



NSK STANDARD BALL SCREWS COMPACT FA SERIES

Quiet, high-speed operating performance.



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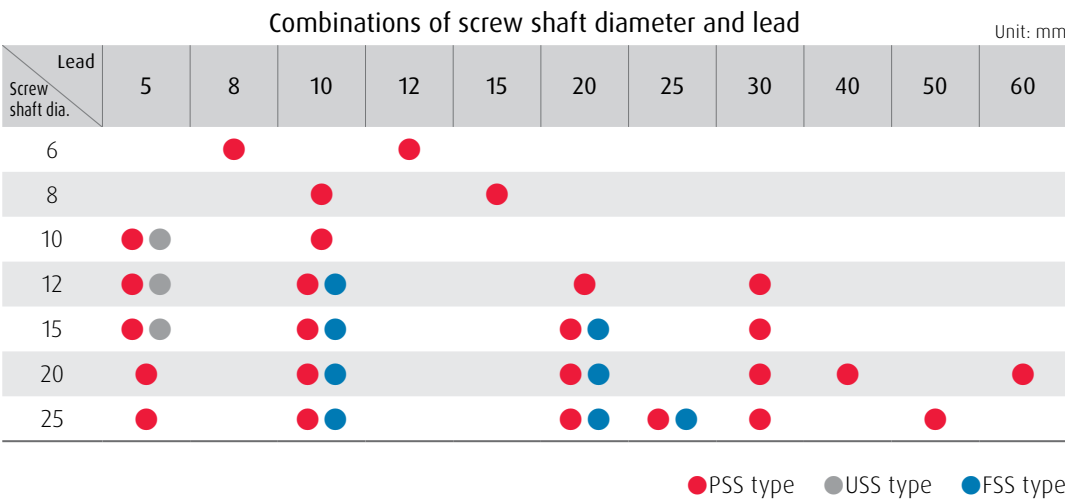
Selection of ball screws

Three types of compact FA Series are available. Choose optimal types for your application.

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Support Unit

Square Type	46-47
For general use, for clean use, space saving (low-profile type)	
Round Type	48-49
For general use, for clean use	
Square Type	50-51
For simple support side	



NSK Standard Ball Screws: Compact FA Series

Compact FA Series ball screws incorporate NSK's ball recirculation system and offer quiet, high-speed performance. In order to respond quickly to a wide range of needs, NSK offers four-week delivery on common sizes. These high-performing ball screws are ready for use in a variety of industries including: semiconductor manufacturing, medical equipment, factory automation and general industrial use.

The Compact FA Series includes the following types to meet your application requirements:

- PSS Type which offers various sizes for general use.
- USS Type for high accuracy and clean environment use.
- FSS Type for transfer equipment.

Features

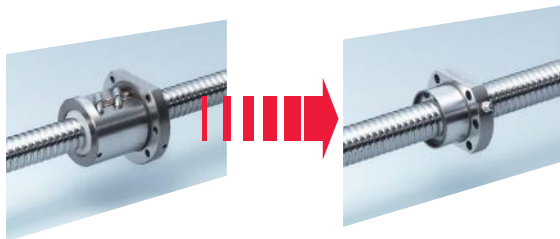
Quick delivery

Domestic manufacturing and comprehensive stocking program ensure four-week delivery and reduced shipping costs.

Compact ball screw

The outside diameter of the ball nut is as much as 30% smaller than those of existing NSK products. Compact size enables all sorts of equipment and devices, such as linear stages, to be smaller. NSK has also designed low profile support units, specific for the Compact FA series, enabling a unique space-saving design.

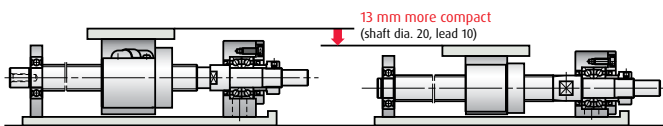
Shaft dia. 25 mm, lead 5 mm



Existing FA Series

Compact FA Series

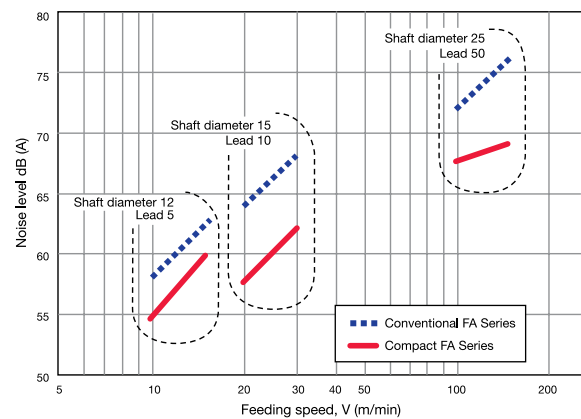
Comparison of existing FA Series and Compact FA Series



Quiet operation

The noise level of ball screws has been reduced by 6 dB, about half of what is sensed by the ear. Ball screws subsequently produce a quieter and gentler sound.

Noise data



(Microphone was positioned at a distance of 400 mm for all noise measurements.)

High-speed operation

They handle speeds up to 5000 min⁻¹. This capability dramatically expands the range of service conditions.

Note: Please refer to the dimension table for details of permissible rotational speed.

Grease fitting provided as standard equipment

The new ball screws are equipped with a grease fitting (M5 × 0.8). Lubrication ports are provided in two locations to facilitate maintenance. The ball screws can be easily connected to an integrated lubrication system.

Contact seal

Compact, thin plastic seal is available and helps to minimize grease dispersion and maintain a clean work environment.

Compact FA Series: PSS Type for General Use

Applications

Semiconductor manufacturing equipment, LCD manufacturing equipment, material handling equipment, measuring equipment, medical equipment, etc.

Accuracy grade and axial play

Accuracy grade: C5 grade of JIS

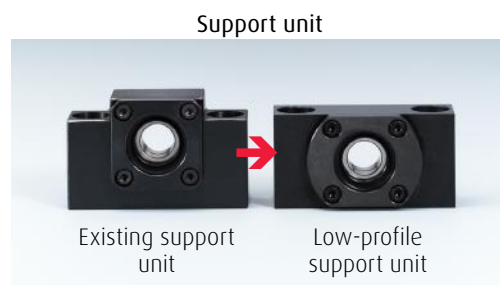
Axial play 1) Shaft dia. 6 and 8 mm: 0.005 mm or less
2) Shaft dia. 10 mm or over: 0 (Oversize ball preload)

Wide variation

Various combinations of shaft diameter, lead and stroke are available to meet a wide range of customer needs.

Shaft end support

The low-profile support units are compatible for the Compact FA Series. Each end of the ball screw shaft is designed to fit support unit, no detailed design after purchase is necessary.



Combinations of shaft diameter, lead and stroke

Shaft dia.	Lead	50	100	150	200	300	400	500	600	700	800	1000	1200	1600	2000	Page	Recommended support unit	
																	Fixed	Simple
6	8			▲*												8-9	WBK04-01M (square) WBK04-11M (round)	-
	12			▲*														
8	10			▲*												10-11	WBK06-01M (square) WBK06-11M (round)	-
	15			▲*														
10	5	●	●		●	●	●									12-13	WBK08-01B	WBK08S-01B
	10		●		●	●	●	●										
12	5	●	●		●	●	●	●								14-15	WBK08-01B	WBK08S-01B
	10		●		●	●	●	●	●									
	20		▲		▲	▲	▲	▲										
15	30		▲		▲	▲	▲	▲										
	5	●	●		●	●	●	●	●	●	●	●				16-19	WBK12-01B WBK10-01B	WBK12S-01B
	10		●		●	●	●	●	●	●	●	●						
20	20		●		●	●	●	●	●	●	●	●	●			20-25	WBK15-01B	WBK15S-01B
	30		▲		▲	▲	▲	▲	▲	▲	▲	▲	▲	▲				
	40				▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲			
	60						▲	▲	▲	▲	▲	▲	▲	▲	▲			
	5		●	●	●	●	●	●	●	●	●	●	●	●	●			
25	10				●	●	●	●	●	●	●	●	●	●	●			
	20					●	●	●	●	●	●	●	●	●	●			
	25						●	●	●	●	●	●	●	●	●			
	30							▲	▲	▲	▲	▲	▲	▲	▲			
	50							▲	▲	▲	▲	▲	▲	▲	▲			

*For shaft diameter 6 and 8, length shown is overall length.

● Stocked: 4-week delivery. ▲ Contact NSK for availability.

Reference number

PSS COMPACT FA PSS TYPE	15 SCREW SHAFT DIAMETER (MM)	05 LEAD (MM)	N1D NSK CONTROL NUMBER	0361 SCREW SHAFT LENGTH (MM)
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Compact FA Series: USS Type for High-Accuracy and Clean Room Use

Applications

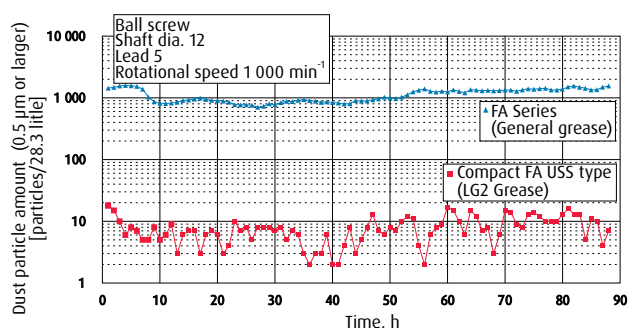
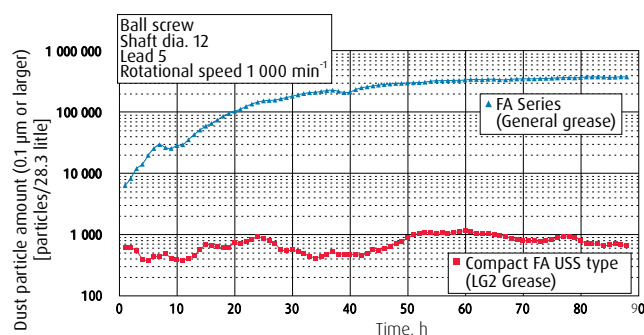
Semiconductor manufacturing equipment, LCD manufacturing equipment, and inspection equipment for clean room environments.

Accuracy grade and axial play

Accuracy grade: C3 grade of JIS Axial play: 0 (Oversize ball preload)

Low-dust emission

- LG2 clean grease is used as standard and reduces dust particle generation 90% compared to lithium grease
- 1/100 of dust particles generated with LG2 grease
- Ideal for clean room environmental use



Shaft end support

Low-profile support units for clean environments are available.

Combinations of screw shaft diameter, lead and stroke

Shaft dia.	Lead	Stroke					Page	Recommended support unit		
		100	200	400	500	600		Fixed	Simple	Application
10	5	●	●	●			32-33	WBK08-01B	WBK08S-01B	Low
								WBK08-01C	WBK08S-01C	Clean
12		●	●		●		34-35	WBK08-01B	WBK08S-01B	Low
								WBK08-01C	WBK08S-01C	Clean
15		●	●	●		●	36-37	WBK12-01B	WBK12S-01B	Low
								WBK12-01C	WBK12S-01C	Clean

Reference number

USS

COMPACT FA USS TYPE

15

SCREW SHAFT DIAMETER (MM)

05

LEAD (MM)

N1D

NSK CONTROL NUMBER

0361

SCREW SHAFT LENGTH (MM)

Compact FA Series: FSS Type for Transfer Equipment

Applications

Transfer equipment used in industrial fields such as automotive, semiconductor, and medical equipment.

Accuracy grade and axial play

Accuracy grade: Ct7 grade of JIS Axial play: 0.010 mm or less

Easy stroke setting

- Flexible stroke setting with fixed-simple support by means of mounting support unit (simple support side) directly to ball screw thread outside diameter.
- Since corner cutting is not necessary, customers can cut ball screws, which results in reduced cost and lead time.
- If necessary, NSK can cut shaft if requested. Contact NSK for more information.

Precautions

- During the cutting process, be careful not to let metal particles or burrs fall inside the ball nut.
- Customers are also advised to treat the cut surface.
- When inserting the support unit (simple support side), apply oil or grease on the outside of the shaft and inside the bearing.

Shaft end support

Fixed side: The low-profile support units compatible for compact FA PSS type are available.
Simple side: Proprietary support units are available.



Design precautions

Permissible rotational speed varies when using cut screw shaft. To determine permissible rotational speed, calculate two items below. Use smaller number to determine permissible rotational speed.

- Critical speed which is the resonance vibration of the shaft. (Refer to the technical description of the catalog "Precision Machine Components".)
- Maximum rotational speed 5 000 min⁻¹

Combinations of shaft diameter, lead and shaft length

Shaft dia.	Lead	Overall shaft length						Page	Recommended support unit	
		400	500	600	900	1 000	1 450		Fixed	Simple
12	10	•		•	•			38-39	WBK08-01B	WBK12SF-01B
15	10		•			•	•	40-41	WBK12-01B	WBK15SF-01B
	20		•			•	•			
20	10			•		•	•	42-43	WBK15-01B	WBK20SF-01B
	20			•		•	•			
25	10			•		•	•	44-45	WBK20-01	WBK25SF-01
	20			•		•	•			
	25			•		•	•			

Reference number

FSS COMPACT FA FSS TYPE	15 SCREW SHAFT DIAMETER (MM)	10 LEAD (MM)	N1D NSK CONTROL NUMBER	1000 SCREW SHAFT LENGTH (MM)
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Precautions

Design

- (1) If the left shaft end of a ball screw (opposite driven side) is the shape I, and is supported with the "fixed-fixed" supporting method, you should be aware that the operating life of support bearings may drop due to thermal expansion of the screw shaft, depending on usage conditions. In this case, you should consider a structure that can absorb thermal expansion of the screw shaft if necessary. Please consult NSK for detailed examination.
- (2) For general precautions concerning ball screws, please see NSK Catalog No. E3162 "Precision Machine Components."

Usage and handling

Ball screws are precision products and should be treated as follows:

Lubrication

- (1) Compact FA Series ball screws are packed and coated with lubrication grease at the factory, and require no further lubrication under ordinary circumstances. If the surface of the grease becomes contaminated with dirt or metal powder under operation, clean it with white kerosene and replenish with new grease of the same kind through the oil hole (grease fitting) on the ball nut. Avoid mixing different types of grease.
- (2) Lubricant should be checked after the first 2 to 3 months of operation. If excessively dirty, we recommend you wipe away the old grease and replenish with a generous quantity of grease. After that, grease should be checked and replenished once a year under ordinary circumstances, but the period may vary depending upon the service environment.



Check lubrication

Handling

- (1) Never disassemble the ball screw, otherwise dirt may contaminate the inside of the unit and affect precision or result in equipment failure.
- (2) Compact FA Series ball screws incorporate a new ball re-circulation system. Consequently, only NSK authorized plants should conduct disassembly and reassembly. If the nut accidentally comes off the screw shaft or is dropped, contact NSK. We can perform inspection and repair if needed.
- (3) When the ball screw is erected upright, the screw shaft or nut could fall by force of its own weight and result in injury. If dropped, the ball grooves could be dented or re-circulation parts damaged, resulting in loss of function. This would require the ball screw to be inspected by NSK. If so, be sure to send the ball screw to NSK and we will check it for a fee.



Do not disassemble



Beware of dropping

Usage

- (1) Ball screws should be used in a clean environment. The ball screws should be installed with a dust cover to prevent the entry of debris such as dust and metal powder. If foreign matter is allowed to contaminate the ball screw, this could not only cause the ball screw to lose some of its function, but also result in clogging and damaging the re-circulation system parts, or cause the table to fall or a similar serious accident.
- (2) Compact FA Series ball screws are designed to be used in a service temperature environment of 80°C or lower. Do not allow the service temperature limit to be exceeded. In some cases, using ball screws in temperatures above 80°C might lead to damage of re-circulation system parts or seal parts. Contact NSK if 80°C must be exceeded.



Dust control



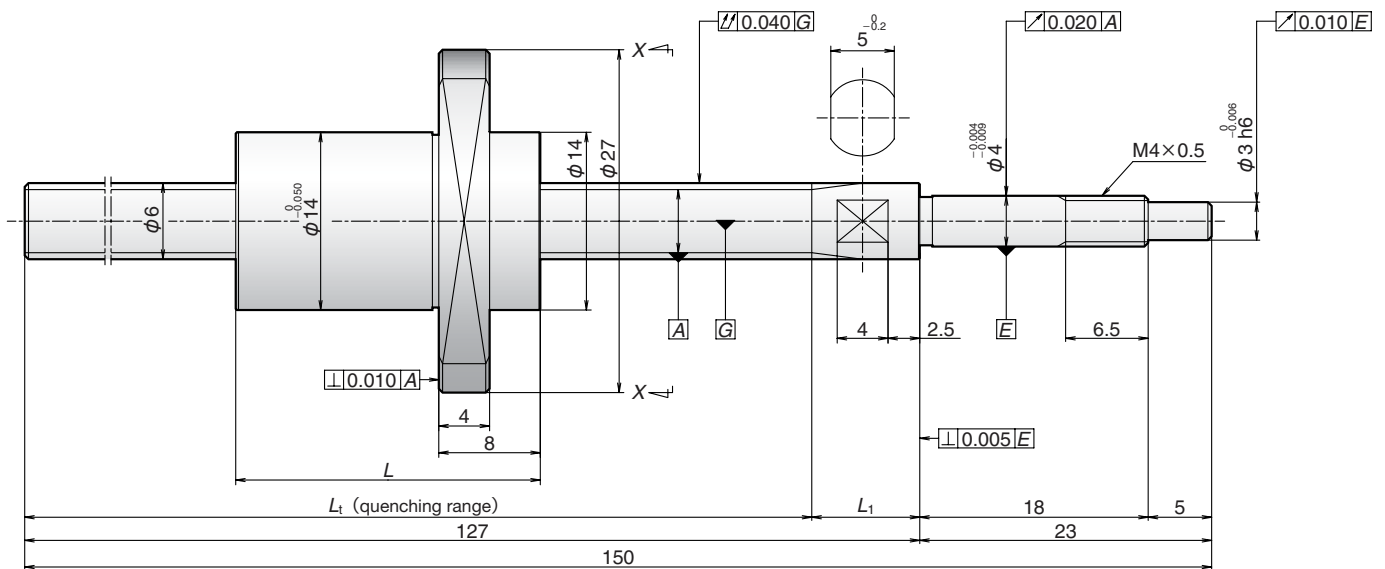
Caution max. temperature

Compact FA Series options

Consult with NSK for information regarding shaft end machining, reversing ball nut direction and other options.

Compact FA Series

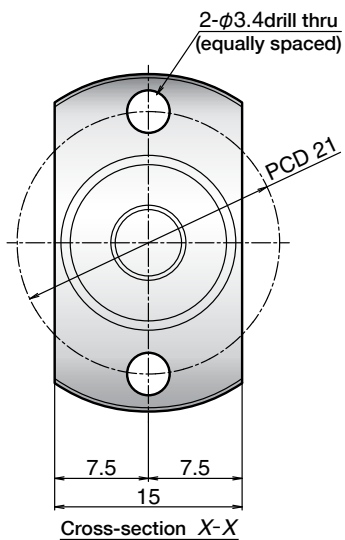
Screw shaft diameter 6 mm, Lead 8 and 12 mm



Reference no.	Screw shaft dia. d	Lead ℓ	Effective turns of balls	Basic load ratings (N)		Stroke max.	Nut length L	Screw shaft dimensions	
				Dynamic C _a	Static C _{0a}			L _t	L _i
PSS0608NAD0150	6	8	2	550	715	97.5	16	118.5	8.5
PSS0608NBD0150			4	1 180	1 760	89.5	24	118.5	8.5
PSS0612NAD0150		12	2	550	715	92.0	20	117.0	10.0
PSS0612NBD0150			4	1 180	1 760	80.0	32	117.0	10.0

Notes 1. Contact NSK if permissible rotational speed is to be exceeded.

PSS Type for General Use



Unit : mm

Ball screw specification	
Ball dia./screw shaft root dia.	1.2 / 4.9
Ball circle dia.	6.2
Accuracy grade/axial play	C5 / 0.005 mm or less
Factory-packed grease	NSK grease PS2

Recommended support unit

For drive side (Fixed)	
WBK04-01M (square)	P 46-47
WBK04-11M (round)	P 48-49

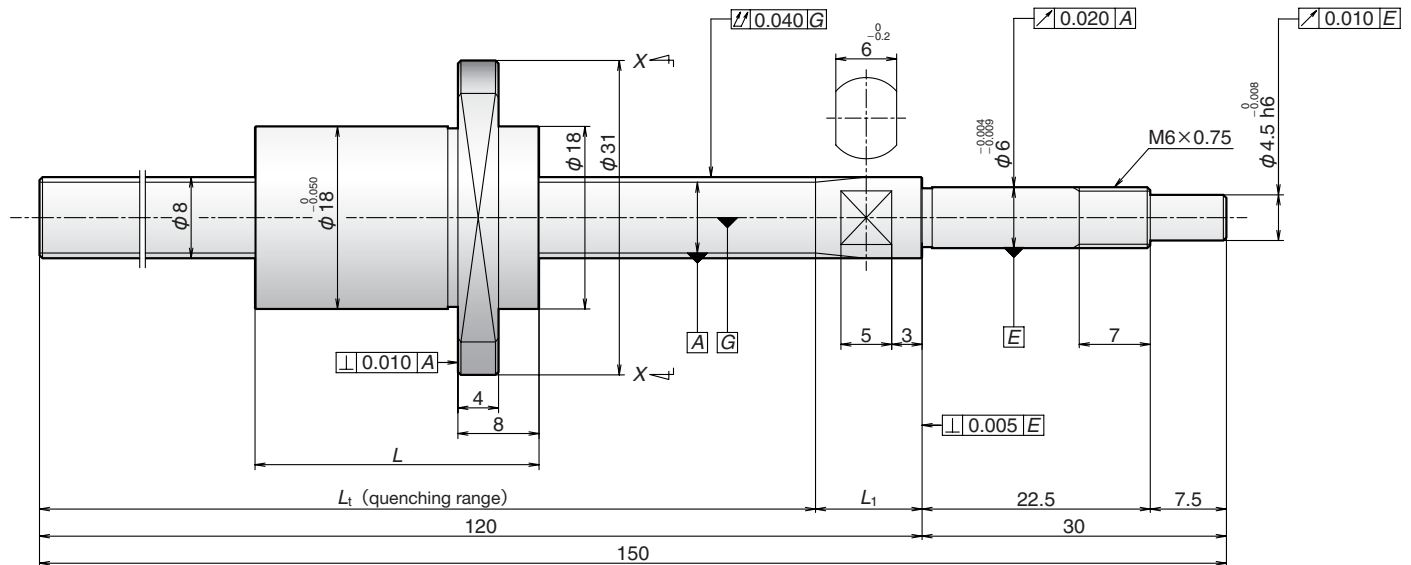
Unit : mm

Lead accuracy			Dynamic preload torque (N·cm)	Mass (kg)	Permissible rotational speed (min ⁻¹)	Internal spatial volume of nut (cm ³)	Standard volume of grease replenishing (cm ³)
Target value T	Error e _p	Variation V _u					
0	20	18	0.5 or less	0.06	5 000	0.2	0.1
				0.06		0.3	0.2
				0.06		0.2	0.1
				0.07		0.3	0.2

- 2. Service temperature range is 0 to 80°C.
- 3. Use of NSK support unit is recommended. Refer to pages 46 to 49 for details.

Compact FA Series

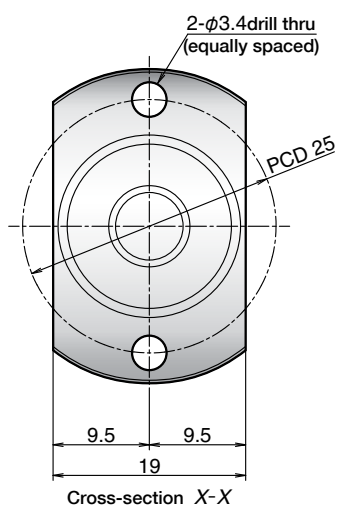
Screw shaft diameter 8 mm, Lead 10 and 15 mm



Reference no.	Screw shaft dia. d	Lead ℓ	Effective turns of balls	Basic load ratings (N)		Stroke max.	Nut length L	Screw shaft dimensions	
				Dynamic C _a	Static C _{0a}			L ₁	L ₂
PSS0810NAD0150	8	10	2	910	1 260	86.5	18	109.5	10.5
PSS0810NBD0150			4	1 950	3 080	76.5	28	109.5	10.5
PSS0815NAD0150		15	2	910	1 260	80.0	22	107.0	13.0
PSS0815NBD0150			4	1 950	3 080	65.0	37	107.0	13.0

Notes 1. Contact NSK if permissible rotational speed is to be exceeded.

PSS Type for General Use



Unit : mm

Ball screw specification	
Ball dia./screw shaft root dia.	1.588 / 6.6
Ball circle dia.	8.3
Accuracy grade/axial play	C5 / 0.005 mm or less
Factory-packed grease	NSK grease PS2

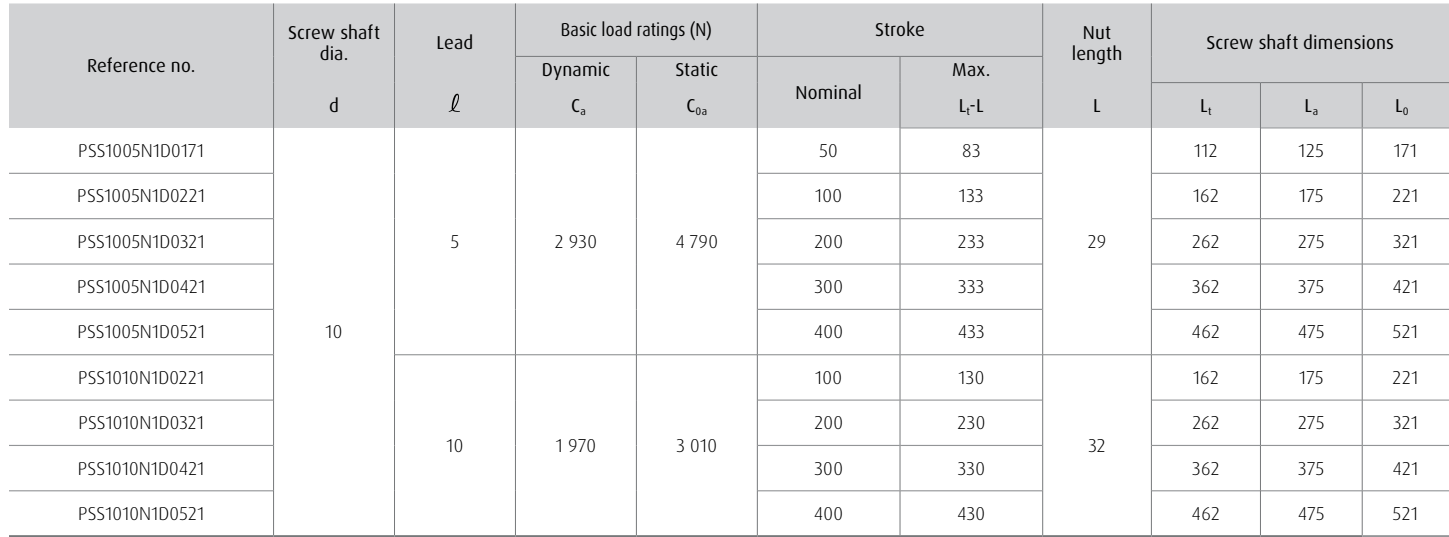
Recommended support unit

For drive side (Fixed)	
WBK06-01M (square)	P 46-47
WBK06-11M (round)	P 48-49

Unit : mm

Lead accuracy			Dynamic preload torque (N·cm)	Mass (kg)	Permissible rotational speed (min ⁻¹) ¹	Internal spatial volume of nut (cm ³)	Standard volume of grease replenishing (cm ³)
Target value T	Error e _p	Variation V _u					
0	20	18	0.5 or less	0.09	5 000	0.4	0.2
				0.11		0.5	0.3
				0.10		0.4	0.2
				0.12		0.6	0.3

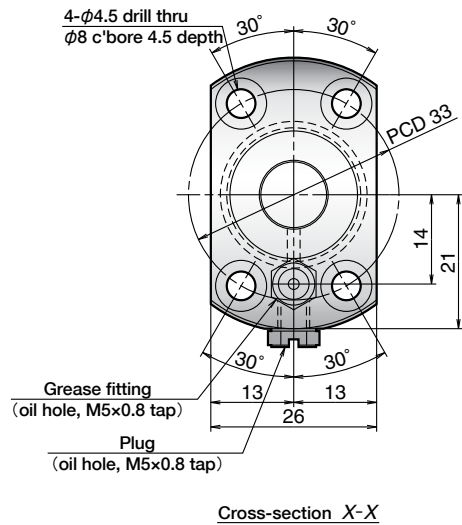
2. Service temperature range is 0 to 80°C.
3. Use of NSK support unit is recommended. Refer to pages 46 to 49 for details.



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PSS Type for General Use

Unit : mm



Ball screw specification	
Preload type	Oversize ball (P-preload)
Ball dia./screw shaft root dia.	2.000 / 8.2
Ball circle dia.	10.3
Accuracy grade/axial play	C5 / 0
Factory-packed grease	NSK grease PS2

Recommended support unit

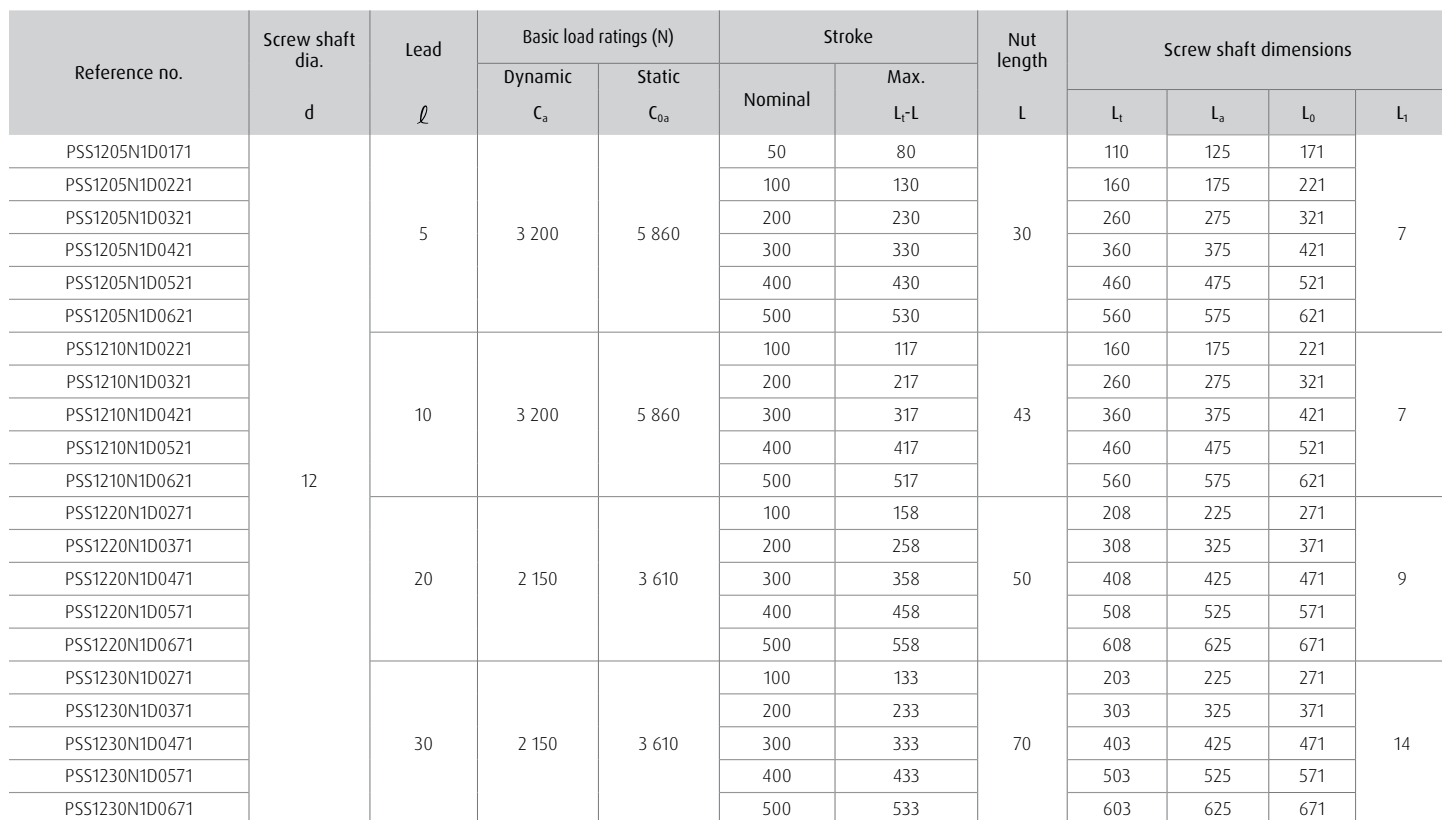
For drive side (Fixed)		For opposite to drive side (Simple)
WBK08-01B (square, low)	P 46-47	WBK08S-01B (square, low) P 50-51
WBK08-11 (round)	P 48-49	-
WBK08-11B (round, high-load)	P 48-49	-

Unit : mm

Lead accuracy			Shaft run-out	Dynamic preload torque	Mass	Permissible rotational speed (min ⁻¹) ⁷²	Internal spatial volume of nut	Standard volume of grease replenishing	
Target value	Error	Variation				Fixed-simple			
T	e _p	V _u	C	(N·cm) ⁻¹	(kg)		(cm ³)	(cm ³)	
0	0.020	0.018	0.030	0.7 to 3.3	0.3	5 000	0.8	0.4	
	0.020	0.018	0.045	0.7 to 3.3	0.3				
	0.023	0.018	0.060	0.6 to 4.3	0.3				
	0.025	0.020	0.070	0.6 to 4.3	0.4				
	0.027	0.020	0.085	0.4 to 4.9	0.5		0.7		
	0.020	0.018	0.045	0.7 to 3.3	0.3				
	0.023	0.018	0.060	0.6 to 4.3	0.4				
	0.025	0.020	0.070	0.6 to 4.3	0.4				
	0.027	0.020	0.0850	0.4 to 4.9	0.5				

- Service temperature range is 0 to 80°C.
- Use of NSK support unit is recommended. Refer to pages 46 to 51 for details.

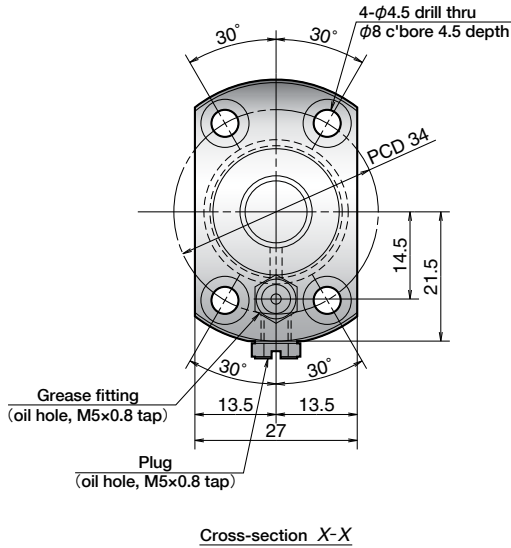
Screw shaft diameter 12 mm, Lead 5, 10, 20 and 30 mm



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PSS Type for General Use

Unit : mm



Ball screw specification	
Preload type	Oversize ball (P-preload)
Ball dia./screw shaft root dia.	2.000 / 10.2
Ball circle dia.	12.3
Accuracy grade/axial play	C5 / 0
Factory-packed grease	NSK grease PS2

Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK08-01B (square, low) P 46-47	WBK08S-01B (square, low) P 50-51
WBK08-11 (round) P 48-49	-
WBK08-11B (round, high-load) P 48-49	-

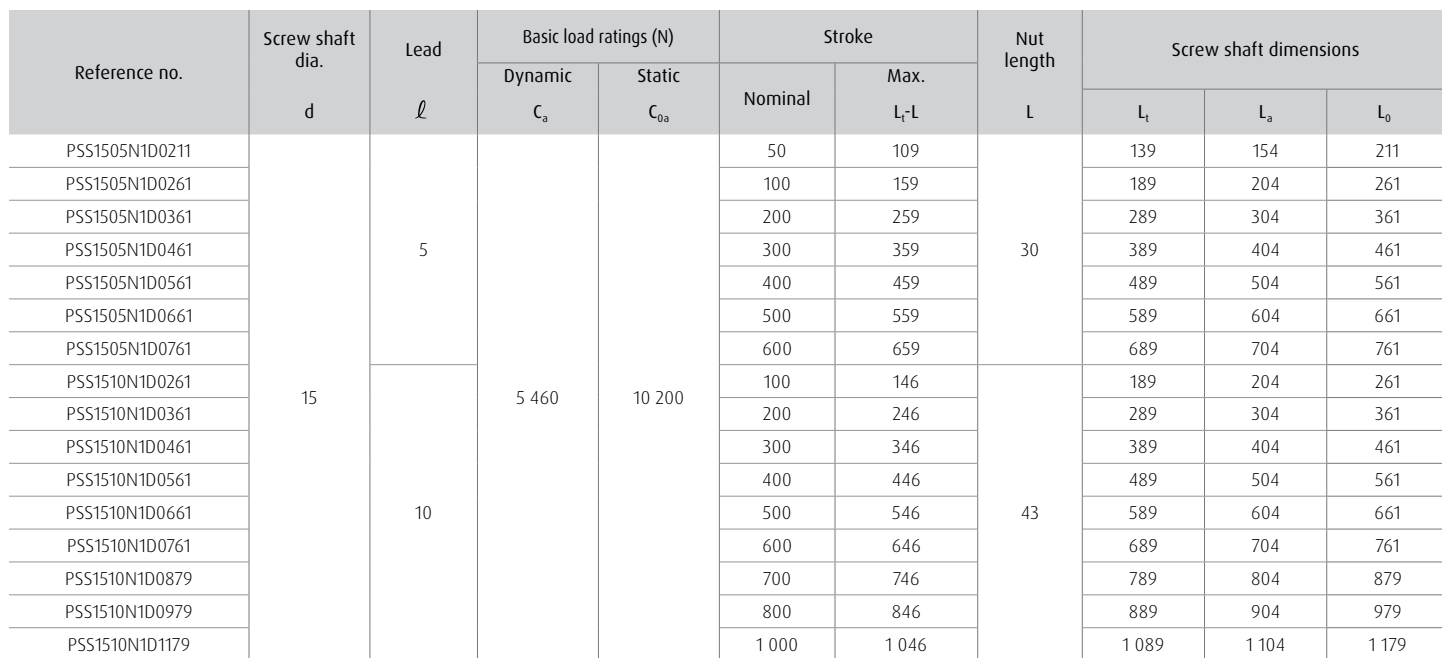
Unit : mm

Lead accuracy			Shaft run-out	Dynamic preload torque	Mass	Permissible rotational speed (min ⁻¹) ²	Internal spatial volume of nut	Standard volume of grease replenishing
Target value	Error	Variation				Fixed-simple		
T	e _p	V _u	C	(N·cm) ⁻¹	(kg)		(cm ³)	(cm ³)
0	0.020	0.018	0.030	0.7 to 3.3	0.3	5 000	1.0	0.5
	0.020	0.018	0.045	0.7 to 3.3	0.3			
	0.023	0.018	0.060	0.6 to 4.3	0.4			
	0.025	0.020	0.070	0.6 to 4.3	0.5			
	0.027	0.020	0.085	0.6 to 4.3	0.6			
	0.030	0.023	0.085	0.4 to 4.9	0.7	5 000	1.0	0.5
	0.020	0.018	0.045	0.7 to 3.3	0.4			
	0.023	0.018	0.060	0.6 to 4.3	0.5			
	0.025	0.020	0.070	0.6 to 4.3	0.5			
	0.027	0.020	0.085	0.6 to 4.3	0.6			
	0.030	0.023	0.085	0.4 to 4.9	0.7	5 000	1.2	0.6
	0.023	0.018	0.045	1.4 to 4.5	0.4			
	0.023	0.018	0.060	0.9 to 4.9	0.5			
	0.027	0.020	0.070	0.9 to 4.9	0.6			
	0.030	0.023	0.085	0.6 to 5.9	0.7			
	0.030	0.023	0.110	0.6 to 5.9	0.8	4 200		
	0.023	0.018	0.045	1.4 to 4.5	0.5	5 000	1.5	0.8
	0.023	0.018	0.060	0.9 to 4.9	0.6			
	0.027	0.020	0.070	0.9 to 4.9	0.7			
	0.030	0.023	0.085	0.6 to 5.9	0.7			
	0.030	0.023	0.110	0.6 to 5.9	0.8	4 300		

3. Service temperature range is 0 to 80°C.

4. Use of NSK support unit is recommended. Refer to pages 46 to 51 for details.

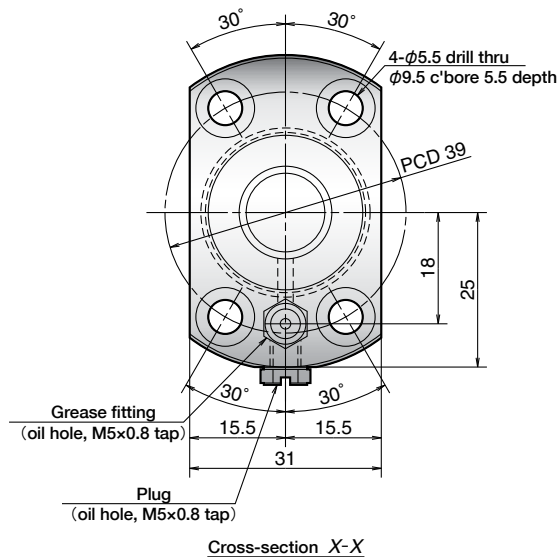
Screw shaft diameter 15 mm, Lead 5 and 10 mm



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PSS Type for General Use

Unit : mm



Ball screw specification

Preload type	Oversize ball (P-preload)
Ball dia./screw shaft root dia.	2.778 / 12.6
Ball circle dia.	15.5
Accuracy grade/axial play	C5 / 0
Factory-packed grease	NSK grease LR3

Recommended support unit

For drive side (Fixed)	For opposite to drive side	
	(Fixed)	(Simple)
WBK12-01B (square, low) P 46-47	WBK10-01B (square, low) P 46-47	WBK12S-01B (square, low) P 50-51
WBK12-11 (round) P 48-49	WBK10-11 (round) P 48-49	-

Unit : mm

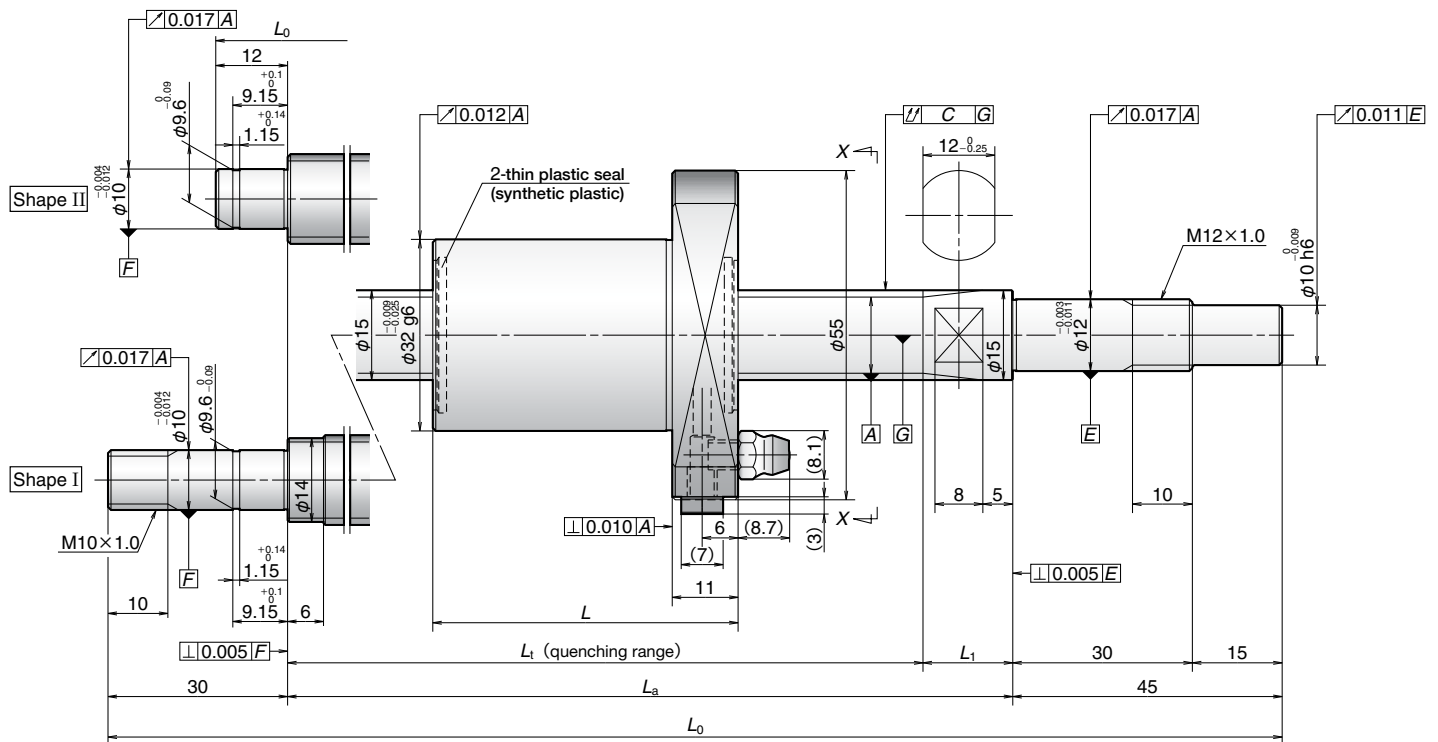
Left shaft end (opposite driven side)	Lead accuracy			Shaft run-out C	Dynamic preload torque (N·cm) ^{*1}	Mass (kg)	Permissible rotational speed (min ⁻¹) ^{*2}		Internal spatial volume of nut (cm ³)	Standard volume of grease replenishing (cm ³)
	Target value T	Error e _p	Variation V _a				Fixed-simple	Fixed-Fixed		
II	0	0.020	0.018	0.035	0.2 to 6.9	0.5	5 000	—	2.0	1.0
		0.020	0.018	0.035	0.2 to 6.9	0.5				
		0.023	0.018	0.045	0.2 to 6.9	0.6				
		0.025	0.020	0.050	0.4 to 9.8	0.8				
		0.027	0.020	0.060	0.4 to 9.8	0.9				
		0.030	0.023	0.075	0.4 to 9.8	1.0				
0.035		0.025	0.075	0.4 to 11.8	1.1	3 600				
II		0.020	0.018	0.035	0.6 to 7.4	0.6	5 000	—		
		0.023	0.018	0.045	0.6 to 7.4	0.7				
		0.025	0.020	0.050	0.4 to 9.8	0.8				
		0.027	0.020	0.060	0.4 to 9.8	1.0				
		0.030	0.023	0.075	0.4 to 9.8	1.1				
	0.035	0.025	0.075	0.4 to 11.8	1.2	3 600				
I	0.035	0.025	0.095	0.4 to 11.8	1.4	2 700	3 400			
	0.040	0.027	0.095	0.4 to 11.8	1.5	2 200	3 400			
	0.046	0.03	0.120	0.4 to 11.8	1.7	1 400	2 300			

3. Service temperature range is 0 to 80°C.

4. Use of NSK support unit is recommended. Refer to pages 46 to 51 for details.

Compact FA Series

Screw shaft diameter 15 mm, Lead 20 and 30 mm

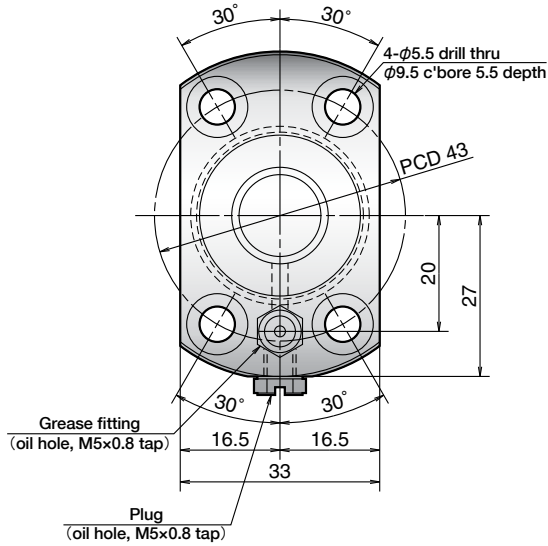


Reference no.	Screw shaft dia. d	Lead ℓ	Basic load ratings (N)		Stroke		Nut length L	Screw shaft dimensions			
			Dynamic C _a	Static C _{0a}	Nominal	Max. L _t -L		L _t	L _a	L ₀	L ₁
PSS1520N1D0261	15	20	5 070	8 730	100	135	51	186	204	261	18
PSS1520N1D0361					200	235		286	304	361	
PSS1520N1D0461					300	335		386	404	461	
PSS1520N1D0561					400	435		486	504	561	
PSS1520N1D0661					500	535		586	604	661	
PSS1520N1D0761					600	635		686	704	761	
PSS1520N1D0879					700	735		786	804	879	
PSS1520N1D0979					800	835		886	904	979	
PSS1520N1D1179					1 000	1 035		1 086	1 104	1 179	
PSS1530N1D0311	15	30	5 070	8 730	100	159	71	230	254	311	24
PSS1530N1D0411					200	259		330	354	411	
PSS1530N1D0511					300	359		430	454	511	
PSS1530N1D0611					400	459		530	554	611	
PSS1530N1D0711					500	559		630	654	711	
PSS1530N1D0811					600	659		730	754	811	
PSS1530N1D0929					700	759		830	854	929	
PSS1530N1D1029					800	859		930	954	1 029	
PSS1530N1D1229					1 000	1 059		1 130	1 154	1 229	

Notes 1. Indicates ball screw preload control value. Approximately 2.0 N•cm of torque is added due to thin plastic seals.
2. Contact NSK if permissible rotational speed is to be exceeded.

PSS Type for General Use

Unit : mm



Cross-section X-X

Ball screw specification

Preload type	Oversize ball (P-preload)
Ball dia./screw shaft root dia.	3.175 / 12.2
Ball circle dia.	15.5
Accuracy grade/axial play	C5 / 0
Factory-packed grease	NSK grease LR3

Recommended support unit

For drive side (Fixed)	For opposite to drive side	
	(Fixed)	(Simple)
WBK12-01B (square, low) P 46-47	WBK10-01B (square, low) P 46-47	WBK12S-01B (square, low) P 50-51
WBK12-11 (round) P 48-49	WBK10-11 (round) P 48-49	-

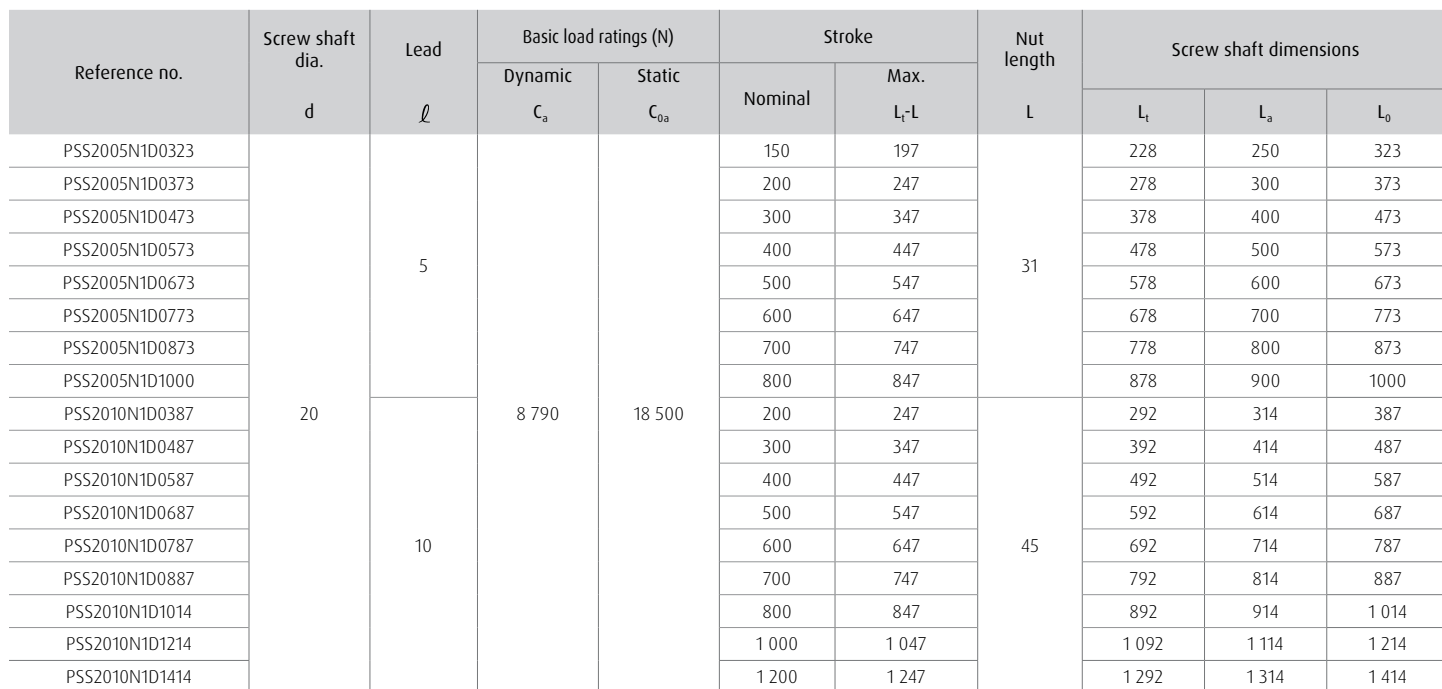
Unit : mm

Left shaft end (opposite driven side)	Lead accuracy			Shaft run-out	Dynamic preload torque	Mass	Permissible rotational speed (min ⁻¹) ²		Internal spatial volume of nut	Standard volume of grease replenishing
	Target value T	Error e _p	Variation V _u				Fixed-simple	Fixed-Fixed		
II	0	0.020	0.018	0.035	0.8 to 8.8	0.7	5 000	—	2.8	1.4
		0.023	0.018	0.045	0.8 to 8.8	0.8				
		0.025	0.020	0.050	0.8 to 10.8	0.9				
		0.027	0.020	0.060	0.8 to 10.8	1.1				
		0.030	0.023	0.075	0.8 to 10.8	1.2				
		0.035	0.025	0.075	0.8 to 13.8	1.3	3 700			
I		0.035	0.025	0.095	0.8 to 13.8	1.5	2 900	4 200		
		0.040	0.027	0.095	0.8 to 13.8	1.6	2 200	3 300		
		0.046	0.030	0.120	0.8 to 13.8	1.9	1 500	2 200		
II		0.023	0.018	0.035	1.2 to 9.3	0.8	5 000	—	3.4	1.7
		0.025	0.020	0.050	0.8 to 10.8	1.0				
		0.027	0.020	0.060	0.8 to 10.8	1.1				
		0.030	0.023	0.060	0.8 to 10.8	1.2				
		0.030	0.023	0.075	0.8 to 13.8	1.4	4 500			
		0.035	0.025	0.095	0.8 to 13.8	1.5	3 300			
I		0.040	0.027	0.095	0.8 to 13.8	1.6	2 600	3 800		
		0.040	0.027	0.120	0.8 to 13.8	1.8	2 000	3 000		
		0.046	0.030	0.120	0.8 to 13.8	2.0	1 400	2 000		

3. Service temperature range is 0 to 80°C.

4. Use of NSK support unit is recommended. Refer to pages 46 to 51 for details.

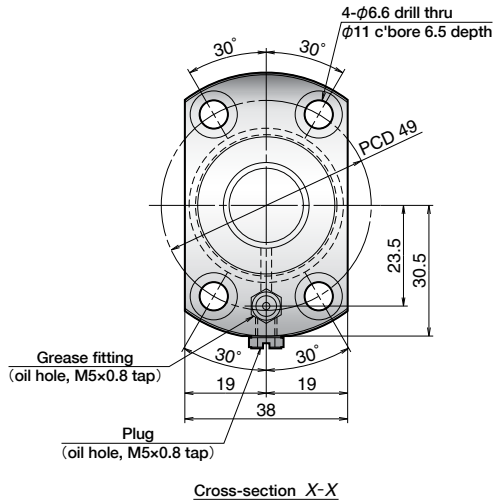
Screw shaft diameter 20 mm, Lead 5 and 10 mm



20

PSS Type for General Use

Unit : mm



Ball screw specification

Preload type	Oversize ball (P-preload)
Ball dia./screw shaft root dia.	3.175 / 17.2
Ball circle dia.	20.5
Accuracy grade/axial play	C5 / 0
Factory-packed grease	NSK grease LR3

Recommended support unit

For drive side (Fixed)	For opposite to drive side	
	(Fixed)	(Simple)
WBK15-01B (square, low) P 46-47	WBK15-01B (square, low) P 46-47	WBK15S-01B (square, low) P 50
WBK15-11 (round) P 48-49	WBK15-11 (round) P 48-49	-

Unit : mm

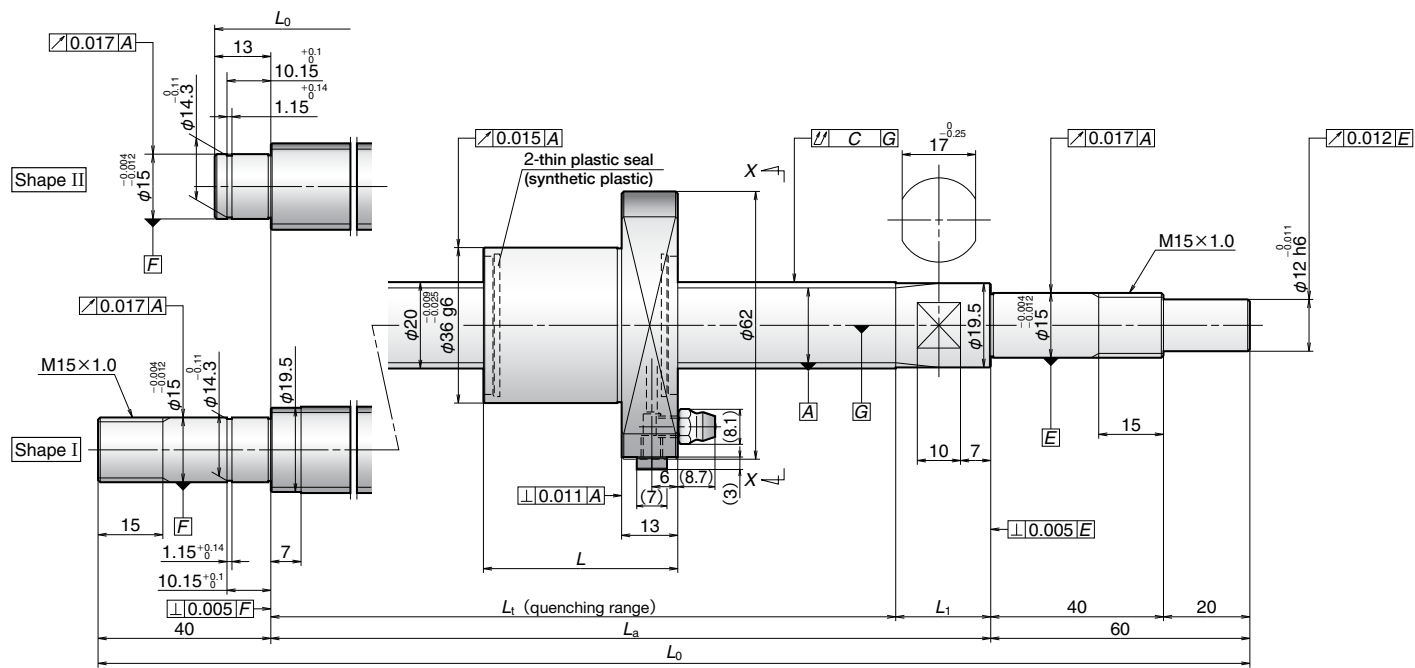
Left shaft end (opposite driven side)	Lead accuracy			Shaft run-out	Dynamic preload torque	Mass	Permissible rotational speed (min ⁻¹) ²		Internal spatial volume of nut	Standard volume of grease replenishing
	Target value	Error	Variation				Fixed-simple	Fixed-Fixed		
	T	e _p	V _a	C	(N·cm) ⁻¹	(kg)			(cm ³)	(cm ³)
II	0	0.023	0.018	0.045	0.6 to 7.4	1.0	5 000	—	3.4	1.7
		0.023	0.018	0.045	0.6 to 7.4	1.1				
		0.025	0.020	0.050	0.6 to 7.4	1.3				
		0.027	0.020	0.060	0.4 to 9.8	1.5				
		0.030	0.023	0.075	0.4 to 9.8	1.7				
		0.035	0.025	0.075	0.4 to 9.8	1.9				
I		0.035	0.025	0.095	0.4 to 9.8	2.2	4 000	4 700		
		0.040	0.027	0.095	0.4 to 11.8	2.4	3 200			
II		0.023	0.018	0.045	1.2 to 9.3	1.2	5 000	—	3.2	1.6
		0.025	0.020	0.050	1.2 to 9.3	1.4				
		0.027	0.020	0.060	0.8 to 10.8	1.7				
		0.030	0.023	0.075	0.8 to 10.8	1.9				
	0.035	0.025	0.075	0.8 to 10.8	2.1					
	0.035	0.025	0.095	0.8 to 10.8	2.4	4 000				
I	0.040	0.027	0.120	0.8 to 13.8	2.6	3 100	4 600			
	0.046	0.030	0.120	0.8 to 13.8	3.1	2 100	3 100			
	0.054	0.035	0.160	0.8 to 13.8	3.6	1 500	2 200			

3. Service temperature range is 0 to 80°C.

4. Use of NSK support unit is recommended. Refer to pages 46 to 51 for details.

Compact FA Series

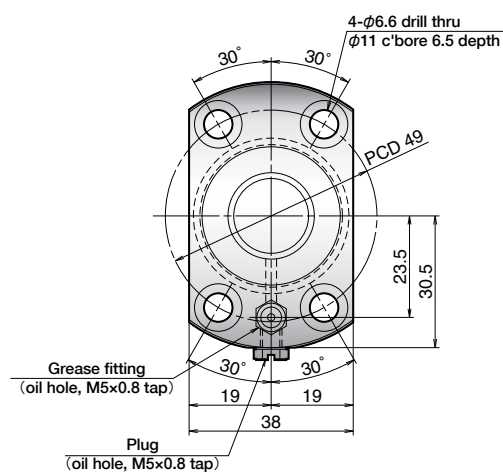
Screw shaft diameter 20 mm, Lead 20 and 30 mm



Reference no.	Screw shaft dia. d	Lead ℓ	Basic load ratings (N)		Stroke		Nut length L	Screw shaft dimensions			
			Dynamic C _a	Static C _{0a}	Nominal	Max. L _t -L		L _t	L _a	L ₀	L ₁
PSS2020N1D0508	20	20	5 900	11 700	300	359	54	413	435	508	22
PSS2020N1D0608					400	459		513	535	608	
PSS2020N1D0708					500	559		613	635	708	
PSS2020N1D0808					600	659		713	735	808	
PSS2020N1D0908					700	759		813	835	908	
PSS2020N1D1035					800	859		913	935	1 035	
PSS2020N1D1235					1 000	1 059		1 113	1 135	1 235	
PSS2020N1D1435					1 200	1 259		1 313	1 335	1 435	
PSS2020N1D1835					1 600	1 659		1 713	1 735	1 835	
PSS2030N1D0408	20	30	5 900	11 700	200	234	74	308	335	408	27
PSS2030N1D0508					300	334		408	435	508	
PSS2030N1D0608					400	434		508	535	608	
PSS2030N1D0708					500	534		608	635	708	
PSS2030N1D0808					600	634		708	735	808	
PSS2030N1D0908					700	734		808	835	908	
PSS2030N1D1035					800	834		908	935	1 035	
PSS2030N1D1235					1 000	1 034		1 108	1 135	1 235	
PSS2030N1D1435					1 200	1 234		1 308	1 335	1 435	

- Notes
1. Indicates ball screw preload control value. Approximately 2.0 N•cm of torque is added due to thin plastic seals.
 2. Contact NSK if permissible rotational speed is to be exceeded.

PSS Type for General Use



Cross-section *X-X*

Unit : mm

Ball screw specification	
Preload type	Oversize ball (P-preload)
Ball dia./screw shaft root dia.	3.175 / 17.2
Ball circle dia.	20.5
Accuracy grade/axial play	C5 / 0
Factory-packed grease	NSK grease LR3

Recommended support unit

For drive side (Fixed)		For opposite to drive side	
		(Fixed)	(Simple)
WBK15-01B (square, low) P 46-47		WBK15-01B (square, low) P 46-47	WBK15S-01B (square, low) P 50-51
WBK15-11 (round)	P 48-49	WBK15-11 (round)	P 48-49

Unit : mm

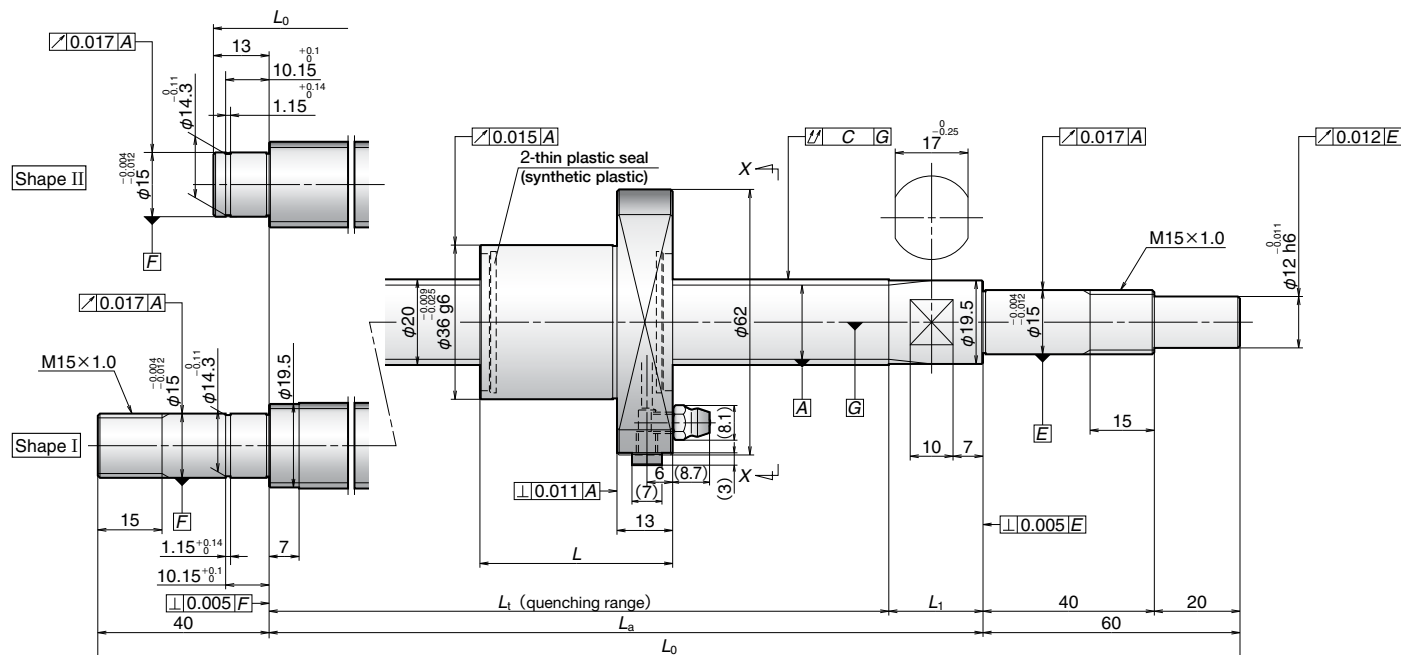
Left shaft end (opposite driven side)	Lead accuracy			Shaft run-out	Dynamic preload torque	Mass	Permissible rotational speed (min ⁻¹) ²		Internal spatial volume of nut	Standard volume of grease replenishing
	Target value T	Error ε _p	Variation V _u				Fixed-simple	Fixed-Fixed		
II	0	0.027	0.020	0.060	1.4 to 11.8	1.6	5 000	—	3.2	1.6
		0.030	0.023	0.060	1.4 to 11.8	1.8				
		0.030	0.023	0.075	1.4 to 11.8	2.0				
		0.035	0.025	0.095	1.4 to 11.8	2.3				
		0.040	0.027	0.095	0.8 to 13.8	2.5				
I		0.040	0.027	0.120	0.8 to 13.8	2.8	3 000	4 500		
		0.046	0.030	0.120	0.8 to 13.8	3.3	2 000	3 000		
		0.054	0.035	0.160	0.8 to 13.8	3.8	1 400	2 100		
		0.065	0.040	0.200	0.8 to 13.8	4.7	800	1 200		
		II	0.023	0.018	0.050	1.6 to 9.8	1.4	5 000		
0.027			0.020	0.060	1.4 to 11.8	1.7				
0.030			0.023	0.060	1.4 to 11.8	1.9				
0.030			0.023	0.075	1.4 to 11.8	2.1				
0.035			0.025	0.095	1.4 to 11.8	2.4				
0.040			0.027	0.095	0.8 to 13.8	2.6				
I	0.040	0.027	0.120	0.8 to 13.8	2.9	3 100	4 600			
	0.046	0.030	0.120	0.8 to 13.8	3.4	2 100	3 000			
	0.054	0.035	0.160	0.8 to 13.8	3.9	1 500	2 200			

3. Service temperature range is 0 to 80°C.

4. Use of NSK support unit is recommended. Refer to pages 46 to 51 for details.

Compact FA Series

Screw shaft diameter 20 mm, Lead 40 and 60 mm

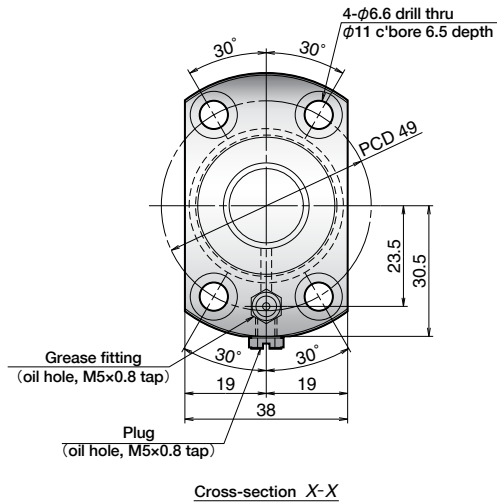


Reference no.	Screw shaft dia. d	Lead ℓ	Basic load ratings (N)		Stroke		Nut length L	Screw shaft dimensions			
			Dynamic C _a	Static C _{0a}	Nominal	Max. L _t -L		L _t	L _a	L ₀	L ₁
PSS2040N1D0658	20	40	5 900	11 700	400	461	92	553	585	658	32
PSS2040N1D0758					500	561		653	685	758	
PSS2040N1D0858					600	661		753	785	858	
PSS2040N1D0958					700	761		853	885	958	
PSS2040N1D1085					800	861		953	985	1 085	
PSS2040N1D1285					1 000	1 061		1 153	1 185	1 285	
PSS2040N1D1485					1 200	1 261		1 353	1 385	1 485	
PSS2040N1D1885					1 600	1 661		1 753	1 785	1 885	
PSS2040N1D2285					2 000	2 061		2 153	2 185	2 285	
PSS2060N1D0708	20	60	5 900	11 700	400	464	129	593	635	708	42
PSS2060N1D0808					500	564		693	735	808	
PSS2060N1D0908					600	664		793	835	908	
PSS2060N1D1008					700	764		893	935	1 008	
PSS2060N1D1135					800	864		993	1 035	1 135	
PSS2060N1D1335					1 000	1 064		1 193	1 235	1 335	
PSS2060N1D1535					1 200	1 264		1 393	1 435	1 535	
PSS2060N1D1935					1 600	1 664		1 793	1 835	1 935	
PSS2060N1D2335					2 000	2 064		2 193	2 235	2 335	

- Notes
1. Indicates ball screw preload control value. Approximately 2.0 N•cm of torque is added due to thin plastic seals.
 2. Contact NSK if permissible rotational speed is to be exceeded.

PSS Type for General Use

Unit : mm



Ball screw specification

Preload type	Oversize ball (P-preload)
Ball dia./screw shaft root dia.	3.175 / 17.2
Ball circle dia.	20.5
Accuracy grade/axial play	C5 / 0
Factory-packed grease	NSK grease LR3

Recommended support unit

For drive side (Fixed)	For opposite to drive side	
	(Fixed)	(Simple)
WBK15-01B (square, low) P 46-47	WBK15-01B (square, low) P 46-47	WBK15S-01B (square, low) P 50
WBK15-11 (round) P 48-49	WBK15-11 (round) P 48-49	-

Unit : mm

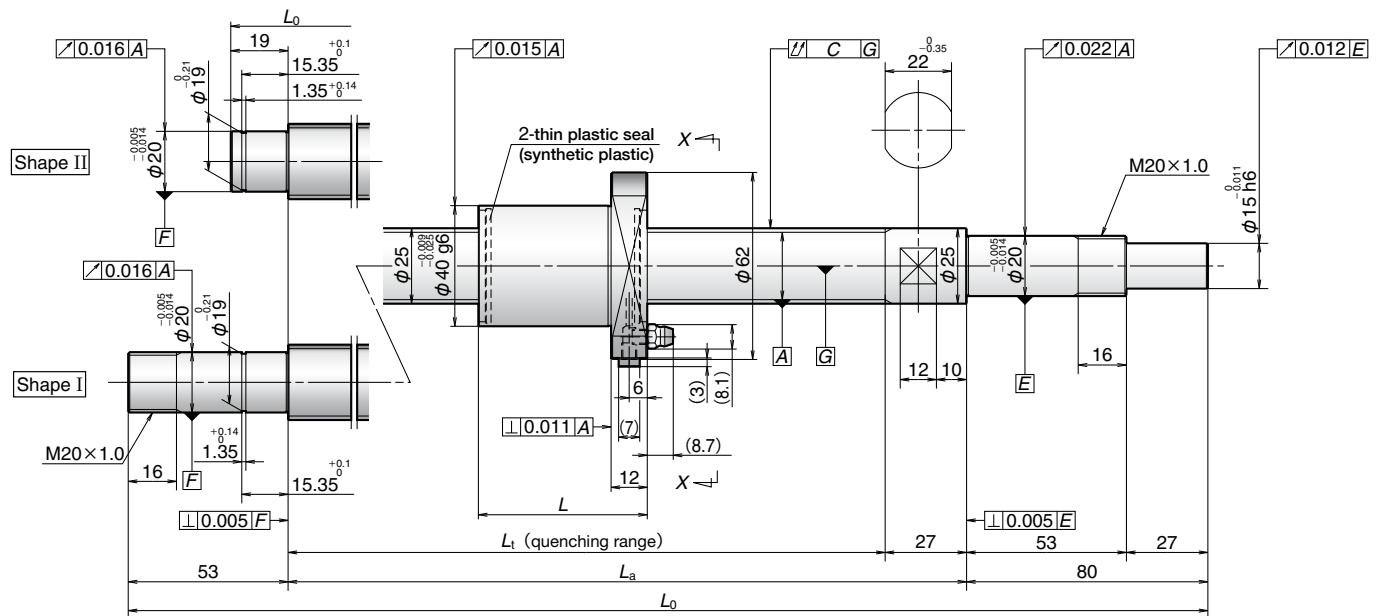
Left shaft end (opposite driven side)	Lead accuracy			Shaft run-out	Dynamic preload torque	Mass	Permissible rotational speed (min ⁻¹) ²		Internal spatial volume of nut	Standard volume of grease replenishing
	Target value T	Error e _p	Variation V _u				Fixed-simple	Fixed-Fixed		
II	0	0.030	0.023	0.075	2.2 to 12.8	2.1	5 000	—	5.3	2.7
		0.035	0.025	0.075	2.2 to 12.8	2.4				
		0.035	0.025	0.095	2.2 to 12.8	2.6				
		0.040	0.027	0.095	1.8 to 14.8	2.8				
I		0.040	0.027	0.120	1.8 to 14.8	3.1	2 800	4 200		
		0.046	0.030	0.160	1.8 to 14.8	3.6	1 900	2 800		
		0.054	0.035	0.160	1.8 to 14.8	4.1	1 400	2 000		
		0.065	0.040	0.200	1.8 to 14.8	5.1	800	1 200		
II		0.077	0.046	0.240	1.8 to 14.8	6.0	500	800		
		0.030	0.023	0.075	2.7 to 13.8	2.4	5 000	—	7.0	3.5
		0.035	0.025	0.095	2.7 to 13.8	2.6				
		0.035	0.025	0.095	2.7 to 13.8	2.9				
0.040		0.027	0.120	1.8 to 14.8	3.1	3 300				
I		0.040	0.027	0.120	1.8 to 14.8	3.4	2 600	3 900		
		0.046	0.030	0.160	1.8 to 14.8	3.9	1 800	2 700		
		0.054	0.035	0.160	1.8 to 14.8	4.4	1 300	1 900		
		0.065	0.040	0.200	1.8 to 14.8	5.4	800	1 100		
		0.077	0.046	0.240	1.8 to 14.8	6.3	500	700		

3. Service temperature range is 0 to 80°C.

4. Use of NSK support unit is recommended. Refer to pages 46 to 51 for details.

Compact FA Series

Screw shaft diameter 25 mm, Lead 5 and 10 mm

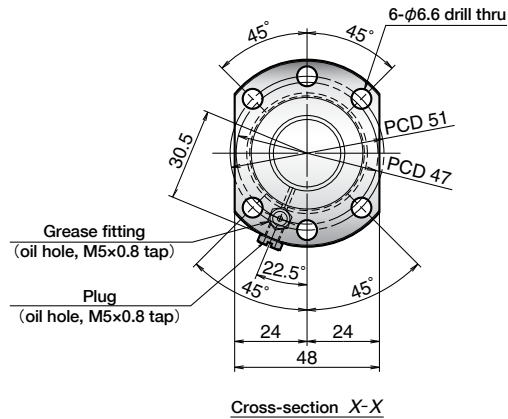


Reference no.	Screw shaft dia. d	Lead ℓ	Basic load ratings (N)		Stroke		Nut length L	Screw shaft dimensions		
			Dynamic C _a	Static C _{0a}	Nominal 	Max. L _t -L		L _t	L _a	L ₀
PSS2505N1D0349	25	5	9 760	23 600	150	191	32	223	250	349
PSS2505N1D0399					200	241		273	300	399
PSS2505N1D0499					300	341		373	400	499
PSS2505N1D0599					400	441		473	500	599
PSS2505N1D0699					500	541		573	600	699
PSS2505N1D0899					700	741		773	800	899
PSS2505N1D0999					800	841		873	900	999
PSS2505N1D1233					1 000	1 041		1 073	1 100	1 233
PSS2510N1D0549		10	12 800	32 300	300	367	56	423	450	549
PSS2510N1D0649					400	467		523	550	649
PSS2510N1D0749					500	567		623	650	749
PSS2510N1D0849					600	667		723	750	849
PSS2510N1D0949					700	767		823	850	949
PSS2510N1D1049					800	867		923	950	1 049
PSS2510N1D1283					1 000	1 067		1 123	1 150	1 283
PSS2510N1D1883					1 600	1 667		1 723	1 750	1 883

- Notes
1. Indicates ball screw preload control value. Approximately 2.0 N•cm of torque is added due to thin plastic seals.
 2. Contact NSK if permissible rotational speed is to be exceeded.

PSS Type for General Use

Unit : mm



Ball screw specification

Preload type	Oversize ball (P-preload)
Ball dia./screw shaft root dia.	3.175 / 22.2
Ball circle dia.	25.5
Accuracy grade/axial play	C5 / 0
Factory-packed grease	NSK grease LR3

Recommended support unit

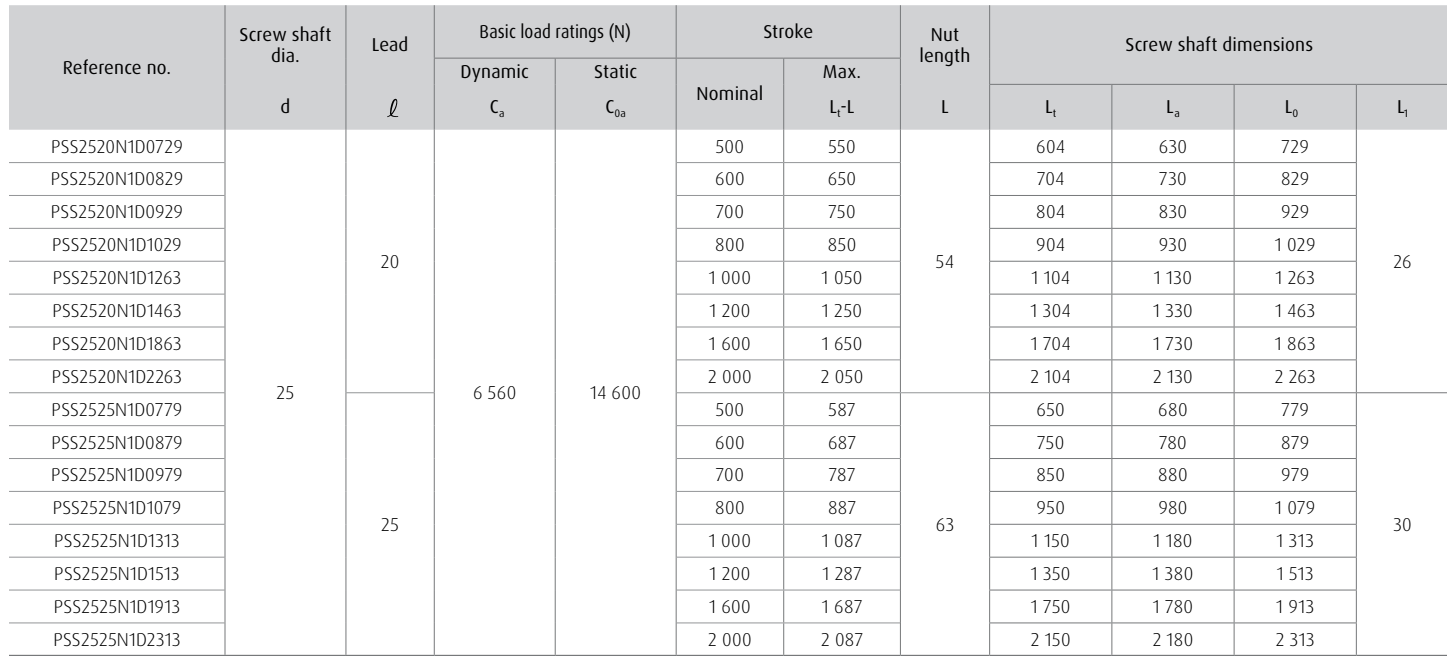
For drive side (Fixed)		For opposite to drive side	
		(Fixed)	(Simple)
WBK20-01 (square)	P 46-47	WBK20-01 (square) P 46-47	WBK20S-01 (square) P 50
WBK20-11 (round)	P 48-49	WBK20-11 (round) P 48-49	-

Unit : mm

Left shaft end (opposite driven side)	Lead accuracy			Shaft run-out	Dynamic preload torque	Mass	Permissible rotational speed (min ⁻¹) ²		Internal spatial volume of nut	Standard volume of grease replenishing	
	Target value	Error	Variation				Fixed-simple	Fixed-Fixed			
	T	e _p	V _u	C	(N·cm) ⁻¹	(kg)			(cm ³)	(cm ³)	
II	0	0.023	0.018	0.035	1.2 to 9.3	1.5	5 000	—	4.4	2.2	
		0.023	0.018	0.035	1.2 to 9.3	1.6					
		0.025	0.020	0.040	1.2 to 9.3	2.0					
		0.027	0.020	0.045	1.2 to 9.3	2.3					
		0.030	0.023	0.055	0.8 to 10.8	2.7					
		0.035	0.025	0.065	0.8 to 10.8	3.4					
0.040		0.027	0.065	0.8 to 10.8	3.7	4 100	4 000				
I		0.046	0.030	0.080	0.8 to 13.8	4.5		2 700			
II		0.027	0.020	0.045	3.1 to 11.8	2.4	5000	-	4.7	2.4	
		0.030	0.023	0.055	2.2 to 12.8	2.7					
		0.030	0.023	0.055	2.2 to 12.8	3.1					
		0.035	0.025	0.065	2.2 to 12.8	3.5					
		0.040	0.027	0.065	2.2 to 12.8	3.8					
		0.040	0.027	0.080	2.2 to 12.8	4.2	3 600				
I	0.046	0.030	0.100	1.8 to 14.8	5.0	2 500	3 700				
	0.065	0.040	0.130	1.8 to 14.8	7.2	1 000	1 600				

3. Service temperature range is 0 to 80°C.

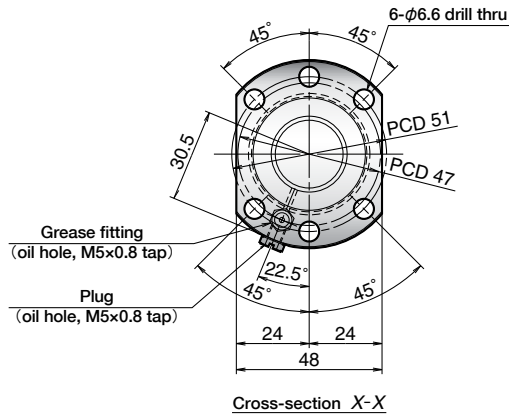
4. Use of NSK support unit is recommended. Refer to pages 46 to 51 for details.



28

PSS Type for General Use

Unit : mm



Ball screw specification	
Preload type	Oversize ball (P-preload)
Ball dia./screw shaft root dia.	3.175 / 22.2
Ball circle dia.	25.5
Accuracy grade/axial play	C5 / 0
Factory-packed grease	NSK grease LR3

Recommended support unit

For drive side (Fixed)		For opposite to drive side	
		(Fixed)	(Simple)
WBK20-01 (square)	P 46-47	WBK20-01 (square) P 46-47	WBK20S-01 (square) P 50
WBK20-11 (round)	P 48-49	WBK20-11 (round) P 48-49	-

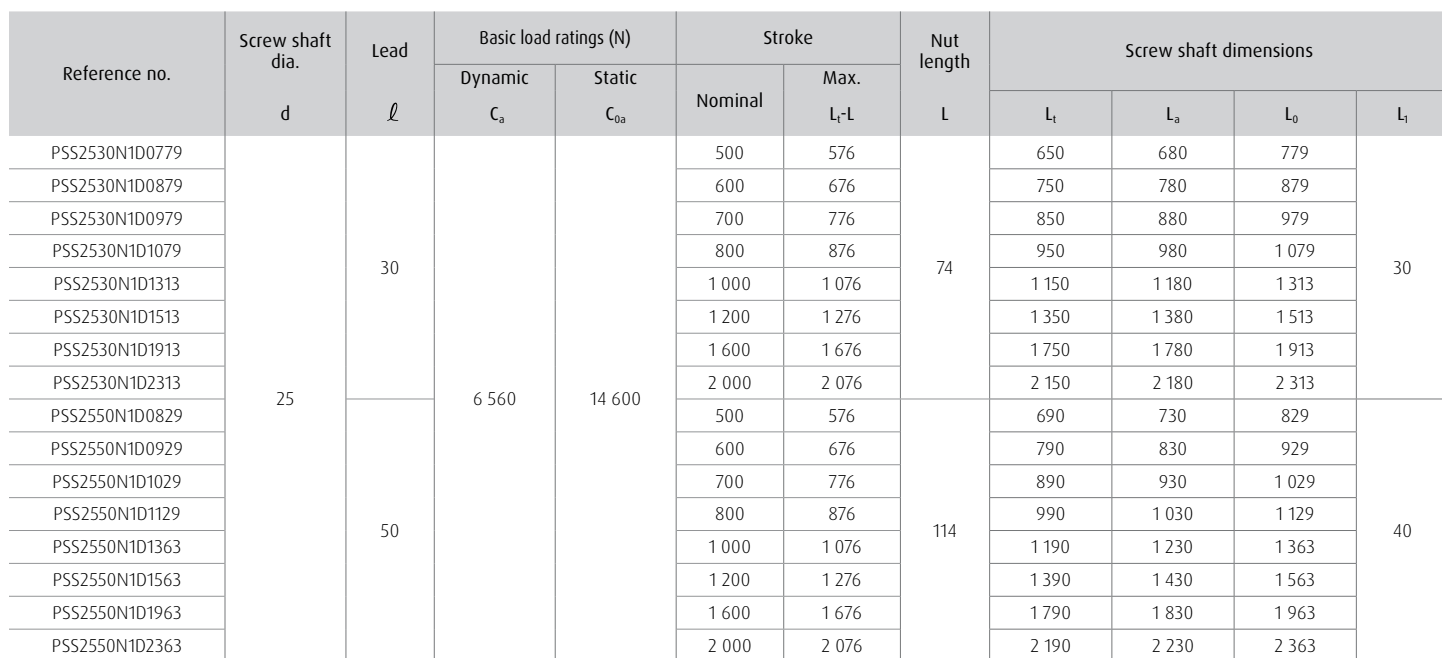
Unit : mm

Left shaft end (opposite driven side)	Lead accuracy			Shaft run-out C	Dynamic preload torque (N·cm) ⁻¹	Mass (kg)	Permissible rotational speed (min ⁻¹) ²		Internal spatial volume of nut (cm ³)	Standard volume of grease replenishing (cm ³)	
	Target value T	Error e _p	Variation V _u				Fixed-simple	Fixed-Fixed			
II	0	0.030	0.023	0.055	2.2 to 12.8	3.1	5 000	—	3.9	2.0	
		0.035	0.025	0.065	2.2 to 12.8	3.4					
		0.040	0.027	0.065	2.2 to 12.8	3.8					
		0.040	0.027	0.080	2.2 to 12.8	4.2					
I		0.046	0.030	0.100	1.8 to 14.8	5.0	2 600	3 800			
		0.054	0.035	0.100	1.8 to 14.8	5.8	1 800	2 700			
		0.065	0.040	0.130	1.8 to 14.8	7.3	1 100	1 600			
		0.077	0.046	0.170	1.8 to 14.8	8.8	700	1 000			
II		0.035	0.025	0.055	2.7 to 13.8	3.3	5 000	—	4.3	2.2	
		0.035	0.025	0.065	2.7 to 13.8	3.7					
		0.040	0.027	0.065	2.7 to 13.8	4.1					4 300
		0.040	0.027	0.080	2.7 to 13.8	4.4					3 400
I		0.046	0.030	0.100	1.8 to 14.8	5.3	2 300	3 500			
		0.054	0.035	0.100	1.8 to 14.8	6.0	1 700	2 600			
		0.065	0.040	0.130	1.8 to 14.8	7.5	1 000	1 500			
		0.077	0.046	0.170	1.8 to 14.8	9.1	700	1 000			

3. Service temperature range is 0 to 80°C.

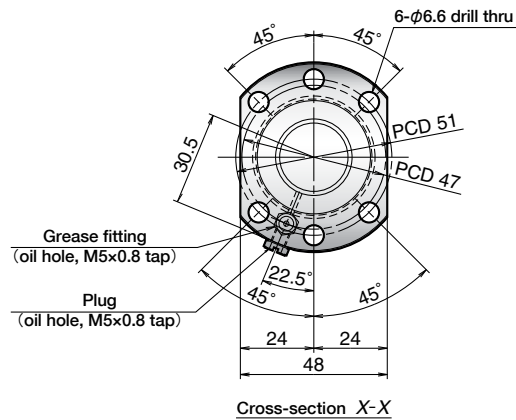
4. Use of NSK support unit is recommended. Refer to pages 46 to 51 for details.

Screw shaft diameter 25 mm, Lead 30 and 50 mm



30

PSS Type for General Use



Unit : mm

Ball screw specification	
Preload type	Oversize ball (P-preload)
Ball dia./screw shaft root dia.	3.175 / 22.2
Ball circle dia.	25.5
Accuracy grade/axial play	C5 / 0
Factory-packed grease	NSK grease LR3

Recommended support unit

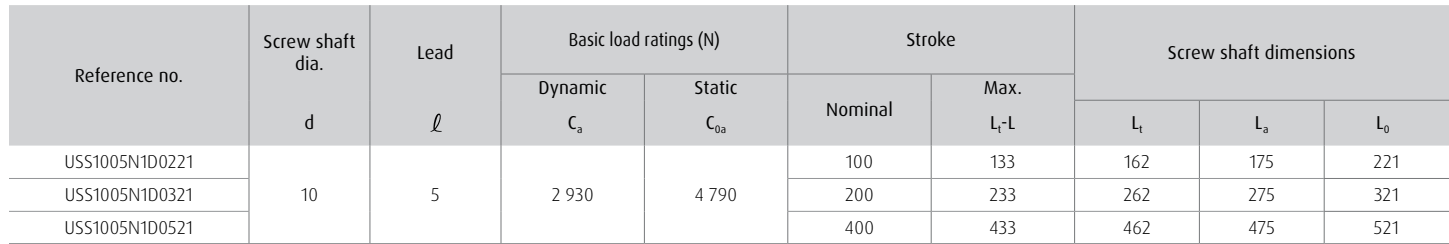
For drive side (Fixed)		For opposite to drive side	
		(Fixed)	(Simple)
WBK20-01 (square)	P 46-47	WBK20-01 (square) P 46-47	WBK20S-01 (square) P 50
WBK20-11 (round)	P 48-49	WBK20-11 (round) P 48-49	-

Unit : mm

Left shaft end (opposite driven side)	Lead accuracy			Shaft run-out C	Dynamic preload torque (N·cm) ¹	Mass (kg)	Permissible rotational speed (min ⁻¹) ²		Internal spatial volume of nut (cm ³)	Standard volume of grease replenishing (cm ³)
	Target value	Error	Variation				Fixed-simple	Fixed-Fixed		
	T	e _p	V _u							
II	0	0.035	0.025	0.055	2.7 to 13.8	3.4	5 000	—	5.5	2.8
		0.035	0.025	0.065	2.7 to 13.8	3.7				
		0.040	0.027	0.065	2.7 to 13.8	4.1				
		0.040	0.027	0.080	2.7 to 13.8	4.5				
I		0.046	0.030	0.100	1.8 to 14.8	5.3	2 300	3 600		
		0.054	0.035	0.100	1.8 to 14.8	6.1	1 700	2 600		
		0.065	0.040	0.130	1.8 to 14.8	7.6	1 000	1 500		
		0.077	0.046	0.170	1.8 to 14.8	9.1	700	1 000		
II		0.035	0.025	0.065	5.4 to 17.6	3.8	5 000	—	7.7	3.9
		0.035	0.025	0.065	5.4 to 17.6	4.1	4 800			
		0.040	0.027	0.080	5.4 to 17.6	4.5	3 800			
		0.040	0.027	0.080	5.4 to 17.6	4.9	3 100			
I		0.046	0.030	0.100	4.1 to 19.6	5.8	2 200	3 400		
		0.054	0.035	0.100	4.1 to 19.6	6.5	1 600	2 500		
		0.065	0.040	0.130	4.1 to 19.6	8.0	900	1 500		
		0.077	0.046	0.170	4.1 to 19.6	9.6	600	1 000		

3. Service temperature range is 0 to 80°C.

4. Use of NSK support unit is recommended. Refer to pages 46 to 51 for details.



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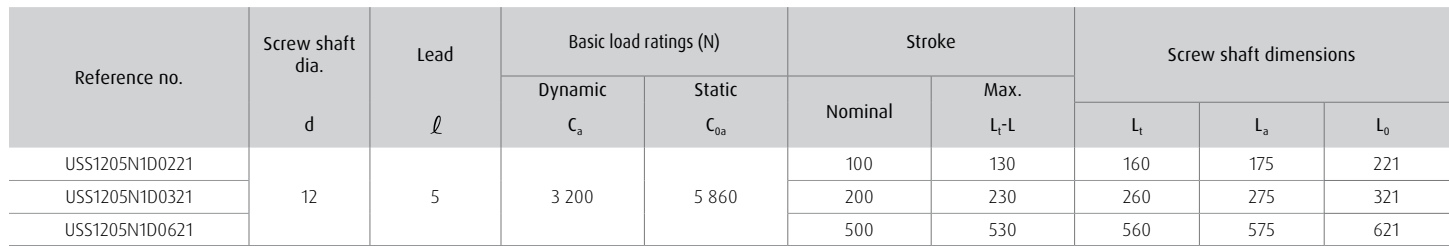


Ball screw specification	
Shaft dia.	Ø10
Preload type	Oversize ball (P-preload)
Ball dia./screw shaft root dia.	2.000 / 8.2
Ball circle dia.	10.3
Accuracy grade/axial play	C3 / 0
Factory-packed grease	NSK clean grease LG2

For drive side (Fixed)		For opposite to drive side (Simple)	
WBK08-01B (square, low)	P 46-47	WBK08S-01B (square, low)	P 50
WBK08-11 (round)	P 48-49	WBK08S-01C (square, clean)	P 50
WBK08-01C (square, clean)	P 46-47	-	
WBK08-11C (round, clean)	P 48-49	-	

Unit : mm

- 33



4- ϕ 4.5 drill thru
 ϕ 8 c'bore 4.5 depth

30 30

PCD 34

14.5

21.5

30 30

13.5 13.5

27

Grease fitting
 (oil hole, M5x0.8 tap)

Plug
 (oil hole, M5x0.8 tap)

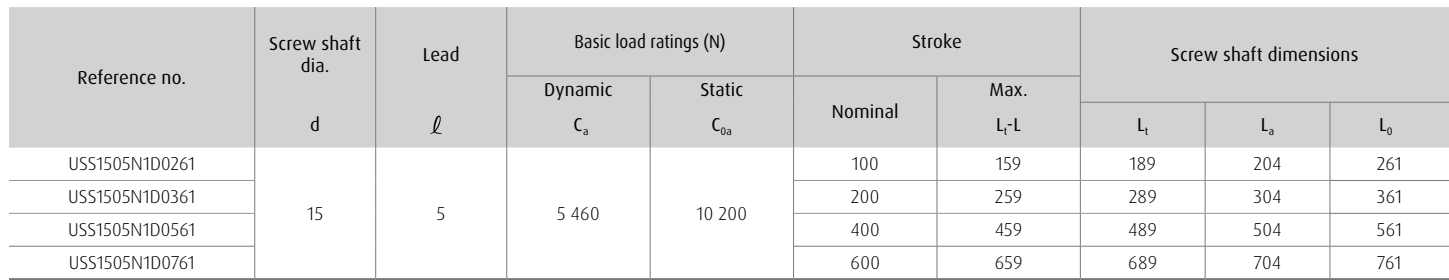
Cross-section X-X

Shaft dia.	Ø12
Preload type	Oversize ball (P-preload)
Ball dia./screw shaft root dia.	2.000 / 10.2
Ball circle dia.	12.3
Accuracy grade/axial play	C3 / 0
Factory-packed grease	NSK clean grease LG2

For drive side (Fixed)		For opposite to drive side (Simple)	
WBK08-01B (square, low)	P 46-47	WBK08S-01B (square, low)	P 50
WBK08-11 (round)	P 48-49	WBK08S-01C (square, clean)	P 50
WBK08-01C (square, clean)	P 46-47	-	
WBK08-11C (round, clean)	P 48-49	-	

Lead accuracy			Shaft run-out	Dynamic preload torque	Mass	Permissible rotational speed (min ⁻¹) ¹	Internal spatial volume of nut	Standard volume of grease replenishing
Target value	Error	Variation				Fixed-simple		
T	e _p	V _u	C	(N·cm) ⁻¹	(kg)		(cm ³)	(cm ³)
0	0.010	0.008	0.035	0.2 to 1.8	0.3	5 000	1	0.5
	0.012	0.008	0.045	0.2 to 2.0	0.3			
	0.016	0.012	0.070	0.2 to 3.0	0.7			

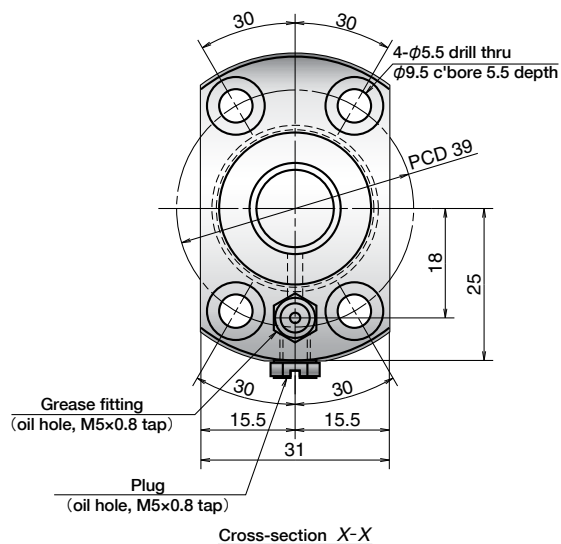
- 35



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USS Type for High-Accuracy and Clean Room Use

Unit : mm



Ball screw specification	
Shaft dia.	Ø15
Preload type	Oversize ball (P-preload)
Ball dia./screw shaft root dia.	2.778 / 12.6
Ball circle dia.	15.5
Accuracy grade/axial play	C3 / 0
Factory-packed grease	NSK clean grease LG2

Recommended support unit

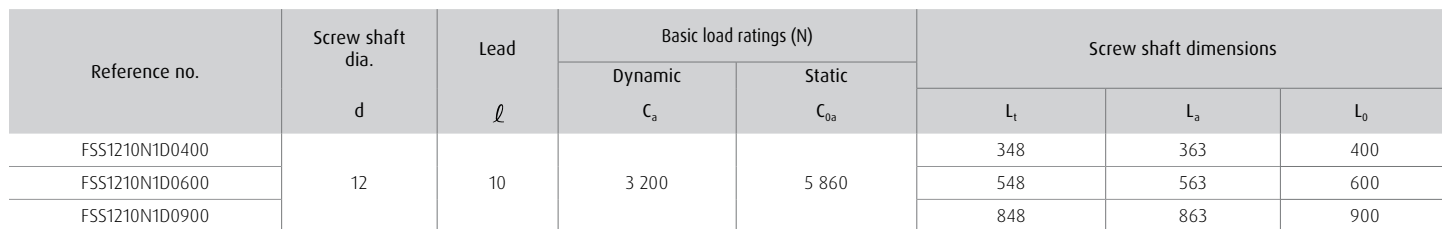
For drive side (Fixed)		For opposite to drive side (Simple)	
WBK12-01B (square, low)	P 46-47	WBK12S-01B (square, low)	P 50
WBK12-11 (round)	P 48-49	WBK12S-01C (square, clean)	P 50
WBK12-01C (square, clean)	P 46-47	-	
WBK12-11C (round, clean)	P 48-49	-	

Unit : mm

Lead accuracy			Shaft run-out	Dynamic preload torque	Mass	Permissible rotational speed (min ⁻¹) ^{1,2}	Internal spatial volume of nut	Standard volume of grease replenishing
Target value	Error	Variation				Fixed-simple		
T	e _p	v _u	C	(N·cm) ¹	(kg)		(cm ³)	(cm ³)
0	0.010	0.008	0.025	0.2 to 5.0	0.5	5 000	2	1
	0.012	0.008	0.035	0.2 to 5.0	0.6			
	0.015	0.010	0.045	0.2 to 6.0	0.9			
	0.018	0.013	0.060	0.2 to 8.0	1.1	3 600		

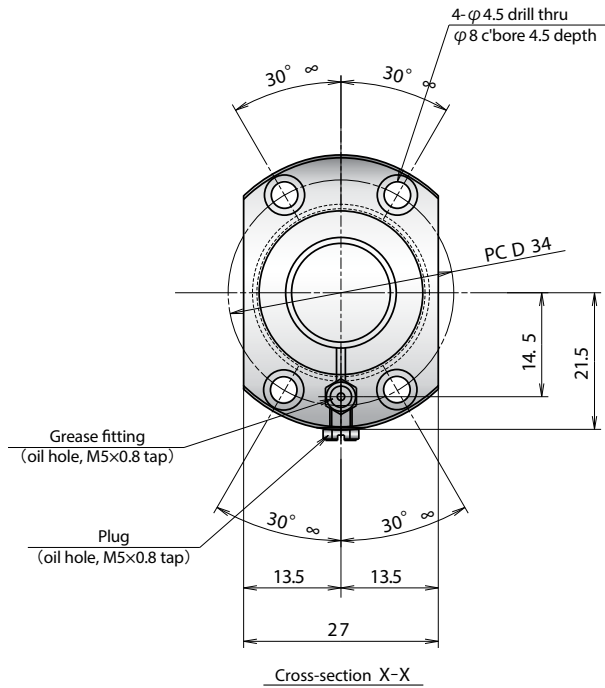
- Service temperature range is 0 to 80°C.
- Use of NSK support unit is recommended. Refer to pages 46 to 50 for details.

Screw shaft diameter 12 mm, Lead 10 mm



38

FSS Type for Transfer Equipment



Unit : mm

Ball screw specification	
Ball dia./screw shaft root dia.	2.000 / 10.2
Ball circle dia.	12.3
Accuracy grade/axial play	Ct7 / 0.010 or less
Factory-packed grease	NSK grease LR3

Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK08-01B (square, low) P 46-47	WBK12SF-01B (square, low) P 51

Unit : mm

Lead accuracy			Shaft run-out	Mass	Internal spatial volume of nut	Standard volume of grease replenishing
Target value	Error	Variation				
T	e _p	v _u	C	(kg)	(cm ³)	(cm ³)
0	0.120	0.052	0.08	0.5	1.0	0.5
	0.195		0.12	0.7		
	0.310		0.18	1.0		

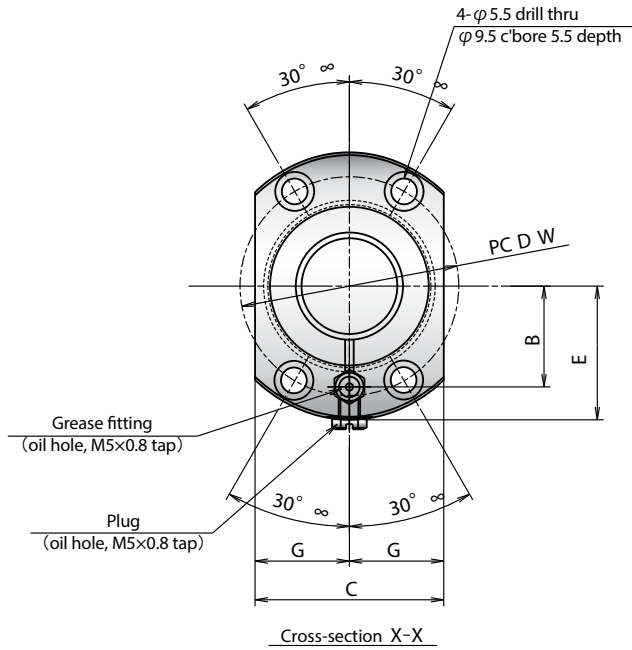
- Service temperature range is 0 to 80°C.
- Use of NSK support unit is recommended. Refer to pages 46 to 51 for details.

1. Approximately 2.0 N•cm of torque is added due to thin plastic seals.

* Critical speed which is the resonance vibration of the shaft.

INTERMITTENT ROTATION OF SPEEDS

FSS Type for Transfer Equipment



Unit : mm

Ball screw specification		
Lead	10	20
Ball dia./screw shaft root dia.	2.778 / 12.6	3.175 / 12.2
Ball circle dia.	15.5	
Accuracy grade/axial play	Ct7 / 0.010 or less	
Factory-packed grease	NSK grease LR3	

Recommended support unit

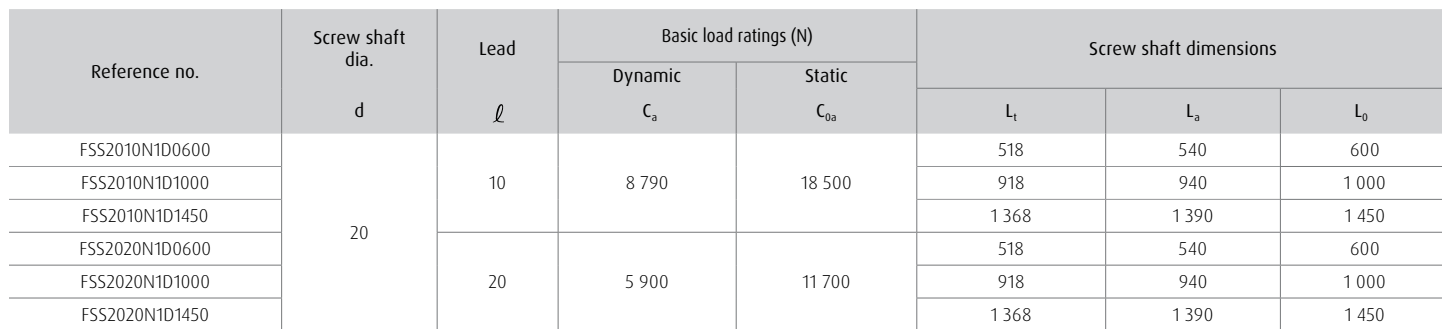
For drive side (Fixed)		For opposite to drive side (Simple)	
WBK12-01B (square, low)	P 46-47	WBK15SF-01B (square, low)	P 51

Unit : mm

Nut dimensions								Lead accuracy			Shaft run-out	Mass	Internal spatial volume of nut	Standard volume of grease replenishing
L	D ₁	D ₂	W	B	C	E	G	Target value	Error	Variation				
								T	e _p	V _u	C	(kg)	(cm ³)	(cm ³)
43	28	51	39	18	31	25	15.5	0	0.155	0.052	0.070	0.9	2.0	1.0
									0.310		0.125	1.7		
									0.490		0.200	2.3		
51	32	55	43	20	33	27	16.5		0.155		0.070	1.0	2.8	1.4
									0.310		0.125	1.7		
									0.490		0.200	2.3		

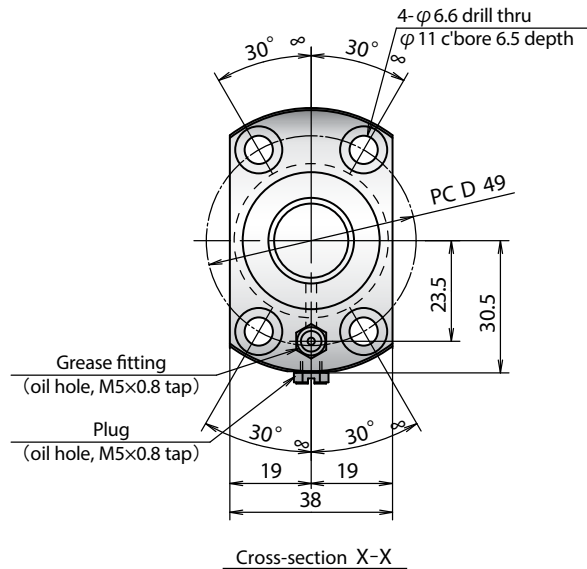
- Service temperature range is 0 to 80°C.
- Use of NSK support unit is recommended. Refer to pages 46 to 51 for details.

Screw shaft diameter 20 mm, Lead 10 and 20 mm



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FSS Type for Transfer Equipment



Unit : mm

Ball screw specification	
Ball dia./screw shaft root dia.	3.175 / 17.2
Ball circle dia.	20.5
Accuracy grade/axial play	Ct7 / 0.010 or less
Factory-packed grease	NSK grease LR3

Recommended support unit

For drive side (Fixed)		For opposite to drive side (Simple)	
WBK15-01B (square, low)	P 46-47	WBK20SF-01B (square, low)	P 51

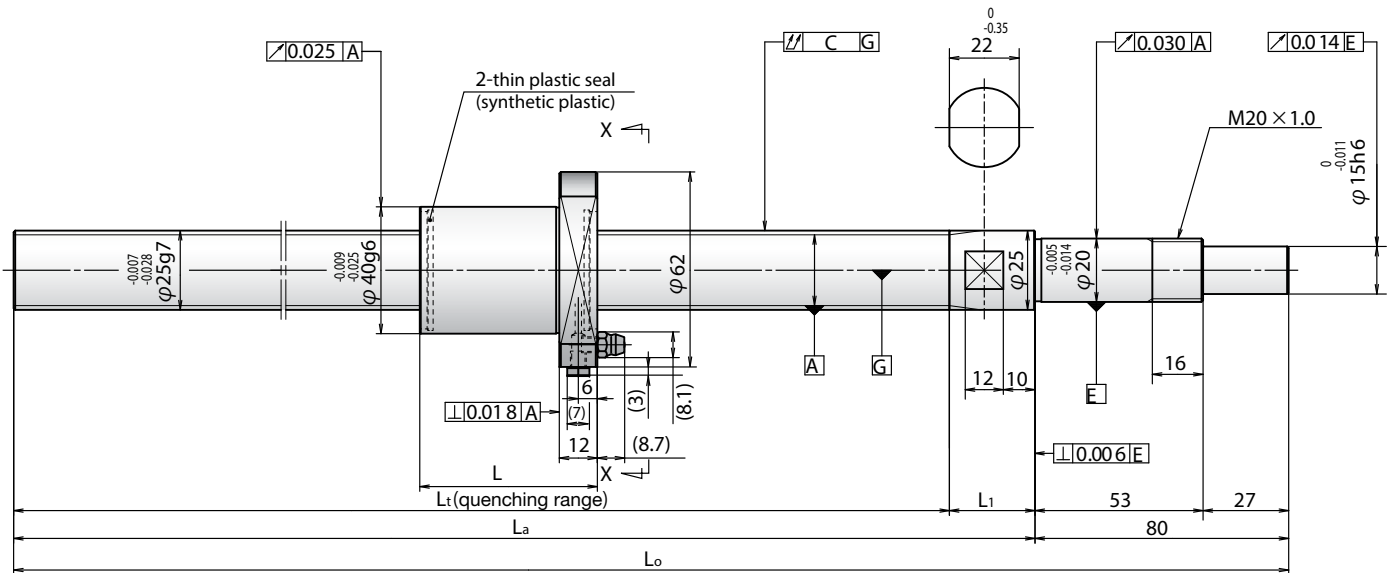
Unit : mm

Nut length	Lead accuracy			Shaft run-out	Mass	Internal spatial volume of nut	Standard volume of grease replenishing
L	Target value T	Error e _p	Variation V _u				
45	0	0.195	0.052	0.085	1.7	3.2	1.6
		0.310		0.125	2.6		
		0.490		0.200	3.6		
54		0.195		0.085	1.8		
		0.310		0.125	2.7		
		0.490		0.200	3.8		

- Service temperature range is 0 to 80°C.
- Use of NSK support unit is recommended. Refer to pages 46 to 51 for details.

Compact FA Series

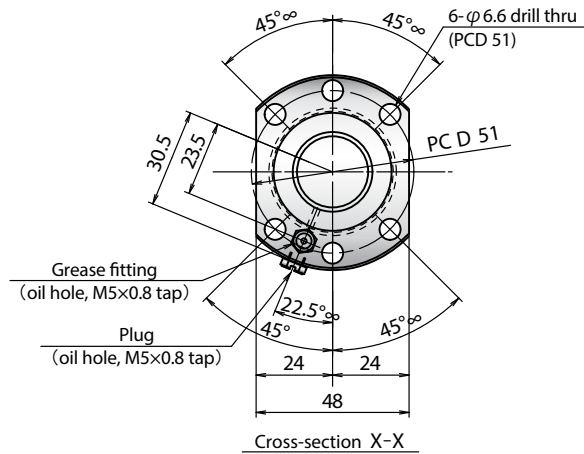
Screw shaft diameter 25 mm, Lead 10, 20 and 25 mm



Reference no.	Screw shaft dia. d	Lead	Basic load ratings (N)		Screw shaft dimensions			
			Dynamic C _a	Static C _{0a}				
	L _t	L _a	L ₀	L ₁				
FSS2510N1D0600	25	10	12 800	32 300	493	520	600	27
FSS2510N1D1000					893	920	1 000	
FSS2510N1D1450					1 343	1 370	1 450	
FSS2520N1D0600		20	6 560	14 600	494	520	600	26
FSS2520N1D1000					894	920	1 000	
FSS2520N1D1450					1 344	1 370	1 450	
FSS2525N1D0600		25			490	520	600	30
FSS2525N1D1000					890	920	1 000	
FSS2525N1D1450					1 340	1 370	1 450	

- Notes
1. Approximately 2.0 N•cm of torque is added due to thin plastic seals.
 2. Permissible rotational speed varies when using cut screws shaft. It is necessary to calculate two items below, and whichever is smaller is the permissible rotational speed.
 - * Critical speed which is the resonance vibration of the shaft.
 - * Maximum rotational speed 5000 min⁻¹.

FSS Type for Transfer Equipment



Unit : mm

Ball screw specification	
Ball dia./screw shaft root dia.	3.175 / 22.2
Ball circle dia.	25.5
Accuracy grade/axial play	Ct7 / 0.010 or less
Factory-packed grease	NSK grease LR3

Recommended support unit

For drive side (Fixed)		For opposite to drive side (Simple)	
WBK20-01 (square)	P 46-47	WBK25SF-01 (square)	P 51

Unit : mm

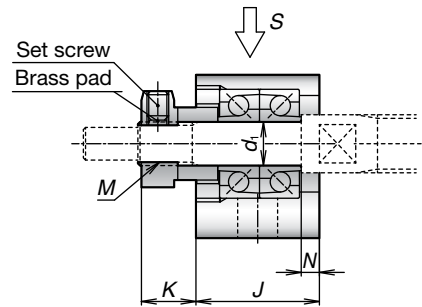
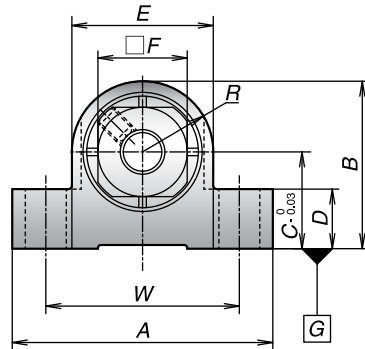
Nut length	Lead accuracy			Shaft run-out	Mass	Internal spatial volume of nut	Standard volume of grease replenishing
L	Target value T	Error e _p	Variation V _u				
56	0	0.155	0.052	0.065	2.6	4.7	2.4
		0.310		0.090	4.0		
		0.490		0.130	5.8		
54		0.155		0.065	2.6	3.9	2.0
		0.310		0.090	4.0		
		0.490		0.130	5.8		
63		0.155		0.065	2.6	4.3	2.2
		0.310		0.090	4.1		
		0.490		0.130	5.8		

- Service temperature range is 0 to 80°C.
- Use of NSK support unit is recommended. Refer to pages 46 to 51 for details.

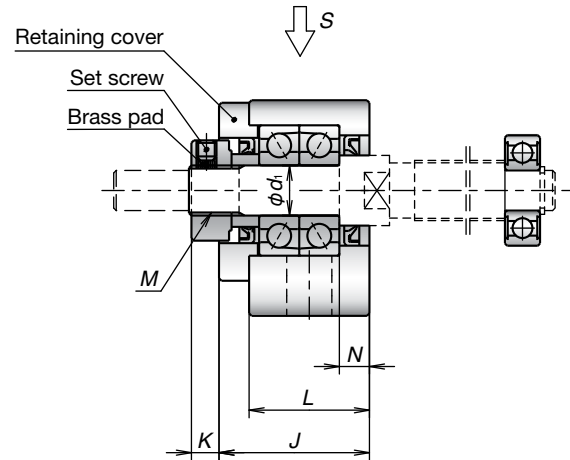
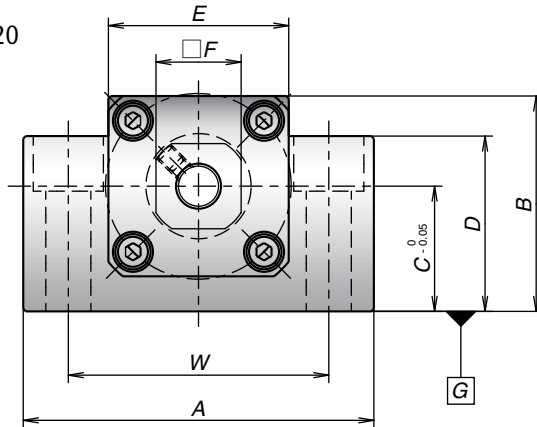
Support Units

Fixed support side support unit (square type)

WBK04 and 06



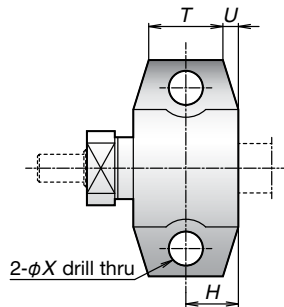
WBK08 to 20



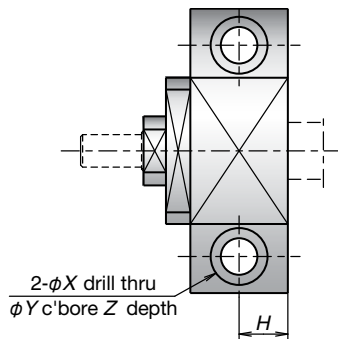
Reference no.	Use	d ₁	A	B	C	D	E	F	L	J	K	R	T	U	N
WBK04-01M	General	4	27	17.0	10.0	6	14	10	-	14.0	5.5	7.0	9	1.5	2.0
WBK06-01M	General	6	35	22.5	13.0	8	19	12	-	17.0	7.5	9.5	12	2.5	2.5
WBK08-01A	General	8	52	32.0	17.0	26	25	14	23.0	23.0	7.0	-	-	-	4.0
WBK08-01B	Low type		62	31.0	15.5	31	-		21.5	25.5	4.5				3.5
WBK08-01C	Clean		52	32.0	17.0	26	25		23.0	23.0	7.0				4.0
WBK10-01A	General	10	70	43.0	25.0	35	36	17	24.0	30.0	5.5	-	-	-	6.0
WBK10-01B	Low type			38.0	20.0	38	-								
WBK10-01C	Clean			43.0	25.0	35	36								
WBK12-01A	General	12	70	43.0	25.0	35	36	19	24.0	30.0	5.5	-	-	-	6.0
WBK12-01B	Low type			38.0	20.0	38	-								
WBK12-01C	Clean			43.0	25.0	35	36								
WBK15-01A	General	15	80	50.0	30.0	40	41	22	25.0	31.0	12.0	-	-	-	5.0
WBK15-01B	Low type			42.0	22.0	42	-								
WBK15-01C	Clean			50.0	30.0	40	41								
WBK20-01	General	20	95	58.0	30.0	45	56	30	42.0	52.0	10.0	-	-	-	10.0

- Notes
1. Use datum surface G 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.

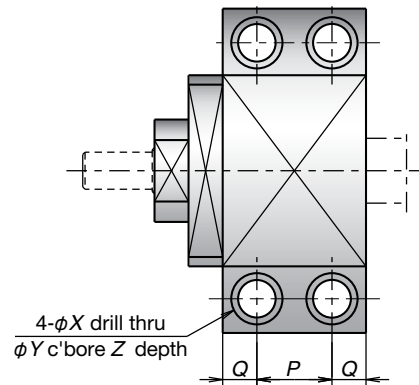
Square Type



View S (WBK04 and 06)



View S (WBK08 to 15)



View S (WBK20)

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)
WBK20-**-	1 670	147 (M4)

Counterbore dimensions							Mass (kg)	Specification				Locknut screw	Attached bearing for support side
H	P	Q	W	X	Y	Z		Axial Direction			Maximum starting torque		
								Basic dynamic load rating	Load limit	Rigidity			
								C _a (N)	N	(N/μm)	(N·cm)		
7.0	-	-	21	3.5	-	-	0.03	1 470	464	39	0.20	M4×0.50	-
8.5	-	-	26	5.5	-	-	0.05	2 760	854	60	0.35	M6×0.75	-
11.5	-	-	38	6.6	11	12	0.25	4 400	1 450	49	0.88	M8×1.0	606ZZ
11.0			46	9.0	14	18	0.30	6 600	2 730	94	1.90		606VV
11.5			38	6.6	11	12	0.25	3 100	1 100	36	0.52		
12.0	-	-	52	9.0	14	11	0.50	6 600	2 730	94	1.90	M10×1.0	608ZZ
						19	0.45	6 600	2 730	94	1.90		608VV
						11	0.50	4 250	1 364	50	1.10		
12.0	-	-	52	9.0	14	11	0.50	7 100	3 040	104	2.10	M12×1.0	6000ZZ
						19	0.40	7 100	3 040	104	2.10		6000VV
						11	0.50	4 700	2 443	57	1.20		
12.5	-	-	60	11.0	17	15	0.70	7 600	3 380	113	2.40	M15×1.0	6002ZZ
						23	0.60	7 600	3 380	113	2.40		6002VV
						15	0.70	5 100	2 757	63	1.30		
-	22	10	75	11.0	17	15	1.40	17 900	8 240	155	6.20	M20×1.0	6204ZZ

Unit : mm

4. Deep groove ball bearing and snap ring are also provided for simple support side. (except WBK04-01M, WBK06-01M).

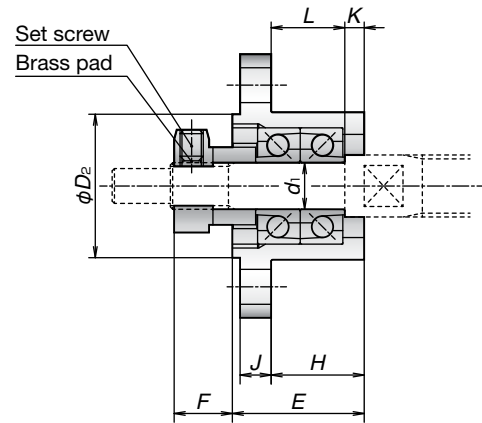
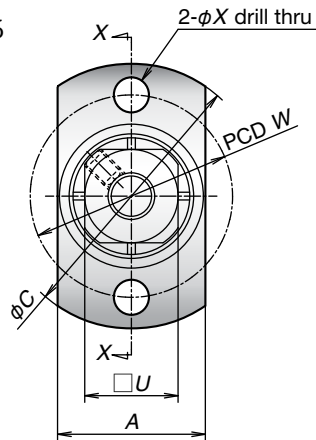
5. For retaining cover side of WBK08-01A and WBK08-01C, there are no seals.

6. For WBK04-01M and WBK06-01M, non-contact metal seals are installed in both sides of bearings.

Support Units

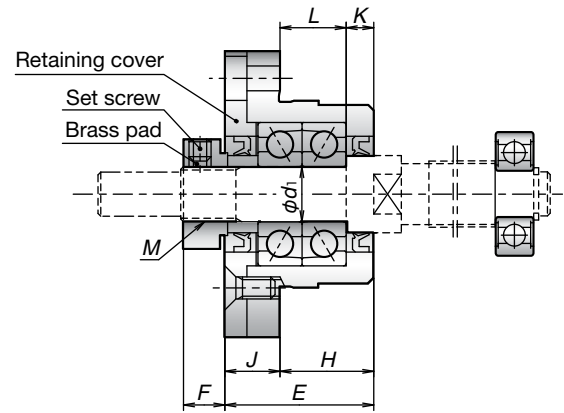
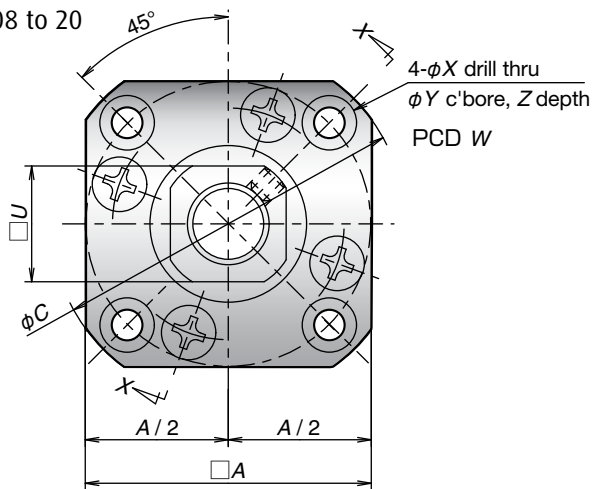
Fixed support side support unit (round type)

WBK04 and 06



Cross section X-X (Example 1)

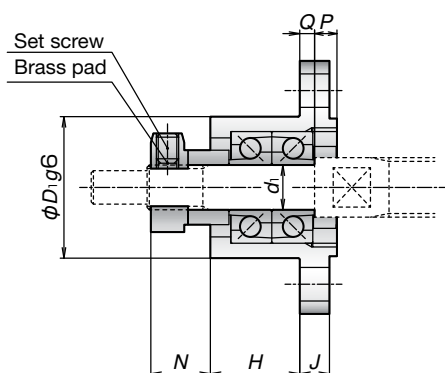
WBK08 to 20



View X-X (Example 1)

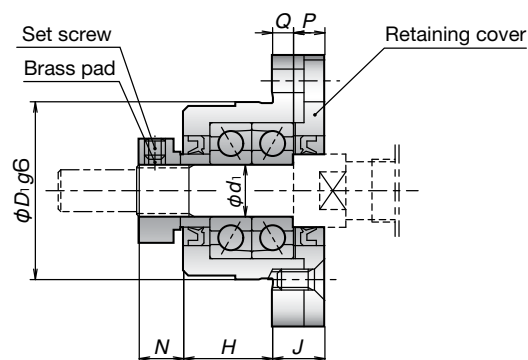
Reference no.	Use	d ₁	A	C	D ₁	D ₂	E	H	L	K	F	N	U	P	Q
WBK04-11M	General	4	14	26	14	14.0	13.5	8.5	7.0	1.5	5.5	6.6	10	2.6	2.4
WBK06-11M	General	6	19	34	19	18.5	17.0	12.0	9.5	2.5	7.5	8.0	12	3.0	2.0
WBK08-11B	High-load	8	42	52	34	-	25.5	15.5	12.0	3.5	4.5	7.0	14	6.0	4.0
WBK08-11	General		35	43	28		23.0	14.0	10.0	4.0	7.0	8.0		5.0	
WBK08-11C	Clean														
WBK10-11	General	10	42	52	34	-	27.0	17.0	12.0	5.0	7.5	8.5	17	6.0	4.0
WBK10-11C	Clean	12	44	54	36	-	27.0	17.0	12.0	5.0	7.5	8.5	19	6.0	4.0
WBK12-11	General														
WBK12-11C	Clean														
WBK15-11	General	15	52	63	40	-	32.0	17.0	11.0	6.0	12.0	14.0	22	8.0	7.0
WBK15-11C	Clean														
WBK20-11	General		68	85	57		52.0	30.0	20.0	10.0	10.0	14.0	30	14.0	8.0

- 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.



Cross section X-X (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)
WBK20-**	1 670	147 (M4)



View X-X (Example 2)

Unit : mm

Counterbore dimensions					Mass (kg)	Specification				Locknut screw	Attached bearing for support side
J	W	X	Y	Z		Axial Direction			Maximum starting torque		
						Basic dynamic load rating	Load limit	Rigidity			
						C _a (N)	N	(N/μm)	(N·cm)		
3	20	3.5	-	-	0.02	1 470	464	39	0.20	M4 × 0.50	-
4	26	4.5	-	-	0.04	2 760	854	60	0.35	M6 × 0.75	-
10	42	4.5	8.0	4	0.20	6 600	2 730	94	1.90	M8 × 1.0	606ZZ
9	35	3.4	6.5		0.15	4 400	1 450	49	0.88		606ZZ
						3 100	1 100	36	0.52		606VV
10	42	4.5	8.0	4	0.20	6 600	2 730	94	1.90	M10 × 1.0	608ZZ
						4 250	1 364	50	1.10		608VV
10	44	4.5	8.0	4	0.25	7 100	3 040	104	2.10	M12 × 1.0	6000ZZ
						4 700	2 443	57	1.20		6000VV
15	50	5.5	9.5	6	0.40	7 600	3 380	113	2.40	M15 × 1.0	6002ZZ
						5 100	2 757	63	1.30		6002VV
22	70	6.6	11.0	10	1.10	17 900	8 240	155	6.20	M20 × 1.0	6204ZZ

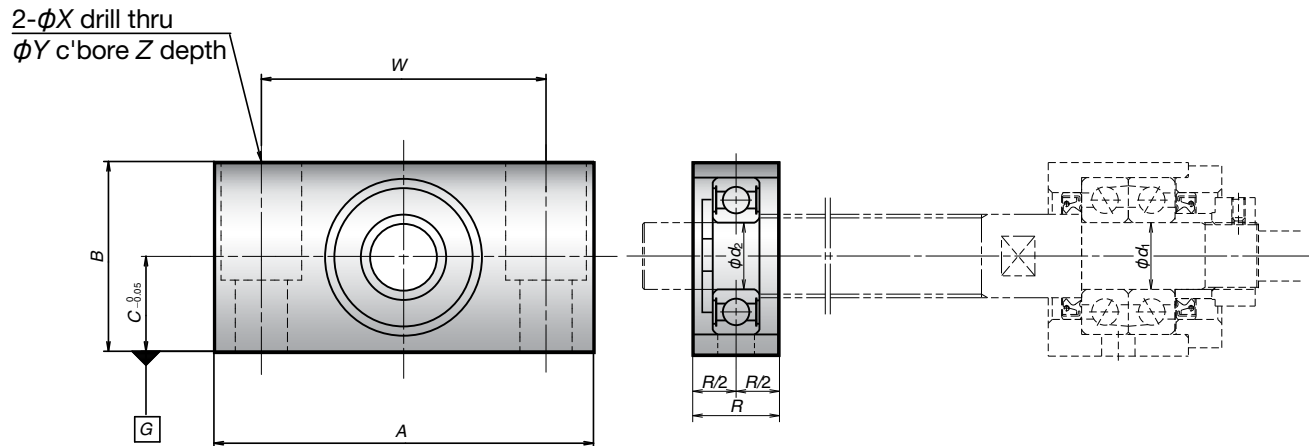
3. Deep groove ball bearing and snap ring are also provided for simple support side. (except WBK04-11M and WBK06-11M)

4. For retaining cover side of WBK08-11 and WBK08-11C, there are no seals.

5. For WBK04-11M and WBK06-11M, non-contact metal seals are installed in both sides of bearings.

Support Units for Simple Support Side

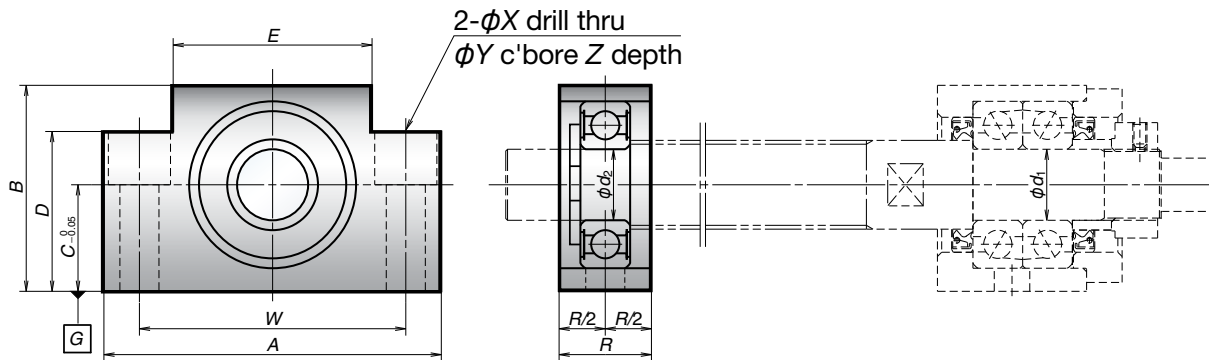
Simple support side support unit for PSS and USS types



Unit : mm

Reference no.	Use	d ₂	A	B	C	R	Counterbore dimensions				Mass (kg)	Bearing reference no.	Radial direction basic dynamic load rating (N)
							W	X	Y	Z			
WBK08S-01B	Low	6	62	31	15.5	16	46	9	14	18	0.2	606ZZ	2 260
WBK12S-01B	Low	10	70	38	20.0	20	52	9	14	19	0.4	6000ZZ	4 550
WBK15S-01B	Low	15	80	42	22.0	20	60	9	14	23	0.4	6002ZZ	5 600

Note 1. Use datum surface G for mounting to machine base.



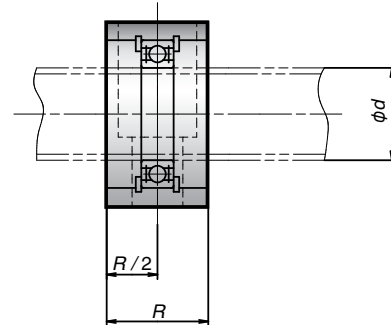
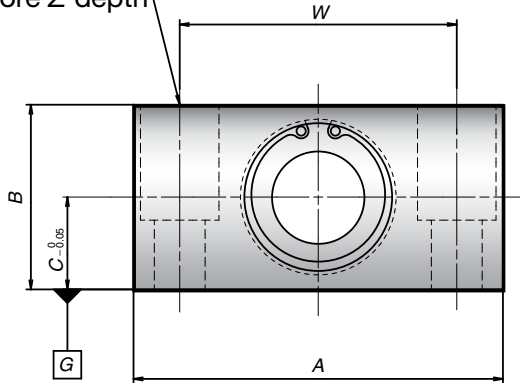
Unit : mm

Reference no.	Use	d ₂	A	B	C	D	E	R	Counterbore dimensions				Mass (kg)	Bearing reference no.	Radial direction basic dynamic load rating (N)
									W	X	Y	Z			
WBK08S-01	General	6	52	32	17	26	25	15	38	6.6	11	12	0.15	606ZZ	2 260
WBK08S-01C	Clean													606VV	2 260
WBK10S-01	General	8	70	43	25	35	36	20	52	9.0	14	11	0.40	608ZZ	3 300
WBK10S-01C	Clean													608VV	3 300
WBK12S-01	General	10	70	43	25	35	36	20	52	9.0	14	11	0.35	6000ZZ	4 550
WBK12S-01C	Clean													6000VV	4 550
WBK15S-01	General	15	80	50	30	40	41	20	60	9.0	14	11	0.45	6002ZZ	5 600
WBK15S-01C	Clean													6002VV	5 600
WBK20S-01	General	20	95	58	30	45	56	26	75	11.0	17	15	0.80	6204ZZ	12 800

Note 1. Use datum surface G for mounting to machine base.

Simple support side support unit for FSS types

2- ϕX drill thru
 ϕY c'bore Z depth

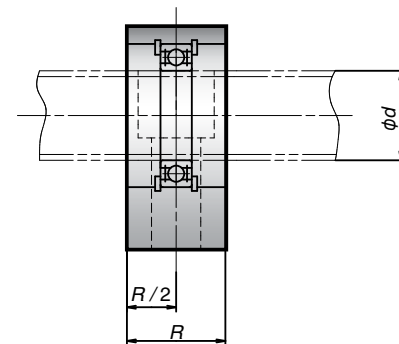
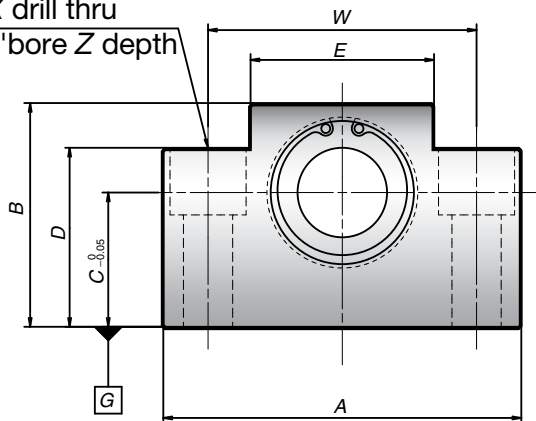


Unit : mm

Reference no.	d	A	B	C	R	Counterbore dimensions				Mass (kg)	Bearing reference no.	Radial direction basic dynamic load rating (N)
						W	X	Y	Z			
WBK12SF-01B	12	62	31	15.5	18	46	9	14	18	0.2	6801ZZ	1 920
WBK15SF-01B	15	70	38	20.0	18	52	9	14	19	0.3	6902ZZ	4 350
WBK20SF-01B	20	80	42	22.0	22	60	11	17	23	0.4	6804ZZ	4 000

Note 1. Use datum surface G for mounting to machine base.

2- ϕX drill thru
 ϕY c'bore Z depth



Unit : mm

Reference no.	d	A	B	C	D	E	R	Counterbore dimensions				Mass (kg)	Bearing reference no.	Radial direction basic dynamic load rating (N)
								W	X	Y	Z			
WBK25SF-01	25	95	58	30	45	56	22	75	11	17	15	0.55	6005ZZ	10 100

Note 1. Use datum surface G for mounting to machine base.

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