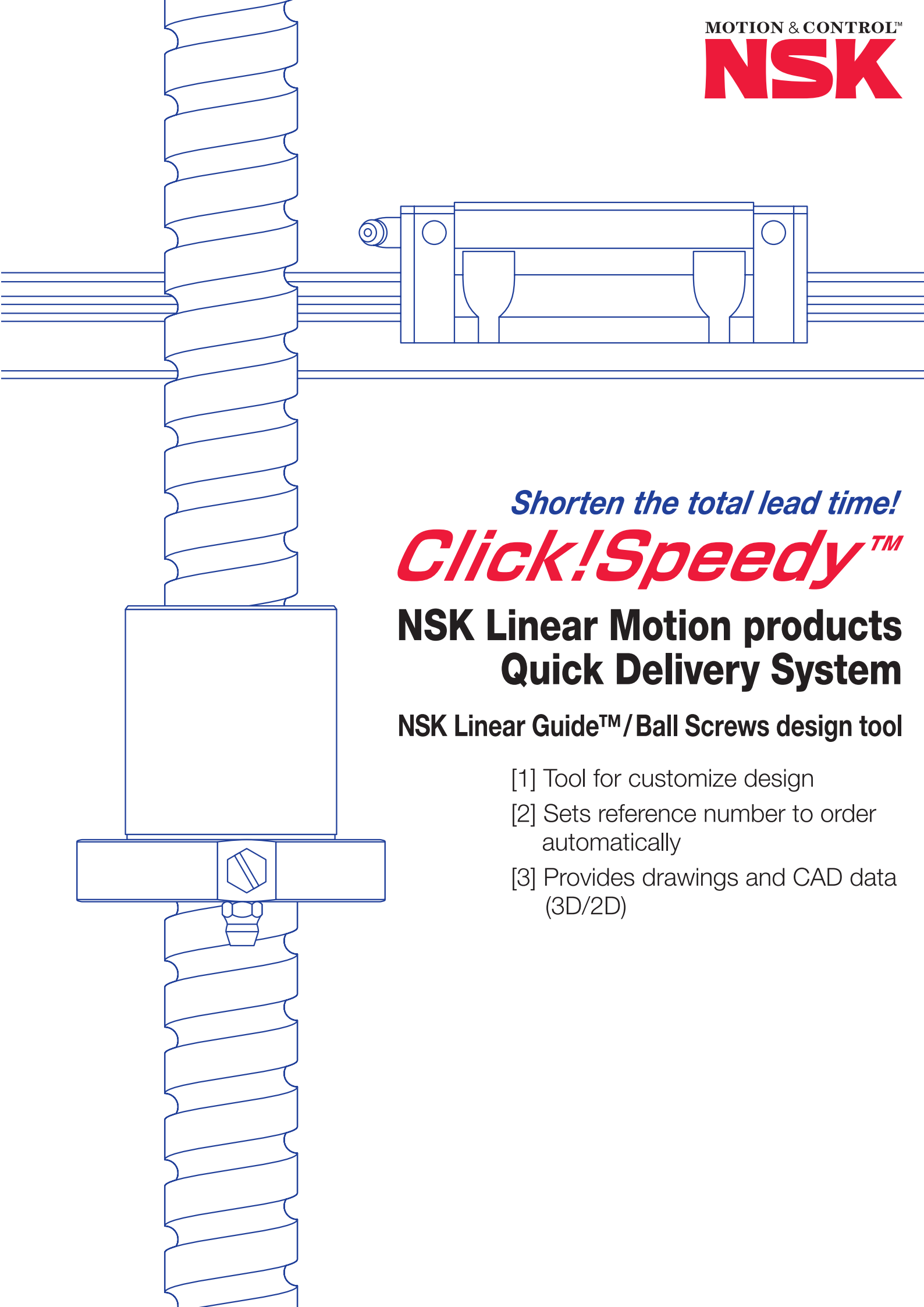
MOTION & CONTROL™
NSK



Shorten the total lead time!

Click!Speedy™

NSK Linear Motion products Quick Delivery System

NSK Linear Guide™/Ball Screws design tool

[1] Tool for customize design

[2] Sets reference number to order automatically

[3] Provides drawings and CAD data (3D/2D)

A. NSK Linear Guide™ A1 ⟆ A48

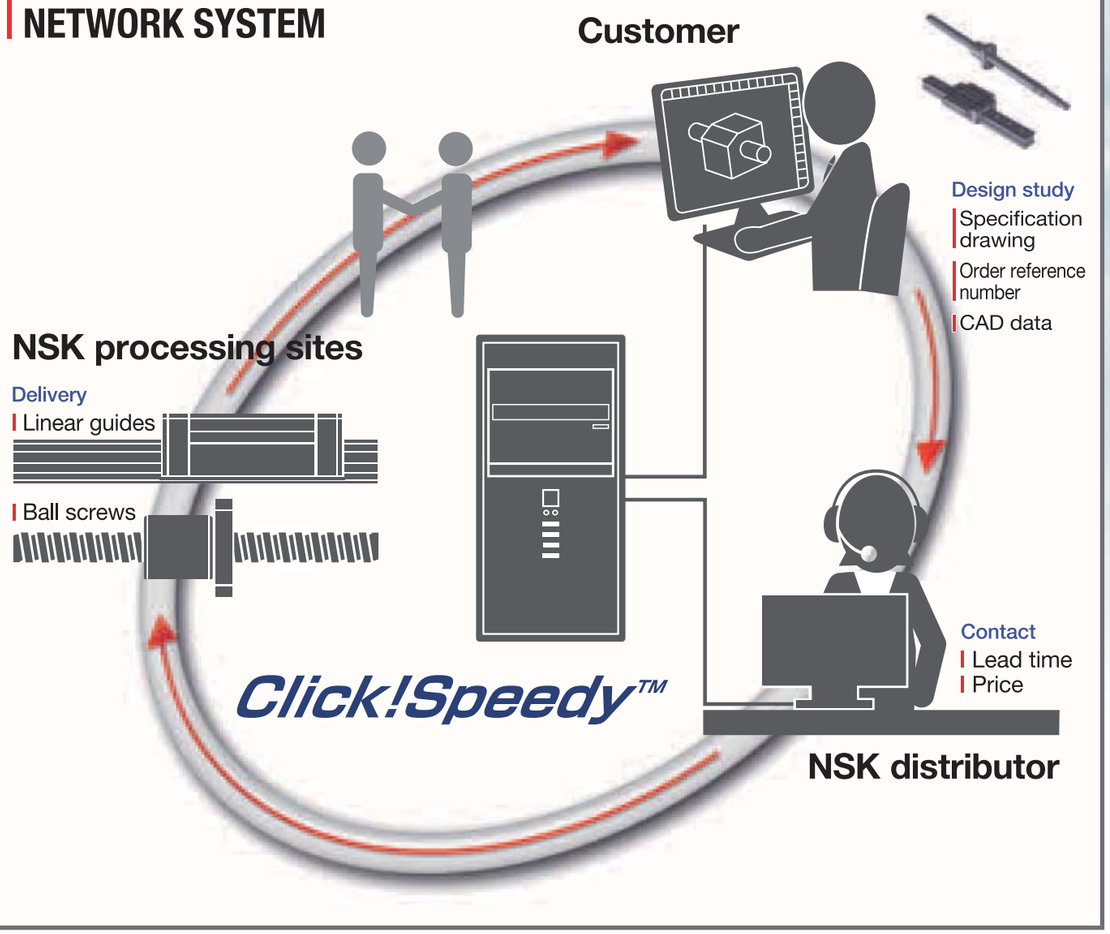
B. Ball Screws B1 ⟆ B214

C. Other C1 ⟆ C18

NSK Linear Motion products (NSK Linear Guide™ and Ball Screws) Quick Delivery System Design Tool

Click!Speedy™

NETWORK SYSTEM



Feature 1 Directly connect to NSK on the Internet

Provides customized design suited for customer's specification by simple operations.
Provides drawings and CAD data (3D / 2D) and sets reference number to order.

Feature 2 Essentially short lead time

NSK processing sites

Standard-length product always in stock at the processing site
→Start immediately upon receipt of order.

Linear guides

Ball screws

Wide variety of options

"NSK K1™" lubrication unit

Surface treatment with high rust preventive effects

"NSK K1™" for food processing equipment and medical devices

Various greases for each purposes

Design tool
Click!Speedy™

NSK Linear Guide™	Ball Screws
All randam-matching 6 series NH/NS/LW/PU/PE/RA	All standard 7 series PSS/USS/FSS/FA/MA/SA/HSA

Note: Range of series depends on region.

Contents

A. NSK Linear Guide™

NSK Linear Guide™ Click!Speedy Series A1

A-1 Accuracy A5

A-2 Preload A7

A-3 Materials and Surface Treatment A9

A-4 "NSK K1™" lubrication unit A10

A-5 Lubrication A13

A-6 Datum surfaces A16

A-7 Butting rail specification A17

A-8 Lubrication components A17

A-9 Mounting position and direction of lubrication accessories A18

A-10 Dust Proof A19

A-11 Bolt-hole cap to plug the bolt holes for rail mounting A21

Dimension Table

NH15-30AN・BN A23

NH35-65AN・BN A25

NH25-55AL・BL A27

NH15-30EM・GM A29

NH35-65EM・GM A31

NS-AL・CL A33

NS-EM・JM A35

LW17-35EL A37

PU09-15 ..... A39

PE09-15 ..... A41

RA25-45AN・BN A43

RA25-45AL・BL A45

RA25-45EM・GM A47

B. Ball Screws

Ball Screws Click!Speedy Series B1

B-1 Ball screw recirculation system B5

B-2 Preload system B7

B-3 Accuracy B8

B-4 Friction Torque and Drive Torque B12

B-5 Lubrication of Ball Screw B14

B-6 Equipped with "NSK K1™" Lubrication Unit B15

B-7 Precautions When Handling Ball Screws B17

B-8 Accessories B19

B-9 Ball screw support bearings B33

Dimension Table

Compact FA PSS Type B37

Compact FA USS Type B97

Compact FA FSS Type B103

MA Type, Miniature, Fine Lead B119

FA Type for Small Equipment B141

SA Type for Machine Tools B177

HSA Type for Machine Tools B197

C. Other

C-1 Rust Prevention and Surface Treatment C1

C-2 Clean environment C3

C-3 Lubrication C6

C-4 RoHS Compliant C18

NSK Linear Guide™

Deliver many various standard series in a short lead time.

NH and NS series appear ! They are completely compatible with LH and LS series and have **a service life twice** as long as LH and LS series.*1 *1) Representative value of series

Standard length rail and slide : Always in stock

Random-matching achieved through high processing accuracy

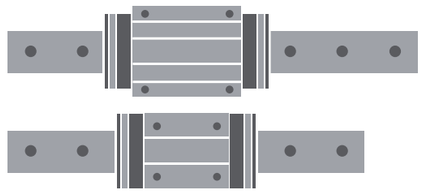
[Standard length rail] Standard stock

[Slide] Standard stock

Point

Quick delivery

★Rail: Cut to the specified length
★Slide: Various types available

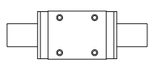
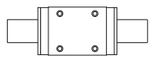
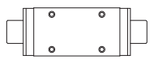
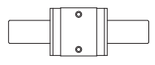
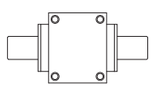
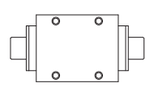
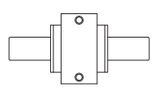


Click!Speedy Applicable series

Series	Appearance	Category	Slide type	Size												
				09	12	15	17	20	21	25	27	30	35	45	55	65
NH		General	AL/AN/ BL/BN/ EM/GM			●		●		●		●	●	●	●	●
NS		Compact	AL/CL/ EM/JM			●		●		●		●	●			
LW		Wide	EL				●		●		●		●			
PU		Miniature	AL/BL TR/UR	●	●	●										
PE		Miniature wide	AR/BR/ TR/UR	●	●	●										
RA		Roller guide	AL/AN/ BL/BN/ EM/GM							●		●	●	●		

The above series has many options such as change of grease, surface treatment, installation of "NSK K1™" lubrication unit.

Slide shape

Shape		Cross section	Length		
			Standard	Long	Short
Square type	High type		AN 	BN 	—
	Low type		AL/AR/TR 	BL/BR/UR 	CL 
Flange type	Low type		EL/EM 	GM 	JM 

Slides of RA and LW series have six mounting holes.

Options

Item	Descriptions	Item	Descriptions
Accuracy (selective)	High precision grade Normal grade	Packed lubricant (selective)	Grease (AS2, PS2, LR3, NF2) Clean Grease (LG2, LGU) None (rust preventive oil is applied)
Preload (selective)	Fine clearance Slight preload Medium preload	Type of lubrication accessory	A, B or C type grease fitting Drive-in type grease fitting SF type tube fitting LF type tube fitting
Material (selective)	Special high carbon steel Stainless steel		
Surface treatment	Low temperature chrome plating Fluoride low temperature chrome plating	Dust-proof specification	Double seal Protector Double seal and protector Bolt-hole cap
Lubrication unit	NSK K1 lubrication unit NSK K1 for food processing equipment and medical devices		

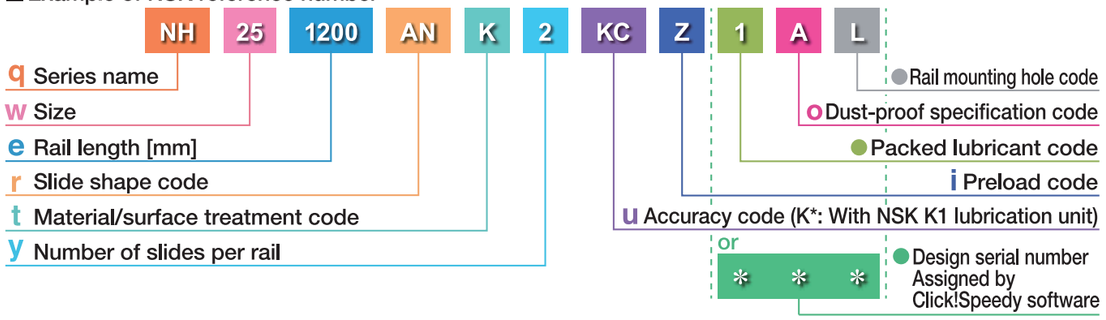
Some series and sizes don't have the above options. Can be confirmed through detail on click!Speedy. Also, please consult NSK.

NSK Linear Guide™

Competitor reference numbers can be converted into NSK reference numbers with easy operation.

Example of Click!Speedy reference number

■ Example of NSK reference number



Replaceable series in THK

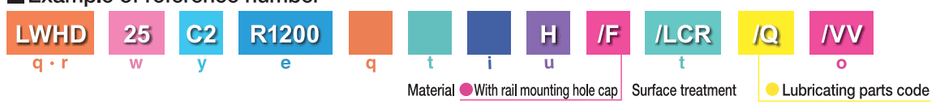
Manufacturer	General	Compact	Wide	Roller guide	Miniature
NSK	NH	NS	LW	RA	PU, PE
THK	SHS, HSR	SSR, SR	HRW	SRG	RSH, RSR

■ Example of reference number

Replaceable series in IKO

Manufacturer	General	Compact	Wide	Roller guide	Miniature
NSK	NH	NS	LW	RA	PU, PE
IKO	LWH, MH	LWE, ME	LWFF	LRX, MX	LWL, ML, LWLF, MLF

■ Example of reference number



Replaceable series in MISUMI

Manufacturer	General	Compact	Wide	Roller guide	Miniature
NSK	NH	NS	LW	RA	PU, PE
MISUMI	SE, SH, SSH	SSV, SSX, SV, SX	—	—	SAU, SAW, SE, SEL, SSE, SSEL

■ Example of reference number

Replaceable series in HIWIN

Manufacturer	General	Compact	Wide	Roller guide	Miniature
NSK	NH	NS	LW	RA	PU, PE
HIWIN	HGH, HGL, HGW, QHH, QHW	EGH, EGW, QEH, QEW	WEW	RGH, RGW, QRH, QRW	MGN, MGW

■ Example of reference number

*For items not otherwise stated, only codes (q , w , e …) are indicated in accordance with NSK reference number.

Example of proposed NSK products

Specification check Can confirm even differences between NSK and competitor specifications.

We have selected an NSK equivalent model, based on the competitor specifications provided.
The selected product is the closest equivalent in mounting, load rating, accuracy, preload, materials, plating, and dust-proof specifications.
A comparison of basic load rating and dimension is given below.
Please confirm the selected product fulfills your requirements. If you have any questions, please contact an NSK representative.

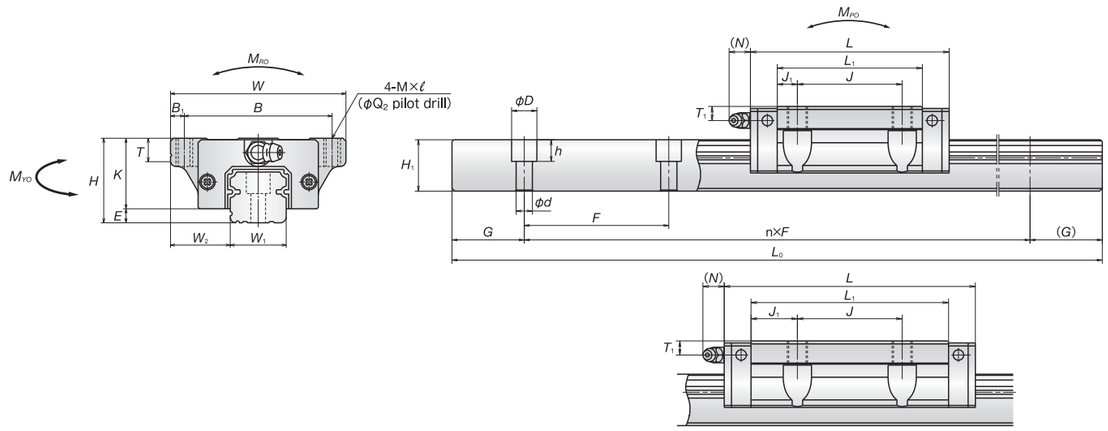
Please note NSK standard specifications for the product you have selected below.

- Compatible slide with quick delivery item selected.
- Accuracy grade for random matching selected quick delivery item given.
- Preload classification for random matching selected quick delivery item given.
- AS2 grade is used as standard grease for NSK equivalent products.
- B type grease fitting is used as a lubrication accessory.

■ Dimensions (L : incl. dust-proof seals) (Dimensions highlighted differ from competitor specifications) Unit : mm

	Reference number	Assembly			Slide													
		Height			Width	Length	Mounting hole									Grease fitting	
		H	E	W_2	W	L	B	J	M× Pitch ×ℓ Q_1×ℓ	Q_2	B_1	L_1	J_1	K	T	Hole size	T_1
NSK equivalent model	NH200850EMN2PCZ1AL	30	5	21.5	63	69.8	53	40	M6×1×9.5	5.3	5	50	5	25	10	M6×0.75	5
Competitor specification	(Competitor reference number)	30	4	21.5	63	70	53	40	M6×9.5	5.4	5	49	5.4	26	10	M6	5

	Reference number	Rail				Basic load rating				
		Width	Height	Pitch	Mounting bolt hole	Dynamic	Static	Static moment (N·m)		
		W_1	H_1	F	d×D×h	C(N)	C_0(N)	M_{R0}	M_{P0}	M_{Y0}
NSK equivalent model	NH200850EMN2PCZ1AL	20	18	60	6×9.5×8.5	23 700	32 500	219	185	155
Competitor specification	(Competitor reference number)	20	18	60	6×9.5×8.5	12 000	22 000	200	180	180



A-1 Accuracy

A-1-1 Accuracy standard

The accuracy characteristics of linear guide are specified to each series in the variations of assembled height, assembled width, and running parallelism.

A-1-2 Definition of accuracy

・Table 1, Fig. 1 and Fig. 2 show accuracy characteristics.

Table 1 Definition of accuracy

Characteristics	Definition (Figs. 1 and 2)
Mounting height *H*	Distance from A (rail bottom datum surface) to C (slide top surface)
Variation of *H*	Variation of *H* in slides assembled to the rails of a set of linear guides
Mounting width W_2 or W_3	Distance from B (rail side datum surface) to D (slide side datum surface). Applicable only to the reference linear guide.
Variation of W_2 or W_3	Difference of the width (W_2 or W_3) between the assembled slides which are installed in the same rail. Applicable only to the reference linear guide.
Running parallelism of slide, surface C to surface A	Variation of C (slide top surface) to A (rail bottom datum surface) when slide is moving.
Running parallelism of slide, surface D to surface B	Variation of D (slide side datum surface) to B (rail side datum surface) when a slide is moving.

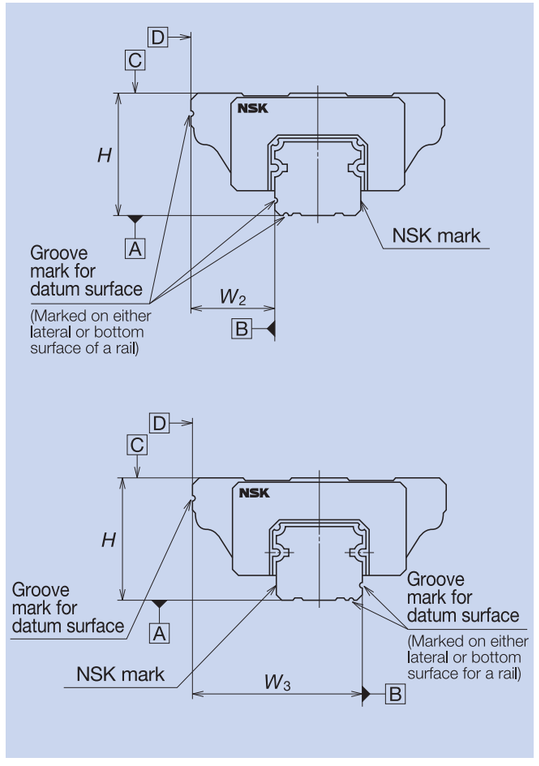


Fig. 1 Assembled dimensions

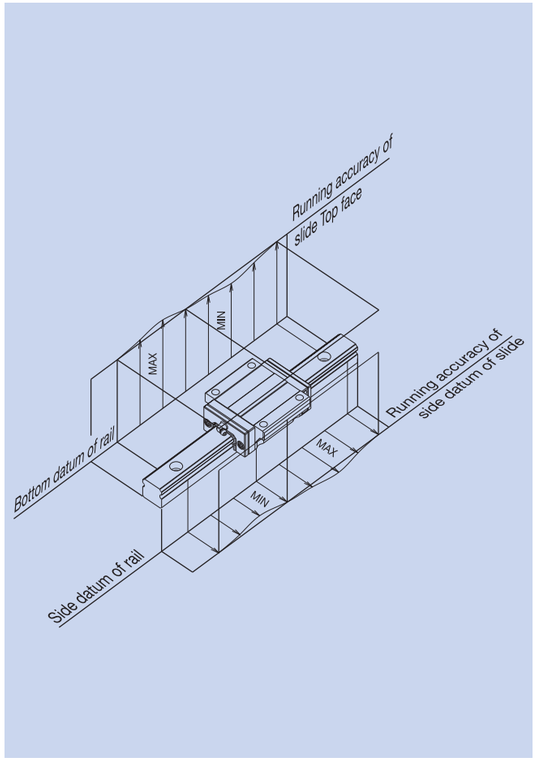


Fig. 2 Running parallelism of slide

Mounting width: W_2 and W_3

・Mounting width differs depending on the arrangement of the datum surfaces of the rail and slide on the reference linear guide (indicated as KL on the rail). (Fig. 3 and Fig. 4)

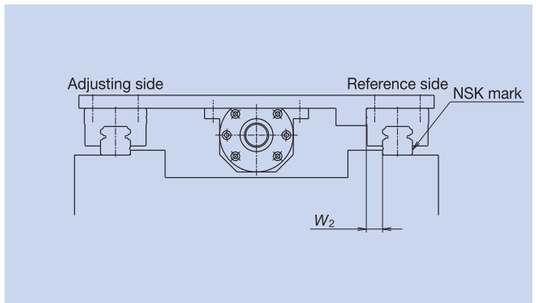


Fig. 3 Mounting width W_2

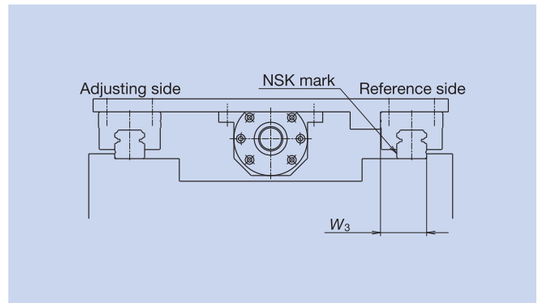


Fig. 4 Mounting width W_3

Running parallelism of slide

・The running parallelism which matches the characteristic of each series is set for the NSK linear guides. Table 2 shows the running parallelism for each series.

Table 2 Running parallelism of slide

NH・NS・LW・RA Series — Unit: μm

Rail length (mm) over	Rail length (mm) or less	High precision grade PH	Normal grade PC
	50	2	5
50	80	3	5
80	125	3	5
125	200	3.5	6
200	250	4.5	7.5
250	315	5	8.5
315	400	5.5	9.5
400	500	6	11
500	630	6.5	12
630	800	7	13
800	1 000	7.5	15
1 000	1 250	8.5	16
1 250	1 600	9.5	17
1 600	2 000	11	19
2 000	2 500	12	21
2 500	3 150	13	23
3 150	4 000	14	25

Note: LW series is only applicable to normal grade (PC)

PU・PE Series — Unit: μm

Rail length (mm) over	Rail length (mm) or less	Normal grade PC
	50	6
50	80	6
80	125	6.5
125	200	7
200	250	8
250	315	9
315	400	11
400	500	12
500	630	14
630	800	16
800	1 000	18
1 000	1 250	20

A-1-3 Selection of accuracy

・The accuracy grade which matches the characteristic of each series is set for the NSK linear guides.
・Table 3 shows the accuracy grades available for each series.

Table 3 Accuracy grades and applicable series

Series \ Accuracy grade	High precision grade PH	Normal grade PC
NH	○	○
NS	○	○
LW		○
PU		○
PE		○
RA	○	

A-2 Preload

A-2-1 Objective of preload

・An elimination of clearance between the raceways and rolling elements vanishes the mechanical play of the linear guide system.
・When a preload is applied, the deformation of linear guides by external vertical load is further improved thus increasing the system stiffness.
・Preloading method
The preload is applied by inserting rolling elements slightly bigger than the space of two raceways as shown in Fig. 5.

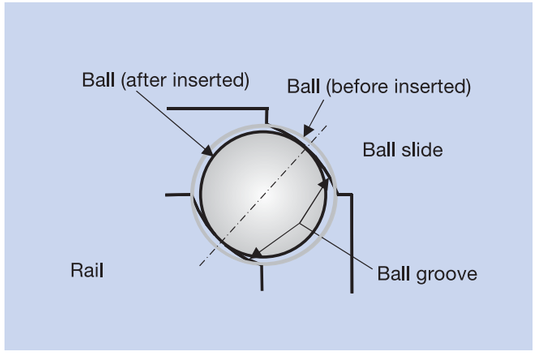


Fig. 5 Preloading method

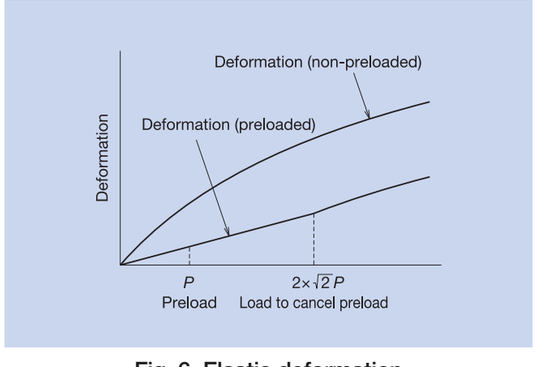


Fig. 6 Elastic deformation

A-2-2 Selection of preload classification

・Several types of preload that match the characteristic of each series are set for the NSK linear guides.
・Types of preload classification for each series are shown in Table 4. Table 5 shows the selection criterion of the preload classification.

Table 4 Classification of preload in each series

Series \ Preload	Medium preload ZH	Slight preload ZZ	Fine clearance ZT
NH	○	○	○
NS	○	○	○
LW		○	
PU			○
PE			○
RA	○		

Table 5 Selection criterion of the preload

Classification of preload	Use condition
ZT Fine clearance	・An application in which a set of two parallel linear guides (four slides/two rails) is used to sustain a unidirectional load with low vibration and impact. ・An application in which the accuracy is not very necessary but a friction force must be minimized.
ZZ Slight preload	・Moment loads are applied. ・Application for a highly accurate operation.
ZH Medium preload	・Application in which extremely high stiffness is essential. ・Application in which vibration and impact load will be applied.

Combination of accuracy grade and preload

・Combinations of accuracy grade and preload are shown in Table 6.

Table 6 Combinations of accuracy grade and preload type

Accuracy grade	Preload
PH	ZH, ZZ
PC	ZH, ZZ, ZT*

*) NH15 to 25 and NS15 to 30 are not available.

A-3 Materials and Surface Treatment

A-3-1 Stainless steel

Standard material for NSK linear guides is special high carbon steel, and stainless steel is also a standard material for some series.

○Stainless steel standard series

PU Series
PE Series

○Available in stainless steel

NH Series（NH15 to NH30）
NS Series

Select from the above when using in the environments which invite rust.

A-3-2 Surface treatment

(1) Recommended surface treatment

We recommend "low temperature chrome plating" and "fluoride low temperature chrome plating" for rust prevention because of the result of the humidity chamber test for antirust characteristics and their cost-effectiveness.

However, never apply any organic solvent to those treatments for degreasing because it has adverse effect on antirust characteristics.

○Low temperature chrome plating (Electrolytic rust prevention black treatment)

・Used to prevent corrosion, light reflection, and for cosmetic purpose.

○Fluoride low temperature chrome plating

・Fluoroplastic coating is provided following the low temperature chrome plating.
・Resistance to corrosion is higher than electrolytic rust prevention film treatment.

(2) Rust prevention of fluoride low temperature chrome plating

The use environment of NSK linear guides is expanding from general industrial machines, semiconductor and flat panel display manufacturing systems to aerospace equipment. Among all measures to cope with environment, rust prevention is the most challenging. Such environment includes:

・Moisture for washing machines and other equipment
・Chemicals used in the wet processing of semiconductor and flat panel display manufacturing equipment

NSK has developed electrolytic rust prevention black film treatment (black chrome plating) which is added by fluororesin impregnating treatment. (Hereinafter referred as "Fluoride low temperature chrome plating") This surface treatment methods has proved its superiority as the rust prevention of linear guides which are used in the above equipment.

●What is "Fluoride low temperature chrome plating?"

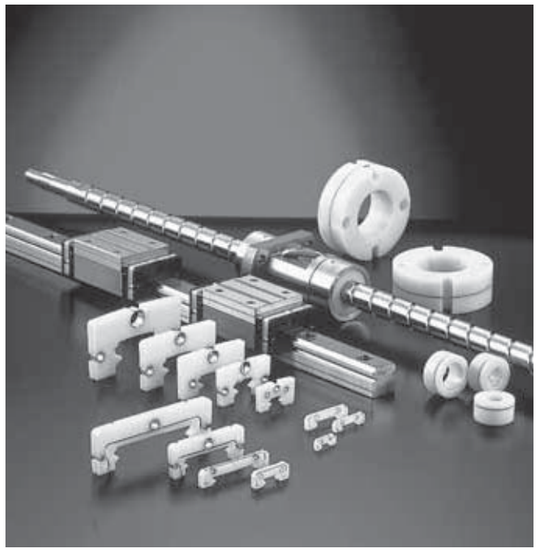
This is a type of black chrome plating which forms a black film (1 to 2 μm in thickness) on the metal surface. Fluoroplastic coating is added to the film to increase corrosion resistance.

・Accuracy control is easily manageable due to low temperature treatment and to the absence of hydrogen embrittlement.
・Product accuracy is less affected due to the thin film which has high-corrosion resistance.
・This method is superior to other surface treatments in durability on the rolling surface.
・Inexpensive compared with products with other surface treatment and stainless steel products.

However, do not use organic solvent because it adversely affects antirust property of the plating.

A-4 "NSK K1™" lubrication unit

A-4-1 NSK linear guides equipped with "NSK K1™" lubrication unit



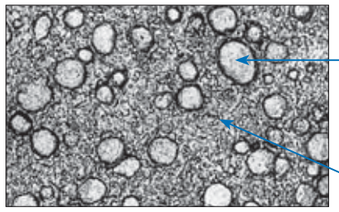
NSK K1 lowers machine operation cost, and reduces impact on the environment.

What is "long-term, maintenance-free" operation?

Ball screws and linear guides which are equipped with NSK K1 do not require maintenance for five years or up to 10 000 km operational distance.

What is NSK K1 lubrication unit?

NSK K1 is a lubrication device which combines oil and resin in a single unit. The porous resin contains a large amount of lubrication oil. Touching its surface to the raceway of a rail close to the ball contact point NSK K1 constantly supplies fresh oil which seeps from the resin.



Enlarged surface of NSK K1 lubrication unit

Polyolefin
Unlike vinyl chloride products, polyolefin does not produce dioxin. Polyolefin is also being used increasingly at supermarkets for food wrapping.

Lubrication oil
It is mineral oil-based lubricant. The oil has a viscosity of 100 cSt.

Remarkable capacity with new material: NSK K1™ lubrication unit information

●A NSK K1 lubrication unit (referred to as NSK K1 hereafter) equipped with an NSK linear guide is an outstanding new lubrication material.
●A Newly developed porous synthetic resin contains large volume of lubricant oil that seeps out and enhances lubricating function.
●Simply install NSK K1 inside a standard end seal (rubber).

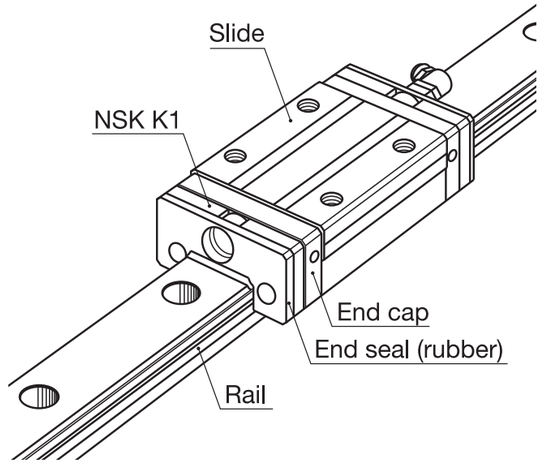


Fig. 7

A-4-2 Specifications

(1) Applicable series

・Can be installed in each series.
・Can be used with stainless steel materials and surface-treated items.

(2) Standard specifications

・NSK K1 is installed between the end seal and end cap. (Double seals, protectors, etc. are available for some series.)
・NSK standard grease is packed inside the slide. (Users can select from NSK standard grease.)
・Accuracy and preload classifications are the same as standard items. (Dynamic friction increases slightly due to NSK K1.)

(3) Number of installed NSK K1

Normally, one NSK K1 should be installed on both ends of slides. (two K1s for one slide)
If NSK K1 is required depending on service conditions and environment, a maximum of two sheets per side (four sheets on both sides) can be added. If even more sheets than these is necessary, please consult NSK.

A-4-3 "NSK linear guides for food processing equipment and medical devices" for sanitary environment

Used with NSK K1 for food processing equipment and medical devices and grease for food processing equipment.

What is "NSK K1™" for food processing equipment and medical devices?

With an amazing innovation lubrication unit, the NSK K1 for food processing equipment and medical devices utilizing the US Food and Drug Administration (FDA) compliant material, provides reliability when used in food processing equipment and medical devices. The newly developed porous synthetic resin contains abundant lubricant. With the basic function of highly praised NSK K1 lubrication unit for general industry, more sophisticated materials make it applicable in food and medical equipment.
It also offers easy installation: it is installed inside the standard end seal.

(1) Features

The highest grade of category H1 grease of USDA standard is used for NSK K1 lubrication unit.
*category H1: Lubricants permitted for use where there is possibility of incidental food contact
*USDA: USDA (The United States Department of Agriculture)
<Features of grease for food processing machines>
・This grease is approved by USDA H1. (National Science Foundation [NSF] carries out certification for USDA.)
・Superb water resistance and antirust capability
・Superb wear resistance
・Applicable for a centralized oiling system

(2) Available models

Table 7 shows available models.

Table 7 Available models

Series	Size
NH	NH15, NH20, NH25, NH30
NS	NS15, NS20, NS25, NS30
LW	LW17, LW21, LW27
PU	PU09, PU12, PU15
PE	PE09, PE12, PE15

Precautions for use

To maintain optimal performance of NSK K1 lubrication unit over a long time, please follow the instructions below:

1.Temperatures range for use: Maximum temperature in use: 50˚C
Momentary maximum temperature in use: 80˚C

2.Chemicals that should not come to contact :
Do not leave NSK K1 lubrication unit in organic solvent, white kerosene such as hexane, thinner which removes oil, and rust prevention oil which contains white kerosene.

Note: Water-type cutting oil, oil-type cutting oil and grease such as mineral-type and ester-type do not damage NSK K1 lubrication unit.

A-5 Lubrication

Mainly there are two ways of lubrication, grease and oil, for linear guides. Use a lubricant agent and method most suitable to condition requirements and the purpose to optimize functions of linear guides.

In general, lubricants with low base oil kinematic viscosity are used for high-speed operation, in which thermal expansion has a large impact, and in low temperatures.

Lubrication with high base oil kinematic viscosity is used for oscillating operations, operations in low speeds and in high temperatures.

The following are lubrication methods by grease and by oil.

A-5-1 Grease Lubrication

Grease lubrication is widely used because it does not require a special oil supply system or piping. Grease lubriction accessories available from NSK are:

・Various types of grease in bellows tube which can be instantly attached to the hand grease pump;

・NSK Grease Unit that consists of a hand grease pump and various nozzles. These are compact and easy to use.

(1) NSK grease lubricants

Table 8 shows the marketed general grease widely used for linear guides. In addition to these grease, NSK provides special grease for specific conditions and purposes.

Table 8 Grease lubricant for linear guides

Type	Thickener	Base oil	Base oil kinematic viscosity mm^2/s (40°C)	Range of use temperature (°C)	Purpose
AS2*1	Lithium type	Mineral oil	130	−10 to 110	For general use at high load
PS2*2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	−50 to 110	For low temperature and high frequency operation
LG2	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	−20 to 70	For clean environment
LGU	Diurea	Synthetic hydrocarbon oil	95.8	−30 to 120	For clean environment
NF2	Urea composite type	Synthetic hydrocarbon oil	26	−40 to 100	For fretting resistant
PARALIQ GA351*3	Aluminium complex	Paraffin oil	—	−40 to 120	For food processing machine

*1) Standard grease of NH, NS, LW, and RA Series.
*2) Standard grease of PU and PE Series.
*3) NSF H1 registered grease.

(2) How to replenish grease

Use the grease fitting of a slide if an exclusive grease supply system is not used. Supply the required amount of grease by a grease pump. Wipe off old grease and accumulated dust before supplying new grease. If the grease fitting is not used due to the size limitation, apply grease directly to the rail. Remove the seal if possible, and move the slide few strokes so the grease permeates it. A hand grease pump, an exclusive and easy lubricating device for linear guides, is available at NSK.

(3) Volume of grease to be replenished

Once grease is replenished, another supply is not required for a long time. But under some operational conditions, it is necessary to periodically replenish grease. The following are replenishing methods.

・When there is an exclusive grease supply system and the volume from the spout can be controlled, the criterion is: All at once, replenish the amount that fills about 50% of the internal space of the slide. This method eliminates waste of grease, and is efficient. Page C11 shows the internal spaces of slide of each series for your reference.

・When replenishing grease using a grease pump:
Use a grease pump and fill the inside of slide with grease. Supply grease until it comes out from the slide area. Move the slide by hand while filling them with grease, so the grease permeates all areas. Do not operate the machine immediately after replenishing. Always try to run-in the system a few times to spread the grease throughout the system and to remove excess grease from inside. Running-in operation is necessary because the sliding force of the linear guide greatly increases immediately after the replenishment (full-pack state) and may cause problems. Grease's stirring resistance is accountable for this phenomenon. Wipe off excess grease that accumulates at the end of the rail after trial runs, so the grease does not scatter to other areas.

(4) Intervals of checks and replenishments

Although the grease is of high quality, it gradually deteriorates and its lubrication function diminishes. Also, the grease in the slide is gradually removed by stroke movement. In some environments, the grease becomes dirty, and foreign objects may enter a slide. New grease should be replenished depending on the frequency of use. Table 9 shows a guide of intervals of grease replenishments to linear guides.

Table 9 Intervals of checks and replenishments for grease lubrication

Intervals of checks	Items to be checked	Intervals of replenishments
3 − 6 months	Dirt, foreign matters such as cutting chip	Usually once per year is sufficient. Every 3 000 km for a system such as material handling equipment that travels more than 3 000 km per year. Replenish if checking results warrant it necessary.

Notes: 1) As a general rule, do not mix greases of different brands. Grease structure may be destroyed if greases of different thickeners are mixed. Even when greases have the same thickener, different additives in them may have an adverse effect on each other.
2) Grease viscosity varies by temperature. Viscosity is particular high in winter due to low temperature. Pay attention to increase in linear guide's sliding resistance in such occasion.

A-5-2 Oil lubrication

Required amount of new oil is regularly supplied by:

- Manual or automatic intermittent supply system;
- Oil mist lubricating system via piping.

Equipment for oil lubrication is more costly than one for grease lubrication. However, oil mist lubricating system supplies air as well as oil, thus raising the inner pressure of the slide. This prevents foreign matters from entering, and the air cools the system. Use an oil of high atomizing rate such as ISO VG 32-68 for the oil mist lubrication system.

ISO VG 68-220 are recommended for common intermittent replenishment system. Approximate volume of oil Q for a slide of linear guide per hour can be obtained by the following formula.

In case of all ball type linear guides

$Q \geq n \diagup 150 (cm^3/hr)$

In case of RA series

$Q \geq n \diagup 100 (cm^3/hr)$

n: Linear guide size code

e.g. When NH45 is used, $n = 45$

Therefore, $Q = 45/150 = 0.3\ cm^3/hr$

For the oil lubrication by gravity drip, the oil supply position and installation position of the slide are crucial. In case of linear guide, unless it is installed to a horizontal position, the oil flows only on the down side, and does not spread to all raceway surface. This may cause insufficient lubrication. Please consult NSK to correct such situations prior to use. NSK has the internal design which allows oil lubricant to flow throughout the system.

Table 10 shows the criterion of intervals of oil checks and replenishments.

Table 10 Intervals of checks and replenishments

Method	Intervals of checks	Items to check	Replenishment or intervals of changes
Automatic intermittent supply	Weekly	Volume of oil, dirt, etc.	Replenish at each check. Suitable volume for tank capacity.
Oil bath	Daily before operation	Oil surface	Make a suitable criterion based on consumption

Notes: 1) As with grease lubrication, do not mix oil lubricant with different types.
2) Some components of the linear guide are made of plastic. Avoid using an oil that adversely affects synthetic resin.
3) When using oil mist lubricating system, please confirm an oil supply amount at the each outlet port.

A-6 Datum Surfaces

- For NSK linear guides, the datum surfaces of the rail and of the slide are either marked with a "datum surface groove" or with an "arrow." (Fig. 8).
- When the datum surfaces of the reference side rail and slides are pressed to their mounting datum surfaces respectively, the variation of distance (mounting width W_2 or W_3) between the datum surfaces of the rails and that of the slides must be a minimum and therefore, it is specified as the standard. (Figs. 9 and 10)
- The ways to indicate the datum surfaces of each series are shown in Table 11.

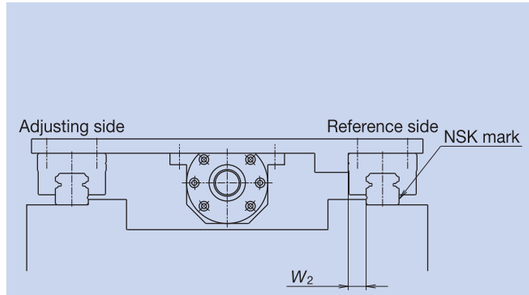


Fig. 9 Most common setting of the referenc side rail

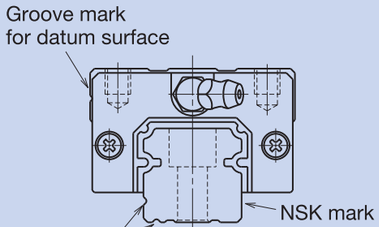


Fig. 8 Datum surface

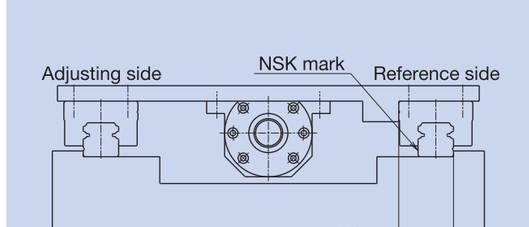
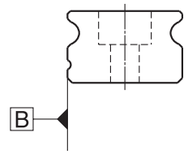
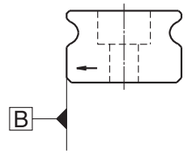
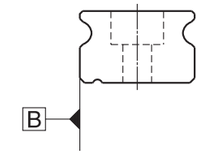
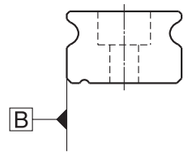
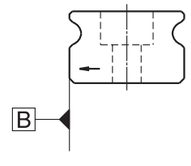
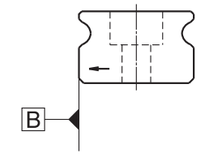


Fig. 10 Setting of the reference side rail in certain occasions

Table 11 Marks on the rail datum surfaces in each series

Material \ Model No.	Standard	PU series	NH15, NS15	PE series LW17, 21
Special high carbon steel				
Stainless steel				

A-7 Butting rail specification

- A rail which requires the length that exceeds the machine capacity manufactured maximum length comes in butting specification.
- The rails with butting specification are marked with an arrow on the opposite side of the mounting datum surface. Use the arrows for assembly order and direction of the rail (Fig. 11).
- The pitch of the rail mounting hole on the butting section should be as *F* in Fig. 12. When two rails are used in parallel, the butted sections should not align. This is to avoid change in the running accuracy of the table at the butted sections.
- We recommend shifting the butting sections more than the length of a slide. If the higher running accuracy is required, consider installing the slides into the table so that they do not simultaneously pass the butting sections.

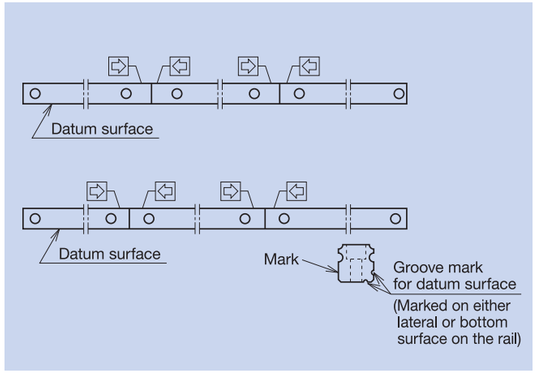


Fig. 11

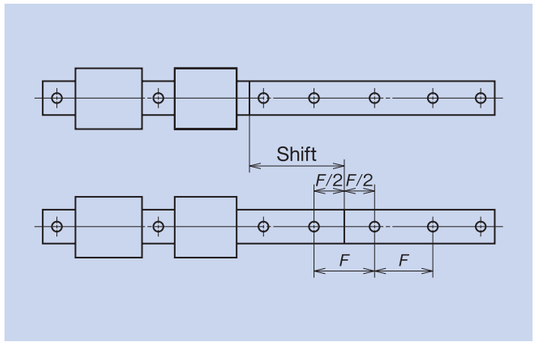


Fig. 12

A-8 Lubrication components

1. Types of lubrication accessories

Fig. 13 show grease fittings and tube fittings.

We provide lubrication accessories with extended thread body length (*L*) for the addition of dust-proof accessories such as NSK K1 lubrication unit, double seal and protector.

We provide a suitable lubrication accessory for the special requirement on dust-proof accessories.

Consult NSK for a lubrication accessory with extended length of thread body for your convenience of replenishing lubricant.

When you require stainless lubrication accessories, please ask NSK.

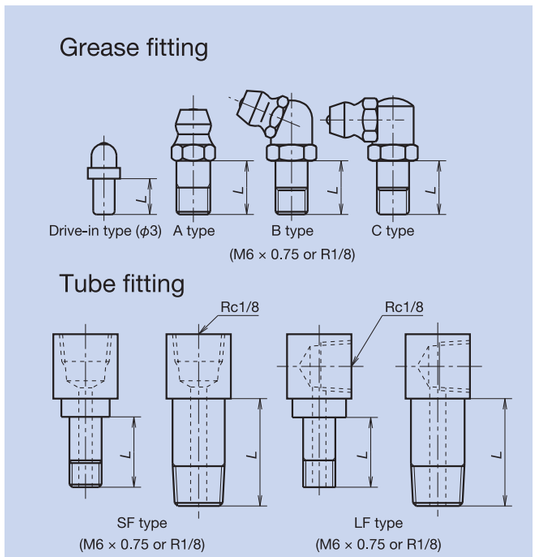


Fig. 13 Grease fitting and tube fitting

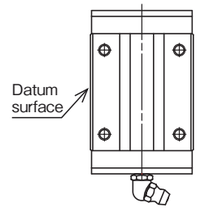
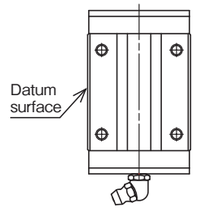
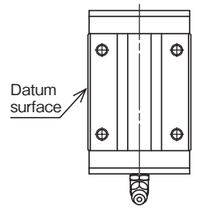
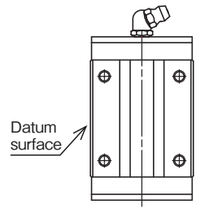
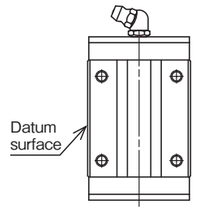
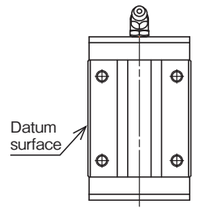
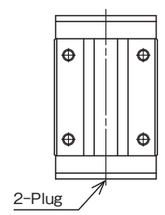
A-9 Position and direction of lubrication accessory

When the lubrication accessory is chosen, not only its standard position but also the other position can be selected on each slide. The right or left end as seen from the datum surface of slide can be selected.

Furthermore, for B or C type grease fitting and LF type tube fitting, the direction of the lubrication port can be selected. "The datum surface direction" facing the datum surface side, or "upward" facing the top surface of the slide as well as standard "the opposite direction of the datum surface" facing the opposite direction of the datum surface can be selected. The directions of each lubrication port should be the same for all slides on one rail.

Table 12 shows positions and directions of each case.

Table 12 Positions and directions of lubrication accessories

			Direction (symbols in the table represent positions and directions of lubrication accessory in case of slide only)		
			Opposite direction of the datum surface	Datum surface direction	Upward
Mounting position	Seeing from the datum surface	Right end	 Code: A	 Code: C	 Code: E
		Left end	 Code: B	 Code: D	 Code: F
Without lubrication accessory			 Code: N		

Note) When drive-in type fitting (ϕ3) is chosen, use code A or B is also used for positions of lubrication accessory in case of slide only.

Attention) Depending on a direction of lubrication accessory, some problems could be caused such as interference with the table mounting to the slide top surface (especially upward) or tightening of piping connected to the lubrication accessory. Please check space around the lubrication accessory on the drawing beforehand.

A-10 Dust Proof

A-10-1 Standard specification parts

- To keep foreign matters from entering inside the slide, NSK linear guides have end seals on both ends, bottom seals at the bottom surfaces, and an inner seal in the inside of slide.
- The seals for standard specification for each series are shown in Table 13.

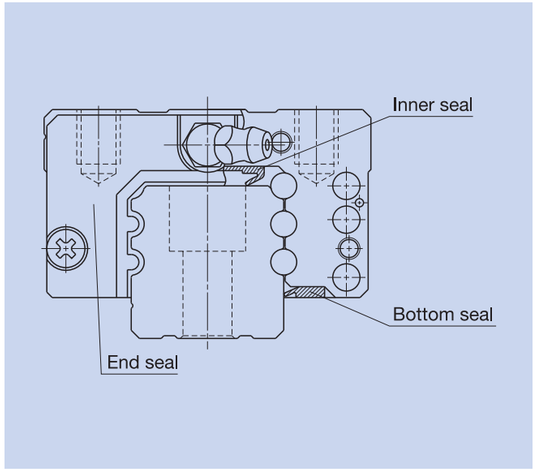


Fig. 14

Table 13 Standard seals

Series	End seal	Bottom seal	Inner seal
NH	○	○	–
NS	○	○	–
LW	○	○	–
PU	○	–	–
PE	○	–	–
RA	○	○	○

○: Equipped as a standard feature

A-10-2 Dust-proof parts

- NSK has the following items for the dust-proof parts. Select a suitable type for the operating environment.

Table 14 Optional dust-proof parts

Name	Purpose
NSK K1 lubrication unit	Made of oil impregnated resin. Enhances lubricating functions. Refer to page A10.
Double seal	It combines two end seals for enhancing sealing function.
Protector	Protect the end seal from hot and hard contaminants.
Rail cap	Prevents foreign matters, such as swarf generated in cutting operation from clogging the rail-mounting holes. Refer to page A22.

(1) Double seal

- It is a combination of two end seals to enhance seal function.
- When the double seal is installed, the end seal section becomes thicker than the standard item. Please pay attention to the increase in a slide length when designing the mounting dimension of slide and the table stroke. Please refer to each series dimension for length of the slide with double seal installed.

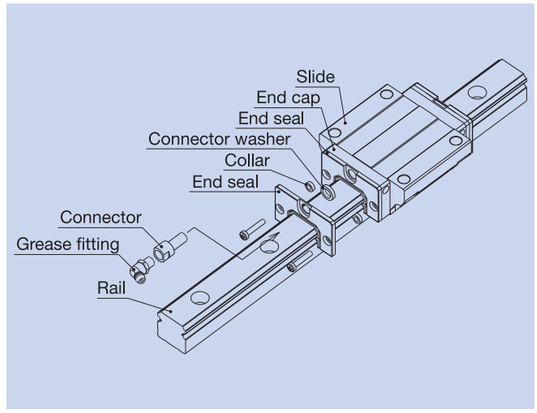


Fig. 15 Double seal

(2) Protector

- A protector is usually installed outside the end seal to prevent high-temperature fine particles such as welding spatter and other hard foreign matters from entering the slide.
- Same as the case with the double seal, when the protector is installed, the slide becomes longer. Take this thickness of slide into consideration for determining the relevant dimensions such as the system stroke and the slide installation envelope. Please refer to each series dimension table for length of the slide with protector installed.

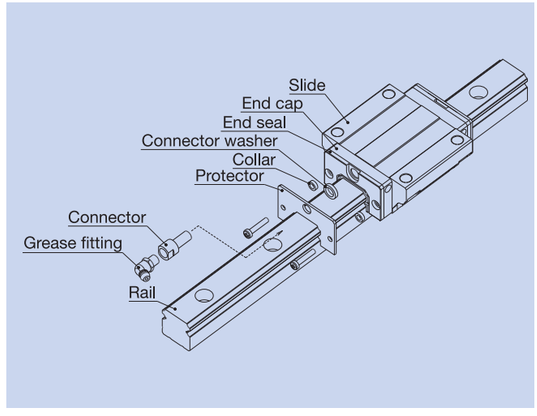


Fig. 16 Protector

A-11 Bolt-hole cap to plug the bolt holes for rail mounting

- After the rail is mounted to the machine base, a bolt-hole cap is used to plug the bolt hole to prevent foreign matters from clogging up the hole and from entering into the slide (Fig. 17).
- The bolt-hole cap is made of synthetic resin which has superb in its resistance to oil and abrasion.
- To insert the cap into the rail bolt hole, use a flat dolly block (Fig. 18). Pound the cap gradually until its height becomes flush with the rail top surface.

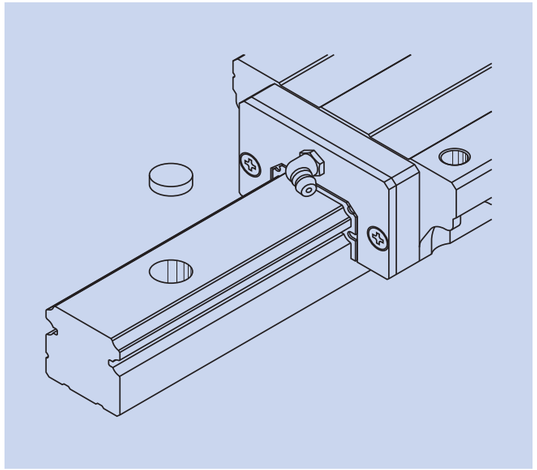


Fig. 17

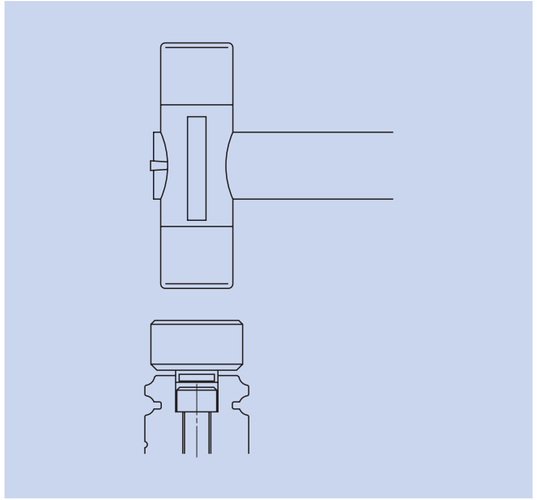


Fig. 18

NH Series (NH15 to 30) NH-AN, NH-BN / Cross-sections : Square (High type)

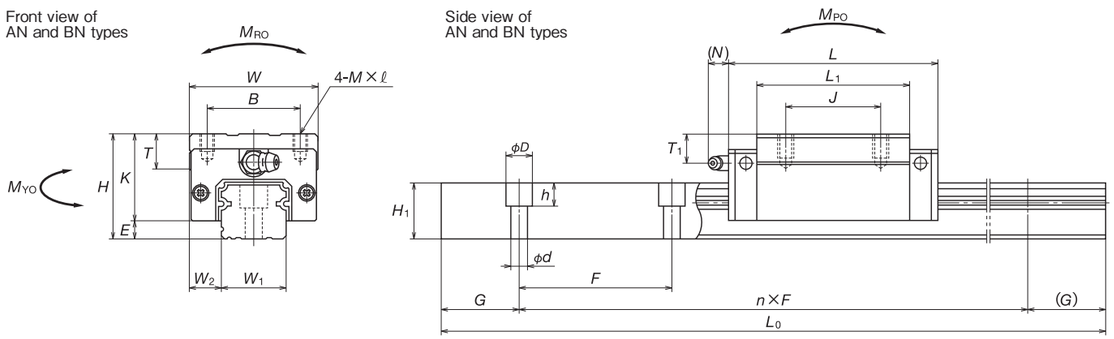


Fig. 1 Front view and side view

Reference number

Rail and ball slide assembly

Without serial number (*1) **NH 30 1200 AN N 2 PC Z 1 A L**

- Series name
- Size
- Rail length (mm)
- Ball slide shape code (See Table 1.)
- Material/surface treatment code (See Table 2.)
- Number of ball slides per rail
- Accuracy code (See Table 3.)
- Preload code (See Table 6.)
- Packed lubricant code (See Table 5.)
- Dust-proof code (See Table 4.)
- Rail mounting hole code (L: Standard)

With serial number (*2) **NH 30 1200 AN N 2 PC Z ***

- Design serial number: Ex.) 001, 002, 003, ..., 010, 011, ... +01, +02, +03, ..., +10, +11, ...

Ball slide

Without serial number (*3) **NAH 30 AN N PC Z 1 A A**

- Ball slide series code: NAH: NH Series ball slide
- Size
- Ball slide shape code (See Table 1.)
- Material/surface treatment code (See Table 2.)
- Accuracy code (See Table 3.)
- Preload code (See Table 6.)
- Packed lubricant code (See Table 5.)
- Dust-proof code (See Table 4.)
- Lubrication accessories position and direction code: A, B, C, D, E, F, N (See A18)

With serial number (*2) **NAH 30 AN N PC Z ***

- Design serial number: Ex.) 001, 002, 003, ..., 010, 011, ... +01, +02, +03, ..., +10, +11, ...

Rail

Without serial number (*4) **N1H 30 1200 L N N PC Z =40**

- Rail series code: N1H: NH Series rail
- Size
- Rail length (mm)
- Rail shape code: L: L: Standard
- Material/surface treatment code (See Table 2.)
- Accuracy code (See Table 3.)
- Butting rail specification: N: Non-butting. L: Butting specification
- Preload code (See Table 6.)
- Dimension G: Indicated in two digit after "=" (equal)

With serial number (*2) **N1H 30 1200 L N N PC Z ***

- Design serial number: Ex.) 001, 002, 003, ..., 010, 011, ... +01, +02, +03, ..., +10, +11, ...

(*1) The design serial number is not required when the mounting width is W_2, dimensions of G at right and left ends of the rail are the same and minimum, the rail isn't with butting, the selected lubrication accessory is not only the standard type (drive-in type / B type) but also mounted standard position and direction, and the codes of packed lubricant, dust-proof specification and rail mounting hole specification are prepared.
(*2) The design serial number should be given when the requirements are not satisfied.
(*3) The design serial number is not required when the selected lubrication accessory is not only the standard type (drive-in type / B type) but also mounted standard position and direction and the codes of packed lubricant, dust-proof specification and rail mounting hole specification are standard.
(*4) The design serial number is not required when the dimension of G at left end on the drawing is two or less digit integer. If dimension of G at left end is decimal fraction number, G at right end must be equivalent to the left end G dimension, otherwise design serial number will be necessary. And if butting rail is required, design serial number will be necessary.

Table 1 Dimensions

Unit: mm

Model No.	Slide shape	Assembly Height H	E	W_2	Ball slide Width W	Length L	Mounting hole B	J	M×pitch×ℓ	L_1	K	T	Grease fitting Hole size	T_1	N
NH15AN	AN	28	4.6	9.5	34	55	26	26	M4×0.7×6	39	23.4	8	φ3	8.5	3.3
NH15BN	BN					74				58					
NH20AN	AN	30	5	12	44	69.8	32	36	M5×0.8×6	50	25	12	M6×0.75	5	11
NH20BN	BN					91.8		50		72					
NH25AN	AN	40	7	12.5	48	79	35	35	M6×1×9	58	33	12	M6×0.75	10	11
NH25BN	BN					107		50		86					
NH30AN	AN	45	9	16	60	85.6	40	40	M8×1.25×10	59	36	14	M6×0.75	10	11
NH30BN	BN					124.6		60		98					

Model No.	Rail Width W_1	Height H_1	Pitch F	Mounting bolt hole d×D×h	G (reference)	Max. length L_{0max} ( ) for stainless	Basic load rating *)Dynamic [50km] C_{50} (N)	[100km] C_{100} (N)	Static C_0 (N)	Static moment (N·m) M_{RO}	M_{PO} (One slide)	M_{PO} (Two slides)	M_{YO} (One slide)	M_{YO} (Two slides)	Weight Ball slide (kg)	Rail (kg/m)
NH15AN	15	15	60	4.5×7.5×5.3	20	2 980	14 200	11 300	20 700	108	94.5	575	79.5	480	0.18	1.6
NH15BN						(1 800)	18 100	14 400	32 000	166	216	1 150	181	965	0.26	
NH20AN	20	18	60	6×9.5×8.5	20	3 960	23 700	18 800	32 500	219	185	1 140	155	955	0.33	2.6
NH20BN						(3 500)	30 000	24 000	50 500	340	420	2 230	355	1 870	0.48	
NH25AN	23	22	60	7×11×9	20	3 960	33 500	26 800	46 000	360	320	1 840	267	1 540	0.55	3.6
NH25BN						(3 500)	45 500	36 500	71 000	555	725	3 700	610	3 100	0.82	
NH30AN	28	26	80	9×14×12	20	4 000	41 000	32 500	51 500	490	350	2 290	292	1 920	0.77	5.2
NH30BN						(3 500)	61 000	48 500	91 500	870	1 030	5 600	865	4 700	1.3	

Notes: External appearance of stainless steel ball slides differs from those of special carbon steel ball slides.
*) The basic load rating comply with the ISO standard. (ISO 14728-1, 14728-2)
C_{50} ; the basic dynamic load rating for 50 km rated fatigue life C_{100} ; the basic dynamic load rating for 100 km rated fatigue life
The basic static load rating shows static permissible load.

Table 2 Material/surface treatment code

Type	Special high carbon steel	Stainless steel
Without surface treatment	N	K
Low temperature chrome plating	D	H
Fluoride low temperature chrome plating	F	E

Notes: Low temperature chrome plating: Electrolytic rust prevention black treatment (black chrome plating)
Fluoride low temperature chrome plating: Fluoroplastic coating is provided following the low temperature chrome plating.

Table 3 Accuracy grade and accuracy standard

Unit: μm

Accuracy grade		High precision grade	Normal grade
"NSK K1™" lubrication unit	Without NSK K1 lubrication unit	PH	PC
	With NSK K1 lubrication unit	KH	KC
	With NSK K1 for food and medical equipment	FH	FC
Characteristics	Mounting height H	±20	±20
	Variation of H	15① 30②	15① 30②
	Mounting width W_2 or W_3	±30	±30
	Variation of W_2 or W_3	20	25
	Running parallelism of surface C to surface A	See page A6.	See page A6.
	Running parallelism of surface D to surface B		

Notes 1) High precision grade is available for special high-carbon steel products.
2) ①: Variation on the same rail ②: Variation on multiple rails
3) "NSK K1™" lubrication unit: Equipped with NSK linear guide. A Newly developed porous synthetic resin contains large volume of lubricant oil that seeps out and enhances lubricating function.

Table 4 Dust-proof specification code and length of ball slide equipped with dust-proof components

Unit: mm

Dust-proof specification			Standard	Double seal installed	Protector installed	Double seal and protector installed	Increase when NSK K1 installed
Dust-proof code	Rail cap	Without	A	C	E	G	
		With	B	D	F	H	
Ball slide length	Model No.	**NH15AN**	55	–	–	–	+10.6
		NH15BN	74	–	–	–	
		NH20AN	69.8	74.8	75.6	80.6	+10.6
		NH20BN	91.8	96.8	97.6	102.6	
		NH25AN	79	84.6	85.4	91	+11.6
		NH25BN	107	112.6	113.4	119	
		NH30AN	85.6	92.8	94	101.2	+12.0
		NH30BN	124.6	131.8	133	140.2	

Notes: Double seal: It combines two end seals for enhancing sealing function.
Protector: Protect the end seal from hot and hard contaminants.
Rail cap: Prevents foreign matters, such as swarf generated in cutting operation from clogging the rail-mounting holes.

Table 5 Packed lubricant

Type	Code	Thickener	Base oil	Base oil kinematic viscosity [mm^2/s (40°C)]	Range of use temperature (°C)	Purpose
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For low temperature and high frequency operation
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistant
PARALIQ GA351	7	Aluminium complex	Paraffin oil	–	–40 to 120	For food processing equipment
None (Rust preventive oil applied)	9	–	–	–	–	–

Table 6 Preload code and amount of clearance/preload

Unit: μm

		Fine clearance ZT	Slight preload ZZ	Medium preload ZH
Preload code		T	Z	H
Model No.	**NH15**	–	–4 to 0	–7 to –3
	NH20	–	–5 to 0	–8 to –3
	NH25	–	–5 to 0	–9 to –4
	NH30	–5 to 15	–7 to 0	–12 to –5

Notes 1) Medium preload is available for special high-carbon steel products.
2) Minus sign denotes that a value is an amount of preload (elastic deformation of balls).

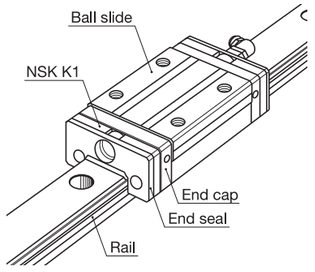


Fig. 2 "NSK K1™" lubrication unit

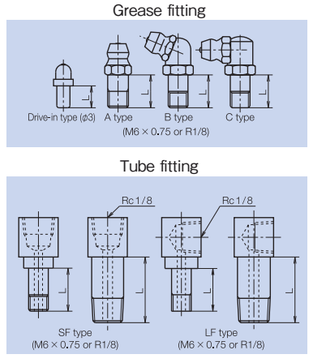


Fig. 3 Grease fitting and tube fitting

Standard lubrication accessory for NH15 is drive-in type (φ3). Standard lubrication accessory for NH20 or over is B type.

NH Series (NH35 to 65) NH-AN, NH-BN / Cross-sections : Square (High type)

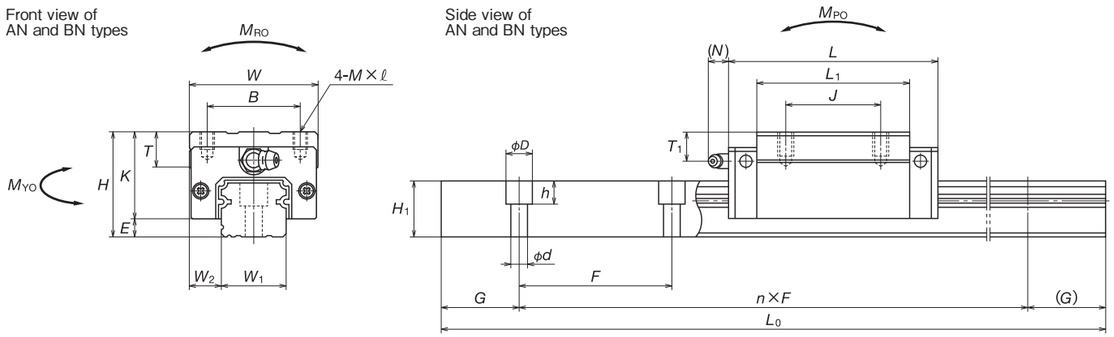


Fig. 1 Front view and side view

Reference number

Rail and ball slide assembly

Without serial number (*1) **NH 45 1300 AN N 2 PC Z 1 A L**

- Series name
- Size
- Rail length (mm)
- Ball slide shape code (See Table 1.)
- Material/surface treatment code (See Table 2.)
- Number of ball slides per rail
- Accuracy code (See Table 3.)
- Preload code (See Table 6.)
- Packed lubricant code (See Table 5.)
- Dust-proof code (See Table 4.)
- Rail mounting hole code — L: Standard

With serial number (*2) **NH 45 1300 AN N 2 PC Z ***

- Design serial number — Ex.) 001, 002, 003, ..., 010, 011, ... +01, +02, +03, ..., +10, +11, ...

Ball slide

Without serial number (*3) **NAH 45 AN N PC Z 1 A A**

- Ball slide series code — NAH: NH Series ball slide
- Size
- Ball slide shape code (See Table 1.)
- Material/surface treatment code (See Table 2.)
- Accuracy code (See Table 3.)
- Preload code (See Table 6.)
- Packed lubricant code (See Table 5.)
- Dust-proof code (See Table 4.)
- Lubrication accessories position and direction code — A, B, C, D, E, F, N (See A18)

With serial number (*2) **NAH 45 AN N PC Z ***

- Design serial number — Ex.) 001, 002, 003, ..., 010, 011, ... +01, +02, +03, ..., +10, +11, ...

Rail

Without serial number (*4) **N1H 45 1300 L N N PC Z =20**

- Rail series code — N1H: NH Series rail
- Size
- Rail length (mm)
- Material/surface treatment code (See Table 2.)
- Accuracy code (See Table 3.)
- Preload code (See Table 6.)
- Butting rail specification — N: Non-butting. L: Butting specification
- Dimension G — Indicated in two digit after "=" (equal)

With serial number (*2) **N1H 45 1300 L N N PC Z ***

- Design serial number — Ex.) 001, 002, 003, ..., 010, 011, ... +01, +02, +03, ..., +10, +11, ...

(*1) The design serial number is not required when the mounting width is W_2, dimensions of G at right and left ends of the rail are the same and minimum, the rail isn't with butting, the selected lubrication accessory is not only the standard type (B type) but also mounted standard position and direction, and the codes of packed lubricant, dust-proof specification and rail mounting hole specification are prepared.
(*2) The design serial number should be given when the requirements are not satisfied.
(*3) The design serial number is not required when the selected lubrication accessory is not only the standard type (B type) but also mounted standard position and direction and the codes of packed lubricant, dust-proof specification and rail mounting hole specification are standard.
(*4) The design serial number is not required when the dimension of G at left end on the drawing is two or less digit integer. If dimension of G at left end is decimal fraction number, G at right end must be equivalent to the left end G dimension, otherwise design serial number will be necessary. And if butting rail is required, design serial number will be necessary.

Table 1 Dimensions

Unit: mm

Model No.	Slide shape	Assembly Height H	E	W_2	Ball slide Width W	Length L	Mounting hole B	J	M×pitch×ℓ	L_1	K	T	Grease fitting Hole size	T_1	N
NH35AN	AN	55	9.5	18	70	109	50	50	M8×1.25×12	80	45.5	15	M6×0.75	15	11
NH35BN	BN					143		72		114					
NH45AN	AN	70	14	20.5	86	139	60	60	M10×1.5×17	105	56	17	Rc1/8	20	13
NH45BN	BN					171		80		137					
NH55AN	AN	80	15	23.5	100	163	75	75	M12×1.75×18	126	65	18	Rc1/8	21	13
NH55BN	BN					201		95		164					
NH65AN	AN	90	16	31.5	126	193	76	70	M16×2×20	147	74	23	Rc1/8	19	13
NH65BN	BN					253		120		207					

Model No.	Rail Width W_1	Height H_1	Pitch F	Mounting bolt hole d×D×h	G (reference)	Max. length L_{0max}	Basic load rating *)Dynamic [50km] C_{50}(N)	[100km] C_{100}(N)	Static C_0 (N)	Static moment (N·m) M_{RO}	M_{PO} (One slide)	M_{PO} (Two slides)	M_{YO} (One slide)	M_{YO} (Two slides)	Weight Ball slide (kg)	Rail (kg/m)
NH35AN	34	29	80	9×14×12	20	4 000	62 500	49 500	80 500	950	755	4 500	630	3 800	1.5	7.2
NH35BN							81 000	64 500	117 000	1 380	1 530	8 350	1 280	7 000	2.1	
NH45AN	45	38	105	14×20×17	22.5	3 990	107 000	84 500	140 000	2 140	1 740	9 750	1 460	8 150	3.0	12.3
NH45BN							131 000	104 000	187 000	2 860	3 000	15 600	2 520	13 100	3.9	
NH55AN	53	44	120	16×23×20	30	3 960	158 000	125 000	198 000	3 600	3 000	16 300	2 510	13 700	4.7	16.9
NH55BN							193 000	153 000	264 000	4 850	5 150	26 300	4 350	22 100	6.1	
NH65AN	63	53	150	18×26×22	35	3 900	239 000	190 000	281 000	6 150	4 950	27 900	4 150	23 400	7.7	24.3
NH65BN							310 000	246 000	410 000	8 950	10 100	51 500	8 450	43 500	10.8	

*) The basic load rating comply with the ISO standard. (ISO 14728-1, 14728-2)
C_{50} ; the basic dynamic load rating for 50 km rated fatigue life C_{100} ; the basic dynamic load rating for 100 km rated fatigue life
The basic static load rating shows static permissible load.

Table 2 Material/surface treatment code

Type	Special high carbon steel
Without surface treatment	N
Low temperature chrome plating	D
Fluoride low temperature chrome plating	F

Notes: Low temperature chrome plating: Electrolytic rust prevention black treatment (black chrome plating)
Fluoride low temperature chrome plating: Fluoroplastic coating is provided following the low temperature chrome plating.

Table 3 Accuracy grade and accuracy standard

Unit: μm

Accuracy grade		High precision grade NH35	High precision grade NH45, 55, 65	Normal grade NH35	Normal grade NH45, 55, 65
"NSK K1™" lubrication unit	Without NSK K1 lubrication unit	PH		PC	
	With NSK K1 lubrication unit	KH		KC	
Characteristics	Mounting height H	±20	±30	±20	±30
	Variation of H	15① 30②	20① 35②	15① 30②	20① 35②
	Mounting width W_2 or W_3	±30	±35	±30	±35
	Variation of W_2 or W_3	20	20	25	30
	Running parallelism of surface C to surface A	See page A6.		See page A6.	
	Running parallelism of surface D to surface B				

Notes 1) ①: Variation on the same rail ②: Variation on multiple rails
2) "NSK K1™" lubrication unit: Equipped with NSK linear guide. A Newly developed porous synthetic resin contains large volume of lubricant oil that seeps out and enhances lubricating function.

Table 4 Dust-proof specification code and length of ball slide equipped with dust-proof components

Unit: mm

Dust-proof specification		Standard	Double seal installed	Protector installed	Double seal and protector installed	Increase when NSK K1 installed
Dust-proof code	Without	A	C	E	G	
Rail cap	With	B	D	F	H	
Ball slide length	**NH35AN**	109	116.2	117.4	124.6	+13
Model No.	**NH35BN**	143	150.2	151.4	158.6	
	NH45AN	139	147.6	148.8	157.4	+15
	NH45BN	171	179.6	180.8	189.4	
	NH55AN	163	171.6	172.8	181.4	+15
	NH55BN	201	209.6	210.8	219.4	
	NH65AN	193	202.8	204	213.8	+18
	NH65BN	253	262.8	264	273.8	

Notes: Double seal: It combines two end seals for enhancing sealing function.
Protector: Protect the end seal from hot and hard contaminants.
Rail cap: Prevents foreign matters, such as swarf generated in cutting operation from clogging the rail-mounting holes.

Table 5 Packed lubricant

Type	Code	Thickener	Base oil	Base oil kinematic viscosity [mm^2/s (40°C)]	Range of use temperature (°C)	Purpose
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For low temperature and high frequency operation
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistant
PARALIQ GA351	7	Aluminium complex	Paraffin oil	–	–40 to 120	For food processing equipment
None (Rust preventive oil applied)	9	–	–	–	–	–

Table 6 Preload code and amount of clearance/preload

Unit: μm

		Fine clearance ZT	Slight preload ZZ	Medium preload ZH
Preload code		T	Z	H
Model No.	**NH35**	–5 to 15	–7 to 0	–12 to –5
	NH45	–5 to 15	–7 to 0	–14 to –7
	NH55	–	–9 to 0	–
	NH65	–	–9 to 0	–

Note: Minus sign denotes that a value is an amount of preload (elastic deformation of balls).

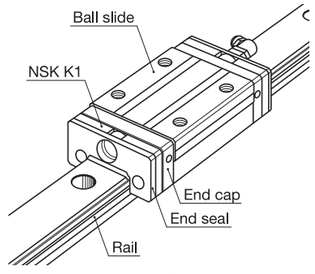


Fig. 2 "NSK K1™" lubrication unit

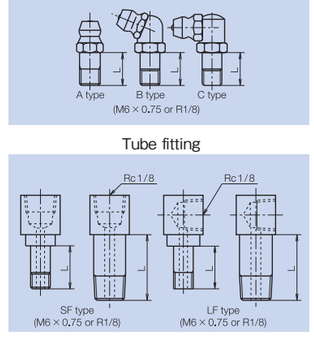


Fig. 3 Grease fitting and tube fitting

Standard lubrication accessory is B type

NH Series (NH25 to 55) NH-AL, NH-BL / Cross-sections : Square (Low type)

Front view of AL and BL types

Side view of AL and BL types

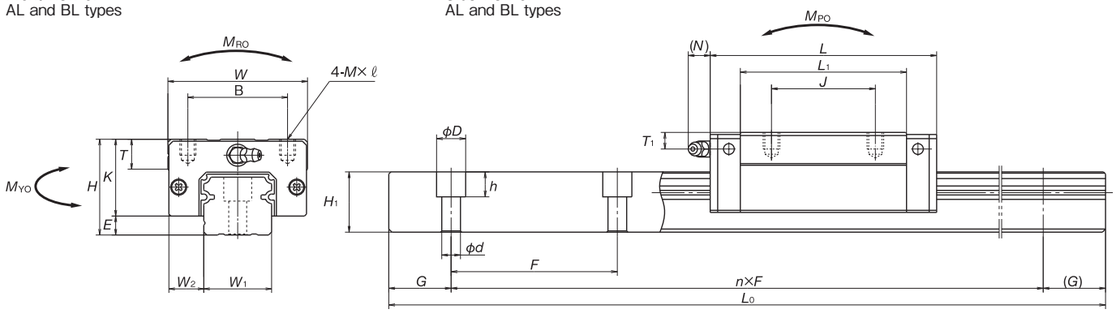


Fig. 1 Front view and side view

Reference number

Rail and ball slide assembly

Without serial number (*1) **NH 30 1200 AL N 2 PC Z 1 A L**

- Series name
- Size
- Rail length (mm)
- Ball slide shape code (See Table 1.)
- Material/surface treatment code (See Table 2.)
- Number of ball slides per rail
- Accuracy code (See Table 3.)
- Preload code (See Table 6.)
- Packed lubricant code (See Table 5.)
- Dust-proof code (See Table 4.)
- Rail mounting hole code — L: Standard

With serial number (*2) **NH 30 1200 AL N 2 PC Z ***

- Design serial number — Ex.) 001, 002, 003, ..., 010, 011, ... +01, +02, +03, ..., +10, +11, ...

Ball slide

Without serial number (*3) **NAH 30 AL N PC Z 1 A A**

- Ball slide series code — NAH: NH Series ball slide
- Size
- Ball slide shape code (See Table 1.)
- Material/surface treatment code (See Table 2.)
- Accuracy code (See Table 3.)
- Preload code (See Table 6.)
- Packed lubricant code (See Table 5.)
- Dust-proof code (See Table 4.)
- Lubrication accessories position and direction code — A, B, C, D, E, F, N (See A18)

With serial number (*2) **NAH 30 AL N PC Z ***

- Design serial number — Ex.) 001, 002, 003, ..., 010, 011, ... +01, +02, +03, ..., +10, +11, ...

Rail

Without serial number (*4) **N1H 30 1200 L N N PC Z =40**

- Rail series code — N1H: NH Series rail
- Size
- Rail length (mm)
- Material/surface treatment code (See Table 2.)
- Rail shape code: L — L: Standard
- Butting rail specification — N: Non-butting. L: Butting specification
- Accuracy code (See Table 3.)
- Preload code (See Table 6.)
- Dimension G — Indicated in two digit after "=" (equal)

With serial number (*2) **N1H 30 1200 L N N PC Z ***

- Design serial number — Ex.) 001, 002, 003, ..., 010, 011, ... +01, +02, +03, ..., +10, +11, ...

(*1) The design serial number is not required when the mounting width is W_2, dimensions of G at right and left ends of the rail are the same and minimum, the rail isn't with butting, the selected lubrication accessory is not only the standard type (B type) but also mounted standard position and direction, and the codes of packed lubricant, dust-proof specification and rail mounting hole specification are prepared.
(*2) The design serial number should be given when the requirements are not satisfied.
(*3) The design serial number is not required when the selected lubrication accessory is not only the standard type (B type) but also mounted standard position and direction and the codes of packed lubricant, dust-proof specification and rail mounting hole specification are standard.
(*4) The design serial number is not required when the dimension of G at left end on the drawing is two or less digit integer. If dimension of G at left end is decimal fraction number, G at right end must be equivalent to the left end G dimension, otherwise design serial number will be necessary. And if butting rail is required, design serial number will be necessary.

Table 1 Dimensions

Unit: mm

Model No.	Slide shape	Assembly Height H	E	W_2	Ball slide Width W	Length L	Mounting hole B	J	M×pitch×ℓ	L_1	K	T	Grease fitting Hole size	T_1	N
NH25AL	AL	36	7	12.5	48	79	35	35	M6×1×6	58	29	12	M6×0.75	6	11
NH25BL	BL					107		50		86					
NH30AL	AL	42	9	16	60	85.6	40	40	M8×1.25×8	59	33	14	M6×0.75	7	11
NH30BL	BL					124.6		60		98					
NH35AL	AL	48	9.5	18	70	109	50	50	M8×1.25×8	80	38.5	15	M6×0.75	8	11
NH35BL	BL					143		72		114					
NH45AL	AL	60	14	20.5	86	139	60	60	M10×1.5×10	105	46	17	Rc1/8	10	13
NH45BL	BL					171		80		137					
NH55AL	AL	70	15	23.5	100	163	75	75	M12×1.75×13	126	55	15	Rc1/8	11	13
NH55BL	BL					201		95		164					

Model No.	Rail Width W_1	Height H_1	Pitch F	Mounting bolt hole d×D×h	G (reference)	Max. length L_{0max}	Basic load rating *) Dynamic [50km] C_{50} (N)	[100km] C_{100} (N)	Static C_0 (N)	Static moment (N·m) M_{RO}	M_{PO} (One slide)	M_{PO} (Two slides)	M_{YO} (One slide)	M_{YO} (Two slides)	Weight Ball slide (kg)	Rail (kg/m)
NH25AL	23	22	60	7×11×9	20	3 960	33 500	26 800	46 000	360	320	1 840	267	1 540	0.46	3.6
NH25BL							45 500	36 500	71 000	555	725	3 700	610	3 100	0.69	
NH30AL	28	26	80	9×14×12	20	4 000	41 000	32 500	51 500	490	350	2 290	292	1 920	0.69	5.2
NH30BL							61 000	48 500	91 500	870	1 030	5 600	865	4 700	1.16	
NH35AL	34	29	80	9×14×12	20	4 000	62 500	49 500	80 500	950	755	4 500	630	3 800	1.2	7.2
NH35BL							81 000	64 500	117 000	1 380	1 530	8 350	1 280	7 000	1.7	
NH45AL	45	38	105	14×20×17	22.5	3 990	107 000	84 500	140 000	2 140	1 740	9 750	1 460	8 150	2.2	12.3
NH45BL							131 000	104 000	187 000	2 860	3 000	15 600	2 520	13 100	2.9	
NH55AL	53	44	120	16×23×20	30	3 960	158 000	125 000	198 000	3 600	3 000	16 300	2 510	13 700	3.7	16.9
NH55BL							193 000	153 000	264 000	4 850	5 150	26 300	4 350	22 100	4.7	

*) The basic load rating comply with the ISO standard. (ISO 14728-1, 14728-2)
C_{50} ; the basic dynamic load rating for 50 km rated fatigue life C_{100} ; the basic dynamic load rating for 100 km rated fatigue life
The basic static load rating shows static permissible load.

Table 2 Material/surface treatment code

Type	Special high carbon steel
Without surface treatment	N
Low temperature chrome plating	D
Fluoride low temperature chrome plating	F

Notes: Low temperature chrome plating: Electrolytic rust prevention black treatment (black chrome plating)
Fluoride low temperature chrome plating: Fluoroplastic coating is provided following the low temperature chrome plating.

Table 3 Accuracy grade and accuracy standard

Unit: μm

Accuracy grade		High precision grade NH25, 30, 35	NH45, 55	Normal grade NH25, 30, 35	NH45, 55
"NSK K1™" lubrication unit	Without NSK K1 lubrication unit	PH		PC	
	With NSK K1 lubrication unit	KH		KC	
	With NSK K1 for food and medical equipment	FH *)	–	FC *)	–
Characteristics	Mounting height H	±20	±30	±20	±30
	Variation of H	15① 30②	20① 35②	15① 30②	20① 35②
	Mounting width W_2 or W_3	±30	±35	±30	±35
	Variation of W_2 or W_3	20	20	25	30
	Running parallelism of surface C to surface A	See page A6.		See page A6.	
	Running parallelism of surface D to surface B				

Notes 1) High precision grade is available for special high-carbon steel products.
2) ①: Variation on the same rail ②: Variation on multiple rails
3) "NSK K1™" lubrication unit: Equipped with NSK linear guide. A Newly developed porous synthetic resin contains large volume of lubricant oil that seeps out and enhances lubricating function.
*) NH25 and NH30 are only available.

Table 4 Dust-proof specification code and length of ball slide equipped with dust-proof components

Unit: mm

Dust-proof specification			Standard	Double seal installed	Protector installed	Double seal and protector installed	Increase when NSK K1 installed
Dust-proof code	Rail cap	Without	A	C	E	G	
		With	B	D	F	H	
Ball slide length	Model No.	**NH25AL**	79	84.6	85.4	91	+11.6
		NH25BL	107	112.6	113.4	119	
		NH30AL	85.6	92.8	94	101.2	+12
		NH30BL	124.6	131.8	133	140.2	
		NH35AL	109	116.2	117.4	124.6	+13
		NH35BL	143	150.2	151.4	158.6	
		NH45AL	139	147.6	148.8	157.4	+15
		NH45BL	171	179.6	180.8	189.4	
		NH55AL	163	171.6	172.8	181.4	+15
		NH55BL	201	209.6	210.8	219.4	

Notes: Double seal: It combines two end seals for enhancing sealing function.
Protector: Protect the end seal from hot and hard contaminants.
Rail cap: Prevents foreign matters, such as swarf generated in cutting operation from clogging the rail-mounting holes.

Table 5 Packed lubricant

Type	Code	Thickener	Base oil	Base oil kinematic viscosity [mm^2/s (40°C)]	Range of use temperature (°C)	Purpose
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For low temperature and high frequency operation
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistant
PARALIQ GA351	7	Aluminium complex	Paraffin oil	–	–40 to 120	For food processing equipment
None (Rust preventive oil applied)	9	–	–	–	–	–

Table 6 Preload code and amount of clearance/preload

Unit: μm

		Fine clearance ZT	Slight preload ZZ	Medium preload ZH
Preload code		T	Z	H
Model No.	**NH25**	–	–5 to 0	–9 to –4
	NH30	–5 to 15	–7 to 0	–12 to –5
	NH35	–5 to 15	–7 to 0	–12 to –5
	NH45	–5 to 15	–7 to 0	–14 to –7
	NH55	–	–9 to 0	–

Notes 1) Medium preload is available for special high-carbon steel products.
2) Minus sign denotes that a value is an amount of preload (elastic deformation of balls).

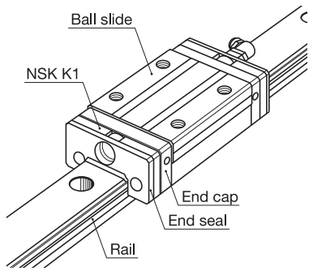


Fig. 2 "NSK K1™" lubrication unit

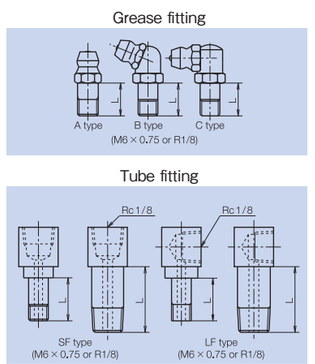


Fig. 3 Grease fitting and tube fitting

Standard lubrication accessory is B type.

NH Series (NH15 to 30) NH-EM, NH-GM ／ Cross-sections : Flange type

Front view of EM and GM types

Side view of EM and GM types

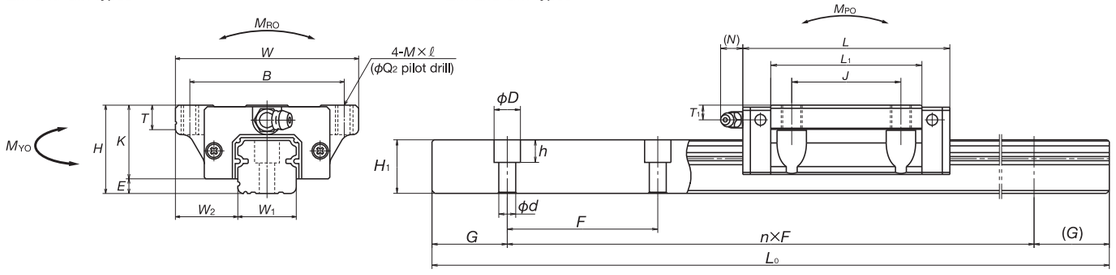


Fig. 1 Front view and side view

Reference number

Rail and ball slide assembly

Without serial number (*1) **NH 30 1200 EM N 2 PC Z 1 A L**

- Series name
- Size
- Rail length (mm)
- Ball slide shape code (See Table 1.)
- Material/surface treatment code (See Table 2.)
- Number of ball slides per rail
- Accuracy code (See Table 3.)
- Preload code (See Table 6.)
- Packed lubricant code (See Table 5.)
- Dust-proof code (See Table 4.)
- Rail mounting hole code — L: Standard

With serial number (*2) **NH 30 1200 EM N 2 PC Z ***

- Design serial number — Ex.) 001, 002, 003, ..., 010, 011, ... +01, +02, +03, ..., +10, +11, ...

Ball slide

Without serial number (*3) **NAH 30 EM N PC Z 1 A A**

- Ball slide series code — NAH: NH Series ball slide
- Size
- Ball slide shape code (See Table 1.)
- Material/surface treatment code (See Table 2.)
- Accuracy code (See Table 3.)
- Preload code (See Table 6.)
- Packed lubricant code (See Table 5.)
- Dust-proof code (See Table 4.)
- Lubrication accessories position and direction code — A, B, C, D, E, F, N (See A18)

With serial number (*2) **NAH 30 EM N PC Z ***

- Design serial number — Ex.) 001, 002, 003, ..., 010, 011, ... +01, +02, +03, ..., +10, +11, ...

Rail

Without serial number (*4) **N1H 30 1200 L N N PC Z =40**

- Rail series code — N1H: NH Series rail
- Size
- Rail length (mm)
- Rail shape code: L — L: Standard
- Material/surface treatment code (See Table 2.)
- Accuracy code (See Table 3.)
- Butting rail specification — N: Non-butting. L: Butting specification
- Preload code (See Table 6.)
- Dimension G — Indicated in two digit after "=" (equal)

With serial number (*2) **N1H 30 1200 L N N PC Z ***

- Design serial number — Ex.) 001, 002, 003, ..., 010, 011, ... +01, +02, +03, ..., +10, +11, ...

(*1) The design serial number is not required when the mounting width is W_2, dimensions of G at right and left ends of the rail are the same and minimum, the rail isn't with butting, the selected lubrication accessory is not only the standard type (drive-in type / B type) but also mounted standard position and direction, and the codes of packed lubricant, dust-proof specification and rail mounting hole specification are prepared.
(*2) The design serial number should be given when the requirements are not satisfied.
(*3) The design serial number is not required when the selected lubrication accessory is not only the standard type (drive-in type / B type) but also mounted standard position and direction and the codes of packed lubricant, dust-proof specification and rail mounting hole specification are standard.
(*4) The design serial number is not required when the dimension of G at left end on the drawing is two or less digit integer. If dimension of G at left end is decimal fraction number, G at right end must be equivalent to the left end G dimension, otherwise design serial number will be necessary. And if butting rail is required, design serial number will be necessary.

Table 1 Dimensions

Unit: mm

Model No.	Slide shape	Assembly			Ball slide										
		Height			Width	Length	Mounting hole							Grease fitting		
		H	E	W_2	W	L	B	J	M×pitch×ℓ	Q_2	L_1	K	T	Hole size	T_1	N
NH15EM	EM	24	4.6	16	47	55	38	30	M5×0.8×7	4.4	39	19.4	8	ϕ3	4.5	3.3
NH15GM	GM					74					58					
NH20EM	EM	30	5	21.5	63	69.8	53	40	M6×1×9.5	5.3	50	25	10	M6×0.75	5	11
NH20GM	GM					91.8					72					
NH25EM	EM	36	7	23.5	70	79	57	45	M8×1.25×10	6.8	58	29	11	M6×0.75	6	11
NH25GM	GM					107			(M8×1.25×11.5)		86		(12)			
NH30EM	EM	42	9	31	90	98.6	72	52	M10×1.5×12	8.6	72	33	11	M6×0.75	7	11
NH30GM	GM					124.6			(M10×1.5×14.5)		98		(15)			

Model No.	Rail						Basic load rating						Weight	
	Width	Height	Pitch	Mounting bolt hole	G	Max. length	*) Dynamic		Static	Static moment (N·m)				Ball slide	Rail
							[50km]	[100km]			M_{PO}		M_{YO}			
	W_1	H_1	F	d×D×h	(reference)	L_{0max} ( ) for stainless	C_{50} (N)	C_{100} (N)	C_0 (N)	M_{RO}	(One slide)	(Two slides)	(One slide)	(Two slides)	(kg)	(kg/m)
NH15EM	15	15	60	4.5×7.5×5.3	20	2 980	14 200	11 300	20 700	108	94.5	575	79.5	480	0.17	1.6
NH15GM						(1 800)	18 100	14 400	32 000	166	216	1 150	181	965	0.25	
NH20EM	20	18	60	6×9.5×8.5	20	3 960	23 700	18 800	32 500	219	185	1 140	155	955	0.45	2.6
NH20GM						(3 500)	30 000	24 000	50 500	340	420	2 230	355	1 870	0.65	
NH25EM	23	22	60	7×11×9	20	3 960	33 500	26 800	46 000	360	320	1 840	267	1 540	0.63	3.6
NH25GM						(3 500)	45 500	36 500	71 000	555	725	3 700	610	3 100	0.93	
NH30EM	28	26	80	9×14×12	20	4 000	47 000	37 500	63 000	600	505	3 150	425	2 650	1.2	5.2
NH30GM						(3 500)	61 000	48 500	91 500	870	1 030	5 600	865	4 700	1.6	

Notes: External appearance of stainless steel ball slides differs from those of special carbon steel ball slides.
*) The basic load rating comply with the ISO standard. (ISO 14728-1, 14728-2)
C_{50} ; the basic dynamic load rating for 50 km rated fatigue life C_{100} ; the basic dynamic load rating for 100 km rated fatigue life
The basic static load rating shows static permissible load.

Table 2 Material/surface treatment code

Type	Special high carbon steel	Stainless steel
Without surface treatment	N	K
Low temperature chrome plating	D	H
Fluoride low temperature chrome plating	F	E

Notes: Low temperature chrome plating: Electrolytic rust prevention black treatment (black chrome plating)
Fluoride low temperature chrome plating: Fluoroplastic coating is provided following the low temperature chrome plating.

Table 3 Accuracy grade and accuracy standard

Unit: μm

Accuracy grade		High precision grade	Normal grade
"NSK K1™" lubrication unit	Without NSK K1 lubrication unit	PH	PC
	With NSK K1 lubrication unit	KH	KC
	With NSK K1 for food and medical equipment	FH	FC
Characteristics	Mounting height H	±20	±20
	Variation of H	15① 30②	15① 30②
	Mounting width W_2 or W_3	±30	±30
	Variation of W_2 or W_3	20	25
	Running parallelism of surface C to surface A	See page A6.	See page A6.
	Running parallelism of surface D to surface B		

Notes 1) High precision grade is available for special high-carbon steel products.
2) ① : Variation on the same rail ② : Variation on multiple rails
3) "NSK K1™" lubrication unit: Equipped with NSK linear guide. A Newly developed porous synthetic resin contains large volume of lubricant oil that seeps out and enhances lubricating function.

Table 4 Dust-proof specification code and length of ball slide equipped with dust-proof components

Unit: mm

Dust-proof specification			Standard	Double seal installed	Protector installed	Double seal and protector installed	Increase when NSK K1 installed
Dust-proof code	Rail cap	Without	A	C	E	G	
		With	B	D	F	H	
Ball slide length	Model No.	**NH15EM**	55	–	–	–	+10.6
		NH15GM	74	–	–	–	
		NH20EM	69.8	74.8	75.6	80.6	+10.6
		NH20GM	91.8	96.8	97.6	102.6	
		NH25EM	79	84.6	85.4	91	+11.6
		NH25GM	107	112.6	113.4	119	
		NH30EM	98.6	105.8	107	114.2	+12
		NH30GM	124.6	131.8	133	140.2	

Notes: Double seal: It combines two end seals for enhancing sealing function.
Protector: Protect the end seal from hot and hard contaminants.
Rail cap: Prevents foreign matters, such as swarf generated in cutting operation from clogging the rail-mounting holes.

Table 5 Packed lubricant

Type	Code	Thickener	Base oil	Base oil kinematic viscosity [mm^2/s (40°C)]	Range of use temperature (°C)	Purpose
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For low temperature and high frequency operation
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistant
PARALIQ GA351	7	Aluminium complex	Paraffin oil	–	–40 to 120	For food processing equipment
None (Rust preventive oil applied)	9	–	–	–	–	–

Table 6 Preload code and amount of clearance/preload

Unit: μm

		Fine clearance ZT	Slight preload ZZ	Medium preload ZH
Preload code		T	Z	H
Model No.	**NH15**	–	–4 to 0	–7 to –3
	NH20	–	–5 to 0	–8 to –3
	NH25	–	–5 to 0	–9 to –4
	NH30	–5 to 15	–7 to 0	–12 to –5

Notes 1) Medium preload is available for special high-carbon steel products.
2) Minus sign denotes that a value is an amount of preload (elastic deformation of balls).

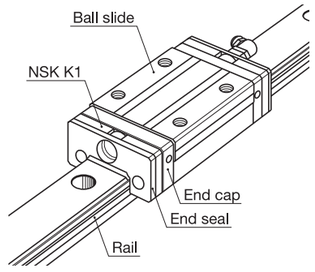


Fig. 2 "NSK K1™" lubrication unit

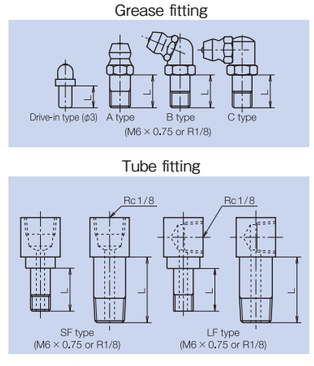


Fig. 3 Grease fitting and tube fitting

Standard lubrication accessory for NH15 is drive-in type (ϕ3). Standard lubrication accessory for NH20 or over is B type.

NH Series (NH35 to 65) NH-EM, NH-GM ／ Cross-sections : Flange type

Front view of
EM and GM types

Side view of
EM and GM types

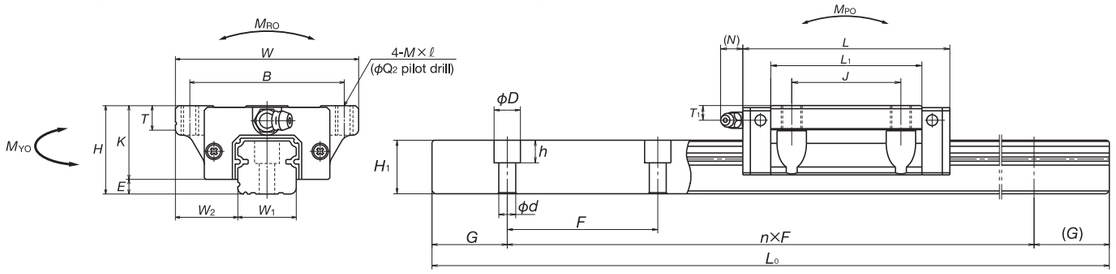


Fig. 1 Front view and side view

Reference number

Rail and ball slide assembly

Without serial number (*1) **NH 45 1300 EM N 2 PC Z 1 A L**

- Series name
- Size
- Rail length (mm)
- Ball slide shape code (See Table 1.)
- Material/surface treatment code (See Table 2.)
- Number of ball slides per rail
- Accuracy code (See Table 3.)
- Preload code (See Table 6.)
- Packed lubricant code (See Table 5.)
- Dust-proof code (See Table 4.)
- Rail mounting hole code
  L: Standard

With serial number (*2) **NH 45 1300 EM N 2 PC Z ***

- Design serial number
  Ex.) 001, 002, 003, ..., 010, 011, ...
  +01, +02, +03, ..., +10, +11, ...

Ball slide

Without serial number (*3) **NAH 45 EM N PC Z 1 A A**

- Ball slide series code
  NAH: NH Series ball slide
- Size
- Ball slide shape code (See Table 1.)
- Material/surface treatment code (See Table 2.)
- Accuracy code (See Table 3.)
- Preload code (See Table 6.)
- Packed lubricant code (See Table 5.)
- Dust-proof code (See Table 4.)
- Lubrication accessories position and direction code
  A, B, C, D, E, F, N (See A18)

With serial number (*2) **NAH 45 EM N PC Z ***

- Design serial number
  Ex.) 001, 002, 003, ..., 010, 011, ...
  +01, +02, +03, ..., +10, +11, ...

Rail

Without serial number (*4) **N1H 45 1300 L N N PC Z =20**

- Rail series code
  N1H: NH Series rail
- Size
- Rail length (mm)
- Rail shape code: L
  L: Standard
- Material/surface treatment code (See Table 2.)
- Dimension G
  Indicated in two digit after "=" (equal)
- Preload code (See Table 6.)
- Accuracy code (See Table 3.)
- Butting rail specification
  N: Non-butting. L: Butting specification

With serial number (*2) **N1H 45 1300 L N N PC Z ***

- Design serial number
  Ex.) 001, 002, 003, ..., 010, 011, ...
  +01, +02, +03, ..., +10, +11, ...

(*1) The design serial number is not required when the mounting width is W_2, dimensions of G at right and left ends of the rail are the same and minimum, the rail isn't with butting, the selected lubrication accessory is not only the standard type (B type) but also mounted standard position and direction, and the codes of packed lubricant, dust-proof specification and rail mounting hole specification are prepared.
(*2) The design serial number should be given when the requirements are not satisfied.
(*3) The design serial number is not required when the selected lubrication accessory is not only the standard type (B type) but also mounted standard position and direction and the codes of packed lubricant, dust-proof specification and rail mounting hole specification are standard.
(*4) The design serial number is not required when the dimension of G at left end on the drawing is two or less digit integer. If dimension of G at left end is decimal fraction number, G at right end must be equivalent to the left end G dimension, otherwise design serial number will be necessary. And if butting rail is required, design serial number will be necessary.

Table 1 Dimensions

Unit: mm

Model No.	Slide shape	Assembly			Ball slide										
		Height			Width	Length	Mounting hole							Grease fitting		
		H	E	W_2	W	L	B	J	M×pitch×ℓ	Q_2	L_1	K	T	Hole size	T_1	N
NH35EM	EM	48	9.5	33	100	109	82	62	M10×1.5×13	8.6	80	38.5	12	M6×0.75	8	11
NH35GM	GM					143					114					
NH45EM	EM	60	14	37.5	120	139	100	80	M12×1.75×15	10.5	105	46	13	Rc1/8	10	13
NH45GM	GM					171					137					
NH55EM	EM	70	15	43.5	140	163	116	95	M14×2×18	12.5	126	55	15	Rc1/8	11	13
NH55GM	GM					201					164					
NH65EM	EM	90	16	53.5	170	193	142	110	M16×2×24	14.6	147	74	23	Rc1/8	19	13
NH65GM	GM					253					207					

Model No.	Rail						Basic load rating								Weight	
	Width	Height	Pitch	Mounting bolt hole	G	Max. length	*) Dynamic		Static	Static moment (N·m)					Ball slide	Rail
							[50km]	[100km]			M_{PO}		M_{YO}			
	W_1	H_1	F	d×D×h	(reference)	L_{0max}	C_{50} (N)	C_{100} (N)	C_0 (N)	M_{RO}	(One slide)	(Two slides)	(One slide)	(Two slides)	(kg)	(kg/m)
NH35EM	34	29	80	9×14×12	20	4 000	62 500	49 500	80 500	950	755	4 500	630	3 800	1.7	7.2
NH35GM							81 000	64 500	117 000	1 380	1 530	8 350	1 280	7 000	2.4	
NH45EM	45	38	105	14×20×17	22.5	3 990	107 000	84 500	140 000	2 140	1 740	9 750	1 460	8 150	3	12.3
NH45GM							131 000	104 000	187 000	2 860	3 000	15 600	2 520	13 100	3.9	
NH55EM	53	44	120	16×23×20	30	3 960	158 000	125 000	198 000	3 600	3 000	16 300	2 510	13 700	5	16.9
NH55GM							193 000	153 000	264 000	4 850	5 150	26 300	4 350	22 100	6.5	
NH65EM	63	53	150	18×26×22	35	3 900	239 000	190 000	281 000	6 150	4 950	27 900	4 150	23 400	10	24.3
NH65GM							310 000	246 000	410 000	8 950	10 100	51 500	8 450	43 500	14.1	

*) The basic load rating comply with the ISO standard. (ISO 14728-1, 14728-2)
C_{50} ; the basic dynamic load rating for 50 km rated fatigue life C_{100} ; the basic dynamic load rating for 100 km rated fatigue life
The basic static load rating shows static permissible load.

Table 2 Material/surface treatment code

Type	Special high carbon steel
Without surface treatment	N
Low temperature chrome plating	D
Fluoride low temperature chrome plating	F

Notes: Low temperature chrome plating: Electrolytic rust prevention black treatment (black chrome plating)
Fluoride low temperature chrome plating:
Fluoroplastic coating is provided following the low temperature chrome plating.

Table 3 Accuracy grade and accuracy standard

Unit: μm

Accuracy grade		High precision grade		Normal grade	
		NH35	NH45, 55, 65	NH35	NH45, 55, 65
"NSK K1™" lubrication unit	Without NSK K1 lubrication unit	PH		PC	
	With NSK K1 lubrication unit	KH		KC	
Characteristics	Mounting height H	±20	±30	±20	±30
	Variation of H	15① 30②	20① 35②	15① 30②	20① 35②
	Mounting width W_2 or W_3	±30	±35	±30	±35
	Variation of W_2 or W_3	20	20	25	30
	Running parallelism of surface C to surface A	See page A6.		See page A6.	
	Running parallelism of surface D to surface B				

Notes 1) ①: Variation on the same rail ②: Variation on multiple rails
2) "NSK K1™" lubrication unit: Equipped with NSK linear guide. A Newly developed porous synthetic resin contains large volume of lubricant oil that seeps out and enhances lubricating function.

Table 4 Dust-proof specification code and length of ball slide equipped with dust-proof components

Unit: mm

Dust-proof specification			Standard	Double seal installed	Protector installed	Double seal and protector installed	Increase when NSK K1 installed
Dust-proof code	Rail cap	Without	A	C	E	G	
		With	B	D	F	H	
Ball slide length	Model No.	**NH35EM**	109	116.2	117.4	124.6	+13
		NH35GM	143	150.2	151.4	158.6	
		NH45EM	139	147.6	148.8	157.4	+15
		NH45GM	171	179.6	180.8	189.4	
		NH55EM	163	171.6	172.8	181.4	+15
		NH55GM	201	209.6	210.8	219.4	
		NH65EM	193	202.8	204	213.8	+18
		NH65GM	253	262.8	264	273.8	

Notes: Double seal: It combines two end seals for enhancing sealing function.
Protector: Protect the end seal from hot and hard contaminants.
Rail cap: Prevents foreign matters, such as swarf generated in cutting operation from clogging the rail-mounting holes.

Table 5 Packed lubricant

Type	Code	Thickener	Base oil	Base oil kinematic viscosity [mm^2/s (40°C)]	Range of use temperature (°C)	Purpose
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For low temperature and high frequency operation
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistant
PARALIQ GA351	7	Aluminium complex	Paraffin oil	–	–40 to 120	For food processing equipment
None (Rust preventive oil applied)	9	–	–	–	–	–

Table 6 Preload code and amount of clearance/preload

Unit: μm

		Fine clearance ZT	Slight preload ZZ	Medium preload ZH
Preload code		T	Z	H
Model No.	**NH35**	–5 to 15	–7 to 0	–12 to –5
	NH45	–5 to 15	–7 to 0	–14 to –7
	NH55	–	–9 to 0	–
	NH65	–	–9 to 0	–

Note: Minus sign denotes that a value is an amount of preload (elastic deformation of balls).

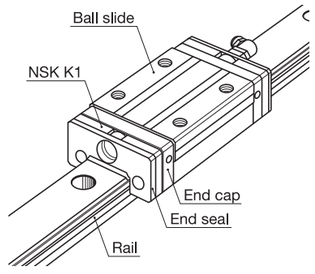
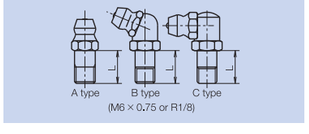


Fig. 2 "NSK K1™" lubrication unit

Grease fitting



Tube fitting

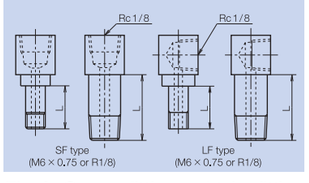


Fig. 3 Grease fitting and tube fitting
Standard lubrication accessory is B type.

NS Series (NS15 to 35) NS-AL, NS-CL / Cross-sections : Square (Low type)

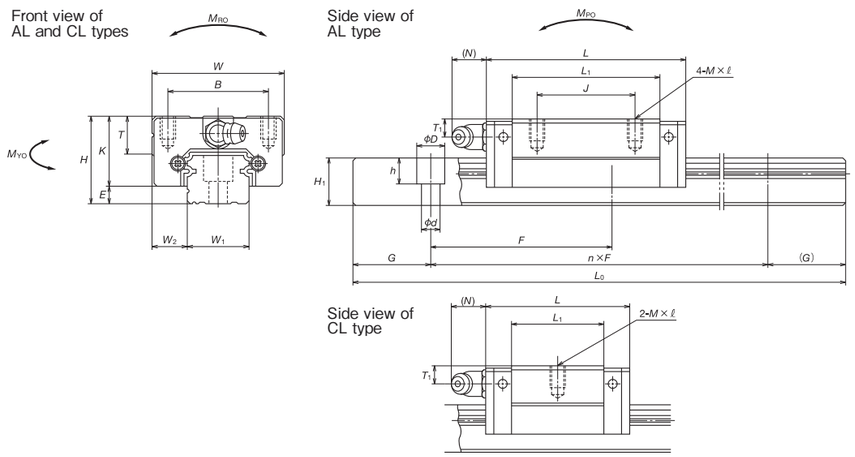


Fig. 1 Front view and side view

Reference number

Rail and ball slide assembly

Without serial number (*1) NS 30 1200 AL N 2 PC Z 1 A L

- Series name
- Size
- Rail length (mm)
- Ball slide shape code (See Table 1.)
- Material/surface treatment code (See Table 2.)
- Number of ball slides per rail
- Accuracy code (See Table 3.)
- Preload code (See Table 6.)
- Packed lubricant code (See Table 5.)
- Dust-proof code (See Table 4.)
- Rail mounting hole code
  L: NS15 with mounting holes for M3, NS20 to NS35 standard
  T: NS15 with mounting holes for M4

With serial number (*2) NS 30 1200 AL N 2 PC Z ***

- Design serial number
  Ex.) 001, 002, 003, ..., 010, 011, ...
  +01, +02, +03, ..., +10, +11, ...

Ball slide

Without serial number (*3) NAS 30 AL N PC Z 1 A A

- Ball slide series code
  NAS: NS Series ball slide
- Size
- Ball slide shape code (See Table 1.)
- Material/surface treatment code (See Table 2.)
- Accuracy code (See Table 3.)
- Preload code (See Table 6.)
- Packed lubricant code (See Table 5.)
- Dust-proof code (See Table 4.)
- Lubrication accessories position and direction code
  A, B, C, D, E, F, N (See A18)

With serial number (*2) NAS 30 AL N PC Z ***

- Design serial number
  Ex.) 001, 002, 003, ..., 010, 011, ...
  +01, +02, +03, ..., +10, +11, ...

Rail

Without serial number (*4) N1S 30 1200 L N N PC Z =40

- Rail series code
  N1S: NS Series rail
- Size
- Rail length (mm)
- Rail shape code: L
  L: NS15 with mounting holes for M3, NS20 to NS35 standard
  T: NS15 with mounting holes for M4
- Material/surface treatment code (See Table 2.)
- Accuracy code (See Table 3.)
- Preload code (See Table 6.)
- Butting rail specification
  N: Non-butting. L: Butting specification
- Dimension G
  Indicated in two digit after "=" (equal)

With serial number (*2) N1S 30 1200 L N N PC Z ***

- Design serial number
  Ex.) 001, 002, 003, ..., 010, 011, ...
  +01, +02, +03, ..., +10, +11, ...

(*1) The design serial number is not required when the mounting width is W_2, dimensions of G at right and left ends of the rail are the same and minimum, the rail isn't with butting, the selected lubrication accessory is not only the standard type (drive-in type / B type) but also mounted standard position and direction, and the codes of packed lubricant, dust-proof specification and rail mounting hole specification are prepared.
(*2) The design serial number should be given when the requirements are not satisfied.
(*3) The design serial number is not required when the selected lubrication accessory is not only the standard type (drive-in type / B type) but also mounted standard position and direction and the codes of packed lubricant, dust-proof specification and rail mounting hole specification are standard.
(*4) The design serial number is not required when the dimension of G at left end on the drawing is two or less digit integer. If dimension of G at left end is decimal fraction number, G at right end must be equivalent to the left end G dimension, otherwise design serial number will be necessary. And if butting rail is required, design serial number will be necessary.

Table 1 Dimensions

Unit: mm

Model No.	Slide shape	Assembly Height H	E	W_2	Ball slide Width W	Length L	Mounting hole B	J	M×pitch×ℓ	L_1	K	T	Grease fitting Hole size	T_1	N
NS15CL	CL	24	4.6	9.5	34	40.4	26	–	M4×0.7×6	23.6	19.4	10	φ3	6	3
NS15AL	AL					56.8		26		40					
NS20CL	CL	28	6	11	42	47.2	32	–	M5×0.8×7	30	22	12	M6×0.75	5.5	11
NS20AL	AL					65.2		32		48					
NS25CL	CL	33	7	12.5	48	59.6	35	–	M6×1×9	38	26	12	M6×0.75	7	11
NS25AL	AL					81.6		35		60					
NS30CL	CL	42	9	16	60	67.4	40	–	M8×1.25×12	42	33	13	M6×0.75	8	11
NS30AL	AL					96.4		40		71					
NS35CL	CL	48	10.5	18	70	77	50	–	M8×1.25×12	49	37.5	14	M6×0.75	8.5	11
NS35AL	AL					108		50		80					

Model No.	Rail Width W_1	Height H_1	Pitch F	Mounting bolt hole d×D×h	G (reference)	Max. length L_{0max} ( ) for stainless	Basic load rating *1) Dynamic [50km] C_{50} (N)	[100km] C_{100} (N)	Static C_0 (N)	Static moment (N·m) M_{RO}	M_{PO} (One slide)	M_{PO} (Two slides)	M_{YO} (One slide)	M_{YO} (Two slides)	Weight Ball slide (kg)	Rail (kg/m)
NS15CL	15	12.5	60	*2)4.5×7.5×5.3	20	2 920	7 250	5 750	9 100	45.5	24.5	196	20.5	165	0.14	1.4
NS15AL				3.5×6×4.5		(1 800)	11 200	8 850	16 900	84.5	77	470	64.5	395	0.20	
NS20CL	20	15.5	60	6×9.5×8.5	20	3 960	10 600	8 400	13 400	91.5	46.5	330	39	279	0.19	2.3
NS20AL						(3 500)	15 600	12 400	23 500	160	133	755	111	630	0.28	
NS25CL	23	18	60	7×11×9	20	3 960	17 700	14 000	20 800	164	91	655	76	550	0.34	3.1
NS25AL						(3 500)	26 100	20 700	36 500	286	258	1 470	217	1 230	0.51	
NS30CL	28	23	80	7×11×9	20	4 000	24 700	19 600	29 600	282	139	1 080	116	905	0.58	4.8
NS30AL						(3 500)	38 000	30 000	55 000	520	435	2 650	365	2 220	0.85	
NS35CL	34	27.5	80	9×14×12	20	4 000	34 500	27 300	40 000	465	220	1 670	185	1 400	0.86	7.0
NS35AL						(3 500)	52 500	42 000	74 500	865	695	4 000	580	3 350	1.3	

Notes: External appearance of stainless steel ball slides differs from those of special carbon steel ball slides.
*1) The basic load rating comply with the ISO standard. (ISO 14728-1, 14728-2)
C_{50} ; the basic dynamic load rating for 50 km rated fatigue life C_{100} ; the basic dynamic load rating for 100 km rated fatigue life
The basic static load rating shows static permissible load.
*2) Standard mounting hole of NS15 rail is for M4 bolts (Hole size: 4.5×7.5×5.3). If you require mounting hole for M3 bolts (Hole size: 3.5×6×4.5), please specify when ordering.

Table 2 Material/surface treatment code

Type	Special high carbon steel	Stainless steel
Without surface treatment	N	K
Low temperature chrome plating	D	H
Fluoride low temperature chrome plating	F	E

Notes: Low temperature chrome plating: Electrolytic rust prevention black treatment (black chrome plating)
Fluoride low temperature chrome plating: Fluoroplastic coating is provided following the low temperature chrome plating.

Table 3 Accuracy grade and accuracy standard

Unit: μm

Accuracy grade		High precision grade	Normal grade
"NSK K1™" lubrication unit	Without NSK K1 lubrication unit	PH	PC
	With NSK K1 lubrication unit	KH	KC
	With NSK K1 for food and medical equipment	FH *)	FC *)
Characteristics	Mounting height H	±20	±20
	Variation of H	15① 30②	15① 30②
	Mounting width W_2 or W_3	±30	±30
	Variation of W_2 or W_3	20	25
	Running parallelism of surface C to surface A	See page A6.	See page A6.
	Running parallelism of surface D to surface B		

Notes 1) High precision grade is available for special high-carbon steel products.
2) ①: Variation on the same rail ②: Variation on multiple rails
3) "NSK K1™" lubrication unit: Equipped with NSK linear guide. A Newly developed porous synthetic resin contains large volume of lubricant oil that seeps out and enhances lubricating function.
*) NS15 to NS30 are only available.

Table 4 Dust-proof specification code and length of ball slide equipped with dust-proof components

Unit: mm

Dust-proof specification			Standard	Double seal installed	Protector installed	Double seal and protector installed	Increase when NSK K1 installed
Dust-proof code	Rail cap	Without	A	C	E	G	
		With	B	D	F	H	
Ball slide length	Model No.	**NS15CL**	40.4	–	–	–	+9.6
		NS15AL	56.8	–	–	–	
		NS20CL	47.2	52.2	52.6	57.6	+10.6
		NS20AL	65.2	70.2	70.6	75.6	
		NS25CL	59.6	65.2	66	71.6	+10.6
		NS25AL	81.6	87.2	88	93.6	
		NS30CL	67.4	74.6	75.8	83	+12
		NS30AL	96.4	103.6	104.8	112	
		NS35CL	77	84.2	85.4	92.6	+13
		NS35AL	108	115.2	116.4	123.6	

Notes: Double seal: It combines two end seals for enhancing sealing function.
Protector: Protect the end seal from hot and hard contaminants.
Rail cap: Prevents foreign matters, such as swarf generated in cutting operation from clogging the rail-mounting holes.

Table 5 Packed lubricant

Type	Code	Thickener	Base oil	Base oil kinematic viscosity [mm^2/s (40°C)]	Range of use temperature (°C)	Purpose
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For low temperature and high frequency operation
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistant
PARALIQ GA351	7	Aluminium complex	Paraffin oil	–	–40 to 120	For food processing equipment
None (Rust preventive oil applied)	9	–	–	–	–	–

Table 6 Preload code and amount of clearance/preload

Unit: μm

		Fine clearance ZT	Slight preload ZZ	Medium preload ZH
Preload code		T	Z	H
Model No.	**NS15**	–	–4 to 0	–7 to –3
	NS20	–	–4 to 0	–7 to –3
	NS25	–	–5 to 0	–9 to –4
	NS30	–	–5 to 0	–9 to –4
	NS35	–5 to 15	–6 to 0	–10 to –4

Notes 1) Medium preload is available for special high-carbon steel products.
2) Minus sign denotes that a value is an amount of preload (elastic deformation of balls).

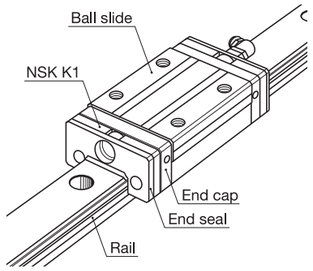


Fig. 2 "NSK K1™" lubrication unit

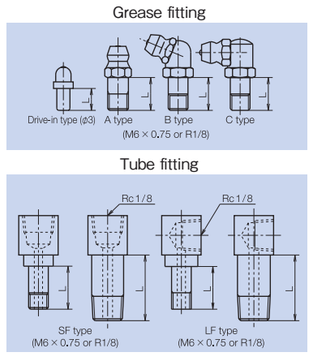


Fig. 3 Grease fitting and tube fitting

Standard lubrication accessory for NS15 is drive-in type (φ3). Standard lubrication accessory for NS20 or over is B type.

NS Series (NS15 to 35) NS-EM, NS-JM / Cross-sections : Flange type

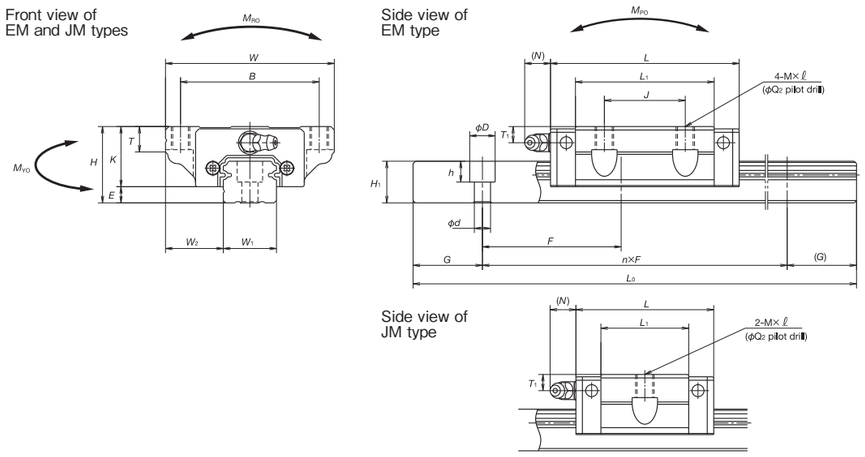


Fig. 1 Front view and side view

Reference number

Rail and ball slide assembly

Without serial number (*1) **NS 30 1200 EM N 2 PC Z 1 A L**

- Series name
- Size
- Rail length (mm)
- Ball slide shape code (See Table 1.)
- Material/surface treatment code (See Table 2.)
- Number of ball slides per rail
- Accuracy code (See Table 3.)
- Preload code (See Table 6.)
- Packed lubricant code (See Table 5.)
- Dust-proof code (See Table 4.)
- Rail mounting hole code
  L: NS15 with mounting holes for M3, NS20 to NS35 standard
  T: NS15 with mounting holes for M4

With serial number (*2) **NS 30 1200 EM N 2 PC Z ***

- Design serial number
  Ex.) 001, 002, 003, ..., 010, 011, ...
  +01, +02, +03, ..., +10, +11, ...

Ball slide

Without serial number (*3) **NAS 30 EM N PC Z 1 A A**

- Ball slide series code
  NAS: NS Series ball slide
- Size
- Ball slide shape code (See Table 1.)
- Material/surface treatment code (See Table 2.)
- Accuracy code (See Table 3.)
- Preload code (See Table 6.)
- Packed lubricant code (See Table 5.)
- Dust-proof code (See Table 4.)
- Lubrication accessories position and direction code
  A, B, C, D, E, F, N (See A18)

With serial number (*2) **NAS 30 EM N PC Z ***

- Design serial number
  Ex.) 001, 002, 003, ..., 010, 011, ...
  +01, +02, +03, ..., +10, +11, ...

Rail

Without serial number (*4) **N1S 30 1200 L N N PC Z =40**

- Rail series code
  N1S: NS Series rail
- Size
- Rail length (mm)
- Rail shape code: L
  L: NS15 with mounting holes for M3, NS20 to NS35 standard
  T: NS15 with mounting holes for M4
- Material/surface treatment code (See Table 2.)
- Dimension G
  Indicated in two digit after "=" (equal)
- Preload code (See Table 6.)
- Accuracy code (See Table 3.)
- Butting rail specification
  N: Non-butting. L: Butting specification

With serial number (*2) **N1S 30 1200 L N N PC Z ***

- Design serial number
  Ex.) 001, 002, 003, ..., 010, 011, ...
  +01, +02, +03, ..., +10, +11, ...

(*1) The design serial number is not required when the mounting width is W_2, dimensions of G at right and left ends of the rail are the same and minimum, the rail isn't with butting, the selected lubrication accessory is not only the standard type (drive-in type / B type) but also mounted standard position and direction, and the codes of packed lubricant, dust-proof specification and rail mounting hole specification are prepared.
(*2) The design serial number should be given when the requirements are not satisfied.
(*3) The design serial number is not required when the selected lubrication accessory is not only the standard type (drive-in type / B type) but also mounted standard position and direction and the codes of packed lubricant, dust-proof specification and rail mounting hole specification are standard.
(*4) The design serial number is not required when the dimension of G at left end on the drawing is two or less digit integer. If dimension of G at left end is decimal fraction number, G at right end must be equivalent to the left end G dimension, otherwise design serial number will be necessary. And if butting rail is required, design serial number will be necessary.

Table 1 Dimensions

Unit: mm

Model No.	Slide shape	Assembly: Height H	E	W_2	Ball slide: Width W	Length L	Mounting hole: B	J	M×pitch×ℓ	Q_2	L_1	K	T	Grease fitting: Hole size	T_1	N
NS15JM	JM	24	4.6	18.5	52	40.4	41	—	M5×0.8×7	4.4	23.6	19.4	8	ϕ 3	6	3
NS15EM	EM					56.8		26			40					
NS20JM	JM	28	6	19.5	59	47.2	49	—	M6×1×9	5.3	30	22	10	M6×0.75	5.5	11
NS20EM	EM					65.2		32	(M6×1×9.5)		48					
NS25JM	JM	33	7	25	73	59.6	60	—	M8×1.25×10	6.8	38	26	11	M6×0.75	7	11
NS25EM	EM					81.6		35	(M8×1.25×11.5)		60		(12)			
NS30JM	JM	42	9	31	90	67.4	72	—	M10×1.5×12	8.6	42	33	11	M6×0.75	8	11
NS30EM	EM					96.4		40	(M10×1.5×14.5)		71		(15)			
NS35JM	JM	48	10.5	33	100	77	82	—	M10×1.5×13	8.6	49	37.5	12	M6×0.75	8.5	11
NS35EM	EM					108		50	(M10×1.5×14.5)		80		(15)			

Model No.	Rail: Width W_1	Height H_1	Pitch F	Mounting bolt hole d×D×h	G (reference)	Max. length L_{0max} ( ) for stainless	Basic load rating: *1) Dynamic [50km] C_{50} (N)	[100km] C_{100} (N)	Static C_0 (N)	Static moment (N·m) M_{RO}	M_{PO} (One slide)	M_{PO} (Two slides)	M_{YO} (One slide)	M_{YO} (Two slides)	Weight: Ball slide (kg)	Rail (kg/m)
NS15JM	15	12.5	60	*2)4.5×7.5×5.3	20	2 920	7 250	5 750	9 100	45.5	24.5	196	20.5	165	0.17	1.4
NS15EM				3.5×6×4.5		(1 800)	11 200	8 850	16 900	84.5	77	470	64.5	395	0.26	
NS20JM	20	15.5	60	6×9.5×8.5	20	3 960	10 600	8 400	13 400	91.5	46.5	330	39	279	0.24	2.3
NS20EM						(3 500)	15 600	12 400	23 500	160	133	755	111	630	0.35	
NS25JM	23	18	60	7×11×9	20	3 960	17 700	14 000	20 800	164	91	655	76	550	0.44	3.1
NS25EM						(3 500)	26 100	20 700	36 500	286	258	1 470	217	1 230	0.66	
NS30JM	28	23	80	7×11×9	20	4 000	24 700	19 600	29 600	282	139	1 080	116	905	0.76	4.8
NS30EM						(3 500)	38 000	30 000	55 000	520	435	2 650	365	2 220	1.2	
NS35JM	34	27.5	80	9×14×12	20	4 000	34 500	27 300	40 000	465	220	1 670	185	1 400	1.2	7
NS35EM						(3 500)	52 500	42 000	74 500	865	695	4 000	580	3 350	1.7	

Notes 1) External appearance of stainless steel ball slides differs from those of special carbon steel ball slides. 2) Parenthesized dimensions are for items made of stainless steel.
*1) The basic load rating comply with the ISO standard. (ISO 14728-1, 14728-2)
C_{50} ; the basic dynamic load rating for 50 km rated fatigue life C_{100} ; the basic dynamic load rating for 100 km rated fatigue life
The basic static load rating shows static permissible load.
*2) Standard mounting hole of NS15 rail is for M4 bolts (Hole size: 4.5×7.5×5.3). If you require mounting hole for M3 bolts (Hole size: 3.5×6×4.5), please specify when ordering.

Table 2 Material/surface treatment code

Type	Special high carbon steel	Stainless steel
Without surface treatment	N	K
Low temperature chrome plating	D	H
Fluoride low temperature chrome plating	F	E

Notes: Low temperature chrome plating: Electrolytic rust prevention black treatment (black chrome plating)
Fluoride low temperature chrome plating: Fluoroplastic coating is provided following the low temperature chrome plating.

Table 3 Accuracy grade and accuracy standard

Unit: μm

Accuracy grade		High precision grade	Normal grade
"NSK K1™" lubrication unit	Without NSK K1 lubrication unit	PH	PC
	With NSK K1 lubrication unit	KH	KC
	With NSK K1 for food and medical equipment	FH *)	FC *)
Characteristics	Mounting height H	±20	±20
	Variation of H	15① 30②	15① 30②
	Mounting width W_2 or W_3	±30	±30
	Variation of W_2 or W_3	20	25
	Running parallelism of surface C to surface A	See page A6.	See page A6.
	Running parallelism of surface D to surface B		

Notes 1) High precision grade is available for special high-carbon steel products.
2) ①: Variation on the same rail ②: Variation on multiple rails
3) "NSK K1™" lubrication unit: Equipped with NSK linear guide. A Newly developed porous synthetic resin contains large volume of lubricant oil that seeps out and enhances lubricating function.
*) NS15 to NS30 are only available.

Table 4 Dust-proof specification code and length of ball slide equipped with dust-proof components

Unit: mm

Dust-proof specification			Standard	Double seal installed	Protector installed	Double seal and protector installed	Increase when NSK K1 installed
Dust-proof code	Rail cap	Without	A	C	E	G	
		With	B	D	F	H	
Ball slide length	Model No.	**NS15JM**	40.4	–	–	–	+9.6
		NS15EM	56.8	–	–	–	
		NS20JM	47.2	52.2	52.6	57.6	+10.6
		NS20EM	65.2	70.2	70.6	75.6	
		NS25JM	59.6	65.2	66	71.6	+10.6
		NS25EM	81.6	87.2	88	93.6	
		NS30JM	67.4	74.6	75.8	83	+12
		NS30EM	96.4	103.6	104.8	112	
		NS35JM	77	84.2	85.4	92.6	+13
		NS35EM	108	115.2	116.4	123.6	

Notes: Double seal: It combines two end seals for enhancing sealing function.
Protector: Protect the end seal from hot and hard contaminants.
Rail cap: Prevents foreign matters, such as swarf generated in cutting operation from clogging the rail-mounting holes.

Table 5 Packed lubricant

Type	Code	Thickener	Base oil	Base oil kinematic viscosity [mm^2/s (40°C)]	Range of use temperature (°C)	Purpose
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For low temperature and high frequency operation
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistant
PARALIQ GA351	7	Aluminium complex	Paraffin oil	–	–40 to 120	For food processing equipment
None (Rust preventive oil applied)	9	–	–	–	–	–

Table 6 Preload code and amount of clearance/preload

Unit: μm

Preload code		Fine clearance ZT	Slight preload ZZ	Medium preload ZH
		T	Z	H
Model No.	**NS15**	–	–4 to 0	–7 to –3
	NS20	–	–4 to 0	–7 to –3
	NS25	–	–5 to 0	–9 to –4
	NS30	–	–5 to 0	–9 to –4
	NS35	–5 to 15	–6 to 0	–10 to –4

Notes 1) Medium preload is available for special high-carbon steel products.
2) Minus sign denotes that a value is an amount of preload (elastic deformation of balls).

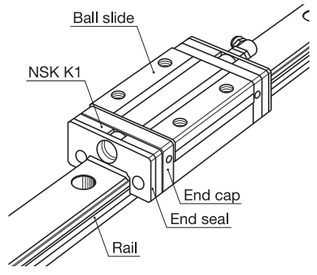


Fig. 2 "NSK K1™" lubrication unit

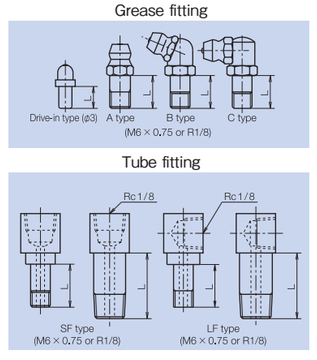


Fig. 3 Grease fitting and tube fitting

Standard lubrication accessory for NS15 is drive-in type (ϕ3). Standard lubrication accessory for NS20 or over is B type.

LW Series (LW17 to 35) LW-EL / Cross-sections : Flange type

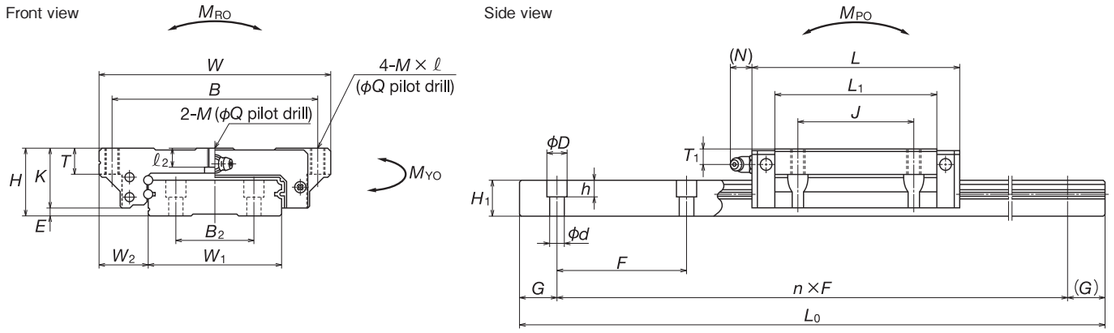


Fig. 1 Front view and side view

Reference number

Rail and ball slide assembly

Without serial number (*1) LW 35 1000 EL N 2 PC Z 1 A L

- Series name: LW
- Size: 35
- Rail length (mm): 1000
- Ball slide shape code (See Table 1.): EL
- Material/surface treatment code (See Table 2.): N
- Number of ball slides per rail: 2
- Accuracy code (See Table 3.): PC
- Preload code (See Table 6.): Z
- Packed lubricant code (See Table 5.): 1
- Dust-proof code (See Table 4.): A
- Rail mounting hole code: L (L: Standard)

With serial number (*2) LW 35 1000 EL N 2 PC Z ***

- Design serial number: Ex.) 001, 002, 003, ..., 010, 011, ... +01, +02, +03, ..., +10, +11, ...

Ball slide

Without serial number (*3) LAW 35 EL N PC Z 1 A A

- Ball slide series code: LAW (LAW: LW Series ball slide)
- Size: 35
- Ball slide shape code (See Table 1.): EL
- Material/surface treatment code (See Table 2.): N
- Accuracy code (See Table 3.): PC
- Preload code (See Table 6.): Z
- Packed lubricant code (See Table 5.): 1
- Dust-proof code (See Table 4.): A
- Lubrication accessories position and direction code: A (A, B, C, D, E, F, N (See A18))

With serial number (*2) LAW 35 EL N PC Z ***

- Design serial number: Ex.) 001, 002, 003, ..., 010, 011, ... +01, +02, +03, ..., +10, +11, ...

Rail

Without serial number (*4) L1W 35 1000 L N N PC Z =20

- Rail series code: L1W (L1W: LW Series rail)
- Size: 35
- Rail length (mm): 1000
- Rail shape code: L (L: Standard)
- Material/surface treatment code (See Table 2.): N
- Accuracy code (See Table 3.): PC
- Preload code (See Table 6.): Z
- Dimension G: =20 (Indicated in two digit after "=" (equal))
- Butting rail specification: N (N: Non-butting. L: Butting specification)

With serial number (*2) L1W 35 1000 L N N PC Z ***

- Design serial number: Ex.) 001, 002, 003, ..., 010, 011, ... +01, +02, +03, ..., +10, +11, ...

(*1) The design serial number is not required when the mounting width is W_2, dimensions of G at right and left ends of the rail are the same and minimum, the rail isn't with butting, the selected lubrication accessory is not only the standard type (drive-in type / B type) but also mounted standard position and direction, and the codes of packed lubricant, dust-proof specification and rail mounting hole specification are prepared.
(*2) The design serial number should be given when the requirements are not satisfied.
(*3) The design serial number is not required when the selected lubrication accessory is not only the standard type (drive-in type / B type) but also mounted standard position and direction and the codes of packed lubricant, dust-proof specification and rail mounting hole specification are standard.
(*4) The design serial number is not required when the dimension of G at left end on the drawing is two or less digit integer. If dimension of G at left end is decimal fraction number, G at right end must be equivalent to the left end G dimension, otherwise design serial number will be necessary. And if butting rail is required, design serial number will be necessary.

Table 1 Dimensions

Unit: mm

Model No.	Slide shape	Assembly			Ball slide											
		Height			Width	Length	Mounting hole								Grease fitting		
		H	E	W_2	W	L	B	J	M×pitch×ℓ	ℓ_2	Q	L_1	K	T	Hole size	T_1	N
LW17EL	EL	17	2.5	13.5	60	51.4	53	26	M4×0.7×6	3.2	3.3	35	14.5	6	φ3	4	3
LW21EL	EL	21	3	15.5	68	58.8	60	29	M5×0.8×8	3.7	4.4	41	18	8	M6×0.75	4.5	11
LW27EL	EL	27	4	19	80	74	70	40	M6×1×10	6	5.3	56	23	10	M6×0.75	6	11
LW35EL	EL	35	4	25.5	120	108	107	60	M8×1.25×14	9	6.8	84	31	14	M6×0.75	8	11

Model No.	Rail							Basic load rating								Weight	
	Width	Height		Pitch	Mounting bolt hole	G	Max. length	*) Dynamic		Static	Static moment (N·m)					Ball slide	Rail
								[50km]	[100km]			M_{PO}		M_{YO}			
	W_1	H_1	B_2	F	d×D×h	(reference)	L_{0max}	C_{50} (N)	C_{100} (N)	C_0 (N)	M_{RO}	(One slide)	(Two slides)	(One slide)	(Two slides)	(kg)	(kg/m)
LW17EL	33	8.7	18	40	4.5×7.5×5.3	15	1 000	5 600	4 450	11 300	135	44	288	37	242	0.2	2.1
LW21EL	37	10.5	22	50	4.5×7.5×5.3	15	1 600	6 450	5 150	13 900	185	65.5	400	55	335	0.3	2.9
LW27EL	42	15	24	60	4.5×7.5×5.3	20	2 000	12 800	10 200	26 900	400	171	970	143	815	0.5	4.7
LW35EL	69	19	40	80	7×11×9	20	2 000	33 000	26 400	66 500	1 690	645	3 550	545	2 990	1.5	9.6

*) The basic load rating comply with the ISO standard. (ISO 14728-1, 14728-2)
C_{50} ; the basic dynamic load rating for 50 km rated fatigue life C_{100} ; the basic dynamic load rating for 100 km rated fatigue life

Table 2 Material/surface treatment code

Type	Special high carbon steel
Without surface treatment	N
Low temperature chrome plating	D
Fluoride low temperature chrome plating	F

Notes: Low temperature chrome plating: Electrolytic rust prevention black treatment (black chrome plating)
Fluoride low temperature chrome plating: Fluoroplastic coating is provided following the low temperature chrome plating.

Table 3 Accuracy grade and accuracy standard

Unit: μm

Accuracy grade		Normal grade
"NSK K1™" lubrication unit	Without NSK K1 lubrication unit	PC
	With NSK K1 lubrication unit	KC
	With NSK K1 for food and medical equipment	FC *)
Characteristics	Mounting height H	±20
	Variation of H	15① 30②
	Mounting width W_2 or W_3	±30
	Variation of W_2 or W_3	25
	Running parallelism of surface C to surface A	See page A6.
	Running parallelism of surface D to surface B	

Notes 1) ①: Variation on the same rail ②: Variation on multiple rails
2) "NSK K1™" lubrication unit: Equipped with NSK linear guide. A Newly developed porous synthetic resin contains large volume of lubricant oil that seeps out and enhances lubricating function.
*) LW17 to LW27 are only available.

Table 4 Dust-proof specification code and length of ball slide equipped with dust-proof components

Unit: mm

Dust-proof specification			Standard	Double seal installed	Protector installed	Double seal and protector installed	Increase when NSK K1 installed
Dust-proof code	Rail cap	Without	A	C	E	G	
		With	B	D	F	H	
Ball slide length	Model No.	**LW17EL**	51.4	–	–	–	+10.2
		LW21EL	58.8	64.4	65.2	70.8	+12.6
		LW27EL	74	79	79.8	84.8	+12.6
		LW35EL	108	114	115.2	121.2	+15

Notes: Double seal: It combines two end seals for enhancing sealing function.
Protector: Protect the end seal from hot and hard contaminants.
Rail cap: Prevents foreign matters, such as swarf generated in cutting operation from clogging the rail-mounting holes.

Table 5 Packed lubricant

Type	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40°C)]	Range of use temperature (°C)	Purpose
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For low temperature and high frequency operation
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistant
PARALIQ GA351	7	Aluminium complex	Paraffin oil	–	–40 to 120	For food processing equipment
None (Rust preventive oil applied)	9	–	–	–	–	–

Table 6 Preload code and amount of clearance/preload

Unit: μm

		Slight preload ZZ
Preload code		Z
Model No.	**LW17**	–3.5 to 0
	LW21	–3.5 to 0
	LW27	–4 to 0
	LW35	–5 to 0

Note: Minus sign denotes that a value is an amount of preload (elastic deformation of balls).

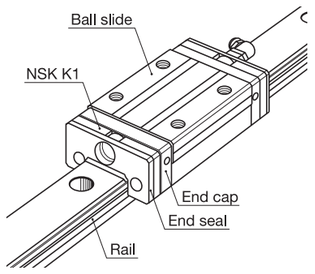


Fig. 2 "NSK K1™" lubrication unit

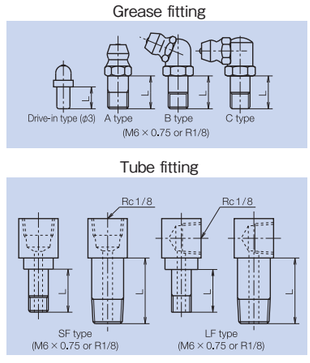


Fig. 3 Grease fitting and tube fitting

Standard lubrication accessory for LW17 is drive-in type (φ3). Standard lubrication accessory for LW21 or over is B type.

PU Series (PU09 to 15)

PU-TR, PU-AL / Standard
PU-UR, PU-BL / Long

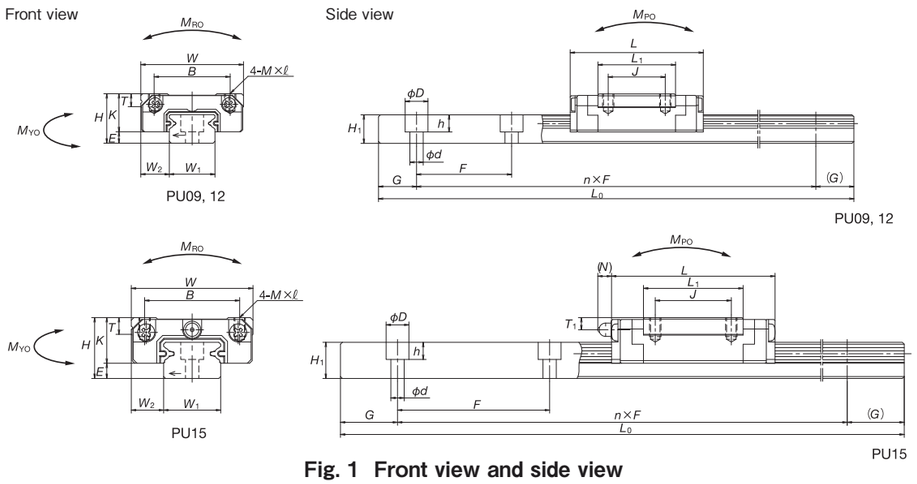


Fig. 1 Front view and side view

Reference number

Rail and ball slide assembly

Without serial number (*1) **PU 15 0470 AL K 2 PC T 2 A R**

- Series name: PU
- Size: 15
- Rail length (mm): 0470
- Ball slide shape code (See Table 1.): AL
- Material/surface treatment code (See Table 2.): K
- Number of ball slides per rail: 2
- Accuracy code (See Table 3.): PC
- Preload code (See Table 6.): T
- Dust-proof code (See Table 4.): 2
- Packed lubricant code (See Table 5.): A
- Rail mounting hole code (R: PU15, S: PU09·12): R

With serial number (*2) **PU 15 0470 AL K 2 PC T ***

- Design serial number: ***
  Ex.) 001, 002, 003, ..., 010, 011, ...
  +01, +02, +03, ..., +10, +11, ...

Ball slide

Without serial number (*3) **PAU 15 AL K PC T 2 A A**

- Ball slide series code: PAU (PU Series ball slide)
- Size: 15
- Ball slide shape code (See Table 1.): AL
- Material/surface treatment code (See Table 2.): K
- Accuracy code (See Table 3.): PC
- Preload code (See Table 6.): T
- Dust-proof code (See Table 4.): 2
- Packed lubricant code (See Table 5.): A
- Lubrication accessories position and direction code (A, B, N (See A18)): A

With serial number (*2) **PAU 15 AL K PC T ***

- Design serial number: ***
  Ex.) 001, 002, 003, ..., 010, 011, ...
  +01, +02, +03, ..., +10, +11, ...

Rail

Without serial number (*4) **P1U 15 0470 R K N PC T =15**

- Rail series code: P1U (PU Series rail)
- Size: 15
- Rail length (mm): 0470
- Rail shape code: R (R: PU15, S: PU09·12)
- Material/surface treatment code (See Table 2.): K
- Butting rail specification (N: Non-butting, L: Butting specification): N
- Accuracy code (See Table 3.): PC
- Preload code (See Table 6.): T
- Dimension G (Indicated in two digit after "=" (equal)): =15

With serial number (*2) **P1U 15 0470 R K N PC T ***

- Design serial number: ***
  Ex.) 001, 002, 003, ..., 010, 011, ...
  +01, +02, +03, ..., +10, +11, ...

(*1) The design serial number is not required when the mounting width is W_2, dimensions of G at right and left ends of the rail are the same and minimum, the rail isn't with butting, the selected lubrication accessory is not only the standard type (none / drive-in type) but also mounted standard position, and the codes of packed lubricant, dust-proof specification and rail mounting hole specification are prepared.
(*2) The design serial number should be given when the requirements are not satisfied.
(*3) The design serial number is not required when the selected lubrication accessory is not only the standard type (none / drive-in type) but also mounted standard position and the codes of packed lubricant, dust-proof specification and rail mounting hole specification are standard.
(*4) The design serial number is not required when the dimension of G at left end on the drawing is two or less digit integer. If dimension of G at left end is decimal fraction number, G at right end must be equivalent to the left end G dimension, otherwise design serial number will be necessary. And if butting rail is required, design serial number will be necessary.

Table 1 Dimensions

Unit: mm

Model No.	Slide shape	Assembly: Height H	Assembly: E	Assembly: W_2	Ball slide: Width W	Ball slide: Length L	Mounting hole: B	Mounting hole: J	Mounting hole: $M\times$pitch$\times\ell$	L_1	K	T	Grease fitting: Hole size	Grease fitting: T_1	Grease fitting: N
PU09TR	TR	10	2.2	5.5	20	30	15	10	M3×0.5×3	19.6	7.8	2.6	–	–	–
PU09UR	UR					41		16		30.6					
PU12TR	TR	13	3	7.5	27	35	20	15	M3×0.5×3.5	20.4	10	3.4	–	–	–
PU12UR	UR					48.7		20		34.1					
PU15AL	AL	16	4	8.5	32	43	25	20	M3×0.5×5	26.2	12	4.4	ϕ3	3.2	(3.6)
PU15BL	BL					61		25		44.2					

Model No.	Rail: Width W_1	Rail: Height H_1	Rail: Pitch F	Rail: Mounting bolt hole $d\times D\times h$	Rail: G (reference)	Rail: Max. length L_{0max}	Basic load rating: *) Dynamic [50km] C_{50} (N)	Basic load rating: *) Dynamic [100km] C_{100} (N)	Basic load rating: Static C_0 (N)	Static moment (N·m): M_{RO}	Static moment (N·m): M_{PO} (One slide)	Static moment (N·m): M_{PO} (Two slides)	Static moment (N·m): M_{YO} (One slide)	Static moment (N·m): M_{YO} (Two slides)	Weight: Ball slide (g)	Weight: Rail (g/100mm)
PU09TR	9	5.5	20	3.5×6×4.5	7.5	600	1 490	1 180	2 150	9.90	6.10	41.0	6.10	41.0	16	35
PU09UR							2 100	1 670	3 500	16.2	15.6	88.0	15.6	88.0	25	
PU12TR	12	7.5	25	3.5×6×4.5	10	800	2 830	2 250	3 500	21.1	11.4	73.5	11.4	73.5	32	65
PU12UR							4 000	3 150	5 700	34.5	28.3	174	28.3	174	53	
PU15AL	15	9.5	40	3.5×6×4.5	15	1 000	5 550	4 400	6 600	49.5	25.6	190	25.6	190	59	105
PU15BL							8 100	6 400	11 300	84.5	69.5	435	69.5	435	100	

*) The basic load rating comply with the ISO standard. (ISO 14728-1, 14728-2)
C_{50} ; the basic dynamic load rating for 50 km rated fatigue life C_{100} ; the basic dynamic load rating for 100 km rated fatigue life

Table 2 Material/surface treatment code

Type	Stainless steel
Without surface treatment	K
Low temperature chrome plating	H
Fluoride low temperature chrome plating	E

Notes: Low temperature chrome plating: Electrolytic rust prevention black treatment (black chrome plating)
Fluoride low temperature chrome plating: Fluoroplastic coating is provided following the low temperature chrome plating.

Table 3 Accuracy grade and accuracy standard

Unit: μm

Accuracy grade		Normal grade
"NSK K1™" lubrication unit	Without NSK K1 lubrication unit	PC
	With NSK K1 lubrication unit	KC
	With NSK K1 for food and medical equipment	FC
Characteristics	Mounting height H	±20
	Variation of H	15① 30②
	Mounting width W_2 or W_3	±20
	Variation of W_2 or W_3	20
	Running parallelism of surface C to surface A	See page A6.
	Running parallelism of surface D to surface B	

Notes 1) ①: Variation on the same rail ②: Variation on multiple rails
2) "NSK K1™" lubrication unit: Equipped with NSK linear guide. A Newly developed porous synthetic resin contains large volume of lubricant oil that seeps out and enhances lubricating function.

Table 4 Dust-proof specification code and length of ball slide equipped with NSK K1 lubrication unit

Unit: mm

Dust-proof specification			Standard	NSK K1 installed
Dust-proof code	Rail cap	Without	A	
		With	B	
Ball slide length	Model No.	**PU09TR**	30	36.4
		PU09UR	41	47.4
		PU12TR	35	42
		PU12UR	48.7	55.7
		PU15AL	43	51.2
		PU15BL	61	69.2

Note: Rail cap: Prevents foreign matters, such as swarf generated in cutting operation from clogging the rail-mounting holes.

Table 5 Packed lubricant

Type	Code	Thickener	Base oil	Base oil kinematic viscosity [mm^2/s (40°C)]	Range of use temperature (°C)	Purpose
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For low temperature and high frequency operation
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistant
PARALIQ GA351	7	Aluminium complex	Paraffin oil	–	–40 to 120	For food processing equipment
None (Rust preventive oil applied)	9	–	–	–	–	–

Table 6 Preload code and clearance

Unit: μm

Preload code			Fine clearance ZT: T
Model No.	Standard type	**PU09TR**	3 or less
		PU12TR	
		PU15AL	
	High-load type	**PU09UR**	5 or less
		PU12UR	
		PU15BL	

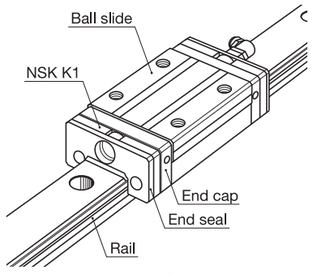


Fig. 2 "NSK K1™" lubrication unit

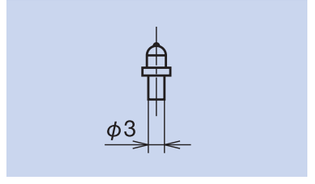


Fig. 3 Grease fitting

Standard lubrication accessory for PU15 is drive-in type (ϕ3). For the models of PU09 and PU12, apply grease directly to the ball grooves of rail using a point nozzle.

PE Series (PE09 to 15)

PE-AR, PE-TR / Standard
PE-UR, PE-BR / Long

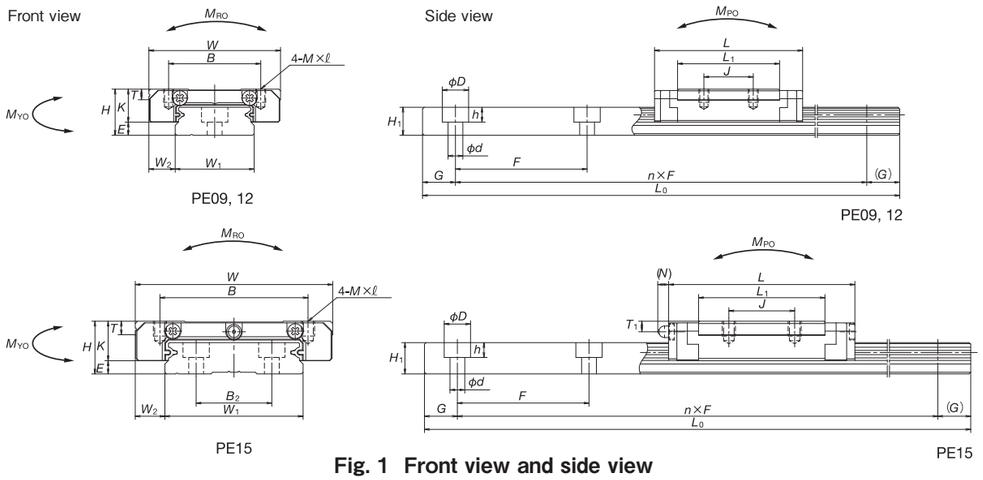


Fig. 1 Front view and side view

Reference number

Rail and ball slide assembly

Without serial number (*1) PE 15 0470 AR K 2 PC T 2 A P

- Series name
- Size
- Rail length (mm)
- Ball slide shape code (See Table 1.)
- Material/surface treatment code (See Table 2.)
- Number of ball slides per rail
- Accuracy code (See Table 3.)
- Preload code (See Table 6.)
- Packed lubricant code (See Table 5.)
- Dust-proof code (See Table 4.)
- Rail mounting hole code — P: PE15, R: PE09·12

With serial number (*2) PE 15 0470 AR K 2 PC T ***

- Design serial number — Ex.) 001, 002, 003, ..., 010, 011, ... +01, +02, +03, ..., +10, +11, ...

Ball slide

Without serial number (*3) PAE 15 AR K PC T 2 A A

- Ball slide series code — PAE: PE Series ball slide
- Size
- Ball slide shape code (See Table 1.)
- Material/surface treatment code (See Table 2.)
- Accuracy code (See Table 3.)
- Preload code (See Table 6.)
- Packed lubricant code (See Table 5.)
- Dust-proof code (See Table 4.)
- Lubrication accessories position and direction code — A, B, N (See A18)

With serial number (*2) PAE 15 AR K PC T ***

- Design serial number — Ex.) 001, 002, 003, ..., 010, 011, ... +01, +02, +03, ..., +10, +11, ...

Rail

Without serial number (*4) P1E 15 0470 P K N PC T =15

- Rail series code — P1E: PE Series rail
- Size
- Rail length (mm)
- Rail shape code: P — P: PE15, R: PE09·12
- Material/surface treatment code (See Table 2.)
- Butting rail specification — N: Non-butting. L: Butting specification
- Accuracy code (See Table 3.)
- Preload code (See Table 6.)
- Dimension G — Indicated in two digit after "=" (equal)

With serial number (*2) P1E 15 0470 P K N PC T ***

- Design serial number — Ex.) 001, 002, 003, ..., 010, 011, ... +01, +02, +03, ..., +10, +11, ...

(*1) The design serial number is not required when the mounting width is W_2, dimensions of G at right and left ends of the rail are the same and minimum, the rail isn't with butting, the selected lubrication accessory is not only the standard type (none / drive-in type) but also mounted standard position, and the codes of packed lubricant, dust-proof specification and rail mounting hole specification are prepared.
(*2) The design serial number should be given when the requirements are not satisfied.
(*3) The design serial number is not required when the selected lubrication accessory is not only the standard type (none / drive-in type) but also mounted standard position and the codes of packed lubricant, dust-proof specification and rail mounting hole specification are standard.
(*4) The design serial number is not required when the dimension of G at left end on the drawing is two or less digit integer. If dimension of G at left end is decimal fraction number, G at right end must be equivalent to the left end G dimension, otherwise design serial number will be necessary. And if butting rail is required, design serial number will be necessary.

Table 1 Dimensions

Unit: mm

Model No.	Slide shape	Assembly: Height H	Assembly: E	Assembly: W_2	Ball slide: Width W	Ball slide: Length L	Mounting hole: B	Mounting hole: J	Mounting hole: M×pitch×ℓ	L_1	K	T	Oil hole: Hole size	Oil hole: T_1	Oil hole: N
PE09TR	TR	12	4	6	30	39.8	21	12	M3×0.5×3	26.6	8	2.8	φ2	2.3	–
PE09UR	UR					51.2	23	24		38					
PE12AR	AR	14	4	8	40	45	28	15	M3×0.5×4	31	10	3.2	φ2.5	2.7	–
PE12BR	BR					60	28	28		46					
PE15AR	AR	16	4	9	60	56.6	45	20	M4×0.7×4.5	38.4	12	4.1	φ3	3.2	(3.3)
PE15BR	BR					76	45	35		57.8					

Model No.	Rail: Width W_1	Rail: Height H_1	Rail: B_2	Rail: Pitch F	Rail: Mounting bolt hole d×D×h	Rail: G (reference)	Rail: Max. length L_{0max}	Basic load rating: *) Dynamic [50km] C_{50} (N)	Dynamic [100km] C_{100} (N)	Static C_0 (N)	Static moment (N·m): M_{RO}	M_{PO} (One slide)	M_{PO} (Two slides)	M_{YO} (One slide)	M_{YO} (Two slides)	Weight: Ball slide (g)	Weight: Rail (g/100mm)
PE09TR	18	7.5	–	30	3.5×6×4.5	10	800	3 000	2 390	4 500	36.5	17.3	113	17.3	113	35	95
PE09UR								4 000	3 150	6 700	54.5	37.5	210	37.5	210	50	
PE12AR	24	8.5	–	40	4.5×8×4.5	15	1 000	4 350	3 450	6 350	70.5	29.3	180	29.3	180	66	140
PE12BR								5 800	4 600	9 550	106	63.5	345	63.5	345	98	
PE15AR	42	9.5	23	40	4.5×8×4.5	15	1 200	7 600	6 050	10 400	207	59.0	370	59.0	370	140	275
PE15BR								10 300	8 200	16 000	320	135	740	135	740	211	

*) The basic load rating comply with the ISO standard. (ISO 14728-1, 14728-2)
C_{50} ; the basic dynamic load rating for 50 km rated fatigue life C_{100} ; the basic dynamic load rating for 100 km rated fatigue life

Table 2 Material/surface treatment code

Type	Stainless steel
Without surface treatment	K
Low temperature chrome plating	H
Fluoride low temperature chrome plating	E

Notes: Low temperature chrome plating: Electrolytic rust prevention black treatment (black chrome plating)
Fluoride low temperature chrome plating: Fluoroplastic coating is provided following the low temperature chrome plating.

Table 3 Accuracy grade and accuracy standard

Unit: μm

	Accuracy grade	Normal grade
"NSK K1™" lubrication unit	Without NSK K1 lubrication unit	PC
	With NSK K1 lubrication unit	KC
	With NSK K1 for food and medical equipment	FC
Characteristics	Mounting height H	±20
	Variation of H	15① 30②
	Mounting width W_2 or W_3	±20
	Variation of W_2 or W_3	20
	Running parallelism of surface C to surface A	See page A6.
	Running parallelism of surface D to surface B	

Notes 1) ①: Variation on the same rail ②: Variation on multiple rails
2) "NSK K1™" lubrication unit: Equipped with NSK linear guide. A Newly developed porous synthetic resin contains large volume of lubricant oil that seeps out and enhances lubricating function.

Table 4 Dust-proof specification code and length of ball slide equipped with NSK K1 lubrication unit

Unit: mm

Dust-proof specification			Standard	NSK K1 installed
Dust-proof code	Rail cap	Without	A	
		With *)	B	
Ball slide length	Model No.	**PE09TR**	39.8	46.8
		PE09UR	51.2	58.2
		PE12AR	45	53
		PE12BR	60	68
		PE15AR	56.6	66.2
		PE15BR	76	85.6

Note: Rail cap: Prevents foreign matters, such as swarf generated in cutting operation from clogging the rail-mounting holes.
*) Only PE09 is available.

Table 5 Packed lubricant

Type	Code	Thickener	Base oil	Base oil kinematic viscosity [mm^2/s (40°C)]	Range of use temperature (°C)	Purpose
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For low temperature and high frequency operation
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistant
PARALIQ GA351	7	Aluminium complex	Paraffin oil	–	–40 to 120	For food processing equipment
None (Rust preventive oil applied)	9	–	–	–	–	–

Table 6 Preload code and clearance

Unit: μm

			Fine clearance ZT
Preload code			T
Model No.	Standard type	**PE09TR**	3 or less
		PE12AR	
		PE15AR	
	High-load type	**PE09UR**	5 or less
		PE12BR	
		PE15BR	

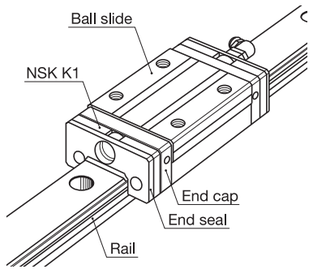


Fig. 2 "NSK K1™" lubrication unit

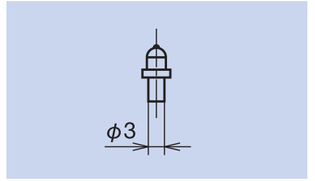


Fig. 3 Grease fitting

Standard lubrication accessory for PE15 is drive-in type φ3). For the models of PE09 and PE12, apply grease directly to the ball grooves of rail using a point nozzle.

RA Series (RA25 to 45) RA-AN, RA-BN / Square (High type)

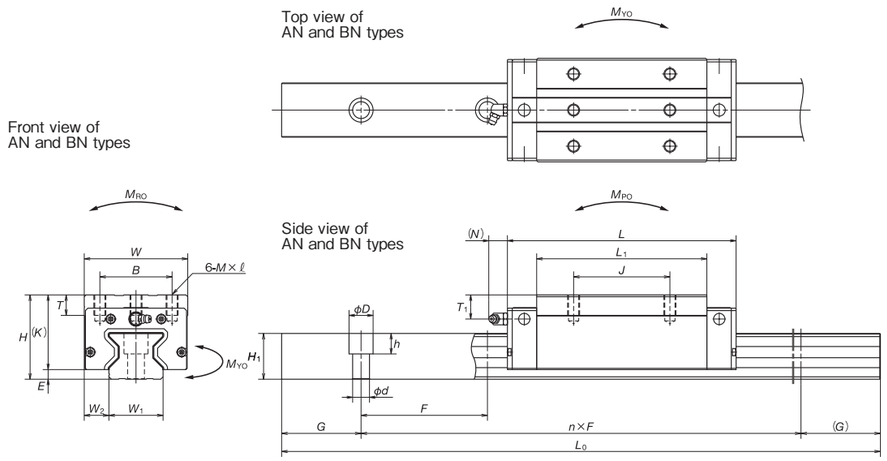


Fig. 1 Front view, side view and top view

Reference number

Rail and roller slide assembly

Without serial number (*1) RA 35 1000 AN N 2 PH H 1 A L

- Series name: RA
- Size: 35
- Rail length (mm): 1000
- Roller slide shape code (See Table 1.): AN
- Material/surface treatment code (See Table 2.): N
- Number of roller slides per rail: 2
- Accuracy code (See Table 3.): PH
- Preload code H: Medium preload
- Packed lubricant code (See Table 5.): 1
- Dust-proof code (See Table 4.): A
- Rail mounting hole code: L
  - L: Standard

With serial number (*2) RA 35 1000 AN N 2 PH H ***

- Design serial number
  - Ex.) 001, 002, 003, ..., 010, 011, ...
  - +01, +02, +03, ..., +10, +11, ...

Roller slide

Without serial number (*3) RAA 35 AN N PH H 1 A A

- Roller slide series code: RAA
  - RAA: RA Series roller slide
- Size: 35
- Roller slide shape code (See Table 1.): AN
- Material/surface treatment code (See Table 2.): N
- Accuracy code (See Table 3.): PH
- Preload code H: Medium preload
- Packed lubricant code (See Table 5.): 1
- Dust-proof code (See Table 4.): A
- Lubrication accessories position and direction code: A
  - A, B, C, D, E, F, N (See A18)

With serial number (*2) RAA 35 AN N PH H ***

- Design serial number
  - Ex.) 001, 002, 003, ..., 010, 011, ...
  - +01, +02, +03, ..., +10, +11, ...

Rail

Without serial number (*4) R1A 35 1000 L N N PH Z =20

- Rail series code: R1A
  - R1A: RA Series rail
- Size: 35
- Rail length (mm): 1000
- Rail shape code: L
  - L: Standard
- Material/surface treatment code (See Table 2.): N
- Butting rail specification: N
  - N: Non-butting. L: Butting specification
- Accuracy code (See Table 3.): PH
- Preload code: Z
  - Z: Slight preload (Common for medium preload)
- Dimension G: =20
  - Indicated in two digit after "=" (equal)

With serial number (*2) R1A 35 1000 L N N PH Z ***

- Design serial number
  - Ex.) 001, 002, 003, ..., 010, 011, ...
  - +01, +02, +03, ..., +10, +11, ...

(*1) The design serial number is not required when the mounting width is W_2, dimensions of G at right and left ends of the rail are the same and minimum, the rail isn't with butting, the selected lubrication accessory is not only the standard type (B type) but also mounted standard position and direction, and the codes of packed lubricant, dust-proof specification and rail mounting hole specification are prepared.
(*2) The design serial number should be given when the requirements are not satisfied.
(*3) The design serial number is not required when the selected lubrication accessory is not only the standard type (B type) but also mounted standard position and direction and the codes of packed lubricant, dust-proof specification and rail mounting hole specification are standard.
(*4) The design serial number is not required when the dimension of G at left end on the drawing is two or less digit integer. If dimension of G at left end is decimal fraction number, G at right end must be equivalent to the left end G dimension, otherwise design serial number will be necessary. And if butting rail is required, design serial number will be necessary.

Table 1 Dimensions

Unit: mm

Model No.	Slide shape	Assembly Height H	Assembly E	Assembly W_2	Roller slide Width W	Roller slide Length L	Mounting hole B	Mounting hole J	Mounting hole M×pitch×ℓ	L_1	K	T	Grease fitting Hole size	Grease fitting T_1	Grease fitting N
RA25AN	AN	40	5	12.5	48	97.5	35	35	M6×1×9	65.5	35	12	M6×0.75	10	11
RA25BN	BN					115.5		50		83.5					
RA30AN	AN	45	6.5	16	60	110.8	40	40	M8×1.25×11	74	38.5	14	M6×0.75	10	11
RA30BN	BN					135.4		60		98.6					
RA35AN	AN	55	6.5	18	70	123.8	50	50	M8×1.25×12	83.2	48.5	15	M6×0.75	15	11
RA35BN	BN					152		72		111.4					
RA45AN	AN	70	8	20.5	86	154	60	60	M10×1.5×17	105.4	62	17	Rc1/8	20	14
RA45BN	BN					190		80		141.4					

Model No.	Rail Width W_1	Rail Height H_1	Rail Pitch F	Rail Mounting bolt hole d×D×h	Rail G (reference)	Rail Max. length L_{0max}	Basic load rating *) Dynamic [50km] C_{50} (N)	Dynamic [100km] C_{100} (N)	Static C_0 (N)	Static moment (N·m) M_{RO}	M_{PO} (One slide)	M_{PO} (Two slides)	M_{YO} (One slide)	M_{YO} (Two slides)	Weight Roller slide (kg)	Weight Rail (kg/m)
RA25AN	23	24	30	7×11×9	20	3 900	36 000	29 200	72 700	970	760	4 850	760	4 850	0.60	3.4
RA25BN							43 500	35 400	92 900	1 240	1 240	7 200	1 240	7 200	0.91	
RA30AN	28	28	40	9×14×12	20	3 900	47 800	38 900	93 500	1 670	1 140	7 100	1 140	7 100	1.0	4.9
RA30BN							58 500	47 600	121 000	2 170	1 950	11 500	1 950	11 500	1.3	
RA35AN	34	31	40	9×14×12	20	3 900	65 500	53 300	129 000	2 810	1 800	11 000	1 800	11 000	1.6	6.8
RA35BN							82 900	67 400	175 000	3 810	3 250	17 800	3 250	17 800	2.1	
RA45AN	45	38	52.5	14×20×17	22.5	3 650	114 000	92 800	229 000	6 180	4 080	24 000	4 080	24 000	3.0	10.9
RA45BN							143 000	116 000	305 000	8 240	7 150	39 000	7 150	39 000	4.1	

*) The basic load rating comply with the ISO standard. (ISO 14728-1, 14728-2)
C_{50} ; the basic dynamic load rating for 50 km rated fatigue life C_{100} ; the basic dynamic load rating for 100 km rated fatigue life

Table 2 Material/surface treatment code

Type	Special high carbon steel
Without surface treatment	N

Table 3 Accuracy grade and accuracy standard

Unit: μm

Accuracy grade		High precision grade
"NSK K1™" lubrication unit	Without NSK K1 lubrication unit	PH
	With NSK K1 lubrication unit	KH
Characteristics	Mounting height H	±20
	Variation of H	15① 25②
	Mounting width W_2 or W_3	±25
	Variation of W_2 or W_3	20
	Running parallelism of surface C to surface A	See page A6.
	Running parallelism of surface D to surface B	

Notes 1) ①: Variation on the same rail ②: Variation on multiple rails
2) "NSK K1™" lubrication unit: Equipped with NSK linear guide. A Newly developed porous synthetic resin contains large volume of lubricant oil that seeps out and enhances lubricating function.

Table 4 Dust-proof specification code and length of roller slide equipped with dust-proof components

Unit: mm

Dust-proof specification			Standard	Double seal installed	Increase when NSK K1 installed
Dust-proof code	Rail cap	Without	A	C	
		With	B	D	
Roller slide length	Model No.	**RA25AN**	97.5	103.9	+10
		RA25BN	115.5	121.9	
		RA30AN	110.8	117.6	+12
		RA30BN	135.4	142.2	
		RA35AN	123.8	130.6	+13
		RA35BN	152	158.8	
		RA45AN	154	162	+14
		RA45BN	190	198	

Notes: Double seal: It combines two end seals for enhancing sealing function.
Rail cap: Prevents foreign matters, such as swarf generated in cutting operation from clogging the rail-mounting holes.

Table 5 Packed lubricant

Type	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40°C)]	Range of use temperature (°C)	Purpose
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For low temperature and high frequency operation
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistant
None (Rust preventive oil applied)	9	–	–	–	–	–

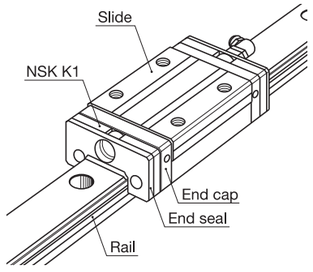


Fig. 2 "NSK K1™" lubrication unit

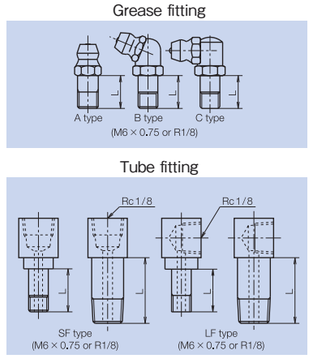


Fig. 3 Grease fitting and tube fitting

Standard lubrication accessory is B type.

RA Series (RA25 to 45) RA-AL, RA-BL / Square (Low type)

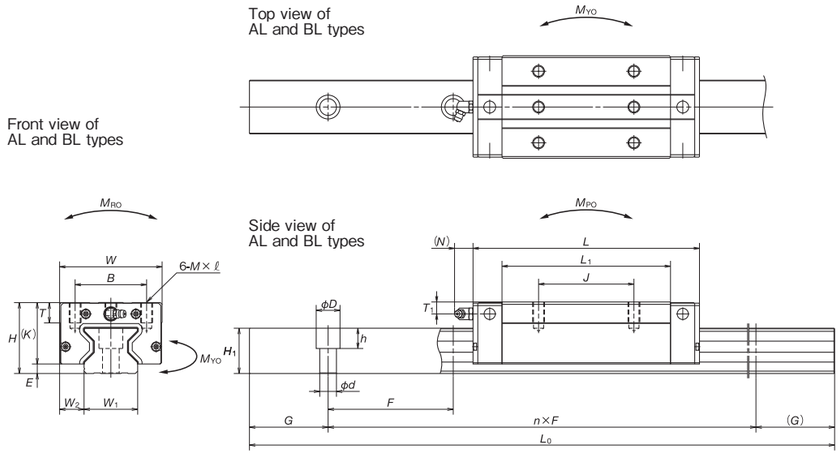


Fig. 1 Front view, side view and top view

Reference number

Rail and roller slide assembly

Without serial number (*1) RA 35 1000 AL N 2 PH H 1 A L

- Series name: RA
- Size: 35
- Rail length (mm): 1000
- Roller slide shape code (See Table 1.): AL
- Material/surface treatment code (See Table 2.): N
- Number of roller slides per rail: 2
- Accuracy code (See Table 3.): PH
- Preload code H: Medium preload
- Packed lubricant code (See Table 5.): 1
- Dust-proof code (See Table 4.): A
- Rail mounting hole code: L (L: Standard)

With serial number (*2) RA 35 1000 AL N 2 PH H ***

- Design serial number: *** Ex.) 001, 002, 003, ..., 010, 011, ... +01, +02, +03, ..., +10, +11, ...

Roller slide

Without serial number (*3) RAA 35 AL N PH H 1 A A

- Roller slide series code: RAA (RAA: RA Series roller slide)
- Size: 35
- Roller slide shape code (See Table 1.): AL
- Material/surface treatment code (See Table 2.): N
- Accuracy code (See Table 3.): PH
- Preload code H: Medium preload
- Packed lubricant code (See Table 5.): 1
- Dust-proof code (See Table 4.): A
- Lubrication accessories position and direction code: A (A, B, C, D, E, F, N (See A18))

With serial number (*2) RAA 35 AL N PH H ***

- Design serial number: *** Ex.) 001, 002, 003, ..., 010, 011, ... +01, +02, +03, ..., +10, +11, ...

Rail

Without serial number (*4) R1A 35 1000 L N N PH Z =20

- Rail series code: R1A (R1A: RA Series rail)
- Size: 35
- Rail length (mm): 1000
- Rail shape code: L (L: Standard)
- Material/surface treatment code (See Table 2.): N
- Butting rail specification: N (N: Non-butting. L: Butting specification)
- Accuracy code (See Table 3.): PH
- Preload code: Z (Z: Slight preload (Common for medium preload))
- Dimension G: =20 (Indicated in two digit after "=" (equal))

With serial number (*2) R1A 35 1000 L N N PH Z ***

- Design serial number: *** Ex.) 001, 002, 003, ..., 010, 011, ... +01, +02, +03, ..., +10, +11, ...

(*1) The design serial number is not required when the mounting width is W_2, dimensions of G at right and left ends of the rail are the same and minimum, the rail isn't with butting, the selected lubrication accessory is not only the standard type (B type) but also mounted standard position and direction, and the codes of packed lubricant, dust-proof specification and rail mounting hole specification are prepared.
(*2) The design serial number should be given when the requirements are not satisfied.
(*3) The design serial number is not required when the selected lubrication accessory is not only the standard type (B type) but also mounted standard position and direction and the codes of packed lubricant, dust-proof specification and rail mounting hole specification are standard.
(*4) The design serial number is not required when the dimension of G at left end on the drawing is two or less digit integer. If dimension of G at left end is decimal fraction number, G at right end must be equivalent to the left end G dimension, otherwise design serial number will be necessary. And if butting rail is required, design serial number will be necessary.

Table 1 Dimensions

Unit: mm

Model No.	Slide shape	Assembly Height H	Assembly E	Assembly W_2	Roller slide Width W	Roller slide Length L	Mounting hole B	Mounting hole J	Mounting hole M×pitch×ℓ	L_1	K	T	Grease fitting Hole size	Grease fitting T_1	Grease fitting N
RA25AL	AL	36	5	12.5	48	97.5	35	35	M6×1×8	65.5	31	12	M6×0.75	6	11
RA25BL	BL					115.5		50		83.5					
RA30AL	AL	42	6.5	16	60	110.8	40	40	M8×1.25×11	74	35.5	14	M6×0.75	7	11
RA30BL	BL					135.4		60		98.6					
RA35AL	AL	48	6.5	18	70	123.8	50	50	M8×1.25×12	83.2	41.5	15	M6×0.75	8	11
RA35BL	BL					152		72		111.4					
RA45AL	AL	60	8	20.5	86	154	60	60	M10×1.5×16	105.4	52	17	Rc1/8	10	14
RA45BL	BL					190		80		141.4					

Model No.	Rail Width W_1	Rail Height H_1	Rail Pitch F	Rail Mounting bolt hole d×D×h	Rail G (reference)	Rail Max. length L_{0max}	Basic load rating *) Dynamic [50km] C_{50} (N)	Dynamic [100km] C_{100} (N)	Static C_0 (N)	Static moment (N·m) M_{RO}	M_{PO} (One slide)	M_{PO} (Two slides)	M_{YO} (One slide)	M_{YO} (Two slides)	Weight Roller slide (kg)	Weight Rail (kg/m)
RA25AL	23	24	30	7×11×9	20	3 900	36 000	29 200	72 700	970	760	4 850	760	4 850	0.45	3.4
RA25BL							43 500	35 400	92 900	1 240	1 240	7 200	1 240	7 200	0.80	
RA30AL	28	28	40	9×14×12	20	3 900	47 800	38 900	93 500	1 670	1 140	7 100	1 140	7 100	0.85	4.9
RA30BL							58 500	47 600	121 000	2 170	1 950	11 500	1 950	11 500	1.1	
RA35AL	34	31	40	9×14×12	20	3 900	65 500	53 300	129 000	2 810	1 800	11 000	1 800	11 000	1.2	6.8
RA35BL							82 900	67 400	175 000	3 810	3 250	17 800	3 250	17 800	1.7	
RA45AL	45	38	52.5	14×20×17	22.5	3 650	114 000	92 800	229 000	6 180	4 080	24 000	4 080	24 000	2.5	10.9
RA45BL							143 000	116 000	305 000	8 240	7 150	39 000	7 150	39 000	3.4	

*) he basic load rating comply with the ISO standard. (ISO 14728-1, 14728-2)
C_{50} ; the basic dynamic load rating for 50 km rated fatigue life C_{100} ; the basic dynamic load rating for 100 km rated fatigue life

Table 2 Material/surface treatment code

Type	Special high carbon steel
Without surface treatment	N

Table 3 Accuracy grade and accuracy standard

Unit: μm

Accuracy grade		High precision grade
"NSK K1™" lubrication unit	Without NSK K1 lubrication unit	PH
	With NSK K1 lubrication unit	KH
Characteristics	Mounting height H	±20
	Variation of H	15① 25②
	Mounting width W_2 or W_3	±25
	Variation of W_2 or W_3	20
	Running parallelism of surface C to surface A	See page A6.
	Running parallelism of surface D to surface B	

Notes 1) ①: Variation on the same rail ②: Variation on multiple rails
2) "NSK K1™" lubrication unit: Equipped with NSK linear guide. A Newly developed porous synthetic resin contains large volume of lubricant oil that seeps out and enhances lubricating function.

Table 4 Dust-proof specification code and length of roller slide equipped with dust-proof components

Unit: mm

Dust-proof specification			Standard	Double seal installed	Increase when NSK K1 installed
Dust-proof code	Rail cap	Without	A	C	
		With	B	D	
Roller slide length	Model No.	**RA25AL**	97.5	103.9	+10
		RA25BL	115.5	121.9	
		RA30AL	110.8	117.6	+12
		RA30BL	135.4	142.2	
		RA35AL	123.8	130.6	+13
		RA35BL	152	158.8	
		RA45AL	154	162	+14
		RA45BL	190	198	

Notes: Double seal: It combines two end seals for enhancing sealing function.
Rail cap: Prevents foreign matters, such as swarf generated in cutting operation from clogging the rail-mounting holes.

Table 5 Packed lubricant

Type	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40°C)]	Range of use temperature (°C)	Purpose
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For low temperature and high frequency operation
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistant
None (Rust preventive oil applied)	9	–	–	–	–	–

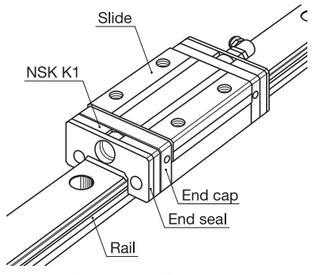


Fig. 2 "NSK K1™" lubrication unit

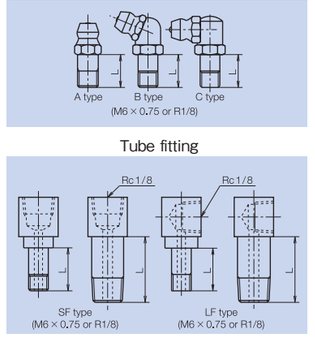


Fig. 3 Grease fitting and tube fitting
Standard lubrication accessory is B type.

RA Series (RA25 to 45) RA-EM, RA-GM / Flange type

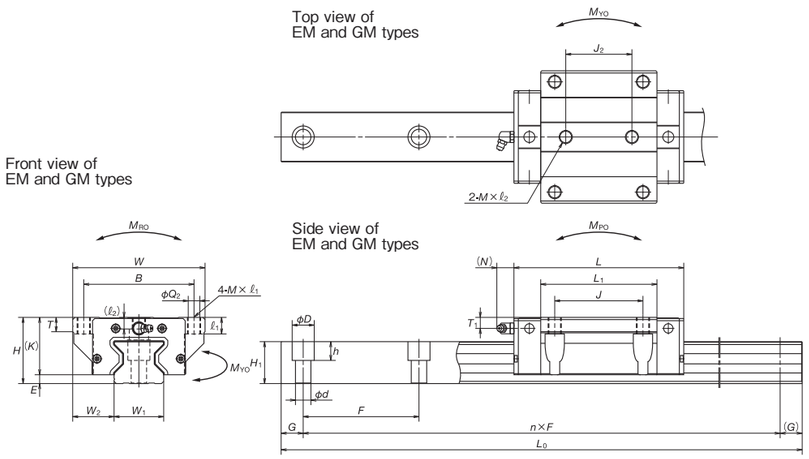


Fig. 1 Front view, side view and top view

Reference number

Rail and roller slide assembly

Without serial number (*1) **RA 35 1000 EM N 2 PH H 1 A L**

- Series name
- Size
- Rail length (mm)
- Roller slide shape code (See Table 1.)
- Material/surface treatment code (See Table 2.)
- Number of roller slides per rail
- Accuracy code (See Table 3.)
- Preload code H: Medium preload
- Packed lubricant code (See Table 5.)
- Dust-proof code (See Table 4.)
- Rail mounting hole code — L: Standard

With serial number (*2) **RA 35 1000 EM N 2 PH H ***

- Design serial number — Ex.) 001, 002, 003, ..., 010, 011, ... +01, +02, +03, ..., +10, +11, ...

Roller slide

Without serial number (*3) **RAA 35 EM N PH H 1 A A**

- Roller slide series code — RAA: RA Series roller slide
- Size
- Roller slide shape code (See Table 1.)
- Material/surface treatment code (See Table 2.)
- Accuracy code (See Table 3.)
- Preload code H: Medium preload
- Packed lubricant code (See Table 5.)
- Dust-proof code (See Table 4.)
- Lubrication accessories position and direction code — A, B, C, D, E, F, N (See A18)

With serial number (*2) **RAA 35 EM N PH H ***

- Design serial number — Ex.) 001, 002, 003, ..., 010, 011, ... +01, +02, +03, ..., +10, +11, ...

Rail

Without serial number (*4) **R1A 35 1000 L N N PH Z =20**

- Rail series code — R1A: RA Series rail
- Size
- Rail length (mm)
- Rail shape code: L — L: Standard
- Material/surface treatment code (See Table 2.)
- Accuracy code (See Table 3.)
- Butting rail specification — N: Non-butting. L: Butting specification
- Preload code — Z: Slight preload (Common for medium preload)
- Dimension G — Indicated in two digit after "=" (equal)

With serial number (*2) **R1A 35 1000 L N N PH Z ***

- Design serial number — Ex.) 001, 002, 003, ..., 010, 011, ... +01, +02, +03, ..., +10, +11, ...

(*1) The design serial number is not required when the mounting width is W_2, dimensions of G at right and left ends of the rail are the same and minimum, the rail isn't with butting, the selected lubrication accessory is not only the standard type (B type) but also mounted standard position and direction, and the codes of packed lubricant, dust-proof specification and rail mounting hole specification are prepared.
(*2) The design serial number should be given when the requirements are not satisfied.
(*3) The design serial number is not required when the selected lubrication accessory is not only the standard type (B type) but also mounted standard position and direction and the codes of packed lubricant, dust-proof specification and rail mounting hole specification are standard.
(*4) The design serial number is not required when the dimension of G at left end on the drawing is two or less digit integer. If dimension of G at left end is decimal fraction number, G at right end must be equivalent to the left end G dimension, otherwise design serial number will be necessary. And if butting rail is required, design serial number will be necessary.

Table 1 Dimensions

Unit: mm

Model No.	Slide shape	Assembly Height H	Assembly E	Assembly W_2	Roller slide Width W	Roller slide Length L	Mounting hole B	Mounting hole J	Mounting hole J_2	Mounting hole $M\times$pitch$\times\ell_1(\ell_2)$	Mounting hole Q_2	L_1	K	T	Grease fitting Hole size	Grease fitting T_1	Grease fitting N
RA25EM	EM	36	5	23.5	70	97.5	57	45	40	M8×1.25×10 (11)	6.8	65.5	31	11	M6×0.75	6	11
RA25GM	GM					115.5						83.5					
RA30EM	EM	42	6.5	31	90	110.8	72	52	44	M10×1.5×12 (12.5)	8.6	74	35.5	11	M6×0.75	7	11
RA30GM	GM					135.4						98.6					
RA35EM	EM	48	6.5	33	100	123.8	82	62	52	M10×1.5×13 (7)	8.6	83.2	41.5	12	M6×0.75	8	11
RA35GM	GM					152						111.4					
RA45EM	EM	60	8	37.5	120	154	100	80	60	M12×1.75×15 (10.5)	10.5	105.4	52	13	Rc1/8	10	14
RA45GM	GM					190						141.4					

Model No.	Rail Width W_1	Rail Height H_1	Rail Pitch F	Rail Mounting bolt hole $d\times D\times h$	Rail G (reference)	Rail Max. length L_{0max}	Basic load rating *) Dynamic [50km] C_{50} (N)	Dynamic [100km] C_{100} (N)	Static C_0 (N)	Static moment (N·m) M_{RO}	M_{PO} (One slide)	M_{PO} (Two slides)	M_{YO} (One slide)	M_{YO} (Two slides)	Weight Roller slide (kg)	Weight Rail (kg/m)
RA25EM	23	24	30	7×11×9	20	3 900	36 000	29 200	72 700	970	760	4 850	760	4 850	0.80	3.4
RA25GM							43 500	35 400	92 900	1 240	1 240	7 200	1 240	7 200	1.1	
RA30EM	28	28	40	9×14×12	20	3 900	47 800	38 900	93 500	1 670	1 140	7 100	1 140	7 100	1.3	4.9
RA30GM							58 500	47 600	121 000	2 170	1 950	11 500	1 950	11 500	1.7	
RA35EM	34	31	40	9×14×12	20	3 900	65 500	53 300	129 000	2 810	1 800	11 000	1 800	11 000	1.7	6.8
RA35GM							82 900	67 400	175 000	3 810	3 250	17 800	3 250	17 800	2.3	
RA45EM	45	38	52.5	14×20×17	22.5	3 650	114 000	92 800	229 000	6 180	4 080	24 000	4 080	24 000	3.2	10.9
RA45GM							143 000	116 000	305 000	8 240	7 150	39 000	7 150	39 000	4.3	

*) The basic load rating comply with the ISO standard. (ISO 14728-1, 14728-2)
C_{50} ; the basic dynamic load rating for 50 km rated fatigue life C_{100} ; the basic dynamic load rating for 100 km rated fatigue life

Table 2 Material/surface treatment code

Type	Special high carbon steel
Without surface treatment	N

Table 3 Accuracy grade and accuracy standard

Unit: μm

Accuracy grade		High precision grade
"NSK K1™" lubrication unit	Without NSK K1 lubrication unit	PH
	With NSK K1 lubrication unit	KH
Characteristics	Mounting height H	±20
	Variation of H	15① 25②
	Mounting width W_2 or W_3	±25
	Variation of W_2 or W_3	20
	Running parallelism of surface C to surface A	See page A6.
	Running parallelism of surface D to surface B	

Notes 1) ①: Variation on the same rail ②: Variation on multiple rails
2) "NSK K1™" lubrication unit: Equipped with NSK linear guide. A Newly developed porous synthetic resin contains large volume of lubricant oil that seeps out and enhances lubricating function.

Table 4 Dust-proof specification code and length of roller slide equipped with dust-proof components

Unit: mm

Dust-proof specification: Dust-proof code	Rail cap		Standard A	Double seal installed C	Increase when NSK K1 installed
		Without	A	C	
		With	B	D	
Roller slide length	Model No.	**RA25EM**	97.5	103.9	+10
		RA25GM	115.5	121.9	
		RA30EM	110.8	117.6	+12
		RA30GM	135.4	142.2	
		RA35EM	123.8	130.6	+13
		RA35GM	152	158.8	
		RA45EM	154	162	+14
		RA45GM	190	198	

Notes: Double seal: It combines two end seals for enhancing sealing function.
Rail cap: Prevents foreign matters, such as swarf generated in cutting operation from clogging the rail-mounting holes.

Table 5 Packed lubricant

Type	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40°C)]	Range of use temperature (°C)	Purpose
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For low temperature and high frequency operation
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistant
None (Rust preventive oil applied)	9	–	–	–	–	–

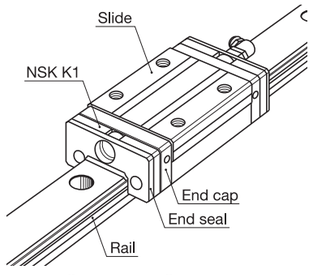


Fig. 2 "NSK K1™" lubrication unit

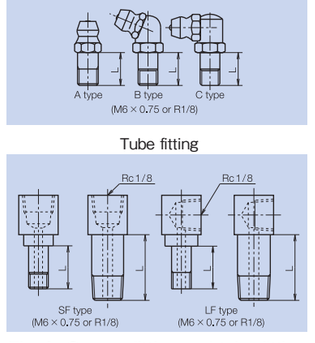
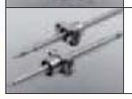


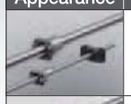
Fig. 3 Grease fitting and tube fitting
Standard lubrication accessory is B type.

Ball Screws

Customize NSK Standard ball screws! Now you can simply purchase made-to-order ball screws to your specification.
⇒ You can specify the stroke. ⇒ You can select 'nut direction', 'lubricant' and 'surface treatment'.

Click!Speedy Applicable series

Appearance	Series		Accuracy	Shaft dia./Lead
	PSS	Compact FA	C5	Dia. 6-25 Lead 5-60
	USS	Compact FA High precision	C3	Dia. 10-15 Lead 5

Appearance	Series		Accuracy	Shaft dia./Lead
	FSS	Compact FA For transfer equipment	Ct7	Dia. 12-25 Lead 10-25
	MA	Miniature/ small lead	C3	Dia. 4-16 Lead 1-2.5

Appearance	Series		Accuracy	Shaft dia./Lead
	FA	For small equipment	C3 C5	Dia. 10-32 Lead 4-50
	SA	For machine tools	C5	Dia. 20-28 Lead 4-10

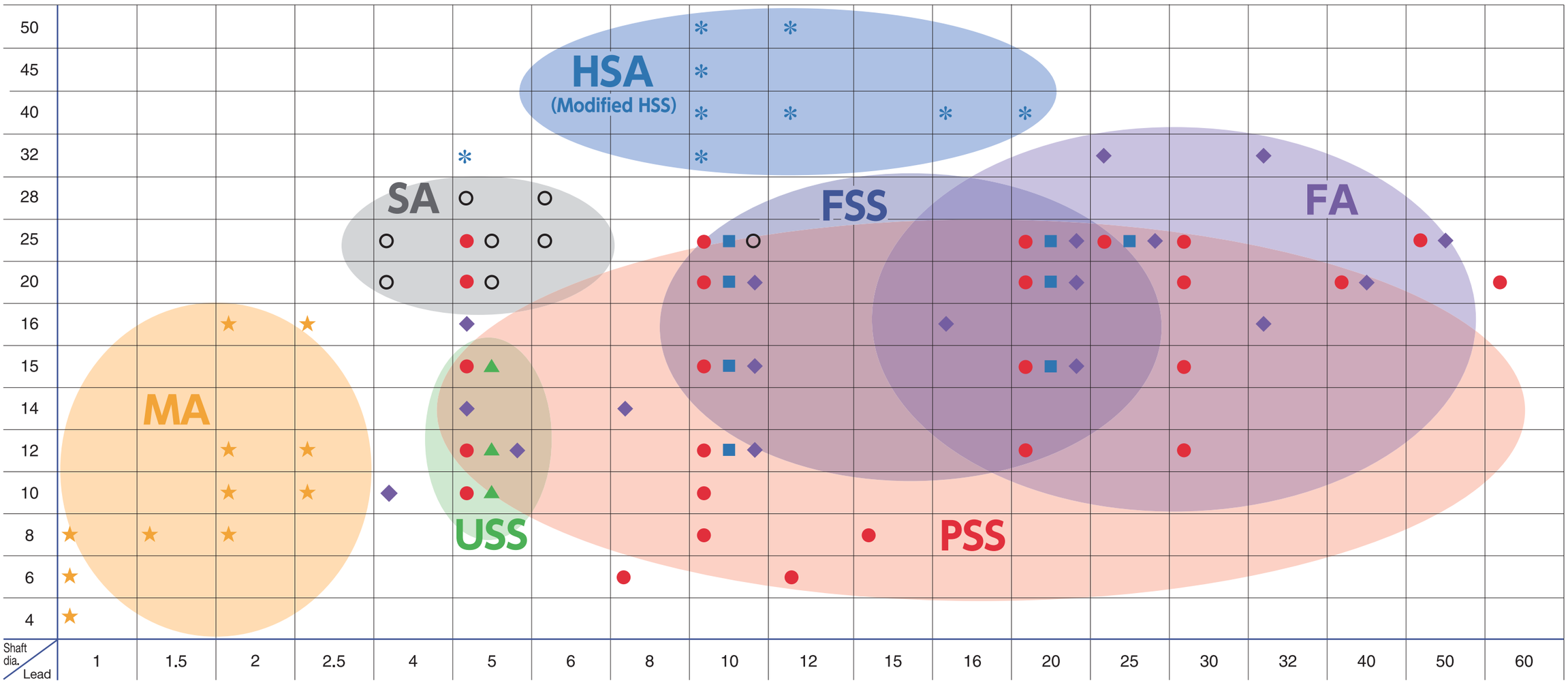
Appearance	Series		Accuracy	Shaft dia./Lead
	HSA	For machine tools (Modified HSS)	C5	Dia. 32-50 Lead 5-20

A wide range of series have become available for Click!Speedy, giving you more choices.

●=PSS ▲=USS ■=FSS ★=MA ◆=FA ○=SA ✻=HSA (Modified HSS)

(Shaded oval areas below are rough indications.)

unit: mm



Ball Screws

Click!Speedy Reference Number

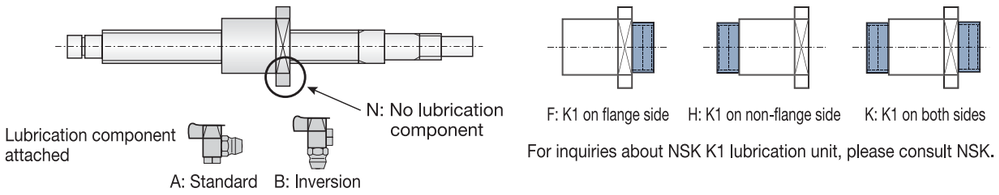
PSP1520N3AB0561 * * *

1 2 3 4/5 6/7 8 9 10 11 12~15 16~18

1	2	3	4 5	6 7	8	9	10	11	12 13 14 15	16 17 18
Accuracy grade	Nut code	Preload system and axial play	Shaft diameter	Lead	Surface treatment	Lubricant	Lubrication components	Nut direction and shaft end shape	Overall length of shaft	Design serial number
U: C3 P: C5 F: Ct7	T: Tube Y: Deflector (Bridge) G: End cap S: End deflector (except for shaft dia. ϕ6, ϕ8) A: End deflector (shaft dia.: ϕ6, ϕ8, Effective turns of balls:2) B: End deflector (shaft dia.: ϕ6, ϕ8, Effective turns of balls:4) F: SRC (Smooth Return Coupling) M: Middle deflector	P: P preload Z: Z preload T: Play (0,005 or less) E: Play (0,010 or less)		*1	N: None D: Low temperature chrome plating F: Fluoride low temperature chrome plating	1: AS2 2: PS2 3: LR3 4: LG2 5: LGU 6: NF2 9: Rust preventive oil *2	N: None A: Standard *3 F: Flange side K1 H: Non-flange side K1 K: K1 on both sides *4	Refer to Table 1 (Nut code: T,Y,G,S,A,B) and Table 2 (Nut code: F,M)	4-digit display (rounded down to the nearest decimal)	The last three digits are our control number. Design control number assigned automatically by Click!Speedy software

*1) Lead 1,5 and 2.5 are displayed as 61 and 62 respectively
*2) When other grease or oil lubrication is used.
*3) When the nut code is S, select A or B.
*4) When the nut code is T or G and NSK K1 lubrication unit is fitted, select F, H or K.

Lubrication components (10 digits of reference number)



For inquiries about NSK K1 lubrication unit, please consult NSK.

Nut direction and shaft end shape (11 digits of reference number)

Table 1 Nut code T, Y, G, S, A, B

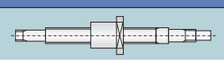
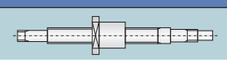
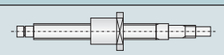
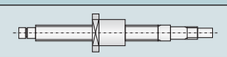
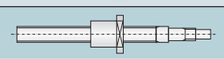
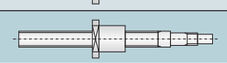
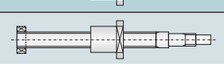
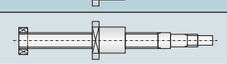
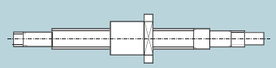
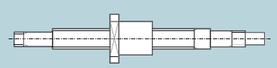
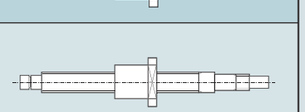
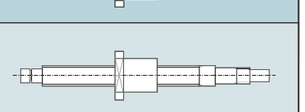
Installation method	Nut flange direction	Code	Appearance	Nut flange direction	Code	Appearance
Fixed - Fixed support	Right	A		Left	E	
Fixed - Simple support		B			F	
Fixed - Free support		C			G	
Fixed - Main body support		D			H	

Table 2 Nut code F and M

Installation method	Support type	Nut flange direction	Code	Appearance	Nut flange direction	Code	Appearance
Fixed - Fixed support	DF type	Right	A		Left	C	
	DFD type		E			G	
	DFF type		J			L	
Fixed - Simple support	DF type		B			D	
	DFD type		F			H	
	DFF type		K			M	
	BSBD type		N			P	

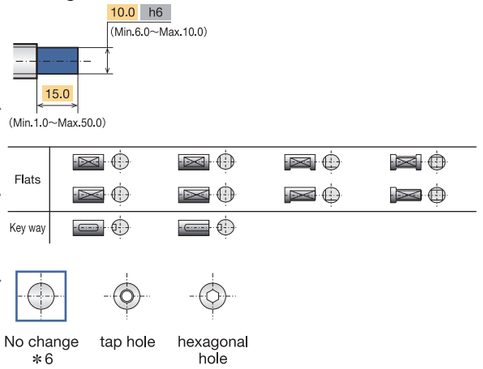
Options available

Item	Options
Nut direction	Left side of flange / Right side of flange
Lubricant	Grease (AS2, PS2, LR3, NF2) Clean grease (LG2, LGU) None (except application of rust preventive oil) *5
Surface treatment	Low temperature chrome plating Fluoride low temperature chrome plating
Lubrication components (PSS, USS, FSS)	Standard type Inversion type
Lubrication unit	NSK K1 lubrication unit

* 5) When other grease or oil lubrication is used.
For inquiries about NSK K1 lubrication unit, please consult NSK.

Shaft shape change

Change of dimensions



· Please specify the dimensions on the drawing.
· Reference number will have additional 16th to 18th digits. These are NSK control number assigned by Click!Speedy software.
*6 In some cases, center holes may be drilled.

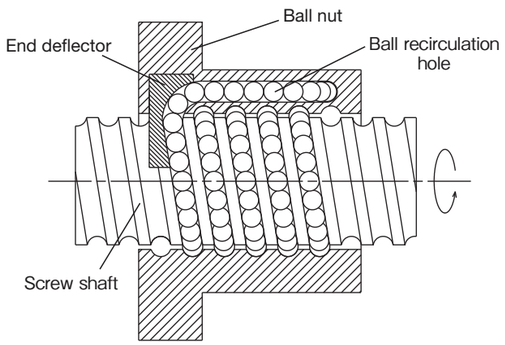
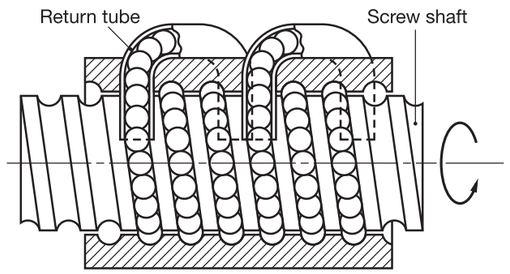
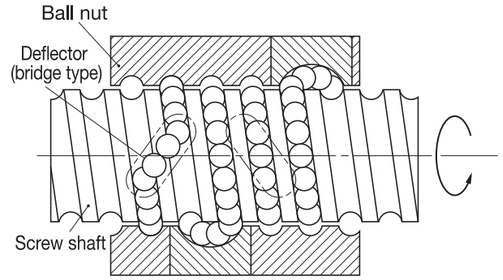
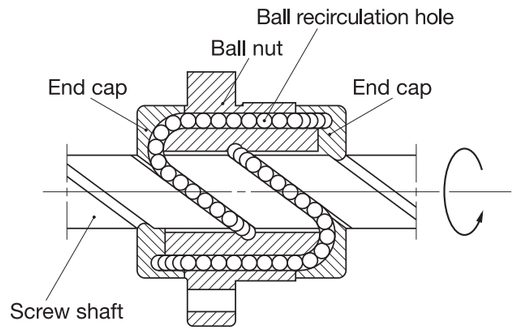
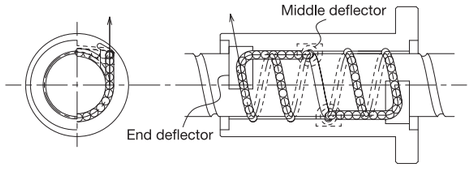
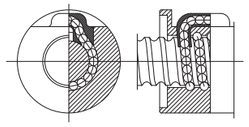
When NSK Standard Ball Screw Series are customized, the reference numbers will change.

Series	Reference number of existing standard products	Click!Speedy™ reference number
Compact FA PSS type	PSS1520N1D0361	PSP1520N3AB0361
Compact FA USS type	USS1505N1D0761	USP1505N4AB0761
Compact FA FSS type	FSS1210N1D0400	FSE1210N3AD0400
Finished shaft ends MA type	W0801MA-5PY-C3Z1.5	UYP0861N2NB0168
Finished shaft ends FA type	W1504FA-7PG-C5Z20	PGP1520N3NB0571
Finished shaft ends SA type	W2005SA-1P-C5Z4	PTP2004N9NB0685

B-1 Ball Recirculation System

A ball recirculation system is categorically most important, as well as the preload system, to classify the structure of ball screw. As shown in Table 1, four types of ball recirculation system are used for the NSK ball screws.

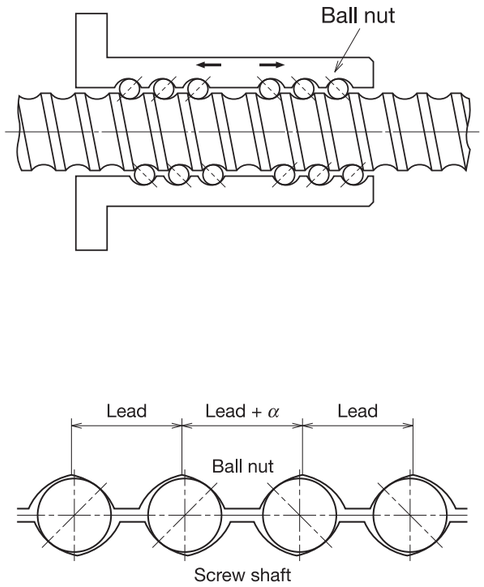
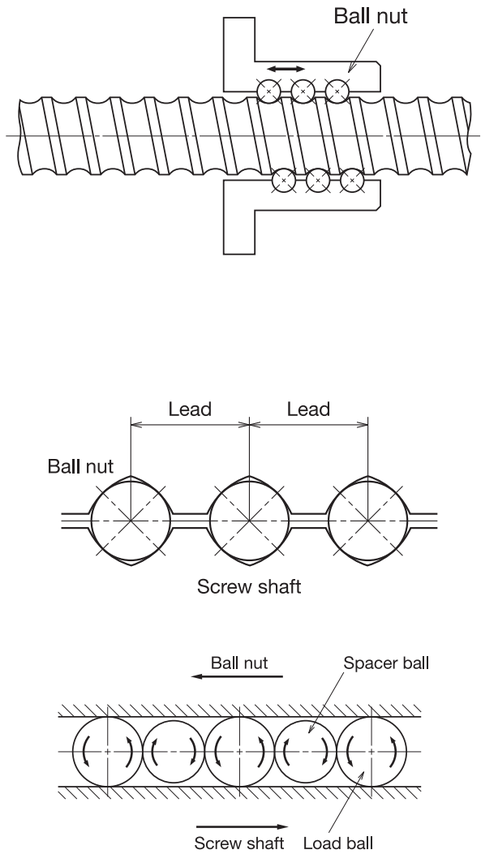
Table 1 Ball screw recirculation system

End deflector type	Ball return tube type	Deflector (bridge) type	End cap type
			
[Structure] Balls are smoothly picked up in the tangential direction at the end of nut, and recirculated via a hole in the nut. If the balls are picked up at the middle of the nut, it is called middle deflector type. [Features] ・Small nut outside diameter allows compact nut design. ・Low noise, high speed.	[Structure] Balls are recirculating through a pipe (ball return tube) of optimized size, bridging the start and end of recirculation. [Features] ・Adapt to various specifications. (screw shaft diameter, lead)	[Structure] Balls are recirculated by a horseshoe shaped deflector bridging the adjacent ball thread grooves. [Features] ・Suitable for fine lead ball screws. ・Small nut outside diameter, allows compact nut design.	[Structure] Balls are picked up by an end cap placed at both ends of the nut, and recirculated via a hole through the nut. [Features] ・Suitable for high helix and ultra high helix lead ball screws. ・Not universal due to complex recirculation structure.
 If the balls are picked up at the middle of the nut, it is called middle deflector type. (Lead 16 and 20) [Features] ・Smooth pick up of balls in tangential direction	 SRC recirculation system Lead 5 to 12 [Features] ・Smooth pick up of balls in tangential direction		
[Series] End deflector type ・Compact FA PSS type ・Compact FA USS type ・Compact FA FSS type Middle deflector type ・HSA type for machine tools (HSS shaft end machining lead16 and 20)	[Series] Ball return tube type ・FA type for small equipment ・SA type for machine tools SRC type ・HSA type for machine tools (HSS shaft end machining lead 5 to 12)	[Series] Deflector (bridge) type ・MS type, Miniature, fine lead ball screws	[Series] End cap type ・FA type for small equipment

B-2 Preload system

There are several methods of applying preload to NSK ball screws depending on the application.

Table 2 Preload system for ball screws

Preload system	Offset preload (Z-Preload)	Oversize ball preload (P-Preload)
Structure		
Description	To apply preload, the lead near the center of the nut is offset by the volume equivalent to preload (α). This method is like to creating a preload system similar to the double nut preload (D-preload) by a single ball nut, thus enabling a compact nut design.	Balls slightly larger than the ball groove space (over-size balls) are inserted to allow them to contact at four points. Provides better torque characteristics in the low torque range.
Nut length	Medium	Short
Torque characteristics	○	○
Rigidity	◎	○

B-3 Accuracy

B-3-1 Lead Accuracy

The lead accuracy of NSK precision ball screws (C0 to C5 grades) conforms to the four characteristics specified in JIS Standards. These characteristics are expressed by codes ep, υ_u, υ_{300}, and $\upsilon_{2\pi}$.

Fig. 1 explains the definition of each characteristic, and shows allowable value of each. Leads are classified into two categories: C system for positioning; Ct system for transportation. Tables 4, 5 and 6 show tolerance of each characteristic.

JIS B1192 sets C type and Cp type standards for positioning ball screws. NSK uses the specification of C type only. JIS B1192 specifies Ct1, 3, and 5 grade. NSK standards are integrated by C type only. Refer to Table 4 for C type standard tolerance.

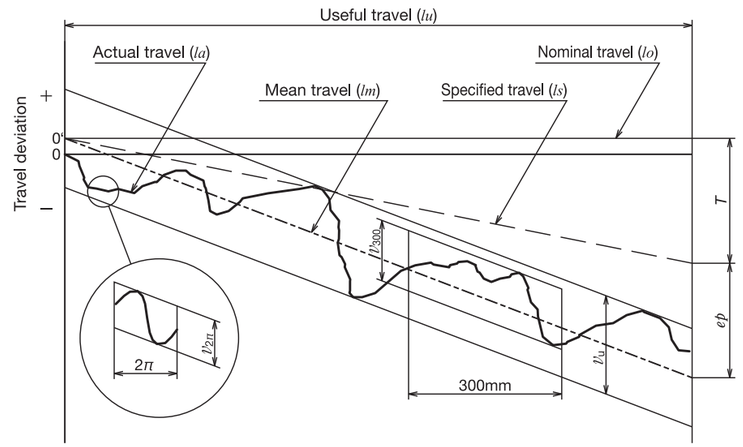


Fig. 1 Definition of lead accuracy

Table 3 Terminology in lead accuracy

Term	Code	Description	Tolerance
Specified travel	ls	The travel compensates the nominal travel for an elongation caused by an increase of temperature or load.	
Travel compensation	T	Value obtained by subtracting the specified travel from the nominal travel based on the useful travel. The value is to compensate for the errors caused by thermal deformation or deformation by load. This value is determined by tests and experience (Table 3).	
Actual travel	la	Actually measured travel	
Actual mean travel	lm	A straight line that demonstrates the direction of actual travel. This straight line is obtained from the curve that shows actual travel volume by least-squares method or by resembling approximation.	
Tolerance on specified travel	ep	Obtained by subtracting the specified travel from the actual mean travel.	Table 4
Travel variation	υ_u υ_{300} $\upsilon_{2\pi}$	Maximum range of the actual travel which is between the two straight lines drawn parallel to the actual mean travel. There are three categories as shown below. ・Maximum range relative to the effective length of thread. ・Maximum range relative to the length of 300 mm anywhere within the effective length of thread. ・Maximum range which corresponds to any single rotation (2π *rad*.) within the effective length of thread.	Table 4 Table 5, 6 Table 5

Table 4 Tolerance on specified travel (±*ep*) and travel variation (υ_u) of the positioning (C type) ball screws

Unit: μm

	Accuracy grade		C3		C5	
	over	or less	±*ep*	υ_u	±*ep*	υ_u
Effective thread length, mm	–	100	8	8	18	18
	100	200	10	8	20	18
	200	315	12	8	23	18
	315	400	13	10	25	20
	400	500	15	10	27	20
	500	630	16	12	30	23
	630	800	18	13	35	25
	800	1 000	21	15	40	27
	1 000	1 250	24	16	46	30
	1 250	1 600	29	18	54	35
	1 600	2 000	35	21	65	40
	2 000	2 500	41	24	77	46
	2 500	3 150	50	29	93	54
	3 150	4 000	60	35	115	65
	4 000	5 000	72	41	140	77
	5 000	6 300	90	50	170	93
	6 300	8 000	110	60	210	115
	8 000	10 000			260	140
	10 000	12 500			320	170

Table 5 Tolerance of travel variation relative to 300 mm (υ_{300}) and one revolution ($\upsilon_{2\pi}$) of the positioning (C type) ball screws

Unit: μm

Accuracy grade	C3	C5
υ_{300}	8	18
$\upsilon_{2\pi}$	6	8

Note: to JIS B1192 standards. Values in other areas are NSK standards.

Table 6 Travel variation (υ_{300}) relative to 300 mm of the transportation (Ct type) ball screws

Unit: μm

Accuracy grade	Ct7	Ct10
υ_{300}	52	210

Note: Tolerance on specified travel (ep) of the transportation (Ct type) ball screws is calculated as follows.

$$e_p = \pm \frac{l_u}{300} \times \upsilon_{300}$$

l_u: Effective length of the screw thread

B-3-2 Mounting Accuracy and Tolerance of Ball Screws

The accuracy related to mount the ball screws is specified in the following seven characteristics (Fig. 2). The tolerance is indicated in the specification drawing.

Detailed tolerances are specified by JIS B1192. For reference, Table 7 shows standard values of "(7) Total run-out of the screw shaft axis (straightness of the screw shaft)". NSK sets stricter tolerance standards than JIS standards.

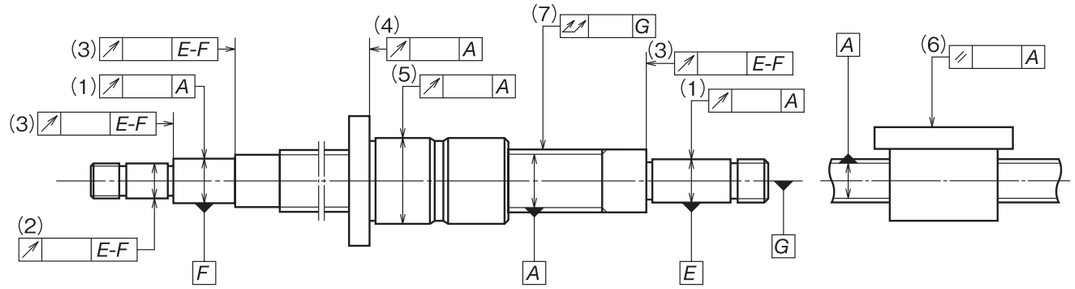


Fig. 2 Mounting accuracy of ball screw

(1) Radial run-out of the support bearing seat relative to the axis of the ball thread of screw shaft.
(2) Radial run-out of the other shaft ends section relative to the axis of the support bearing seat.
(3) Radial run-out of the shoulder of support bearing seat relative to the axis of support bearing seat.
(4) Radial run-out of the nut flange surface, or of the nut end datum surface, relative to the axis of screw shaft.
(5) Radial run-out of the nut outside surface (cylindrical shape) to the axis of screw shaft.
(6) Parallelism of the nut mounting surface to the screw shaft axis. (in case of flat mounting surface)
(7) Total run-out of the screw shaft axis.

Table 7 Total run-out of the screw shaft axis

Unit: μm

Accuracy grade			C3							C5						
Nominal diameter (mm)		over	–	8	12	20	32	50	80	–	8	12	20	32	50	80
	over	or less	8	12	20	32	50	80	125	8	12	20	32	50	80	125
Overall length of screw shaft (mm)	–	125	25	25	20					35	35	35				
	125	200	35	35	25	20				50	40	40	35			
	200	315	50	40	30	30				65	55	45	40			
	315	400	60	50	40	35	25			75	65	55	45	35		
	400	500		65	50	40	30				80	60	50	45		
	500	630		70	55	45	35	30			90	75	60	50	40	
	630	800			70	55	40	35				90	70	55	45	
	800	1 000			95	65	50	40	30			120	85	65	50	45
	1 000	1 250			120	85	60	45	35			150	100	75	60	50
	1 250	1 600			160	110	75	55	40			190	130	95	70	55
	1 600	2 000				140	95	70	50				170	120	85	65
	2 000	2 500					120	85	60					150	110	80
	2 500	3 150					160	110	75					200	140	95
	3 150	4 000					220	150	100					260	180	120
	4 000	5 000						200	130						240	160
	5 000	6 300													310	210
	6 300	8 000														280
	8 000	10 000														370

B-4 Friction Torque and Drive Torque

Operations that use ball screw drives require a motor torque which is equivalent to the total of following two:

- Friction torque, i.e. the friction of the ball screw itself
- Drive torque which is required for operation

B-4-1 Friction Torque

(1) Starting friction torque (Break away torque)

A high torque is necessary to start a ball screw. This is called "starting friction torque" or "break away torque." This torque is 2 to 2.5 times larger than the dynamic (friction) torque due to preload which is described below.

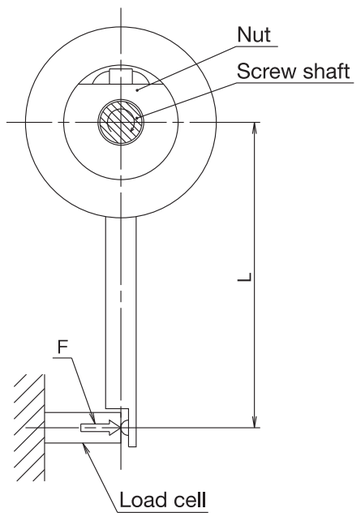


Fig. 3 Preload dynamic torque measuring method

The starting friction torque quickly diminishes once the ball screw begins to move.

(2) Dynamic friction torque (dynamic friction torque due to preload)

When a ball screw is moving, two types of torque generate: the dynamic friction torque due to preload and the friction torque associated with ball recirculation. JIS B1192 sets the standard of dynamic friction torque due to preload, which is the total of these two torque types. They are defined in Fig. 4.

The dynamic friction torque due to preload is calculated by the following formula. When the screw shaft is rotated as Fig. 3 in the following measuring conditions, measure the nut holding power F and then multiple the distance of action line L which is perpendicular to the direction of the power F .

$$T_p = F \cdot L \quad \cdots (1)$$

- Measuring rotational speed 100 min^{-1}
- Viscosity of lubrication is ISO VG 68 as prescribed in JIS K 2009.
- Remove Seals.

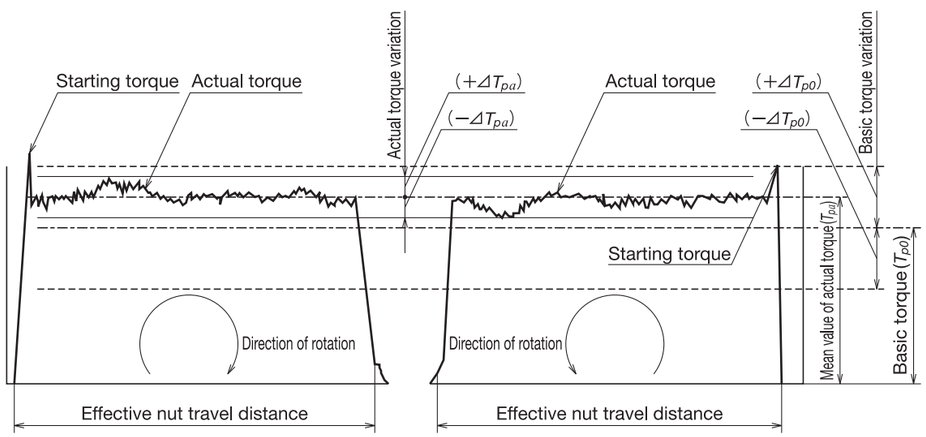


Fig. 4 Definitions of dynamic preloaded drag torque

(3) Calculation of basic torque

The basic torque of preloaded ball screw T_{p0} can be obtained by the following formula.

$$T_{p0} = k\frac{F_{a0} \cdot l}{2\pi} \fallingdotseq 0.014\, F_{a0}\sqrt{d_m \cdot l}\ (\mathrm{N \cdot cm}) \qquad \cdots(2)$$

In this formula:

F_{a0} : Preload (N)

l : Lead (cm)

k : Torque coefficient of ball screw

$$k = \frac{0.05}{\sqrt{\tan\beta}}$$

β : Lead angle (deg.)

d_m : Ball pitch circle diameter (cm)

Allowable values of torque variation rate relative to basic torque are regulated as shown in Table 8.

B-4-2 Drive Torque

(1) Operating torque of a ball screw

(a) Normal drive

The torque when converting rotational motion to linear motion (normal operation) is obtained by the following formula.

$$T_a = \frac{F_a \cdot l}{2\pi \cdot \eta_1}(\mathrm{N \cdot cm}) \qquad \cdots(3)$$

In this formula:

T_a : Normal operation torque (N · cm)

F_a : Axial load (N)

l : Lead (cm)

η_1 : Normal efficiency (η_1 = 0.9 to 0.95)

(b) Back-drive operation

The torque when converting linear motion to rotational motion (back-drive operation) is obtained by the following formula.

$$T_b = \frac{F_a \cdot l \cdot \eta_2}{2\pi}(\mathrm{N \cdot cm}) \qquad \cdots(4)$$

In this formula:

T_b : Reverse operation torque (N · cm)

η_2 : Reverse efficiency (η_2 = 0.9 to 0.95)

(c) Dynamic drag torque of the preloaded ball screw

the operation torque of preloaded ball screw can be obtained by Formula (2).

Table 8 Range of allowable values of torque variation rates (Source: JIS B 1192)

Basic torque (N · cm)		Effective length of the screw thread (mm)										
		4 000 or under								Over 4 000 and 10 000 or under		
		Slenderness ratio(1): 40 or less				Slenderness ratio(1): More than 40 and 60 or less				—		
		Accuracy grade				Accuracy grade				Accuracy grade		
Over	Incl.	C0	C1	C2、3	C5	C0	C1	C2、3	C5	C1	C2、3	C5
20	40	±30%	±35%	±40%	±50%	±40%	±40%	±50%	±60%	—	—	—
40	60	±25%	±30%	±35%	±40%	±35%	±35%	±40%	±45%	—	—	—
60	100	±20%	±25%	±30%	±35%	±30%	±30%	±35%	±40%	—	±40%	±45%
100	250	±15%	±20%	±25%	±30%	±25%	±25%	±30%	±35%	—	±35%	±40%
250	630	±10%	±15%	±20%	±25%	±20%	±20%	±25%	±30%	—	±30%	±35%
630	1000	—	±15%	±15%	±20%	—	—	±20%	±25%	—	±25%	±30%

Notes: 1. Slenderness ratio: The value obtained by dividing the length of the screw thread section of screw shaft (mm) by diameter of the screw shaft (mm).
2. NSK independently sets torque standards which are under 20 N · cm.

B-5 Lubrication of Ball Screw

Lithium soap-based grease with base oil viscosity of 30 to 140 mm²/s (40°C) is recommended for grease lubrication and oil of ISO VG 32 to 100 for oil lubrication.

In general, a lubricant with low base oil viscosity is recommended where a ball screw is used for high-speed operation, and thus requires reducing thermal elongation of the screw shaft. On the other hand, a lubricant with high base oil viscosity is recommended for a low-speed, high-temperature operation, or a high-load and oscillating operation.

Please consult NSK about greases for high-load drives and high-temperature applications.

NSK markets "NSK Grease Unit" as the standard series products for a variety of applications. NSK Grease Unit for ball screw lubrication includes:

1) Various types of grease in the bellows-tube which can be instantly attached to the grease pump
2) Hand grease pump which is compact and easy to use
3) Nozzles

Table 9 shows NSK greases, and names of other ball screw greases.

Table 10 explains checking points in lubrication and standard intervals between replenishments. It is important to wipe off old grease from the screw shaft prior to applying new grease. Page C10 also explains in detail concerning the replenishing methods.

Table 9 Grease for ball screw

Product name	Thickener	Base oil	Base oil viscosity mm²/s (40°C)	Range of temperature for use °C	Application
NSK Grease AS2	Lithium base	Mineral oil	130	–10 to 110	General heavy load
NSK Grease PS2	Lithium base	Synthetic oil combined with Synthetic hydrocarbon oil	15.9	–50 to 110	Light load
NSK Grease LR3	Lithium base	Synthetic oil	30	–30 to 130	High-speed medium load
NSK Grease LG2	Lithium base	Mineral oil combined with Synthetic hydrocarbon oil	32	–20 to 70	For clean environment
NSK Grease NF2	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	Fretting resistant

*Refer to page C6 for the nature of NSK greases.

Table 10 Checking lubricant and intervals of replenishment

Lubricating method	Checking intervals	Check points	Replenish/replacing interval
Intermittent automatic oil supply	Once a week	Remaining volume, contamination	Supply oil when checking (depending on the tank volume)
Grease	2 – 3 months after start of use	Clean, foreign matters	Generally once a year (replenish when necessary)
Oil bath	Every day, when start to work	Oil level	Specify according to oil consumption

B-6 Equipped with "NSK K1™" Lubrication Unit

This product is being applied for a patent.

B-6-1 Features

NSK K1 is a new, efficient lubrication unit. Equipped with NSK K1, the ball screws demonstrate a superb performance as shown below.

● Long-term, maintenance-free usage

In mechanical environments where lubrication is difficult to apply, long-term running efficiency is maintained by using the NSK K1 in combination with grease.

[ex.] For automotive component processing lines, etc.

● Does not pollute the environment

A very small volume of grease combined with NSK K1 can provide sufficient lubrication in the environment where grease is undesirable as well as in the environment where high cleanliness is required.

[ex.] Food processing equipment, medical equipment, flat panel display/semiconductor manufacturing equipment, etc.

● Good for environments where lubricant is washed away

When used with grease, life of the machine is prolonged even when the machine is washed entirely by water, or in an environment where the machine is exposed to rain or wind.

[ex.] Food processing equipment, housing/construction machines, etc.

● Maintains efficiency in dusty environment

In environment where oil- and grease-absorbing dust is produced, long-term efficiency in lubrication and prevention from foreign inclusions are maintained by using the NSK K1 in combination with grease.

[ex.] Woodworking machines, etc.

● Comparative duration test of samples with and without NSK K1

Sample, testing conditions and test result are shown in Table 11 and Fig. 5.

Without lubricant, operation became impossible after running 8.6 km. With NSK K1 alone, it was possible to continue running exceeding 10 000 km.

NSK conducts various tests under different conditions. Please consult NSK.

Table 11 Sample and testing conditions

Ball screw	Shaft dia. 20 mm, lead 20 mm
Lubrication	Comparison with only NSK K1 against no lubrication
Speed	4 000 min^{-1} (80 m/min)
Stroke	600 mm

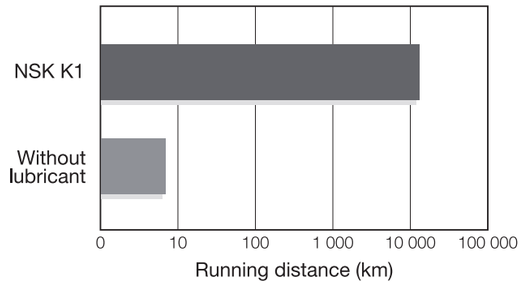


Fig. 5 Duration test results on ball screws without lubricant

B-6-2 Specifications

(1) Structure

The structure makes it possible to have a stable contact between the NSK K1 and outside of a ball screw with moderate force by a garter spring which fits onto outside of the NSK K1.

NSK K1 is installed between the ball screw nut and the labyrinth seal. The overall nut length is slightly longer than that of the standard ball screw.

Combination of NSK standard grease (factory-packed in the nut) and NSK K1 are standard specifications.

Fig. 6 NSK K1

(2) Accuracy grade and axial play

Accuracy grades, clearance and preload specifications remain unchanged from the existing products. There is a slight increase in torque due to the equipped NSK K1.

(3) Overall nut length after equipped with NSK K1™

The nut length becomes longer than that of standard ball screws after equipped with NSK K1.

(4) Application examples

Ball screws equipped with NSK K1 are maintenance-free for a long period of time. Its application is expanding in various industries.

- Semiconductor/ flat panel display manufacturing equipment
- Industrial robot
- Wood working machines
- Machine tools
- Automobile manufacturing machines

B-6-3 Precautions for use

Temperature range for use: Maximum temperature: 50℃
Momentary maximum temperature: 80℃

Chemicals that should not come to contact with K1:
Do not leave NSK K1 in organic solvent, white kerosene such as hexane, thinner which removes oil, and rust preventive oil which contains white kerosene.

Note: Water-type cutting oil, oil-type cutting oil, grease such as mineral-type AS2 and ester-type PS2 do not damage K1 Seal.

Note: NSK K1 is not applicable to the Compact FA series.

B-7 Precautions When Handling Ball Screws

Ball screws are precision products. They require careful handling as described below.

Confirm lubrication

Lubrication

(1) Confirm the state of lubrication before use. Insufficient lubrication causes loss of ball screw functions in a short period.

(2) Do not apply any lubrication if grease is already applied to the ball screws. Remove dust or swarf if they stuck to the greased surface during handling. Wipe the surface with clean white kerosene, and then apply the same type of new lubricant before use. Avoid using different types of grease at the same time.

Consult NSK for special oil lubricant if it is required to your application.

(3) Check the grease after two to three months of operation. Wipe off the old grease if it is excessively contaminated, and apply sufficient volume of a fresh coat of grease. After the initial check, check and replenish the grease approximately every year. Check more often if environment requires.

Note: Refer to page C6 for lubrication.

Do not disassemble | Do not reassemble | Watch out for falling objects | Handle with care | Do not apply shock

Handling

(1) Never disassemble the ball screw. It invites dust to enter, and lowers precision, or may cause an accident.

(2) Once the ball screw is disassembled for some reason, the user should never reassemble the ball screw by himself. Loss of ball screw function is apt to occur if a mistake is made. Please send the ball screw to NSK for repair or re-assembly. It will be reworked at the minimum service charge.

(3) The ball screw shaft or nut may fall off due to its own weight. Watch out for such falling object. If it falls, the ball groove or ball recirculation component may be damaged and their function might be lost. Make certain to return such item to NSK for check. There will be the minimum charge for this service.

(4) If the recirculation component, the shaft outside, or the ball groove is scratched or damaged by impact, recirculation operation becomes deficient, and may cause a loss of function.

Prevent dust | Rotational speed limitation | Do not overrun | Temperature limitation

Precautions in use

(1) Ball screws should be used in a clean environment. Use a dust cover to keep dust and swarf from entering into the system. Insufficient dust protection causes not only the ball screw function to deteriorate but also brings about damage to the recirculation components if dust plugs the system. This may result in more serious accident such as a fall of the table.

(2) For rotational speed in operation, refer to the applicable section of the catalog "Precision Machine Components" which describes permissible rotational speeds, or to specification drawing furnished by NSK. Exceeding permissible rotational speed damages recirculation components, and may cause the table to fall. A precaution system is recommended in vertical use of ball screw.

(3) Overrunning ball nut (removed from the ball thread) causes the balls to fall out, damages recirculation components, and dent ball groove, resulting in insufficient operation. Continued use under such conditions may cause premature wear, and damages recirculation components. For these reasons, avoid overrun by all means. If overrun occurs, please request NSK to check. There will be a minimum charge for this service.

(4) Ball screws are designed to be used at a temperature of less than 80˚C. Do not operate at temperatures higher than this limit. Use at a higher temperature may damage recirculation and seal components. Please consult NSK if it is necessary to use at a temperature higher than the limit.

When using NSK K1 lubrication unit, the operating temperature should be 50˚C or less. (Momentary maximum temperature in use: 80˚C)

Store in the correct position

Storage

(1) Store in the original NSK package. Do not unwrap or tear the inner wrapping if it is not necessary. This allows dust to enter and rust to set in, and may deteriorate functions.

(2) The following position is recommended when storing ball screws.

①Keep in the NSK original package, and place it flat.

②Place flatly on supports; store in a clean area.

③Hang vertically in a clean place.

B-8 Accessories

This is a support unit that can be used for ball screws drawn with the Click!Speedy NSK Linear Motion Products Quick Delivery system. Please use this as well.

Table 12 Support unit categories

Application		Shape	Support side	Bearing in use	Bearing bore, Bearing seat diameter
Small equipment, light load	Square	WBK**-01* 	Fixed support side	Angular contact ball bearing	ϕ4 to ϕ25
		WBK**S-01* 	Simple support side	Deep groove ball bearing	ϕ6 to ϕ25
		WBK**SF-01 		Deep groove ball bearing	ϕ12, ϕ15 (for FSS type)

①**Classification**

Ball screw support units are classified into categories by their shape (Table 12). Select the type that best suits your particular needs.

②**Features**

●Quick delivery: For details of standard stock products, contact NSK.

●Bearings and seals

On the fixed support side, the angular contact ball bearing is used. It has great rigidity and low friction torque, which match the rigidity of the ball screw. The thrust angular contact ball bearing with high precision and great rigidity is another choice for the fixed support side.

An oil seal is installed to the fixed support side used with an angular contact ball bearing. Fine clearance may occur with this seal.A deep-groove ball bearing with a shield on both sides is used on the simple support side.

●Lock nut is provided.

A lock nut with fine grade finish is provided to fix the bearing with high precision.The lock nuts are designed to be difficult to loosen, but they can still loosen if subjected to strong mechanical vibration. If necessary, this should be prevented by applying threadlocking adhesive or taking similar precautions.

Application		Shape	Support side	Bearing in use	Bearing bore, Bearing seat diameter
Small equipment, light load	Round	WBK**-11* 	Fixed support side	Angular contact ball bearing	ϕ4 to ϕ25
Machine tools, high speed, heavy load	Round	WBK**DF*-31H 	Fixed support side	Thrust angular contact ball bearing	ϕ17 to ϕ40

③Reference number coding

(For light load)

Example: **WBK 08 S - 01 A**

- WBK: Product code for support unit
- 08: Nominal size code*
- S: Mounting code
  - No code: Fixed support unit
  - S: Simple support unit
  - SF: Simple support unit (for FSS)
  - R: Fixed support unit (support kit for miniature ball screws)
- 01: 01: Square type, 11: Round type
- A: No code or A: For general use
  - B: Low-profile type (only for square type)
  - C: For clean environment use
  - M: Miniature general-purpose use
  - W: Lost-wax product

*) In case of simple support unit, please note that the nominal size code of 12 or less does not strictly represent internal bore of bearing in millimeters. Please refer to the dimensional table for internal bore of bearing.

(For high speed and heavy load)

Example: **WBK 25 DF - 31 H**

- WBK: Product code for support unit
- 25: Nominal size code (internal bore of bearing)
- DF: Bearing combination code
  - DF: Face to face duplex combination
  - DFD: Face to face triplex combination
  - DFF: Face to face quadruplex combination
- 31
- H: High speed type

(1) Support Units for Light Load and Small Equipment

Support units for light load and small equipment provide both fixed and support side bearing assemblies to support screw shafts. They provide all required parts such as bearing locknuts so that you can mount them directly to NSK standard ball screws, of which shaft ends are machined.

Please refer to the dimensions listed on the dimension table for the configuration of standard screw shaft ends for NSK standard ball screws with blank shaft ends. For ball screws for transfer equipment, you require optional spacers when mounting fixed support side support units.

①Features

●Prompt delivery

Support units are standard products.

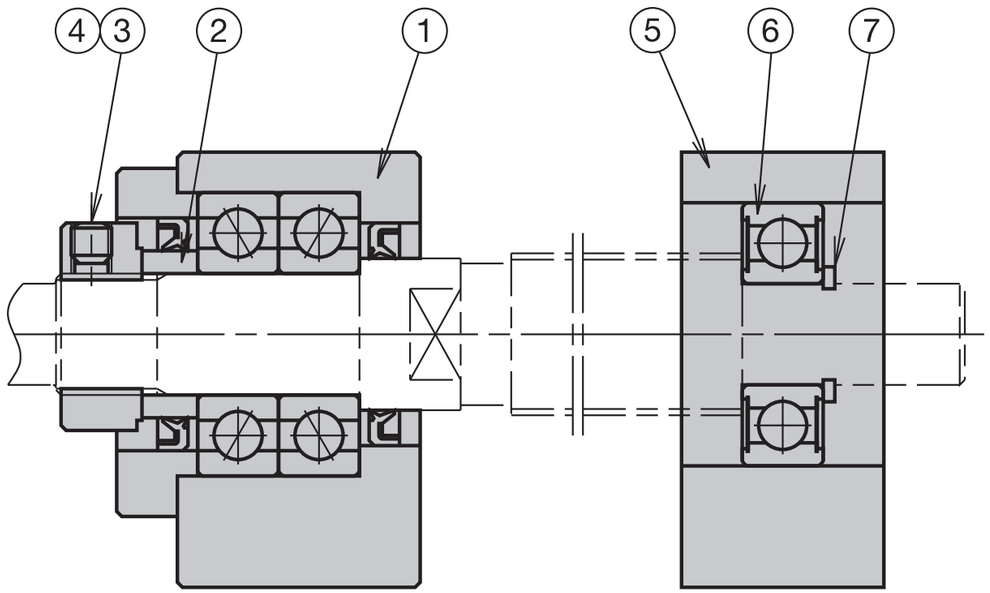
●Best selection of bearings for your application

General use support units for fixed support side are equipped with highly rigid angular contact ball bearings that have been assembled with proper preload, and packed with the appropriate volume of grease. On the other hand, clean support units for fixed support side uses low dust emission grease, and low torque special bearings. Sealed deep groove ball bearings are used for simple support side units for both general and clean environment use.

●Accessories

Support units provide everything necessary for mounting ball screws to machines.
(Please refer to the table below.)

* Do not disassemble fixed support side units as they are equipped with bearings and oil seals



●Antirust treatment

The table on the right shows the surface treatment for the bearing housing, and material of small parts.

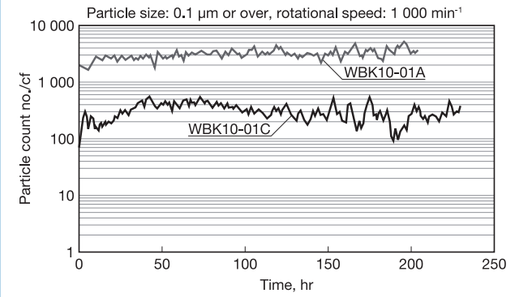
Fixed support side		Simple support side	
Part No.	Name of parts	Part No.	Name of parts
①	Bearing housing	⑤	Bearing housing
②	Spacer	⑥	Bearing
③	Locknut	⑦	Snap ring
④	Set screw with brass pad		

	General support unit
Bearings and grease	Angular contact ball bearings, PS2
Surface treatment	Black oxide
Screws and snap rings	Standard material

②Features of Clean Support Unit

●Outstanding low dust emission

Clean support unit uses "NSK clean grease LG2" which has a proven feature of low dust emission. It reduces dust emission to 1/10 of general support units.



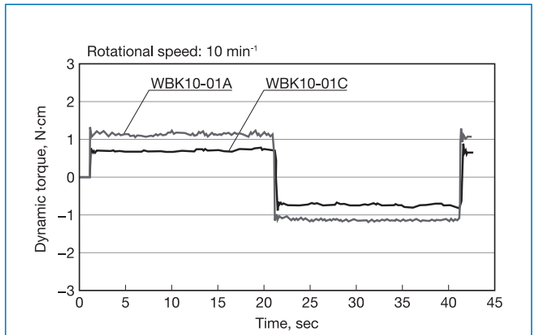
●Low torque

It features low torque characteristics because of special bearings. (50% lower than general support unit.)

●High antirust specification

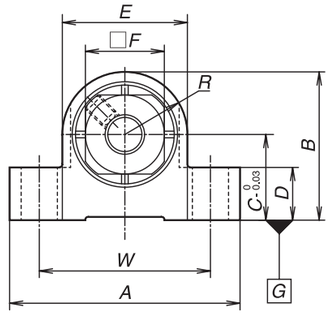
Low temperature chrome plating is applied to bearing housings, retaining plates, locknuts and spacers to improve antirust properties. Moreover, bolts and snap rings are made of stainless steel.
The table below shows the surface treatment of the bearing housing and material of small parts.

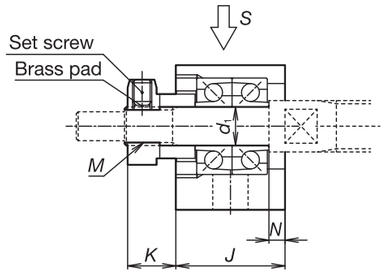
	Clean support unit
Bearing · grease	Special bearings, LG2
Surface treatment	Low temperature chrome plating
Set screw and snap ring material	Stainless steel



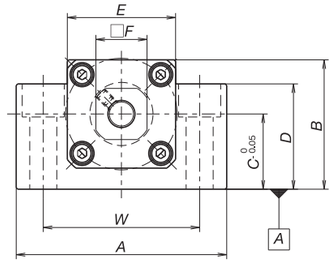
Support Units for Light Load and Small Equipment

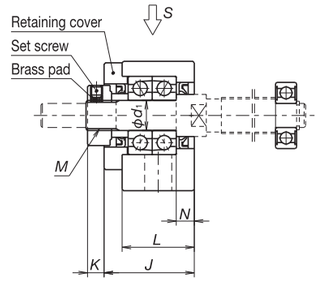
WBK**-01M

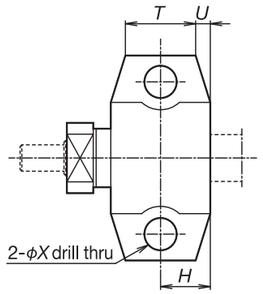




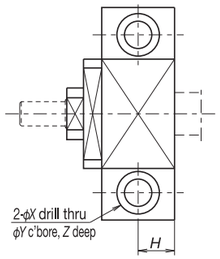
WBK**-01*



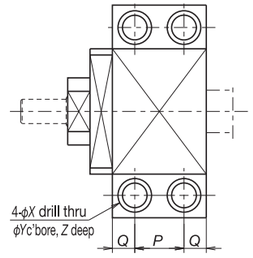




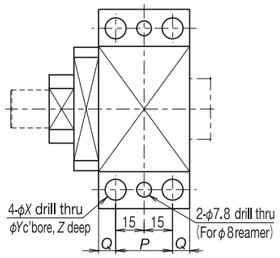
Reference No.	Tightening torque (reference) [N·cm]	
	Locknut	Set screw
WBK04-**	100	69 (M3)
WBK06-**	190	69 (M3)
WBK08-**	230	69 (M3)
WBK10-**	280	147 (M4)
WBK12-**	630	147 (M4)
WBK15-**	790	147 (M4)
WBK17-**	910	147 (M4)
WBK20-**	1670	147 (M4)
WBK25-**	2060	490 (M6)



View S (WBK06–15)



View S (WBK17–20)



View S (WBK25)

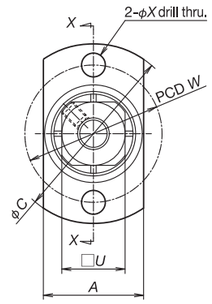
Fixed support side support unit (square type)

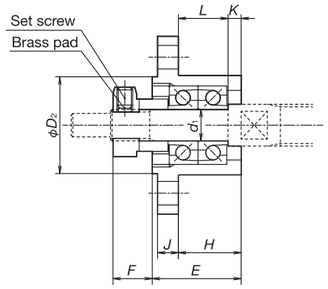
Units: mm

Reference No.	Use	d_1	A	B	C	D	E	F	L	J	K	R	T	U	N	Counterbore dimensions H	P	Q	W	X	Y	Z	Mass (kg)	Locknut screw M	Attached bearing for support side
WBK04-01M	General	4	27	17	10	6	14	10	–	14	5.5	7	9	2.5	2	7	–	–	21	3.5	–	–	0.03	M4×0.5	–
WBK06-01M	General	6	35	22.5	13	8	19	12	–	17	7.5	9.5	12	2.5	2.5	8.5	–	–	26	5.5	–	–	0.05	M6×0.75	–
WBK06-01A[*1]	General	6	42	25	13	20	18	12	20	20	5.5	–	–	–	3.5	10	–	–	30	5.5	9.5	11	0.15	M6×0.75	–
WBK08-01A[*1]	General	8	52	32	17	26	25	14	23	23	7	–	–	–	4	11.5	–	–	38	6.6	11	12	0.25	M8×1	606ZZ
WBK08-01B	Low type		62	31	15.5	31	–		21.5	25.5	4.5				3.5	11			46	9	14	18	0.3		606ZZ
WBK08-01C[*1]	Clean environment		52	32	17	26	25		23	23	7				4	11.5			38	6.6	11	12	0.25		606VV
WBK10-01A	General	10	70	43	25	35	36	17	24	30	5.5	–	–	–	6	12	–	–	52	9	14	11	0.5	M10×1	608ZZ
WBK10-01B	Low type			38	20	38	–															19	0.45		608ZZ
WBK10-01C	Clean environment			43	25	35	36															11	0.5		608VV
WBK12-01A	General	12	70	43	25	35	36	19	24	30	5.5	–	–	–	6	12	–	–	52	9	14	11	0.5	M12×1	6000ZZ
WBK12-01B	Low type			38	20	38	–															19	0.4		6000ZZ
WBK12-01C	Clean environment			43	25	35	36															11	0.5		6000VV
WBK15-01A	General	15	80	50	30	40	41	22	25	31	12	–	–	–	5	12.5	–	–	60	11	17	15	0.7	M15×1	6002ZZ
WBK15-01B	Low type			42	22	42	–															23	0.6		6002ZZ
WBK15-01C	Clean environment			50	30	40	41															15	0.7		6002VV
WBK17-01A	General	17	86	64	39	55	50	24	35	44	7	–	–	–	7	–	19	8	68	9	14	11	1.3	M17×1	6203ZZ
WBK20-01	General	20	95	58	30	45	56	30	42	52	10	–	–	–	10	–	22	10	75	11	17	15	1.4	M20×1	6204ZZ
WBK25-01W	General	25	105	68	35	25	66	36	48	61	13	–	–	–	14	–	30	9	85	11	–	–	1.9	M25×1.5	6205ZZ

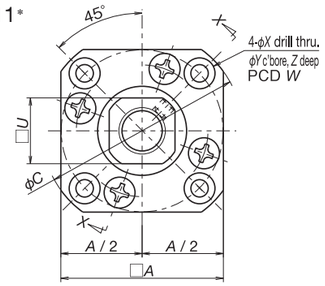
Notes: 1. Use datum surface A for mounting to machine base.
2. Tighten set screw after locknut has been adjusted and tightened.
3. Insert brass pad provided with unit into locknut set screw hole, then insert and tighten the set screw.
4. Deep groove ball bearing and snap ring are also provided for simple support side.
(except WBK04-01M, WBK06-01M and WBK06-01A)
5. Bearings for WBK04-01M and WBK06-01M are equipped with non-contact metal shield.
*1) For retaining cover side of WBK06-01A, WBK08-01A and WBK08-01C, there are no seals.
6. Contact NSK if the rotational speed is 50 min^{-1} and below.

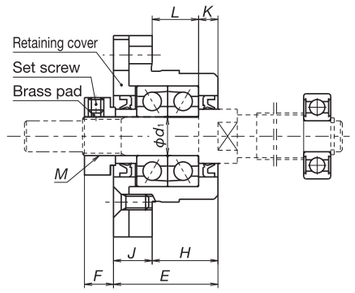
WBK**-11M



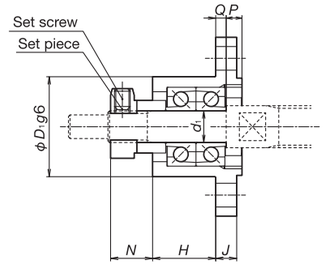


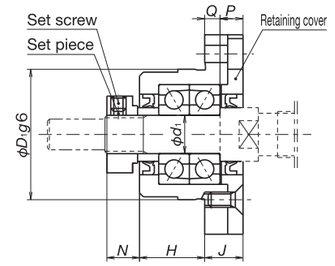
WBK**-11*





View X-X (example 1)





(example 2)

Reference No.	Tightening torque (reference) [N·cm]	
	Locknut	Set screw
WBK04-**	100	69 (M3)
WBK06-**	190	69 (M3)
WBK08-**	230	69 (M3)
WBK10-**	280	147 (M4)
WBK12-**	630	147 (M4)
WBK15-**	790	147 (M4)
WBK17-**	910	147 (M4)
WBK20-**	1670	147 (M4)
WBK25-**	2060	490 (M6)

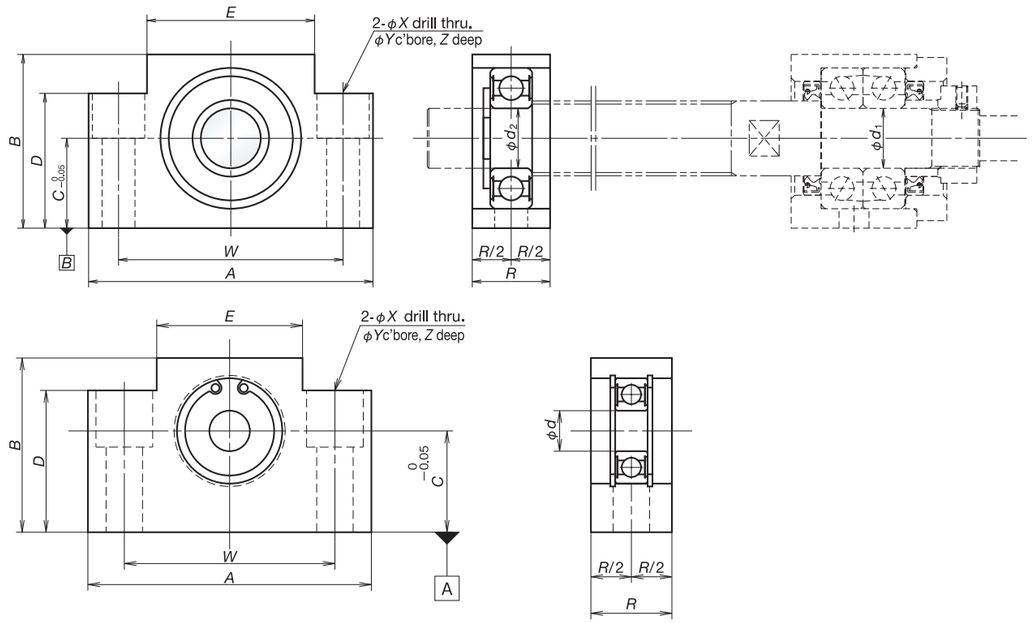
Fixed support side support unit (round type)

Units: mm

Reference No.	Use	d_1	A	C	D_1	D_2	E	H	L	K	F	N
WBK04-11M	General	4	14	26	14	14	13.5	8.5	7	1.5	5.5	6.6
WBK06-11M	General	6	19	34	19	18.5	17	12	9.5	2.5	7.5	8
WBK06-11*	General	6	28	35	22	–	20	13	9.5	3.5	5.5	6.5
WBK08-11B	High-load type	8	42	52	34	–	25.5	15.5	12	3.5	4.5	7
WBK08-11*	General		35	43	28		23	14	10	4	7	8
WBK08-11C*	Clean environment											
WBK10-11	General	10	42	52	34	–	27	17	12	5	7.5	8.5
WBK10-11C	Clean environment											
WBK12-11	General	12	44	54	36	–	27	17	12	5	7.5	8.5
WBK12-11C	Clean environment											
WBK15-11	General	15	52	63	40	–	32	17	11	6	12	14
WBK15-11C	Clean environment											
WBK20-11	General	20	68	85	57	–	52	30	20	10	10	14
WBK25-11	General	25	79	98	63	–	57	30	20	10	13	20

U	P	Q	Counterbore dimensions					Mass (kg)	Locknut screw M	Attached bearing for support side
			J	W	X	Y	Z			
10	2.6	2.4	3	20	3.5	–	–	0.02	M4×0.5	–
12	3	2	4	26	4.5	–	–	0.04	M6×0.75	–
12	4.5	2.5	7	28	2.9	5.5	3.5	0.1	M6×0.75	–
14	6	4	10	42	4.5	8	4	0.2	M8×1	606ZZ
	5		9	35	3.4	6.5		0.15		606ZZ
										606VV
17	6	4	10	42	4.5	8	4	0.2	M10×1	608ZZ
										608VV
19	6	4	10	44	4.5	8	4	0.25	M12×1	6000ZZ
										6000VV
22	8	7	15	50	5.5	9.5	6	0.4	M15×1	6002ZZ
										6002VV
30	14	8	22	70	6.6	11	10	1.1	M20×1	6204ZZ
36	17	10	27	80	9	15	13	1.5	M25×1.5	6205ZZ

Notes: 1. Tighten set screw after locknut has been adjusted and tightened.
2. Insert brass pad provided with unit into locknut set screw hole, then insert and tighten the set screw.
3. Deep groove ball bearing and snap ring are also provided for simple support side.
(except WBK04-11M, WBK06-11M and WBK06-11)
4. Bearings for WBK04-11M and WBK06-11M are equipped with non-contact metal shield.
*For retaining cover side of WBK06-11, WBK08-11 and WBK08-11C, there are no seals.
5. Contact NSK if the rotational speed is 50 min^{-1} and below.



Simple support side support unit (square type)

Units: mm

Reference No.	Use	d_2	A	B	C	D	E	R	Counterbore dimensions W	X	Y	Z	Mass (kg)
WBK08S-01	General	6	52	32	17	26	25	15	38	6.6	11	12	0.15
WBK08S-01B	Low type		62	31	15.5	31	–	16	46	9	14	18	0.2
WBK08S-01C	Clean environment		52	32	17	26	25	15	38	6.6	11	12	0.15
WBK10S-01	General	8	70	43	25	35	36	20	52	9	14	11	0.4
WBK10S-01C	Clean environment												
WBK12S-01	General	10	70	43	25	35	36	20	52	9	14	11	0.35
WBK12S-01B	Low type			38	20	38	–					19	0.4
WBK12S-01C	Clean environment			43	25	35	36					11	0.35
WBK12SF-01*1	General	12											0.3
WBK12SF-01B*1	Low type		62	31	15.5	31	–	18	46			18	0.2
WBK15S-01	General	15	80	50	30	40	41	20	60	9	14	11	0.45
WBK15S-01B	Low type			42	22	42	–					23	0.4
WBK15S-01C	Clean environment			50	30	40	41					11	0.45
WBK15SF-01*1	General		70	43	25	35	36		52				0.3
WBK15SF-01B*1	Low type			38	20	38	–	18				19	
WBK17S-01	General	17	86	64	39	55	50	23	68	9	14	11	0.8
WBK20S-01	General	20	95	58	30	45	56	26	75	11	17	15	0.8
WBK20SF-01B	Low type		80	42	22	42	–	22	60			23	0.4
WBK25S-01W	General	25	105	68	35	25	66	30	85	11	–	–	0.9
WBK25SF-01*1			95	58	30	45	56	22	75	11	17	15	0.55

Notes: 1. Use datum surface B for mounting to machine base.
2. For reference No. 12 or lower numbers, note that the reference numbers and inner dimensions of the bearing are different.
3. WBK ∗∗ SF is a type supporting screw shaft OD.
4. See page B30 for bearing reference number and the basic dynamic load rating in the radial direction.
5. ∗1 is exclusive for FSS type.

Specifications of support unit

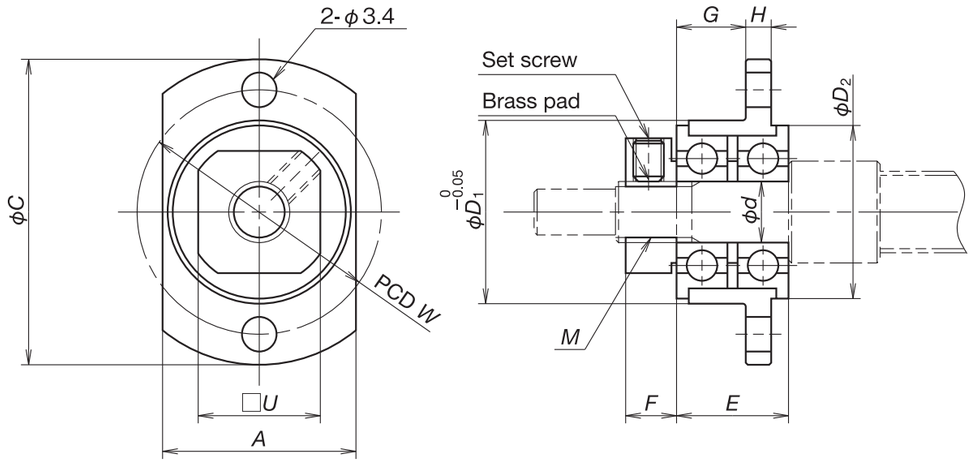
Fixed support side support unit						Simple support side support unit		
Reference No.	Use	Axial direction: Basic dynamic load rating *Ca* [N]	Axial direction: Load limit [N]	Axial direction: Rigidity [N/μm]	Maximum starting torque [N · cm]	Reference No.	Bearing reference No.	Radial direction Basic dynamic load rating *C* [N]
WBK04-01M	General	1 470	464	39	0.2	–	–	–
WBK04-11M	General	1 470	464	39	0.2	–	–	–
WBK06-01A	General	2 670	1 040	28	0.49	–	–	–
WBK06-01M	General	2 760	854	60	0.35	–	–	–
WBK06-11	General	2 670	1 040	28	0.49	–	–	–
WBK06-11M	General	2 760	854	60	0.35	–	–	–
WBK08-01A	General	4 400	1 450	49	0.88	**WBK08S-01**	606ZZ	2 260
WBK08-01B	Low type	6 600	2 730	94	1.9	**WBK08S-01B** **WBK12SF-01B***1	606ZZ 6801ZZ	2 260 1 920
WBK08-01C	Clean environment	3 100	1 100	36	0.52	**WBK08S-01C**	606VV	2 260
WBK08-11	General	4 400	1 450	49	0.88	**WBK08S-01**	606ZZ	2 260
WBK08-11B	High load	6 600	2 730	94	1.9	–	606ZZ	2 260
WBK08-11C	Clean environment	3 100	1 100	36	0.52	**WBK08S-01C**	606VV	2 260
WBK10-01A	General	6 600	2 730	94	1.9	**WBK10S-01** **WBK12SF-01***1	608ZZ 6001ZZ	3 300 5 100
WBK10-01B	Low type	6 600	2 730	94	1.9	–	608ZZ	3 300
WBK10-01C	Clean environment	4 250	1 364	50	1.1	**WBK10S-01C**	608VV	3 300
WBK10-11	General	6 600	2 730	94	1.9	**WBK10S-01**	608ZZ	3 300
WBK10-11C	Clean environment	4 250	1 364	50	1.1	**WBK10S-01C**	608VV	3 300
WBK12-01A	General	7 100	3 040	104	2.1	**WBK12S-01** **WBK15SF-01***1	6000ZZ 6902ZZ	4 550 4 350
WBK12-01B	Low type	7 100	3 040	104	2.1	**WBK12S-01B** **WBK15SF-01B***1	6000ZZ 6902ZZ	4 550 4 350
WBK12-01C	Clean environment	4 700	2 443	57	1.2	**WBK12S-01C**	6000VV	4 550
WBK12-11	General	7 100	3 040	104	2.1	**WBK12S-01**	6000ZZ	4 550
WBK12-11C	Clean environment	4 700	2 443	57	1.2	**WBK12S-01C**	6000VV	4 550
WBK15-01A	General	7 600	3 380	113	2.4	**WBK15S-01**	6002ZZ	5 600
WBK15-01B	Low type	7 600	3 380	113	2.4	**WBK15S-01B** **WBK20SF-01B***1	6002ZZ 6804ZZ	5 600 4 000
WBK15-01C	Clean environment	5 100	2 757	63	1.3	**WBK15S-01C**	6002VV	5 600
WBK15-11	General	7 600	3 380	113	2.4	**WBK15S-01**	6002ZZ	5 600
WBK15-11C	Clean environment	5 100	2 757	63	1.3	**WBK15S-01C**	6002VV	5 600
WBK17-01A	General	13 400	5 800	120	3.5	**WBK17S-01**	6203ZZ	9 550
WBK20-01	General	17 900	8 240	155	6.2	**WBK20S-01** **WBK25SF-01***1	6204ZZ 6005ZZ	12 800 10 100
WBK20-11	General	17 900	8 240	155	6.2	**WBK20S-01W**	6204ZZ	12 800
WBK25-01W	General	20 200	10 000	192	7.2	**WBK25S-01W**	6205ZZ	14 000
WBK25-11	General	20 200	10 000	192	7.2	**WBK25S-01W**	6205ZZ	14 000
WBK04R-11	General	615	490	6.5	0.59	–	–	–
WBK06R-11	General	1 280	930	9	0.59	–	–	–

Notes: 1. ∗1 is exclusive for FSS type.
2. Permissible axial load is 0.7 times of limiting axial load.

Support kits for ball screws for transfer equipment

Support kits are for RMA type ball screw.

In case of RMA1002 or larger rolled ball screws, please use support units for general use.



Units: mm

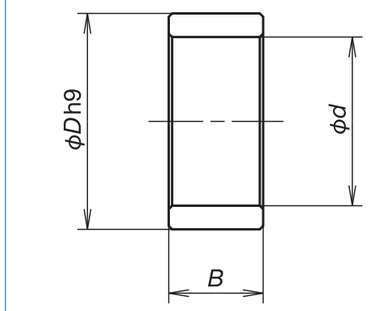
Reference No.	*A*	*C*	*d*	D_1	D_2	*E*	*F*	*G*	*H*	*W*	*U*	*M*	Mass (kg)
WBK04R-11	14	25	4	13	12.5	9	5	5	2.5	19	10	M4×0.5	0.13
WBK06R-11	19	30	6	18	17	11	5	6.8	2.5	24	12	M6×0.75	0.23

Reference No.	Applicable ball screw	Locknut tightening torque (reference) [N·cm]	Set screw tightening torque (reference) [N·cm]
WBK04R-11	RMA0601	100	38 (M2.5)
WBK06R-11	RMA0801 RMA0801.5 RMA0802	190	69 (M3)

Notes:
1. Oscillate bearings slowly so that they fall into place in which run-out of mounting surface is minimal, and then tighten locknut.
2. Support kit is on provisional shaft (bolt) during shipping.
3. When securing support unit on shaft, insert brass pad that is provided with support unit into lock nut hole, and then tighten set screw.

Spacer

When using a fixed support unit, it may require an optional spacer to have an effective shoulder surface at where the ball thread is threaded to the end of the shoulder. This is common for the R series for transporting ball screws.



Units: mm

Reference No.	Internal diameter *d*	Outside diameter *D*	Width *B*	Mass (g)	Applicable support unit
WBK06K	6	9.5	5.0	2	WBK06-＊＊
WBK08K	8	11.5	5.5	2	WBK08-＊＊
WBK10K	10	14.5	5.5	4	WBK10-＊＊
WBK12K	12	15.0	5.6	3	WBK12-＊＊
WBK15K	15	19.5	10.0	10	WBK15-＊＊
WBK17K	17	24.4	7.0	13	WBK17-＊＊
WBK20K	20	25.5	11.0	17	WBK20-＊＊
WBK25K	25	32.0	14.0	34	WBK25-＊＊

B-9 Ball screw support bearings

NSKHPS™ BSBD Series

The BSBD Series are double-row bearing units for the support of ball screws that can accurately and quickly position a work piece or a spindle unit.

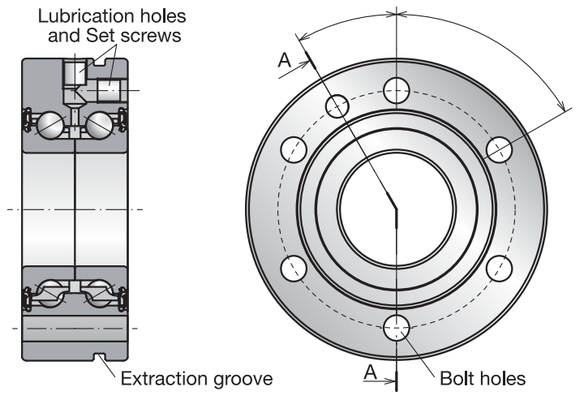
Features

The bearings of this series are double-row angular contact thrust ball bearings with a 60˚ contact angle and a single outer ring. The specifications are the same as those of the NSKTAC bearings, both series being optimized for the support of ball screws in machine tools. All BSBD Series bearings are equipped with a rubber contact seal and prepacked with high performance grease.

●BSF Type

The BSBD Series are double row angular contact thrust ball bearings in a back-to-back arrangement, with a single outer ring. The BSF type of bearings is with bolt holes on the outer ring for easy direct mounting. Two lubrication holes – one in the outer surface and one in the face of the outer ring – allow for relubrication during operation if required. If not used, these holes are closed off with set screws. An extraction groove on the outer surface of the outer ring aids removal of the bearing.

Note: BSF type bearings are supplied with seal and set screws included. Mounting bolts are not included.



NSKHPS BSBD Series

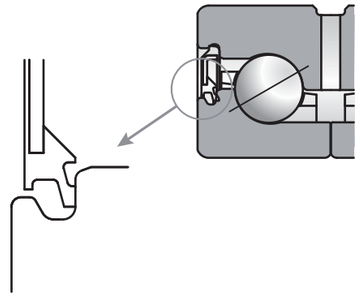
Bearing number Example: **BS F 30 80 DDU H P2B**

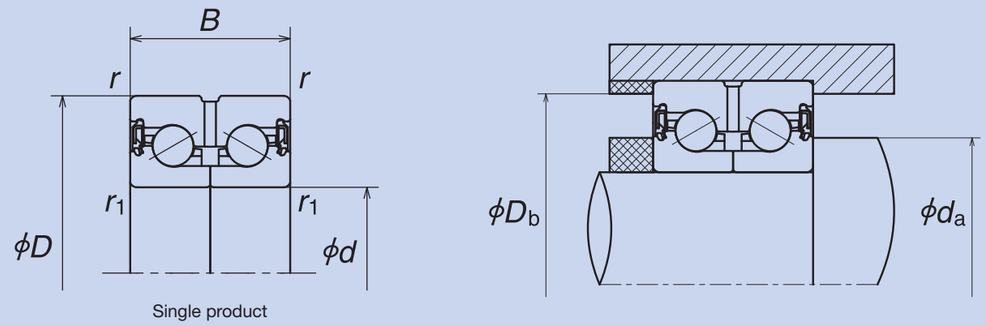
- BS: Bearing type
- F: Flange type
- 30: Bore diameter
- 80: Outer diameter
- DDU: Seal type
- H: Preload
- P2B: Accuracy

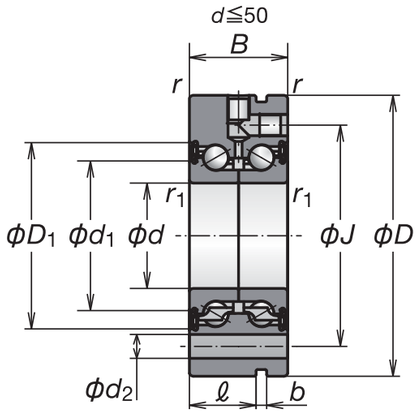
Note:
P2B is an accuracy class specific to the BSBD Series, indicating the following:
Running accuracy:
ISO Class 2
Others: NSK-specific

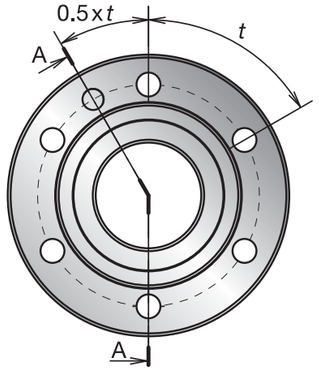
●Seal

Rubber contact seal on both sides. Triple lip structure provides high grease sealing performance and dust resistance.









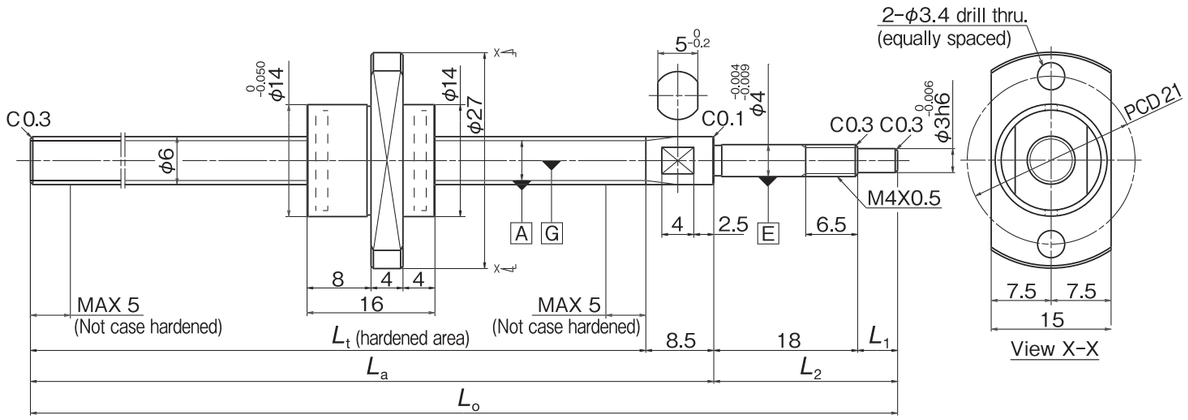
BSF Type Single product

Bearing Numbers	Boundary Dimensions (mm)					Basic Load Rating (kN)		Limiting Axial Load (kN)	Axial Rigidity (N/μm)	Mass (kg)	Limiting speed (min^{-1})
	d	D	B	r (min)	r_1 (min)	C_a (Dynamic)	C_{oa} (Static)				Grease
BSF2575	25	75	28	0.6	0.6	28.3	48.0	34.0	750	0.73	5 100
BSF3080	30	80	28	0.6	0.6	30.0	55.5	38.5	850	0.79	4 500
BSF30100	30	100	38	0.6	0.6	60.5	94.0	66.5	950	1.71	3 900

Reference Dimensions (mm)							Mounting Bolts		Preload	Starting torque (N·m)	Recommended Clamping Force
d_1	D_1	J	d_2	ℓ	b	t	Bolt Dia.	Number of Bolts	(N)	H	(N)
37.6	48	58	6.8	19	3	4 x 90°	M6	4	2 245	0.16	8 100
42.6	53	63	6.8	19	3	6 x 60°	M6	6	2 625	0.19	8 600
49.1	64.4	80	8.8	30	3	8 x 45°	M8	8	4 855	0.59	11 100

Notes: 1. Permissible axial load equals 0.7 times of limiting axial load.
The values refer to the limiting load of the bearing only, without taking the mounting bolts into account.
2. The values indicate starting torque of preloaded bearings, not including seal torque.
3. Inner rings can be separable easily. Please push or pull bearings by clamping inner ring at mounting and dismounting.

Compact FA PSS Type Screw shaft diameter ø6, Lead 8



Specification

Model No.	Nut specification				Screw shaft dimensions (mm)				
	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2
			Dynamic C_a (N)	Static C_{oa} (N)					
BSS0608-2E	6	8	690	805	32.0 to 120.0	40.5 to 128.5	63.5 to 151.5	1.0 to 15.0	19.0 to 33.0

Click!Speedy Reference Number

P A T 06 08 N 2 N C 0151 *

- Accuracy grade P : JIS C5 grade
- Nut code A : End Deflector Type
- Preload system/Axial play code T : Axial play 0.005 or less (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 2 : PS2 (see table 3)
- Lubrication component N : None
- Nut direction/Shaft end shape code (see table 4)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Axial play 0.005 or less
Code	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Nut direction/Shaft end shape code

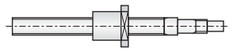
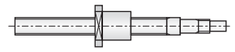
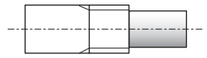
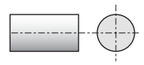
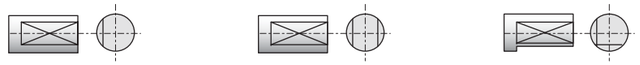
Shaft end shape	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Free
Code	C	G
Shape		

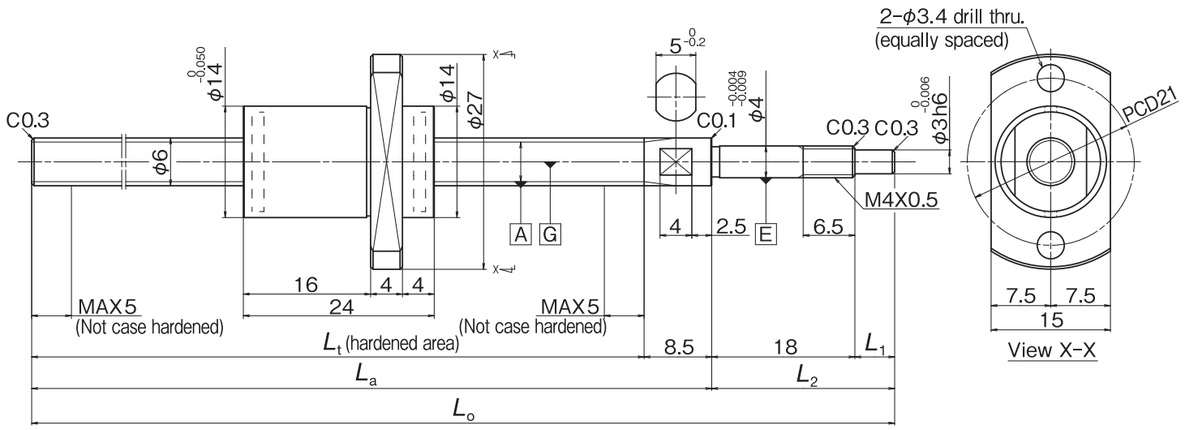
Table 5 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

1. Shaft end shape of fixed support side

Additional element	
None	
Flats	

Compact FA PSS Type Screw shaft diameter ø6, Lead 8



Specification

Model No.	Nut specification				Screw shaft dimensions (mm)				
	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2
			Dynamic C_a (N)	Static C_{oa} (N)					
BSS0608-4E	6	8	1 480	1 940	48.0 to 120.0	56.5 to 128.5	79.5 to 151.5	1.0 to 15.0	19.0 to 33.0

Click!Speedy Reference Number

P B T 06 08 N 2 N C 0151 *

- Accuracy grade P : JIS C5 grade
- Nut code B : End Deflector Type
- Preload system/Axial play code T : Axial play 0.005 or less (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 2 : PS2 (see table 3)
- Lubrication component N : None
- Nut direction/Shaft end shape code (see table 4)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Axial play 0.005 or less
Code	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Nut direction/Shaft end shape code

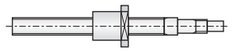
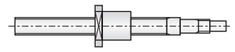
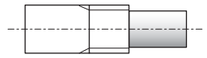
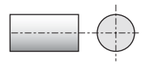
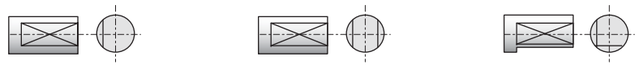
Shaft end shape	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Free
Code	C	G
Shape		

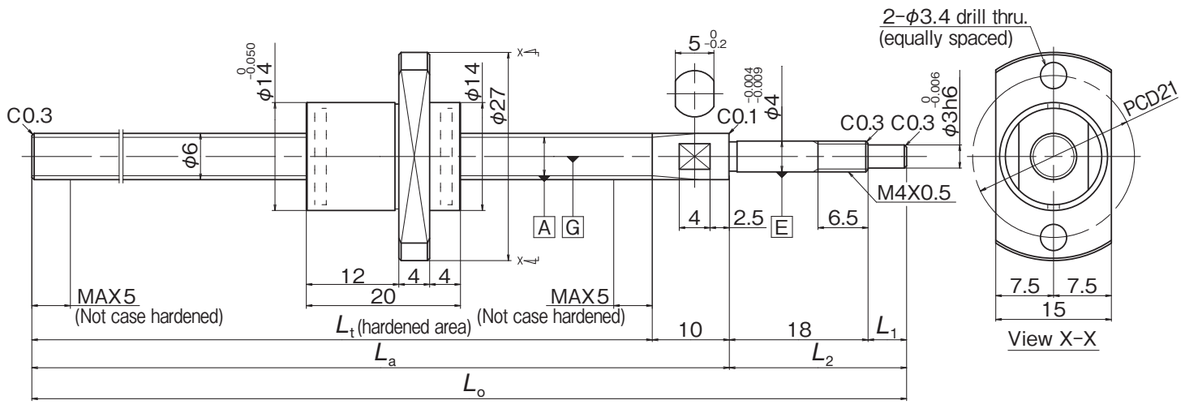
Table 5 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

1. Shaft end shape of fixed support side

Additional element	
None	
Flats	

Compact FA PSS Type Screw shaft diameter ø6, Lead 12



Specification

Model No.	Nut specification				Screw shaft dimensions (mm)				
	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2
			Dynamic C_a (N)	Static C_{oa} (N)					
BSS0612-2E	6	12	665	800	40.0 to 120.0	50.0 to 130.0	73.0 to 153.0	1.0 to 15.0	19.0 to 33.0

Click!Speedy Reference Number

P A T 06 12 N 2 N C 0151 *

- Accuracy grade P : JIS C5 grade
- Nut code A : End Deflector Type
- Preload system/Axial play code T : Axial play 0.005 or less (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Design serial number
- Overall length of shaft (mm)
- Nut direction/Shaft end shape code (see table 4)
- Lubrication component N : None
- Lubricant code 2 : PS2 (see table 3)
- Surface treatment N : None (see table 2)

Table 1 Preload system/Axial play code

Preload system/Axial play	Axial play 0.005 or less
Code	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Nut direction/Shaft end shape code

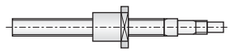
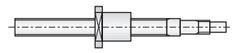
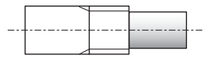
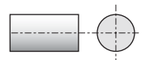
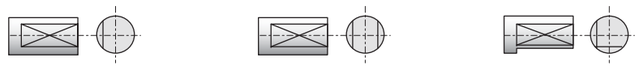
Shaft end shape	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Free
Code	C	G
Shape		

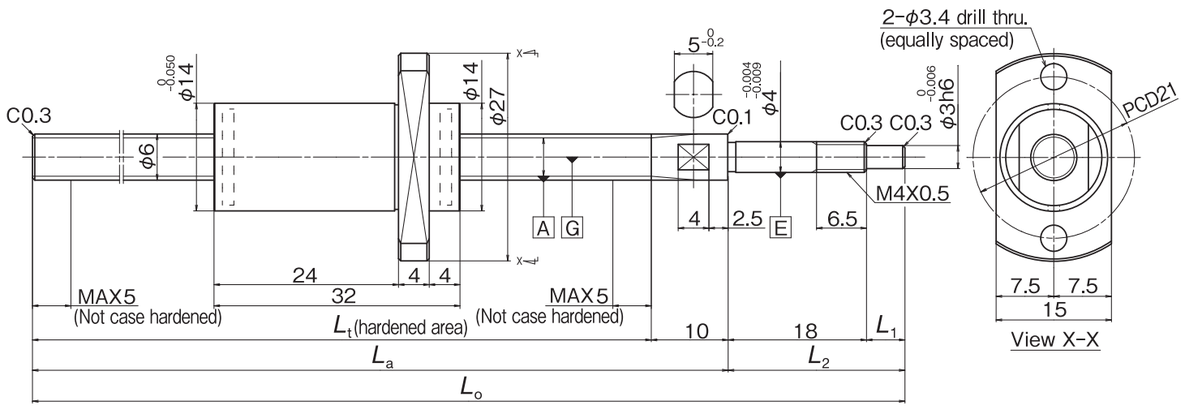
Table 5 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

1. Shaft end shape of fixed support side

Additional element	
None	
Flats	

Compact FA PSS Type Screw shaft diameter ø6, Lead 12



Specification

Model No.	Nut specification: Screw shaft diameter (mm)	Nut specification: Lead (mm)	Nut specification: Basic load rating Dynamic C_a (N)	Nut specification: Basic load rating Static C_{oa} (N)	Screw shaft dimensions (mm): Thread length L_t	Screw shaft dimensions (mm): Supported length L_a	Screw shaft dimensions (mm): Overall length L_o	Screw shaft dimensions (mm): Shaft end length L_1	Screw shaft dimensions (mm): Shaft end length L_2
BSS0612-4E	6	12	1 430	1 970	64.0 to 120.0	74.0 to 130.0	97.0 to 153.0	1.0 to 15.0	19.0 to 33.0

Click!Speedy Reference Number

P B T 06 12 N 2 N C 0151 *

- Accuracy grade P : JIS C5 grade
- Nut code B : End Deflector Type
- Preload system/Axial play code T : Axial play 0.005 or less (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Design serial number
- Overall length of shaft (mm)
- Nut direction/Shaft end shape code (see table 4)
- Lubrication component N : None
- Lubricant code 2 : PS2 (see table 3)
- Surface treatment N : None (see table 2)

Table 1 Preload system/Axial play code

Preload system/Axial play	Axial play 0.005 or less
Code	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
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LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Nut direction/Shaft end shape code

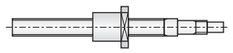
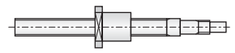
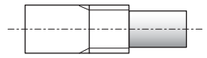
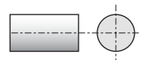
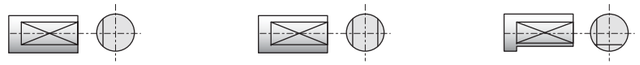
Shaft end shape	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Free
Code	C	G
Shape		

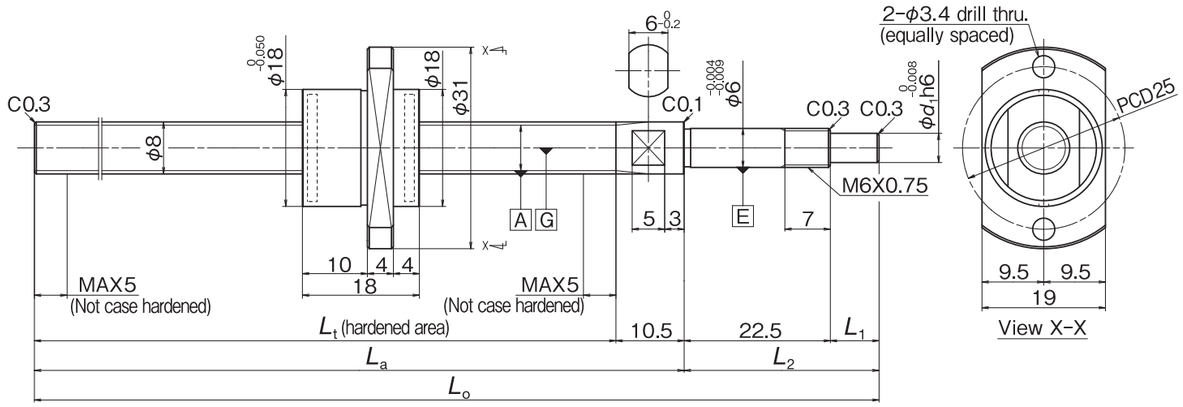
Table 5 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

1. Shaft end shape of fixed support side

Additional element	
None	
Flats	

Compact FA PSS Type Screw shaft diameter ø8, Lead 10



Specification

Nut specification					Screw shaft dimensions (mm)					
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
			Dynamic C_a (N)	Static C_{oa} (N)						
BSS0810-2E	8	10	1 150	1 420	36.0 to 110.0	46.5 to 120.5	76.5 to 150.5	1.0 to 22.5	23.5 to 45.0	3.0 to 4.5

Click!Speedy Reference Number

P A T 08 10 N 2 N C 0151 *

- Accuracy grade P : JIS C5 grade
- Nut code A : End Deflector Type
- Preload system/Axial play code T : Axial play 0.005 or less (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Design serial number
- Overall length of shaft (mm)
- Nut direction/Shaft end shape code (see table 4)
- Lubrication component N : None
- Lubricant code 2 : PS2 (see table 3)
- Surface treatment N : None (see table 2)

Table 1 Preload system/Axial play code

Preload system/Axial play	Axial play 0.005 or less
Code	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Nut direction/Shaft end shape code

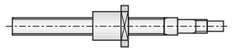
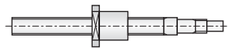
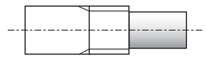
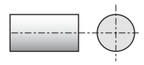
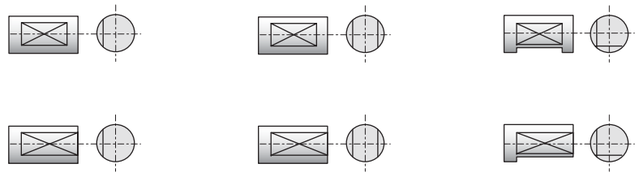
Shaft end shape	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Free
Code	C	G
Shape		

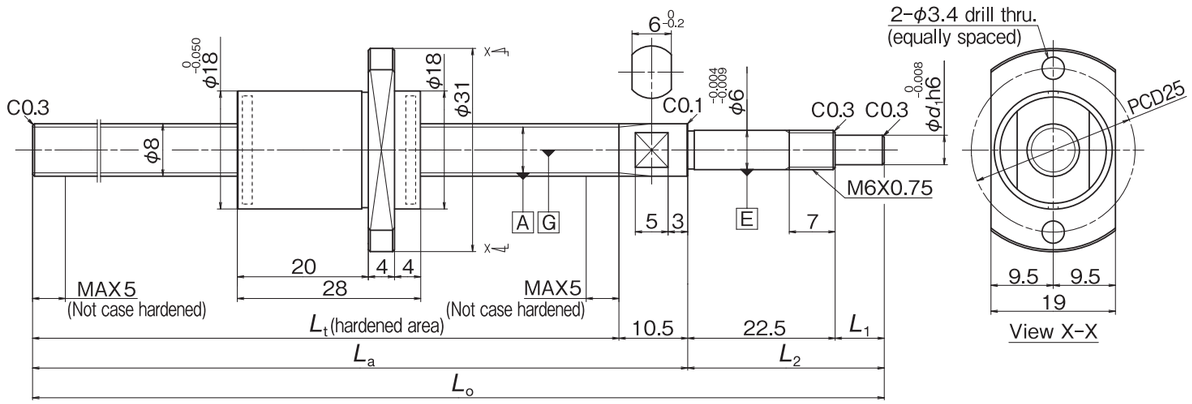
Table 5 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

1. Shaft end shape of fixed support side

Additional element	
None	
Flats	

Compact FA PSS Type Screw shaft diameter ø8, Lead 10



Specification

Nut specification					Screw shaft dimensions (mm)					
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
			Dynamic C_a (N)	Static C_{oa} (N)						
BSS0810-4E	8	10	2 470	3 430	56 to 110	66.5 to 120.5	96.5 to 150.5	1.0 to 22.5	23.5 to 45.0	3.0 to 4.5

Click!Speedy Reference Number

P B T 08 10 N 2 N C 0151 *

- Accuracy grade P : JIS C5 grade
- Nut code B : End Deflector Type
- Preload system/Axial play code T : Axial play 0.005 or less (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 2 : PS2 (see table 3)
- Lubrication component N : None
- Nut direction/Shaft end shape code (see table 4)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Axial play 0.005 or less
Code	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Nut direction/Shaft end shape code

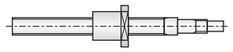
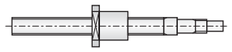
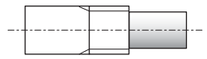
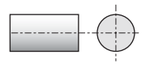
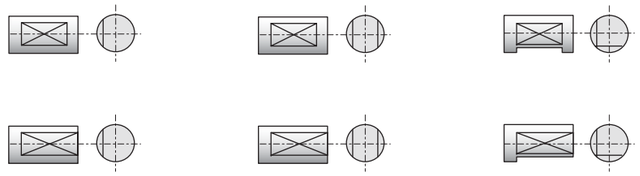
Shaft end shape	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Free
Code	C	G
Shape		

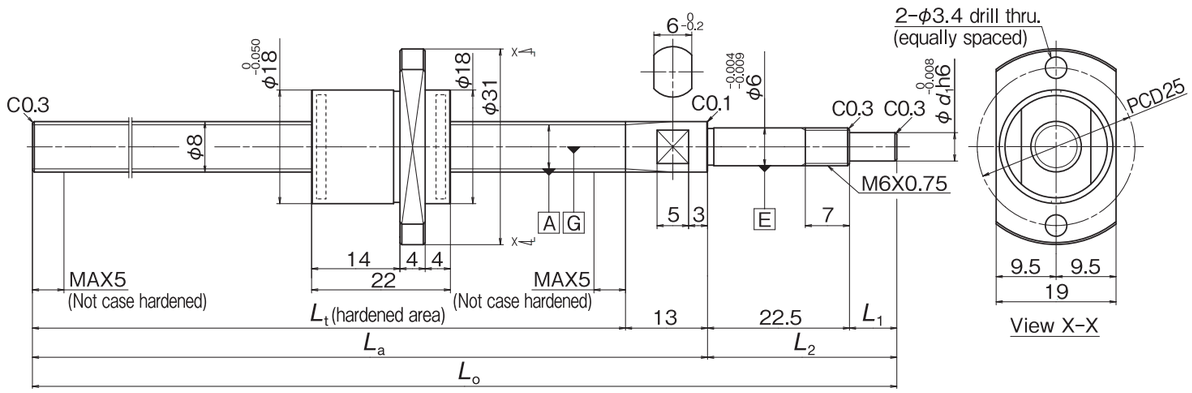
Table 5 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

1. Shaft end shape of fixed support side

Additional element	
None	
Flats	

Compact FA PSS Type Screw shaft diameter ø8, Lead 15



Specification

Nut specification					Screw shaft dimensions (mm)					
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
			Dynamic C_a (N)	Static C_{oa} (N)						
BSS0815-2E	8	15	1 130	1 430	44.0 to 110	57.0 to 123	87.0 to 153	1.0 to 22.5	23.5 to 45.0	3.0 to 4.5

Click!Speedy Reference Number

P A T 08 15 N 2 N C 0153 *

- Accuracy grade P : JIS C5 grade
- Nut code A : End Deflector Type
- Preload system/Axial play code T : Axial play 0.005 or less (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 2 : PS2 (see table 3)
- Lubrication component N : None
- Nut direction/Shaft end shape code (see table 4)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Axial play 0.005 or less
Code	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Nut direction/Shaft end shape code

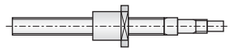
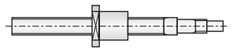
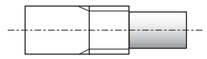
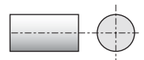
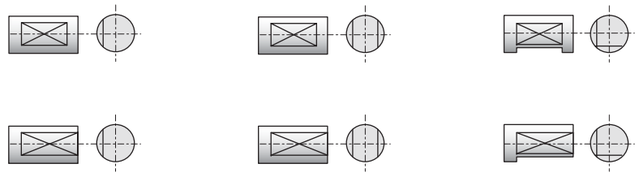
Shaft end shape	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Free
Code	C	G
Shape		

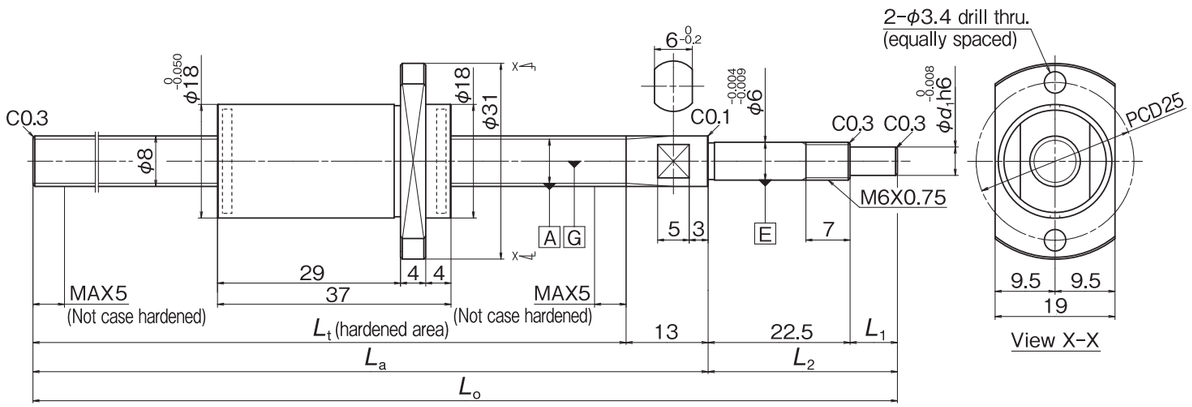
Table 5 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

1. Shaft end shape of fixed support side

Additional element	
None	
Flats	

Compact FA PSS Type Screw shaft diameter ø8, Lead 15



Specification

Nut specification					Screw shaft dimensions (mm)					
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
			Dynamic C_a (N)	Static C_{oa} (N)						
BSS0815-4E	8	15	2 410	3 520	74.0 to 110	87.0 to 123	117 to 153	1.0 to 22.5	23.5 to 45	3.0 to 4.5

Click!Speedy Reference Number

P B T 08 15 N 2 N C 0153 *

- Accuracy grade P : JIS C5 grade
- Nut code B : End Deflector Type
- Preload system/Axial play code T : Axial play 0.005 or less (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 2 : PS2 (see table 3)
- Lubrication component N : None
- Nut direction/Shaft end shape code (see table 4)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Axial play 0.005 or less
Code	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Nut direction/Shaft end shape code

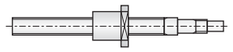
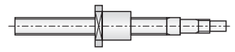
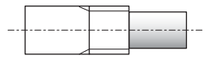
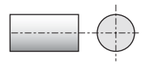
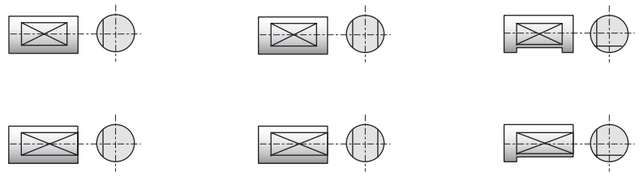
Shaft end shape	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Free
Code	C	G
Shape		

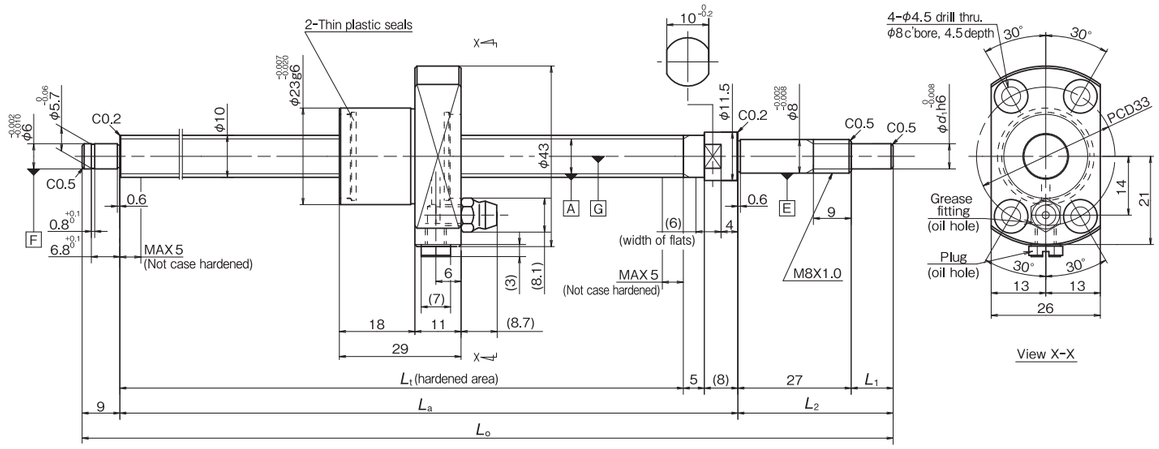
Table 5 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

1. Shaft end shape of fixed support side

Additional element	
None	
Flats	

Compact FA PSS Type Screw shaft diameter ø10, Lead 5



Specification

Model No.	Nut specification: Screw shaft diameter (mm)	Lead (mm)	Basic load rating: Dynamic Ca (N)	Basic load rating: Static Coa (N)	Screw shaft dimensions (mm): Thread length Lt	Supported length La	Overall length Lo	Shaft end length L1	Shaft end length L2	Shaft end dia. d1
BSS1005-3E	10	5	3 420	4 840	58.0 to 479	71.0 to 492	117 to 529	1.0 to 30.0	28.0 to 57.0	3.0 to 6.0

Click!Speedy Reference Number

P S P 10 05 N 2 A B 0529 *

- Accuracy grade P : JIS C5 grade
- Nut code S : End Deflector Type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 2 : PS2 (see table 3)
- Lubrication component A : Axial direction (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication component

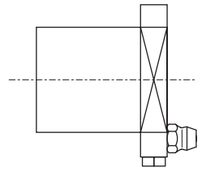
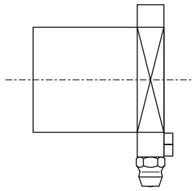
Code/Form	A : Axial direction (standard)	B : Radial direction
Shape		

Table 5 Nut direction/Shaft end shape code

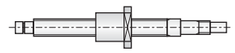
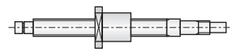
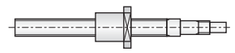
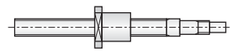
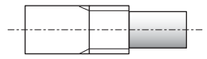
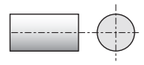
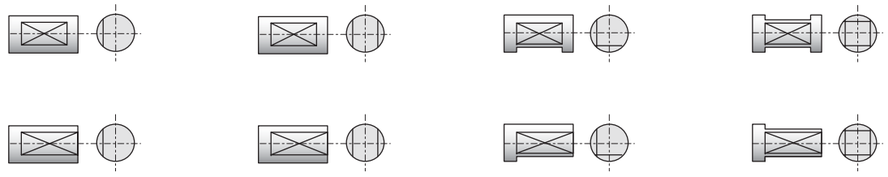
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free
Code	B	F	C	G
Shape				

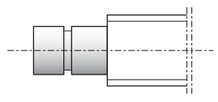
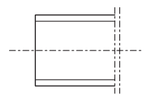
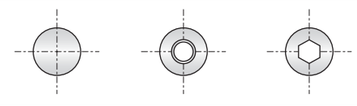
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

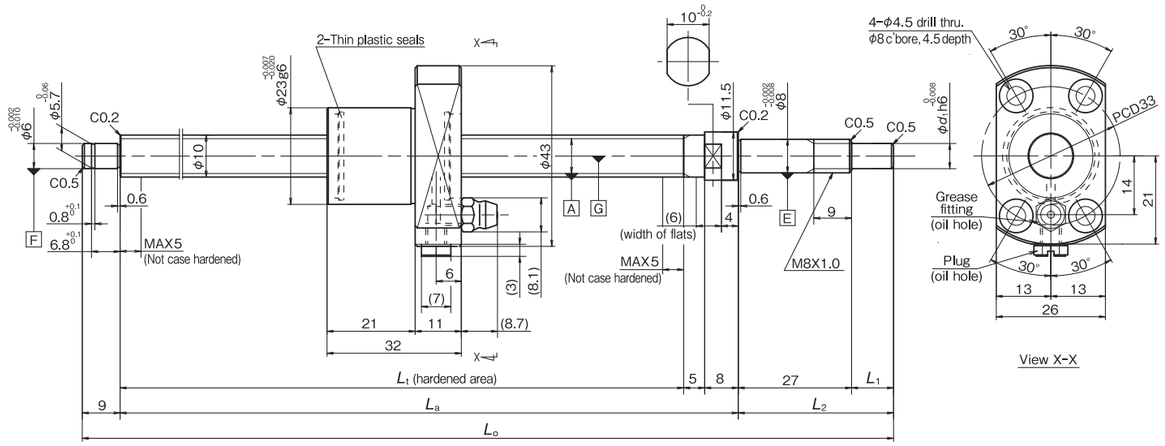
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	

2. Shaft end shape of simple support side

Additional element		
Shaft end		

Compact FA PSS Type Screw shaft diameter ø10, Lead 10



Specification

Nut specification					Screw shaft dimensions (mm)					
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
			Dynamic C_a (N)	Static C_{oa} (N)						
BSS1010-2E	10	10	2 290	2 980	64.0 to 479	77.0 to 492	123 to 529	1.0 to 30.0	28.0 to 57.0	3.0 to 6.0

Click!Speedy Reference Number

P S P 10 10 N 2 A B 0529 *

- Accuracy grade P : JIS C5 grade
- Nut code S : End Deflector Type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 2 : PS2 (see table 3)
- Lubrication component A : Axial direction (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication component

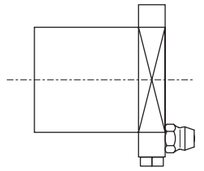
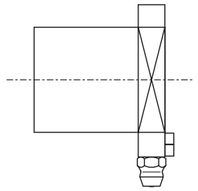
Code/Form	A : Axial direction (standard)	B : Radial direction
Shape		

Table 5 Nut direction/Shaft end shape code

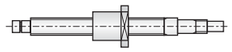
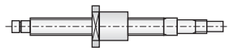
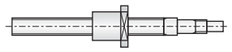
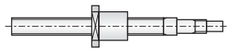
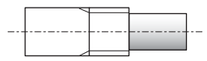
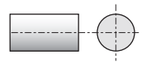
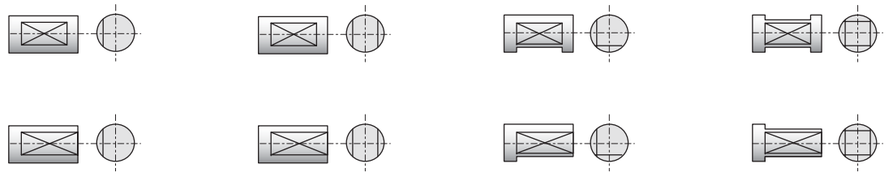
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free
Code	B	F	C	G
Shape				

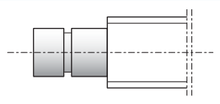
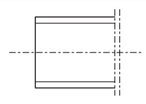
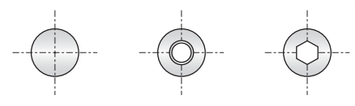
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

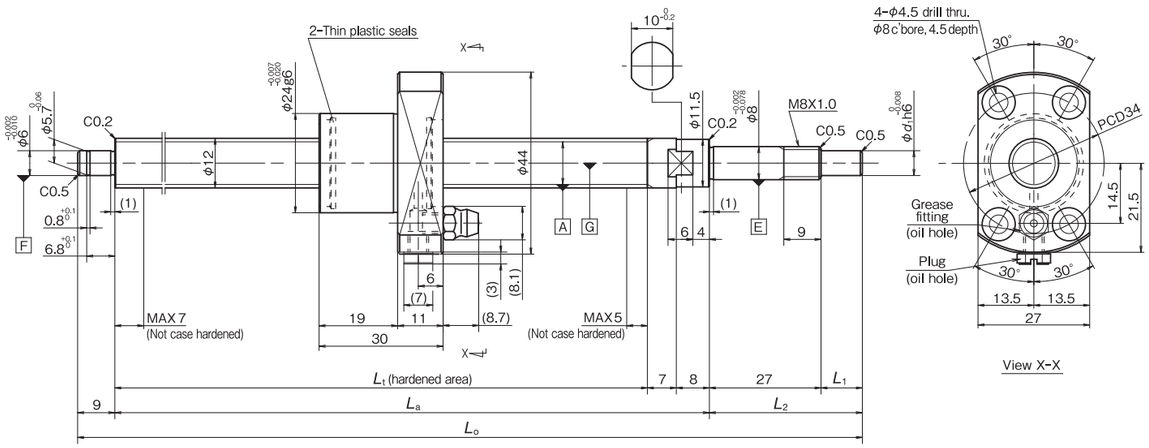
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	

2. Shaft end shape of simple support side

Additional element		
Shaft end		

Compact FA PSS Type Screw shaft diameter ø12, Lead 5



Specification

Nut specification					Screw shaft dimensions (mm)					
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating Dynamic C_a (N)	Basic load rating Static C_{oa} (N)	Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
BSS1205-3E	12	5	3 750	5 810	60.0 to 609	75.0 to 624	112 to 661	1.0 to 30.0	28.0 to 57.0	3.0 to 6.0

Click!Speedy Reference Number

P S P 12 05 N 2 A B 0661 *

- Accuracy grade P : JIS C5 grade
- Nut code S : End Deflector Type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 2 : PS2 (see table 3)
- Lubrication component A : Axial direction (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication component

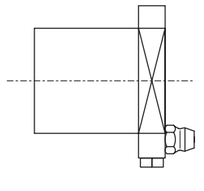
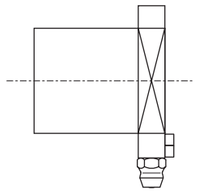
Code/Form	A : Axial direction (standard)	B : Radial direction
Shape		

Table 5 Nut direction/Shaft end shape code

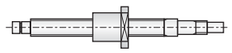
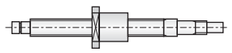
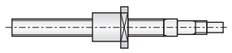
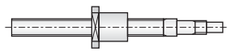
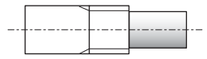
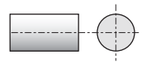
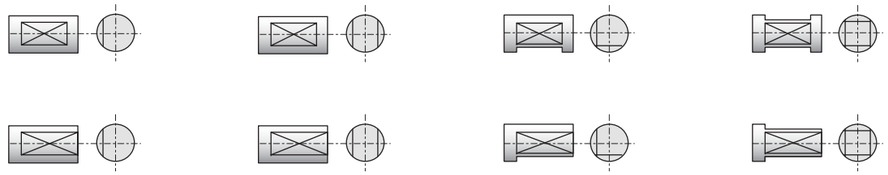
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free
Code	B	F	C	G
Shape				

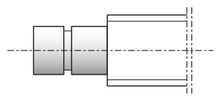
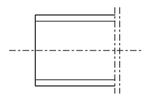
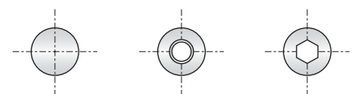
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

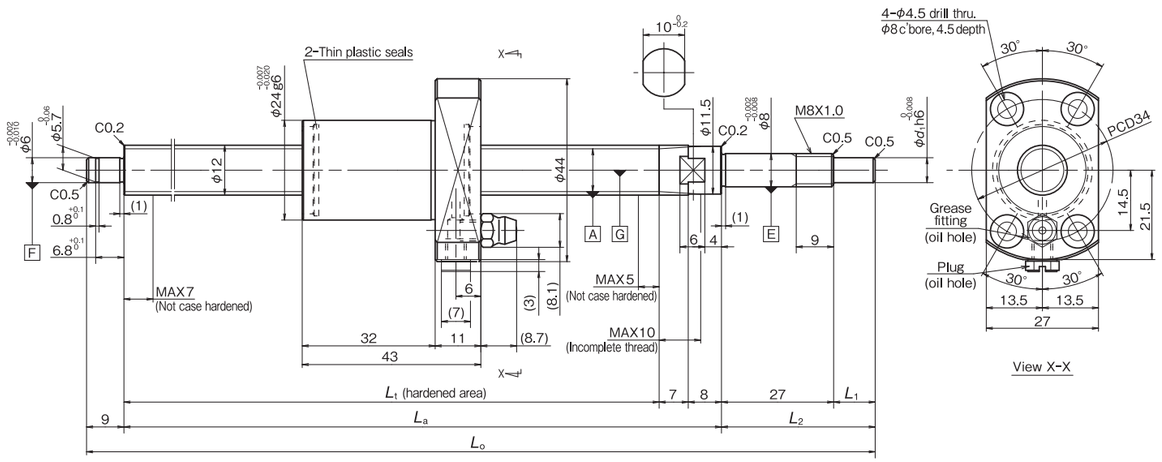
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	

2. Shaft end shape of simple support side

Additional element		
Shaft end		

Compact FA PSS Type Screw shaft diameter ø12, Lead 10



Specification

Nut specification					Screw shaft dimensions (mm)					
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
			Dynamic C_a (N)	Static C_{oa} (N)						
BSS1210-3E	12	10	3 760	5 780	86.0 to 609	101 to 624	138 to 661	1.0 to 30.0	28.0 to 57.0	3.0 to 6.0

Click!Speedy Reference Number

P S P 12 10 N 2 A B 0661 *

- Accuracy grade P : JIS C5 grade
- Nut code S : End Deflector Type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 2 : PS2 (see table 3)
- Lubrication component A : Axial direction (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

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Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
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○Fluoride low temperature chrome plating
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Table 3 Lubricant code

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Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication component

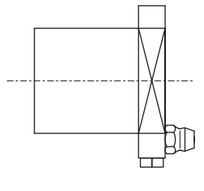
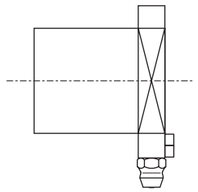
Code/Form	A : Axial direction (standard)	B : Radial direction
Shape		

Table 5 Nut direction/Shaft end shape code

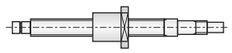
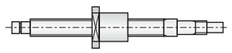
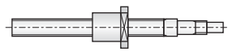
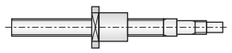
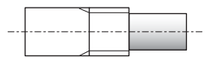
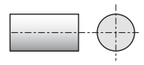
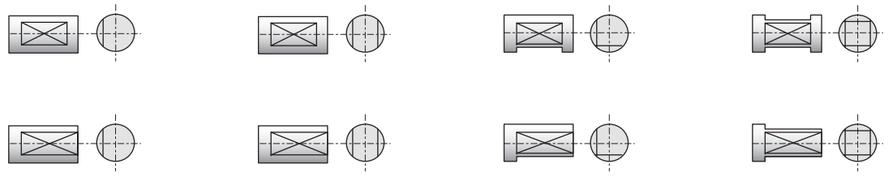
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free
Code	B	F	C	G
Shape				

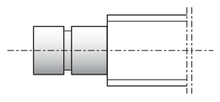
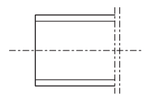
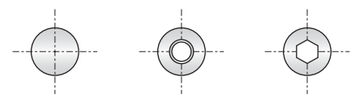
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

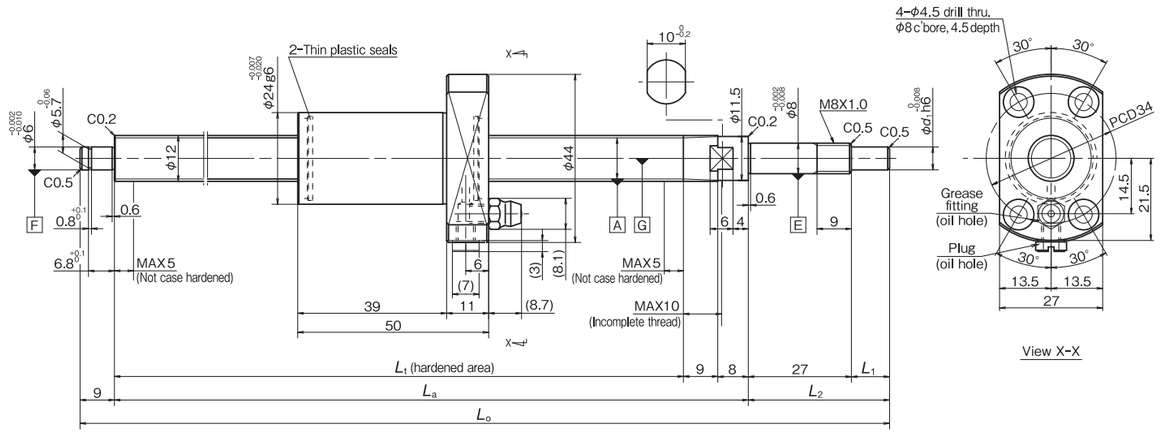
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	

2. Shaft end shape of simple support side

Additional element		
Shaft end		

Compact FA PSS Type Screw shaft diameter ø12, Lead 20



Specification

Model No.	Nut specification: Screw shaft diameter (mm)	Nut specification: Lead (mm)	Nut specification: Basic load rating Dynamic C_a (N)	Nut specification: Basic load rating Static C_{oa} (N)	Screw shaft dimensions (mm): Thread length L_t	Screw shaft dimensions (mm): Supported length L_a	Screw shaft dimensions (mm): Overall length L_o	Screw shaft dimensions (mm): Shaft end length L_1	Screw shaft dimensions (mm): Shaft end length L_2	Screw shaft dimensions (mm): Shaft end dia. d_1
BSS1220-2E	12	20	2 330	3 600	100 to 619	117 to 636	154 to 673	1.0 to 30.0	28.0 to 57.0	3.0 to 6.0

Click!Speedy Reference Number

P S P 12 20 N 2 A B 0673 *

- Accuracy grade P : JIS C5 grade
- Nut code S : End Deflector Type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 2 : PS2 (see table 3)
- Lubrication component A : Axial direction (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication component

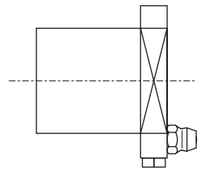
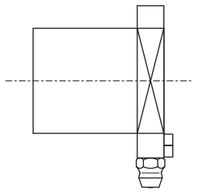
Code/Form	A : Axial direction (standard)	B : Radial direction
Shape		

Table 5 Nut direction/Shaft end shape code

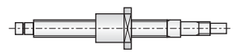
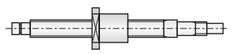
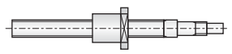
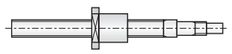
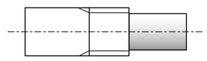
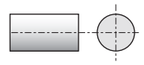
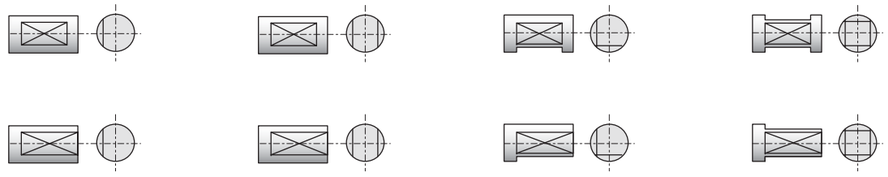
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free
Code	B	F	C	G
Shape				

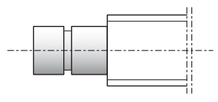
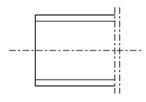
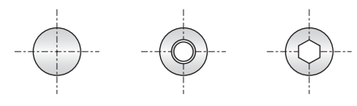
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

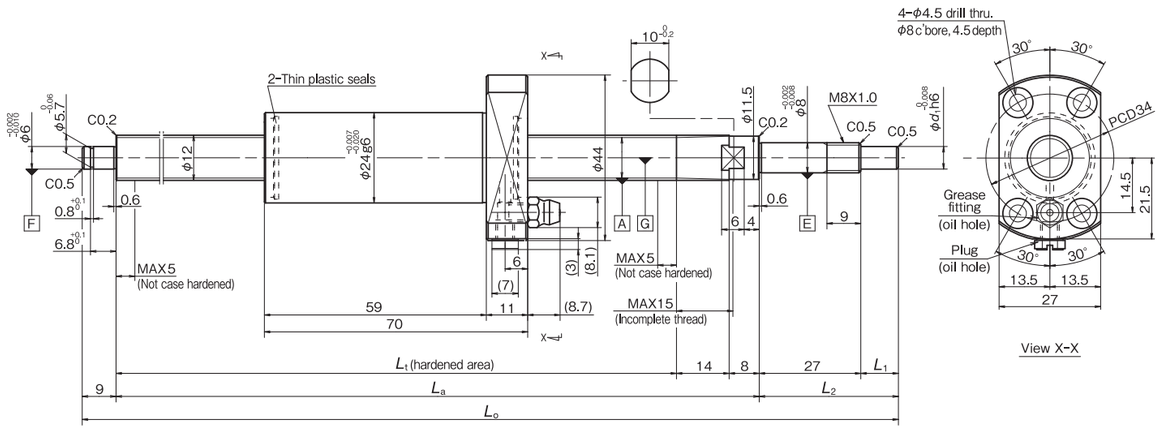
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	

2. Shaft end shape of simple support side

Additional element		
Shaft end		

Compact FA PSS Type Screw shaft diameter ø12, Lead 30



Specification

Model No.	Nut specification: Screw shaft diameter (mm)	Lead (mm)	Basic load rating: Dynamic Ca (N)	Basic load rating: Static Coa (N)	Screw shaft dimensions (mm): Thread length Lt	Supported length La	Overall length Lo	Shaft end length L1	Shaft end length L2	Shaft end dia. d1
BSS1230-2E	12	30	2 190	3 650	140 to 619	162 to 641	199 to 678	1.0 to 30.0	28.0 to 57.0	3.0 to 6.0

Click!Speedy Reference Number

P S P 12 30 N 2 A B 0678 *

- Accuracy grade P : JIS C5 grade
- Nut code S : End Deflector Type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 2 : PS2 (see table 3)
- Lubrication component A : Axial direction (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication component

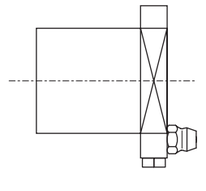
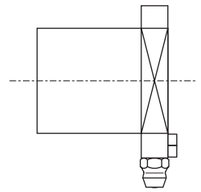
Code/Form	A : Axial direction (standard)	B : Radial direction
Shape		

Table 5 Nut direction/Shaft end shape code

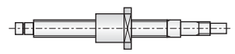
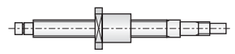
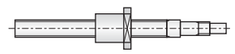
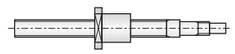
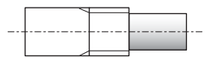
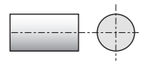
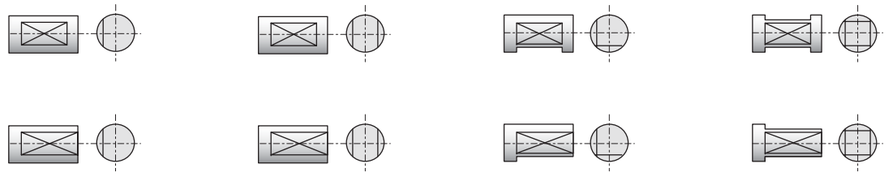
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free
Code	B	F	C	G
Shape				

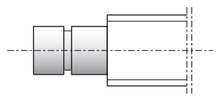
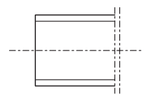
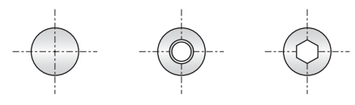
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

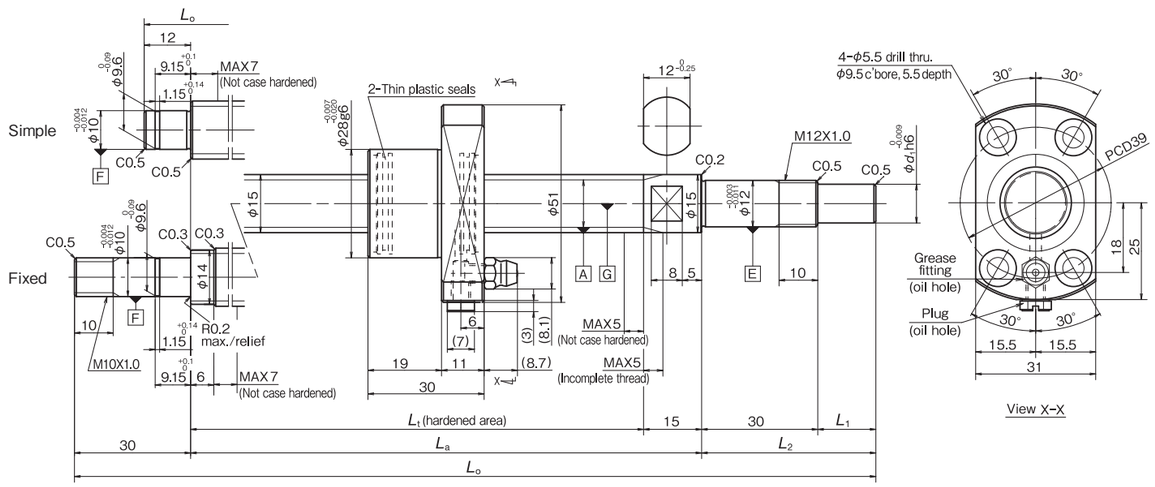
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	

2. Shaft end shape of simple support side

Additional element		
Shaft end		

Compact FA PSS Type Screw shaft diameter ø15, Lead 5



Specification

Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating Dynamic Ca (N)	Basic load rating Static Coa (N)	Shaft end shape	Thread length Lt	Supported length La	Overall length Lo	Shaft end length L1	Shaft end length L2	Shaft end dia. d1
BSS1505-3E	15	5	6 410	10 100	Simple	60 to 724	75 to 739	132 to 796	1.0 to 50.0	31.0 to 80	6.0 to 10.0
					Fixed	60 to 706	81 to 721	156 to 796	1.0 to 50.0	31.0 to 80	6.0 to 10.0

Click!Speedy Reference Number

P S P 15 05 N 3 A B 0796 *

- Accuracy grade P : JIS C5 grade
- Nut code S : End Deflector Type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 3 : LR3 (see table 3)
- Lubrication component A : Axial direction (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
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Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
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Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication component

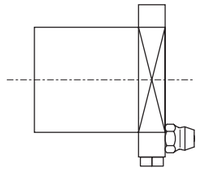
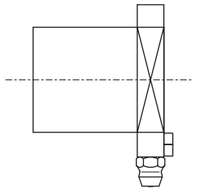
Code/Form	A : Axial direction (standard)	B : Radial direction
Shape		

Table 5 Nut direction/Shaft end shape code

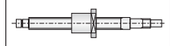
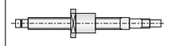
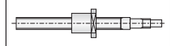
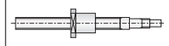
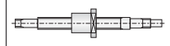
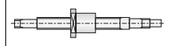
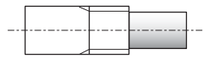
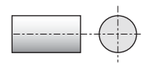
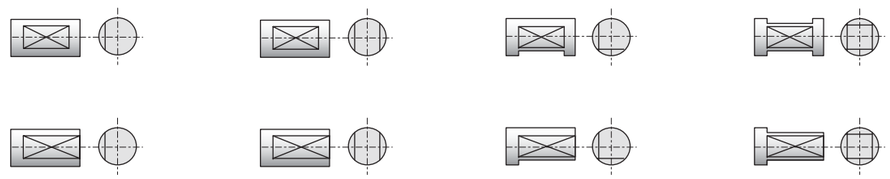
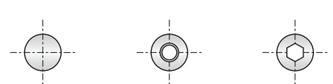
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed	Fixed – Fixed	Fixed – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free	Flange side : Drive side	Flange side : Opposite to drive side
Code	B	F	C	G	A	E
Shape						

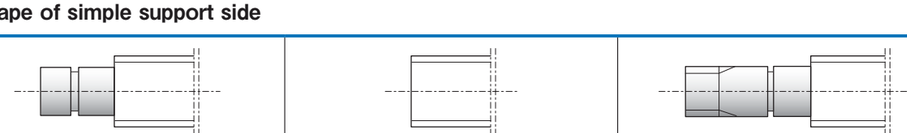
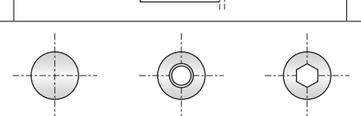
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

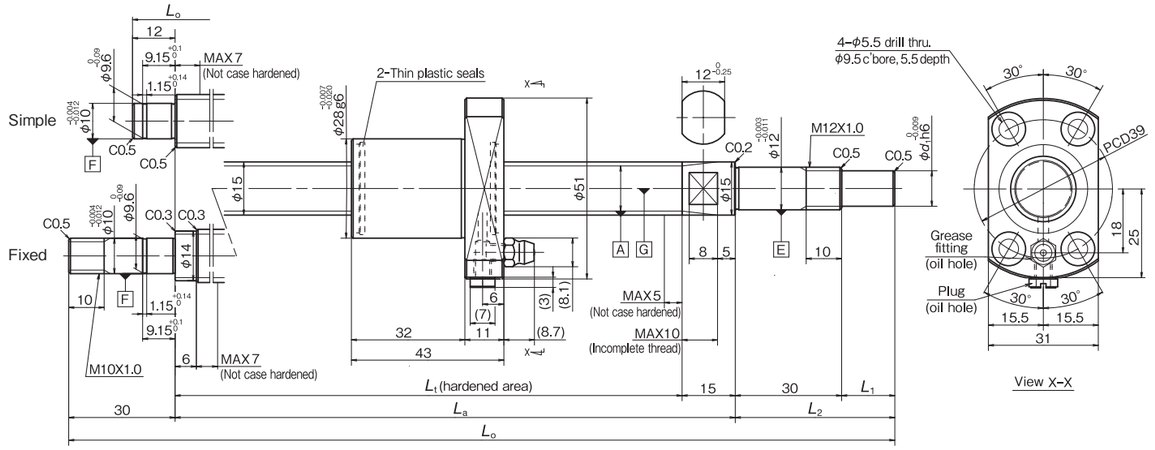
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

Compact FA PSS Type Screw shaft diameter ø15, Lead 10



Specification

Nut specification					Screw shaft dimensions (mm)						
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating Dynamic C_a (N)	Basic load rating Static C_{oa} (N)	Shaft end shape	Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
BSS1510-3E	15	10	6 530	10 200	Simple	86 to 1 224	101 to 1 239	158 to 1 296	1.0 to 50.0	31.0 to 80	6.0 to 10.0
					Fixed	86 to 1 206	107 to 1 221	182 to 1 296	1.0 to 50.0	31.0 to 80	6.0 to 10.0

Click!Speedy Reference Number

P S P 15 10 N 3 A B 1296 *

- Accuracy grade P : JIS C5 grade
- Nut code S : End Deflector Type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 3 : LR3 (see table 3)
- Lubrication component A : Axial direction (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication component

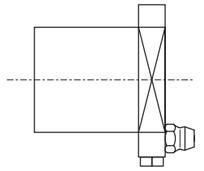
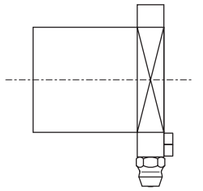
Code/Form	A : Axial direction (standard)	B : Radial direction
Shape		

Table 5 Nut direction/Shaft end shape code

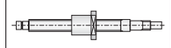
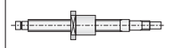
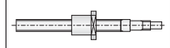
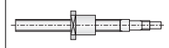
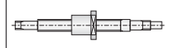
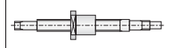
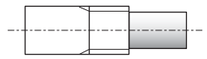
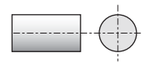
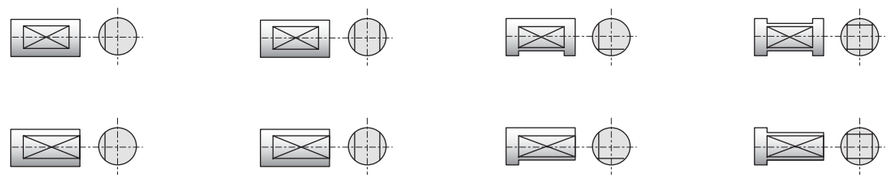
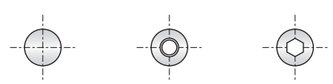
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed	Fixed – Fixed	Fixed – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free	Flange side : Drive side	Flange side : Opposite to drive side
Code	B	F	C	G	A	E
Shape						

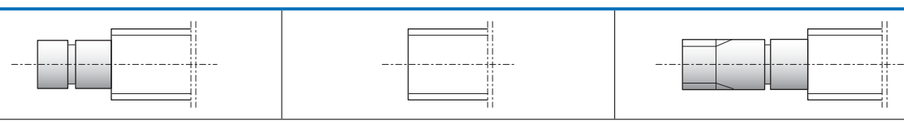
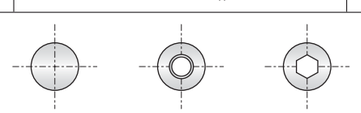
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

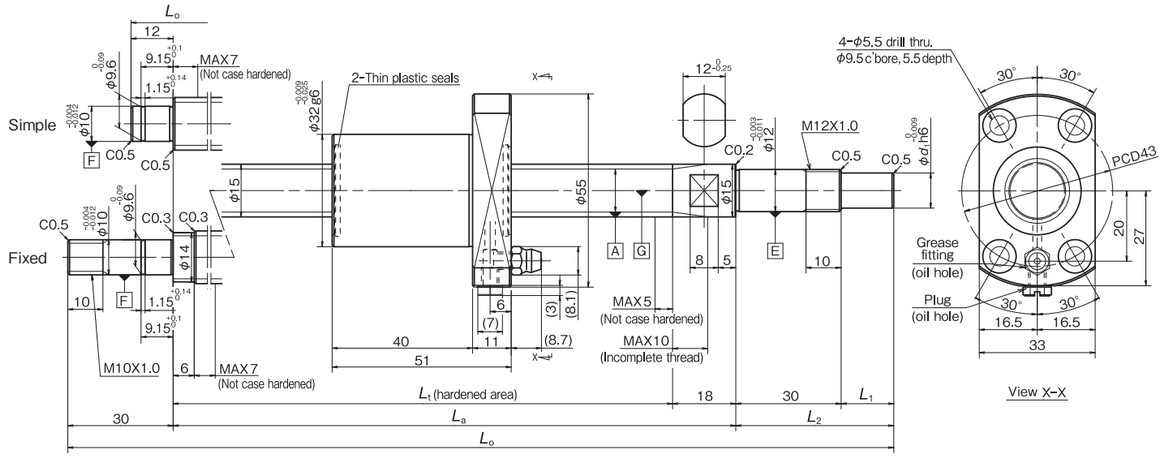
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

Compact FA PSS Type Screw shaft diameter ø15, Lead 20



Specification

Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating Dynamic C_a (N)	Basic load rating Static C_{oa} (N)	Shaft end shape	Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
BSS1520-2E	15	20	5 660	8 700	Simple	102 to 1 224	120 to 1 242	177 to 1 299	1.0 to 50.0	31.0 to 80	6.0 to 10.0
					Fixed	102 to 1 206	126 to 1 224	201 to 1 299	1.0 to 50.0	31.0 to 80	6.0 to 10.0

Click!Speedy Reference Number

P S P 15 20 N 3 A B 1299 *

- Accuracy grade P : JIS C5 grade
- Nut code S : End Deflector Type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 3 : LR3 (see table 3)
- Lubrication component A : Axial direction (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication component

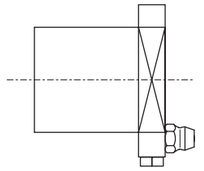
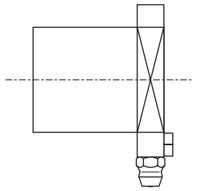
Code/Form	A : Axial direction (standard)	B : Radial direction
Shape		

Table 5 Nut direction/Shaft end shape code

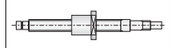
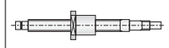
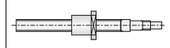
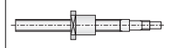
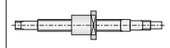
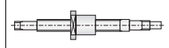
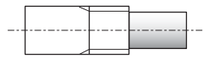
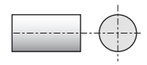
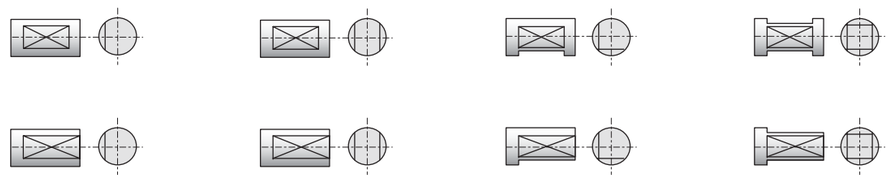
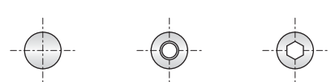
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed	Fixed – Fixed	Fixed – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free	Flange side : Drive side	Flange side : Opposite to drive side
Code	B	F	C	G	A	E
Shape						

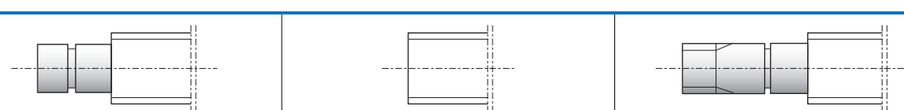
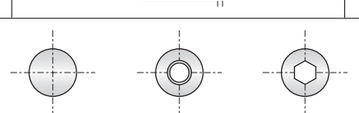
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

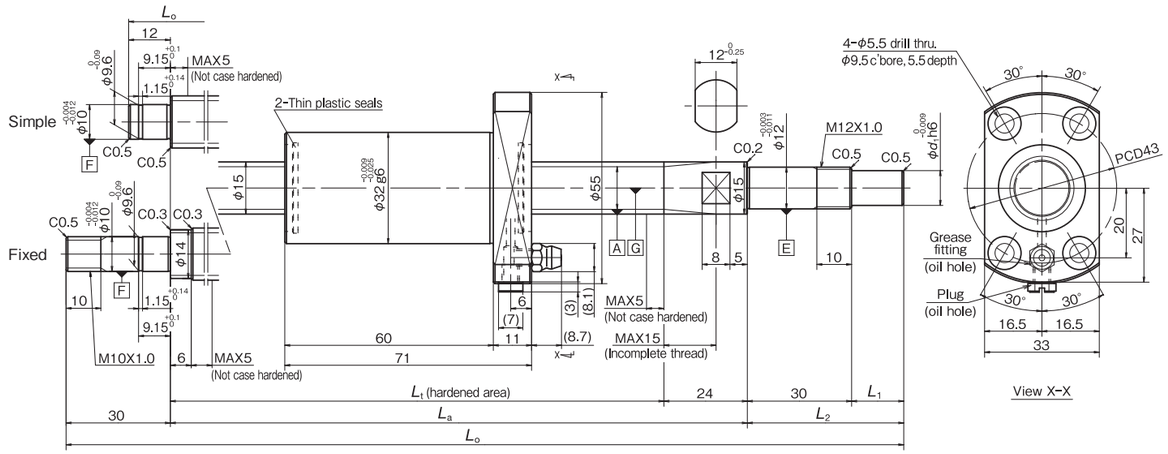
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

Compact FA PSS Type Screw shaft diameter ø15, Lead 30



Specification

Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating Dynamic Ca (N)	Basic load rating Static Coa (N)	Shaft end shape	Thread length Lt	Supported length La	Overall length Lo	Shaft end length L1	Shaft end length L2	Shaft end dia. d1
	Nut specification				Screw shaft dimensions (mm)						
BSS1530-2E	15	30	5 500	8 580	Simple	142 to 1 224	166 to 1 248	223 to 1 305	1.0 to 50.0	31.0 to 80	6.0 to 10.0
					Fixed	142 to 1 206	172 to 1 230	247 to 1 305	1.0 to 50.0	31.0 to 80	6.0 to 10.0

Click!Speedy Reference Number

P S P 15 30 N 3 A B 1305 *

- Accuracy grade P : JIS C5 grade
- Nut code S : End Deflector Type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 3 : LR3 (see table 3)
- Lubrication component A : Axial direction (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication component

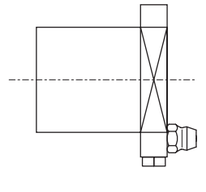
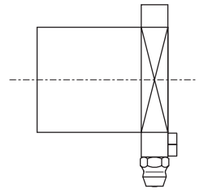
Code/Form	A : Axial direction (standard)	B : Radial direction
Shape		

Table 5 Nut direction/Shaft end shape code

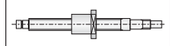
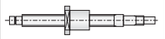
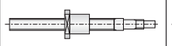
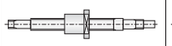
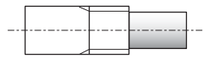
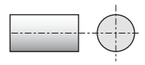
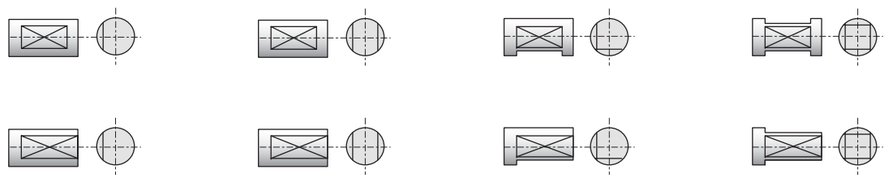
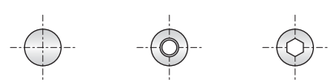
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed	Fixed – Fixed	Fixed – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free	Flange side : Drive side	Flange side : Opposite to drive side
Code	B	F	C	G	A	E
Shape						

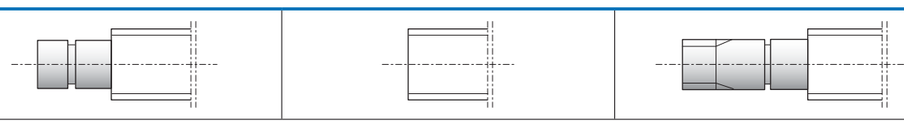
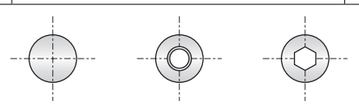
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

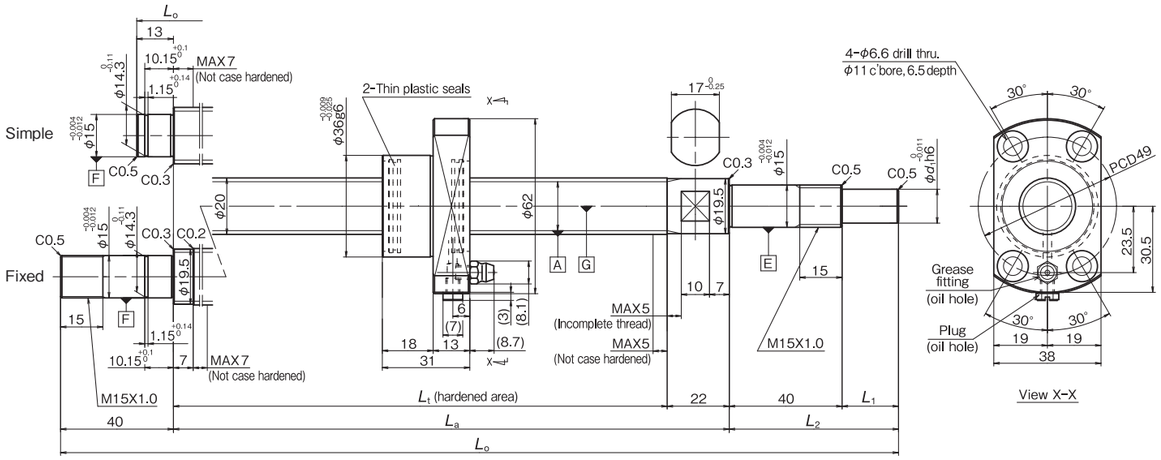
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

Compact FA PSS Type Screw shaft diameter ø20, Lead 5



Specification

Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating Dynamic Ca (N)	Basic load rating Static Coa (N)	Shaft end shape	Thread length Lt	Supported length La	Overall length Lo	Shaft end length L1	Shaft end length L2	Shaft end dia. d1
BSS2005-3E	20	5	10 400	18 500	Simple	62 to 934	84 to 956	157 to 1 029	1.0 to 60.0	41 to 100	6.0 to 12.0
					Fixed	62 to 907	91 to 929	191 to 1 029	1.0 to 60.0	41 to 100	6.0 to 12.0

Click!Speedy Reference Number

P S P 20 05 N 3 A B 1029 ***

- Accuracy grade P : JIS C5 grade
- Nut code S : End Deflector Type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 3 : LR3 (see table 3)
- Lubrication component A : Axial direction (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication component

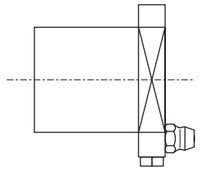
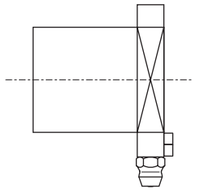
Code/Form	A : Axial direction (standard)	B : Radial direction
Shape		

Table 5 Nut direction/Shaft end shape code

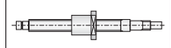
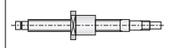
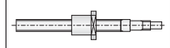
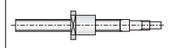
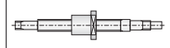
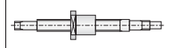
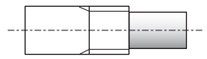
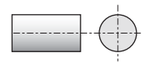
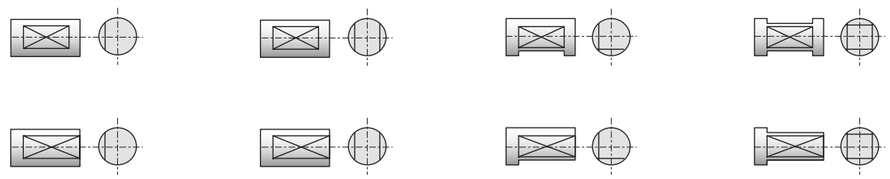
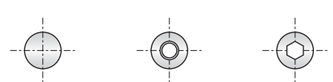
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed	Fixed – Fixed	Fixed – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free	Flange side : Drive side	Flange side : Opposite to drive side
Code	B	F	C	G	A	E
Shape						

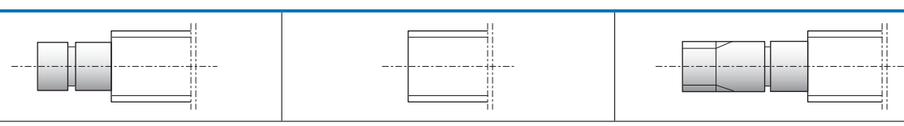
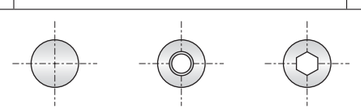
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

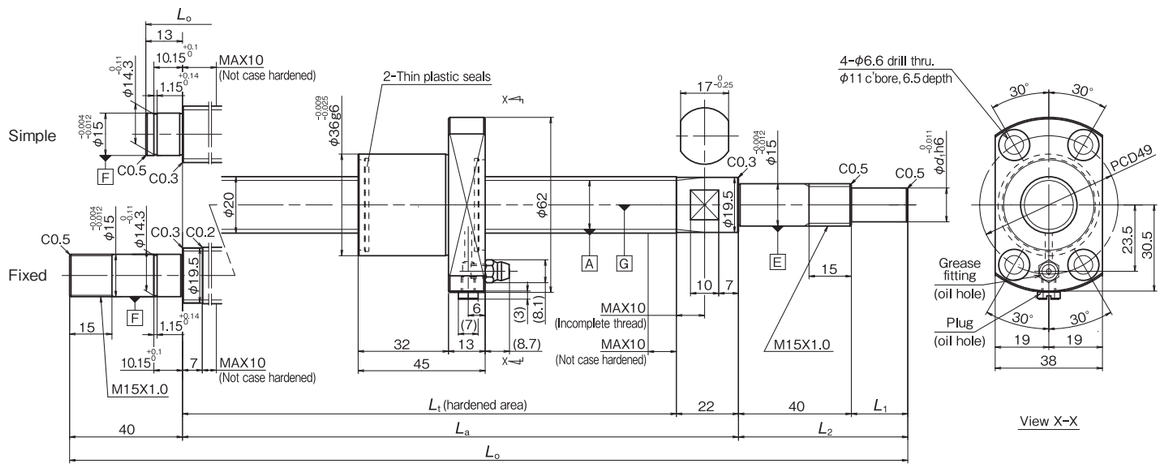
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

Compact FA PSS Type Screw shaft diameter ø20, Lead 10



Specification

Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating Dynamic Ca (N)	Basic load rating Static Coa (N)	Shaft end shape	Thread length Lt	Supported length La	Overall length Lo	Shaft end length L1	Shaft end length L2	Shaft end dia. d1
BSS2010-3E	20	10	10 200	18 600	Simple	90 to 1 334	112 to 1 356	185 to 1 429	1.0 to 60.0	41 to 100	6.0 to 12.0
					Fixed	90 to 1 307	119 to 1 329	219 to 1 429	1.0 to 60.0	41 to 100	6.0 to 12.0

Click!Speedy Reference Number

P S P 20 10 N 3 A B 1429 ***

- Accuracy grade P : JIS C5 grade
- Nut code S : End Deflector Type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 3 : LR3 (see table 3)
- Lubrication component A : Axial direction (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication component

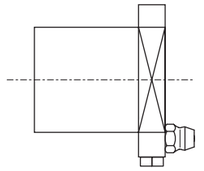
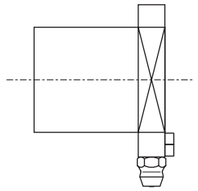
Code/Form	A : Axial direction (standard)	B : Radial direction
Shape		

Table 5 Nut direction/Shaft end shape code

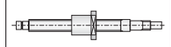
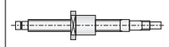
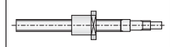
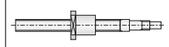
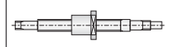
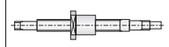
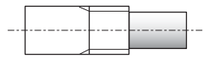
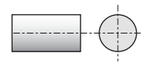
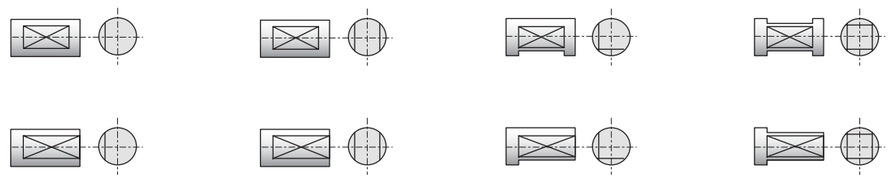
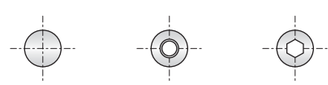
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed	Fixed – Fixed	Fixed – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free	Flange side : Drive side	Flange side : Opposite to drive side
Code	B	F	C	G	A	E
Shape						

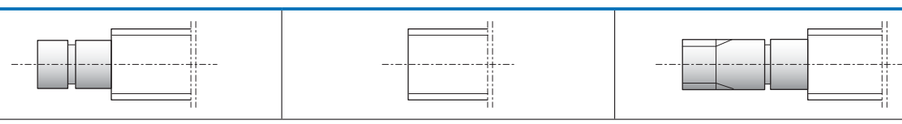
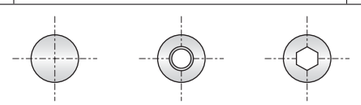
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

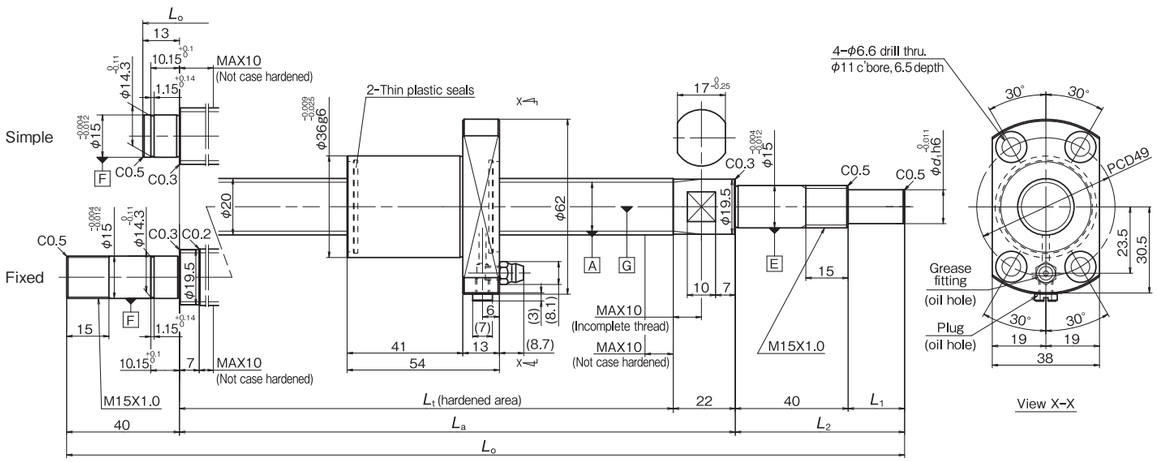
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

Compact FA PSS Type Screw shaft diameter ø20, Lead 20



Specification

Nut specification					Screw shaft dimensions (mm)						
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Shaft end shape	Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
			Dynamic C_a (N)	Static C_{oa} (N)							
BSS2020-2E	20	20	6 790	11 800	Simple	108 to 1 834	130 to 1 856	203 to 1 929	1.0 to 60.0	41 to 100	6.0 to 12.0
					Fixed	108 to 1 807	137 to 1 829	237 to 1 929	1.0 to 60.0	41 to 100	6.0 to 12.0

Click!Speedy Reference Number

P S P 20 20 N 3 A B 1929 *

- Accuracy grade P : JIS C5 grade
- Nut code S : End Deflector Type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 3 : LR3 (see table 3)
- Lubrication component A : Axial direction (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication component

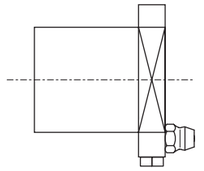
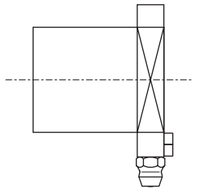
Code/Form	A : Axial direction (standard)	B : Radial direction
Shape		

Table 5 Nut direction/Shaft end shape code

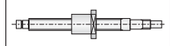
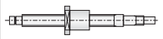
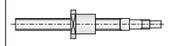
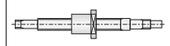
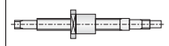
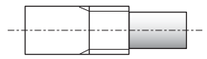
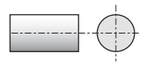
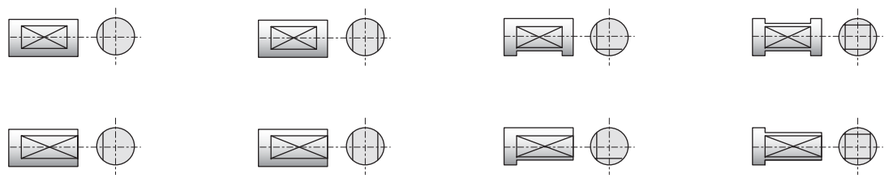
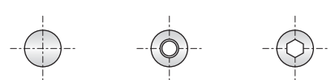
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed	Fixed – Fixed	Fixed – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free	Flange side : Drive side	Flange side : Opposite to drive side
Code	B	F	C	G	A	E
Shape						

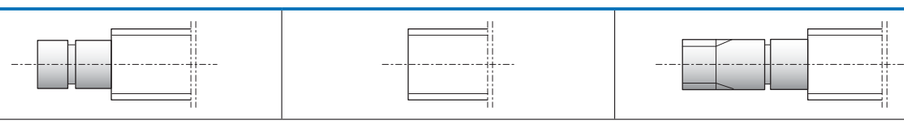
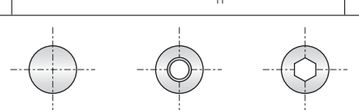
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

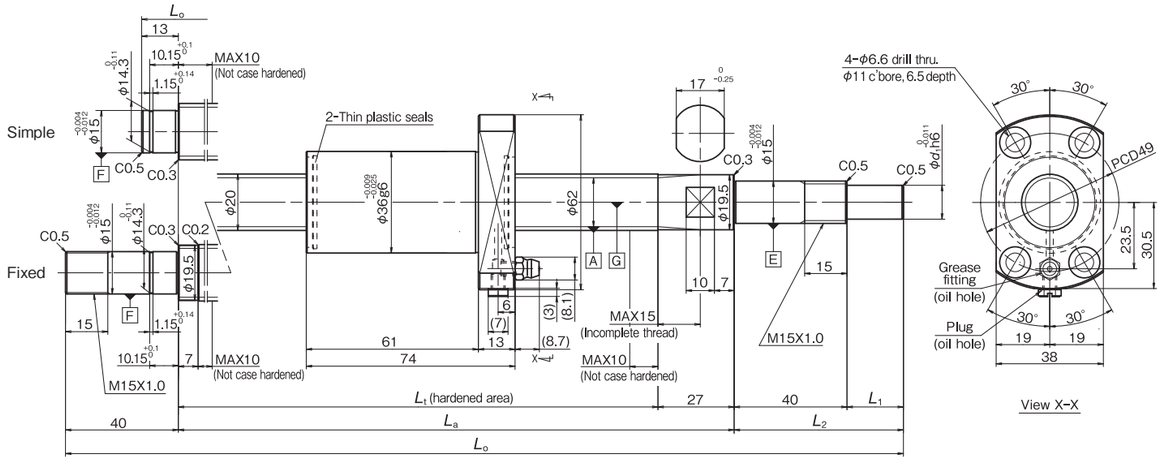
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

Compact FA PSS Type Screw shaft diameter ø20, Lead 30



Specification

Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating Dynamic Ca (N)	Basic load rating Static Coa (N)	Shaft end shape	Thread length Lt	Supported length La	Overall length Lo	Shaft end length L1	Shaft end length L2	Shaft end dia. d1
BSS2030-2E	20	30	6 550	11 800	Simple	148 to 1 384	175 to 1 411	248 to 1 484	1.0 to 60.0	41 to 100	6.0 to 12.0
					Fixed	148 to 1 357	182 to 1 384	282 to 1 484	1.0 to 60.0	41 to 100	6.0 to 12.0

Click!Speedy Reference Number

P S P 20 30 N 3 A B 1484 ***

- Accuracy grade P : JIS C5 grade
- Nut code S : End Deflector Type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 3 : LR3 (see table 3)
- Lubrication component A : Axial direction (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication component

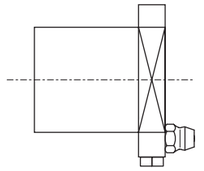
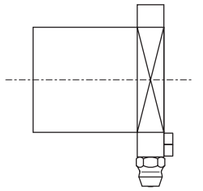
Code/Form	A : Axial direction (standard)	B : Radial direction
Shape		

Table 5 Nut direction/Shaft end shape code

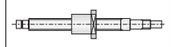
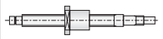
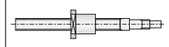
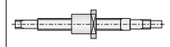
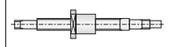
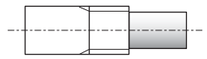
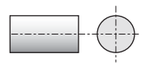
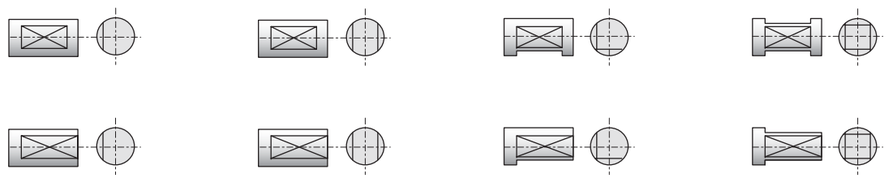
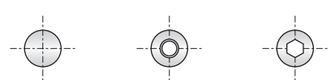
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed	Fixed – Fixed	Fixed – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free	Flange side : Drive side	Flange side : Opposite to drive side
Code	B	F	C	G	A	E
Shape						

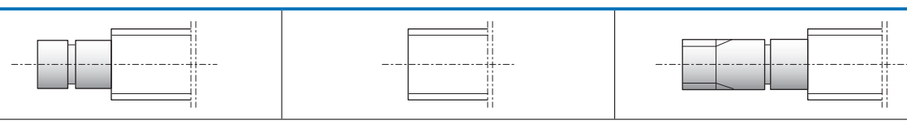
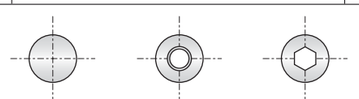
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

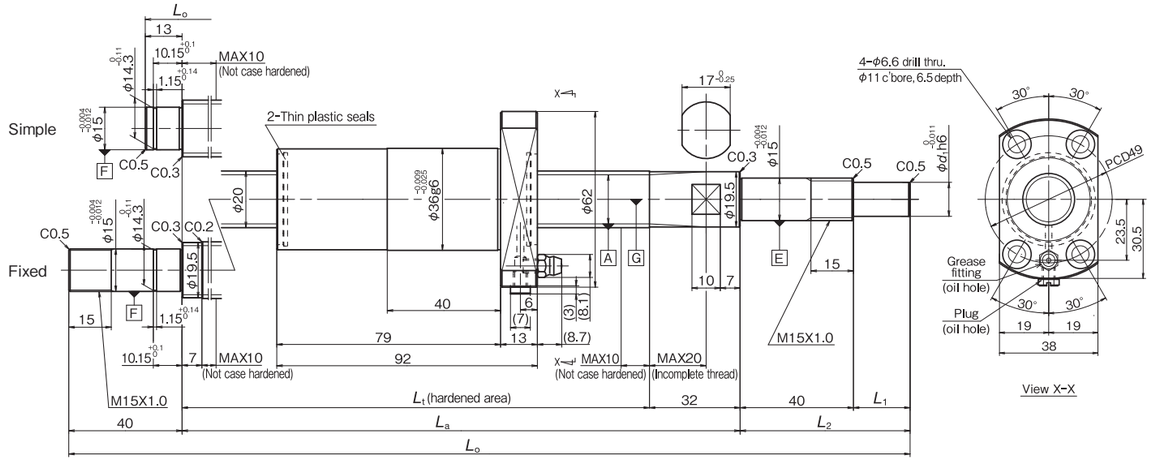
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

Compact FA PSS Type Screw shaft diameter ø20, Lead 40



Specification

Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating Dynamic C_a (N)	Basic load rating Static C_{oa} (N)	Shaft end shape	Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
	Nut specification				Screw shaft dimensions (mm)						
BSS2040-2E	20	40	6 380	11 600	Simple	184 to 2 234	216 to 2 266	289 to 2 339	1.0 to 60.0	41 to 100	6.0 to 12.0
					Fixed	184 to 2 207	223 to 2 239	323 to 2 339	1.0 to 60.0	41 to 100	6.0 to 12.0

Click!Speedy Reference Number

P S P 20 40 N 3 A B 2339 *

- Accuracy grade P : JIS C5 grade
- Nut code S : End Deflector Type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 3 : LR3 (see table 3)
- Lubrication component A : Axial direction (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication component

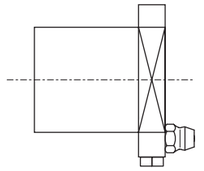
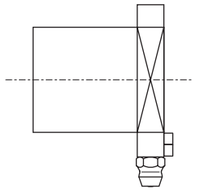
Code/Form	A : Axial direction (standard)	B : Radial direction
Shape		

Table 5 Nut direction/Shaft end shape code

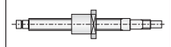
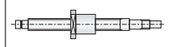
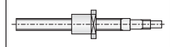
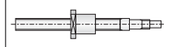
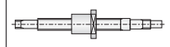
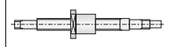
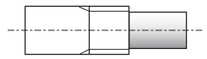
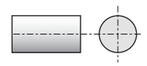
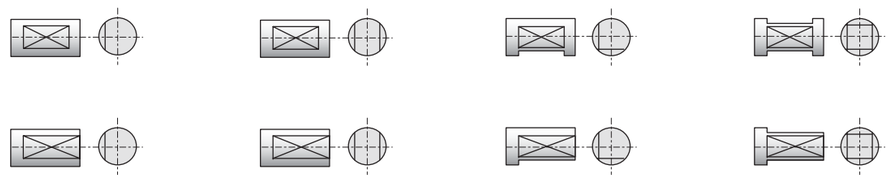
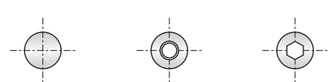
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed	Fixed – Fixed	Fixed – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free	Flange side : Drive side	Flange side : Opposite to drive side
Code	B	F	C	G	A	E
Shape						

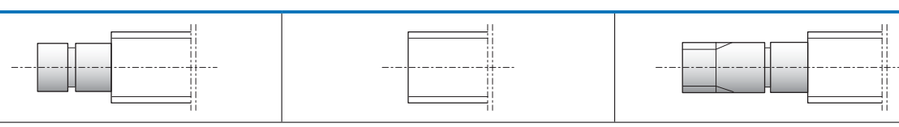
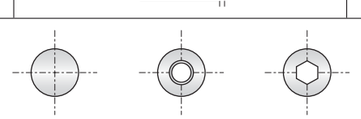
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

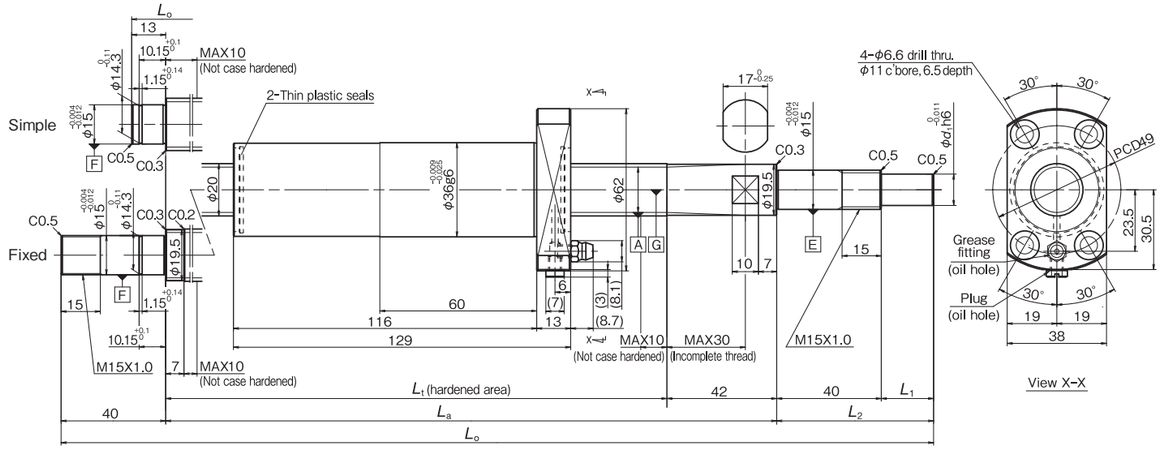
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

Compact FA PSS Type Screw shaft diameter ø20, Lead 60



Specification

Nut specification					Screw shaft dimensions (mm)						
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating Dynamic C_a (N)	Basic load rating Static C_{oa} (N)	Shaft end shape	Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
BSS2060-2E	20	60	5 680	11 800	Simple	258 to 2 234	300 to 2 276	373 to 2 349	1.0 to 60.0	41 to 100	6.0 to 12.0
					Fixed	258 to 2 207	307 to 2 249	407 to 2 349	1.0 to 60.0	41 to 100	6.0 to 12.0

Click!Speedy Reference Number

P S P 20 60 N 3 A B 2349 *

- Accuracy grade P : JIS C5 grade
- Nut code S : End Deflector Type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 3 : LR3 (see table 3)
- Lubrication component A : Axial direction (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication component

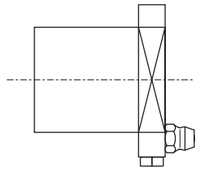
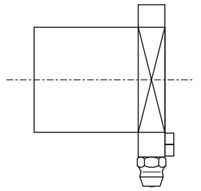
Code/Form	A : Axial direction (standard)	B : Radial direction
Shape		

Table 5 Nut direction/Shaft end shape code

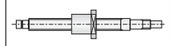
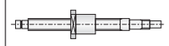
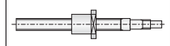
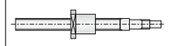
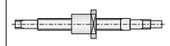
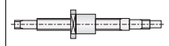
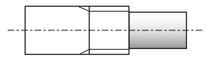
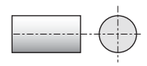
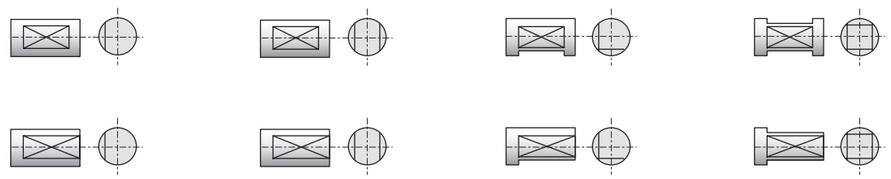
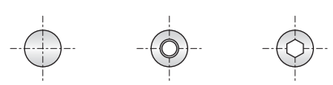
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed	Fixed – Fixed	Fixed – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free	Flange side : Drive side	Flange side : Opposite to drive side
Code	B	F	C	G	A	E
Shape						

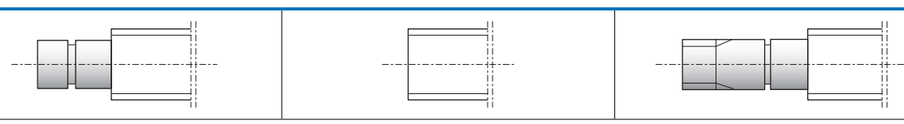
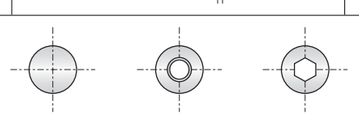
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

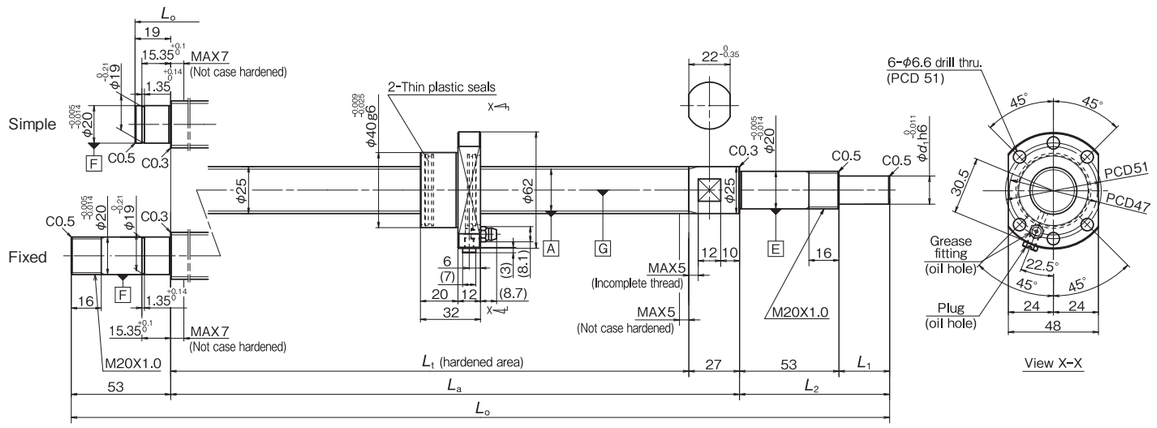
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

Compact FA PSS Type Screw shaft diameter ø25, Lead 5



Specification

Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating Dynamic Ca (N)	Basic load rating Static Coa (N)	Shaft end shape	Thread length Lt	Supported length La	Overall length Lo	Shaft end length L1	Shaft end length L2	Shaft end dia. d1
BSS2505-3E	25	5	11 500	23 500	Simple	64 to 1 134	91 to 1 161	190 to 1 260	1.0 to 75.0	54 to 128	8.0 to 15.0
					Fixed	64 to 1 100	91 to 1 127	224 to 1 260	1.0 to 75.0	54 to 128	8.0 to 15.0

Click!Speedy Reference Number

P S P 25 05 N 3 A B 1260 ***

- Accuracy grade P : JIS C5 grade
- Nut code S : End Deflector Type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 3 : LR3 (see table 3)
- Lubrication component A : Axial direction (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication component

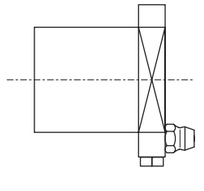
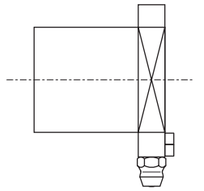
Code/Form	A : Axial direction (standard)	B : Radial direction
Shape		

Table 5 Nut direction/Shaft end shape code

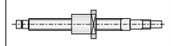
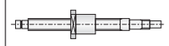
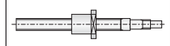
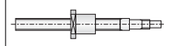
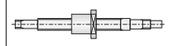
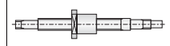
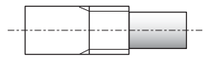
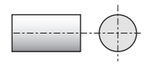
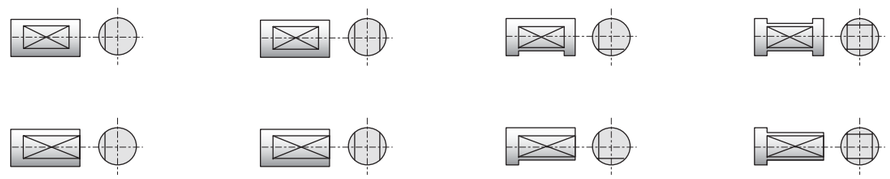
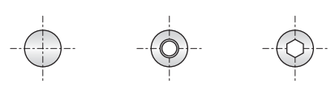
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed	Fixed – Fixed	Fixed – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free	Flange side : Drive side	Flange side : Opposite to drive side
Code	B	F	C	G	A	E
Shape						

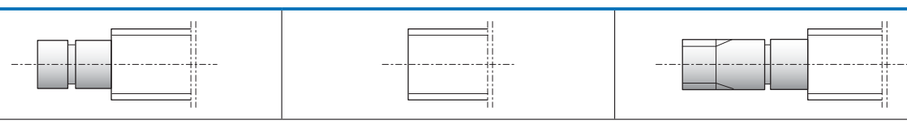
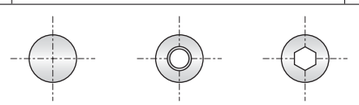
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

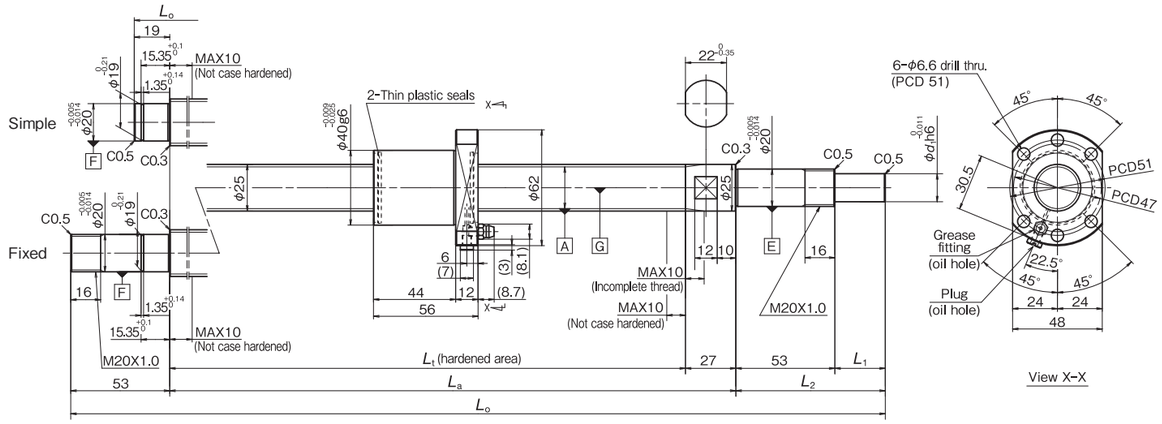
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

Compact FA PSS Type Screw shaft diameter ø25, Lead 10



Specification

Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating Dynamic Ca (N)	Basic load rating Static Coa (N)	Shaft end shape	Thread length Lt	Supported length La	Overall length Lo	Shaft end length L1	Shaft end length L2	Shaft end dia. d1
BSS2510-4E	25	10	15 000	32 400	Simple	112 to 1 834	139 to 1 861	238 to 1 960	1.0 to 75.0	54 to 128	8.0 to 15.0
					Fixed	112 to 1 800	139 to 1 827	272 to 1 960	1.0 to 75.0	54 to 128	8.0 to 15.0

Click!Speedy Reference Number

P S P 25 10 N 3 A B 1960 ***

- Accuracy grade P : JIS C5 grade
- Nut code S : End Deflector Type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 3 : LR3 (see table 3)
- Lubrication component A : Axial direction (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication component

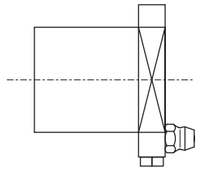
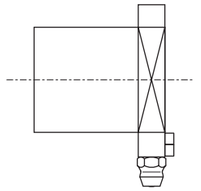
Code/Form	A : Axial direction (standard)	B : Radial direction
Shape		

Table 5 Nut direction/Shaft end shape code

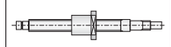
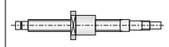
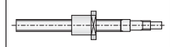
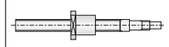
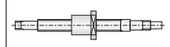
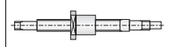
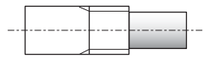
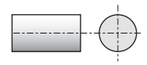
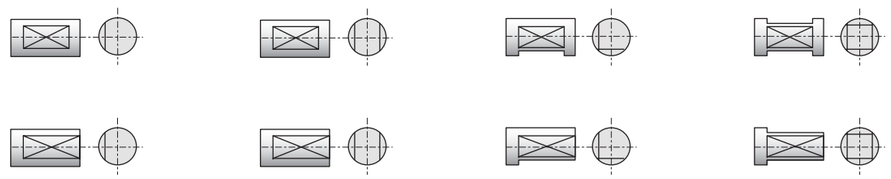
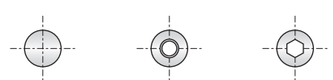
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed	Fixed – Fixed	Fixed – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free	Flange side : Drive side	Flange side : Opposite to drive side
Code	B	F	C	G	A	E
Shape						

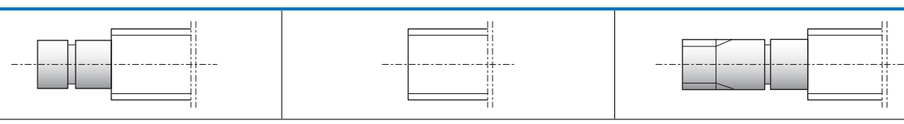
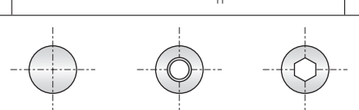
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

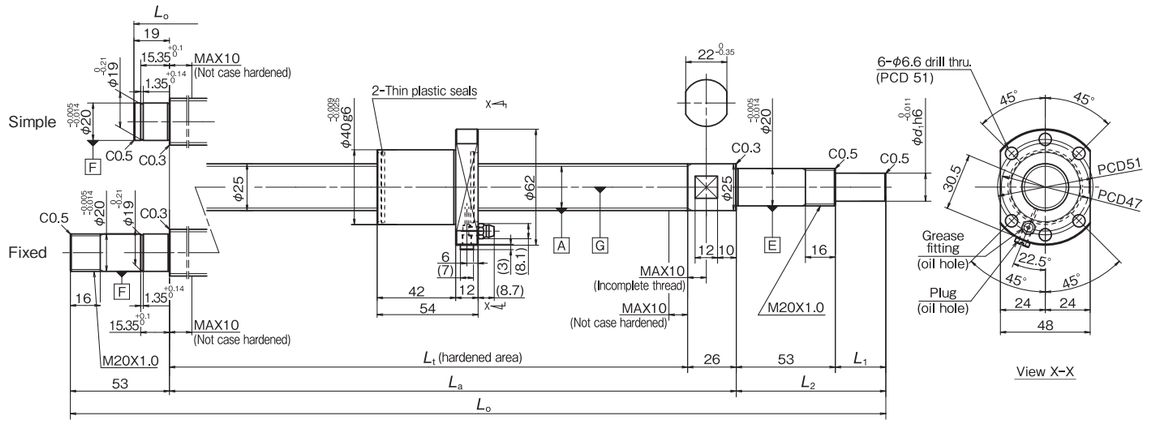
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

Compact FA PSS Type Screw shaft diameter ø25, Lead 20



Specification

Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating Dynamic Ca (N)	Basic load rating Static Coa (N)	Shaft end shape	Thread length Lt	Supported length La	Overall length Lo	Shaft end length L1	Shaft end length L2	Shaft end dia. d1
BSS2520-2E	25	20	7 650	14 800	Simple	108 to 2 234	134 to 2 260	233 to 2 359	1.0 to 75.0	54 to 128	8.0 to 15.0
					Fixed	108 to 2 200	134 to 2 226	267 to 2 359	1.0 to 75.0	54 to 128	8.0 to 15.0

Click!Speedy Reference Number

P S P 25 20 N 3 A B 2359 ***

- Accuracy grade P : JIS C5 grade
- Nut code S : End Deflector Type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 3 : LR3 (see table 3)
- Lubrication component A : Axial direction (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication component

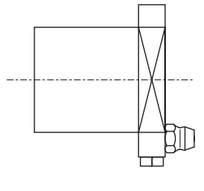
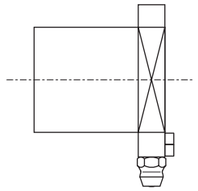
Code/Form	A : Axial direction (standard)	B : Radial direction
Shape		

Table 5 Nut direction/Shaft end shape code

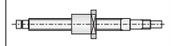
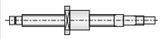
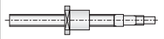
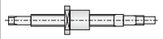
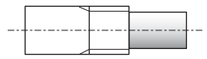
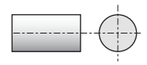
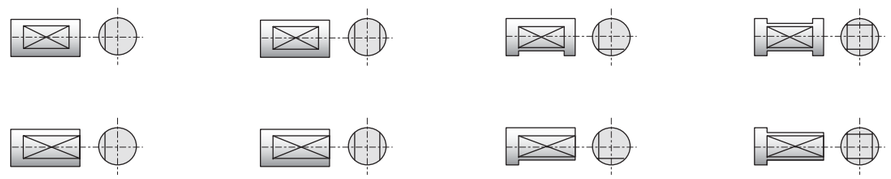
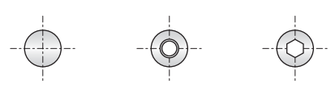
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed	Fixed – Fixed	Fixed – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free	Flange side : Drive side	Flange side : Opposite to drive side
Code	B	F	C	G	A	E
Shape						

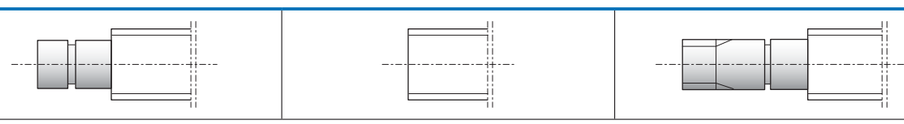
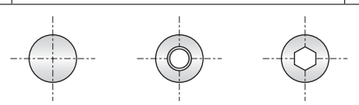
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

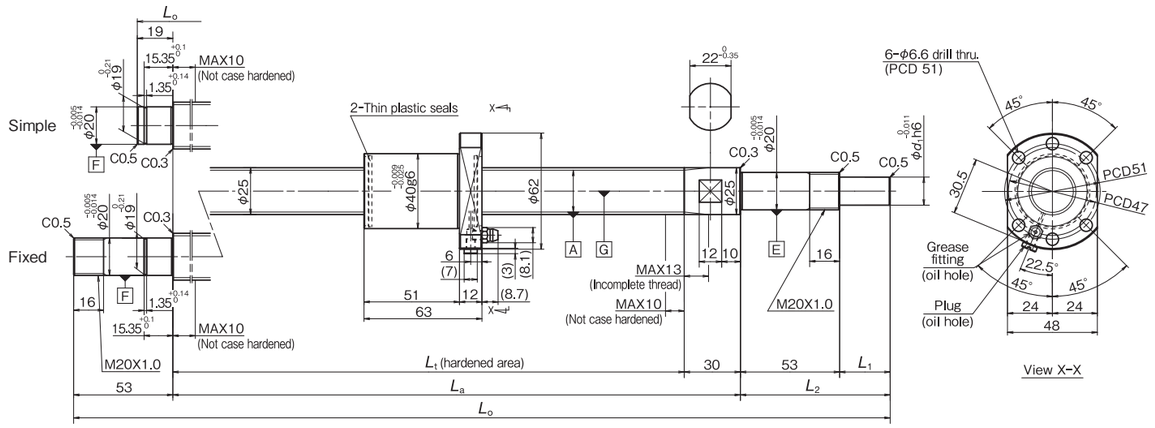
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

Compact FA PSS Type Screw shaft diameter ø25, Lead 25



Specification

Nut specification					Screw shaft dimensions (mm)						
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating Dynamic C_a (N)	Basic load rating Static C_{oa} (N)	Shaft end shape	Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
BSS2525-2E	25	25	7 490	14 600	Simple	126 to 2 234	156 to 2 264	255 to 2 363	1.0 to 75.0	54 to 128	8.0 to 15.0
					Fixed	126 to 2 200	156 to 2 230	289 to 2 363	1.0 to 75.0	54 to 128	8.0 to 15.0

Click!Speedy Reference Number

P S P 25 25 N 3 A B 2363 *

- Accuracy grade P : JIS C5 grade
- Nut code S : End Deflector Type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Design serial number
- Overall length of shaft (mm)
- Nut direction/Shaft end shape code (see table 5)
- Lubrication component A : Axial direction (see table 4)
- Lubricant code 3 : LR3 (see table 3)
- Surface treatment N : None (see table 2)

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication component

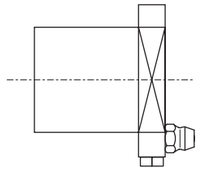
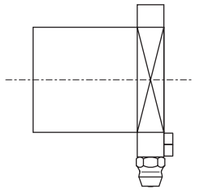
Code/Form	A : Axial direction (standard)	B : Radial direction
Shape		

Table 5 Nut direction/Shaft end shape code

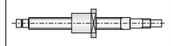
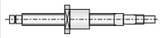
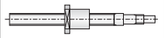
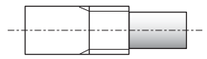
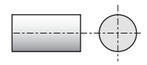
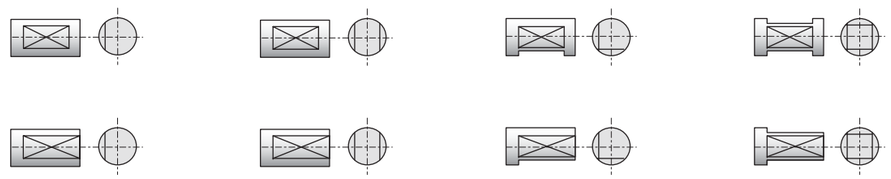
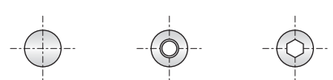
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed	Fixed – Fixed	Fixed – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free	Flange side : Drive side	Flange side : Opposite to drive side
Code	B	F	C	G	A	E
Shape						

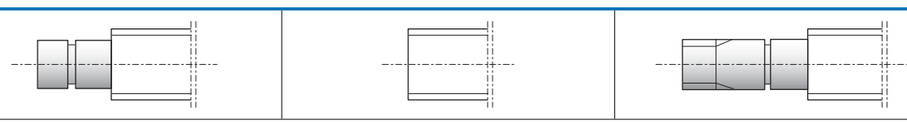
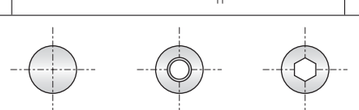
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

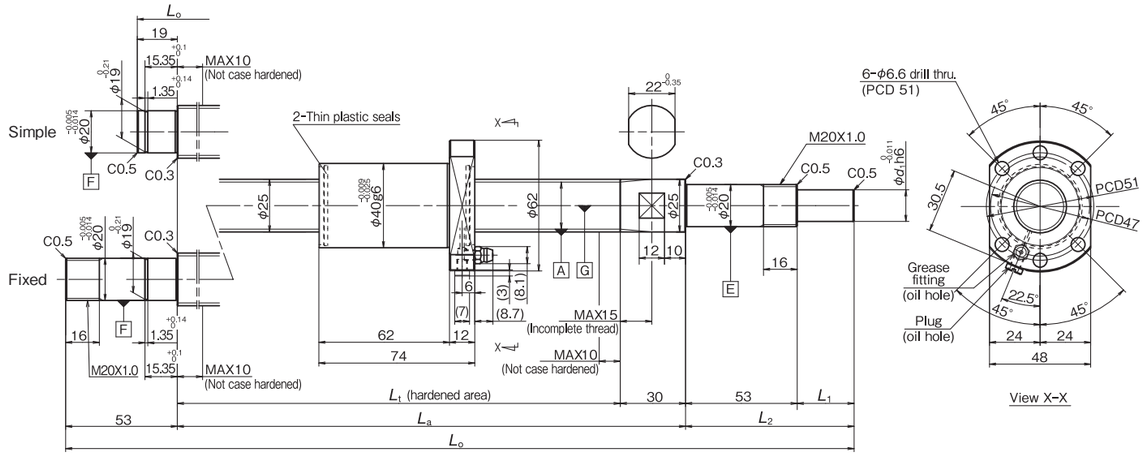
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

Compact FA PSS Type Screw shaft diameter ø25, Lead 30



Specification

Nut specification					Screw shaft dimensions (mm)						
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating Dynamic C_a (N)	Basic load rating Static C_{oa} (N)	Shaft end shape	Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
BSS2530-2E	25	30	7 490	14 600	Simple	148 to 2 234	178 to 2 264	277 to 2 363	1.0 to 75.0	54 to 128	8.0 to 15.0
					Fixed	148 to 2 200	178 to 2 230	311 to 2 363	1.0 to 75.0	54 to 128	8.0 to 15.0

Click!Speedy Reference Number

P S P 25 30 N 3 A B 2363 *

- Accuracy grade P : JIS C5 grade
- Nut code S : End Deflector Type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 3 : LR3 (see table 3)
- Lubrication component A : Axial direction (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
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LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication component

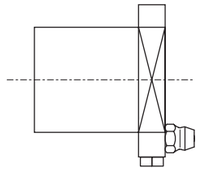
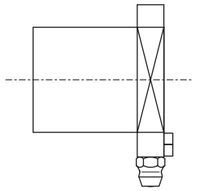
Code/Form	A : Axial direction (standard)	B : Radial direction
Shape		

Table 5 Nut direction/Shaft end shape code

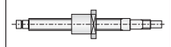
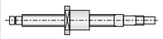
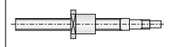
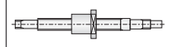
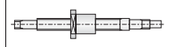
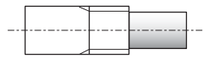
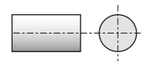
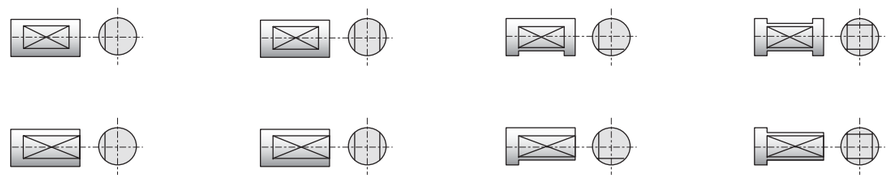
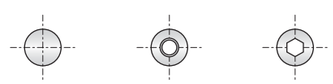
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed	Fixed – Fixed	Fixed – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free	Flange side : Drive side	Flange side : Opposite to drive side
Code	B	F	C	G	A	E
Shape						

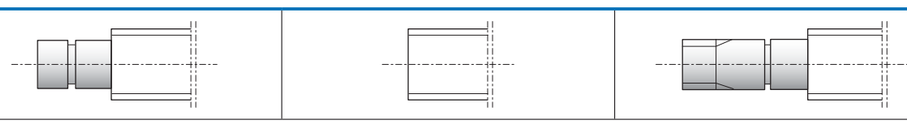
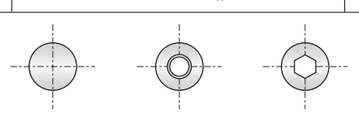
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

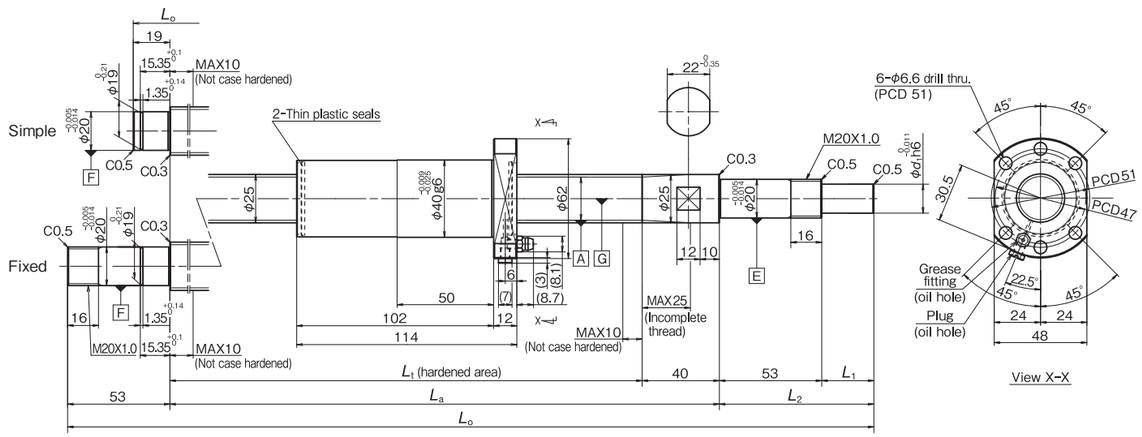
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

Compact FA PSS Type Screw shaft diameter ø25, Lead 50



Specification

Model No.	Nut specification: Screw shaft diameter (mm)	Nut specification: Lead (mm)	Nut specification: Basic load rating Dynamic C_a (N)	Nut specification: Basic load rating Static C_{oa} (N)	Screw shaft dimensions (mm): Shaft end shape	Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
BSS2550-2E	25	50	6 910	14 700	Simple	228 to 2 234	268 to 2 274	367 to 2 373	1.0 to 75.0	54 to 128	8.0 to 15.0
					Fixed	228 to 2 200	268 to 2 240	401 to 2 373	1.0 to 75.0	54 to 128	8.0 to 15.0

Click!Speedy Reference Number

P S P 25 50 N 3 A B 2373 *

- Accuracy grade P : JIS C5 grade
- Nut code S : End Deflector Type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 3 : LR3 (see table 3)
- Lubrication component A : Axial direction (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication component

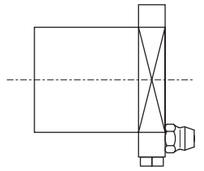
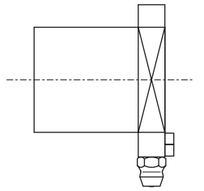
Code/Form	A : Axial direction (standard)	B : Radial direction
Shape		

Table 5 Nut direction/Shaft end shape code

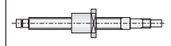
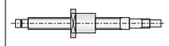
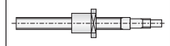
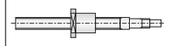
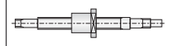
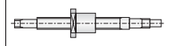
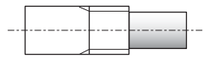
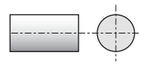
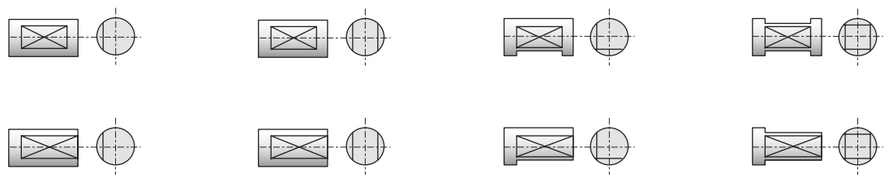
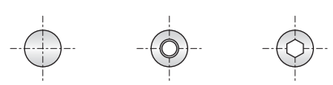
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed	Fixed – Fixed	Fixed – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free	Flange side : Drive side	Flange side : Opposite to drive side
Code	B	F	C	G	A	E
Shape						

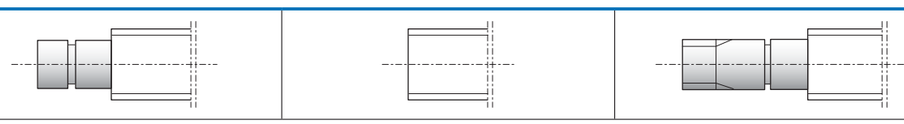
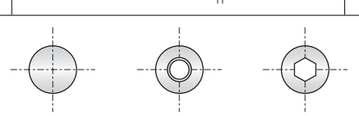
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

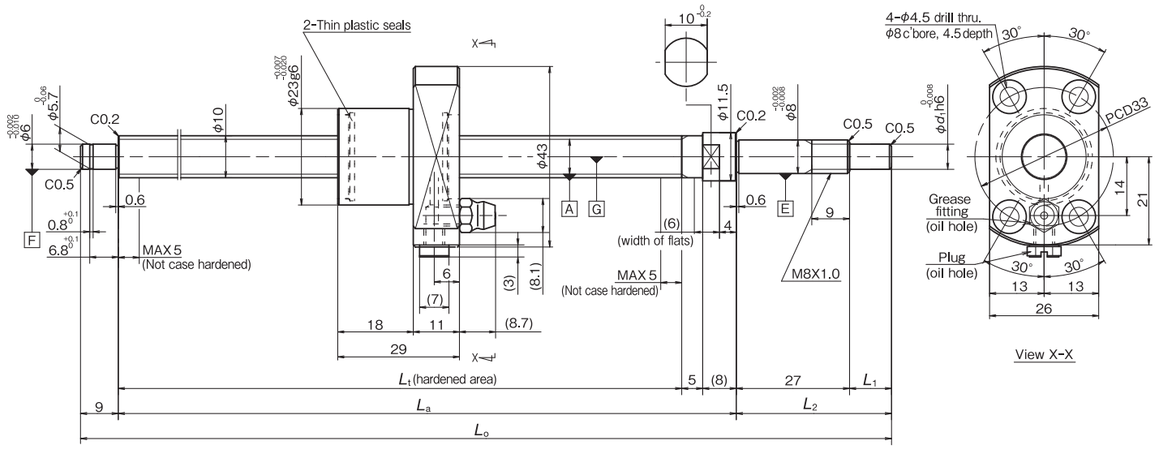
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

Compact FA High precision USS Type Screw shaft diameter ø10, Lead 5



Specification

Nut specification					Screw shaft dimensions (mm)					
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
			Dynamic C_a (N)	Static C_{oa} (N)						
BSS1005-3E	10	5	3 420	4 840	58.0 to 479	71.0 to 492	108 to 529	1.0 to 30.0	28.0 to 57.0	3.0 to 6.0

Click!Speedy Reference Number

U S P 10 05 N 4 A B 0529 *

- Accuracy grade U : JIS C3 grade
- Nut code S : End Deflector Type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 4: LG2 (see table 3)
- Lubrication component A : Axial direction (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication component

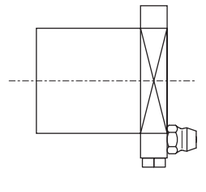
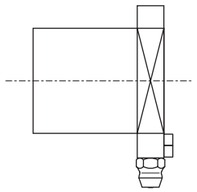
Code/Form	A : Axial direction (standard)	B : Radial direction
Shape		

Table 5 Nut direction/Shaft end shape code

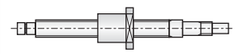
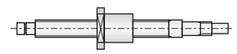
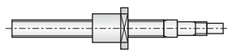
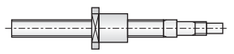
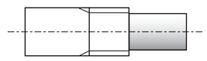
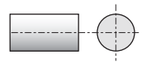
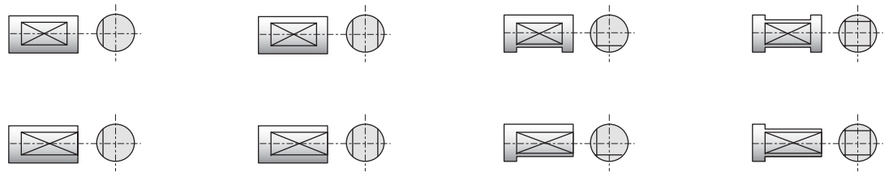
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free
Code	B	F	C	G
Shape				

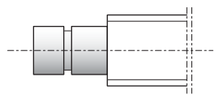
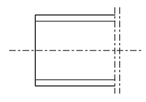
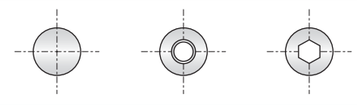
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

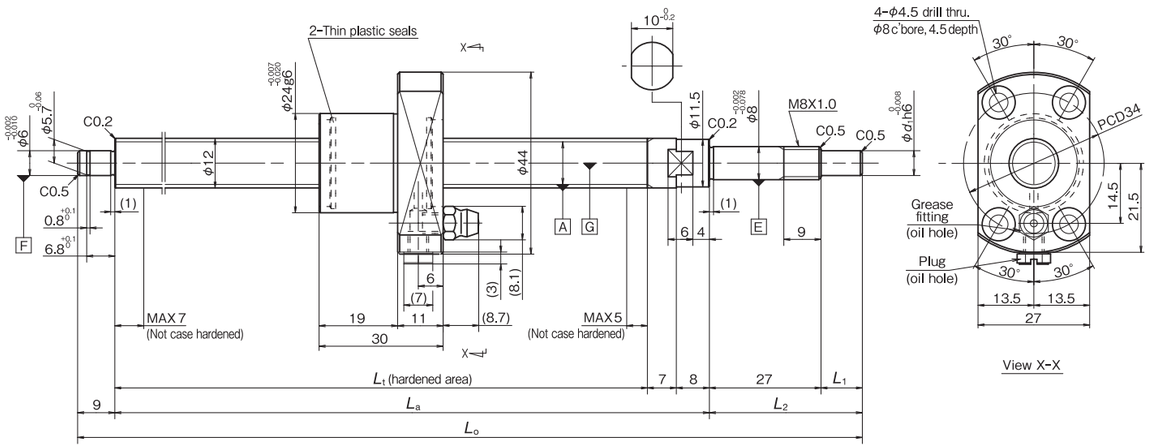
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	

2. Shaft end shape of simple support side

Additional element		
Shaft end		

Compact FA High precision USS Type Screw shaft diameter ø12, Lead 5



Specification

Model No.	Nut specification: Screw shaft diameter (mm)	Lead (mm)	Basic load rating: Dynamic Ca (N)	Basic load rating: Static Coa (N)	Screw shaft dimensions (mm): Thread length Lt	Supported length La	Overall length Lo	Shaft end length L1	Shaft end length L2	Shaft end dia. d1
BSS1205-3E	12	5	3 750	5 810	60.0 to 609	75.0 to 624	112 to 661	1.0 to 30.0	28.0 to 57.0	3.0 to 6.0

Click!Speedy Reference Number

U S P 12 05 N 4 A B 0661 *

- Accuracy grade U : JIS C3 grade
- Nut code S : End Deflector Type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 4: LG2 (see table 3)
- Lubrication component A : Axial direction (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication component

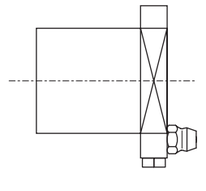
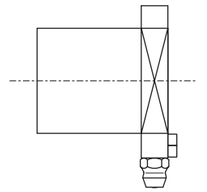
Code/Form	A : Axial direction (standard)	B : Radial direction
Shape		

Table 5 Nut direction/Shaft end shape code

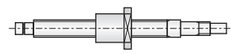
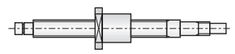
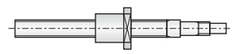
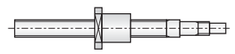
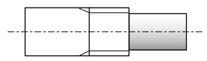
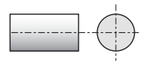
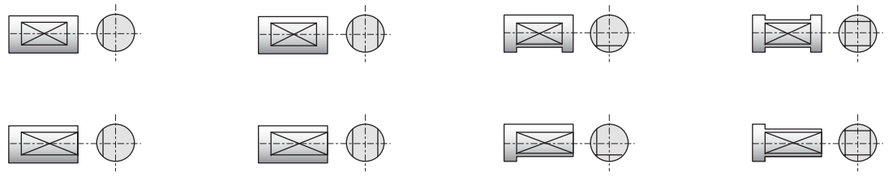
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free
Code	B	F	C	G
Shape				

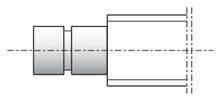
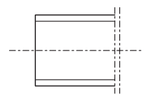
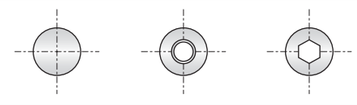
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

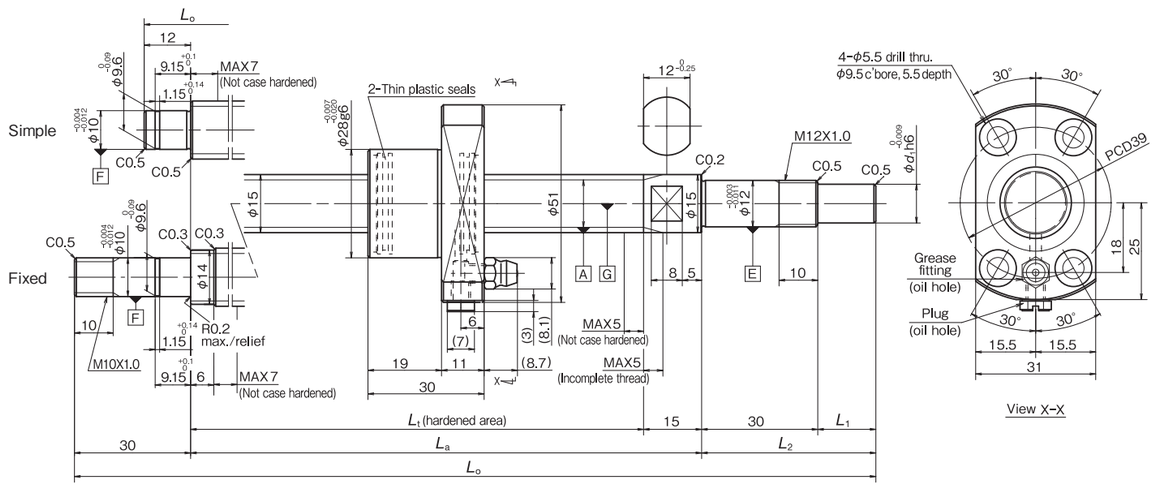
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	

2. Shaft end shape of simple support side

Additional element		
Shaft end		

Compact FA High precision USS Type Screw shaft diameter ø15, Lead 5



Specification

Nut specification					Screw shaft dimensions (mm)						
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Shaft end shape	Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
			Dynamic C_a (N)	Static C_{oa} (N)							
BSS1505-3E	15	5	6 410	10 100	Simple	60 to 724	75 to 739	132 to 796	1.0 to 50.0	31.0 to 80	6.0 to 10.0
					Fixed	60 to 700	81 to 721	156 to 796	1.0 to 50.0	31.0 to 80	6.0 to 10.0

Click!Speedy Reference Number

U S P 15 05 N 4 A B 0796 *

- Accuracy grade U : JIS C3 grade
- Nut code S : End Deflector Type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 4: LG2 (see table 3)
- Lubrication component A : Axial direction (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

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Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication component

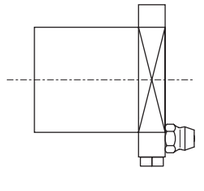
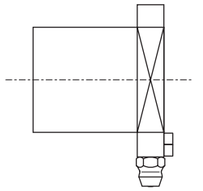
Code/Form	A : Axial direction (standard)	B : Radial direction
Shape		

Table 5 Nut direction/Shaft end shape code

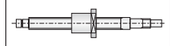
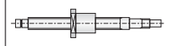
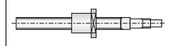
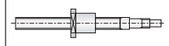
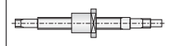
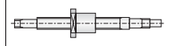
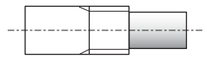
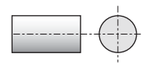
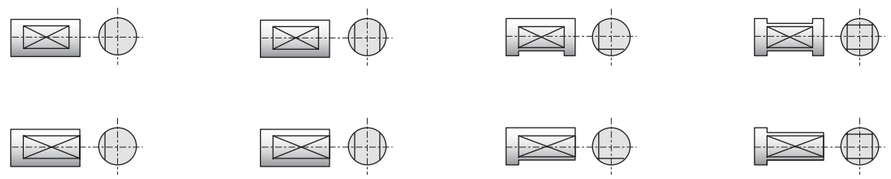
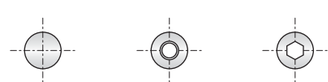
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed	Fixed – Fixed	Fixed – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free	Flange side : Drive side	Flange side : Opposite to drive side
Code	B	F	C	G	A	E
Shape						

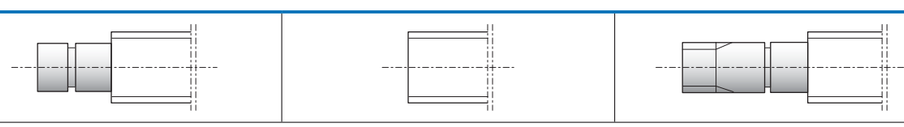
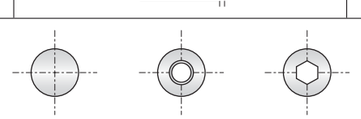
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

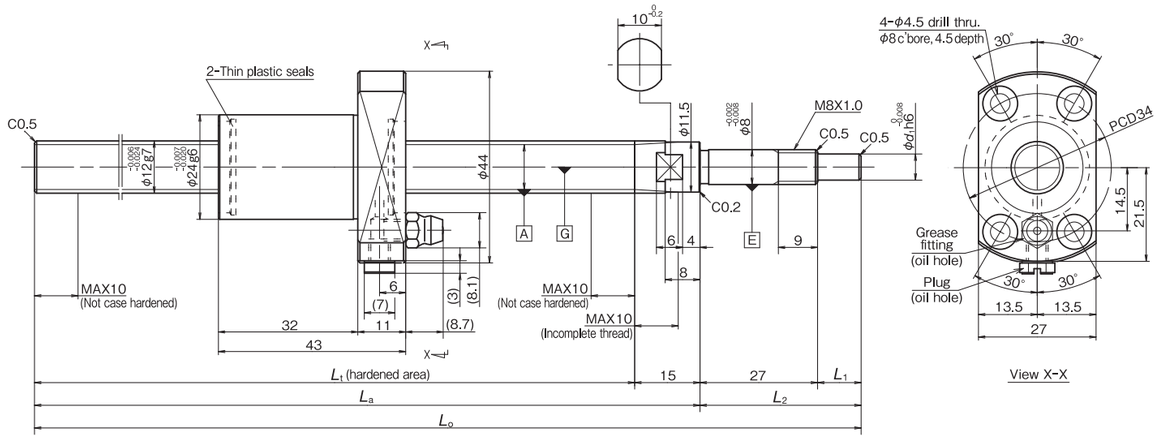
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

Compact FA for transfer equipment FSS Type Screw shaft diameter ø12, Lead 10



Specification

Nut specification					Screw shaft dimensions (mm)					
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
			Dynamic C_a (N)	Static C_{oa} (N)						
BSS1210-3E	12	10	3 760	5 780	86.0 to 859	101 to 874	138 to 911	1.0 to 30.0	28.0 to 57.0	3.0 to 6.0

Click!Speedy Reference Number

F S E 12 10 N 3 A C 0911 *

- Accuracy grade F : JIS Ct7 grade
- Nut code S : End Deflector Type
- Preload system/Axial play code E : Axial play 0.010 or less (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 3: LR3 (see table 3)
- Lubrication component A : Axial direction (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Axial play 0.010 or less
Code	E

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication component

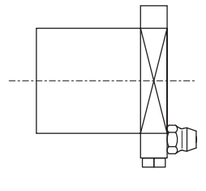
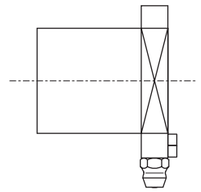
Code/Form	A : Axial direction (standard)	B : Radial direction
Shape		

Table 5 Nut direction/Shaft end shape code

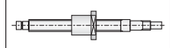
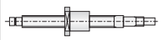
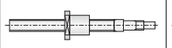
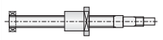
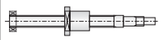
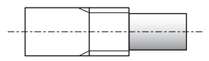
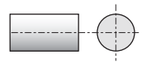
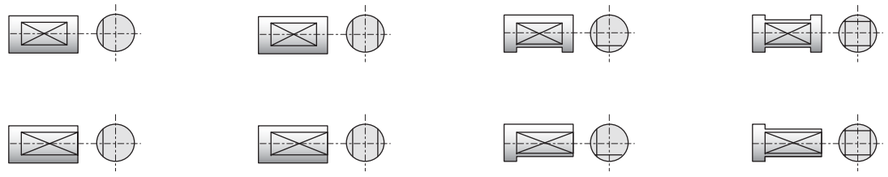
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed	With bearing – Fixed	With bearing – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free	Flange side : Drive side	Flange side : Opposite to drive side
Code	B	F	C	G	D	H
Shape						

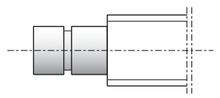
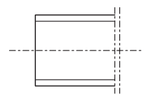
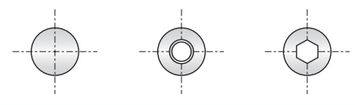
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

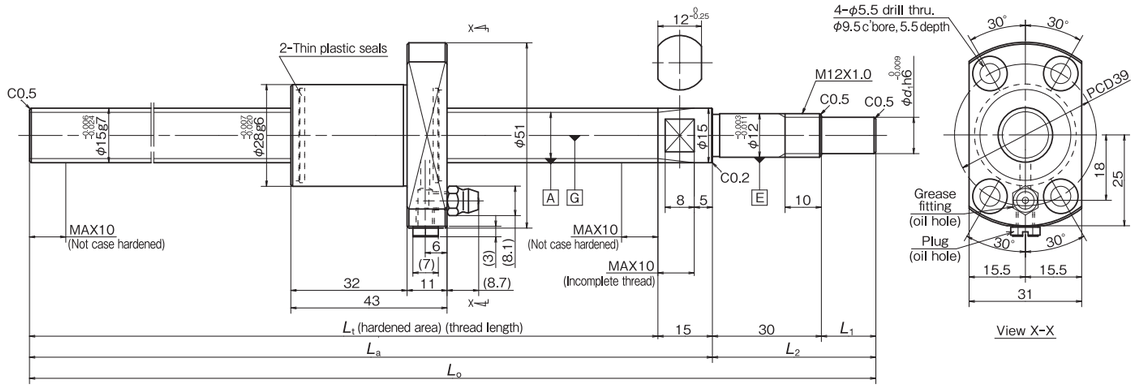
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	

2. Shaft end shape of simple support side

Additional element		
Shaft end		

Compact FA for transfer equipment FSS Type Screw shaft diameter ø15, Lead 10



Specification

Model No.	Nut specification: Screw shaft diameter (mm)	Lead (mm)	Basic load rating: Dynamic C_a (N)	Basic load rating: Static C_{oa} (N)	Screw shaft dimensions (mm): Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
BSS1510-3E	15	10	6 530	10 200	86.0 to 1 412	101 to 1 427	146 to 1 472	1.0 to 50.0	31.0 to 80.0	6.0 to 10.0

Click!Speedy Reference Number

F S E 15 10 N 3 A C 1472 *

- Accuracy grade F : JIS Ct7 grade
- Nut code S : End Deflector Type
- Preload system/Axial play code E : Axial play 0.010 or less (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Design serial number
- Overall length of shaft (mm)
- Nut direction/Shaft end shape code (see table 5)
- Lubrication component A : Axial direction (see table 4)
- Lubricant code 3: LR3 (see table 3)
- Surface treatment N : None (see table 2)

Table 1 Preload system/Axial play code

Preload system/Axial play	Axial play 0.010 or less
Code	E

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
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LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication component

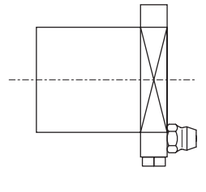
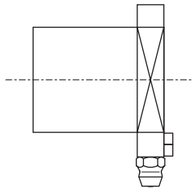
Code/Form	A : Axial direction (standard)	B : Radial direction
Shape		

Table 5 Nut direction/Shaft end shape code

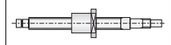
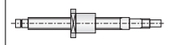
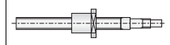
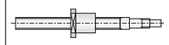
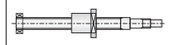
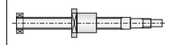
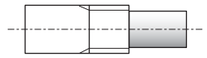
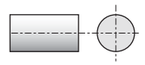
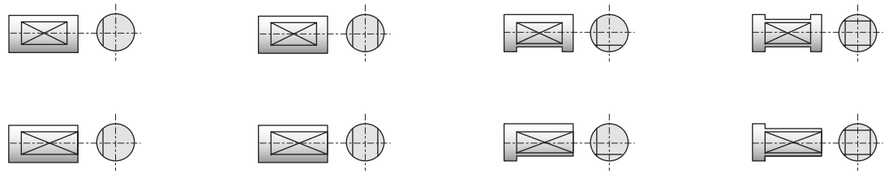
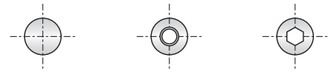
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed	With bearing – Fixed	With bearing – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free	Flange side : Drive side	Flange side : Opposite to drive side
Code	B	F	C	G	D	H
Shape						

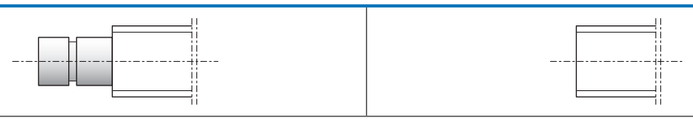
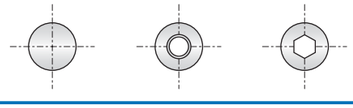
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

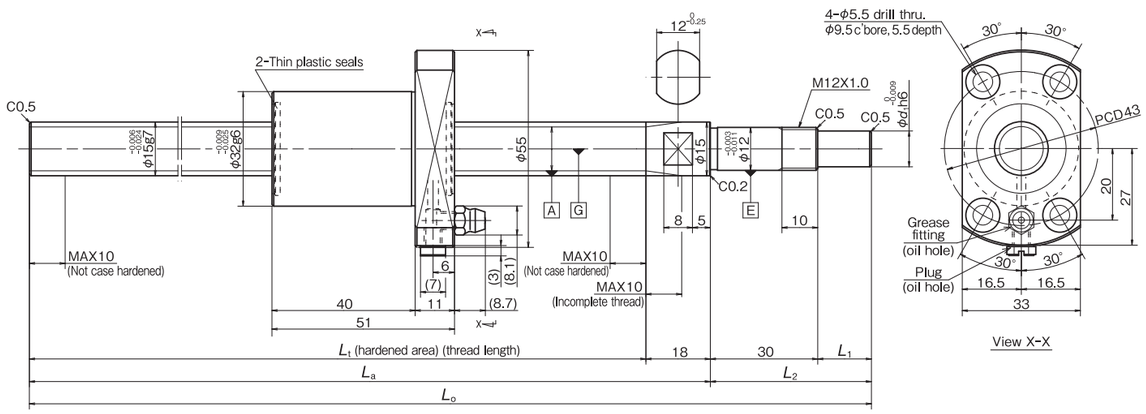
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

Compact FA for transfer equipment FSS Type Screw shaft diameter ø15, Lead 20



Specification

Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Screw shaft dimensions (mm)					
			Dynamic C_a (N)	Static C_{oa} (N)	Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
BSS1520-2E	15	20	5 660	8 700	102 to 1 412	120 to 1 430	165 to 1 475	1.0 to 50.0	31.0 to 80.0	6.0 to 10.0

Click!Speedy Reference Number

F S E 15 20 N 3 A C 1475 *

- Accuracy grade F : JIS Ct7 grade
- Nut code S : End Deflector Type
- Preload system/Axial play code E : Axial play 0.010 or less (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Design serial number
- Overall length of shaft (mm)
- Nut direction/Shaft end shape code (see table 5)
- Lubrication component A : Axial direction (see table 4)
- Lubricant code 3: LR3 (see table 3)
- Surface treatment N : None (see table 2)

Table 1 Preload system/Axial play code

Preload system/Axial play	Axial play 0.010 or less
Code	E

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication component

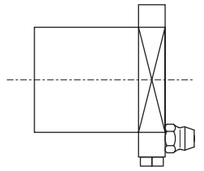
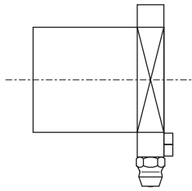
Code/Form	A : Axial direction (standard)	B : Radial direction
Shape		

Table 5 Nut direction/Shaft end shape code

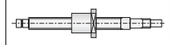
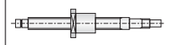
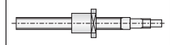
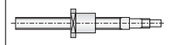
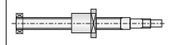
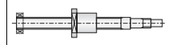
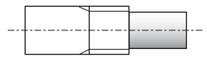
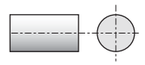
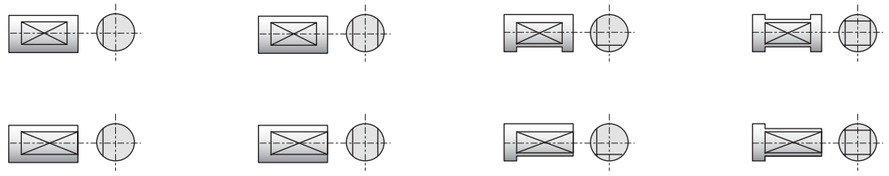
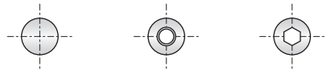
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed	With bearing – Fixed	With bearing – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free	Flange side : Drive side	Flange side : Opposite to drive side
Code	B	F	C	G	D	H
Shape						

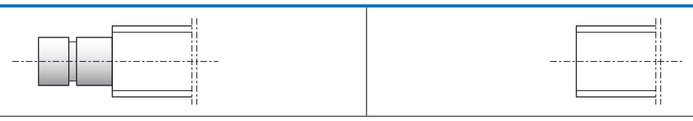
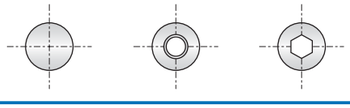
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

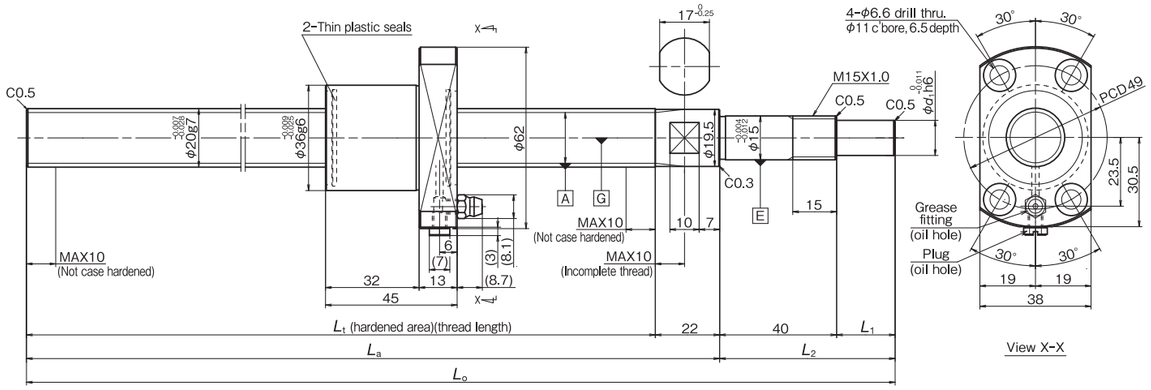
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

Compact FA for transfer equipment FSS Type Screw shaft diameter ø20, Lead 10



Specification

Model No.	Nut specification: Screw shaft diameter (mm)	Lead (mm)	Basic load rating: Dynamic C_a (N)	Basic load rating: Static C_{oa} (N)	Screw shaft dimensions (mm): Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
BSS2010-3E	20	10	10 200	18 600	90 to 1 413	112 to 1 435	172 to 1 495	1.0 to 60.0	41.0 to 100	6.0 to 12.0

Click!Speedy Reference Number

F S E 20 10 N 3 A C 1495 *

- Accuracy grade F : JIS Ct7 grade
- Nut code S : End Deflector Type
- Preload system/Axial play code E : Axial play 0.010 or less (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubrication component A : Axial direction (see table 4)
- Lubricant code 3: LR3 (see table 3)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Axial play 0.010 or less
Code	E

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication component

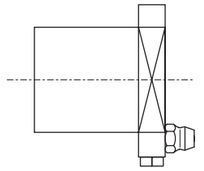
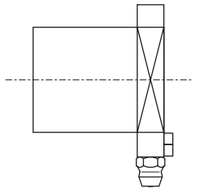
Code/Form	A : Axial direction (standard)	B : Radial direction
Shape		

Table 5 Nut direction/Shaft end shape code

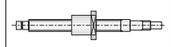
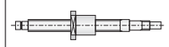
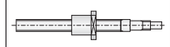
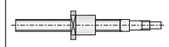
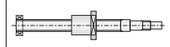
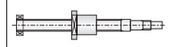
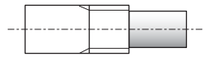
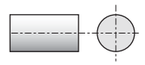
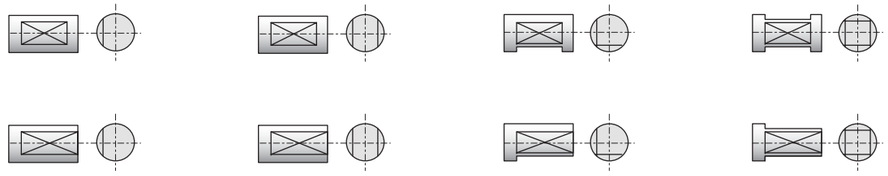
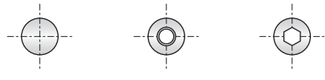
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed	With bearing – Fixed	With bearing – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free	Flange side : Drive side	Flange side : Opposite to drive side
Code	B	F	C	G	D	H
Shape						

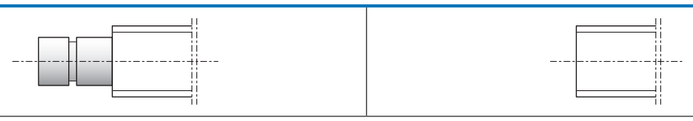
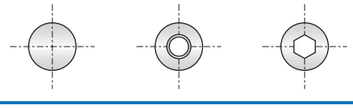
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

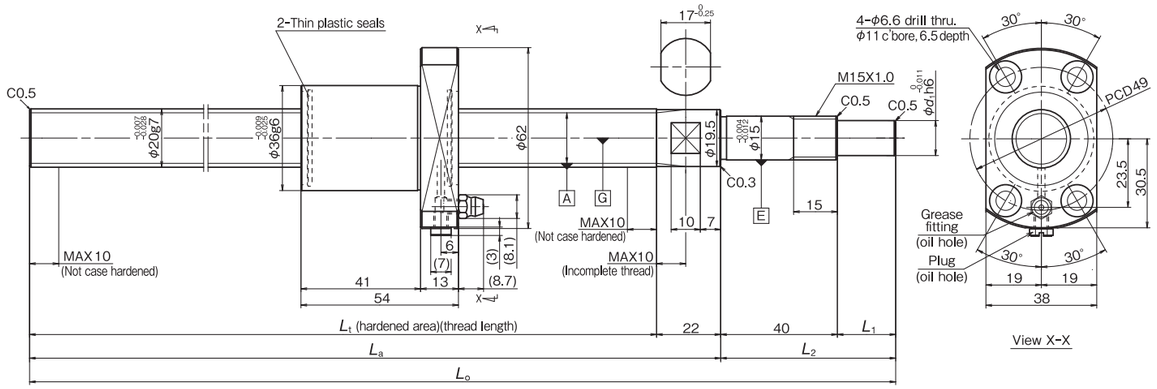
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

Compact FA for transfer equipment FSS Type Screw shaft diameter ø20, Lead 20



Specification

Model No.	Nut specification: Screw shaft diameter (mm)	Nut specification: Lead (mm)	Nut specification: Basic load rating Dynamic Ca (N)	Nut specification: Basic load rating Static Coa (N)	Screw shaft dimensions (mm): Thread length Lt	Supported length La	Overall length Lo	Shaft end length L1	Shaft end length L2	Shaft end dia. d1
BSS2020-2E	20	20	6 790	11 800	108 to 1 413	130 to 1 435	190 to 1 495	1.0 to 60.0	41.0 to 100	6.0 to 12.0

Click!Speedy Reference Number

F S E 20 20 N 3 A C 1495 *

- Accuracy grade F : JIS Ct7 grade
- Nut code S : End Deflector Type
- Preload system/Axial play code E : Axial play 0.010 or less (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Design serial number
- Overall length of shaft (mm)
- Nut direction/Shaft end shape code (see table 5)
- Lubrication component A : Axial direction (see table 4)
- Lubricant code 3: LR3 (see table 3)
- Surface treatment N : None (see table 2)

Table 1 Preload system/Axial play code

Preload system/Axial play	Axial play 0.010 or less
Code	E

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
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LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication component

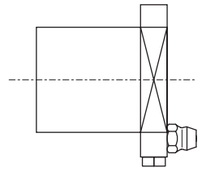
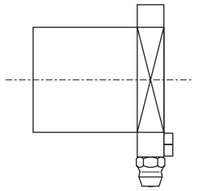
Code/Form	A : Axial direction (standard)	B : Radial direction
Shape		

Table 5 Nut direction/Shaft end shape code

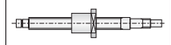
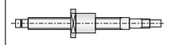
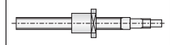
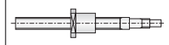
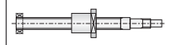
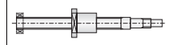
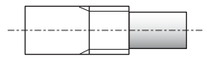
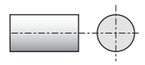
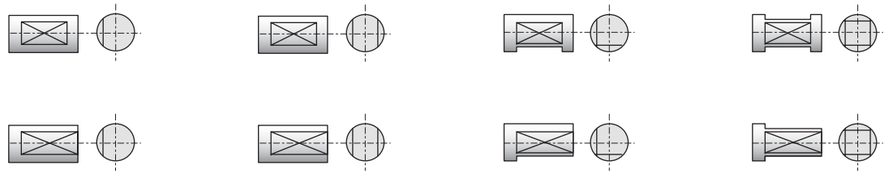
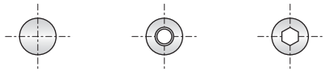
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed	With bearing – Fixed	With bearing – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free	Flange side : Drive side	Flange side : Opposite to drive side
Code	B	F	C	G	D	H
Shape						

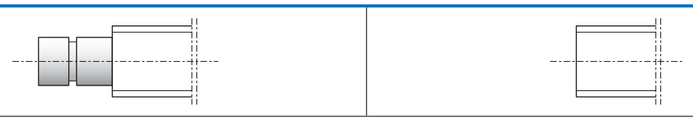
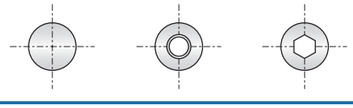
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

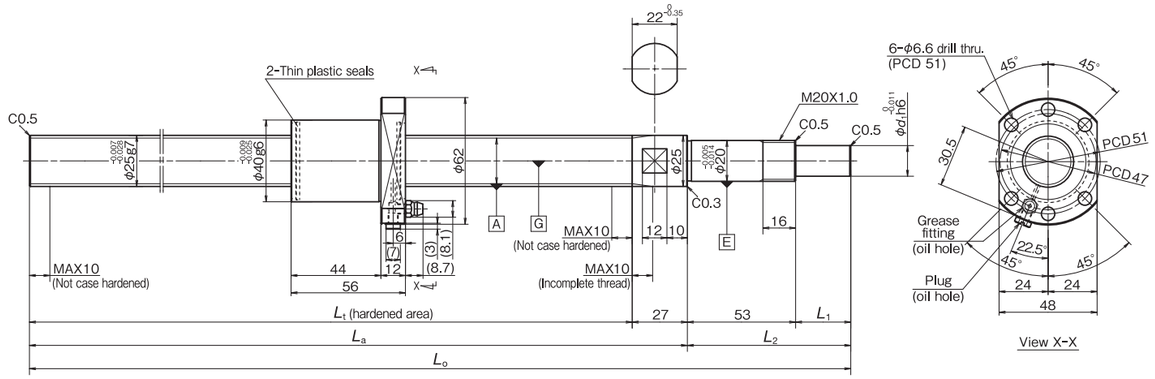
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

Compact FA for transfer equipment FSS Type Screw shaft diameter ø25, Lead 10



Specification

Model No.	Nut specification: Screw shaft diameter (mm)	Nut specification: Lead (mm)	Nut specification: Basic load rating Dynamic C_a (N)	Nut specification: Basic load rating Static C_{oa} (N)	Screw shaft dimensions (mm): Thread length L_t	Screw shaft dimensions (mm): Supported length L_a	Screw shaft dimensions (mm): Overall length L_o	Screw shaft dimensions (mm): Shaft end length L_1	Screw shaft dimensions (mm): Shaft end length L_2	Screw shaft dimensions (mm): Shaft end dia. d_1
BSS2510-4E	25	10	15 000	32 400	112 to 1 419	139 to 1 446	219 to 1 526	1.0 to 75.0	54.0 to 128	8.0 to 15.0

Click!Speedy Reference Number

F S E 25 10 N 3 A C 1526 *

- Accuracy grade F : JIS Ct7 grade
- Nut code S : End Deflector Type
- Preload system/Axial play code E : Axial play 0.010 or less (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Design serial number
- Overall length of shaft (mm)
- Nut direction/Shaft end shape code (see table 5)
- Lubrication component A : Axial direction (see table 4)
- Lubricant code 3: LR3 (see table 3)
- Surface treatment N : None (see table 2)

Table 1 Preload system/Axial play code

Preload system/Axial play	Axial play 0.010 or less
Code	E

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication component

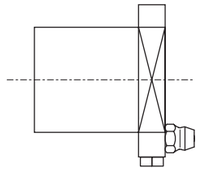
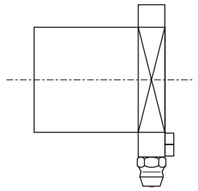
Code/Form	A : Axial direction (standard)	B : Radial direction
Shape		

Table 5 Nut direction/Shaft end shape code

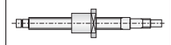
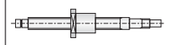
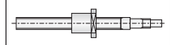
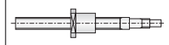
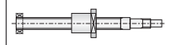
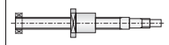
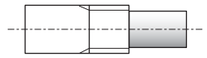
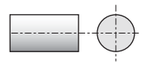
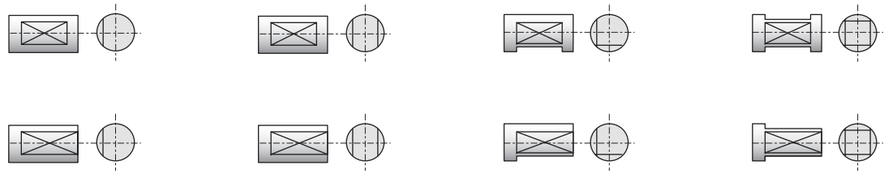
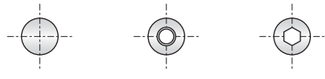
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed	With bearing – Fixed	With bearing – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free	Flange side : Drive side	Flange side : Opposite to drive side
Code	B	F	C	G	D	H
Shape						

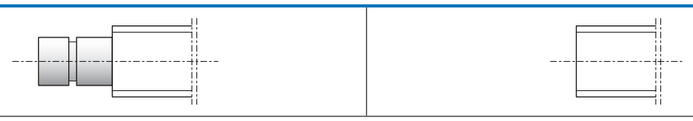
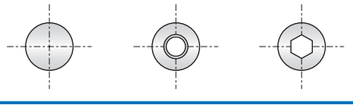
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

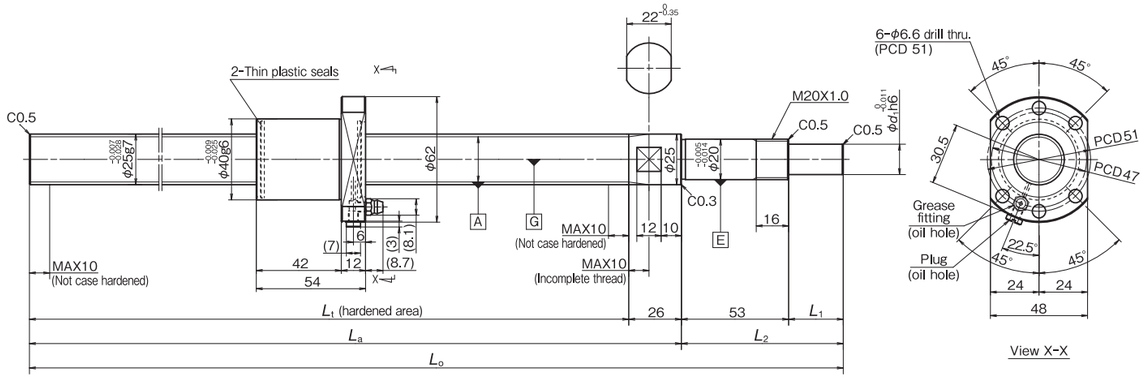
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

Compact FA for transfer equipment FSS Type Screw shaft diameter ø25, Lead 20



Specification

Model No.	Nut specification: Screw shaft diameter (mm)	Lead (mm)	Basic load rating: Dynamic Ca (N)	Basic load rating: Static Coa (N)	Screw shaft dimensions (mm): Thread length Lt	Supported length La	Overall length Lo	Shaft end length L1	Shaft end length L2	Shaft end dia. d1
BSS2520-2E	25	20	7 650	14 800	108 to 1 419	134 to 1 445	214 to 1 525	1.0 to 75.0	54 to 128	8.0 to 15.0

Click!Speedy Reference Number

F S E 25 20 N 3 A C 1525 *

- Accuracy grade F : JIS Ct7 grade
- Nut code S : End Deflector Type
- Preload system/Axial play code E : Axial play 0.010 or less (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Design serial number
- Overall length of shaft (mm)
- Nut direction/Shaft end shape code (see table 5)
- Lubrication component A : Axial direction (see table 4)
- Lubricant code 3: LR3 (see table 3)
- Surface treatment N : None (see table 2)

Table 1 Preload system/Axial play code

Preload system/Axial play	Axial play 0.010 or less
Code	E

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication component

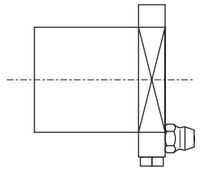
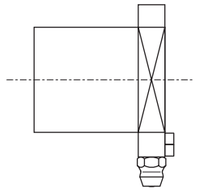
Code/Form	A : Axial direction (standard)	B : Radial direction
Shape		

Table 5 Nut direction/Shaft end shape code

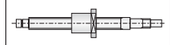
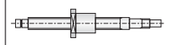
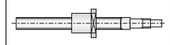
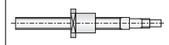
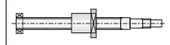
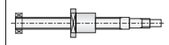
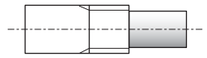
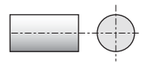
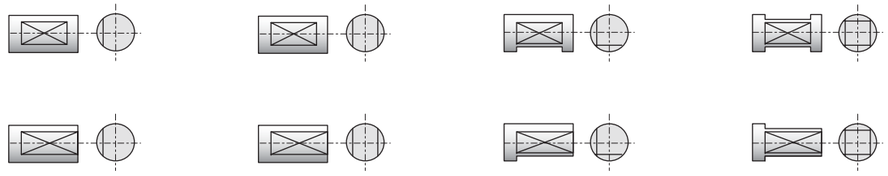
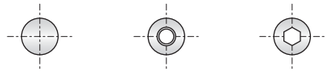
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed	With bearing – Fixed	With bearing – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free	Flange side : Drive side	Flange side : Opposite to drive side
Code	B	F	C	G	D	H
Shape						

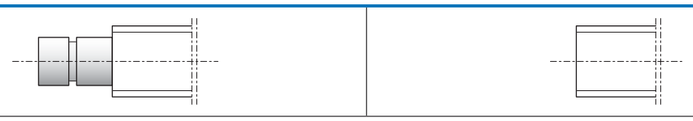
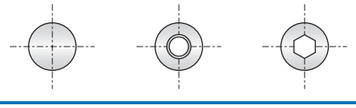
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

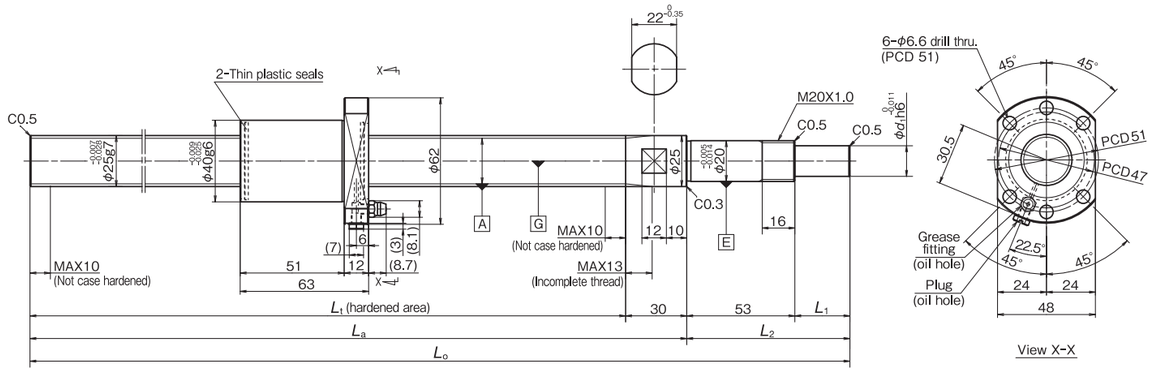
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

Compact FA for transfer equipment FSS Type Screw shaft diameter ø25, Lead 25



Specification

Model No.	Nut specification: Screw shaft diameter (mm)	Nut specification: Lead (mm)	Nut specification: Basic load rating Dynamic C_a (N)	Nut specification: Basic load rating Static C_{oa} (N)	Screw shaft dimensions (mm): Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
BSS2525-2E	25	25	7 490	14 600	126 to 1 419	156 to 1 449	236 to 1 529	1.0 to 75.0	54.0 to 128	8.0 to 15.0

Click!Speedy Reference Number

F S E 25 25 N 3 A C 1529 *

- Accuracy grade F : JIS Ct7 grade
- Nut code S : End Deflector Type
- Preload system/Axial play code E : Axial play 0.010 or less (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Design serial number
- Overall length of shaft (mm)
- Nut direction/Shaft end shape code (see table 5)
- Lubrication component A : Axial direction (see table 4)
- Lubricant code 3: LR3 (see table 3)
- Surface treatment N : None (see table 2)

Table 1 Preload system/Axial play code

Preload system/Axial play	Axial play 0.010 or less
Code	E

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Fluoride low temperature chrome plating
Code	N	F

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
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LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication component

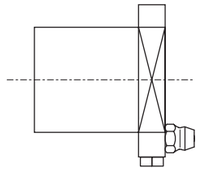
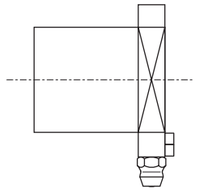
Code/Form	A : Axial direction (standard)	B : Radial direction
Shape		

Table 5 Nut direction/Shaft end shape code

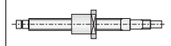
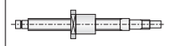
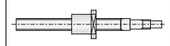
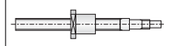
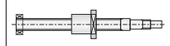
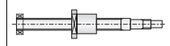
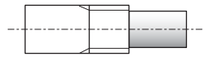
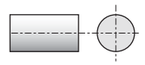
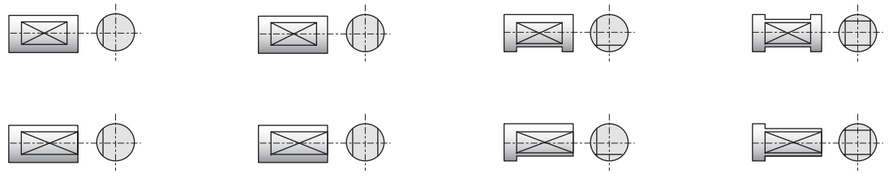
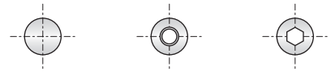
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed	With bearing – Fixed	With bearing – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free	Flange side : Drive side	Flange side : Opposite to drive side
Code	B	F	C	G	D	H
Shape						

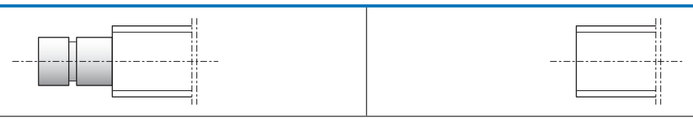
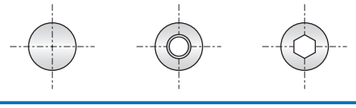
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

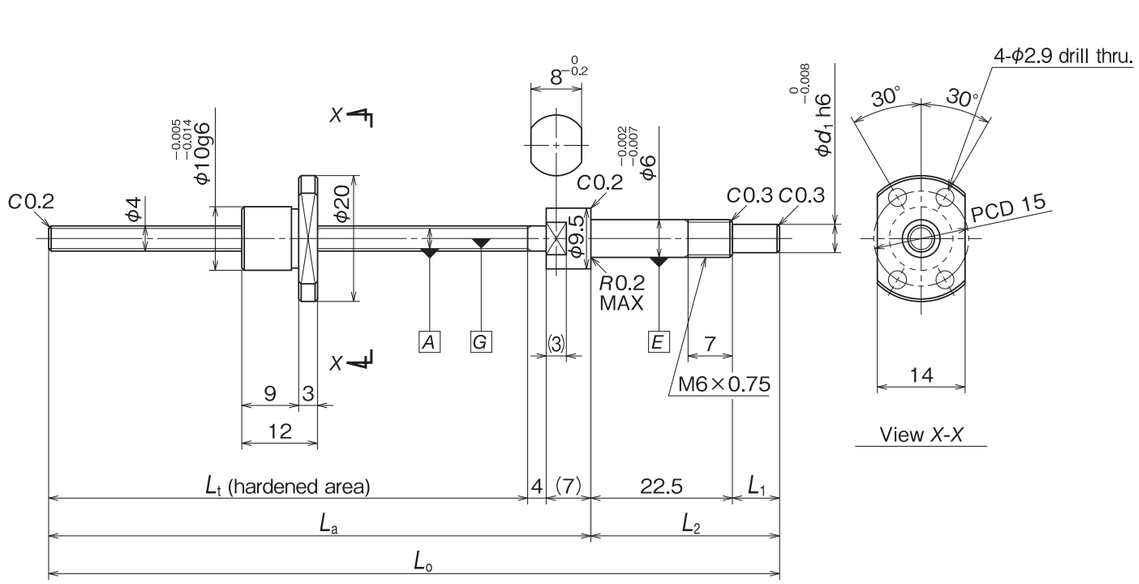
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

Miniature and fine lead MA Type Screw shaft diameter ø4, Lead 1



Specification

Model No.	Nut specification: Screw shaft diameter (mm)	Nut specification: Lead (mm)	Nut specification: Basic load rating Dynamic Ca (N)	Nut specification: Basic load rating Static Coa (N)	Screw shaft dimensions (mm): Thread length Lt	Supported length La	Overall length Lo	Shaft end length L1	Shaft end length L2	Shaft end dia. d1
MPFD0401-2	4	1	370	370	24.0 to 100	35.0 to 111	65.0 to 141	1.0 to 16.5	23.5 to 39.0	3.0 to 4.5

Click!Speedy Reference Number

U Y P 04 01 N 2 N C 0141 *

- Accuracy grade U : JIS C3 grade
- Nut code Y : Deflector (bridge) type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Design serial number
- Overall length of shaft (mm)
- Nut direction/Shaft end shape code (see table 4)
- Lubrication component N : None
- Lubricant code 2 : PS2 (see table 3)
- Surface treatment N : None (see table 2)

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Low temperature chrome plating	Fluoride low temperature chrome plating
Code	N	D	F

○Low temperature chrome plating
- Used to prevent corrosion and light reflection, and for cosmetic purpose.

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Nut direction/Shaft end shape code

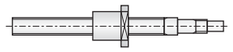
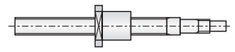
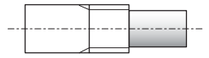
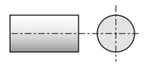
Shaft end shape	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Free
Code	C	G
Shape		

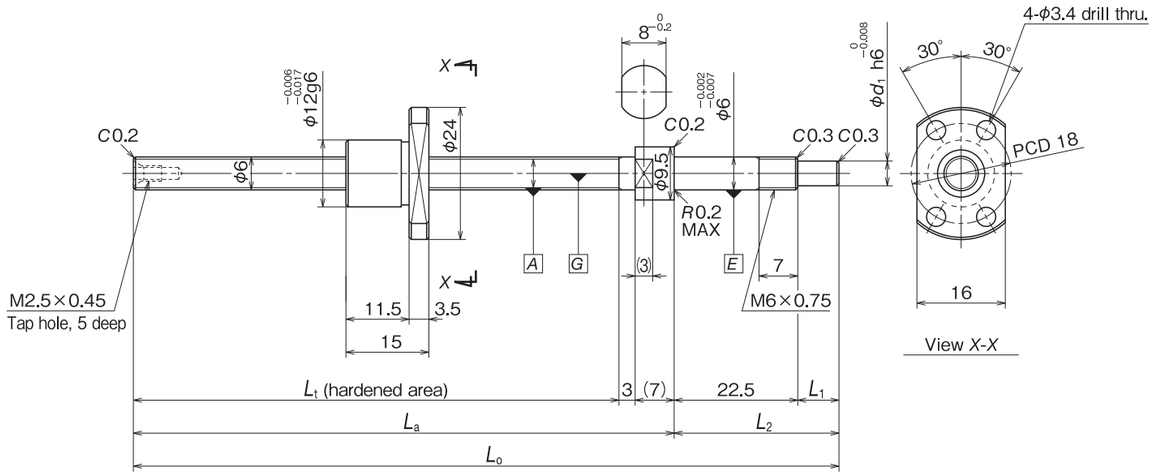
Table 5 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

1. Shaft end shape of fixed support side

Additional element	
None	

Miniature and fine lead MA Type Screw shaft diameter ø6, Lead 1



Specification

Model No.	Nut specification: Screw shaft diameter (mm)	Nut specification: Lead (mm)	Nut specification: Basic load rating Dynamic Ca (N)	Nut specification: Basic load rating Static Coa (N)	Screw shaft dimensions (mm): Thread length Lt	Supported length La	Overall length Lo	Shaft end length L1	Shaft end length L2	Shaft end dia. d1
MPFD0601-3	6	1	680	920	30.0 to 130	40.0 to 140	70.0 to 170	1.0 to 16.5	23.5 to 39.0	3.0 to 4.5

Click!Speedy Reference Number

U Y P 06 01 N 2 N C 0170 *

- Accuracy grade U : JIS C3 grade
- Nut code Y : Deflector (bridge) type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Design serial number
- Overall length of shaft (mm)
- Nut direction/Shaft end shape code (see table 4)
- Lubrication component N : None
- Lubricant code 2 : PS2 (see table 3)
- Surface treatment N : None (see table 2)

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Low temperature chrome plating	Fluoride low temperature chrome plating
Code	N	D	F

○Low temperature chrome plating
- Used to prevent corrosion and light reflection, and for cosmetic purpose.

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Nut direction/Shaft end shape code

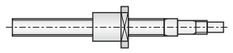
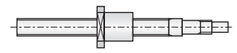
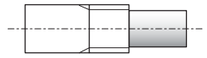
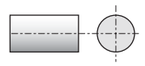
Shaft end shape	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Free
Code	C	G
Shape		

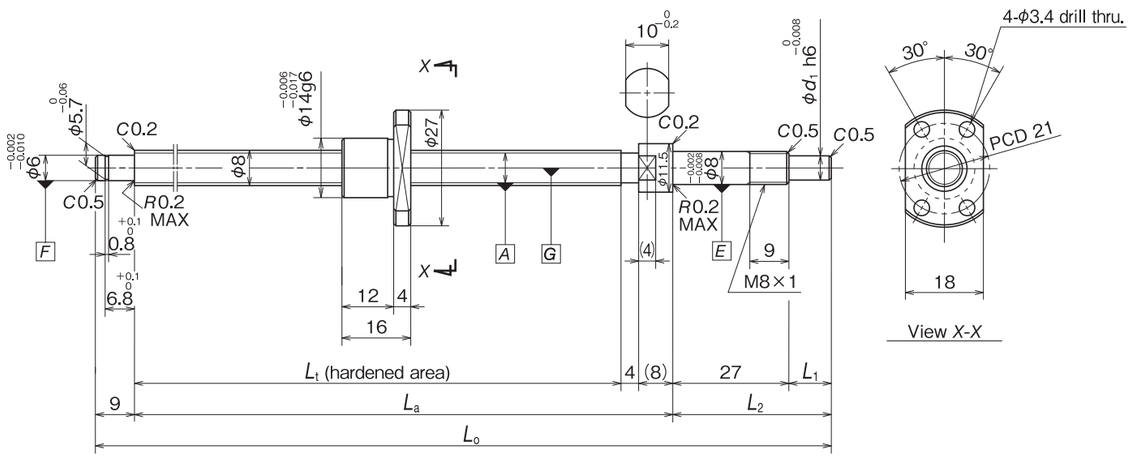
Table 5 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

1. Shaft end shape of fixed support side

Additional element	
None	

Miniature and fine lead MA Type Screw shaft diameter ø8, Lead 1



Specification

Model No.	Nut specification: Screw shaft diameter (mm)	Nut specification: Lead (mm)	Nut specification: Basic load rating Dynamic C_a (N)	Nut specification: Basic load rating Static C_{oa} (N)	Screw shaft dimensions (mm): Thread length L_t	Screw shaft dimensions (mm): Supported length L_a	Screw shaft dimensions (mm): Overall length L_o	Screw shaft dimensions (mm): Shaft end length L_1	Screw shaft dimensions (mm): Shaft end length L_2	Screw shaft dimensions (mm): Shaft end dia. d_1
MPFD0801-3	8	1	790	1 290	32.0 to 209	44.0 to 221	81.0 to 258	1.0 to 21.0	28.0 to 48.0	3.0 to 6.0

Click!Speedy Reference Number

U Y P 08 01 N 2 N B 0258 *

- Accuracy grade U : JIS C3 grade
- Nut code Y : Deflector (bridge) type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Design serial number
- Overall length of shaft (mm)
- Nut direction/Shaft end shape code (see table 4)
- Lubrication component N : None
- Lubricant code 2 : PS2 (see table 3)
- Surface treatment N : None (see table 2)

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Low temperature chrome plating	Fluoride low temperature chrome plating
Code	N	D	F

○Low temperature chrome plating
- Used to prevent corrosion and light reflection, and for cosmetic purpose.

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Nut direction/Shaft end shape code

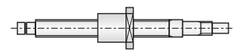
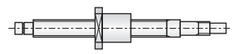
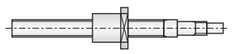
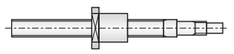
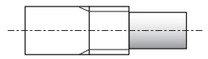
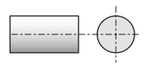
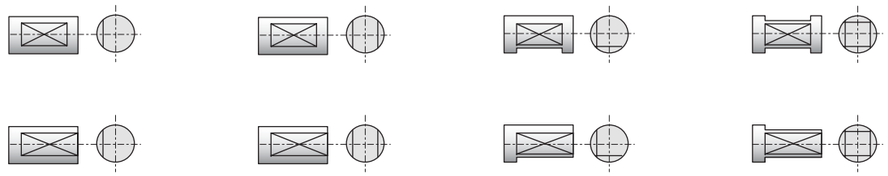
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free
Code	B	F	C	G
Shape				

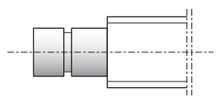
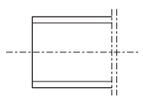
Table 5 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

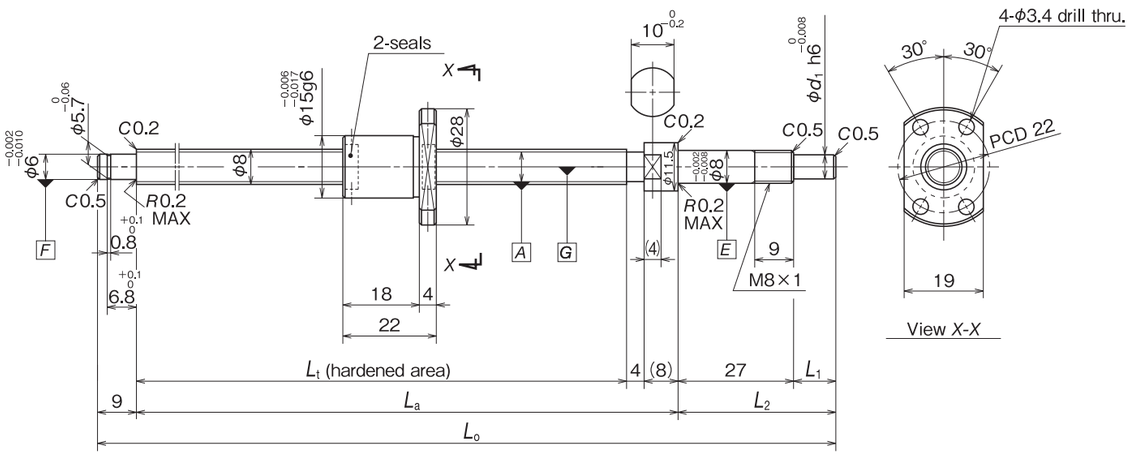
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	

2. Shaft end shape of simple support side

Additional element		

Miniature and fine lead MA Type Screw shaft diameter ø8, Lead 1.5



Specification

Model No.	Nut specification: Screw shaft diameter (mm)	Nut specification: Lead (mm)	Nut specification: Basic load rating Dynamic C_a (N)	Nut specification: Basic load rating Static C_{oa} (N)	Screw shaft dimensions (mm): Thread length L_t	Screw shaft dimensions (mm): Supported length L_a	Screw shaft dimensions (mm): Overall length L_o	Screw shaft dimensions (mm): Shaft end length L_1	Screw shaft dimensions (mm): Shaft end length L_2	Screw shaft dimensions (mm): Shaft end dia. d_1
MPFD0801.5-3	8	1.5	1 270	1 970	44.0 to 209	56.0 to 221	93.0 to 258	1.0 to 21.0	28.0 to 48.0	3.0 to 6.0

Click!Speedy Reference Number

U Y P 08 61 N 2 N B 0258 *

- Accuracy grade U : JIS C3 grade
- Nut code Y : Deflector (bridge) type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Design serial number
- Overall length of shaft (mm)
- Nut direction/Shaft end shape code (see table 4)
- Lubrication component N : None
- Lubricant code 2 : PS2 (see table 3)
- Surface treatment N : None (see table 2)

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Low temperature chrome plating	Fluoride low temperature chrome plating
Code	N	D	F

○Low temperature chrome plating
- Used to prevent corrosion and light reflection, and for cosmetic purpose.

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Nut direction/Shaft end shape code

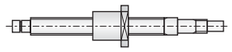
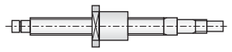
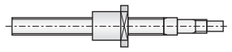
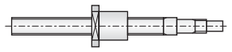
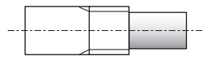
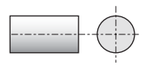
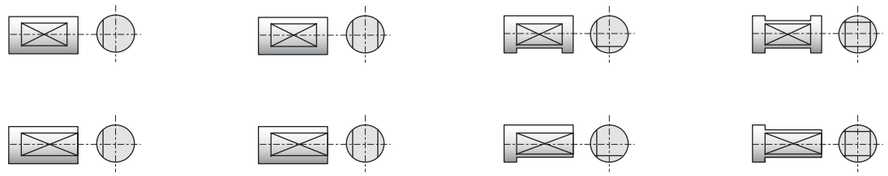
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free
Code	B	F	C	G
Shape				

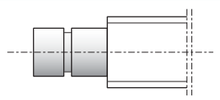
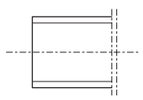
Table 5 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

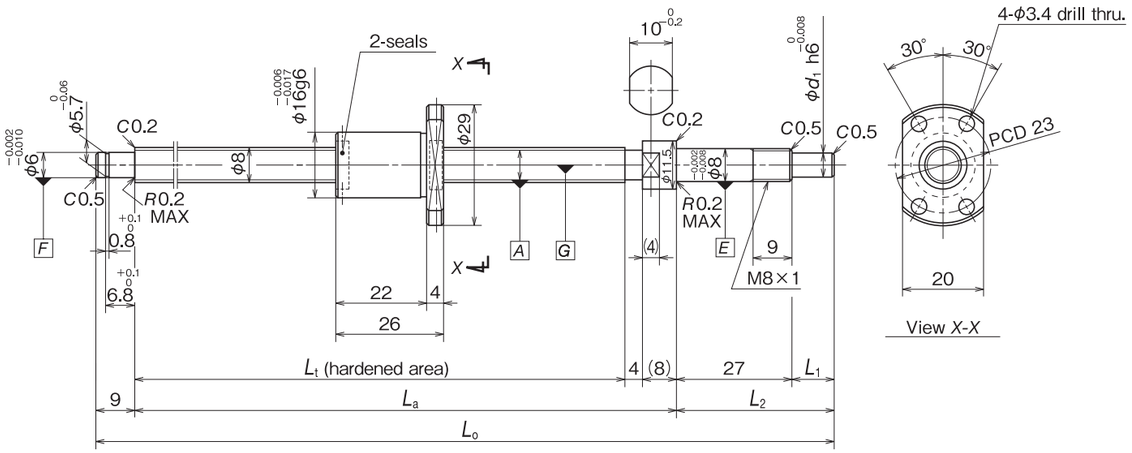
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	

2. Shaft end shape of simple support side

Additional element		

Miniature and fine lead MA Type Screw shaft diameter ø8, Lead 2



Specification

Model No.	Nut specification: Screw shaft diameter (mm)	Lead (mm)	Basic load rating: Dynamic C_a (N)	Basic load rating: Static C_{oa} (N)	Screw shaft dimensions (mm): Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
MPFD0802-3	8	2	1 560	2 200	52.0 to 209	64.0 to 221	101 to 258	1.0 to 21.0	28.0 to 48.0	3.0 to 6.0

Click!Speedy Reference Number

U Y P 08 02 N 2 N B 0258 *

- Accuracy grade U : JIS C3 grade
- Nut code Y : Deflector (bridge) type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Design serial number
- Overall length of shaft (mm)
- Nut direction/Shaft end shape code (see table 4)
- Lubrication component N : None
- Lubricant code 2 : PS2 (see table 3)
- Surface treatment N : None (see table 2)

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Low temperature chrome plating	Fluoride low temperature chrome plating
Code	N	D	F

○Low temperature chrome plating
- Used to prevent corrosion and light reflection, and for cosmetic purpose.

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Nut direction/Shaft end shape code

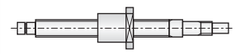
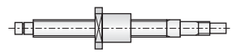
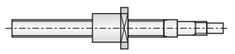
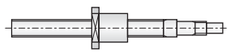
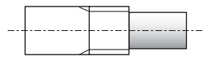
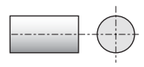
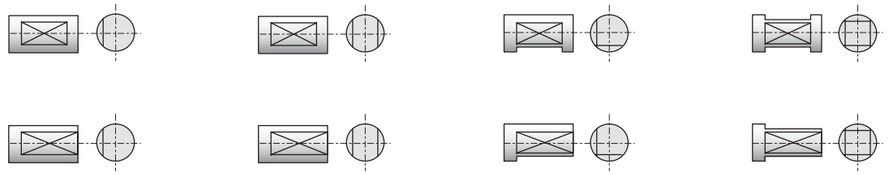
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free
Code	B	F	C	G
Shape				

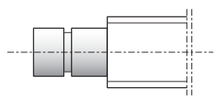
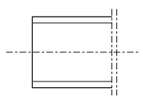
Table 5 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

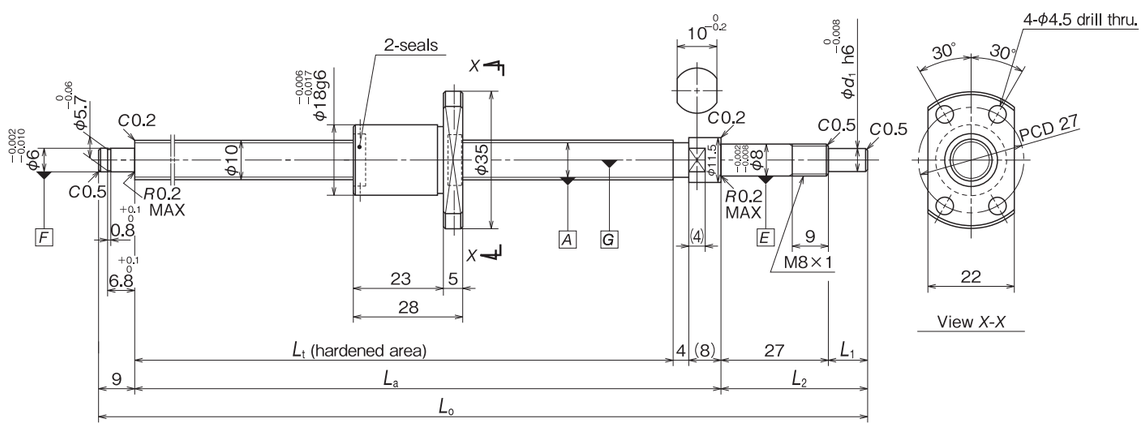
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	

2. Shaft end shape of simple support side

Additional element		

Miniature and fine lead MA Type Screw shaft diameter ø10, Lead 2



Specification

Model No.	Nut specification: Screw shaft diameter (mm)	Lead (mm)	Basic load rating: Dynamic C_a (N)	Basic load rating: Static C_{oa} (N)	Screw shaft dimensions (mm): Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
MPFD1002-3	10	2	1 800	2 970	56.0 to 259	68.0 to 271	105 to 308	1.0 to 30	28.0 to 57.0	3.0 to 6.0

Click!Speedy Reference Number

U Y P 10 02 N 2 N B 0308 *

- Accuracy grade U : JIS C3 grade
- Nut code Y : Deflector (bridge) type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 2 : PS2 (see table 3)
- Lubrication component N : None
- Nut direction/Shaft end shape code (see table 4)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Low temperature chrome plating	Fluoride low temperature chrome plating
Code	N	D	F

○Low temperature chrome plating
- Used to prevent corrosion and light reflection, and for cosmetic purpose.

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Nut direction/Shaft end shape code

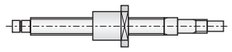
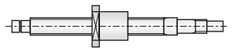
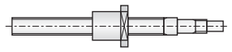
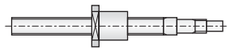
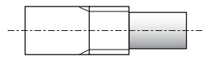
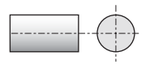
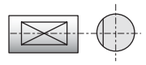
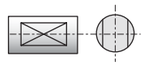
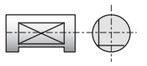
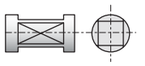
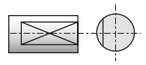
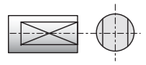
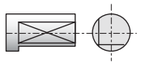
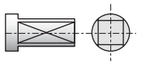
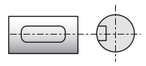
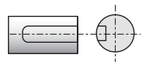
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free
Code	B	F	C	G
Shape				

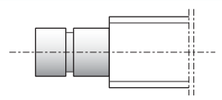
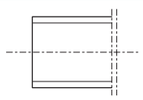
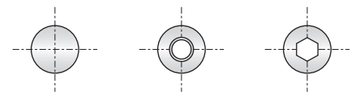
Table 5 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

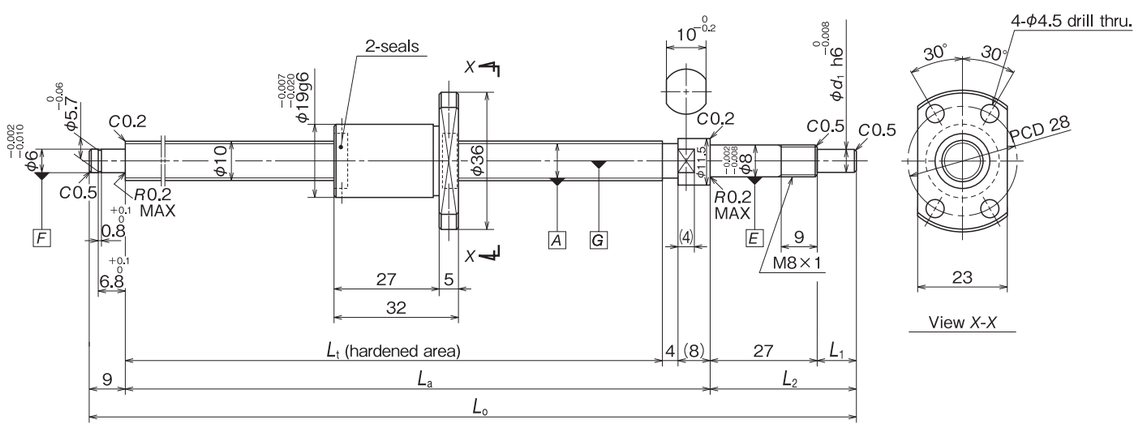
1. Shaft end shape of fixed support side

Additional element				
None				
Flats				
				
Key way				

2. Shaft end shape of simple support side

Additional element		
Shaft end		

Miniature and fine lead MA Type Screw shaft diameter ø10, Lead 2.5



Specification

Model No.	Nut specification: Screw shaft diameter (mm)	Lead (mm)	Basic load rating: Dynamic Ca (N)	Basic load rating: Static Coa (N)	Screw shaft dimensions (mm): Thread length Lt	Supported length La	Overall length Lo	Shaft end length L1	Shaft end length L2	Shaft end dia. d1
MPFD1002.5-3	10	2.5	2 500	3 630	64.0 to 259	76.0 to 271	113 to 308	1.0 to 30.0	28.0 to 57.0	3.0 to 6.0

Click!Speedy Reference Number

U Y P 10 62 N 2 N B 0308 *

- Accuracy grade U : JIS C3 grade
- Nut code Y : Deflector (bridge) type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubrication component N : None
- Lubricant code 2 : PS2 (see table 3)
- Nut direction/Shaft end shape code (see table 4)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Low temperature chrome plating	Fluoride low temperature chrome plating
Code	N	D	F

○Low temperature chrome plating
- Used to prevent corrosion and light reflection, and for cosmetic purpose.

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Nut direction/Shaft end shape code

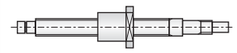
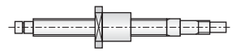
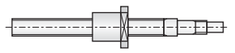
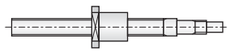
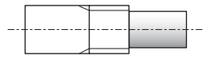
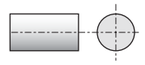
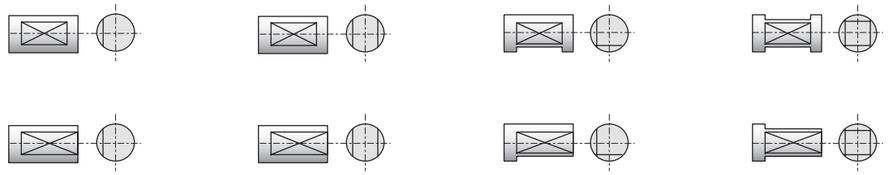
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free
Code	B	F	C	G
Shape				

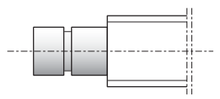
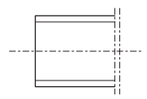
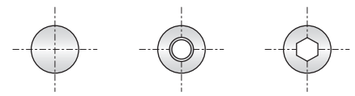
Table 5 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

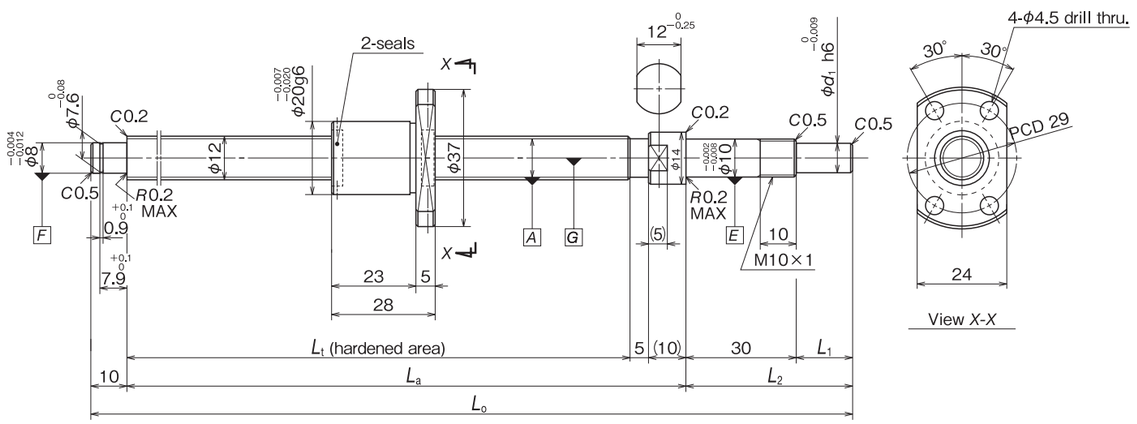
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	

2. Shaft end shape of simple support side

Additional element		
Shaft end		

Miniature and fine lead MA Type Screw shaft diameter ø12, Lead 2



Specification

Nut specification					Screw shaft dimensions (mm)					
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
			Dynamic C_a (N)	Static C_{oa} (N)						
MPFD1202-3	12	2	1 960	3 620	56.0 to 320	71.0 to 335	116 to 380	1.0 to 35.0	31.0 to 65.0	3.0 to 8.0

Click!Speedy Reference Number

U Y P 12 02 N 2 N B 0380 *

- Accuracy grade U : JIS C3 grade
- Nut code Y : Deflector (bridge) type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 2 : PS2 (see table 3)
- Lubrication component N : None
- Nut direction/Shaft end shape code (see table 4)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Low temperature chrome plating	Fluoride low temperature chrome plating
Code	N	D	F

○Low temperature chrome plating
- Used to prevent corrosion and light reflection, and for cosmetic purpose.

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40°C)]	Range of use temperature (°C)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Nut direction/Shaft end shape code

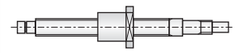
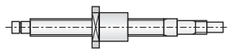
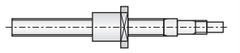
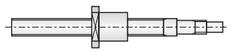
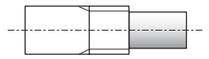
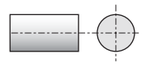
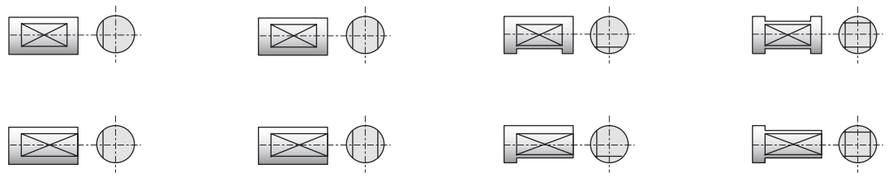
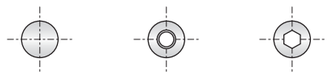
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free
Code	B	F	C	G
Shape				

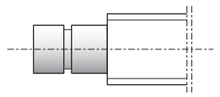
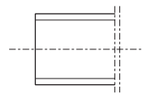
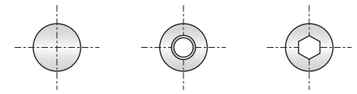
Table 5 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

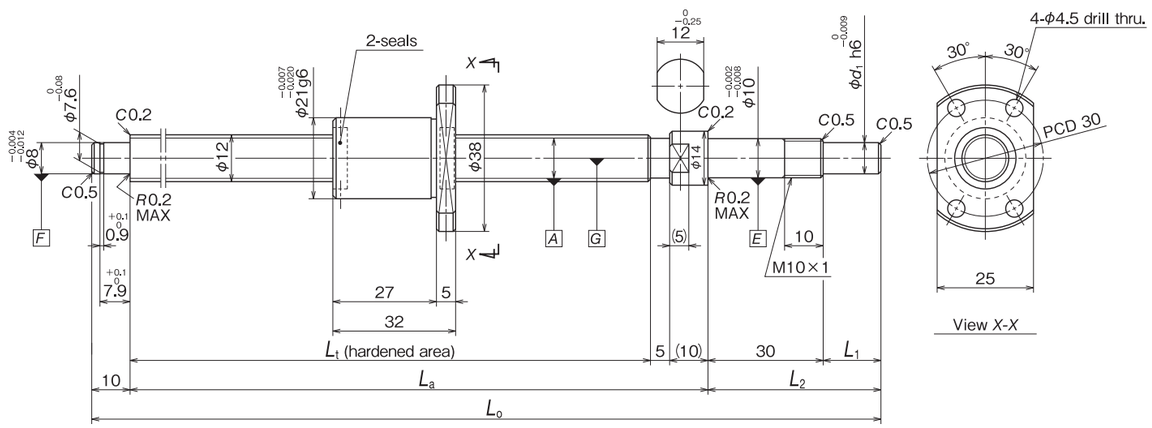
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element		
Shaft end		

Miniature and fine lead MA Type Screw shaft diameter ø12, Lead 2.5



Specification

Model No.	Nut specification: Screw shaft diameter (mm)	Lead (mm)	Basic load rating: Dynamic Ca (N)	Basic load rating: Static Coa (N)	Screw shaft dimensions (mm): Thread length Lt	Supported length La	Overall length Lo	Shaft end length L1	Shaft end length L2	Shaft end dia. d1
MPFD1202.5-3	12	2.5	2 790	4 530	64.0 to 320	79.0 to 335	124 to 380	1.0 to 35.0	31.0 to 65.0	3.0 to 8.0

Click!Speedy Reference Number

U Y P 12 62 N 2 N B 0380 *

- Accuracy grade U : JIS C3 grade
- Nut code Y : Deflector (bridge) type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 2 : PS2 (see table 3)
- Lubrication component N : None
- Nut direction/Shaft end shape code (see table 4)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Low temperature chrome plating	Fluoride low temperature chrome plating
Code	N	D	F

○Low temperature chrome plating
- Used to prevent corrosion and light reflection, and for cosmetic purpose.

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40°C)]	Range of use temperature (°C)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Nut direction/Shaft end shape code

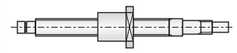
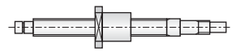
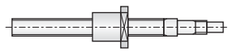
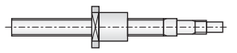
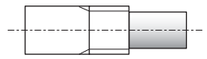
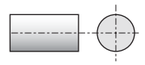
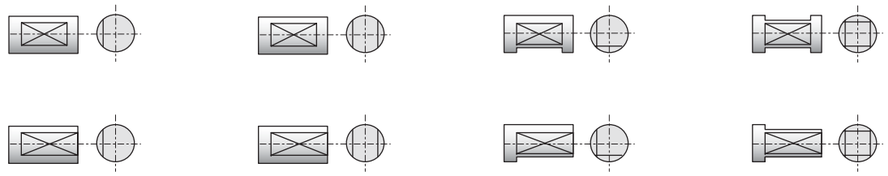
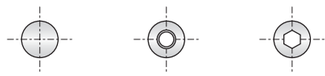
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free
Code	B	F	C	G
Shape				

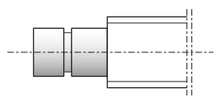
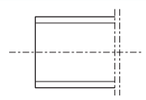
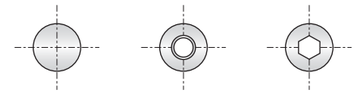
Table 5 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

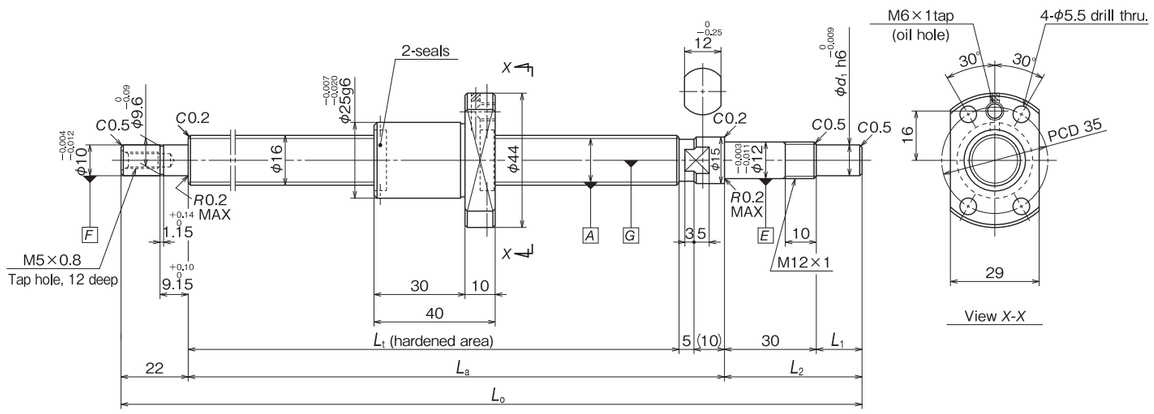
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element		
Shaft end		

Miniature and fine lead MA Type Screw shaft diameter ø16, Lead 2



Specification

Nut specification					Screw shaft dimensions (mm)					
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
			Dynamic C_a (N)	Static C_{oa} (N)						
MPFD1602-4	16	2	4 150	8 450	80.0 to 422	95.0 to 437	140 to 482	1.0 to 50.0	31.0 to 80.0	6.0 to 10.0

Click!Speedy Reference Number

U Y P 16 02 N 2 N B 0482 *

- Accuracy grade U : JIS C3 grade
- Nut code Y : Deflector (bridge) type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 2 : PS2 (see table 3)
- Lubrication component N : None
- Nut direction/Shaft end shape code (see table 4)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Low temperature chrome plating	Fluoride low temperature chrome plating
Code	N	D	F

○Low temperature chrome plating
- Used to prevent corrosion and light reflection, and for cosmetic purpose.

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Nut direction/Shaft end shape code

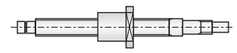
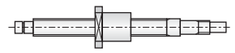
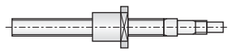
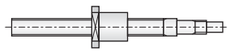
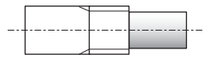
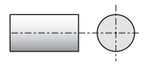
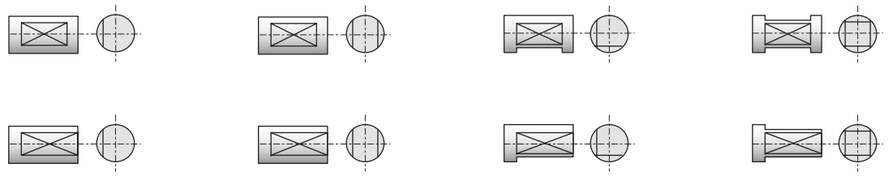
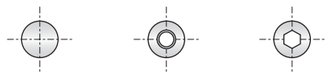
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free
Code	B	F	C	G
Shape				

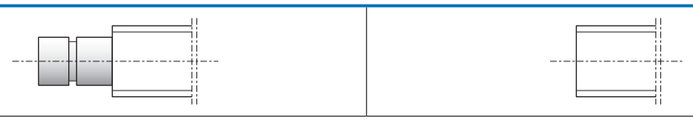
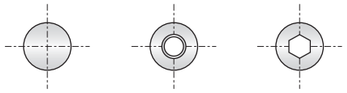
Table 5 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

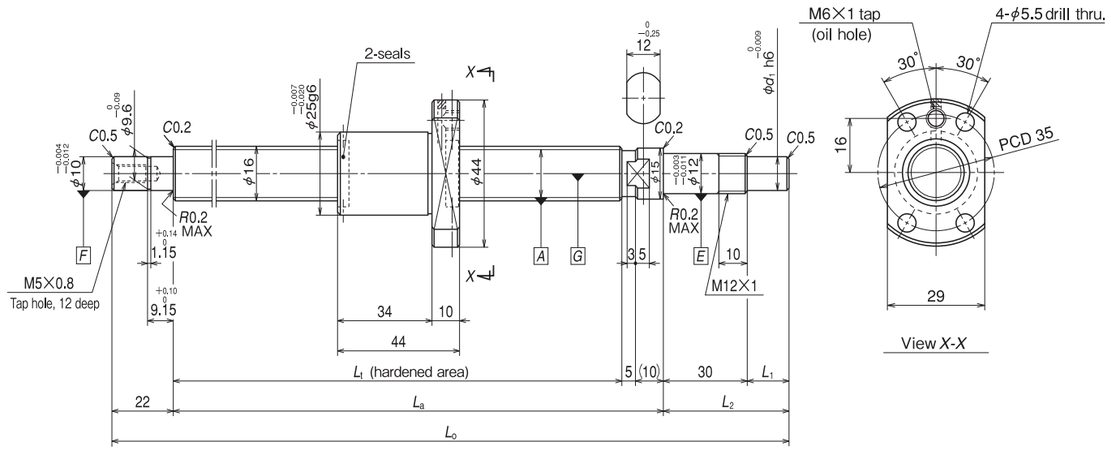
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

Miniature and fine lead MA Type Screw shaft diameter ø16, Lead 2.5



Specification

Model No.	Nut specification: Screw shaft diameter (mm)	Lead (mm)	Basic load rating: Dynamic C_a (N)	Basic load rating: Static C_{oa} (N)	Screw shaft dimensions (mm): Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
MPFD1602.5-4	16	2.5	4 150	8 440	88.0 to 422	103 to 437	148 to 482	1.0 to 50.0	31.0 to 80.0	6.0 to 10.0

Click!Speedy Reference Number

U Y P 16 62 N 2 N B 0482 *

- Accuracy grade U : JIS C3 grade
- Nut code Y : Deflector (bridge) type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 2 : PS2 (see table 3)
- Lubrication component N : None
- Nut direction/Shaft end shape code (see table 4)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Low temperature chrome plating	Fluoride low temperature chrome plating
Code	N	D	F

○Low temperature chrome plating
- Used to prevent corrosion and light reflection, and for cosmetic purpose.

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Nut direction/Shaft end shape code

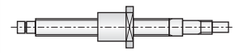
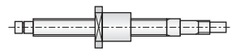
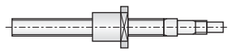
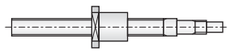
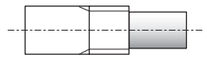
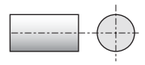
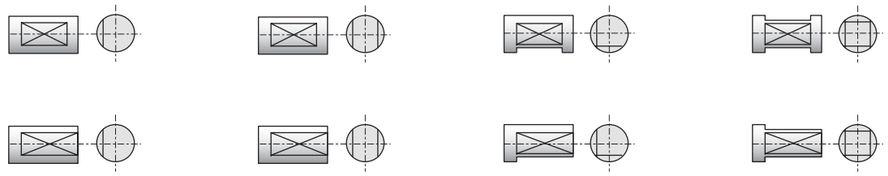
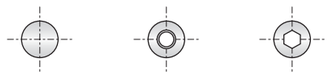
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free
Code	B	F	C	G
Shape				

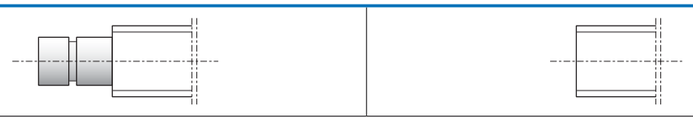
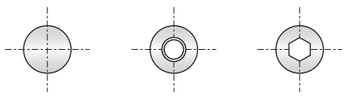
Table 5 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

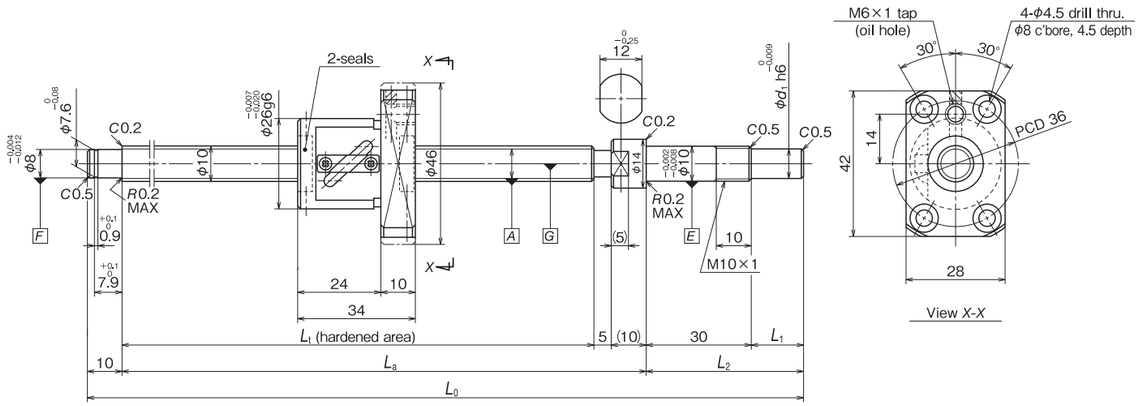
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

For small equipment FA Type Screw shaft diameter ø10, Lead 4



Specification

Nut specification					Screw shaft dimensions (mm)					
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
			Dynamic C_a (N)	Static C_{oa} (N)						
PFT1004-2.5	10	4	2 020	2 210	68.0 to 410	83.0 to 425	128 to 470	1.0 to 25.0	31.0 to 55.0	3.0 to 8.0

Click!Speedy Reference Number

U T P 10 04 N 2 N B 0470 *

- Accuracy grade U : JIS C3 grade
- Nut code T : Ball return tube type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 2 : PS2 (see table 3)
- Lubrication components N : None (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Low temperature chrome plating	Fluoride low temperature chrome plating
Code	N	D	F

○Low temperature chrome plating
- Used to prevent corrosion and light reflection, and for cosmetic purpose.

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication components

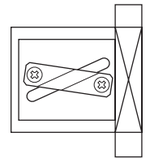
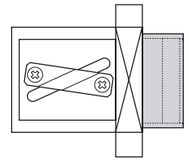
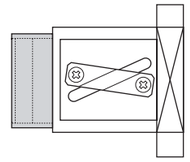
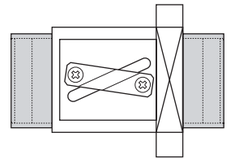
Form	None	Flange side : with K1	Opposite of flange : with K1	Both sides : with K1
Code	N	F	H	K
Shape				

Table 5 Nut direction/Shaft end shape code

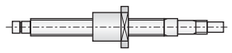
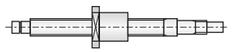
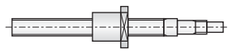
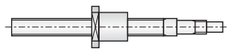
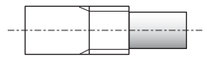
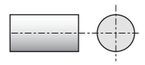
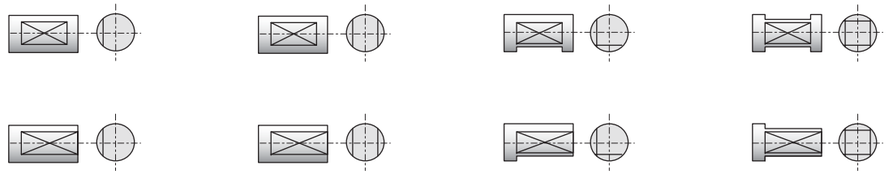
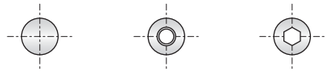
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free
Code	B	F	C	G
Shape				

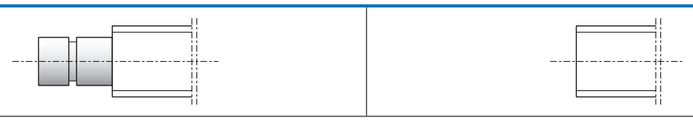
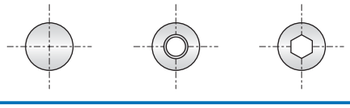
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

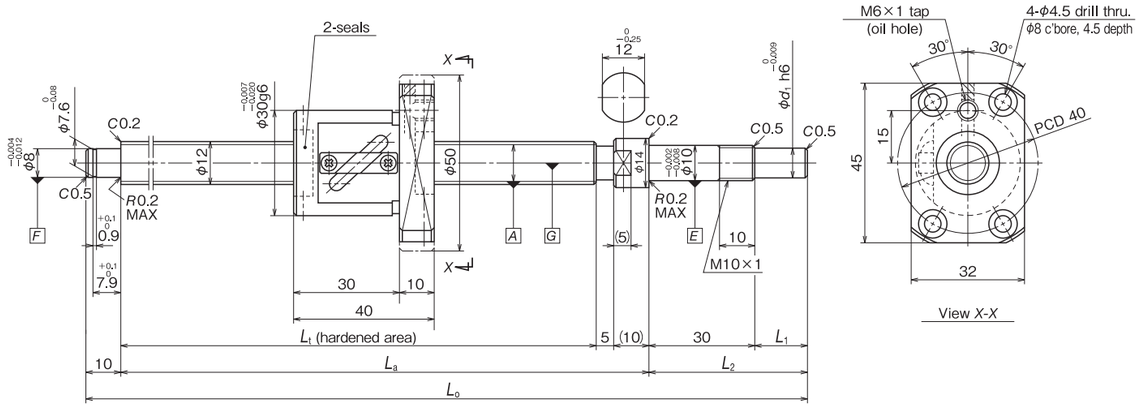
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

For small equipment FA Type　Screw shaft diameter ø12, Lead 5



Specification

Nut specification					Screw shaft dimensions (mm)					
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
			Dynamic C_a (N)	Static C_{oa} (N)						
PFT1205-2.5	12	5	2 770	3 130	80.0 to 610	95.0 to 625	140 to 670	1.0 to 25.0	31.0 to 55.0	3.0 to 8.0

Click!Speedy Reference Number

U T P 12 05 N 2 N B 0670 *

- Accuracy grade　U : JIS C3 grade
- Nut code　T : Ball return tube type
- Preload system/Axial play code　P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment　N : None (see table 2)
- Lubricant code　2 : PS2 (see table 3)
- Lubrication components　N : None (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1　Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play　0.005 or less
Code	P	T

Table 2　Surface treatment

Types of surface treatment	No surface treatment	Low temperature chrome plating	Fluoride low temperature chrome plating
Code	N	D	F

○Low temperature chrome plating
- Used to prevent corrosion and light reflection, and for cosmetic purpose.

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3　Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4　Lubrication components

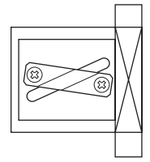
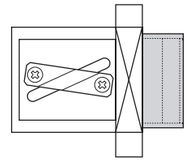
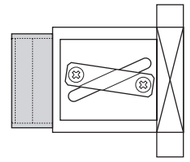
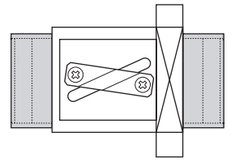
Form	None	Flange side : with K1	Opposite of flange : with K1	Both sides : with K1
Code	N	F	H	K
Shape				

Table 5　Nut direction/Shaft end shape code

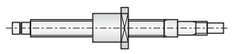
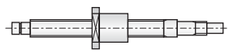
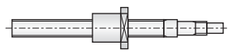
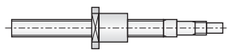
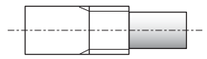
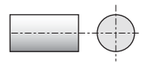
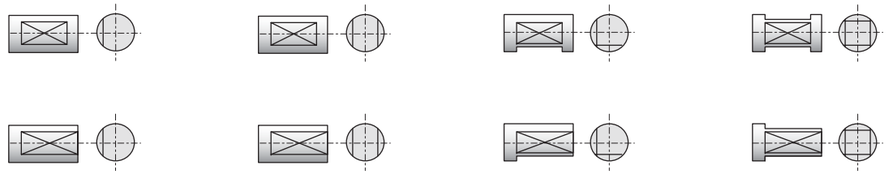
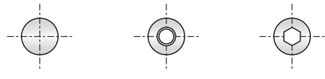
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free
Code	B	F	C	G
Shape				

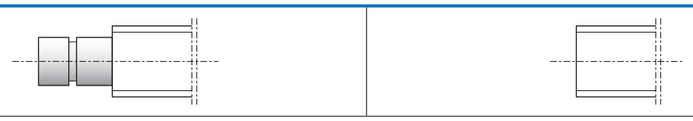
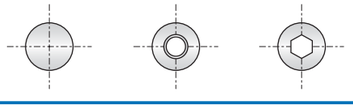
Table 6　Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

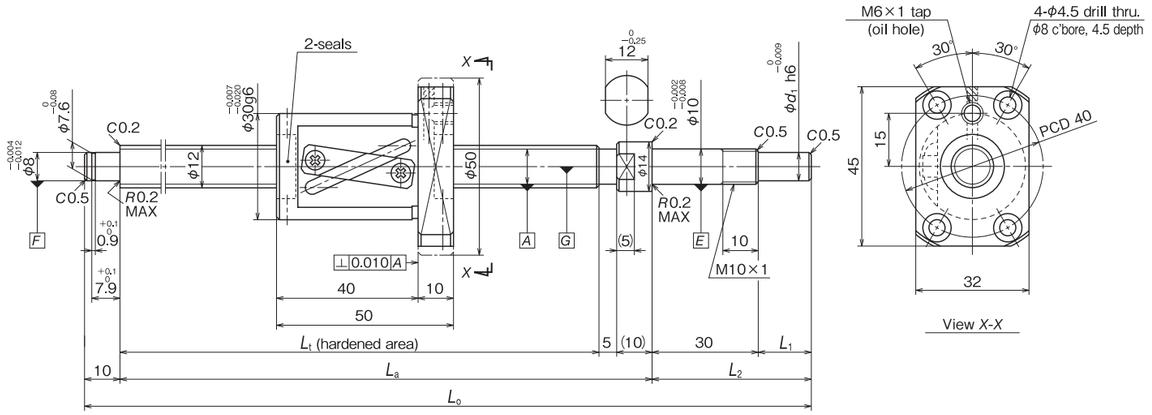
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

For small equipment FA Type Screw shaft diameter ø12, Lead 10



Specification

Nut specification					Screw shaft dimensions (mm)					
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
			Dynamic C_a (N)	Static C_{oa} (N)						
LPFT1210-2.5	12	10	2 790	3 220	100 to 610	115 to 625	160 to 670	1.0 to 25.0	31.0 to 55.0	3.0 to 8.0

Click!Speedy Reference Number

P T P 12 10 N 3 N B 0670 *

- Accuracy grade P : JIS C5 grade
- Nut code T : Ball return tube type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Design serial number
- Overall length of shaft (mm)
- Nut direction/Shaft end shape code (see table 5)
- Lubrication components N : None (see table 4)
- Lubricant code 3 : LR3 (see table 3)
- Surface treatment N : None (see table 2)

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Low temperature chrome plating	Fluoride low temperature chrome plating
Code	N	D	F

○Low temperature chrome plating
- Used to prevent corrosion and light reflection, and for cosmetic purpose.

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication components

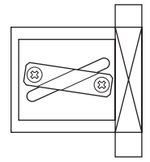
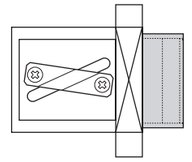
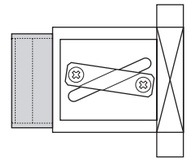
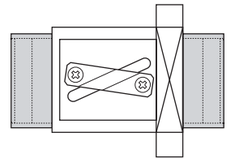
Form	None	Flange side : with K1	Opposite of flange : with K1	Both sides : with K1
Code	N	F	H	K
Shape				

Table 5 Nut direction/Shaft end shape code

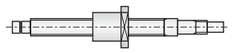
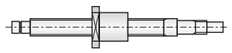
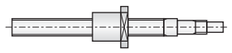
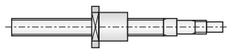
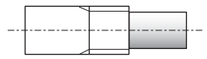
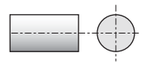
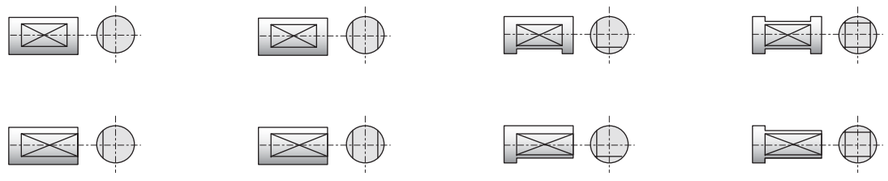
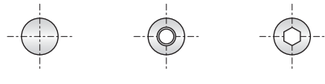
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free
Code	B	F	C	G
Shape				

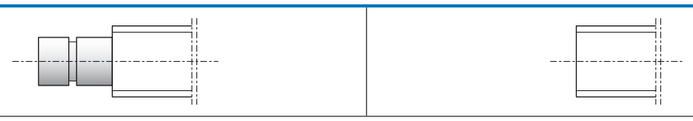
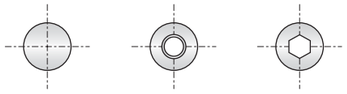
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

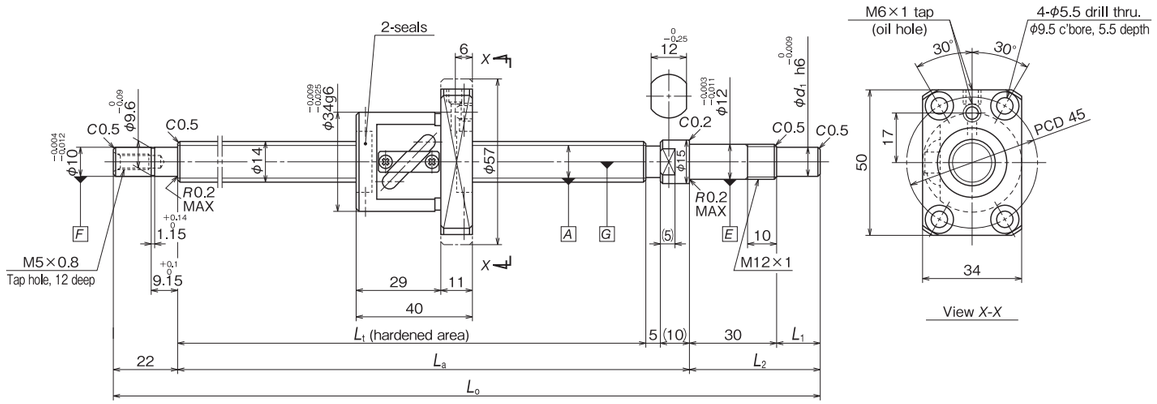
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

For small equipment FA Type Screw shaft diameter ø14, Lead 5



Specification

Nut specification					Screw shaft dimensions (mm)					
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
			Dynamic C_a (N)	Static C_{oa} (N)						
PFT1405-2.5	14	5	5 020	5 970	80.0 to 722	95.0 to 737	140 to 782	1.0 to 50.0	31.0 to 80	6.0 to 10.0

Click!Speedy Reference Number

U T P 14 05 N 3 N B 0782 *

- Accuracy grade U : JIS C3 grade
- Nut code T : Ball return tube type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 3 : LR3 (see table 3)
- Lubrication components N : None (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Low temperature chrome plating	Fluoride low temperature chrome plating
Code	N	D	F

○Low temperature chrome plating
- Used to prevent corrosion and light reflection, and for cosmetic purpose.

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication components

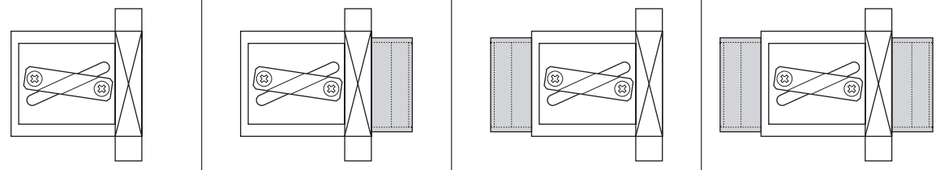
Form	None	Flange side : with K1	Opposite of flange : with K1	Both sides : with K1
Code	N	F	H	K
Shape				

Table 5 Nut direction/Shaft end shape code

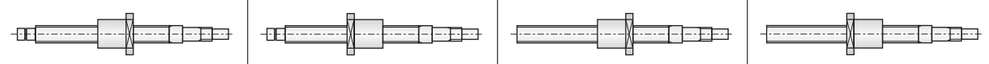
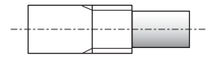
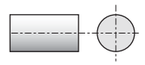
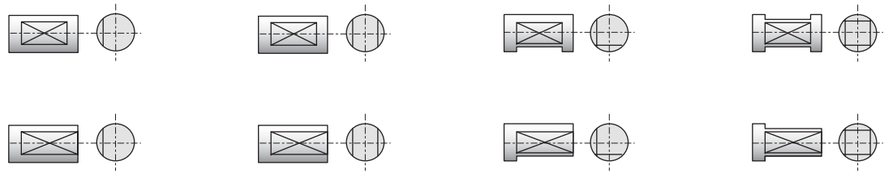
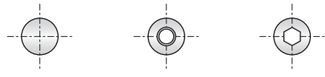
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free
Code	B	F	C	G
Shape				

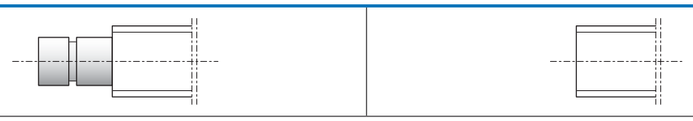
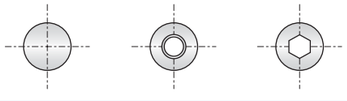
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

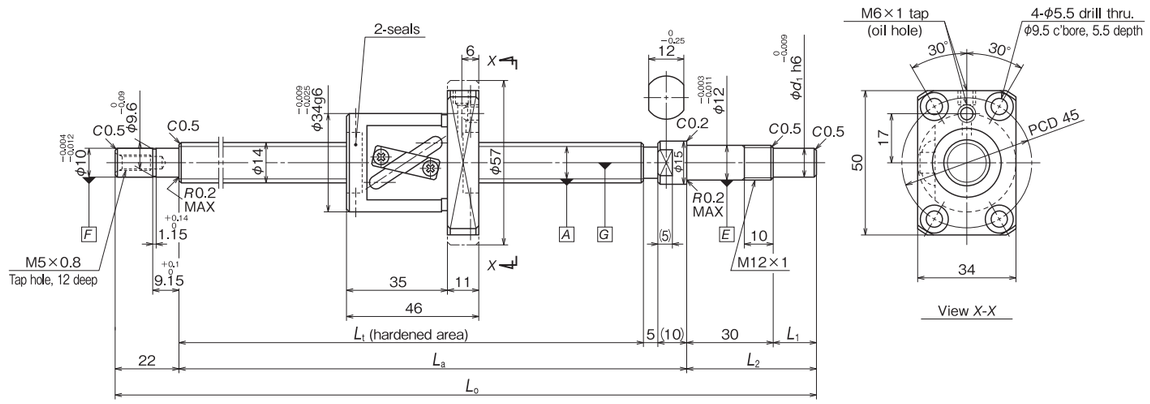
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

For small equipment FA Type Screw shaft diameter ø14, Lead 8



Specification

Model No.	Nut specification				Screw shaft dimensions (mm)					
	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
			Dynamic C_a (N)	Static C_{oa} (N)						
LPFT1408-2.5	14	8	4 960	5 920	92.0 to 822	107 to 837	152 to 882	1.0 to 50.0	31.0 to 80.0	6.0 to 10.0

Click!Speedy Reference Number

P T P 14 08 N 3 N B 0882 *

- Accuracy grade P : JIS C5 grade
- Nut code T : Ball return tube type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 3 : LR3 (see table 3)
- Lubrication components N : None (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Low temperature chrome plating	Fluoride low temperature chrome plating
Code	N	D	F

○Low temperature chrome plating
- Used to prevent corrosion and light reflection, and for cosmetic purpose.

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication components

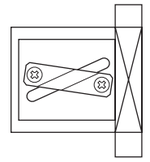
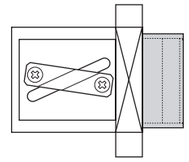
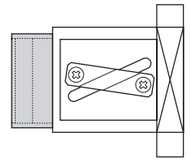
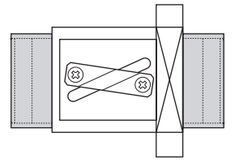
Form	None	Flange side : with K1	Opposite of flange : with K1	Both sides : with K1
Code	N	F	H	K
Shape				

Table 5 Nut direction/Shaft end shape code

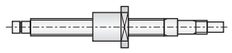
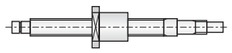
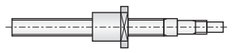
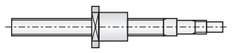
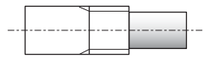
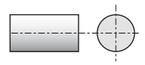
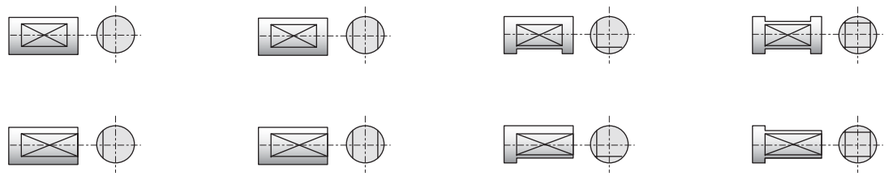
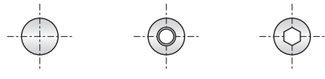
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free
Code	B	F	C	G
Shape				

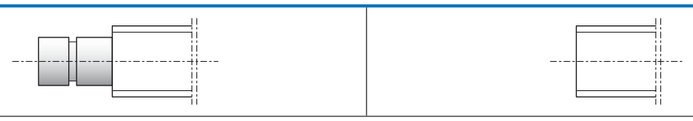
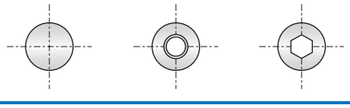
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

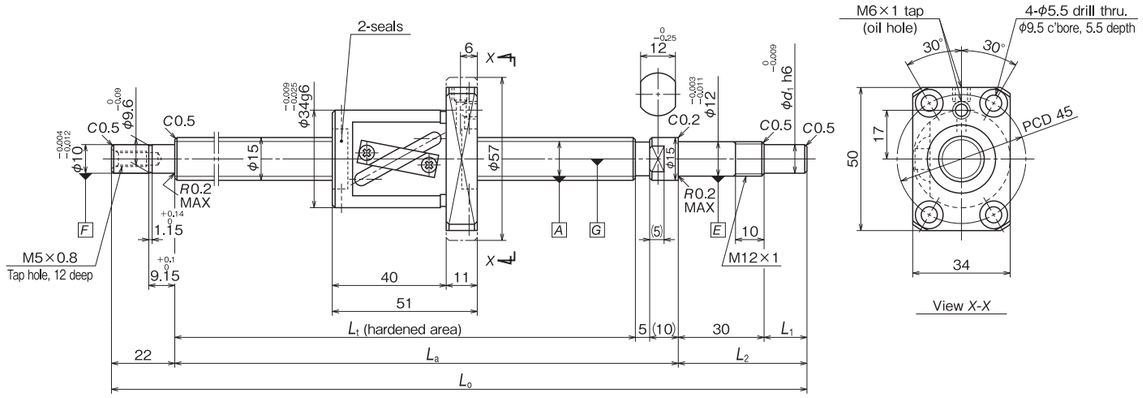
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

For small equipment FA Type Screw shaft diameter ø15, Lead 10



Specification

Model No.	Nut specification: Screw shaft diameter (mm)	Lead (mm)	Basic load rating: Dynamic C_a (N)	Basic load rating: Static C_{oa} (N)	Screw shaft dimensions (mm): Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
LPFT1510-2.5	15	10	5 130	6 420	102 to 1 122	117 to 1 137	162 to 1 182	1.0 to 50.0	31.0 to 80.0	6.0 to 10.0

Click!Speedy Reference Number

P T P 15 10 N 3 N B 1182 *

- Accuracy grade P : JIS C5 grade
- Nut code T : Ball return tube type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Design serial number
- Overall length of shaft (mm)
- Nut direction/Shaft end shape code (see table 5)
- Lubrication components N : None (see table 4)
- Lubricant code 3 : LR3 (see table 3)
- Surface treatment N : None (see table 2)

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Low temperature chrome plating	Fluoride low temperature chrome plating
Code	N	D	F

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○Fluoride low temperature chrome plating
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LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
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NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication components

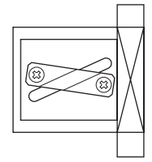
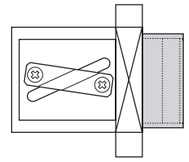
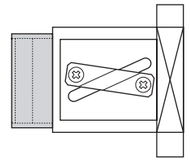
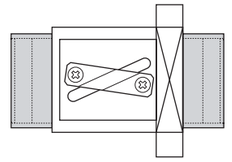
Form	None	Flange side : with K1	Opposite of flange : with K1	Both sides : with K1
Code	N	F	H	K
Shape				

Table 5 Nut direction/Shaft end shape code

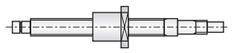
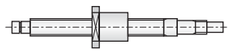
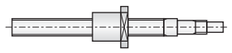
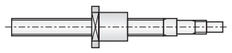
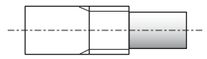
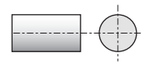
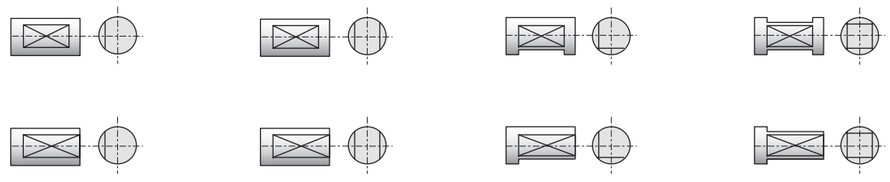
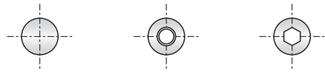
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free
Code	B	F	C	G
Shape				

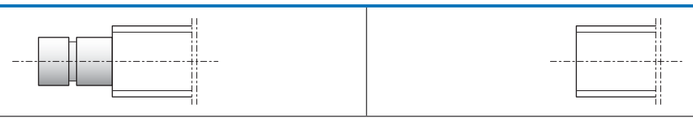
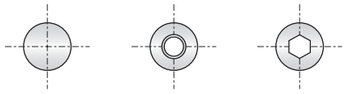
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

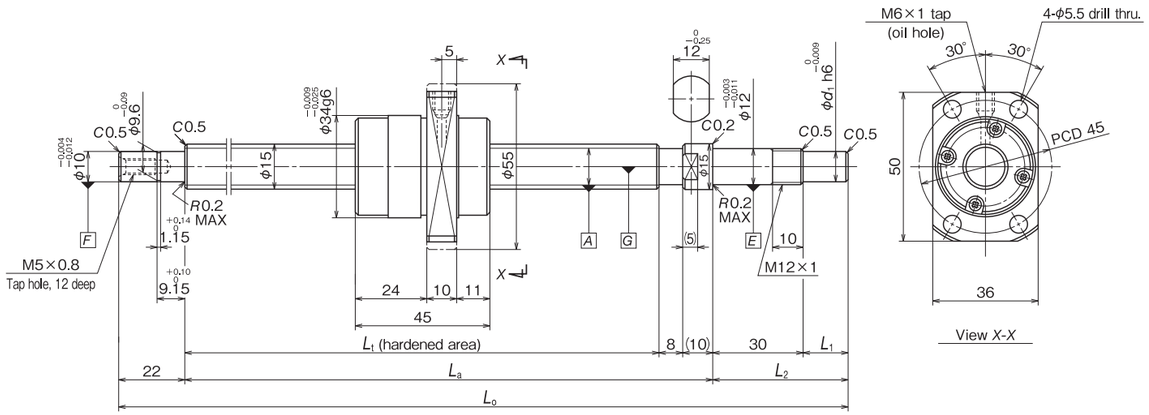
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

For small equipment FA Type Screw shaft diameter ø15, Lead 20



Specification

Model No.	Nut specification: Screw shaft diameter (mm)	Nut specification: Lead (mm)	Nut specification: Basic load rating Dynamic C_a (N)	Nut specification: Basic load rating Static C_{oa} (N)	Screw shaft dimensions (mm): Thread length L_t	Screw shaft dimensions (mm): Supported length L_a	Screw shaft dimensions (mm): Overall length L_o	Screw shaft dimensions (mm): Shaft end length L_1	Screw shaft dimensions (mm): Shaft end length L_2	Screw shaft dimensions (mm): Shaft end dia. d_1
UPFC1520-1.5	15	20	4 320	5 800	90.0 to 1 122	108 to 1 140	153 to 1 185	1.0 to 50.0	31.0 to 80.0	6.0 to 10.0

Click!Speedy Reference Number

P G P 15 20 N 3 N B 1185 *

- Accuracy grade P : JIS C5 grade
- Nut code G : End cap type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Design serial number
- Overall length of shaft (mm)
- Nut direction/Shaft end shape code (see table 5)
- Lubrication components N : None (see table 4)
- Lubricant code 3 : LR3 (see table 3)
- Surface treatment N : None (see table 2)

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Low temperature chrome plating	Fluoride low temperature chrome plating
Code	N	D	F

○Low temperature chrome plating
- Used to prevent corrosion and light reflection, and for cosmetic purpose.

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication components

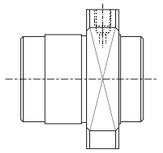
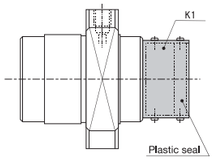
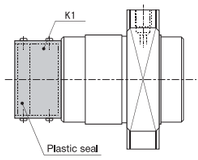
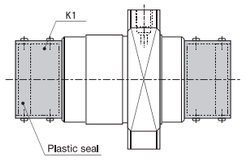
Form	None	Flange side : with K1	Opposite of flange : with K1	Both sides : with K1
Code	N	F	H	K
Shape				

Table 5 Nut direction/Shaft end shape code

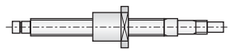
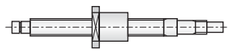
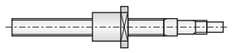
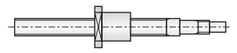
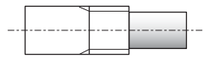
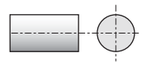
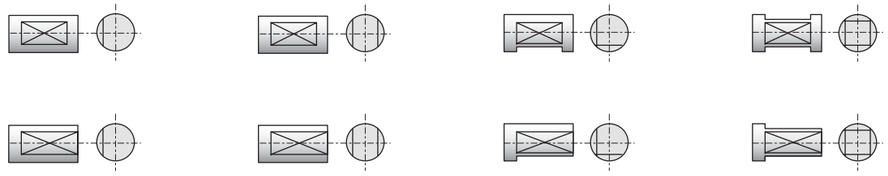
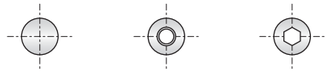
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free
Code	B	F	C	G
Shape				

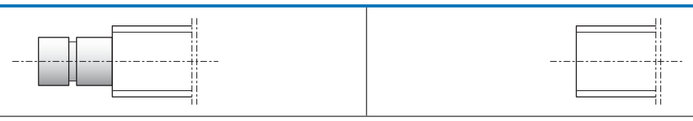
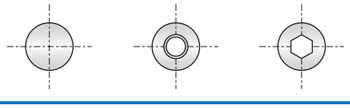
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

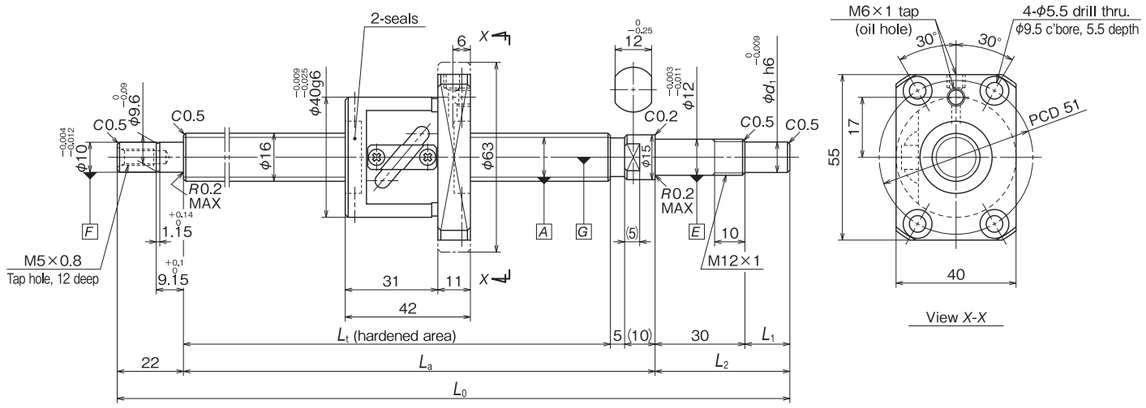
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

For small equipment FA Type Screw shaft diameter ø16, Lead 5



Specification

Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Screw shaft dimensions (mm)					
			Dynamic C_a (N)	Static C_{oa} (N)	Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
PFT1605-2.5	16	5	5 430	6 890	84.0 to 922	99.0 to 937	144 to 982	1.0 to 50.0	31.0 to 80.0	6.0 to 10.0

Click!Speedy Reference Number

U T P 16 05 N 3 N B 0982 *

- Accuracy grade U : JIS C3 grade
- Nut code T : Ball return tube type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 3 : LR3 (see table 3)
- Lubrication components N : None (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Low temperature chrome plating	Fluoride low temperature chrome plating
Code	N	D	F

○Low temperature chrome plating
- Used to prevent corrosion and light reflection, and for cosmetic purpose.

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication components

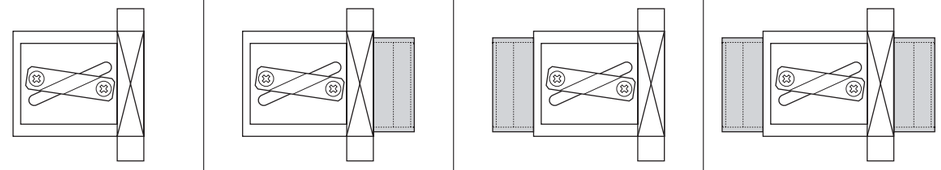
Form	None	Flange side : with K1	Opposite of flange : with K1	Both sides : with K1
Code	N	F	H	K
Shape				

Table 5 Nut direction/Shaft end shape code

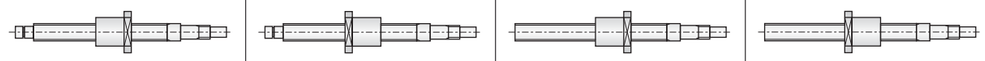
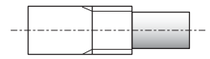
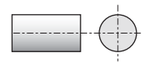
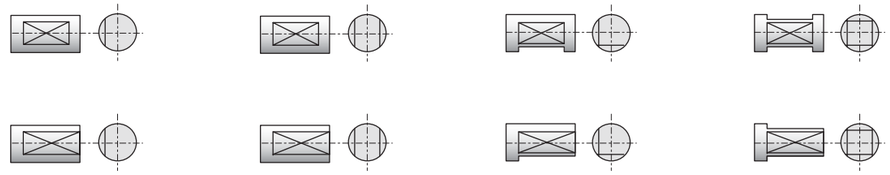
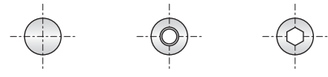
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free
Code	B	F	C	G
Shape				

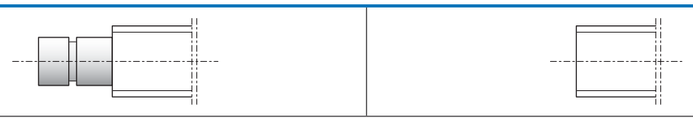
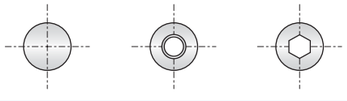
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

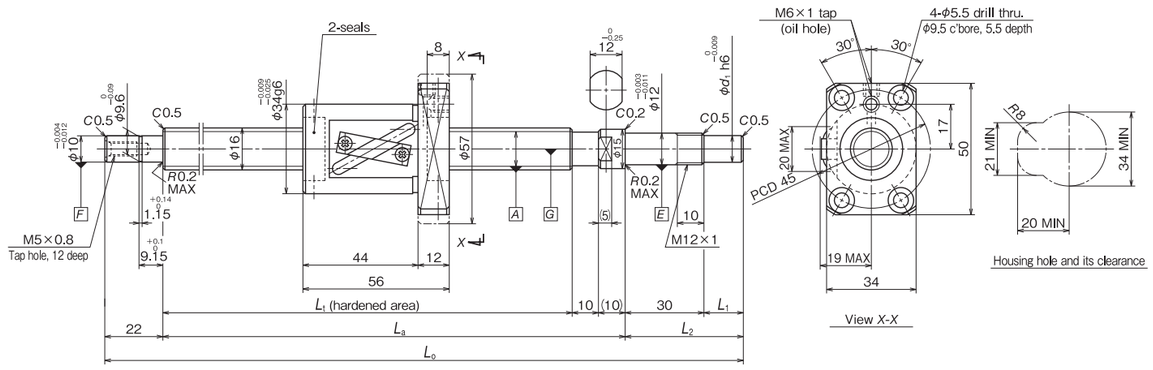
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

For small equipment FA Type Screw shaft diameter ø16, Lead 16



Specification

Nut specification					Screw shaft dimensions (mm)					
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
			Dynamic C_a (N)	Static C_{oa} (N)						
LPFT1616-1.5	16	16	4 180	5 390	112 to 1 122	132 to 1 142	177 to 1 187	1.0 to 50.0	31.0 to 80.0	6.0 to 10.0

Click!Speedy Reference Number

P T P 16 16 N 3 N B 1187 *

- Accuracy grade P : JIS C5 grade
- Nut code T : Ball return tube type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Design serial number
- Overall length of shaft (mm)
- Nut direction/Shaft end shape code (see table 5)
- Lubrication components N : None (see table 4)
- Lubricant code 3 : LR3 (see table 3)
- Surface treatment N : None (see table 2)

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Low temperature chrome plating	Fluoride low temperature chrome plating
Code	N	D	F

○Low temperature chrome plating
- Used to prevent corrosion and light reflection, and for cosmetic purpose.

○Fluoride low temperature chrome plating
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- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
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PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication components

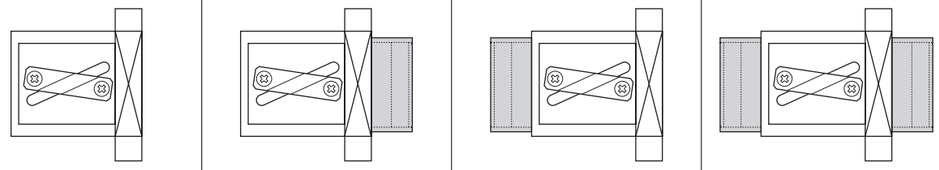
Form	None	Flange side : with K1	Opposite of flange : with K1	Both sides : with K1
Code	N	F	H	K
Shape				

Table 5 Nut direction/Shaft end shape code

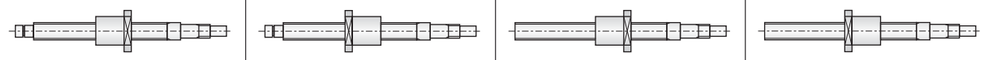
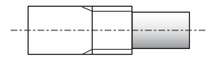
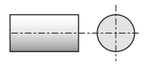
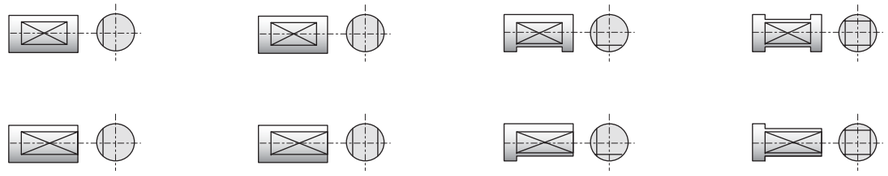
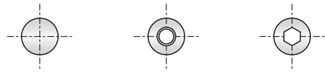
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free
Code	B	F	C	G
Shape				

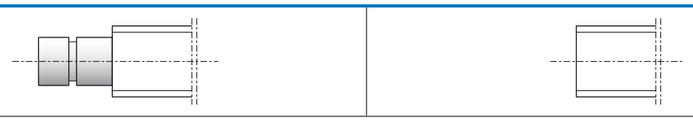
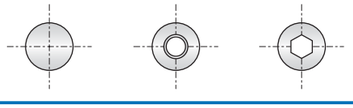
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

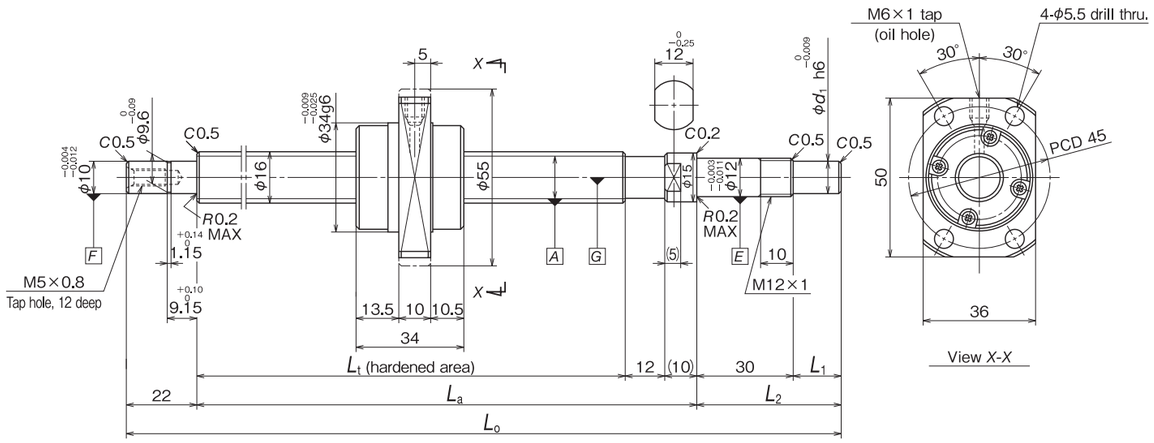
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

For small equipment FA Type　Screw shaft diameter ø16, Lead 32



Specification

Model No.	Nut specification				Screw shaft dimensions (mm)					
	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
			Dynamic C_a (N)	Static C_{oa} (N)						
UPFC1632-1	16	32	4 800	7 510	68.0 to 1 322	90.0 to 1 344	135 to 1 389	1.0 to 50.0	31.0 to 80.0	6.0 to 10.0

Click!Speedy Reference Number

P G P 16 32 N 3 N B 1389 *

- Accuracy grade　P : JIS C5 grade
- Nut code　G : End cap type
- Preload system/Axial play code
  P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Design serial number
- Overall length of shaft (mm)
- Nut direction/Shaft end shape code (see table 5)
- Lubrication components　N : None (see table 4)
- Lubricant code　3 : LR3 (see table 3)
- Surface treatment　N : None (see table 2)

Table 1　Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2　Surface treatment

Types of surface treatment	No surface treatment	Low temperature chrome plating	Fluoride low temperature chrome plating
Code	N	D	F

○Low temperature chrome plating
- Used to prevent corrosion and light reflection, and for cosmetic purpose.

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3　Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4　Lubrication components

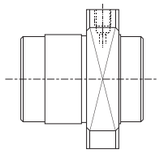
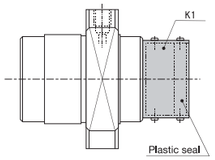
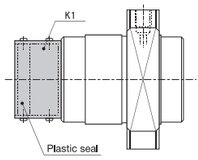
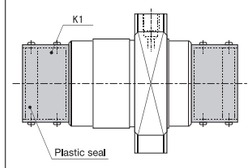
Form	None	Flange side : with K1	Opposite of flange : with K1	Both sides : with K1
Code	N	F	H	K
Shape				

Table 5　Nut direction/Shaft end shape code

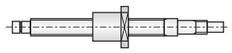
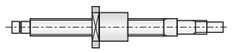
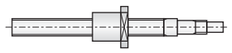
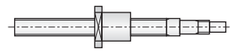
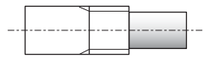
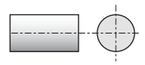
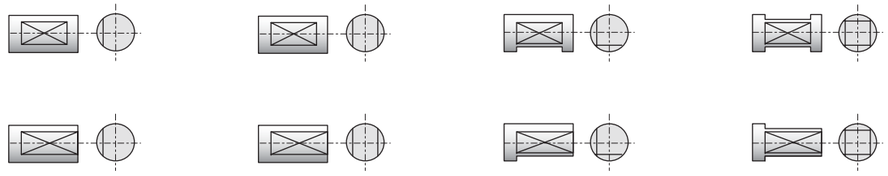
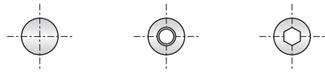
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free
Code	B	F	C	G
Shape				

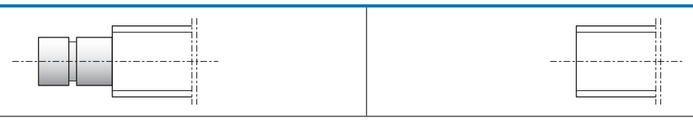
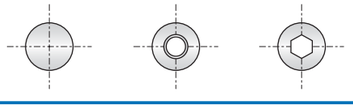
Table 6　Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

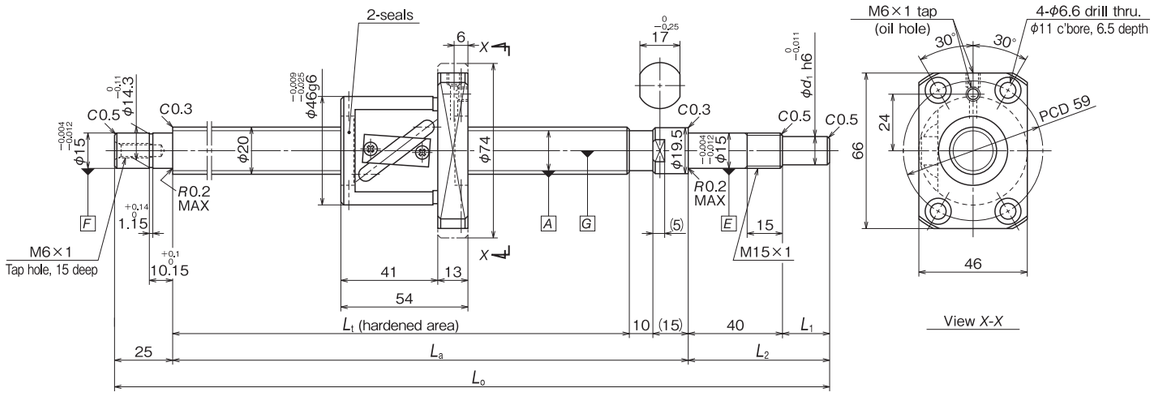
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

For small equipment FA Type Screw shaft diameter ø20, Lead 10



Specification

Nut specification					Screw shaft dimensions (mm)					
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
			Dynamic C_a (N)	Static C_{oa} (N)						
LPFT2010-2.5	20	10	8 350	11 000	108 to 1 325	133 to 1 350	193 to 1 410	1.0 to 60.0	41.0 to 100	6.0 to 12.0

Click!Speedy Reference Number

P T P 20 10 N 3 N B 1410 *

- Accuracy grade P : JIS C5 grade
- Nut code T : Ball return tube type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Design serial number
- Overall length of shaft (mm)
- Nut direction/Shaft end shape code (see table 5)
- Lubrication components N : None (see table 4)
- Lubricant code 3 : LR3 (see table 3)
- Surface treatment N : None (see table 2)

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Low temperature chrome plating	Fluoride low temperature chrome plating
Code	N	D	F

○Low temperature chrome plating
- Used to prevent corrosion and light reflection, and for cosmetic purpose.

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication components

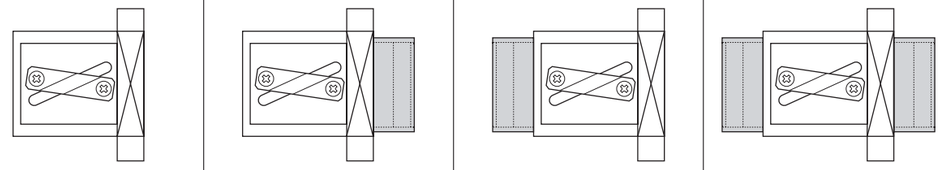
Form	None	Flange side : with K1	Opposite of flange : with K1	Both sides : with K1
Code	N	F	H	K
Shape				

Table 5 Nut direction/Shaft end shape code

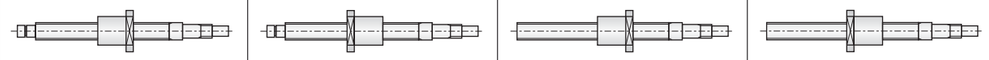
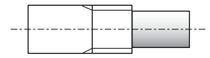
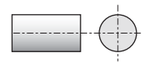
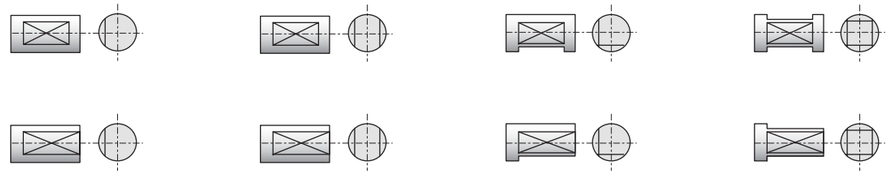
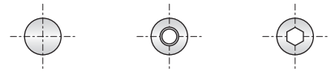
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free
Code	B	F	C	G
Shape				

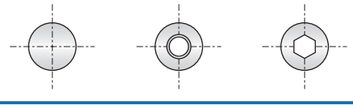
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

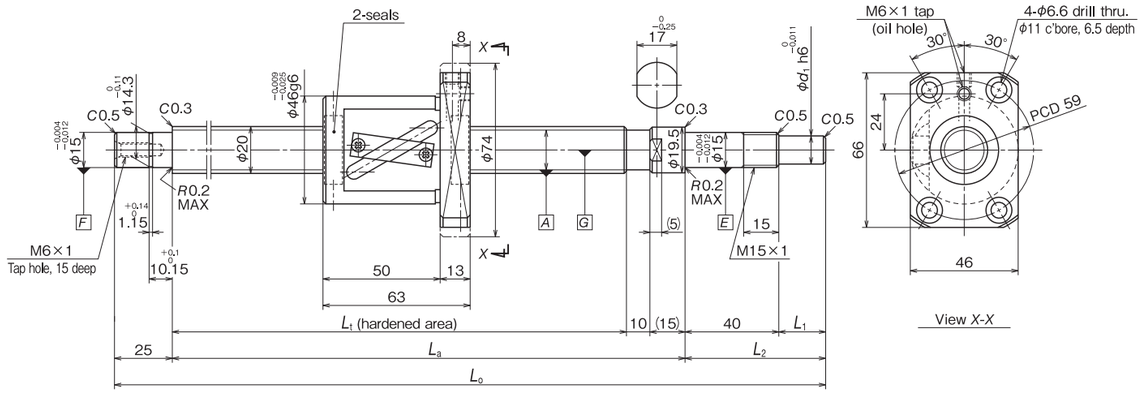
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

For small equipment FA Type Screw shaft diameter ø20, Lead 20



Specification

Nut specification					Screw shaft dimensions (mm)					
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
			Dynamic C_a (N)	Static C_{oa} (N)						
LPFT2020-1.5	20	20	6 250	8 760	126 to 1 825	151 to 1 850	211 to 1 910	1.0 to 60.0	41.0 to 100	6.0 to 12.0

Click!Speedy Reference Number

P T P 20 20 N 3 N B 1910 *

- Accuracy grade P : JIS C5 grade
- Nut code T : Ball return tube type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Design serial number
- Overall length of shaft (mm)
- Nut direction/Shaft end shape code (see table 5)
- Lubrication components N : None (see table 4)
- Lubricant code 3 : LR3 (see table 3)
- Surface treatment N : None (see table 2)

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Low temperature chrome plating	Fluoride low temperature chrome plating
Code	N	D	F

○Low temperature chrome plating
- Used to prevent corrosion and light reflection, and for cosmetic purpose.

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication components

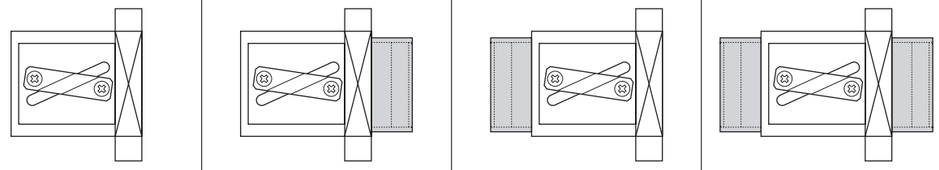
Form	None	Flange side : with K1	Opposite of flange : with K1	Both sides : with K1
Code	N	F	H	K
Shape				

Table 5 Nut direction/Shaft end shape code

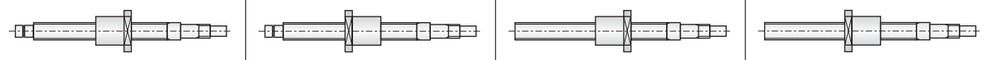
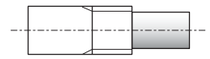
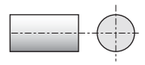
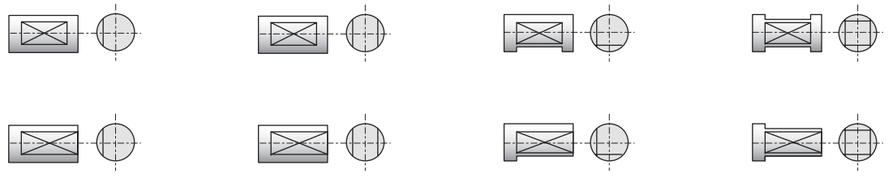
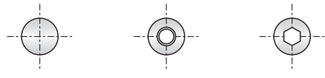
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free
Code	B	F	C	G
Shape				

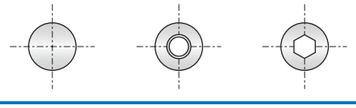
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

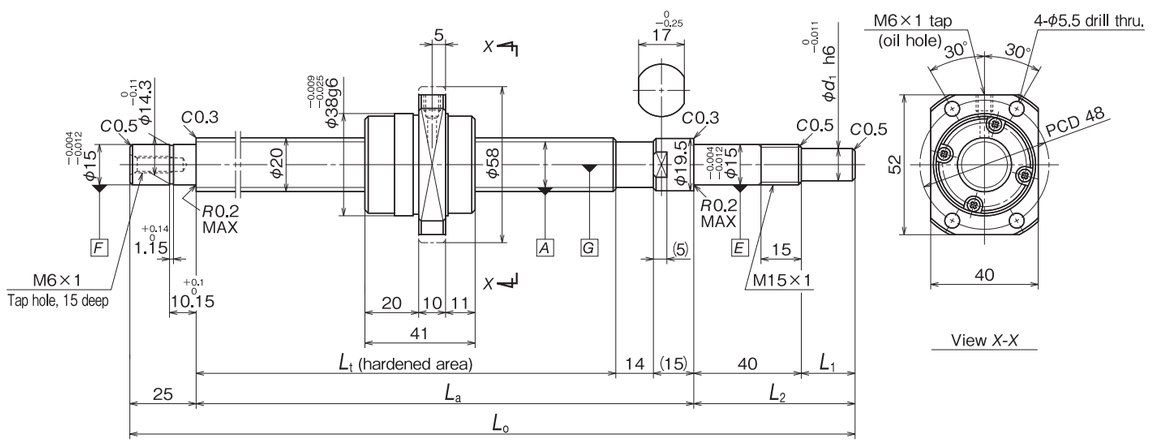
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

For small equipment FA Type　Screw shaft diameter ø20, Lead 40



Specification

Nut specification					Screw shaft dimensions (mm)					
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
			Dynamic C_a (N)	Static C_{oa} (N)						
UPFC2040-1	20	40	5 410	9 360	82.0 to 2 225	111 to 2 254	171 to 2 314	1.0 to 60.0	41.0 to 100	6.0 to 12.0

Click!Speedy Reference Number

P G P 20 40 N 3 N B 2314 *

- Accuracy grade　P : JIS C5 grade
- Nut code　G : End cap type
- Preload system/Axial play code
  P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Design serial number
- Overall length of shaft (mm)
- Nut direction/Shaft end shape code (see table 5)
- Lubrication components　N : None (see table 4)
- Lubricant code　3 : LR3 (see table 3)
- Surface treatment　N : None (see table 2)

Table 1　Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2　Surface treatment

Types of surface treatment	No surface treatment	Low temperature chrome plating	Fluoride low temperature chrome plating
Code	N	D	F

○Low temperature chrome plating
- Used to prevent corrosion and light reflection, and for cosmetic purpose.

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3　Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4　Lubrication components

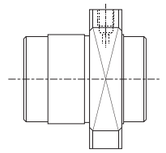
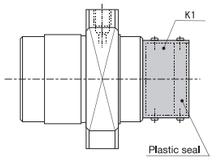
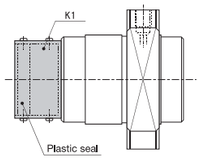
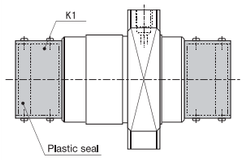
Form	None	Flange side : with K1	Opposite of flange : with K1	Both sides : with K1
Code	N	F	H	K
Shape				

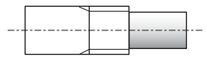
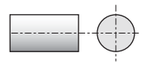
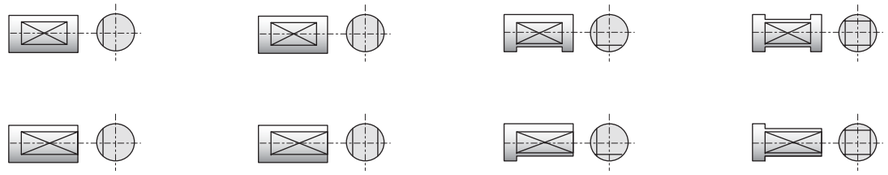
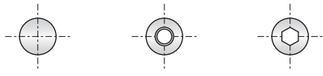
Table 5　Nut direction/Shaft end shape code

Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free
Code	B	F	C	G
Shape				

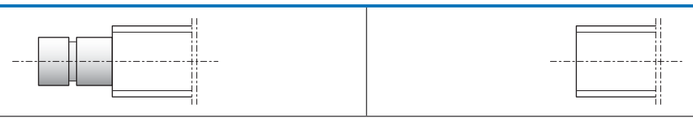
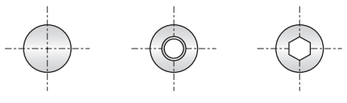
Table 6　Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

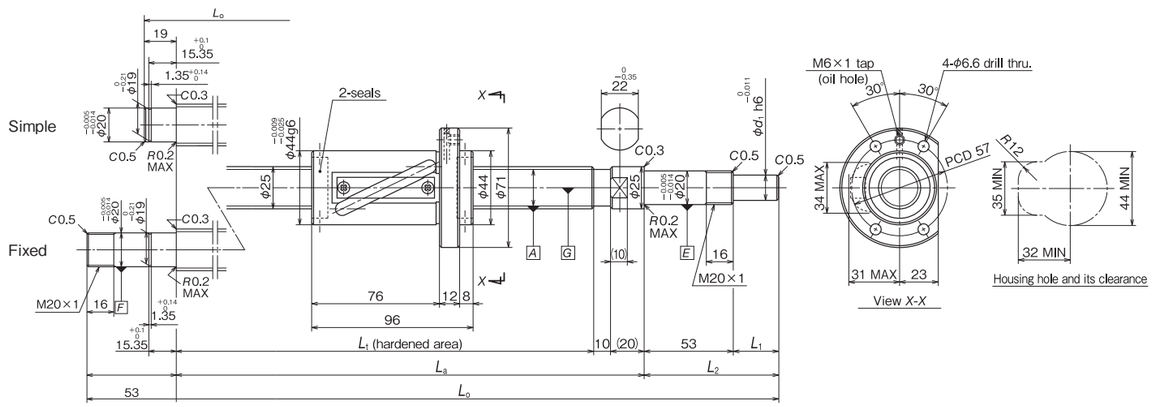
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

For small equipment FA Type Screw shaft diameter ø25, Lead 20



Specification

Nut specification					Screw shaft dimensions (mm)						
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Shaft end shape	Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
			Dynamic C_a (N)	Static C_{oa} (N)							
LPFT2520-2.5	25	20	11 700	16 300	Simple	192 to 2 234	222 to 2 264	321 to 2 363	1.0 to 75.0	54.0 to 128	8.0 to 15.0
					Fixed	192 to 2 200	222 to 2 230	355 to 2 363	1.0 to 75.0	54.0 to 128	8.0 to 15.0

Click!Speedy Reference Number

P T P 25 20 N 3 N B 2363 *

- Accuracy grade P : JIS C5 grade
- Nut code T : Ball return tube type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 3 : LR3 (see table 3)
- Lubrication components N : None (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Low temperature chrome plating	Fluoride low temperature chrome plating
Code	N	D	F

○Low temperature chrome plating
- Used to prevent corrosion and light reflection, and for cosmetic purpose.

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication components

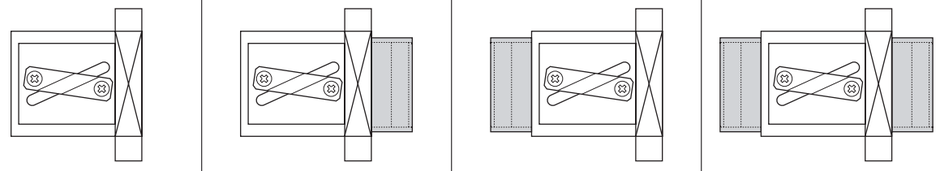
Form	None	Flange side : with K1	Opposite of flange : with K1	Both sides : with K1
Code	N	F	H	K
Shape				

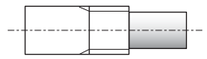
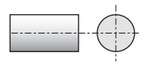
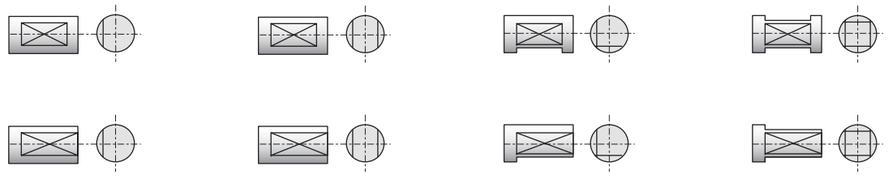
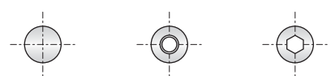
Table 5 Nut direction/Shaft end shape code

Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed	Fixed – Fixed	Fixed – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free	Flange side : Drive side	Flange side : Opposite to drive side
Code	B	F	C	G	A	E
Shape						

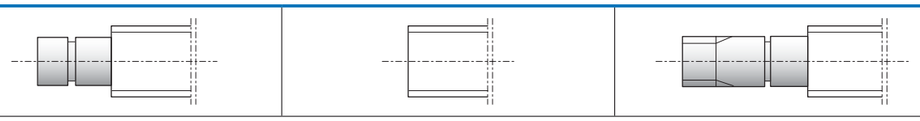
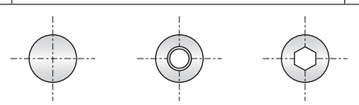
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

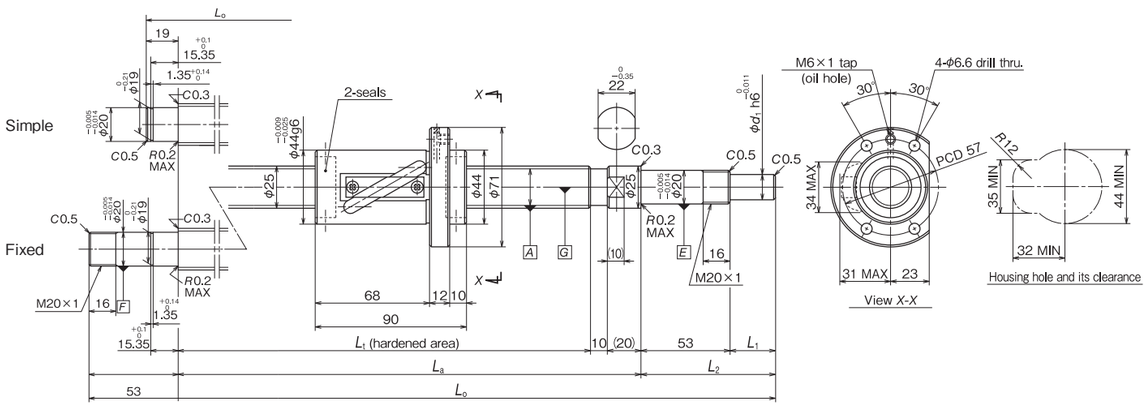
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

For small equipment FA Type　Screw shaft diameter ø25, Lead 25



Specification

Nut specification					Screw shaft dimensions (mm)						
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Shaft end shape	Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
			Dynamic C_a (N)	Static C_{oa} (N)							
LPFT2525-1.5	25	25	8 970	13 100	Simple	180 to 2 234	210 to 2 264	309 to 2 363	1.0 to 75.0	54 to 128	8.0 to 15.0
					Fixed	180 to 2 200	210 to 2 230	343 to 2 363	1.0 to 75.0	54 to 128	8.0 to 15.0

Click!Speedy Reference Number

P T P 25 25 N 3 N B 2363 *

- Accuracy grade　P : JIS　C5 grade
- Nut code　T : Ball return tube type
- Preload system/Axial play code　P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment　N : None (see table 2)
- Lubricant code　3 : LR3 (see table 3)
- Lubrication components　N : None (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1　Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play　0.005 or less
Code	P	T

Table 2　Surface treatment

Types of surface treatment	No surface treatment	Low temperature chrome plating	Fluoride low temperature chrome plating
Code	N	D	F

○Low temperature chrome plating
- Used to prevent corrosion and light reflection, and for cosmetic purpose.

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3　Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4　Lubrication components

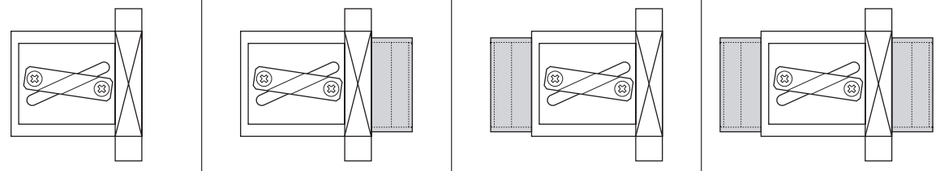
Form	None	Flange side : with K1	Opposite of flange : with K1	Both sides : with K1
Code	N	F	H	K
Shape				

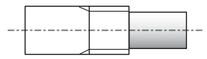
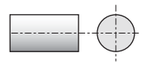
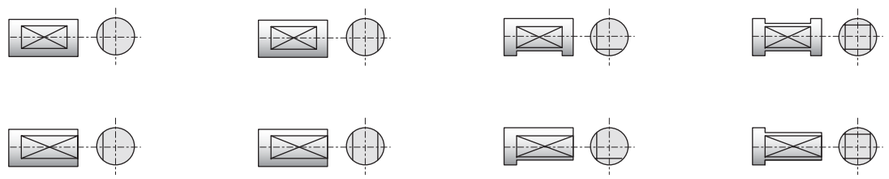
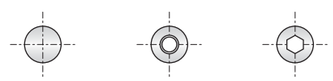
Table 5　Nut direction/Shaft end shape code

Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed	Fixed – Fixed	Fixed – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free	Flange side : Drive side	Flange side : Opposite to drive side
Code	B	F	C	G	A	E
Shape						

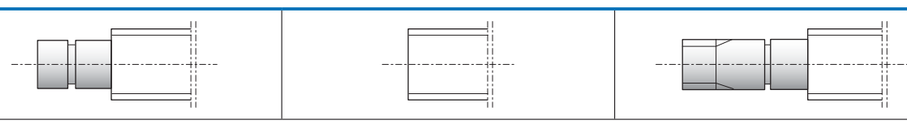
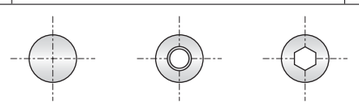
Table 6　Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

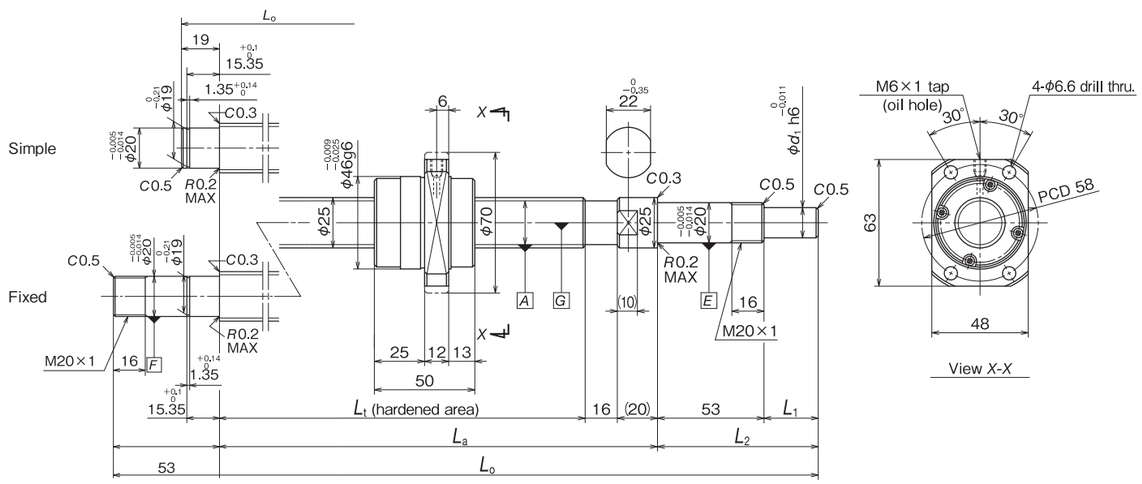
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

For small equipment FA Type　Screw shaft diameter ø25, Lead 50



Specification

Nut specification					Screw shaft dimensions (mm)						
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Shaft end shape	Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
			Dynamic C_a (N)	Static C_{oa} (N)							
UPFC2550-1	25	50	8 090	14 600	Simple	100 to 2 234	136 to 2 270	235 to 2 369	1.0 to 75.0	54 to 128	8.0 to 15.0
					Fixed	100 to 2 200	136 to 2 236	269 to 2 369	1.0 to 75.0	54 to 128	8.0 to 15.0

Click!Speedy Reference Number

P　G　P　25　50　N　3　N　B　2369　***

- Accuracy grade　P : JIS　C5 grade
- Nut code　G : End cap type
- Preload system/Axial play code　P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment　N : None (see table 2)
- Lubricant code　3 : LR3 (see table 3)
- Lubrication components　N : None (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1　Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play　0.005 or less
Code	P	T

Table 2　Surface treatment

Types of surface treatment	No surface treatment	Low temperature chrome plating	Fluoride low temperature chrome plating
Code	N	D	F

○Low temperature chrome plating
- Used to prevent corrosion and light reflection, and for cosmetic purpose.

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3　Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4　Lubrication components

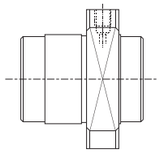
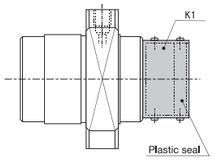
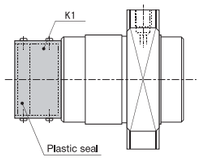
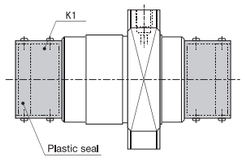
Form	None	Flange side : with K1	Opposite of flange : with K1	Both sides : with K1
Code	N	F	H	K
Shape				

Table 5　Nut direction/Shaft end shape code

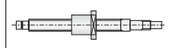
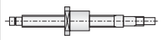
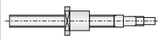
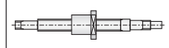
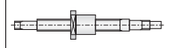
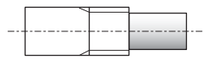
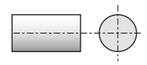
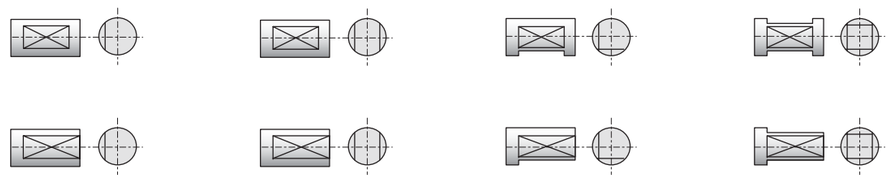
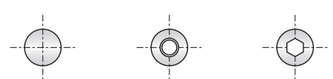
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed	Fixed – Fixed	Fixed – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free	Flange side : Drive side	Flange side : Opposite to drive side
Code	B	F	C	G	A	E
Shape						

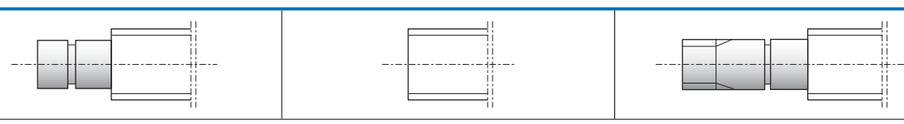
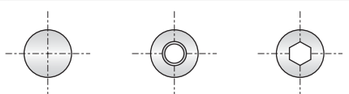
Table 6　Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

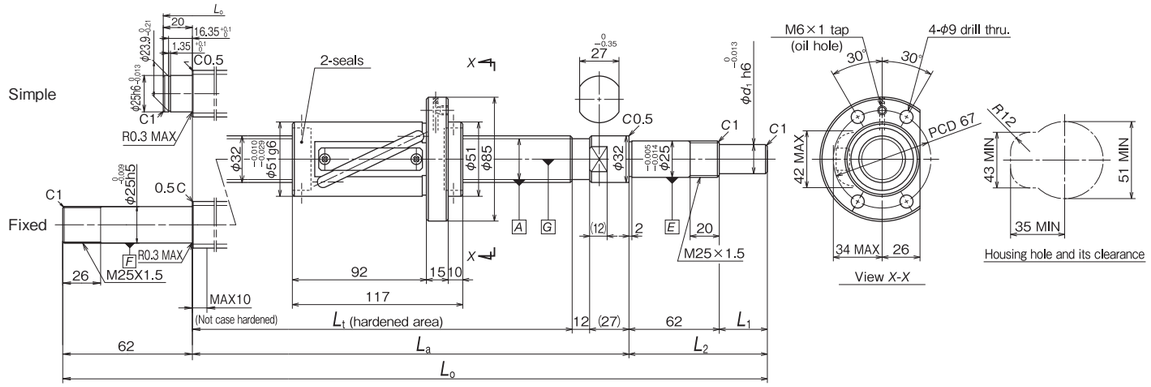
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

For small equipment FA Type　Screw shaft diameter ø32, Lead 25



Specification

Nut specification					Screw shaft dimensions (mm)						
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Shaft end shape	Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
			Dynamic C_a (N)	Static C_{oa} (N)							
LPFT3225-2.5	32	25	12 900	21 100	Simple	234 to 2 842	273 to 2 881	388 to 2 996	1.0 to 100	63 to 162	8.0 to 20.0
					Fixed	234 to 2 800	273 to 2 839	430 to 2 996	1.0 to 100	63 to 162	8.0 to 20.0

Click!Speedy Reference Number

P T P 32 25 N 3 N B 2996 *

- Accuracy grade　P : JIS　C5 grade
- Nut code　T : Ball return tube type
- Preload system/Axial play code　P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment　N : None (see table 2)
- Lubricant code　3 : LR3 (see table 3)
- Lubrication components　N : None (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1　Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play　0.005 or less
Code	P	T

Table 2　Surface treatment

Types of surface treatment	No surface treatment	Low temperature chrome plating	Fluoride low temperature chrome plating
Code	N	D	F

○Low temperature chrome plating
- Used to prevent corrosion and light reflection, and for cosmetic purpose.

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3　Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4　Lubrication components

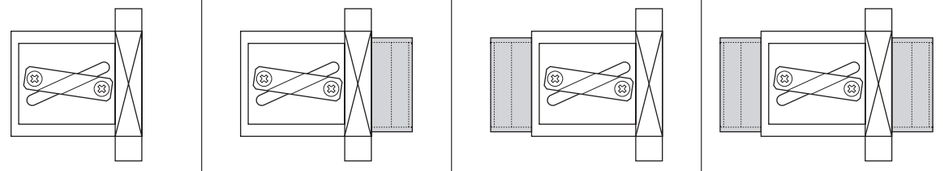
Form	None	Flange side : with K1	Opposite of flange : with K1	Both sides : with K1
Code	N	F	H	K
Shape				

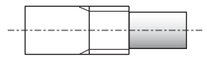
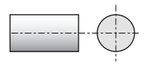
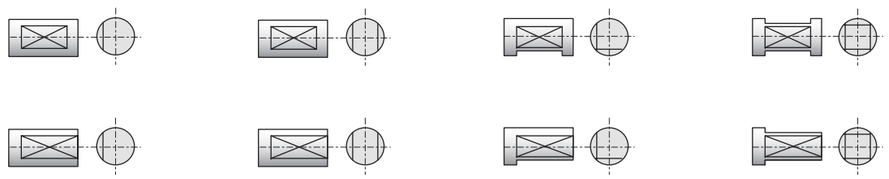
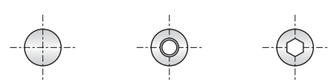
Table 5　Nut direction/Shaft end shape code

Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed	Fixed – Fixed	Fixed – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free	Flange side : Drive side	Flange side : Opposite to drive side
Code	B	F	C	G	A	E
Shape						

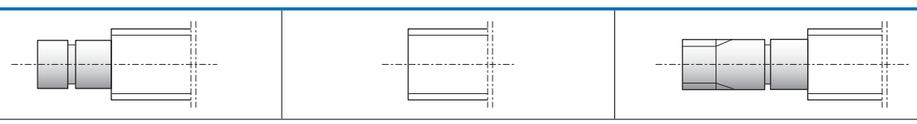
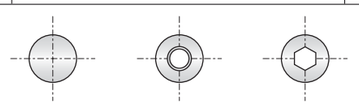
Table 6　Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

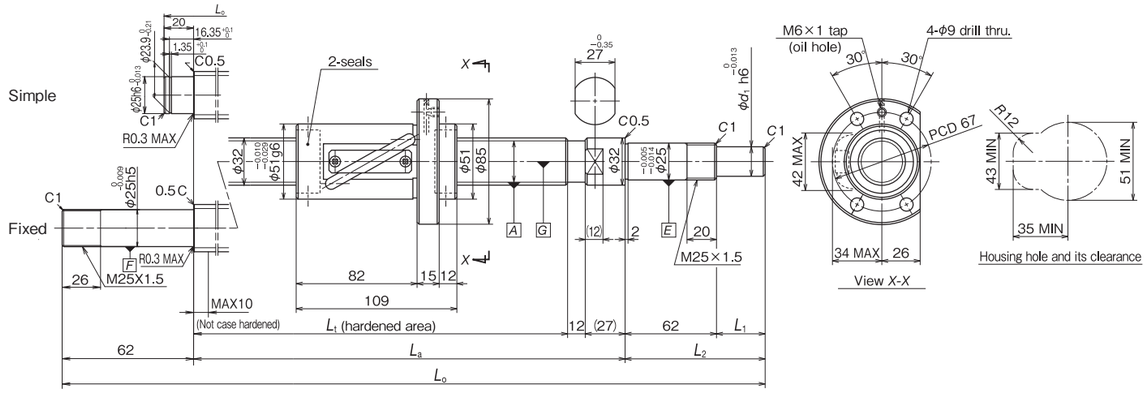
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

For small equipment FA Type　Screw shaft diameter ø32, Lead 32



Specification

Nut specification					Screw shaft dimensions (mm)						
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Shaft end shape	Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
			Dynamic C_a (N)	Static C_{oa} (N)							
LPFT3232-1.5	32	32	10 100	16 800	Simple	218 to 2 842	257 to 2 881	372 to 2 996	1.0 to 100	63 to 162	8.0 to 20.0
					Fixed	218 to 2 800	257 to 2 839	414 to 2 996	1.0 to 100	63 to 162	8.0 to 20.0

Click!Speedy Reference Number

P T P 32 32 N 3 N B 2996 *

- Accuracy grade　P : JIS　C5 grade
- Nut code　T : Ball return tube type
- Preload system/Axial play code　P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment　N : None (see table 2)
- Lubricant code　3 : LR3 (see table 3)
- Lubrication components　N : None (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1　Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play　0.005 or less
Code	P	T

Table 2　Surface treatment

Types of surface treatment	No surface treatment	Low temperature chrome plating	Fluoride low temperature chrome plating
Code	N	D	F

○Low temperature chrome plating
- Used to prevent corrosion and light reflection, and for cosmetic purpose.

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3　Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
PS2	2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	–50 to 110	For light load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4　Lubrication components

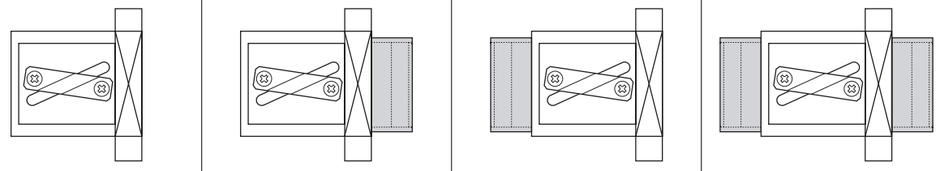
Form	None	Flange side : with K1	Opposite of flange : with K1	Both sides : with K1
Code	N	F	H	K
Shape				

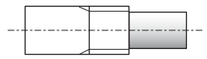
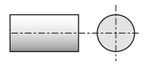
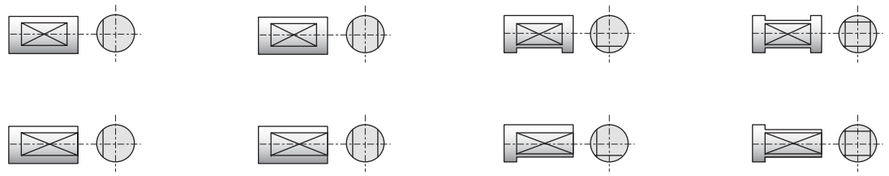
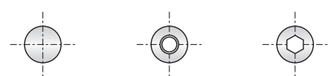
Table 5　Nut direction/Shaft end shape code

Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed	Fixed – Fixed	Fixed – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free	Flange side : Drive side	Flange side : Opposite to drive side
Code	B	F	C	G	A	E
Shape						

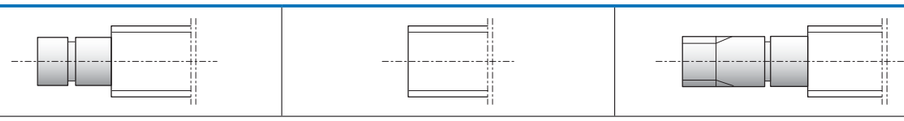
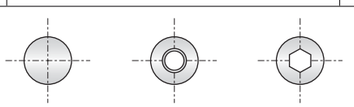
Table 6　Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

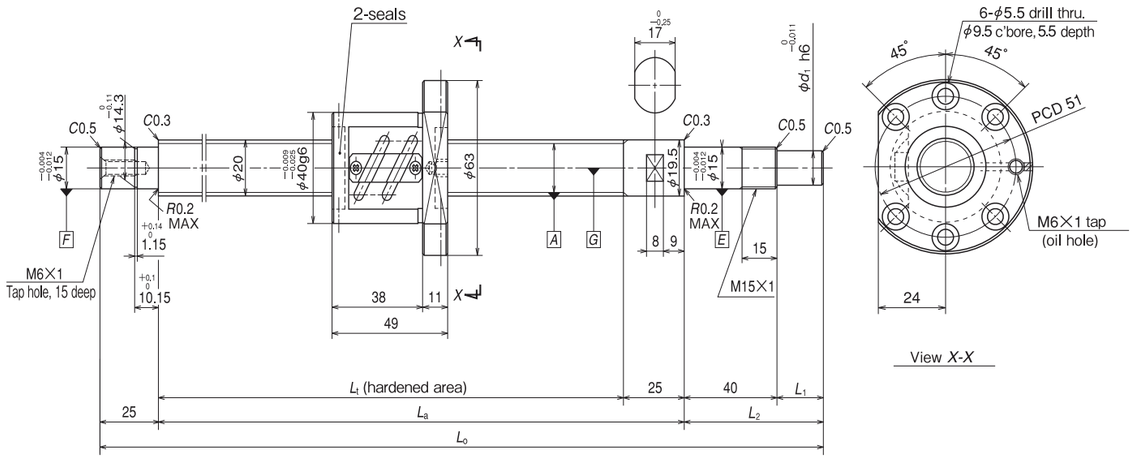
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

For machine tools SA Type Screw shaft diameter ø20, Lead 4



View *X-X*

Specification

Nut specification					Screw shaft dimensions (mm)					
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
			Dynamic C_a (N)	Static C_{oa} (N)						
PFT2004-5	20	4	6 550	10 900	98.0 to 825	123 to 850	183 to 910	1.0 to 60.0	41.0 to 100	6.0 to 12.0

Click!Speedy Reference Number

P T P 20 04 N 9 N B 0910 *

- Accuracy grade P : JIS C5 grade
- Nut code T : Ball return tube type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubrication components N : None (see table 4)
- Lubricant code 9 : Rust preventive oil (see table 3)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Low temperature chrome plating	Fluoride low temperature chrome plating
Code	N	D	F

○Low temperature chrome plating
- Used to prevent corrosion and light reflection, and for cosmetic purpose.

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication components

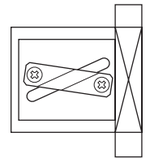
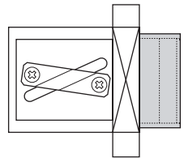
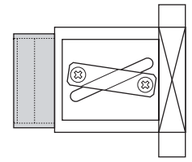
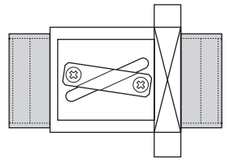
Form	None	Flange side : with K1	Opposite of flange : with K1	Both sides : with K1
Code	N	F	H	K
Shape				

Table 5 Nut direction/Shaft end shape code

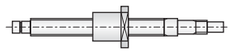
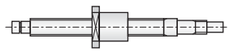
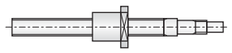
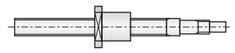
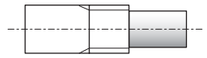
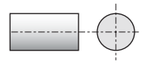
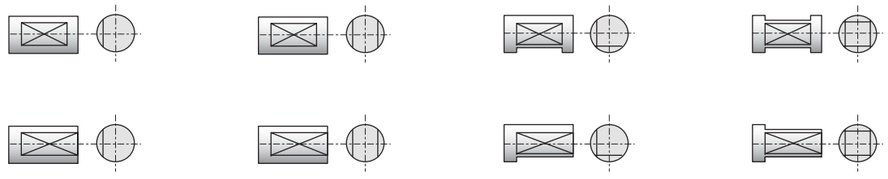
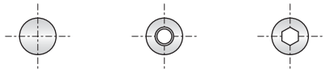
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free
Code	B	F	C	G
Shape				

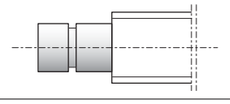
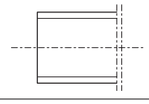
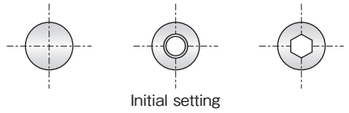
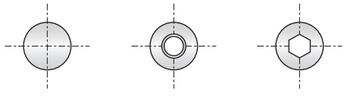
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

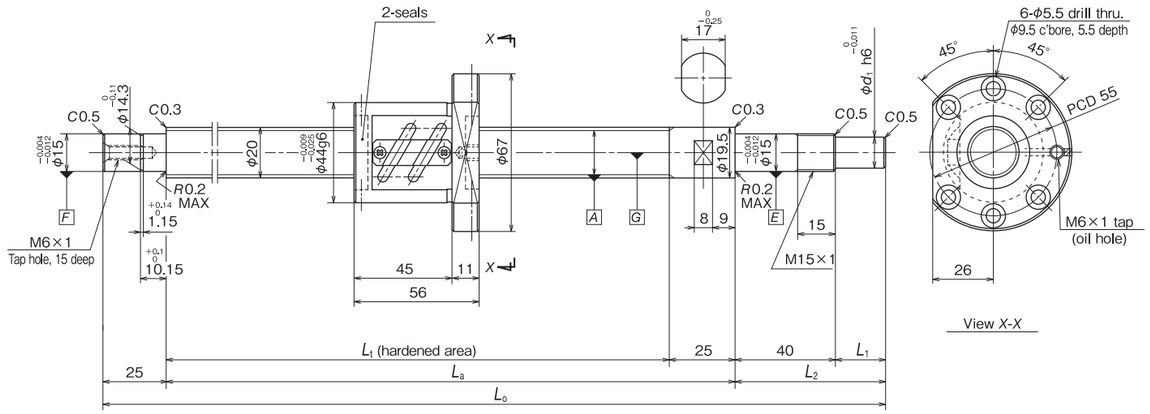
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element		
Shaft end	 Initial setting	

For machine tools SA Type Screw shaft diameter ø20, Lead 5



Specification

Nut specification					Screw shaft dimensions (mm)					
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
			Dynamic C_a (N)	Static C_{oa} (N)						
PFT2005-5	20	5	11 100	17 100	112 to 1 025	137 to 1 050	197 to 1 110	1.0 to 60.0	41.0 to 100	6.0 to 12.0

Click!Speedy Reference Number

P T P 20 05 N 9 N B 1110 *

- Accuracy grade P : JIS C5 grade
- Nut code T : Ball return tube type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 9 : Rust preventive oil (see table 3)
- Lubrication components N : None (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Low temperature chrome plating	Fluoride low temperature chrome plating
Code	N	D	F

○Low temperature chrome plating
- Used to prevent corrosion and light reflection, and for cosmetic purpose.

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication components

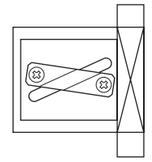
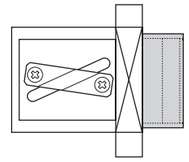
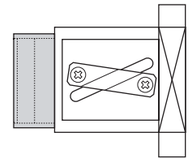
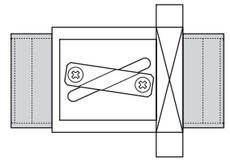
Form	None	Flange side : with K1	Opposite of flange : with K1	Both sides : with K1
Code	N	F	H	K
Shape				

Table 5 Nut direction/Shaft end shape code

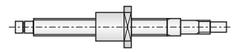
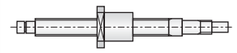
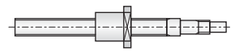
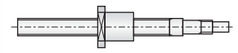
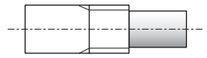
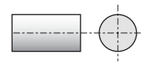
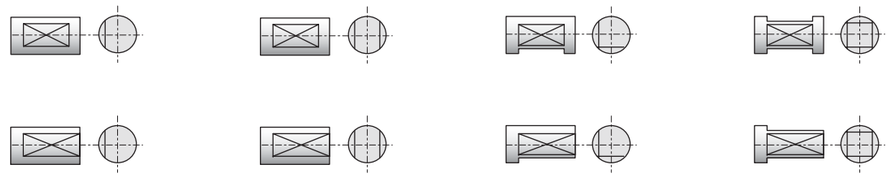
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free
Code	B	F	C	G
Shape				

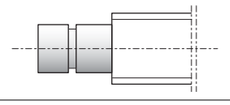
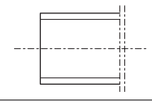
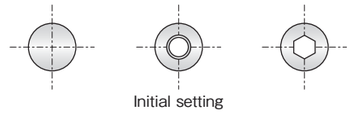
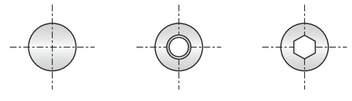
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

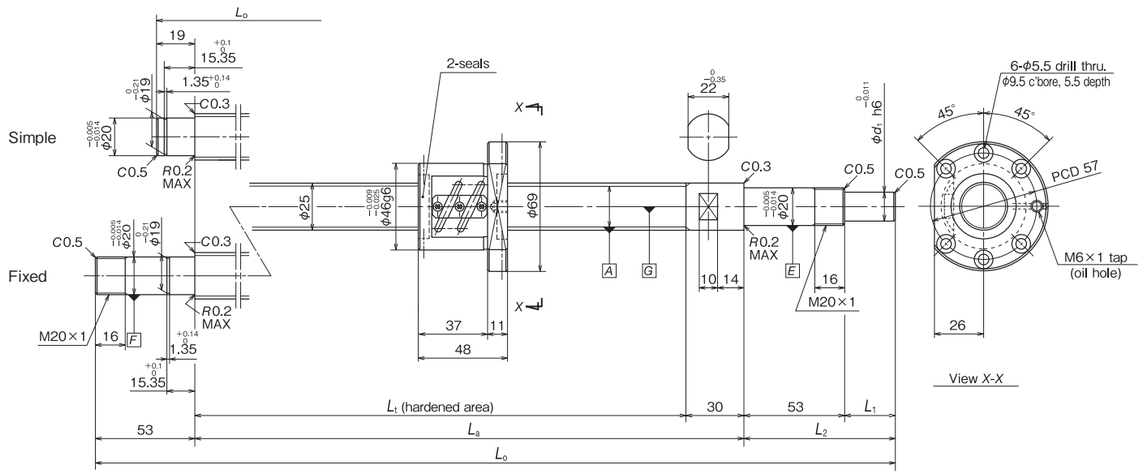
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element		
Shaft end	 Initial setting	

For machine tools SA Type Screw shaft diameter ø25, Lead 4



Specification

Nut specification					Screw shaft dimensions (mm)						
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Shaft end shape	Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
			Dynamic C_a (N)	Static C_{oa} (N)							
PFT2504-5	25	4	7 110	13 600	Simple	96 to 1 034	126 to 1 064	255 to 1 163	1.0 to 75.0	54 to 128	8.0 to 15.0
					Fixed	96 to 1 000	126 to 1 030	259 to 1 163	1.0 to 75.0	54 to 128	8.0 to 15.0

Click!Speedy Reference Number

P T P 25 04 N 9 N B 1163 *

- Accuracy grade P : JIS C5 grade
- Nut code T : Ball return tube type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 9 : Rust preventive oil (see table 3)
- Lubrication components N : None (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Low temperature chrome plating	Fluoride low temperature chrome plating
Code	N	D	F

○Low temperature chrome plating
- Used to prevent corrosion and light reflection, and for cosmetic purpose.

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication components

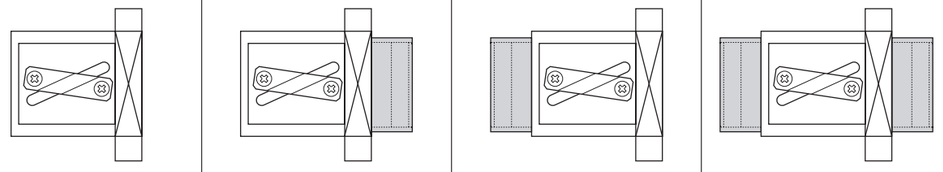
Form	None	Flange side : with K1	Opposite of flange : with K1	Both sides : with K1
Code	N	F	H	K
Shape				

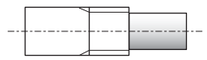
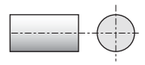
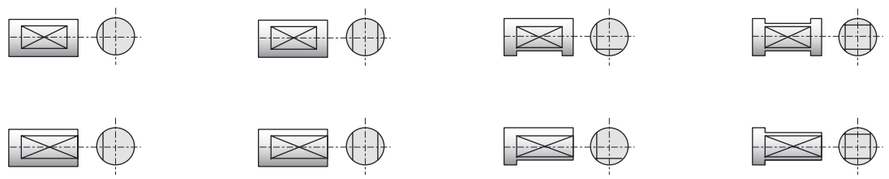
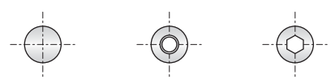
Table 5 Nut direction/Shaft end shape code

Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed	Fixed – Fixed	Fixed – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free	Flange side : Drive side	Flange side : Opposite to drive side
Code	B	F	C	G	A	E
Shape						

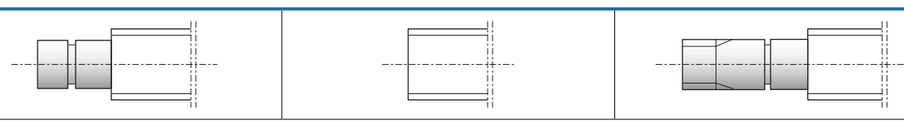
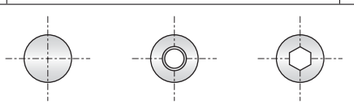
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

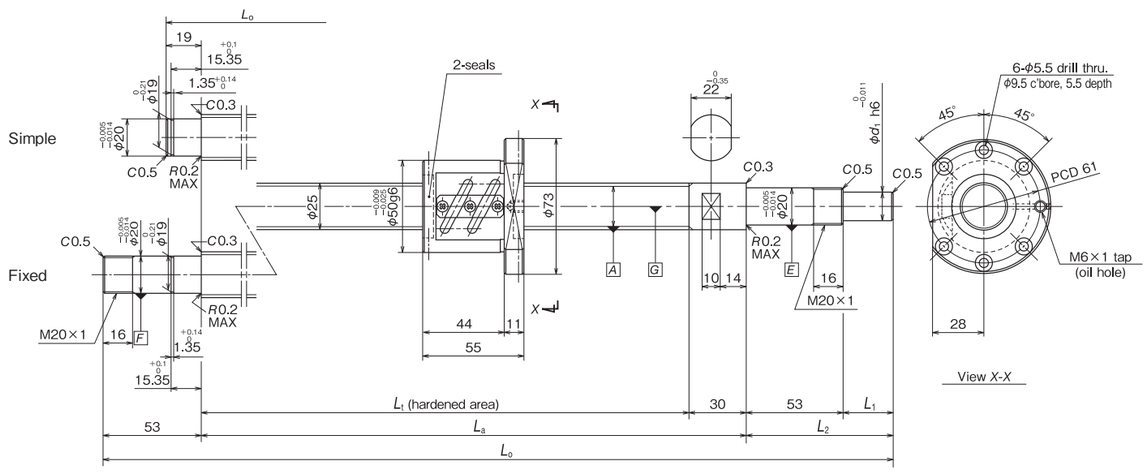
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

For machine tools SA Type Screw shaft diameter ø25, Lead 5



Specification

Nut specification					Screw shaft dimensions (mm)						
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating Dynamic C_a (N)	Basic load rating Static C_{oa} (N)	Shaft end shape	Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
PFT2505-5	25	5	12 300	21 800	Simple	110 to 1 234	140 to 1 264	239 to 1 363	1.0 to 75.0	54 to 128	8.0 to 15.0
					Fixed	110 to 1 200	140 to 1 230	273 to 1 363	1.0 to 75.0	54 to 128	8.0 to 15.0

Click!Speedy Reference Number

P T P 25 05 N 9 N B 1363 *

- Accuracy grade P : JIS C5 grade
- Nut code T : Ball return tube type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubrication code 9 : Rust preventive oil (see table 3)
- Lubrication components N : None (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Low temperature chrome plating	Fluoride low temperature chrome plating
Code	N	D	F

○Low temperature chrome plating
- Used to prevent corrosion and light reflection, and for cosmetic purpose.

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
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LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication components

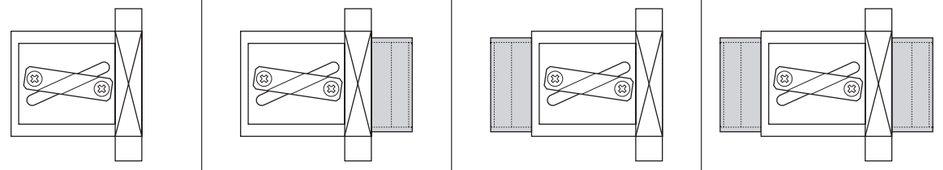
Form	None	Flange side : with K1	Opposite of flange : with K1	Both sides : with K1
Code	N	F	H	K
Shape				

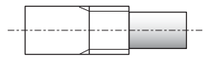
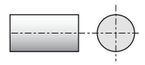
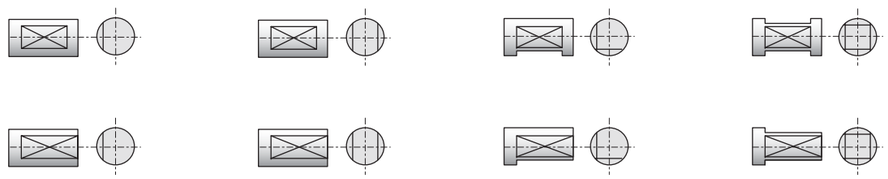
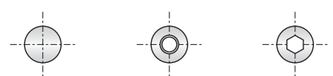
Table 5 Nut direction/Shaft end shape code

Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed	Fixed – Fixed	Fixed – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free	Flange side : Drive side	Flange side : Opposite to drive side
Code	B	F	C	G	A	E
Shape						

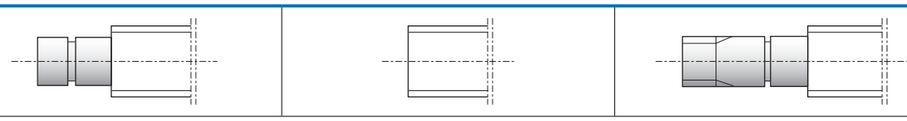
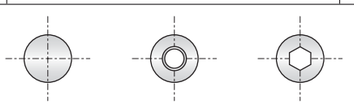
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

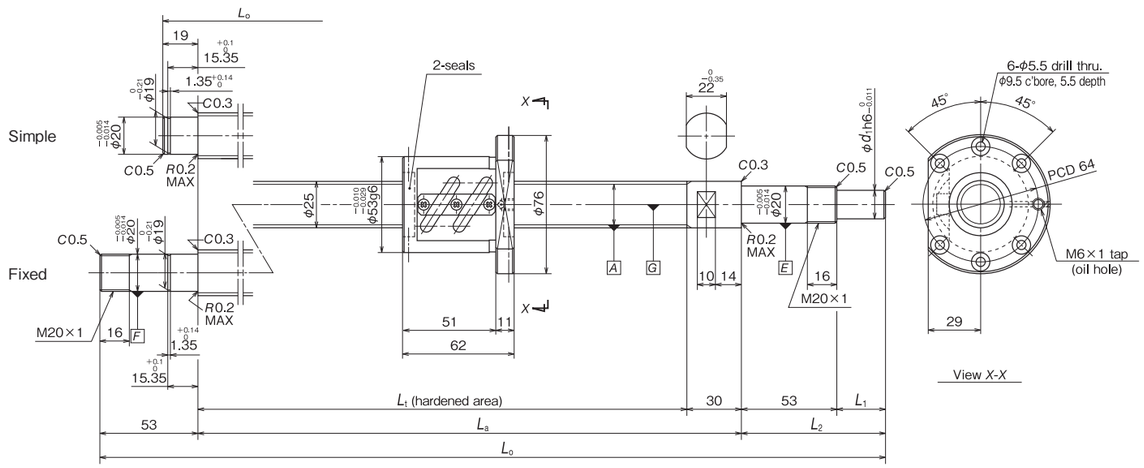
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

For machine tools SA Type Screw shaft diameter ø25, Lead 6



Specification

Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating Dynamic Ca (N)	Basic load rating Static Coa (N)	Shaft end shape	Thread length Lt	Supported length La	Overall length Lo	Shaft end length L1	Shaft end length L2	Shaft end dia. d1
PFT2506-5	25	6	16 600	26 700	Simple	124 to 1 234	154 to 1 264	253 to 1 363	1.0 to 75.0	54 to 128	8.0 to 15.0
					Fixed	124 to 1 200	154 to 1 230	287 to 1 363	1.0 to 75.0	54 to 128	8.0 to 15.0

Click!Speedy Reference Number

P T P 25 06 N 9 N B 1363 ***

- Accuracy grade P : JIS C5 grade
- Nut code T : Ball return tube type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 9 : Rust preventive oil (see table 3)
- Lubrication components N : None (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Low temperature chrome plating	Fluoride low temperature chrome plating
Code	N	D	F

○Low temperature chrome plating
- Used to prevent corrosion and light reflection, and for cosmetic purpose.

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication components

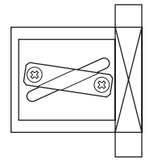
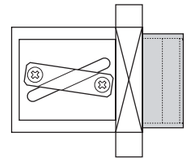
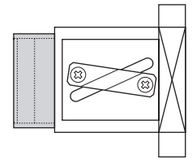
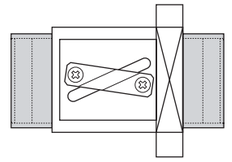
Form	None	Flange side : with K1	Opposite of flange : with K1	Both sides : with K1
Code	N	F	H	K
Shape				

Table 5 Nut direction/Shaft end shape code

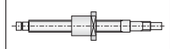
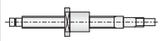
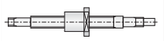
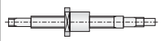
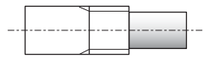
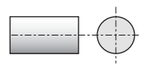
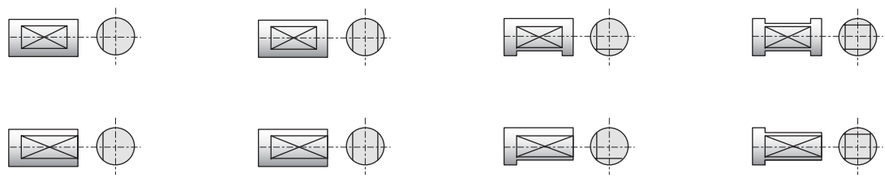
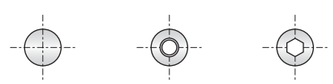
Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed	Fixed – Fixed	Fixed – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free	Flange side : Drive side	Flange side : Opposite to drive side
Code	B	F	C	G	A	E
Shape						

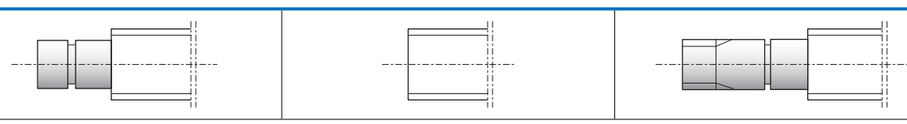
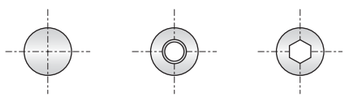
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

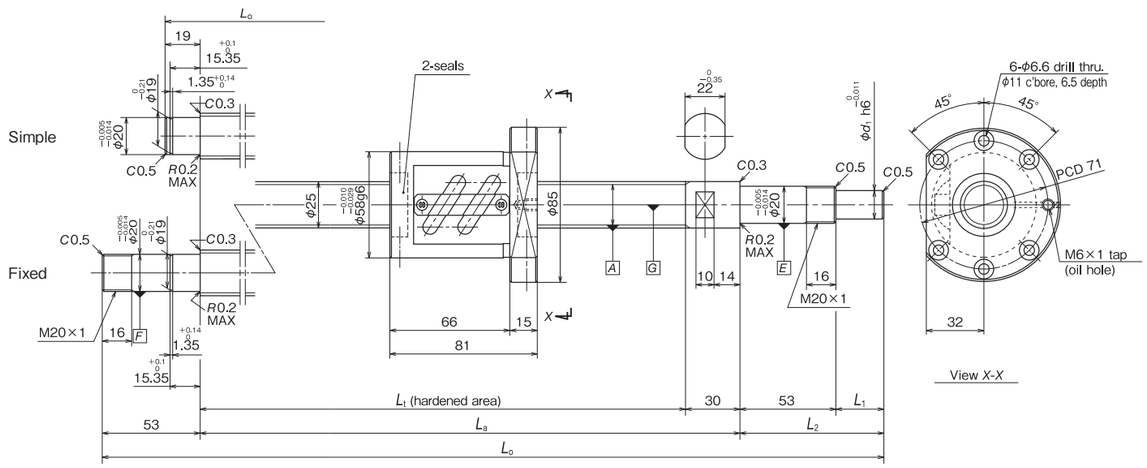
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

For machine tools SA Type Screw shaft diameter ø25, Lead 10



Specification

Nut specification					Screw shaft dimensions (mm)						
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating Dynamic Ca (N)	Basic load rating Static Coa (N)	Shaft end shape	Thread length Lt	Supported length La	Overall length Lo	Shaft end length L1	Shaft end length L2	Shaft end dia. d1
PFT2510-3	25	10	13 600	18 900	Simple	162 to 1 534	192 to 1 564	291 to 1 663	1.0 to 75.0	54 to 128	8.0 to 15.0
					Fixed	162 to 1 500	192 to 1 530	325 to 1 663	1.0 to 75.0	54 to 128	8.0 to 15.0

Click!Speedy Reference Number

P T P 25 10 N 9 N B 1663 ***

- Accuracy grade P : JIS C5 grade
- Nut code T : Ball return tube type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 9 : Rust preventive oil (see table 3)
- Lubrication components N : None (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Low temperature chrome plating	Fluoride low temperature chrome plating
Code	N	D	F

○Low temperature chrome plating
- Used to prevent corrosion and light reflection, and for cosmetic purpose.

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication components

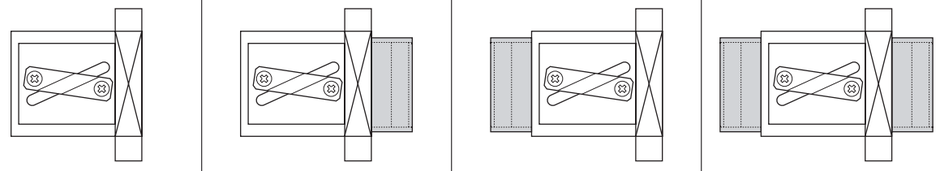
Form	None	Flange side : with K1	Opposite of flange : with K1	Both sides : with K1
Code	N	F	H	K
Shape				

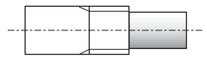
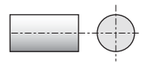
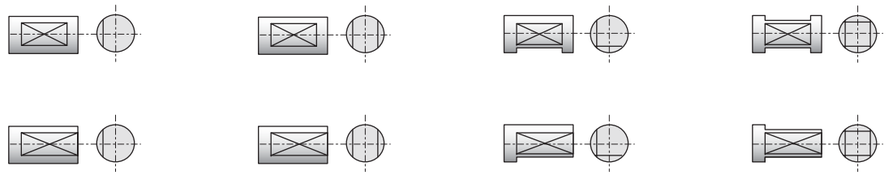
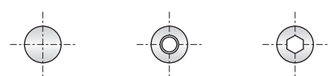
Table 5 Nut direction/Shaft end shape code

Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed	Fixed – Fixed	Fixed – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free	Flange side : Drive side	Flange side : Opposite to drive side
Code	B	F	C	G	A	E
Shape						

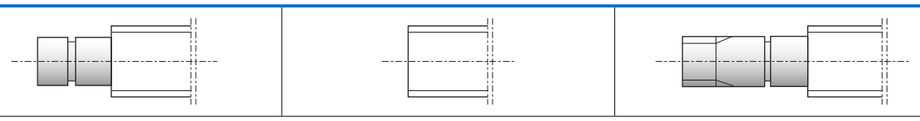
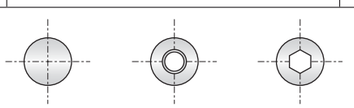
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

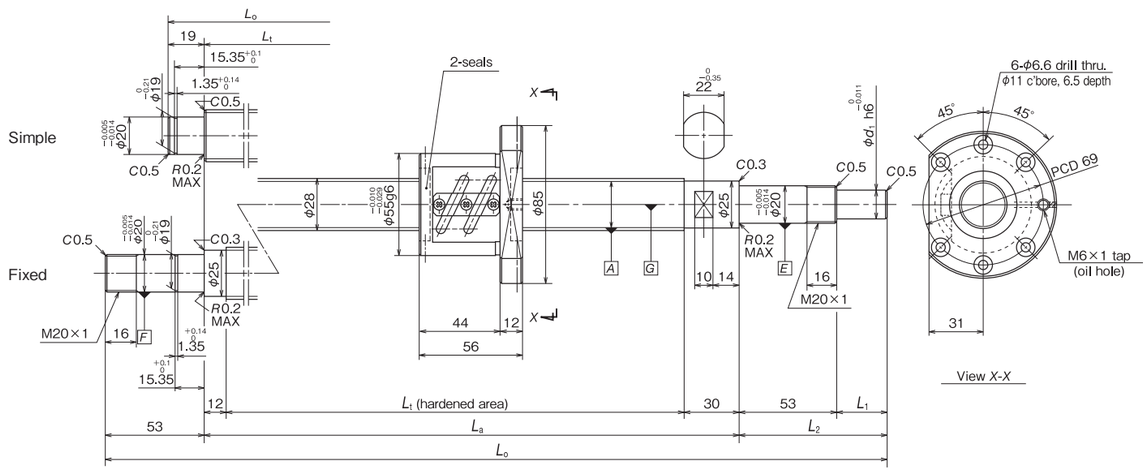
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

For machine tools SA Type Screw shaft diameter ø28, Lead 5



Specification

Nut specification					Screw shaft dimensions (mm)						
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Shaft end shape	Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
			Dynamic C_a (N)	Static C_{oa} (N)							
PFT2805-5	28	5	13 000	24 400	Simple	112 to 1 246	142 to 1 276	241 to 1 375	1.0 to 75.0	54 to 128	8.0 to 15.0
					Fixed	112 to 1 200	154 to 1 242	287 to 1 375	1.0 to 75.0	54 to 128	8.0 to 15.0

Click!Speedy Reference Number

P T P 28 05 N 9 N B 1375 *

- Accuracy grade P : JIS C5 grade
- Nut code T : Ball return tube type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 9 : Rust preventive oil (see table 3)
- Lubrication components N : None (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Low temperature chrome plating	Fluoride low temperature chrome plating
Code	N	D	F

○Low temperature chrome plating
- Used to prevent corrosion and light reflection, and for cosmetic purpose.

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication components

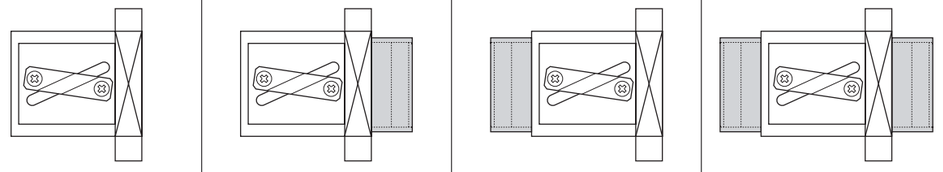
Form	None	Flange side : with K1	Opposite of flange : with K1	Both sides : with K1
Code	N	F	H	K
Shape				

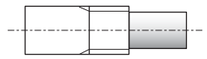
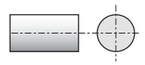
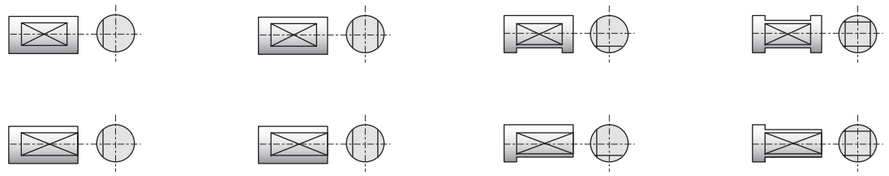
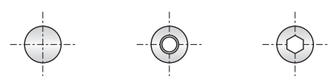
Table 5 Nut direction/Shaft end shape code

Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed	Fixed – Fixed	Fixed – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free	Flange side : Drive side	Flange side : Opposite to drive side
Code	B	F	C	G	A	E
Shape						

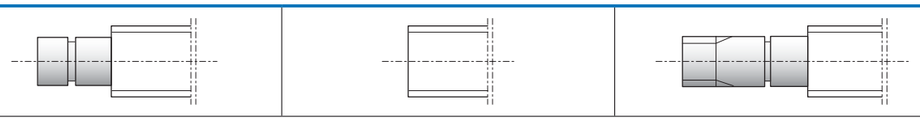
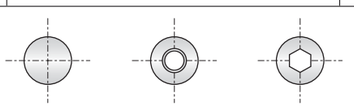
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

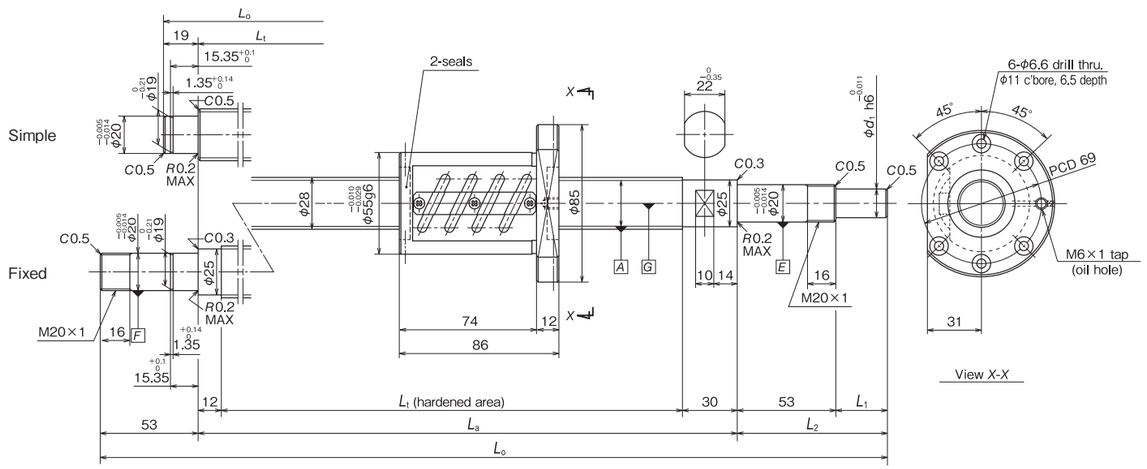
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

For machine tools SA Type Screw shaft diameter ø28, Lead 5



Specification

Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Screw shaft dimensions (mm)						
			Dynamic C_a (N)	Static C_{oa} (N)	Shaft end shape	Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
ZFT2805-10	28	5	20 600	48 700	Simple	172 to 1 246	202 to 1 276	301 to 1 375	1.0 to 75.0	54 to 128	8.0 to 15.0
					Fixed	172 to 1 200	214 to 1 242	347 to 1 375	1.0 to 75.0	54 to 128	8.0 to 15.0

Click!Speedy Reference Number

P T Z 28 05 N 9 N B 1375 *

- Accuracy grade P : JIS C5 grade
- Nut code T : Ball return tube type
- Preload system/Axial play code Z : Offset lead preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 9 : Rust preventive oil (see table 3)
- Lubrication components N : None (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Offset lead preload
Code	Z

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Low temperature chrome plating	Fluoride low temperature chrome plating
Code	N	D	F

○Low temperature chrome plating
- Used to prevent corrosion and light reflection, and for cosmetic purpose.

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication components

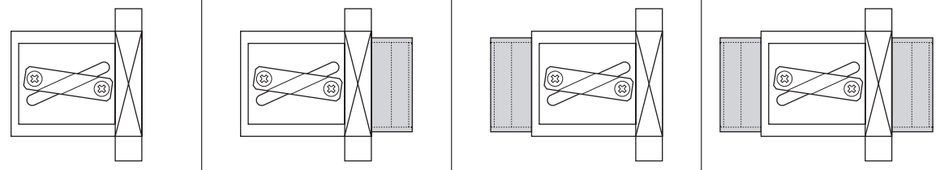
Form	None	Flange side : with K1	Opposite of flange : with K1	Both sides : with K1
Code	N	F	H	K
Shape				

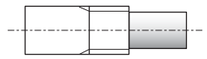
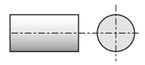
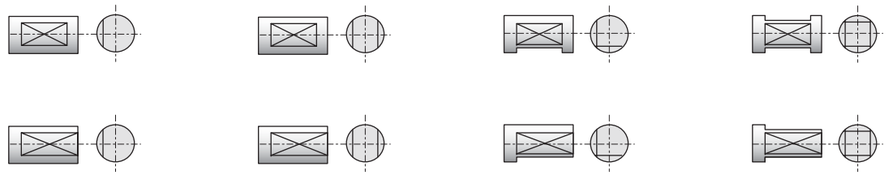
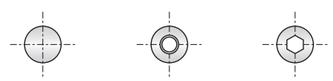
Table 5 Nut direction/Shaft end shape code

Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed	Fixed – Fixed	Fixed – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free	Flange side : Drive side	Flange side : Opposite to drive side
Code	B	F	C	G	A	E
Shape						

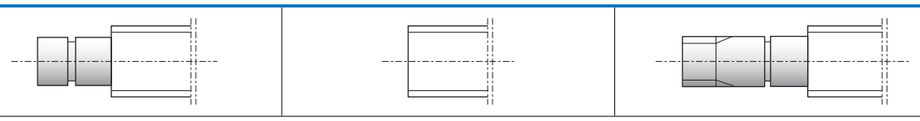
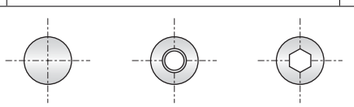
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

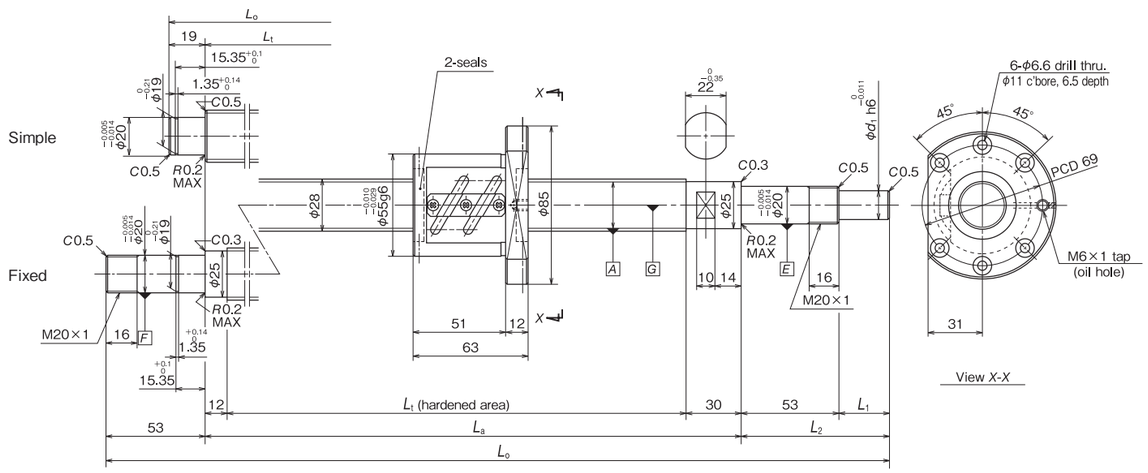
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

For machine tools SA Type Screw shaft diameter ø28, Lead 6



Specification

Nut specification					Screw shaft dimensions (mm)						
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Shaft end shape	Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
			Dynamic C_a (N)	Static C_{oa} (N)							
PFT2806-5	28	6	12 900	24 300	Simple	126 to 1 246	156 to 1 276	255 to 1 375	1.0 to 75.0	54 to 128	8.0 to 15.0
					Fixed	126 to 1 200	168 to 1 242	301 to 1 375	1.0 to 75.0	54 to 128	8.0 to 15.0

Click!Speedy Reference Number

P T P 28 06 N 9 N B 1375 *

- Accuracy grade P : JIS C5 grade
- Nut code T : Ball return tube type
- Preload system/Axial play code P : Oversize ball preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 9 : Rust preventive oil (see table 3)
- Lubrication components N : None (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Oversize ball preload	Axial play 0.005 or less
Code	P	T

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Low temperature chrome plating	Fluoride low temperature chrome plating
Code	N	D	F

○Low temperature chrome plating
- Used to prevent corrosion and light reflection, and for cosmetic purpose.

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication components

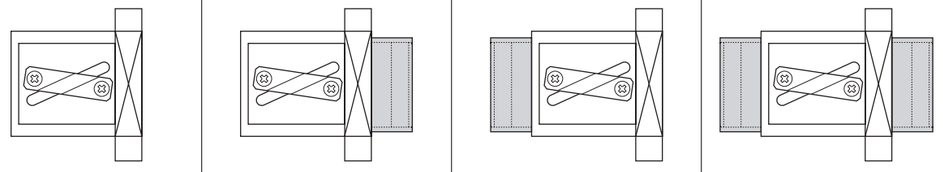
Form	None	Flange side : with K1	Opposite of flange : with K1	Both sides : with K1
Code	N	F	H	K
Shape				

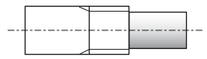
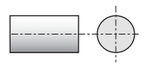
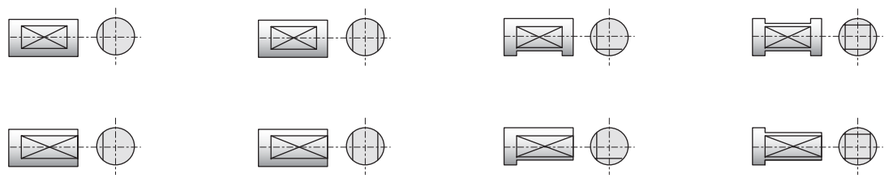
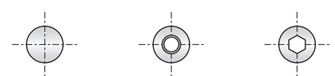
Table 5 Nut direction/Shaft end shape code

Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed	Fixed – Fixed	Fixed – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free	Flange side : Drive side	Flange side : Opposite to drive side
Code	B	F	C	G	A	E
Shape						

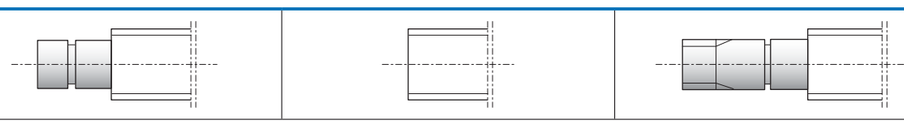
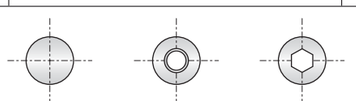
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

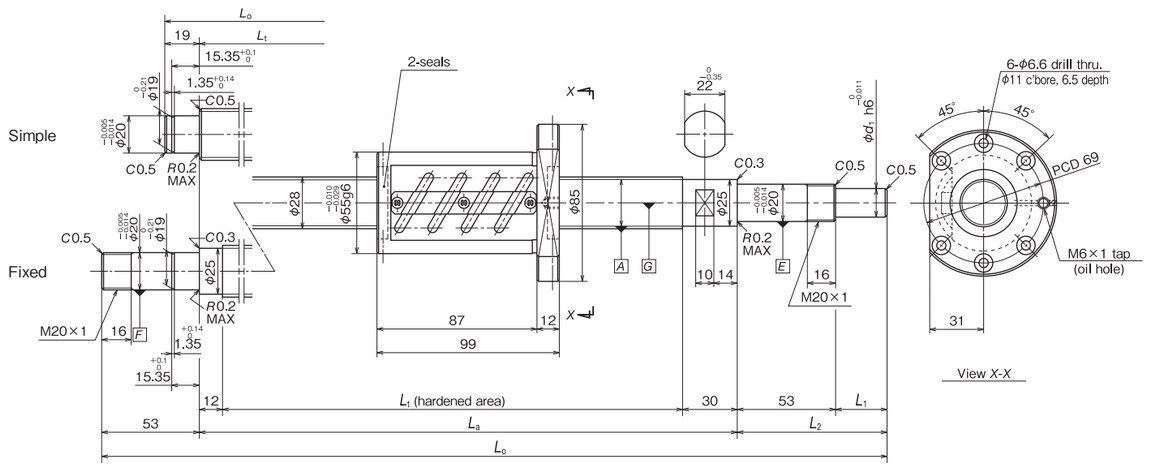
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

For machine tools SA Type Screw shaft diameter ø28, Lead 6



Specification

Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating Dynamic C_a (N)	Basic load rating Static C_{oa} (N)	Shaft end shape	Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end dia. d_1
ZFT2806-10	28	6	20 600	48 700	Simple	198 to 1 246	228 to 1 276	327 to 1 375	1.0 to 75.0	54 to 128	8.0 to 15.0
					Fixed	198 to 1 200	240 to 1 242	373 to 1 375	1.0 to 75.0	54 to 128	8.0 to 15.0

Click!Speedy Reference Number

P T Z 28 06 N 9 N B 1375 *

- Accuracy grade P : JIS C5 grade
- Nut code T : Ball return tube type
- Preload system/Axial play code Z : Offset lead preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 9 : Rust preventive oil (see table 3)
- Lubrication components N : None (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Offset lead preload
Code	Z

Table 2 Surface treatment

Types of surface treatment	No surface treatment	Low temperature chrome plating	Fluoride low temperature chrome plating
Code	N	D	F

○Low temperature chrome plating
- Used to prevent corrosion and light reflection, and for cosmetic purpose.

○Fluoride low temperature chrome plating
- Fluoroplastic coating is provided following the low temperature chrome plating.
- Resistance to corrosion is higher than low temperature chrome plating.

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
LG2	4	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	–20 to 70	For clean environment
LGU	5	Diurea	Synthetic hydrocarbon oil	95.8	–30 to 120	For clean environment
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication components

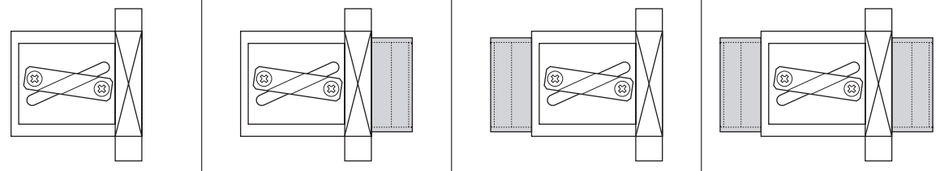
Form	None	Flange side : with K1	Opposite of flange : with K1	Both sides : with K1
Code	N	F	H	K
Shape				

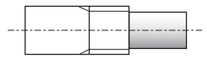
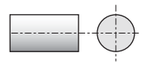
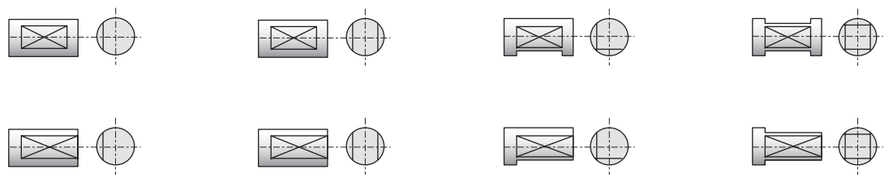
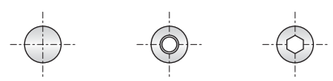
Table 5 Nut direction/Shaft end shape code

Shaft end shape	Simple – Fixed	Simple – Fixed	Free – Fixed	Free – Fixed	Fixed – Fixed	Fixed – Fixed
Nut direction	Flange side : Fixed	Flange side : Simple	Flange side : Fixed	Flange side : Free	Flange side : Drive side	Flange side : Opposite to drive side
Code	B	F	C	G	A	E
Shape						

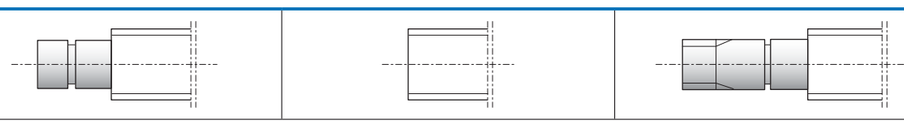
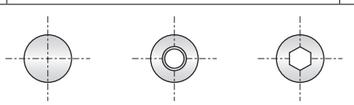
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

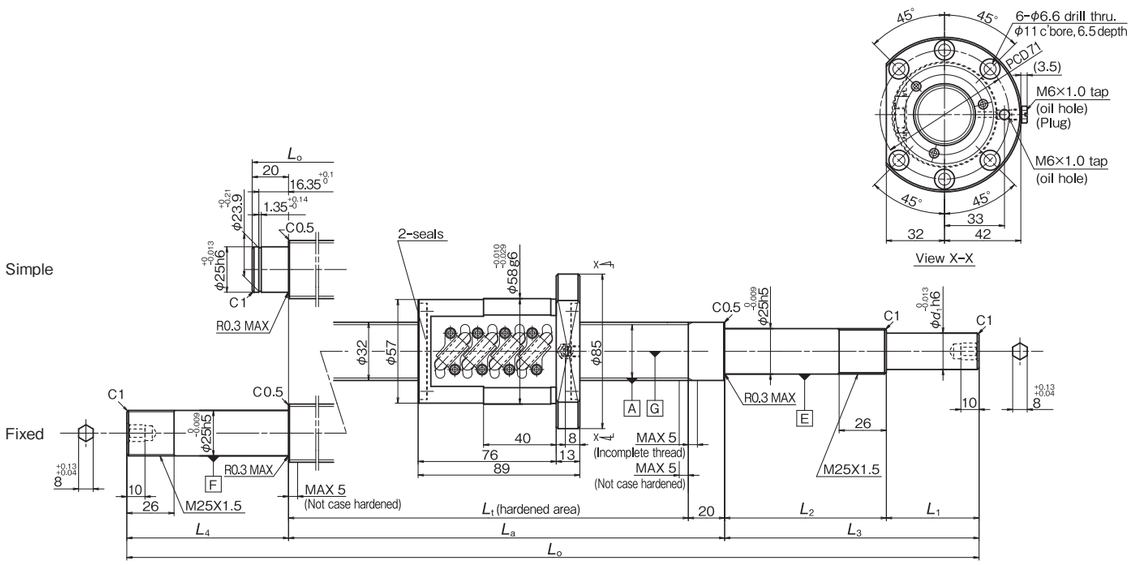
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	

2. Shaft end shape of simple support side

Additional element	
Shaft end	

For machine tools HSA Type (Modified HSS) Screw shaft diameter ø32, Lead 5



Specification

Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Shaft end shape	Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end length L_3	Shaft end length L_4	Shaft end dia. d_1
			Dynamic C_a (N)	Static C_{oa} (N)									
	Nut specification				Screw shaft dimensions (mm)								
ZFRC3205-10	32	5	21 800	56 000	Simple	178 to 1 534	198 to 1 554	358 to 1 729	1.0 to 100	89.0 to 104	90.0 to 204	–	8.0 to 20.0
					Fixed	178 to 1 465	198 to 1 485	427 to 1 729	1.0 to 100	89.0 to 104	90.0 to 204	89.0 to 104	8.0 to 20.0

Click!Speedy Reference Number

P F Z 32 05 N 9 A F 1729 *

- Accuracy grade P : JIS C5 grade
- Nut code F : SRC type
- Preload system/Axial play code Z : Offset lead preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 9 : Rust preventive oil (see table 3)
- Lubrication component A : Axial direction (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Offset lead preload
Code	Z

Table 2 Surface treatment

Types of surface treatment	No surface treatment
Code	N

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication component

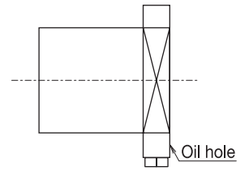
Code/Form	A : Axial direction (standard)
Shape	

Table 5 Nut direction/Shaft end shape code

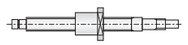
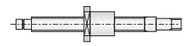
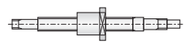
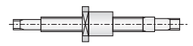
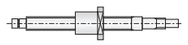
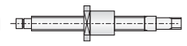
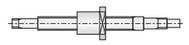
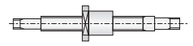
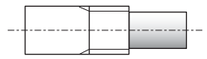
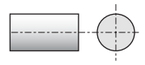
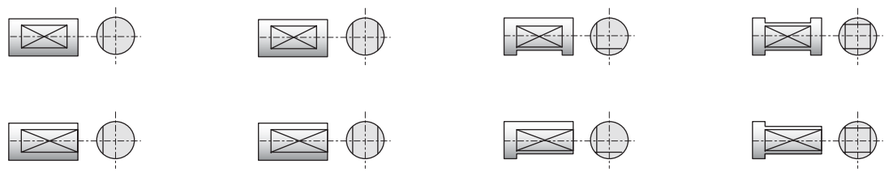
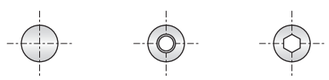
	Drive side bearing	Opposite to drive side bearing: Simple		Opposite to drive side bearing: Fixed	
		Flange side : Drive side	Flange side : Opposite to drive side	Flange side : Drive side	Flange side : Opposite to drive side
Code/Shape	DF type	B 	D 	A 	C 
	DFD type	F 	H 	E 	G 

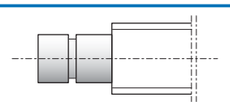
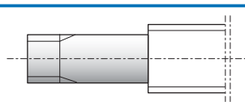
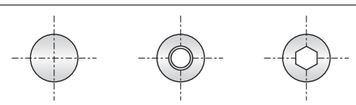
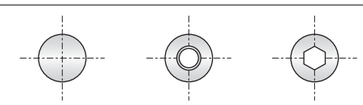
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

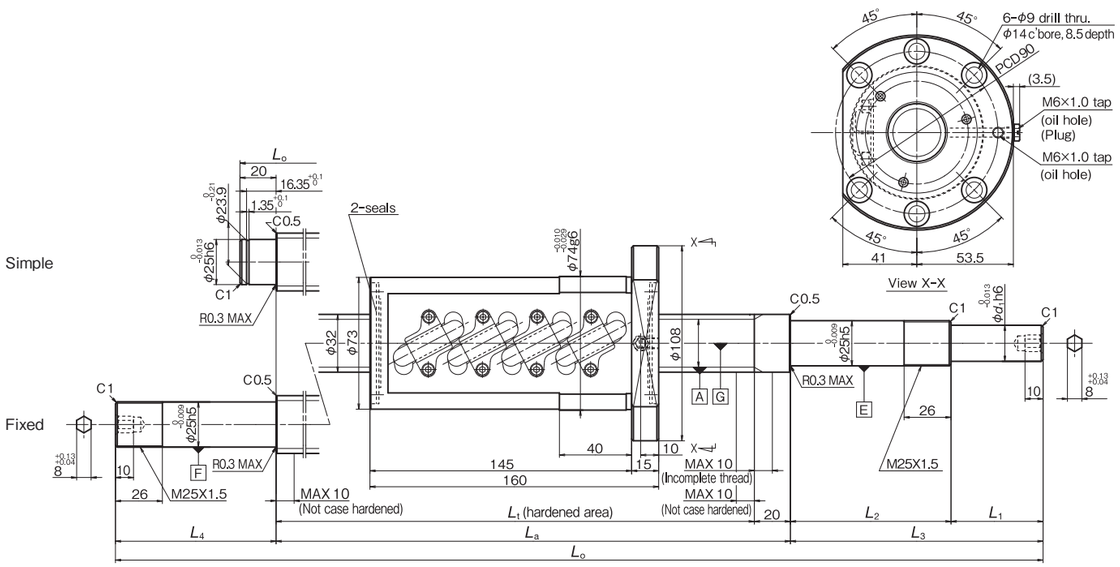
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	 Initial setting

2. Shaft end shape of simple support side

Additional element		
Shaft end		 Initial setting

For machine tools HSA Type (Modified HSS)　Screw shaft diameter ø32, Lead 10



Specification

Nut specification					Screw shaft dimensions (mm)									
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating Dynamic C_a (N)	Basic load rating Static C_{oa} (N)	Shaft end shape	Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end length L_3	Shaft end length L_4	Shaft end dia. d_1
ZFRC3210-10	32	10	54 500	110 000	Simple	320 to 1 934	340 to 1 954	490 to 2 129	1.0 to 100	79.0 to 104	80.0 to 204	–	8.0 to 20.0
					Fixed	320 to 1 865	340 to 1 885	569 to 2 129	1.0 to 100	89.0 to 104	90.0 to 204	89.0 to 104	8.0 to 20.0

Click!Speedy Reference Number

P F Z 32 10 N 9 A F 2129 *

- Accuracy grade　P : JIS　C5 grade
- Nut code　F : SRC type
- Preload system/Axial play code　Z : Offset lead preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment　N : None (see table 2)
- Lubricant code　9 : Rust preventive oil (see table 3)
- Lubrication component　A : Axial direction (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1　Preload system/Axial play code

Preload system/Axial play	Offset lead preload
Code	Z

Table 2　Surface treatment

Types of surface treatment	No surface treatment
Code	N

Table 3　Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4　Lubrication component

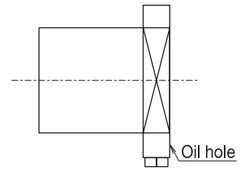
Code/Form	A : Axial direction (standard)
Shape	

Table 5　Nut direction/Shaft end shape code

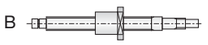
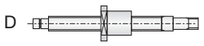
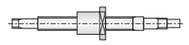
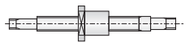
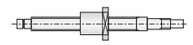
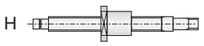
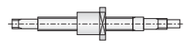
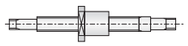
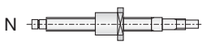
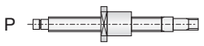
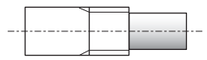
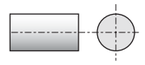
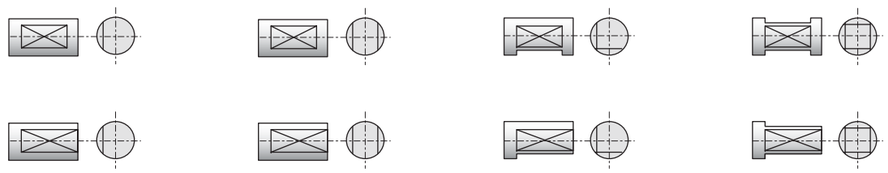
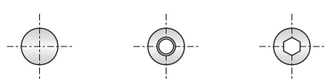
	Drive side bearing	Opposite to drive side bearing: Simple		Opposite to drive side bearing: Fixed	
		Flange side : Drive side	Flange side : Opposite to drive side	Flange side : Drive side	Flange side : Opposite to drive side
Code/Shape	DF type	B 	D 	A 	C 
	DFD type	F 	H 	E 	G 
	BSF type	N 	P 	———	———

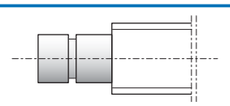
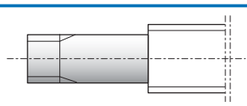
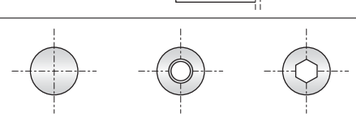
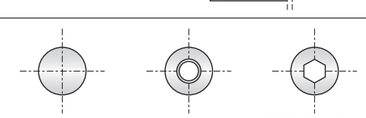
Table 6　Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

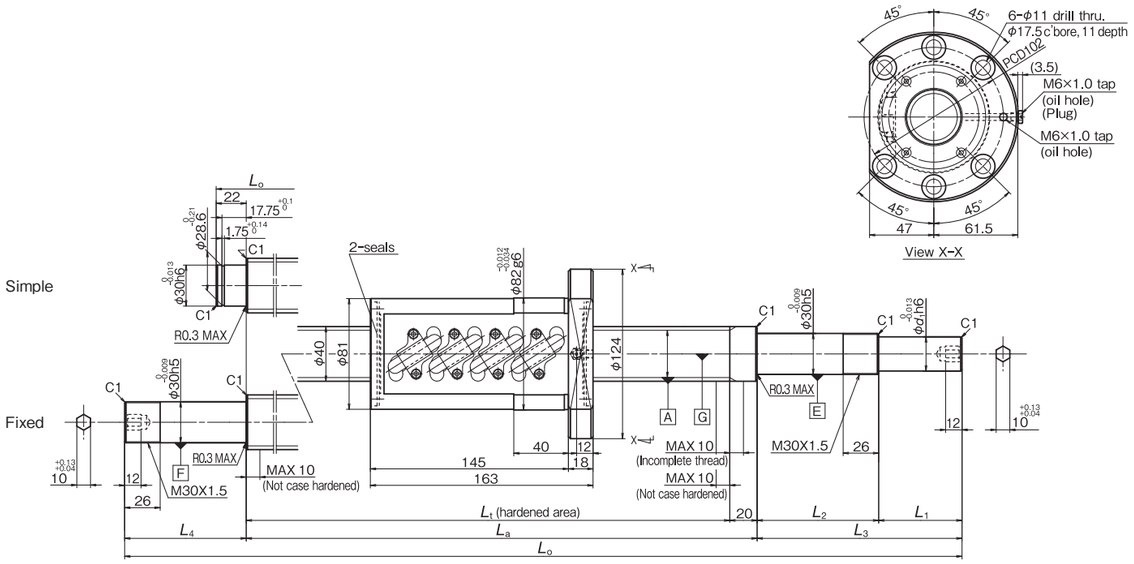
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	 Initial setting

2. Shaft end shape of simple support side

Additional element		
Shaft end		 Initial setting

For machine tools HSA Type (Modified HSS) Screw shaft diameter ø40, Lead 10



Specification

Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating Dynamic Ca (N)	Basic load rating Static Coa (N)	Shaft end shape	Thread length Lt	Supported length La	Overall length Lo	Shaft end length L1	Shaft end length L2	Shaft end length L3	Shaft end length L4	Shaft end dia. d1
ZFRC4010-10	40	10	61 200	137 000	Simple	326 to 2 482	346 to 2 502	508 to 2 689	1.0 to 125	79.0 to 104	80.0 to 229	–	10.0 to 25.0
					Fixed	326 to 2 415	346 to 2 435	585 to 2 689	1.0 to 125	89.0 to 104	90.0 to 229	89.0 to 104	10.0 to 25.0

Click!Speedy Reference Number

P F Z 40 10 N 9 A F 2689 ***

- Accuracy grade P : JIS C5 grade
- Nut code F : SRC type
- Preload system/Axial play code Z : Offset lead preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubrication code 9 : Rust preventive oil (see table 3)
- Lubrication component A : Axial direction (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Offset lead preload
Code	Z

Table 2 Surface treatment

Types of surface treatment	No surface treatment
Code	N

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication component

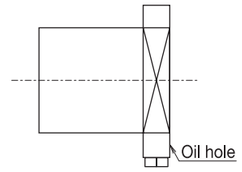
Code/Form	A : Axial direction (standard)
Shape	

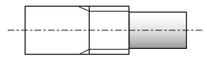
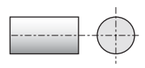
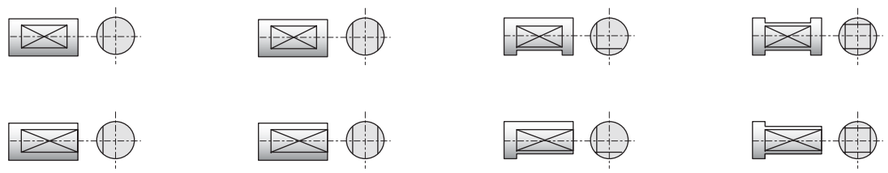
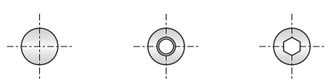
Table 5 Nut direction/Shaft end shape code

	Drive side bearing	Opposite to drive side bearing: Simple		Opposite to drive side bearing: Fixed	
		Flange side : Drive side	Flange side : Opposite to drive side	Flange side : Drive side	Flange side : Opposite to drive side
Code/Shape	DF type	B	D	A	C
	DFD type	F	H	E	G
	BSF type	N	P	—	—

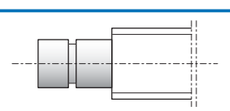
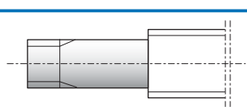
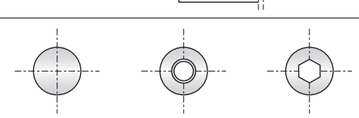
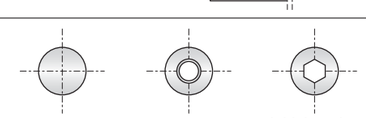
Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

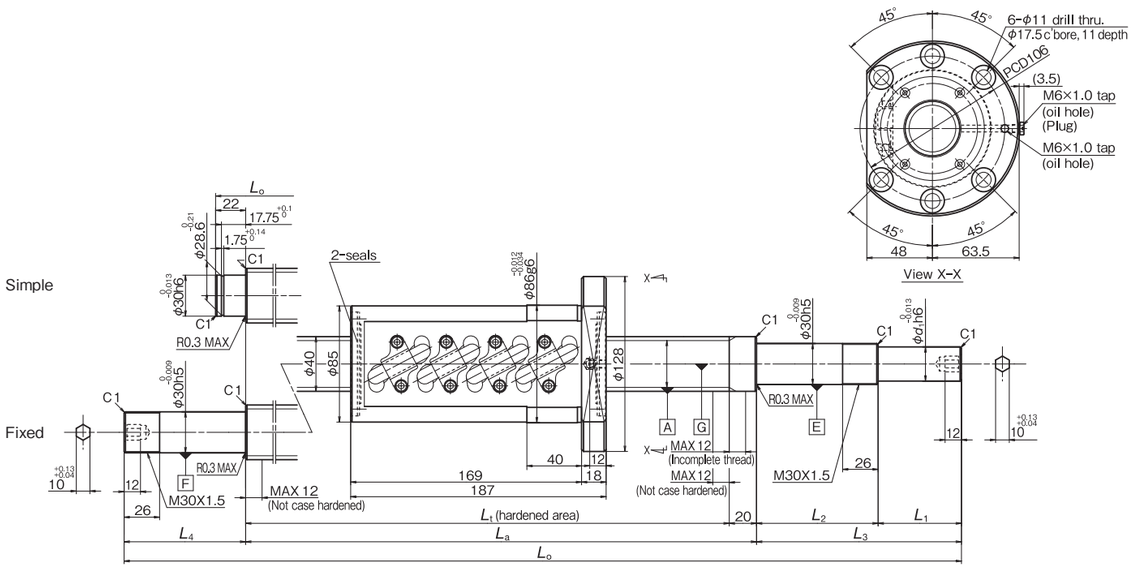
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	 Initial setting

2. Shaft end shape of simple support side

Additional element		
Shaft end		 Initial setting

For machine tools HSA Type (Modified HSS)　Screw shaft diameter ø40, Lead 12



Specification

Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Shaft end shape	Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end length L_3	Shaft end length L_4	Shaft end dia. d_1
			Dynamic C_a (N)	Static C_{oa} (N)		Nut specification / Screw shaft dimensions (mm)							
ZFRC4012-10	40	12	71 700	154 000	Simple	374 to 2 482	394 to 2 502	556 to 2 689	1.0 to 125	79.0 to 104	80.0 to 229	–	10.0 to 25.0
					Fixed	374 to 2 415	394 to 2 435	633 to 2 689	1.0 to 125	89.0 to 104	90.0 to 229	89.0 to 104	10.0 to 25.0

Click!Speedy Reference Number

P F Z 40 12 N 9 A F 2689 *

- Accuracy grade　P : JIS　C5 grade
- Nut code　F : SRC type
- Preload system/Axial play code　Z : Offset lead preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment　N : None (see table 2)
- Lubrication code　9 : Rust preventive oil (see table 3)
- Lubrication component　A : Axial direction (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1　Preload system/Axial play code

Preload system/Axial play	Offset lead preload
Code	Z

Table 2　Surface treatment

Types of surface treatment	No surface treatment
Code	N

Table 3　Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4　Lubrication component

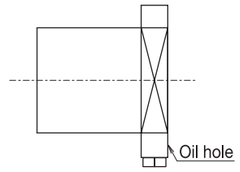
Code/Form	A : Axial direction (standard)
Shape	

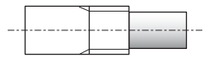
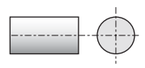
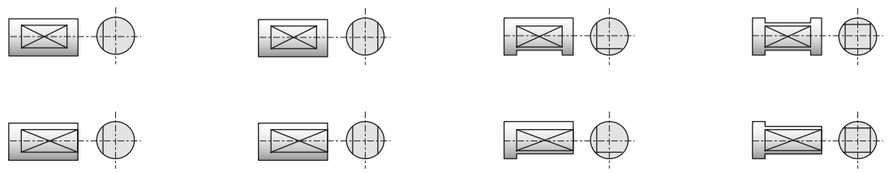
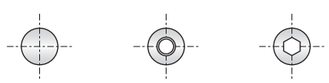
Table 5　Nut direction/Shaft end shape code

	Drive side bearing	Opposite to drive side bearing: Simple		Opposite to drive side bearing: Fixed	
		Flange side : Drive side	Flange side : Opposite to drive side	Flange side : Drive side	Flange side : Opposite to drive side
Code/Shape	DF type	B	D	A	C
	DFD type	F	H	E	G
	BSF type	N	P	—	—

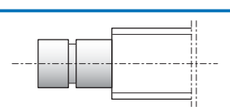
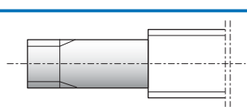
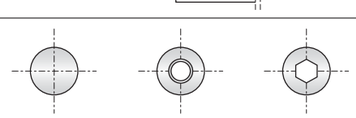
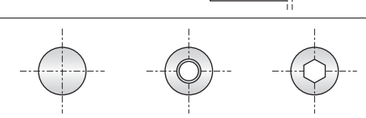
Table 6　Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

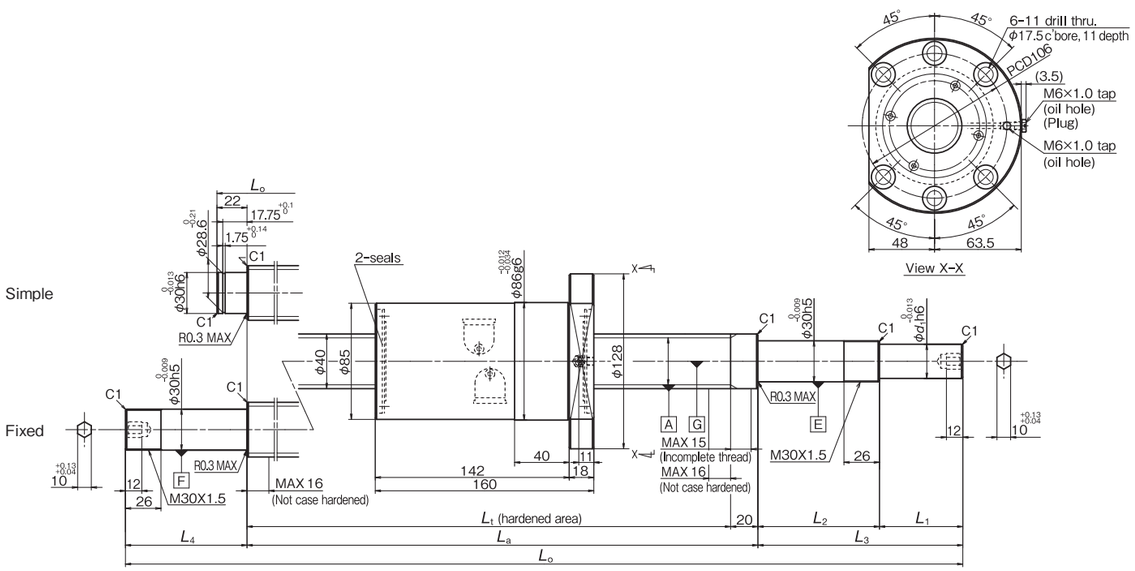
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	 Initial setting

2. Shaft end shape of simple support side

Additional element		
Shaft end		 Initial setting

For machine tools HSA Type (Modified HSS)　Screw shaft diameter ø40, Lead 16



Specification

Nut specification					Screw shaft dimensions (mm)									
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Shaft end shape	Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end length L_3	Shaft end length L_4	Shaft end dia. d_1
			Dynamic C_a (N)	Static C_{oa} (N)									
EM4016-4E	40	16	66 900	131 000	Simple	320 to 2 482	340 to 2 502	502 to 2 689	1.0 to 125	79.0 to 104	80.0 to 229	–	10.0 to 25.0
					Fixed	320 to 2 415	340 to 2 435	579 to 2 689	1.0 to 125	89.0 to 104	90.0 to 229	89.0 to 104	10.0 to 25.0

Click!Speedy Reference Number

P M Z 40 16 N 9 A F 2689 *

- Accuracy grade　P : JIS　C5 grade
- Nut code　M : Middle deflector type
- Preload system/Axial play code
  Z : Offset lead preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment　N : None (see table 2)
- Lubrication code　9 : Rust preventive oil (see table 3)
- Lubrication component　A : Axial direction (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1　Preload system/Axial play code

Preload system/Axial play	Offset lead preload
Code	Z

Table 2　Surface treatment

Types of surface treatment	No surface treatment
Code	N

Table 3　Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4　Lubrication component

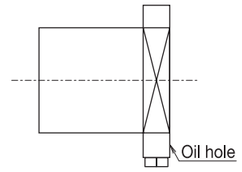
Code/Form	A : Axial direction (standard)
Shape	

Table 5　Nut direction/Shaft end shape code

	Drive side bearing	Opposite to drive side bearing: Simple		Opposite to drive side bearing: Fixed	
		Flange side : Drive side	Flange side : Opposite to drive side	Flange side : Drive side	Flange side : Opposite to drive side
Code/Shape	DF type	B	D	A	C
	DFD type	F	H	E	G
	BSF type	N	P	—	—

Table 6　Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

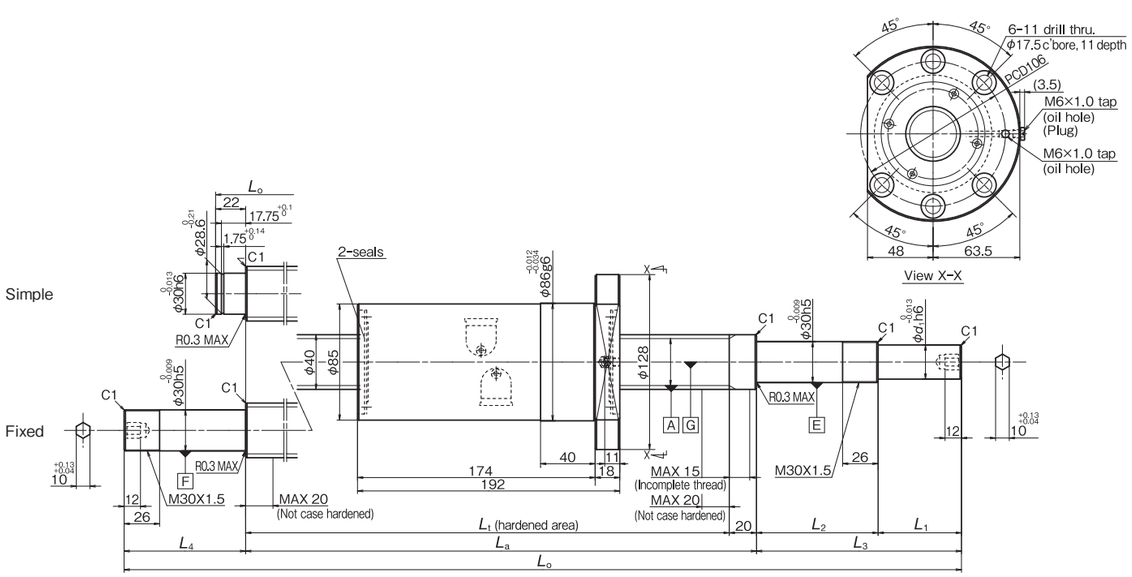
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	Initial setting

2. Shaft end shape of simple support side

Additional element		
Shaft end		Initial setting

For machine tools HSA Type (Modified HSS)　Screw shaft diameter ø40, Lead 20



Specification

Nut specification					Screw shaft dimensions (mm)									
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Shaft end shape	Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end length L_3	Shaft end length L_4	Shaft end dia. d_1
			Dynamic C_a (N)	Static C_{oa} (N)									
EM4020-4E	40	20	66 500	131 000	Simple	384 to 2 482	404 to 2 502	566 to 2 689	1.0 to 125	79.0 to 104	80.0 to 229	–	10.0 to 25.0
					Fixed	384 to 2 415	404 to 2 435	643 to 2 689	1.0 to 125	89.0 to 104	90.0 to 229	89.0 to 104	10.0 to 25.0

Click!Speedy Reference Number

P M Z 40 20 N 9 A F 2689 *

- Accuracy grade　P : JIS　C5 grade
- Nut code　M : Middle deflector type
- Preload system/Axial play code
  Z : Offset lead preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment　N : None (see table 2)
- Lubrication code　9 : Rust preventive oil (see table 3)
- Lubrication component　A : Axial direction (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1　Preload system/Axial play code

Preload system/Axial play	Offset lead preload
Code	Z

Table 2　Surface treatment

Types of surface treatment	No surface treatment
Code	N

Table 3　Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4　Lubrication component

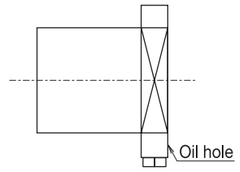
Code/Form	A : Axial direction (standard)
Shape	

Table 5　Nut direction/Shaft end shape code

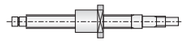
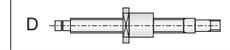
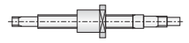
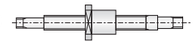
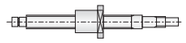
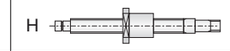
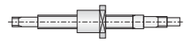
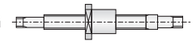
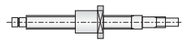
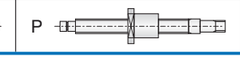
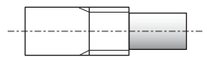
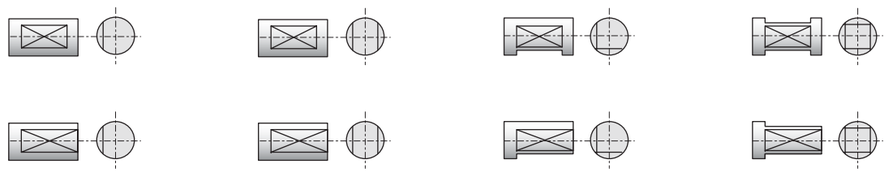
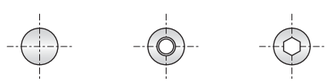
	Drive side bearing	Opposite to drive side bearing: Simple		Opposite to drive side bearing: Fixed	
		Flange side : Drive side	Flange side : Opposite to drive side	Flange side : Drive side	Flange side : Opposite to drive side
Code/Shape	DF type	B 	D 	A 	C 
	DFD type	F 	H 	E 	G 
	BSF type	N 	P 	———	———

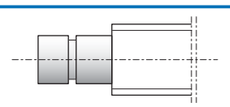
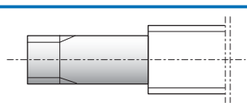
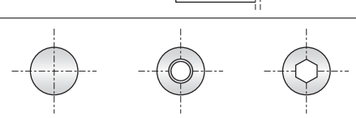
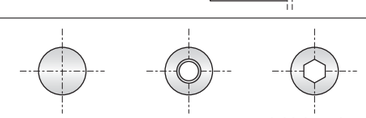
Table 6　Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

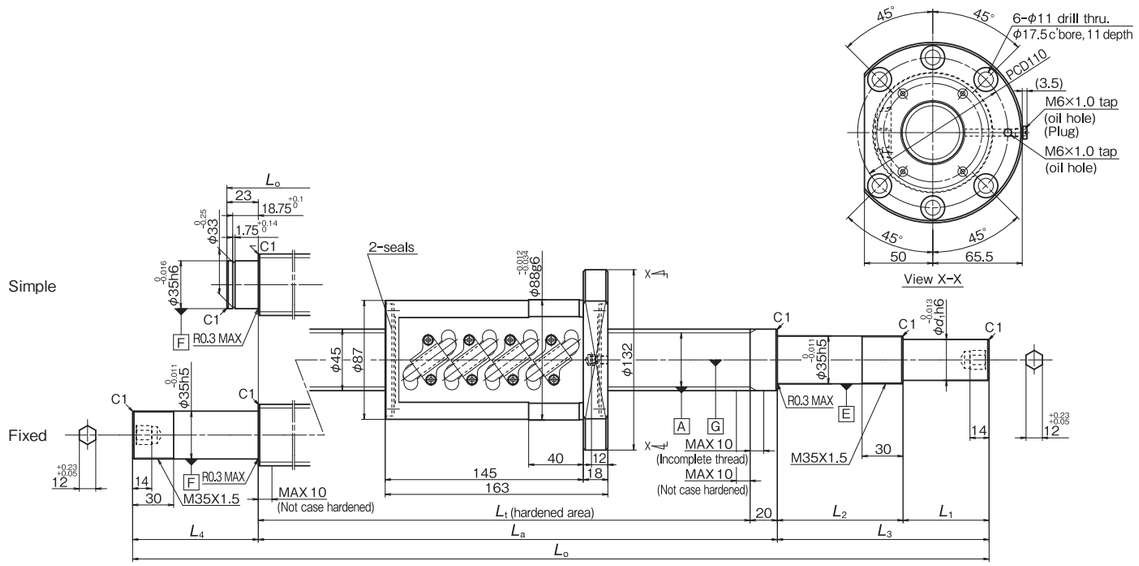
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	 Initial setting

2. Shaft end shape of simple support side

Additional element		
Shaft end		 Initial setting

For machine tools HSA Type (Modified HSS)　Screw shaft diameter ø45, Lead 10



Specification

Nut specification					Screw shaft dimensions (mm)									
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Shaft end shape	Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end length L_3	Shaft end length L_4	Shaft end dia. d_1
			Dynamic C_a (N)	Static C_{oa} (N)									
ZFRC4510-10	45	10	65 800	157 000	Simple	326 to 2 499	346 to 2 519	524 to 2 727	1.0 to 150	92.0 to 122	93.0 to 272	–	10.0 to 30.0
					Fixed	326 to 2 430	346 to 2 450	593 to 2 727	1.0 to 150	92.0 to 122	93.0 to 272	92.0 to 122	10.0 to 30.0

Click!Speedy Reference Number

P F Z 45 10 N 9 A F 2727 *

- Accuracy grade　P : JIS　C5 grade
- Nut code　F : SRC type
- Preload system/Axial play code　Z : Offset lead preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment　N : None (see table 2)
- Lubrication code　9 : Rust preventive oil (see table 3)
- Lubrication component　A : Axial direction (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1　Preload system/Axial play code

Preload system/Axial play	Offset lead preload
Code	Z

Table 2　Surface treatment

Types of surface treatment	No surface treatment
Code	N

Table 3　Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4　Lubrication component

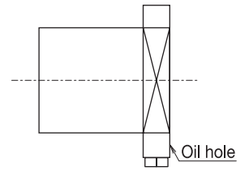
Code/Form	A : Axial direction (standard)
Shape	

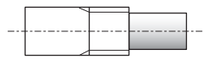
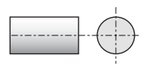
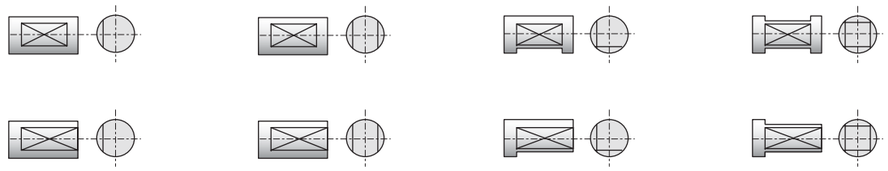
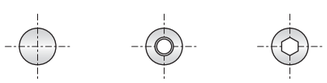
Table 5　Nut direction/Shaft end shape code

	Drive side bearing	Opposite to drive side bearing: Simple		Opposite to drive side bearing: Fixed	
		Flange side : Drive side	Flange side : Opposite to drive side	Flange side : Drive side	Flange side : Opposite to drive side
Code/Shape	DF type	B	D	A	C
	DFD type	F	H	E	G
	DFF type	K	M	J	L

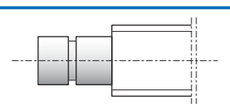
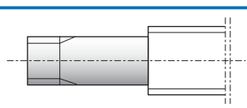
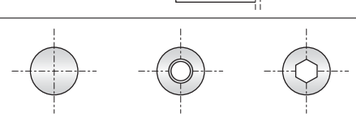
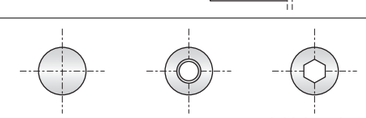
Table 6　Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

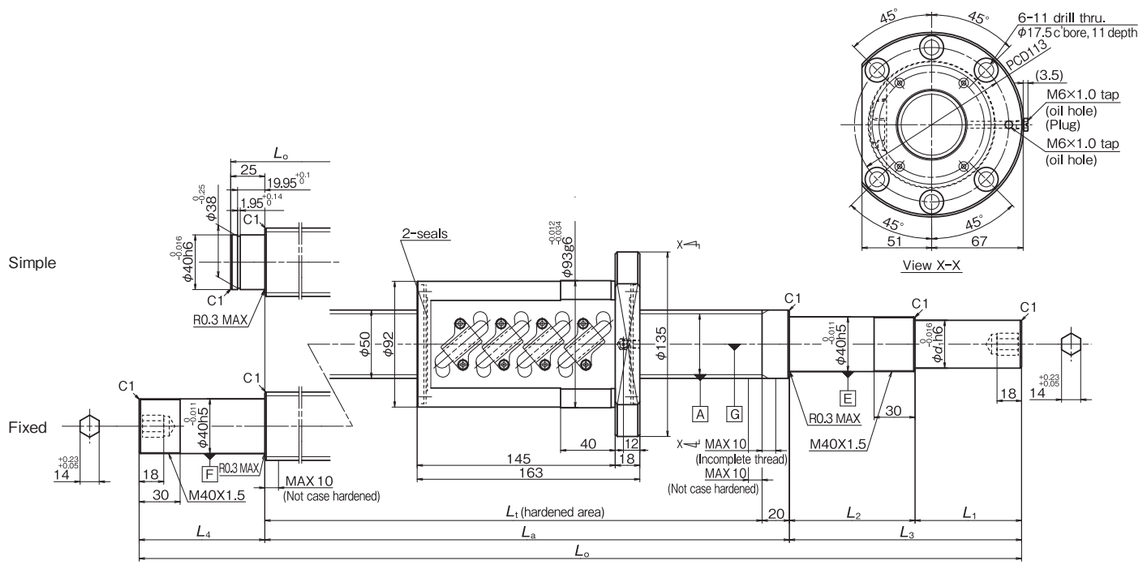
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	 Initial setting

2. Shaft end shape of simple support side

Additional element		
Shaft end		 Initial setting

For machine tools HSA Type (Modified HSS) Screw shaft diameter ø50, Lead 10



Specification

Nut specification					Screw shaft dimensions (mm)									
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Shaft end shape	Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end length L_3	Shaft end length L_4	Shaft end dia. d_1
			Dynamic C_a (N)	Static C_{oa} (N)									
ZFRC5010-10	50	10	68 100	174 000	Simple	326 to 2 497	346 to 2 517	541 to 2 742	1.0 to 175	92.0 to 122	93.0 to 297	–	10.0 to 35.0
					Fixed	326 to 2 430	346 to 2 450	608 to 2 742	1.0 to 175	92.0 to 122	93.0 to 297	92.0 to 122	10.0 to 35.0

Click!Speedy Reference Number

P F Z 50 10 N 9 A F 2742 *

- Accuracy grade P : JIS C5 grade
- Nut code F : SRC type
- Preload system/Axial play code Z : Offset lead preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment N : None (see table 2)
- Lubricant code 9 : Rust preventive oil (see table 3)
- Lubrication component A : Axial direction (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1 Preload system/Axial play code

Preload system/Axial play	Offset lead preload
Code	Z

Table 2 Surface treatment

Types of surface treatment	No surface treatment
Code	N

Table 3 Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4 Lubrication component

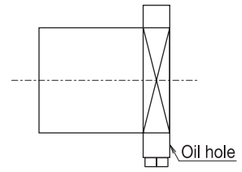
Code/Form	A : Axial direction (standard)
Shape	

Table 5 Nut direction/Shaft end shape code

	Drive side bearing	Opposite to drive side bearing: Simple		Opposite to drive side bearing: Fixed	
		Flange side : Drive side	Flange side : Opposite to drive side	Flange side : Drive side	Flange side : Opposite to drive side
Code/ Shape	DF type	B	D	A	C
	DFD type	F	H	E	G
	DFF type	K	M	J	L

Table 6 Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

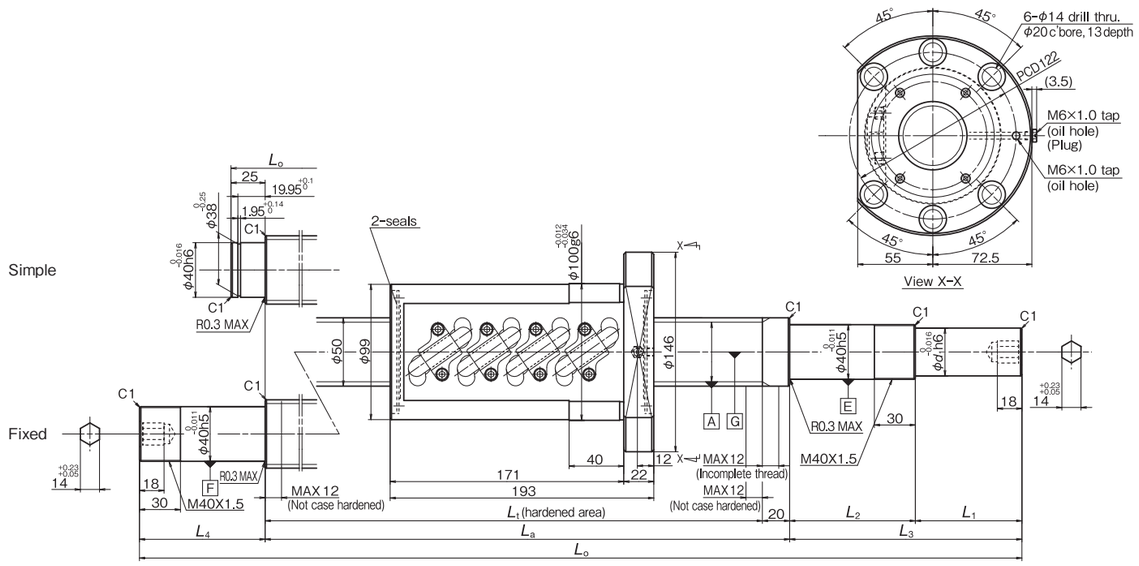
1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	Initial setting

2. Shaft end shape of simple support side

Additional element		
Shaft end		Initial setting

For machine tools HSA Type (Modified HSS)　Screw shaft diameter ø50, Lead 12



Specification

Nut specification					Screw shaft dimensions (mm)									
Model No.	Screw shaft diameter (mm)	Lead (mm)	Basic load rating		Shaft end shape	Thread length L_t	Supported length L_a	Overall length L_o	Shaft end length L_1	Shaft end length L_2	Shaft end length L_3	Shaft end length L_4	Shaft end dia. d_1
			Dynamic C_a (N)	Static C_{oa} (N)									
ZFRC5012-10	50	12	91 500	218 000	Simple	386 to 2 497	406 to 2 517	601 to 2 742	1.0 to 175	92.0 to 122	93.0 to 297	–	10.0 to 35.0
					Fixed	386 to 2 430	406 to 2 450	668 to 2 742	1.0 to 175	92.0 to 122	93.0 to 297	92.0 to 122	10.0 to 35.0

Click!Speedy Reference Number

P F Z 50 12 N 9 A F 2742 *

- Accuracy grade　P : JIS　C5 grade
- Nut code　F : SRC type
- Preload system/Axial play code　Z : Offset lead preload (see table1)
- Screw shaft diameter (mm)
- Lead (mm)
- Surface treatment　N : None (see table 2)
- Lubricant code　9 : Rust preventive oil (see table 3)
- Lubrication component　A : Axial direction (see table 4)
- Nut direction/Shaft end shape code (see table 5)
- Overall length of shaft (mm)
- Design serial number

Table 1　Preload system/Axial play code

Preload system/Axial play	Offset lead preload
Code	Z

Table 2　Surface treatment

Types of surface treatment	No surface treatment
Code	N

Table 3　Lubricant code

Types of lubricant	Code	Thickener	Base oil	Base oil kinematic viscosity [mm²/s (40℃)]	Range of use temperature (℃)	Application
AS2	1	Lithium type	Mineral oil	130	–10 to 110	For general use at high load
LR3	3	Lithium type	Synthetic oil	30	–30 to 130	For high speed, medium load
NF2	6	Urea composite type	Synthetic hydrocarbon oil	26	–40 to 100	For fretting resistance
Rust preventive oil	9	–	–	–	–	–

Table 4　Lubrication component

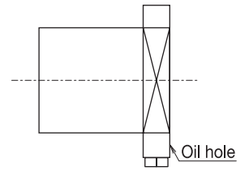
Code/Form	A : Axial direction (standard)
Shape	

Table 5　Nut direction/Shaft end shape code

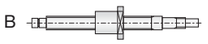
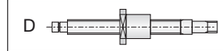
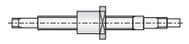
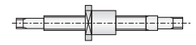
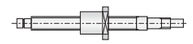
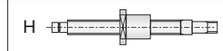
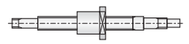
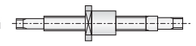
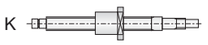
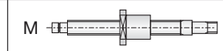
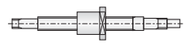
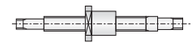
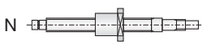
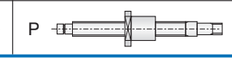
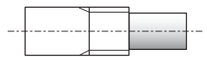
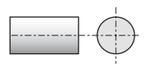
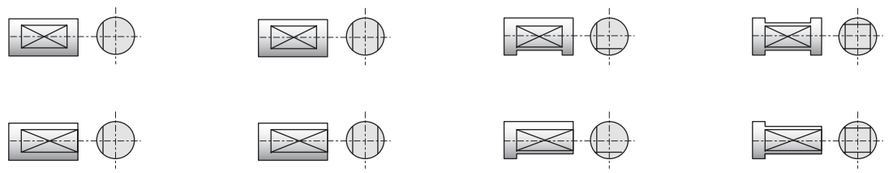
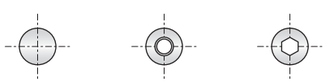
	Drive side bearing	Opposite to drive side bearing: Simple		Opposite to drive side bearing: Fixed	
		Flange side : Drive side	Flange side : Opposite to drive side	Flange side : Drive side	Flange side : Opposite to drive side
Code/Shape	DF type	B 	D 	A 	C 
	DFD type	F 	H 	E 	G 
	DFF type	K 	M 	J 	L 
	BSF type	N 	P 	———	———

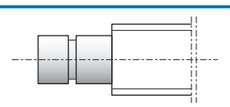
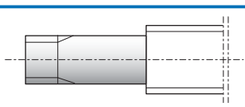
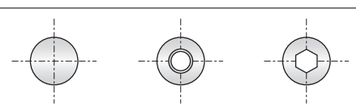
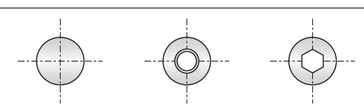
Table 6　Shaft end shape

Dimensional change or addition of element is possible on the gray area of the following drawing. In this case, "Design serial number" is added to the reference number by Click!Speedy software.

1. Shaft end shape of fixed support side

Additional element	
None	
Flats	
Key way	
Shaft end	 Initial setting

2. Shaft end shape of simple support side

Additional element		
Shaft end		 Initial setting

C-1 Rust Prevention and Surface Treatment

C-1-1 Fluoride low temperature chrome plating

The use environment of NSK linear guides and ball screws is expending from general industrial machines, semiconductor and flat panel display manufacturing systems to aerospace equipment.

Among all measures to cope with environment, rust prevention is the most challenging. Such environment includes:

- Moisture for washing machines and other equipment
- Chemicals used in the wet processing of semiconductor and flat panel display manufacturing equipment.

NSK has developed electrolytic rust prevention black film treatment (black chrome plating) which is added by fluoro resin impregnating treatment. (Hereinafter referred as "Fluoride low temperature chrome plating".) This surface treatment methods has proved its superiority as the rust prevention of linear guides and ball screws which are used in the above equipment.

●What is "Fluoride low temperature chrome plating?"

This is a type of black chrome plating which forms a black film (1 to 2 μm in thickness) on the metal surface. Fluoroplastic coating is added to the film to increase corrosion resistance.

- Accuracy control is easily manageable due to low temperature treatment and to the absence of hydrogen embrittlement.
- Product accuracy is less affected due to the thin film which has high corrosion resistance.
- This method is superior to other surface treatments in durability on the rolling surface.
- Inexpensive compared with products with other surface treatment and stainless steel products.

Do not use organic solvent because it adversely affects antirust property of the plating.

●Humidity chamber test

Table 1 Results of the humidity test

Characteristic \ Test sample			Fluoride low temperature chrome plating (recommended)	Hard chrome plating (reference)	Electroless nickel plating (reference)	Equivalent to SUS440C material	Standard steel
Corrosion-resistant property	Rusting	Top	(Ground) B	(Ground) B	(Ground) A	(Ground) C	(Ground) D
		Side	(Ground) A	(Ground) A	(Ground) A	(Ground) C	(Ground) E
		Bottom	(Ground) A	(Ground) A	(Ground) A	(Ground) C	(Ground) E
		End	(Machined) A	(Machined) C	(Machined) A	(Machined) C	(Machined) E
		Chamfer/grinding recess	(Drawn) A	(Drawn) D	(Drawn) A	(Drawn) C	(Drawn) E
	<Test conditions> ●Testing chamber: High temperature, highly moist chamber (made by DABAI ESPEC) ●Temperature: 70℃ ●Relative humidity: 95% ●Testing time: 96h Time to "ramp-up" and "ramp-down" condition of the temperature and the humidity conditions Ramp-up: 5h Ramp-down: 2h						
							
	Film thickness		5 μm	0.5 – 7μm	10μm	—	—

Rusting A: No rust B: Not rusted, but slightly discolored
C: Spotty rust D: slightly rusted E: Completely rusted

●Chemical corrosion resistance test

Table 2 Results of the corrosion resistance test

Test conditions Rail base material: Equivalent to SUS440C
Chemical density: 1 mol/ℓ

Fluoride low temperature chrome plating		Hard chrome plating	None surface treatment
	Immersed in solution for 24 hrs Nitric acid		
	Immersed in solution for 24 hrs Fluoride		
	Exposed to vapor for 72 hrs Hydrochloric acid type washing solution HCℓ : H_2O_2 : H_2O =1 : 1 : 8		
○	Hydrochloric acid (immersed)	○	▲
○	Sulfuric acid (immersed)	○	×
○	Ammonia or sodium hydroxide	○	△

○ : Normal △ : Partial surface damage ▲ : Overall surface damage × : Corroded

●Surface treatment durability test

Peeling resistamce of surface treatment

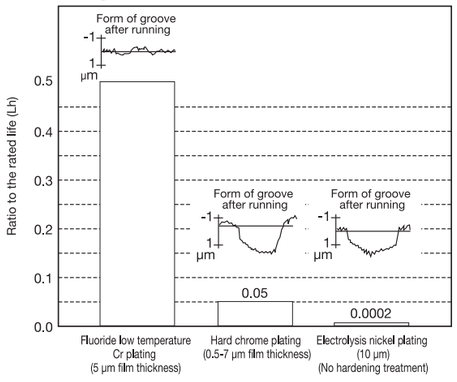


Fig. 1 Results of durability test

●Total evaluation

Table 3 Evaluation

	Available length	Rust prevention ability	Quality stability	Durability	Cost
Fluoride low temperature chrome plating	◎ (4m)	◎	○	◎	◎
Hard chrome plating	△ (2m)	○	×	△	△
Electroless nickel plating	◎ (4m)	◎	△	×	△
Material equivalent to SUS440C	○ (3.5m)	○	◎	◎	△

◎ : Excellent ○ : Suitable in use
△ : Not so good for use × : Problem in use

C-2 Clean environment

C-2-1 NSK Clean Grease LG2 and LGU

NSK Clean Grease LG2 is used in clean room for NSK linear guides, ball screws, Monocarriers, XY Modules, Megatorque motors, XY tables, etc. with low-dust emitting specifications. For its low dust emission and high durability, LG2 earns trust and high reputation of semiconductor equipment manufacturers.

LG2 is superior in many areas to fluorine greases which are commonly used in clean room.

Features

- ●Remarkably low dust emission
- ●Long life -- More than ten times longer than fluoride greases, and equivalent to ordinary greases.
- ●Excellent rust prevention -- Significantly higher capacity than fluorine greases.
- ●Low and stable torque -- 20% or less than that of fluorine greases

Table 4 Nature of Clean Grease LG2 and LGU

Name	Thickener	Base oil	Base oil kinematic viscosity mm^2/s (40℃)	Consistency	Dropping point ℃
Clean Grease LG2	Lithium soap	Synthetic hydrocarbon oil + mineral oil	32	199	201
Clean Grease LGU	Diurea	Synthetic hydrocarbon oil	95.8	201	260

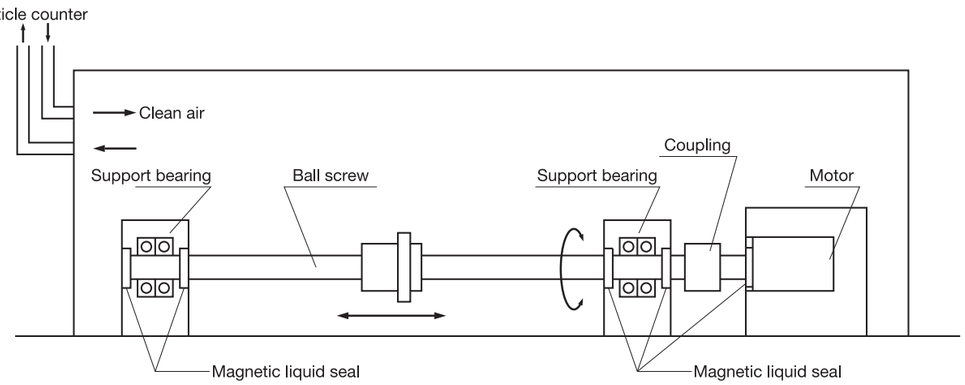


Fig. 2 Setting to measure dust generated by ball screw

●Feature 1: Remarkably low dust emission

Compared with fluoride greases, dust emission by LG2 is low and stable for long period of time.

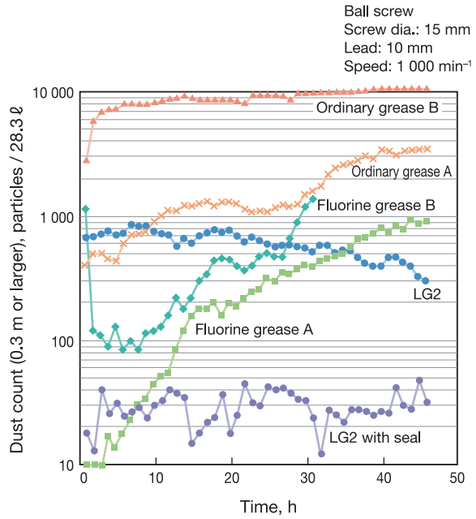


Fig. 3 Comparison in dust emission characteristics

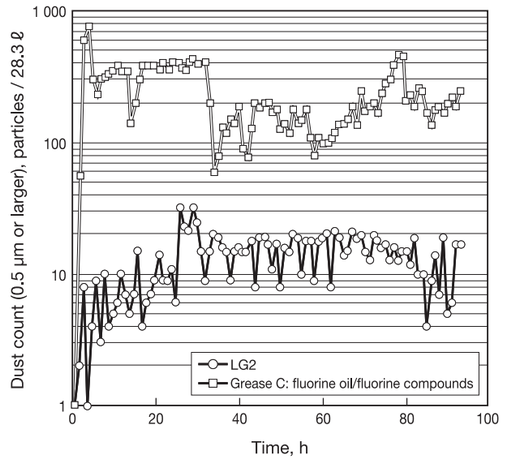


Fig. 4 Dust emission from linear guide (Linear guide: LU09)

●Feature 2: Long life

Life is ten times or longer than fluorine greases, and equivalent to ordinary greases. This stretches maintenance intervals.

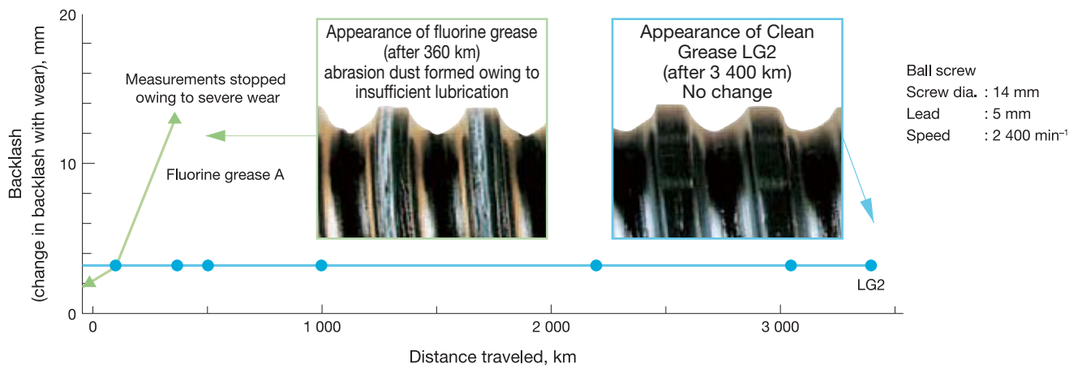
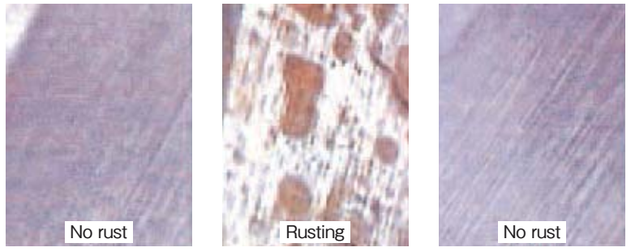


Fig. 5 Results of ball screw durability test

●Feature 3 : Excellent rust prevention capacity

The rust prevention capacity is significantly higher than fluoride type greases. Handling and preparation for operation are easy.



Clean Grease LG2 | Fluorine grease A | Ordinary grease A

Photo 1
Ball screw rust prevention test
(test conditions: 96 hr at humidity 95%, temperature 70℃)

Table 5 Rust prevention test on bearing

Type	Rusting after 7 days
NSK Clean Grease LG2	No rust
Fluorine grease B	Rusted

Test conditions : 19 mg is sealed in ball bearing 695
: Temp. 90℃, Humidity 60%
Evaluation : Studied by microscope

●Feature 4 : Stable torque

Torque is 20% or lower than fluorine greases.

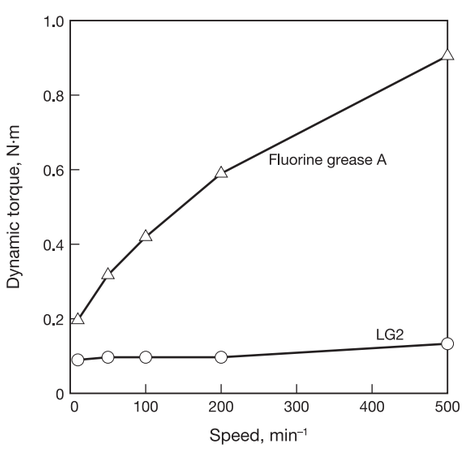


Fig. 6 Comparison of torque characteristics

● Total evaluation

Table 6 Evaluation

Characteristic	LG2	Fluorine grease	General grease
Dust generation	○	○ – △	△ – ×
Torque	○	×	○ – △
Durability	○	△ – ×	○
Rust prevention ability	○	△ – ×	○

○ : Suitable
△ : Not very suitable
× : Problem in use

C-3 Lubrication

There are two types of lubricating method -- grease and oil -- for ball screws and linear guides.

Use a lubricant agent and method most suitable to condition requirements and purpose to optimize functions of ball screws and linear guides.

In general, lubricants with low base oil kinematic viscosity are used for high-speed operation, in which thermal expansion has a large impact, and in low temperatures.

Lubrication with high base oil kinematic viscosity is used for oscillating operations, low speeds and high temperatures.

The following are lubrication methods using grease and oil.

C-3-1 Grease Lubrication

Grease lubrication is widely used because it does not require a special oil supply system or piping. Grease lubricants made by NSK are:

- Various types of grease in bellows tubes that can be instantly attached to a grease pump;
- NSK Grease Unit that consists of a hand grease pump and various nozzles. They are compact and easy to use.

C-3-1.1 NSK grease lubricants

Table 7 shows the marketed general grease widely used for linear guides and ball screws for specific uses, conditions and purposes.

Table 7 Grease lubricant for linear guides and ball screws

Type	Thickener	Base oil	Base oil kinematic viscosity mm^2/s (40℃)	Range of use temperature (℃)	Purpose
AS2	Lithium type	Mineral oil	130	−10 to 110	For general use at high load
PS2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	15.9	−50 to 110	For low temperature and high frequency operation
LR3	Lithium type	Synthetic oil	30	−30 to 130	For high speed, medium load
LG2	Lithium type	Mineral oil + synthetic hydrocarbon oil	32	−20 to 70	For clean environment
LGU	Diurea	Synthetic hydrocarbon oil	95.8	−30 to 120	For clean environment
NF2	Urea composite type	Synthetic hydrocarbon oil	26	−40 to 100	For fretting resistance

(1) NSK Grease AS2

●Features

It is an environmentally friendly and widely used grease for high load application. It is mineral oil based grease containing lithium thickener and several additives. It is superb in load resistance as well as stability in oxidization. It not only maintains good lubrication over a long period of time, but also demonstrates superb capability in retaining water. Even containing a large amount of water, it does not lose grease when it is softened.

●Application

It is a standard grease for general NSK linear guides and ball screws. It is prevalently used in many applications because of its high base oil viscosity, high load resistance, and stability in oxidization.

●Nature

Thickener	Lithium soap base
Base oil	Mineral oil
Consistency	275
Dropping point	181℃
Volume of evaporation	0.24% (99℃, 22 hr)
Copper plate corrosion test	Satisfactory (Method B, 100℃, 24 hr)
Oil separation	2.8% (100℃, 24 hr)
Base oil kinematic viscosity	130 mm^2/s (40℃)

(2) NSK Grease LR3

●Features

It contains a special synthetic oil for high temperature and stability, and a carefully selected anti-oxidation agent. This grease dramatically increases lubrication life under high temperature conditions. It is used for high speed, medium load. Lubrication life exceeded 2 000 hours in the endurance test at 150℃. Its rust prevention capacity in severe conditions such as water and moist environments is further strengthened.

●Application

It is a standard grease for ball screws PSS type (shaft dia. 15 mm or over), FSS type and FA type (except shaft dia. 10 mm with lead of 4mm and shaft dia. 12 mm with lead of 5 mm). It is ideal for operation with medium load, at high speed such as positioning in high tact material handling equipment.

●Nature

Thickener	Lithium soap base
Base oil	Synthetic oil
Consistency	228
Dropping point	208℃
Volume of evaporation	0.58% (99℃, 22 hr)
Copper plate corrosion test	Satisfactory (Method B, 100℃, 24 hr)
Oil separation	1.9% (100℃, 24 hr)
Base oil kinematic viscosity	30mm^2/s (40℃)

(3) NSK Grease PS2

●Features

The major base oil component is synthetic oil with mineral oil. It is an excellent lubrication especially for low temperature operation. It is for high speed and light load.

●Application

It is a standard grease for NSK miniature linear guides and ball screws. It is especially superb for low temperature operation, but also functions well in normal temperatures, making it ideal for small equipment with light load.

●Nature

Thickener	Lithium soap base
Base oil	Synthetic oil + Synthetic hydrocarbon oil
Consistency	275
Dropping point	190℃
Volume of evaporation	0.60% (99℃, 22 hr)
Copper plate corrosion test	Satisfactory (Method B, 100℃, 24 hr)
Oil separation	3.6% (100℃, 24 hr)
Base oil kinematic viscosity	15.9mm^2/s (40℃)

(4) NSK Grease LG2

●Features

This grease was developed by NSK to be exclusively used for linear guides and ball screws in clean room.

Compared to the fluorine grease which are commonly used in clean room, LG2 has several advantages such as:

- Higher in lubrication function
- Longer lubrication life
- More stable torque (resistant to wear)
- Higher rust prevention.

In dust generation, LG2 is more than equal to fluorine grease in keeping dust volume low. Since the base oil is not a special oil but a mineral oil, LG2 can be handled in the same manner as general greases.

●Application

LG2 is a lubrication grease for rolling element products such as linear guides and ball screws for semiconductor and flat panel display (FPD) processing equipment which require a highly clean environment. Because LG2 is exclusively for a clean environment at normal temperatures, however, it cannot be used in a vacuum environment.

Refer to "Clean environment" in page C3 for detailed data on superb characteristics of NSK Grease LG2.

●Nature

Thickener	Lithium soap base
Base oil	Mineral oil + Synthetic hydrocarbon oil
Consistency	199
Dropping point	201℃
Volume of evaporation	1.40% (99℃, 22 hr)
Copper plate corrosion test	Satisfactory (Method B, 100℃, 24hr)
Oil separation	0.8% (100℃, 24 hr)
Base oil kinematic viscosity	32mm^2/s (40℃)

(5) NSK Grease LGU

●Features

This is a proprietary urea base grease of NSK featuring low dust emission exclusively for ball screws and linear guides which are used in clean rooms.

In comparison with fluorine base grease, which has been used commonly in clean rooms, LGU has better lubricating property, longer duration of lubricant, better torque variation, much better anti-rust property, and equivalent or better dust emission. In addition, this grease can be handled in the same way as the other common grease because high-grade synthetic oil is used as the base oil.

LGU grease contains much less metallic elements compared to LG2 grease. It can be used in high temperature environment.

●Application

This is exclusive lubrication grease for ball screws and linear guides that are installed in equipment that requires cleanliness, as same as LG2 grease, and it can be used in high temperature range of – 30 to 120℃.

This cannot be used in vacuum.

●Nature

Thickener	Diurea
Base oil	Synthetic hydrocarbon oil
Consistency	201
Dropping point	260℃
Volume of evaporation	0.09% (99℃, 22 hr)
Copper plate corrosion test	Satisfactory (Method B, 100℃, 24 hr)
Oil separation	0.6% (100℃, 24 hr)
Base oil kinematic viscosity	95.8mm^2/s (40℃)

(6) NSK Grease NF2

●Features

It uses high-grade synthetic oil as the base oil and urea base organic compound as the thickener. It has remarkable anti-fretting corrosion property. It can be used in wide temperature range, from low to high, and has superior lubrication life.

●Application

This grease is suitable for ball screws and linear guides of which application include oscillating operations. Allowable temperature range is –40 to 100℃.

●Nature

Thickener	Diurea
Base oil	Synthetic hydrocarbon oil
Consistency	288
Dropping point	260℃
Volume of evaporation	0.22% (99℃, 22 hr)
Copper plate corrosion test	Satisfactory (Method B, 100℃, 24 hr)
Oil separation	0.5% (100℃, 24 hr)
Base oil kinematic viscosity	26mm²/s (40℃)

- Wash the linear guides and ball screws to remove oil prior to applying Clean Grease LG2 or LGU, so the grease functions are fully utilized.
- Clean grease is exclusively used for clean environments at normal temperatures.

Note) Refer to NSK Grease Unit Catalog (CAT. No.E3317) for details of NSK Grease.

C-3-1.2 Before use of NSK Precision Products

Wipe off the rust preventive oil before use for the products that the oil is applied.

If grease is not applied, apply grease, and move a ball slide or ball nut a few strokes so the grease permeates into the ball slide and inside the nut. (Move the ball slide or the ball nut 5 to 10 times with full stroke.)

Then wipe off the excess grease.

C-3-1.3 How to replenish grease and volume of grease to be replenished

Use grease fitting if exclusive grease supply component is not used. Supply required amount through grease fitting by a grease pump.

Wipe off old grease and accumulated dust before supplying new grease. If grease fitting is not used or there is no oil filler due to the size limitation, apply grease directly to the rail or to the ball groove of the screw shaft. Remove the seal if possible, move a ball slide or ball nut a few strokes so that the grease permeates into the ball slide, nut and inside the slider.

Once grease is replenished, another supply is not required for a long time. But under some operational conditions, it is necessary to periodically replenish grease. The following are replenishing methods.

＊When replenishing using a grease pump:

Use a grease pump and fill the inside of ball slide and ball nut with grease. Supply grease until it comes out from the ball slide or ball nut slider area. Move ball slide or ball nut slider by hand while filling them with grease, so the grease permeates all areas.

Do not operate the machine immediately after replenishing. Always try the system a few times to spread the grease throughout the system and to remove excess grease. Trial operations are necessary because the resistance to sliding force and screw torque greatly increases immediately after replenishment (full-pack state) and may cause problems. The agitating resistance of grease is accountable for this phenomenon. Wipe off excess grease that accumulates at end of rail and screw shaft after trial runs so the grease does not move to other areas.

＊When there is an exclusive grease supply system and the volume from the spout can be controlled, the criterion is:

- All at once, replenish the amount that fills about 50% of the internal space of the ball slide or the internal space of the ball nut. This method eliminates waste of grease and is efficient.

Tables 8 and 9 show internal spaces of ball slide and ball nut for reference.

Table 8 Inside space of the slide of linear guide

NH Series

Unit: cm³

Series / Model No.	NH	
	High-load type	Super-high-load type
15	3	4
20	6	8
25	9	13
30	13	20
35	22	30
45	47	59
55	80	100
65	139	186

NS Series

Unit: cm³

Series / Model No.	NS	
	Medium-load type	High-load type
15	2	3
20	3	4
25	5	8
30	8	12
35	12	19

LW Series

Unit: cm³

Series / Model No.	LW
17	3
21	3
27	7
35	24

PU Series

Unit: cm³

Series / Model No.	PU	
	Standard type	High-load type
09	0.2	0.3
12	0.3	0.4
15	0.8	1.1

PE Series

Unit: cm³

Series / Model No.	PE	
	Standard type	High-load type
09	0.4	0.5
12	0.5	0.7
15	1.2	1.6

RA Series

Unit: cm³

Series / Model No.	RA	
	High-load type	Super-high-load type
25	3	3.5
30	5	6
35	6	8
45	10	13

Table 9 Inside space of ball nut

Return tube type (single nut)

Unit: cm³

Nut model	Inside space
1004−2.5	0.8
1205−2.5	1.2
1210−2.5	1.4
1405−2.5	2.2
1408−2.5	2.1
1510−2.5	2.3
1605−2.5	2.6

Nut model	Inside space
1616−1.5	2.1
2004−5	2.7
2005−5	4.3
2010−2.5	4.7
2020−1.5	4.2
2504−5	3.2
2505−5	5

Nut model	Inside space
2506−5	7
2510−3	9.5
2520−2.5	12
2525−1.5	7.5
2805−5	6
2805−10	9
2806−5	6

Nut model	Inside space
2806−10	9.5
3205−5	7
3206−5	9.5
3210−5	22
3225−2.5	17
3232−1.5	15

End deflector type

Unit: cm³

Nut model	Inside space
0608-2E	0.2
0608-4E	0.3
0612-2E	0.2
0612-4E	0.3
0810-2E	0.4
0810-4E	0.5
0815-2E	0.4
0815-4E	0.6
1005-3E	0.8
1010-2E	0.7

Nut model	Inside space
1205-3E	1.0
1210-3E	1.0
1220-2E	1.2
1230-2E	1.5
1505-3E	2.0
1510-3E	2.0
1520-2E	2.8
1530-2E	3.4

Nut model	Inside space
2005-3E	3.4
2010-3E	3.2
2020-2E	3.2
2030-2E	4.6
2040-2E	5.3
2060-2E	7.0
2505-3E	4.4
2510-4E	4.7
2520-2E	3.9
2525-2E	4.3
2530-2E	5.5
2550-2E	7.7

End cap type

Unit: cm³

Nut model	Inside space
1520−1.5	1.9
1632−1	2.0
2040−1	2.8
2550−1	4.2

Miniature deflector (bridge) type

Unit: cm³

Nut model	Inside space
0401-2	0.1
0601-3	0.2
0801-3	0.3
0801.5-3	0.2
0802-3	0.3
1002-3	0.4
1002.5-3	0.6
1202-3	0.5
1202.5-3	0.8
1602-4	1.6
1602.5-4	1.6

SRC type

Unit: cm³

Nut model	Inside space
3205-10	10
3210-10	43
4010-10	52
4012-10	67

Nut model	Inside space
4510-10	58
5010-10	64
5012-10	99

Middle deflector type

Unit: cm³

Nut model	Inside space
4016-4E	40
4020-4E	47

C-3-1.4 Intervals of checks and replenishments

Although the grease is of high quality, it gradually deteriorates and its lubrication function diminishes.

Also, the grease in the ball slide and ball nut is gradually removed by stroke movement. In some environments, the grease becomes dirty, and foreign objects may enter. Grease should be replenished depending on frequency of use. The following is a guide of grease replenishment intervals for linear guides and ball screws.

Table 10 Intervals of checks and replenishments for grease lubrication

Intervals of checks	Items to check	Intervals of replenishments
3-6 months	Dirt, foreign matters such as cutting chips	Usually once per year. Every 3 000 km for material handling system that travels more than 3 000 km per year. Replenish if checking results warrant it necessary.

Notes: 1) As a general rule, do not mix greases of different brands.
2) Grease viscosity varies by temperature. Viscosity is particular high in winter due to low temperatures. Pay attention to increases in linear guide and ball screw in such conditions.
3) When the ambient temperature is low, or in Winter, if it is difficult to pump out the grease from the container, wait until the grease is softened.
4) In locations where coolant is dispersed or scattered, emulsification of lubricants and rinsing with water may significantly deteriorate the integrity of the lubricant and efficiency of the grease. Protect the grease unit from coolant by shielding it with a cover, etc.

C-3-1.5 NSK Grease Unit

Supply grease to NSK linear guides and ball screws by manual type hand grease pump. Install grease in bellows tube to the pump. Several types of grease (80 g) are available.

Grease in bellows tube

(1) Composition of NSK Grease Unit

Components and grease types are shown below.

	Name	(Tube color)	Reference number
NSK Grease Unit			
NSK Grease (80 g in a bellows tube)	NSK Grease AS2	(Brown)	NSK GRS AS2
	NSK Grease PS2	(Orange)	NSK GRS PS2
	NSK Grease LR3	(Green)	NSK GRS LR3
	NSK Grease LG2	(Blue)	NSK GRS LG2
	NSK Grease LGU	(Yellow)	NSK GRS LGU
	NSK Grease NF2	(Gray)	NSK GRS NF2
NSK Hand Grease Pump Unit			
NSK Hand Grease Pump (Straight nozzle NSK HGP NZ1 -- One nozzle is provided with hand pump.)			NSK HGP
Grease nozzle (used with hand grease pump)			
	NSK straight nozzle		NSK HGP NZ1
	NSK chuck nozzle		NSK HGP NZ2
	NSK drive-in fitting nozzle		NSK HGP NZ3
	NSK point nozzle		NSK HGP NZ4
	NSK flexible nozzle		NSK HGP NZ5
	NSK flexible extension pipe		NSK HGP NZ6
	NSK straight extension pipe		NSK HGP NZ7

(2) NSK Greases (80 g in bellows tube)

Refer to pages C7, C8 and C9 for their natures and details.

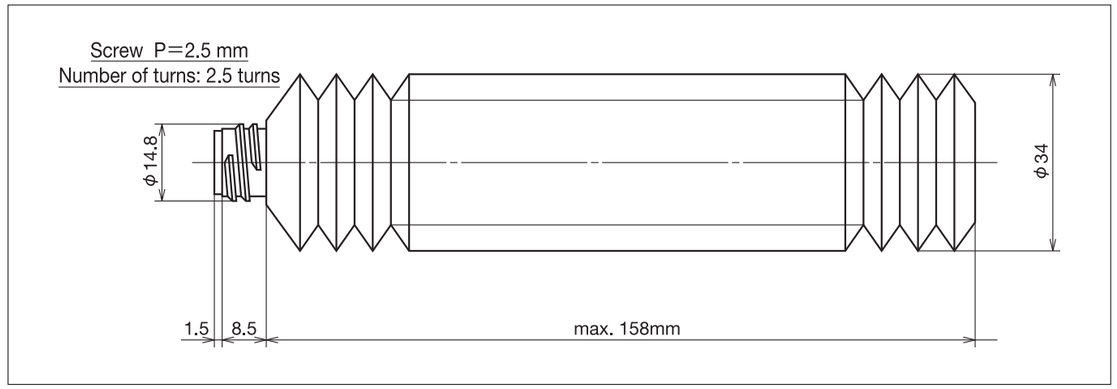


Fig. 7 Bellows tube

(3) NSK Manual Grease Pump Unit

①NSK Hand Grease Pump (Reference number: NSK HGP)

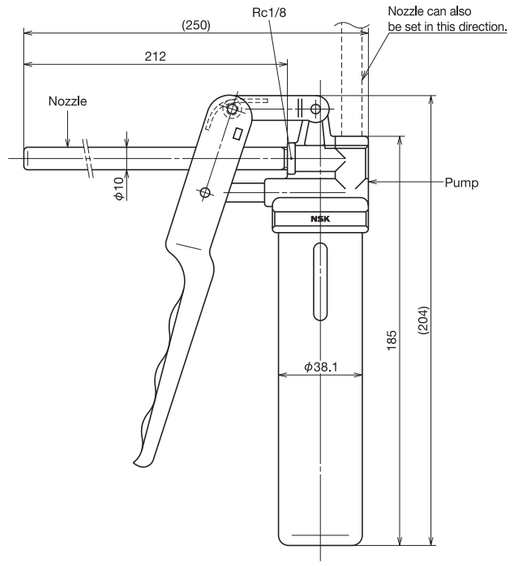


Fig. 8 NSK Hand Grease Pump with NSK straight nozzle

●Features

- Light-weight ····· Can be operated by one hand, yet there is no worry to make a mistake.
- Inserting by high pressure ··· Insert at 15 Mpa.
- No leaking ····· Does not leak when held upside down.
- Easy to change grease ··· Simply attach grease in bellows tube.
- Remaining grease ····· Can be confirmed through slit on tube.
- Several nozzles ····· Five types of nozzles to choose from.

●Specifications

- Discharge pressure ···· 15 Mpa
- Spout volume ····· 0.35 cc/shot
- Mass of main body ···· Without nozzle 240 g
  Provided nozzle 90 g
- Grease tube outer diameter φ38.1
- Accessory ····· Several nozzles for a unique application can be attached

*Air is contained in the unopened bellows tube. Try the system tens of times when to use the hand grease pump. The tube will be use after deflated from the tube.

②Nozzles

Table 11 Nozzles that can be attached to NSK Hand Grease Pump

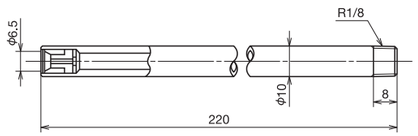
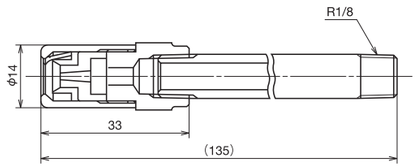
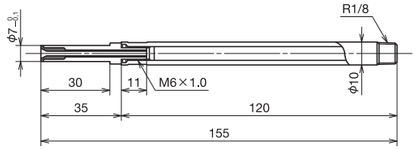
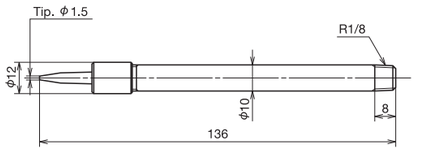
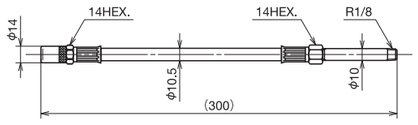
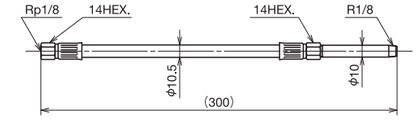
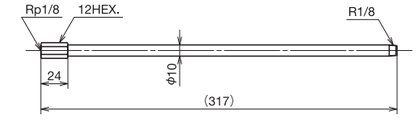
Name	Designation code	Use	Dimensions
NSK straight nozzle	NSK HGP NZ1	Can be used with grease fitting A, B, and C under JIS B1575 standard.	
NSK chuck nozzle	NSK HGP NZ2	Same as above. However, there is no need to press the hand pump because the grease fitting and the nozzle come to contact due to the chucking mechanism at the tip.	
NSK drive-in fitting nozzle	NSK HGP NZ3	Dedicated for the -φ3 drive-in grease fitting.	
NSK point nozzle	NSK HGP NZ4	Used for linear guides and ball screws which do not have grease fitting. Supplies grease directly to the ball grooves, or through the opening of ball slide or ball slide to inside.	
NSK flexible nozzle	NSK HGP NZ5	The tip of the flexible nozzle is chuck nozzle. The straight nozzle is not available for use.	
NSK flexible extension pipe	NSK HGP NZ6	Flexible extension pipe connects the grease pump and the nozzle	
NSK straight extension pipe	NSK HGP NZ7	Straight extension pipe connects the grease pump and the nozzle.	

Table 12 Grease fittings used for NSK linear guide

Series	Model No.	Tap hole for grease fitting	Standard grease fitting	Straight nozzle NZ1	Chuck nozzle NZ2	Drive-in fitting nozzle NZ3	Point nozzle NZ4	Flexible nozzle NZ5
NH	NH15	φ3	Drive-in type			○		
	NH20、25、30、35*	M6×0.75	B type	○	○			○
	NH45、55、65	Rc1/8	B type	○	○			○
NS	NS15	φ3	Drive-in type			○		
	NS20、25、30、35*	M6×0.75	B type	○	○			○
LW	LW17	φ3	Drive-in type			○		
	LW21、27、35*	M6×0.75	B type	○	○			○
PU	PU09、12	–	–				○	
	PU15	φ3	Drive-in type			○		
PE	PE09、12	–	–				○	
	PE15	φ3	Drive-in type			○		
RA	RA25、30、35*	M6×0.75	B type	○	○			○
	RA45	Rc1/8	B type	○	○			○

*) If using a chuck nozzle, avoid interference with table and rail.
Note: 1) For PU and PE Series, apply grease directly to ball groove, etc. using point nozzle.
2) A long threaded grease fitting is required for NSK linear guides because of dust-proof parts.

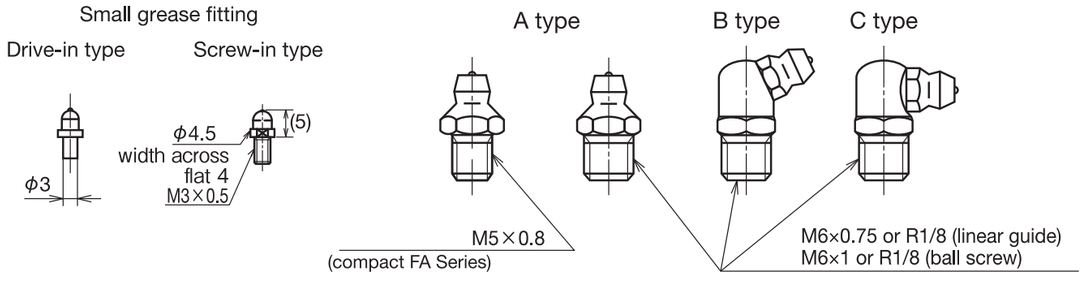


Fig. 9 Grease fittings

Table 13 Applicable grease nozzle for ball screws

SeriesTap hole for grease fitting			Model No.		Tap hole for grease fitting	Standard grease fitting	Straight nozzle NZ1	Chuck nozzle NZ2	Drive-in fitting nozzle NZ3	Point nozzle NZ4	Flexible nozzle NZ5
Finished shaft end	Compact FA	High-accuracy, clean	USS		M5×0.8	A type	○	○		○	○
		General	PSS			A type	○*1	○*1		○	○*1
		Transfer equipment	FSS			A type	○*1	○*1		○	○*1
	Miniature, fine lead		MA	Shaft dia. 12 or less	—	—				○	
				Shaft dia. 16 or over	M6×1	—				○	
	Small equipment		FA		M6×1	—	○*2	○*2		○	○*2
	Machine tools		SA	Shaft dia. 36 or less	M6×1	—	○	○		○	○
				Shaft dia. 40 or over	Rc1/8	—	○	○		○	○
Blank shaft end	Machine tools		HSS		M6×1	—	○	○		○	○

*1 Unavailable for shaft dia. 25 mm *2 If using A type grease fitting, may not install the nozzle.

Notes: 1) Normally, grease fitting is not provided to NSK ball screw except Compact FA Series. Ball nut has a tap hole to install a grease fitting. The user should install a grease fitting if necessary.
2) MA type has no tap hole, apply grease directly to the screw shaft and ball grooves using point nozzle.

C-3-2 Oil Lubrication

Required amount of new oil is regularly supplied by:

- Manual or automatic intermittent supply system;
- Oil mist lubricating system via piping.

Equipment for oil lubrication is more costly than grease lubrication. However, oil mist lubricating system supplies air as well as oil, raising the inner pressure of the ball slide. This prevents foreign matters from entering, and the air cools the system. Use an oil of high atomizing rate such as ISO VG 32 to 68 for the oil mist lubrication system.

ISO VG 68 to 220 are recommended for common intermittent replenishment system. Approximate volume of oil Q for a ball slide of linear guide per hour can be obtained by the following formula.

In case of ball type linear guides

$Q \geq n / 150$ (cm³/hr)

In case of RA Series

$Q \geq n / 100$ (cm³/hr)

n : Linear guide code

e.g. When NH45 is used,

$n = 45$

Therefore,

$Q = 45 / 150 = 0.3$ cm³/hr

Similarly, approximate oil supply volume Q to ball screw can be obtained by the following formula.

$Q = d / 15$ (cm³/hr)

d : Nominal shaft diameter of the ball screw

e.g. When the shaft diameter is 50,

$d = 50$

Therefore,

$Q = 50 / 15 = 3.3$ cm³/hr

For oil lubrication by gravity drip, the oil supply position and installation position of the ball slide or ball nut are crucial. In case of linear guide, unless it is installed to a horizontal position, the oil flows only on the down side, and does not spread to all raceway surface. This may cause insufficient lubrication. For ball screw lubrication as well, oil does not spread if the oil orifice is installed at the bottom, causing insufficient lubrication. Please consult NSK to correct such situations prior to use. NSK has internal design which allows oil lubricant to flow throughout the system. Table 14 shows the criterion of intervals of oil checks and replenishments.

Table 14 Intervals of checks and replenishments

Method	Intervals of checks	Items to check	Replenishment or intervals of changes
Automatic intermittent supply	Weekly	Volume of oil, dirt, etc.	Replenish at each check. Suitable volume for tank capacity.
Oil bath	Daily before operation	Oil surface	Make a suitable criterion based on consumption

Notes: 1) As with grease lubrication, do not mix oil lubricant with different types.
2) Some components of the linear guide and ball screw are made of plastic. Avoid using an oil that adversely affects synthetic resin.
3) When using oil mist lubricating system, please confirm an oil supply amount at the each outlet part.

C-4 RoHS Compliant

For details of country-specific RoHS, contact NSK.

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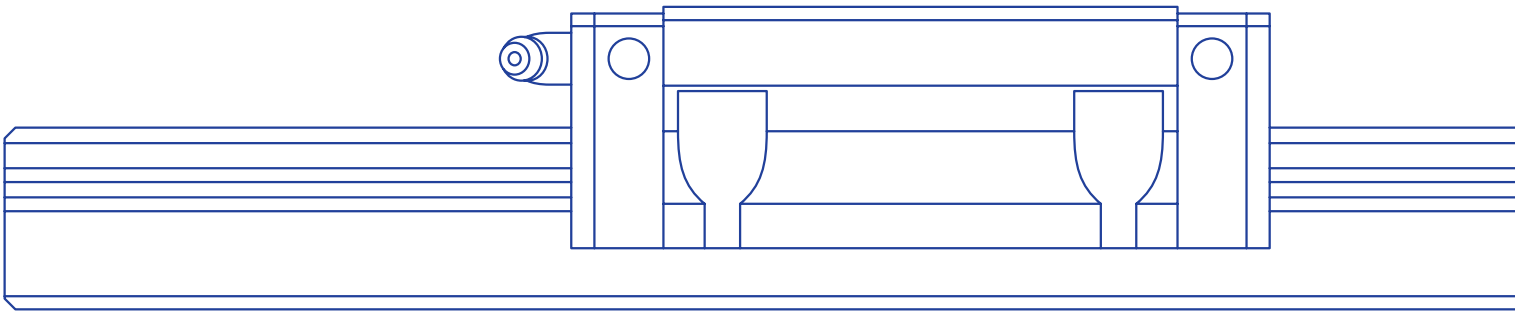

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CAT. No. E3191a 2019 Z-12 Printed in Japan ©NSK Ltd. First edition published in FEB. 2017