down	不使用 Invaild	使用 Vaild	
工作环境温度、湿度 Operating temperature & humidity	0～40℃　85%RH以下（无结露） 0 ～ 40℃　85%RH Max. without any condensation.					
存放环境温度、湿度 Storage temperature & humidity	-10～70℃　85%RH以下（无结露） -10 ～ 70℃　85%RH Max. without any dew condensation.					
重量 Mass	约660g Approximately 660g					

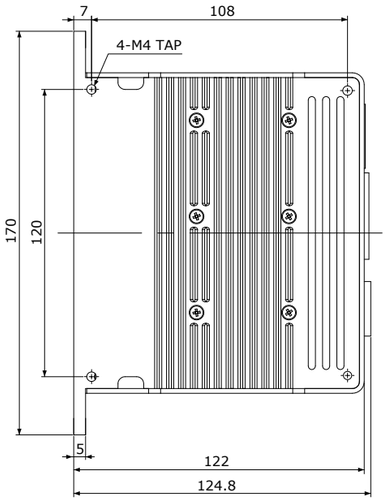
注1）1脉冲的微步角度＝基本步进角 / 插值数

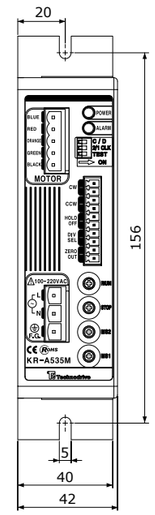
注2）无论插值数的设定如何，在内部发生约250pps，拨动开关No.2 ON时进行CCW旋转，OFF时进行CW旋转。

Note 1）Micro-step angle for 1 pulse=Basic step angle / Number of interpolation

Note 2）Approx. 250pps is generated inside, regardless of splits setting ; CCW rotation when the dip switch NO.2 is ON, and CW rotation when the dip switch NO.2 is OFF.

●驱动器外形尺寸 / Driver Outer Dimensions



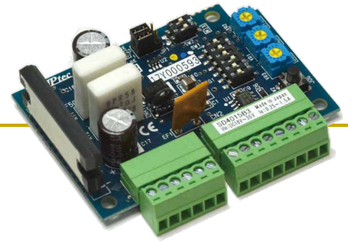


SD4015B3

DC24V输入 2相步进电机驱动器

DC24V Input 2-phase Stepping Motor Driver

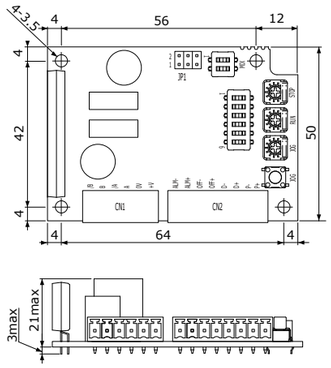
DC24V | 0.25～1.5A / 相 0.25～1.5A / phase | 整步、半步 Full / half step | 电路板类型 Board type



■规 格 Specifications

项 目 Items		内容 Description	备注 Note
输入电源电压 Input voltagee		DC+18V～36V	
输出电流 Output current		0.25～1.5 A peak(±5%)/相 0.25～1.5 A peak(±5%)/phase	电源超过24V时会降额 Being lower rated output current beyond Power Supply 24V
驱动方式 Drive method		双极恒电流斩波方式 Chopper mode by Bipolar constant current	也可使用单极型 It can be used for uni-polar type.
电流下降功能 Current down function		电流自动下降 脉冲停止约0.25～1秒后,电流下降至CDN旋钮设定的电流 Auto Current down Adjusting to set lower current of CND volume about 0.25 ～ 1 second after pulse stop	可通过开关选择功能 Selectable by switch.
最大输入脉冲频率 Maximum input pulse cycle		200Kpps	
调整功能 Adjusting	RUN	励磁电流设定用(0.25～1.5A) For excitation current(0.25～1.5A)	出厂时设定为1A The default factory setting is 1A.
	STOP	用于设定电流下降时的电流 For current down value on current down mode.	RUN电流的10%～60% Selectable between 10% to 60% of RUN current.
	MIX	用于设定混合衰减率(0%、20%、40%、80%) Mixed Decay ratio(0%、20%、40%、80%)	出厂时设定为80% The default factory setting is 80%
	JOG	用于设定JOG速度 For JOG speed setting.	300pps～14Kpps
选择功能 Select function	SW-1,2,3	插值数选择 Select of Resolutions	1/2, 1/8, 1/10, 1/16, 1/20, 1/32, 1/40, 1/64
	SW-4	自动电流下降有效/无效选择 ON/OFF for function of auto current down mode.	开关ON时有效、OFF时无效,出厂时设为“有效” Switch ON is active and OFF is no active. The default factory setting is ON.
	SW-5,6	JOG选择功能 Select of JOG function	SW-5ON时JOG有效。SW-6 ON:CW, OFF:CCW SW-5 ON is active for JOG, SW6 ON is CW, OFF is CCW
	SW-3	混合衰减率选择 Select of Mix-Decay ratio	
	JP1	1脉冲、2脉冲选择 Select of 1-pulse, 2-pulse	
输入信号 Input signals	P+,P-	指令脉冲 Pulse Command	指令脉冲可选择1脉冲或2脉冲。 Selection of 1 pulse an 2 pulse for pulse command. 通过光电耦合器进行输入绝缘 Isolated by photo coupler
	D+,D-	指令方向 Direction Command	
	OFF+,OFF-	励磁OFF No excitation	
输出信号 Output signals	ALM+,ALM-	警报(检测出功率元件过热) 功率元件内的温度达到170℃(Typ.)时输出 Alarm (Prospecting of over-heat for Power device) Output at over 170℃(Typ.) of power device	通过光电耦合器绝缘,正常时为ON、报警时为OFF Photo Isolation, ON is active, OFF is no active(ALARM).
外形尺寸 Dimension		W72×D50×H21	
工作环境温度、湿度 Operating Temperature and Humidity		0～40℃、35～80% RH	无结露 No condensation
存放环境温度、湿度 Storage Temperature and Humidity		-20～+85℃、35～80% RH	无结露 No condensation
重量 Mass		约40g Approximately 40g	

●驱动器外形尺寸 / Driver Outer Dimensions



SD4030B3

DC24V输入 2相微步驱动器

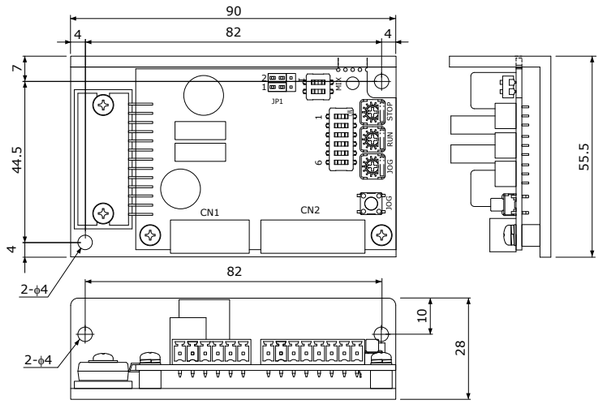
DC24V Input 2-phase Microstep Driver

DC24V | 0.5～3 / 相 0.5～3A / phase | 微型步进 Micro-step | 电路板类型 Board type

■规 格 Specifications

项 目 Items		内容 Description	备注 Note
输入电源电压 Input voltage		DC+18V～36V	
输出电流 Output current		0.5～3Apeak(±5%)/相 0.5～3Apeak(±5%)/phase	电源超过24V时会降额 Being lower rated output current beyond Power Supply 24V
驱动方式 Drive method		双极恒电流斩波方式 Chopper mode by Bipolar constant current	也可使用单极型 It can be used for uni-polar type.
电流下降功能 Current down function		电流自动下降 脉冲停止约0.7秒后,电流下降至CDN旋钮设定的电流 Auto Current down Adjusting to set lower current of CND volume about 0.7 second after pulse stop	可通过开关选择功能 Selectable by switch.
最大输入脉冲频率 Maximum input pulse cycle		200Kpps	
调整功能 Adjusting	RUN	励磁电流设定用(0.5～3A) For excitation current(0.5～3A)	出厂时设定为2A The default factory setting is 2A.
	STOP	用于设定电流下降时的电流 For current down value on current down mode.	RUN电流的10%～60% Selectable between 10% to 60% of RUN current.
	MIX	用于设定混合衰减率(0%、20%、40%、80%) Mixed Decay ratio(0%、20%、40%、80%)	出厂时设定为80% The default factory setting is 80%
	JOG	用于设定JOG速度 For JOG speed setting.	300pps～14Kpps
选择功能 Select function	SW-1,2,3	插值数选择 Select of Resolutions	1/2, 1/8, 1/10, 1/16, 1/20, 1/32, 1/40, 1/64
	SW-4	自动电流下降有效/无效选择 ON/OFF for function of auto current down mode.	开关ON时有效、OFF时无效,出厂时设为“有效” Switch ON is active and OFF is no active. The default factory setting is ON.
	SW-5,6	JOG选择功能 Select of JOG function	SW-5ON时JOG有效。SW-6 ON:CW, OFF:CCW SW-5 ON is active for JOG, SW6 ON is CW, OFF is CCW
	SW-3	混合衰减率选择 Select of Mix-Decay ratio	
	JP1	1脉冲、2脉冲选择 Select of 1-pulse, 2-pulse	
输入信号 Input signals	P+,P-	指令脉冲 Pulse Command	指令脉冲可选择1脉冲或2脉冲。 Selection of 1 pulse an 2 pulse for pulse command. 通过光电耦合器进行输入绝缘 Isolated by photo coupler
	D+,D-	指令方向 Direction Command	
	OFF+,OFF-	励磁OFF No excitation	
输出信号 Output signals	ALM+,ALM-	警报(检测出功率元件过热) 功率元件内的温度达到170℃(Typ.)时输出 Alarm (Prospecting of over-heat for Power device) Output at over 170℃(Typ.) of power device	通过光电耦合器绝缘,正常时为ON、报警时为OFF Photo Isolation, ON is active, OFF is no active(ALARM).
外形尺寸 Dimension		W90×D55.5×H28	
工作环境温度、湿度 Operating Temperature and Humidity		0～40℃、35～80% RH	无结露 No condensation
存放环境温度、湿度 Storage Temperature and Humidity		-20～+85℃、35～80% RH	无结露 No condensation
重量 Mass		约112g Approximately112g	

●驱动器外形尺寸 / Driver Outer Dimensions



附　表　Appendix

公制单位换算表
SI unit conversion table

●前缀　SI-Prefixes

	SI-Prefixes　前缀			SI-Prefixes　前缀			SI-Prefixes　前缀	
	Prefix 名称	Symbol 符号		Prefix 名称	Symbol 符号		Prefix 名称	Symbol 符号
10^{18}	exa（艾）	E	10^{2}	hecto（百）	h	10^{-9}	nano（毫微）	n
10^{15}	peta（贝脱）	P	10^{1}	deca（十）	da	10^{-12}	pico（皮）	p
10^{12}	tera（兆兆）	T	10^{-1}	deci（十分之一）	d	10^{-15}	femto（千万亿分之一）	f
10^{9}	giga（千兆）	G	10^{-2}	centi（厘）	c	10^{-18}	atto（微微微）	a
10^{6}	mega（兆）	M	10^{-3}	milli（毫）	m			
10^{3}	kilo（千）	k	10^{-6}	micro（微）	μ			

●力、重量　Force, Weight

N（牛顿） $kg·m/s^2$	dyn（达因） $g·cm/s^2$	kgf （重量：千克力）	lbf （重量：磅）
1	10^{5}	0.101972	0.224809
10^{-5}	1	1.01972×10^{-6}	0.224809×10^{-6}
9.80665	9.80665×10^{5}	1	2.20462
4.44822	4.44822×10^{5}	0.453592	1

注）带底色的单元格为公制单位。　Note）Highlighted cells show SI unit.

●质量　mass

kg（千克）	g（克）	lb（磅）	t（吨）	oz（盎司）
1	10^{3}	2.20462	10^{-3}	35.274
10^{-3}	1	2.20462×10^{-3}	10^{-6}	0.035274
0.453592	453.592	1	0.453592×10^{-3}	16
1000	10^{6}	2204.62	1	3.5274×10^{4}
0.0283495	28.3495	0.06250	2.83495×10^{-5}	1

注）带底色的单元格为公制单位。　Note）Highlighted cells show SI unit.

●应力　Stress

Pa（帕） N/m^2	MPa（兆帕） N/mm^2	kgf/mm^2	kgf/cm^2
1	1×10^{-6}	1.01972×10^{-7}	1.01972×10^{-5}
1×10^{6}	1	1.01972×10^{-1}	1.01972×10
9.80665×10^{6}	9.80665	1	1×10^{2}
9.80665×10^{4}	9.80665×10^{-2}	1×10^{-2}	1

注）带底色的单元格为公制单位。　Note）Highlighted cells show SI unit.

●压力　Pressure

Pa（帕） N/m^2	MPa（兆帕） N/mm^2	bar	kgf/cm^2	atm	mmH_2O	mmHg Torr
1	1×10^{-6}	1×10^{-5}	1.01972×10^{-5}	9.86923×10^{-6}	1.01972×10^{-1}	7.50062×10^{-3}
1×10^{3}	1×10^{-3}	1×10^{-2}	1.01972×10^{-2}	9.86923×10^{-3}	1.01972×10^{2}	7.50062
1×10^{6}	1	1×10	1.01972×10	9.86923	1.01972×10^{5}	7.50062×10^{3}
1×10^{5}	1×10^{-1}	1	1.01972	9.86923×10^{-1}	1.01972×10^{4}	7.50062×10^{2}
9.80665×10^{4}	9.80665×10^{-2}	9.80665×10^{-1}	1	9.67841×10^{-1}	1×10^{4}	7.35559×10^{2}
1.01325×10^{5}	1.01325×10^{-1}	1.01325	1.03323	1	1.03323×10^{4}	7.60000×10^{2}
9.80665	9.80665×10^{-6}	9.80665×10^{-5}	1×10^{-4}	9.67841×10^{-5}	1	7.35559×10^{-2}
1.33322×10^{2}	1.33322×10^{-4}	1.33322×10^{-3}	1.35951×10^{-3}	1.31579×10^{-3}	1.35951×10	1

注）带底色的单元格为公制单位。　Note）Highlighted cells show SI unit.

●动粘度　Kinematic Viscosity

m^2/s	cSt mm^2/s	St cm^2/s
1	1×10^{6}	1×10^{4}
1×10^{-6}	1	1×10^{-2}
1×10^{-4}	1×10^{2}	1

注）带底色的单元格为公制单位。　Note）Highlighted cells show SI unit.

●速度　Velocity

m/s	m/min	km/h	ft/s	ft/min	mile/h
1	60	3.6	3.28084	196.850	2.23693
0.0166667	1	0.06	0.0546807	3.2808	0.0372823
0.277778	16.667	1	0.911344	54.6807	0.621371
0.30480	18.288	1.09728	1	60	0.681818
5.0800×10^{-3}	0.30480	0.018288	0.0166667	1	0.0113636
0.447041	26.8224	1.60934	1.46667	88	1

●长度　Length

m （米）	cm （厘米）	mm （毫米）	μm （微米）	nm （毫微米）	Å （埃）	in （英寸）	ft （英尺）
1	100	1000	10^{6}	10^{9}	10^{10}	39.3701	3.28084
0.01	1	10	10^{4}	10^{7}	10^{8}	0.393701	0.0328084
0.001	0.1	1	10^{3}	10^{6}	10^{7}	0.0393701	3.28084×10^{-3}
10^{-6}	10^{-4}	10^{-3}	1	10^{3}	10^{4}	39.3701×10^{-6}	3.28084×10^{-6}
10^{-9}	10^{-7}	10^{-6}	10^{-3}	1	10	39.3701×10^{-9}	3.28084×10^{-9}
10^{-10}	10^{-8}	10^{-7}	10^{-4}	0.1	1	39.3701×10^{-10}	3.28084×10^{-10}
0.0254	2.54	25.4	25.4×10^{3}	25.4×10^{6}	25.4×10^{7}	1	0.0833333
0.3048	30.48	304.8	304.8×10^{3}	304.8×10^{6}	304.8×10^{7}	12	1

硬度换算表
Conversion Table for Hardness

Rockwell hardness C-scale 洛氏硬度 标尺C HRC	Vickers hardness 维氏硬度 Hv	Brinell hardness 布氏硬度		Rockwell hardness 洛氏硬度		Shore hardness 肖氏硬度 Hs
		Standard Ball 标准球 HB	Tungsten Carbide Ball 碳化钨球 HB	A-Scale Load;600N barle Pressure Piece 标尺A 负载:600N barle压头 HRA	B-Scale Load;1000N 1/16-in dia.Ball 标尺B 负载:1000N 1/16in球 HRB	
68	940	—	—	85.6	—	97
67	900	—	—	85.0	—	95
66	865	—	—	84.5	—	92
65	832	—	739	83.9	—	91
64	800	—	722	83.4	—	88
63	772	—	705	82.8	—	87
62	746	—	688	82.3	—	85
61	720	—	670	81.8	—	83
60	697	—	654	81.2	—	81
59	674	—	634	80.7	—	80
58	653	—	615	80.1	—	78
57	633	—	595	79.6	—	76
56	613	—	577	79.0	—	75
55	595	—	560	78.5	—	74
54	577	—	543	78.0	—	72
53	560	—	525	77.4	—	71
52	544	500	512	76.8	—	69
51	528	487	496	76.3	—	68
50	513	475	481	75.9	—	67
49	498	464	469	75.2	—	66
48	484	451	455	74.7	—	64
47	471	442	443	74.1	—	63
46	458	432	432	73.6	—	62
45	446	421	421	73.1	—	60
44	434	409	409	72.5	—	58
43	423	400	400	72.0	—	57
42	412	390	390	71.5	—	56
41	402	381	381	70.9	—	55
40	392	371	371	70.4	—	54
39	382	362	362	69.9	—	52
38	372	353	353	69.4	—	51
37	363	344	344	68.9	—	50
36	354	336	336	68.4	(109.0)	49
35	345	327	327	67.9	(108.5)	48
34	336	319	319	67.4	(108.0)	47
33	327	311	311	66.8	(107.5)	46
32	318	301	301	66.3	(107.0)	44
31	310	294	294	65.8	(106.0)	43
30	302	286	286	65.3	(105.5)	42
29	294	279	279	64.7	(104.5)	41
28	286	271	271	64.3	(104.0)	41
27	279	264	264	63.8	(103.0)	40
26	272	258	258	63.3	(102.5)	38
25	266	253	253	62.8	(101.5)	38
24	260	247	247	62.4	(101.0)	37
23	254	243	243	62.0	100.0	36
22	248	237	237	61.5	99.0	35
21	243	231	231	61.0	98.5	35
20	238	226	226	60.5	97.8	34
(18)	230	219	219	—	96.7	33
(16)	222	212	212	—	95.5	32
(14)	213	203	203	—	93.9	31
(12)	204	194	194	—	92.3	29
(10)	196	187	187	—	90.7	28
(8)	188	179	179	—	89.5	27
(6)	180	171	171	—	87.1	26
(4)	173	165	165	—	85.5	25
(2)	166	158	158	—	83.5	24
(0)	160	152	152	—	81.7	24

材料的化学成分
Material Chemical Composition

Category 材料类别	Std. No. 标准号	Designation 符号	Chemical Composition（化学成分） %									
			C	Si	Mn	P	S	Ni	Cr	Mo	Al	others 其他
Carbon Steels for machine structural use 机械结构用碳素钢	JIS G 4051	S40C	0.37～0.43	0.15～0.35	0.60～0.90	≦0.030	≦0.035	≦0.20	≦0.20			Cu≦0.30 Ni+Cr≦0.35
		S45C	0.42～0.48	0.15～0.35	0.60～0.90	≦0.030	≦0.035	≦0.20	≦0.20			Cu≦0.30 Ni+Cr≦0.35
		S50C	0.47～0.53	0.15～0.35	0.60～0.90	≦0.030	≦0.035	≦0.20	≦0.20			Cu≦0.30 Ni+Cr≦0.35
		S53C	0.50～0.56	0.15～0.35	0.60～0.90	≦0.030	≦0.035	≦0.20	≦0.20			Cu≦0.30 Ni+Cr≦0.35
		S55C	0.52～0.58	0.15～0.35	0.60～0.90	≦0.030	≦0.035	≦0.20	≦0.20			Cu≦0.30 Ni+Cr≦0.35
Structural Steels with specified hardenability bands 保证淬透性结构钢	JIS G 4052	SCM415H	0.12～0.18	0.15～0.35	0.55～0.95	≦0.030	≦0.030	≦0.25	0.85～1.25	0.15～0.30		
		SCM420H	0.17～0.23	0.15～0.35	0.55～0.95	≦0.030	≦0.030	≦0.25	0.85～1.25	0.15～0.30		
		SCM435H	0.32～0.39	0.15～0.35	0.55～0.95	≦0.030	≦0.030	≦0.25	0.85～1.25	0.15～0.35		
		SCM440H	0.37～0.44	0.15～0.35	0.55～0.95	≦0.030	≦0.030	≦0.25	0.85～1.25	0.15～0.35		
		SCM445H	0.42～0.49	0.15～0.35	0.55～0.95	≦0.030	≦0.030	≦0.25	0.85～1.25	0.15～0.35		
Chrome-molybdenum Steel 铬钼钢	JIS G 4105	SCM415	0.13～0.18	0.15～0.35	0.60～0.85	≦0.030	≦0.030	≦0.25	0.90～1.20	0.15～0.30		Cu≦0.30
		SCM418	0.16～0.21	0.15～0.35	0.60～0.85	≦0.030	≦0.030	≦0.25	0.90～1.20	0.15～0.30		Cu≦0.30
		SCM420	0.18～0.23	0.15～0.35	0.60～0.85	≦0.030	≦0.030	≦0.25	0.90～1.20	0.15～0.30		Cu≦0.30
		SCM430	0.28～0.33	0.15～0.35	0.60～0.85	≦0.030	≦0.030	≦0.25	0.90～1.20	0.15～0.30		Cu≦0.30
		SCM435	0.35～0.38	0.15～0.35	0.60～0.85	≦0.030	≦0.030	≦0.25	0.90～1.20	0.15～0.30		Cu≦0.30
		SCM440	0.38～0.43	0.15～0.35	0.60～0.85	≦0.030	≦0.030	≦0.25	0.90～1.20	0.15～0.30		Cu≦0.30
		SCM445	0.43～0.48	0.15～0.35	0.60～0.85	≦0.030	≦0.030	≦0.25	0.90～1.20	0.15～0.30		Cu≦0.30

Category 材料类别	Std. No. 标准号	Designation 符号	Chemical Composition（化学成分） %								
			C	Si	Mn	P	S	Ni	Cr	Mo	others 其他
Stainless Steels 不锈钢	JIS G 4303	SUS303	≦0.15	≦1.00	≦2.00	≦0.20	≧0.15	8.00～10.00	17.00～19.00	≦0.60	
		SUS304	≦0.08	≦1.00	≦2.00	≦0.045	≦0.030	8.00～10.50	18.00～20.00		
		SUS316	≦0.08	≦1.00	≦2.00	≦0.045	≦0.030	10.00～14.00	16.00～18.00	2.00～3.00	
		SUS317	≦0.08	≦1.00	≦2.00	≦0.045	≦0.030	11.00～15.00	18.00～20.00	3.00～4.00	
		SUS440A	0.60～0.75	≦1.00	≦1.00	≦0.040	≦0.040		16.00～18.00	≦0.75	
		SUS440B	0.75～0.95	≦1.00	≦1.00	≦0.040	≦0.030		16.00～18.00	≦0.75	
		SUS440C	0.95～1.20	≦1.00	≦1.00	≦0.040	≦0.030		16.00～18.00	≦0.75	
		SUS630	≦0.07	≦1.00	≦1.00	≦0.040	≦0.030	3.00～5.00	15.50～17.50		
		SUS631	≦0.09	≦1.00	≦1.00	≦0.040	≦0.030	6.5～7.75	16.00～18.00		

Category 材料类别	Std. No. 标准号	Designation 符号	Chemical Composition（化学成分） %									
			C	Si	Mn	P	S	Pb	Cr	Mo	W	others 其他
Alloy Tool Steels 合金工具钢	JIS G 4404	SKS 2	1.00～1.10	≦0.35	≦0.80	≦0.030	≦0.030		0.50～1.00		1.00～1.50	
		SKS 3	0.90～1.00	≦0.35	0.90～1.20	≦0.030	≦0.030		0.50～1.00		0.50～1.00	
		SKS 4	0.45～0.55	≦0.35	≦0.50	≦0.030	≦0.030		0.50～1.00		0.50～1.00	
High Carbon Chromium Bearing Steels 高碳铬轴承钢	JIS G 4805	SUJ 1	0.95～1.10	0.15～0.35	≦0.50	≦0.025	≦0.025		0.90～1.20	≦0.08		
		SUJ 2	0.95～1.10	0.15～0.35	≦0.50	≦0.025	≦0.025		1.30～1.60	≦0.08		
		SUJ 3	0.95～1.10	0.40～0.70	0.90～1.15	≦0.025	≦0.025		0.90～1.20	≦0.08		
		SUJ 4	0.95～1.10	0.15～0.35	≦0.50	≦0.025	≦0.025		1.30～1.60	0.10～0.25		

Category 材料类别	Std. No. 标准号	Designation 符号	Chemical Composition（化学成分） %							
			Cu	Pb	Fe	Sn	Zn	Mn	Ni	others 其他
Copper alloy 铜合金	JIS H 3270	C5191B				5.5～7.0				P;0.03～0.35 Cu+Sn+P≧99.5
	JIS H 3260	C3604W	57.0～61.0	1.8～3.7	≦0.50		Remains 剩余部分			Fe+Sn≦1.2

Category 材料类别	Std. No. 标准号	Designation 符号	Chemical Composition（化学成分） %								
			Cu	Zn	Al	Mn	Ni	Pb	Sn	Fe	Si	others 其他
Copper alloy 铜合金	JIS H 5111	BC6	82.0～87.0	4.0～6.0	≦0.01		≦1.0	4.0～6.0	4.0～6.0	≦0.3	≦0.01	

Appended table 附表

与材料有关的JIS标准和相关国外标准

Comparison with other country's standard for material

Japan Industrial Standard;JIS 日本工业标准			ISO （国际标准）	USA （美国）	UK （英国）	Germany （德国）	France （法国）
Category 材料类别	Std. No. 标准号	Designation 符号					
Carbon Steels for Machine structural use 机械结构用碳素钢	JIS G 4051	S40C	C40/C40E4/C40M2	AISI 1040	EN-C40,C40E,C40R		
		S45C	C45/C45E4/C45M2	AISI 1045	EN-C45,C45E,C45R		
		S50C	C50/C50E4/C50M2	AISI 1049	EN-C50,C50E,C50R		
		S53C	—	AISI 1053	—	—	—
		S55C	C55/C55E4/C55M2	AISI 1055	EN-C55,C55E,C55R		
Structural Steels with specified hardenability bands 保证淬透性结构钢	JIS G 4052	SCM415H	—	—	—	—	—
		SCM420H	—	—	708H20	—	—
		SCM435H	34CrMo4/34CrMoS4	AISI 4137H	—	—	—
		SCM440H	42CrMo4/42CrMoS4	AISI 4140H	EN-42CrMo4/42CrMoS4		
		SCM445H	—	AISI 4147H	—	—	—
Chrome-molybdenum Steel 铬钼钢	JIS G 4105	SCM415	—	—	—	—	—
		SCM418	18CrMo4/18CrMoS4	—	—	—	—
		SCM420	—	—	708M20	—	—
		SCM430	—	AISI 4130	—	—	—
		SCM435	34CrMo4/34CrMoS4	AISI 4137	—	—	—
		SCM440	42CrMo4/42CrMoS4	AISI 4140	EN-42CrMo4/42CrMoS4		
		SCM445	—	AISI 4147	—	—	—

Japan Industrial Standard;JIS 日本工业标准			ISO （国际标准）	USA （美国）	UK （英国）	Germany （德国）	France （法国）
Category 材料类别	Std. No. 标准号	Designation 符号					
Stainless Steels 不锈钢	JIS G 4303	SUS303	TR15510(1997)-13	ASTM-S 30300	303 S 31	X10CrNiS 189	Z8 CNF 18.09
		SUS304	TR15510(1997)-6	ASTM-S 30400	304 S 31	X5CrNi 1810	Z7CN 18.09
		SUS316	TR15510(1997)-26	ASTM-S 31600	316 S 31	X5CrNiMo17122	Z7CND 17.11-02
		SUS317	—	ASTM-S 31700	317 S 16	—	—
		SUS440A	—	ASTM-S 44002	EN-1.4109		
		SUS440B	—	ASTM-S 44003	—	—	—
		SUS440C	—	ASTM-S 44004	EN-1.4125		Z100CD17
		SUS630	TR15510(1997)-58	ASTM-S 17400	—	—	Z7CNU 17.04
		SUS631	TR15510(1997)-59	ASTM-S 17700	—	X7CrNiAl 177	Z9CNA 17.07
Alloy Tool Steels 合金工具钢	JIS G 4404	SKS 2	105WCr1	—	—	105WCr6	105WCr5
		SKS 3	—	—	—	—	—
		SKS 4	—	—	—	—	—
High Carbon Chromium Bearing Steels 高碳铬轴承钢	JIS G 4805	SUJ 1	—	ASTM 51100	—	—	—
		SUJ 2	100Cr6	ASTM 52100	—	100Cr6	100Cr6
		SUJ 3	100CrMnSi4-4	ASTM A 485 Grade1	—	—	—
Copper alloy 铜合金	JIS H 3270	C5191B	CuSn6	—	PB103	CuSn6	—
	JIS H 3260	C3604W	CuZn 39 PB 3	—	—	CuZn 39 PB 3	—
	JIS H 5111	BC6	—	ASTM-C 83600	LG2	CuSn 5 ZnPb	—

Appended table 附表

常用配合尺寸公差

Fits tolerances for frequent use　JIS B 0401

●孔用尺寸公差　Fit tolerances of normal holes

Unit(单位):μm

Dimensional division 基准尺寸的分类		Fit tolerance grade for holes 孔的公差带															
over 超过	up to 以下	D8	D9	D10	E7	E8	E9	F6	F7	F8	G6	G7	H6	H7	H8	H9	H10
—	3	+34 +20	+45 +20	+60 +20	+24 +14	+28 +14	+39 +14	+12 +6	+16 +6	+20 +6	+8 +2	+12 +2	+6 0	+10 0	+14 0	+25 0	+40 0
3	6	+48 +30	+60 +30	+78 +30	+32 +20	+38 +20	+50 +20	+18 +10	+22 +10	+28 +10	+12 +4	+16 +4	+8 0	+12 0	+18 0	+30 0	+48 0
6	10	+62 +40	+76 +40	+98 +40	+40 +25	+47 +25	+61 +25	+22 +13	+28 +13	+35 +13	+14 +5	+20 +5	+9 0	+15 0	+22 0	+36 0	+58 0
10	14	+77 +50	+93 +50	+120 +50	+50 +32	+59 +32	+75 +32	+27 +16	+34 +16	+43 +16	+17 +6	+24 +6	+11 0	+18 0	+27 0	+43 0	+70 0
14	18																
18	24	+98 +65	+117 +65	+149 +65	+61 +40	+73 +40	+92 +40	+33 +20	+41 +20	+53 +20	+20 +7	+28 +7	+13 0	+21 0	+33 0	+52 0	+84 0
24	30																
30	40	+119 +80	+142 +80	+180 +80	+75 +50	+89 +50	+112 +50	+41 +25	+50 +25	+64 +25	+25 +9	+34 +9	+16 0	+25 0	+39 0	+62 0	+100 0
40	50																
50	65	+146 +100	+174 +100	+220 +100	+90 +60	+106 +60	+134 +60	+49 +30	+60 +30	+76 +30	+29 +10	+40 +10	+19 0	+30 0	+46 0	+74 0	+120 0
65	80																
80	100	+174 +120	+207 +120	+260 +120	+107 +72	+126 +72	+159 +72	+58 +36	+71 +36	+90 +36	+34 +12	+47 +12	+22 0	+35 0	+54 0	+87 0	+140 0
100	120																

●轴用尺寸公差　Fit tolerances of normal shafts

Unit(单位):μm

Dimensional division 基准尺寸的分类		Fit tolerance grade for shafts 轴的公差带															
over 超过	up to 以下	d8	d9	e7	e8	e9	f6	f7	f8	g5	g6	g7	h5	h6	h7	h8	h9
—	3	-20 -34	-20 -45	-14 -24	-14 -28	-14 -39	-6 -12	-6 -16	-6 -20	-2 -6	-2 -8	-2 -12	0 -4	0 -6	0 -10	0 -14	0 -25
3	6	-30 -48	-30 -60	-20 -32	-20 -38	-20 -50	-10 -18	-10 -22	-10 -28	-4 -9	-4 -12	-4 -16	0 -5	0 -8	0 -12	0 -18	0 -30
6	10	-40 -62	-40 -76	-25 -40	-25 -47	-25 -61	-13 -22	-13 -28	-13 -35	-5 -11	-5 -14	-5 -20	0 -6	0 -9	0 -15	0 -22	0 -36
10	14	-50 -77	-50 -93	-32 -50	-32 -59	-32 -75	-16 -27	-16 -34	-16 -43	-6 -14	-6 -17	-6 -24	0 -8	0 -11	0 -18	0 -27	0 -43
14	18																
18	24	-65 -98	-65 -117	-40 -61	-40 -73	-40 -92	-20 -33	-20 -41	-20 -53	-7 -16	-7 -20	-7 -28	0 -9	0 -13	0 -21	0 -33	0 -52
24	30																
30	40	-80 -119	-80 -142	-50 -75	-50 -89	-50 -112	-25 -41	-25 -50	-25 -64	-9 -20	-9 -25	-9 -34	0 -11	0 -16	0 -25	0 -39	0 -62
40	50																
50	65	-100 -146	-100 -174	-60 -90	-60 -106	-60 -134	-30 -49	-30 -60	-30 -76	-10 -23	-10 -29	-10 -40	0 -13	0 -19	0 -30	0 -46	0 -74
65	80																
80	100	-120 -174	-120 -207	-72 -107	-72 -126	-72 -159	-36 -58	-36 -71	-36 -90	-12 -27	-12 -34	-12 -47	0 -15	0 -22	0 -35	0 -54	0 -87
100	120																

Unit(单位):μm

Dimensional division 基准尺寸的分类		Fit tolerance grade for holes 孔的公差带														
over 超过	up to 以下	JS6	JS7	K6	K7	M6	M7	N6	N7	N8	N9	P6	P7	P8	P9	R7	S7
—	3	±3	±5	0 -6	0 -10	-2 -8	-2 -12	-4 -10	-4 -14	-4 -18	-4 -29	-6 -12	-6 -16	-6 -20	-6 -31	-10 -20	-14 -24
3	6	±4	±6	+2 -6	+3 -9	-1 -9	0 -12	-5 -13	-4 -16	-2 -20	0 -30	-9 -17	-8 -20	-12 -30	-12 -42	-11 -23	-15 -27
6	10	±4.5	±7.5	+2 -7	+5 -10	-3 -12	0 -15	-7 -16	-4 -19	-3 -25	0 -36	-12 -21	-9 -24	-15 -37	-15 -51	-13 -28	-17 -32
10	14	±5.5	±9	+2 -9	+6 -12	-4 -15	0 -18	-9 -20	-5 -23	-3 -30	0 -43	-15 -26	-11 -29	-18 -45	-18 -61	-16 -34	-21 -39
14	18																
18	24	±6.5	±10.5	+2 -11	+6 -15	-4 -17	0 -21	-11 -24	-7 -28	-3 -36	0 -52	-18 -31	-14 -35	-22 -55	-22 -74	-20 -41	-27 -48
24	30																
30	40	±8	±12.5	+3 -13	+7 -18	-4 -20	0 -25	-12 -28	-8 -33	-3 -42	0 -62	-21 -37	-17 -42	-26 -65	-26 -88	-25 -50	-34 -59
40	50																
50	65	±9.5	±15	+4 -15	+9 -21	-5 -24	0 -30	-14 -33	-9 -39	-4 -50	0 -74	-26 -45	-21 -51	-32 -78	-32 -106	-30 -60	-42 -72
65	80															-32 -62	-48 -78
80	100	±11	±17.5	+4 -18	+10 -25	-6 -28	0 -35	-16 -38	-10 -45	-4 -58	0 -87	-30 -52	-24 -59	-37 -91	-37 -124	-38 -73	-58 -93
100	120															-41 -76	-66 -101

Unit(单位):μm

Dimensional division 基准尺寸的分类		Fit tolerance grade for shafts 轴的公差带														
over 超过	up to 以下	js5	js6	js7	k5	k6	k7	m5	m6	n6	p6	r6	s6	t6	u6	x6
—	3	±2	±3	±5	+4 0	+6 0	+10 0	+6 +2	+8 +2	+10 +4	+12 +6	+16 +10	+20 +14	—	+24 +18	+26 +20
3	6	±2.5	±4	±6	+6 +1	+9 +1	+13 +1	+9 +4	+12 +4	+16 +8	+20 +12	+23 +15	+27 +19	—	+31 +23	+36 +28
6	10	±3	±4.5	±7.5	+7 +1	+10 +1	+16 +1	+12 +6	+15 +6	+19 +10	+24 +15	+28 +19	+32 +23	—	+37 +28	+43 +34
10	14	±4	±5.5	±9	+9 +1	+12 +1	+19 +1	+15 +7	+18 +7	+23 +12	+29 +18	+34 +23	+39 +28	—	+44 +33	+51 +40
14	18													—		+56 +45
18	24	±4.5	±6.5	±10.5	+11 +2	+15 +2	+23 +2	+17 +8	+21 +8	+28 +15	+35 +22	+41 +28	+48 +35	—	+54 +41	+67 +54
24	30													+54 +41	+61 +48	+77 +64
30	40	±5.5	±8	±12.5	+13 +2	+18 +2	+27 +2	+20 +9	+25 +9	+33 +17	+42 +26	+50 +34	+59 +43	+64 +48	+76 +60	—
40	50													+70 +54	+86 +70	—
50	65	±6.5	±9.5	±15	+15 +2	+21 +2	+32 +2	+24 +11	+30 +11	+39 +20	+51 +32	+60 +41	+72 +53	+85 +66	+106 +87	—
65	80											+62 +43	+78 +59	+94 +75	+121 +102	—
80	100	±7.5	±11	±17.5	+18 +3	+25 +3	+38 +3	+28 +13	+35 +13	+45 +23	+59 +37	+73 +51	+93 +71	+113 +91	+146 +124	—
100	120											+76 +54	+101 +79	+126 +104	+166 +144	—

Appended table 附表

加工尺寸的普通公差
General tolerances

●切削加工尺寸的普通公差　General tolerances for linear dimensions　JIS B 0405

Unit(单位):mm

Tolerance grade　公差等级		Dimensional division　基准尺寸的分类					
Symbol 符号	Remark 说明	0.5 or over up to 3 0.5以上 3以下	over 3 up to 6 超过3 6以下	over 6 up to 30 超过6 30以下	over 30 up to 120 超过30 120以下	over 120 up to 400 超过120 400以下	over 400 up to 1000 超过400 1000以下
f	Fine 精密级	±0.05	±0.05	±0.1	±0.15	±0.2	±0.3
m	Medium 中级	±0.1	±0.1	±0.2	±0.3	±0.5	±0.8
c	Coarse 普通级	±0.2	±0.3	±0.5	±0.8	±1.2	±2
v	Very coarse 极普通级	—	±0.5	±1	±1.5	±2.5	±4

●倒角部长度尺寸的公差　General tolerances for chamfer dimensions　JIS B 0405

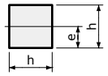
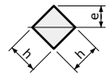
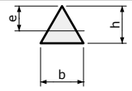
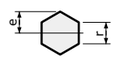
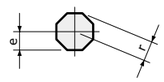
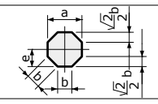
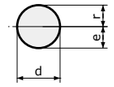
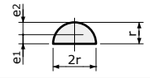
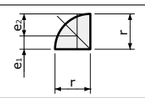
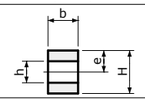
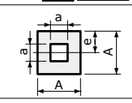
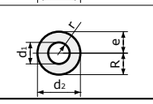
Unit(单位):mm

Tolerance grade　公差等级		Dimensional division　基准尺寸的分类		
Symbol 符号	Remark 说明	0.5 or over up to 3 0.5以上 3以下	over 3 up to 6 超过3 6以下	over 6 超过6
f	Fine 精密级	±0.2	±0.5	±1
m	Medium 中级	±0.2	±0.5	±1
c	Coarse 普通级	±0.4	±1	±2
v	Very coarse 极普通级	±0.4	±1	±2

●角度尺寸的公差　General tolerances for angular dimensions　JIS B 0405

Tolerance grade　公差等级		Length division of shorter side formed angle(mm)　适用角度的短边边长分类(mm)				
Symbol 符号	Remark 说明	up to 10 10以下	over 10 up to 50 超过10 50以下	over 50 up to 120 超过50 120以下	over 120 up to 400 超过120 400以下	over 400 超过400
f	Fine 精密级	±1°	±30′	±20′	±10′	±5′
m	Medium 中级	±1°	±30′	±20′	±10′	±5′
c	Coarse 普通级	±1°30′	±1°	±30′	±15′	±10′
v	Very coarse 极普通级	±3°	±2°	±1°	±30′	±20′

面积、重心、截面惯性矩
Area·Center of gravity·Moment of Inertia of area

Cross section 截面	Sectional area 截面积 A	Distance to center of gravity 重心距离 e	Moment of Inertia of area 截面惯性矩 I	Section modulus 截面模量 Z=I/e
	bh	$\frac{h}{2}$	$\frac{bh^3}{12}$	$\frac{bh^2}{6}$
	h^2	$\frac{h}{2}$	$\frac{h^4}{12}$	$\frac{h^3}{6}$
	h^2	$\frac{h}{2}\sqrt{2}$	$\frac{h^4}{12}$	$0.1179h^3=\frac{\sqrt{2}}{12}h^3$
	$\frac{bh}{12}$	$\frac{2}{3}h$	$\frac{bh^3}{36}$	$\frac{bh^2}{24}$
	$\frac{3\sqrt{3}}{2}r^2$	$\sqrt{\frac{3}{4}}r$	$\frac{5\sqrt{3}}{16}r^4$	$\frac{5}{8}r^3$
		r		$\frac{5\sqrt{3}}{16}r^3$
	$2.828r^2$	$0.924r^2$	$\frac{1+2\sqrt{2}}{6}r^4$	$0.6906r^3$
	$0.8284a^2$	$b=\frac{a}{1+\sqrt{2}}$	$0.0547a^4$	$0.1095a^3$
	$\pi r^2=\frac{\pi d^2}{4}$	$\frac{d}{2}$	$\frac{\pi d^4}{64}=\frac{\pi r^4}{4}$	$\frac{\pi d^3}{32}=\frac{\pi r^3}{4}$
	πab	a	$\frac{\pi}{4}ba^3$	$\frac{\pi}{4}ba^2$
	$\frac{\pi}{2}r^2$	$e_1=0.4244r$ $e_2=0.5756r$	$\left(\frac{\pi}{8}-\frac{8}{9\pi}\right)r^4$	$z_1=0.2587r^3$ $z_2=0.1908r^3$
	$\frac{\pi}{4}r^2$	$e_1=0.4244r$ $e_2=0.5756r$	$0.055r^4$	$z_1=0.1296r^3$ $z_2=0.0956r^3$
	$b(H-h)$	$\frac{H}{2}$	$\frac{b}{12}(H^3-h^3)$	$\frac{b}{6H}(H^3-h^3)$
	A^2-a^2	$\frac{A}{2}$	$\frac{A^4-a^4}{12}$	$\frac{1}{6}\frac{A^4-a^4}{A}$
	$\frac{\pi}{4}(d_2^2-d_1^2)$	$\frac{d_2}{2}$	$\frac{\pi}{64}(d_2^4-d_1^4)$ $=\frac{\pi}{4}(R^4-r^4)$	$\frac{\pi}{32}\left(\frac{d_2^4-d_1^4}{d_2}\right)$ $=\frac{\pi}{4}\frac{R^4-r^4}{R}$

技术数据表

本公司可根据客户的需求选择滚珠丝杠。选择滚珠丝杠时，请尽可能详细告知使用条件，以便我们更准确地选型。
使用以下技术数据表，可方便您快速选型。

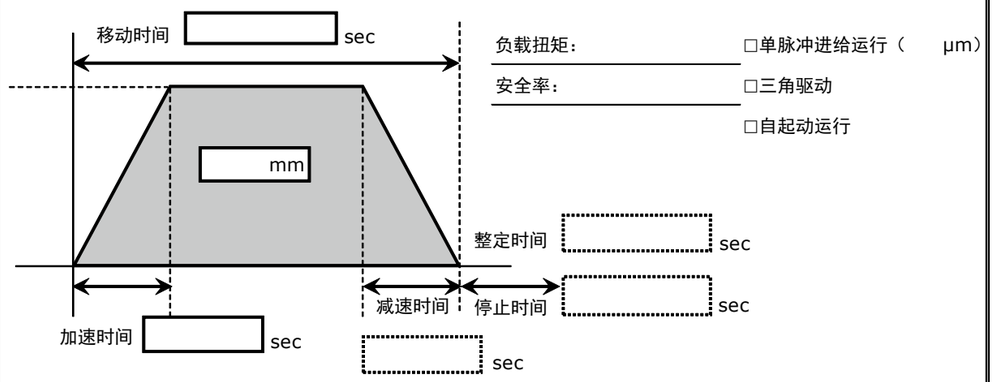
技术数据表

日期和时间	/ /		联系人姓名			
贵公司名称						
TEL			E-mail			
行业	☐半导体 ☐液晶 ☐测量仪器 ☐滑台 ☐光学仪器 ☐食品机械 ☐医疗器械 ☐航空、宇宙相关 ☐汽车 ☐军事 ☐其他（ ）					
产品种类	☐滚珠丝杠 ☐进给丝杠 ☐树脂导程丝杠 ☐带电机滚珠丝杠 ☐执行器 ☐其他（ ）					
使用条件	装置名称		轴径（mm）		导程（mm）	
	使用位置		精度等级		间隙（μm）	
	设置姿态	☐水平 ☐垂直 ☐（ ）度	行程（mm）		润滑	
	环境温度	☐常温 ☐其他（ ）度	负载（最大·常用）		速度（最高·常用）	
	特别事项					
精度要求	绝对定位 μm	重复定位 μm	空转 μm			

●运行曲线 / 速度线图●

必备项目

可选项



负载扭矩：

安全率：

☐单脉冲进给运行（ μm）

☐三角驱动

☐自起动运行

记录

☐滚珠丝杠寿命计算委托 ☐滚珠丝杠选型委托 ☐电机选型委托 ☐其他（ ）

计算寿命	（小时 · 日 · 年）	推荐的滚珠丝杠 / 电机	
受理号			

KSS CO.,LTD. kSS 株式会社

Technical Data Sheet

As customer's request, KSS selects Ball Screws. For selection of Ball Screws, please let us know detail of usage condition as much as possible and it enables precise selection.
Prompt selection can be possible by using technical data sheet below.

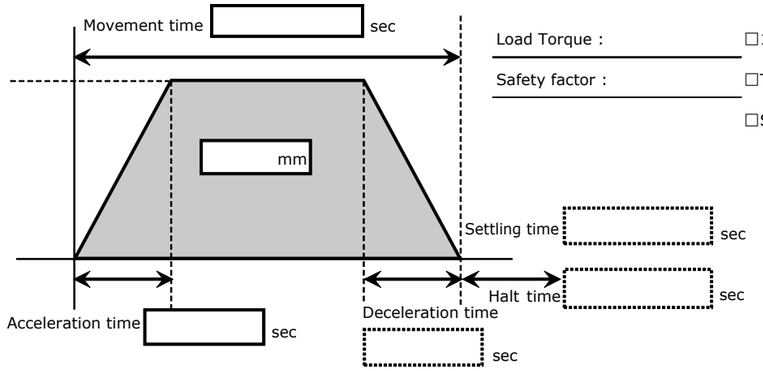
Technical data sheet

Date	/ /		Person in charge			
Company Name						
Telephone No.			E-mail address			
Industry Field	☐ Semiconductor ☐ LCD ☐ Measuring Equipment ☐ Stage ☐ Optical ☐ Food ☐ Medical ☐ Aero space ☐ Automobile ☐ Military affairs ☐ Others（ ）					
Products	☐Ball Screw ☐ Lead Screw ☐ Resin Lead Screw ☐ Direct Motor Drive Ball Screw ☐Actuator ☐ Others（ ）					
Operating Condition	Machine Name		Shaft dia.（mm）		Lead（mm）	
	Application		Accuracy Grade		Axial play（μm）	
	Position	☐ Hor. ☐ Vert.☐（ ）deg	Travel（mm）		Lubrication	
	Operating Temp.	☐Room Temp.☐Others（ ）deg	Load（max/mean）		Speed（max/mean）	
	Remarks					
Reqd. accuracy	Absolute Positioning μm		Repeatability μm		Lost motion μm	

● Operating Pattern ●

Crucial items

Optional Items



Load Torque :

Safety factor :

☐1 pulse feed operation（μm）

☐Triangle drive motion

☐Starting operation

Memorandum

Request items	☐Ball Screw life time ☐ Ball Screw Model selection ☐ Motor Model selection ☐ Others（ ）		
Calculated Ball Screw Life	（hours/days/years）	Recommended Ball Screw/Motor	
Resistered No.			

KSS CO.,LTD.

Appended table 附表

Advanced Technology of "Miniature"

联系方式

ケーエスエス株式会社

URL：https://www.kss-superdrive.co.jp
E-mail ： sales@kss-superdrive.co.jp

国际销售部
TEL：03-3756-3921
FAX：03-3756-3191

小千谷办事处
TEL：0258-89-6257
FAX：0258-81-1339

Contact us

KSS CO.,LTD.

URL：https://www.ballscrew.com
E-mail ： intldept@kss-superdrive.co.jp

International sales dept.
TEL：03-3756-3921
FAX：03-3756-3191

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小千谷工场

小千谷办事处

〒947-0043 新潟县小千谷市大字山谷字新保4－14

Ojiya plant

Ojiya office

Aza Shinbo 4-14, Oaza Yamaya, Ojiya City, Niigata Japan 947-0043

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